Bradford Town Plan

Adopted //2015

Bradford Planning Commission

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With special thanks to Larry Drew
for his 26 years on the Bradford Planning Commission

And with great appreciation and fond memories of Justin Klarich, who chaired the Planning Commission for six years, and who passed away before this plan was completed.

With assistance from the Conservation Commission, Public Safety Commission, Fire Department, Danielle Robinson, Town Administrative Assistant, Robert Wing, Town Zoning Administrator and the citizens of Bradford as well as Two Rivers Ottauquechee Regional Commission

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I. Introduction

Bradford is a town that has been able to retain a vibrant downtown even while expanding its commercial activities to the Lower Plain. Encouraging further development of this commercial area while supporting and expanding the vibrant commercial activity in the downtown is critically important to the ongoing vitality of the entire Bradford community. By focusing efforts to encourage economic growth and stability in its Central Business District, Lower Plain Commercial and the Industrial Park, the ongoing and expanding vitality of the town as a whole will be achieved. The Planning Commission with the support of the Selectboard has developed this town plan to serve as a policy statement for the growth and development of Bradford.

This plan includes an analysis of Bradford's demographics, jobs, economy, schools, roads, housing, natural resources, and land use. This analysis of current conditions in the context of goals for our community leads to policies and recommendations that can help our community make wise choices and provide direction for the patterns of its future growth.

There are key reasons to have a Town Plan:

1. **Guide for local regulations**: State statute requires that all land use regulations (zoning, subdivision, etc.) must be consistent with the goals of the local plan. The municipal plan functions as the framework under which these regulations operate.
2. **A guide for community investments**: Information in the plan can be used for developing the recommendations contained in a Capital Budget and Program, for establishing a community development program, and for providing direction to the Selectboard for such things as community services, emergency services, recreation and municipal facility development to name a few. It also serves to guide the decisions made by the Planning Commission and Zoning Board of Adjustment when permits come before them.
3. **Support for grant applications and planning studies**: Many of the state run grant programs available to Bradford consider whether or not the town has stated a need for its grant request. Studies are often called for within a plan, and the funding for such projects can come from state sources as well.
4. **Support for the downtown designation**: The downtown designation is important to the vitality of Bradford's downtown as it offers support for grants as well as assistance to property owners in the designated downtown.
5. **A guide for future development**: The District Environmental Commission considers Town Plans during an Act 250 hearing under Criterion 10. The Plan should clearly define what is and is not appropriate in terms of development within the community.

A town plan is a dynamic document to be reviewed at least every five years, amended, readopted or replaced to reflect new conditions, needs and vision of the community. State statute requires that a plan expires after five years unless readopted or replaced. While the Planning Commission is the public body responsible for preparing and revising a Town Plan, any individual can petition the municipal government to amend the Plan. Statute also requires that an "approved" town plan be consistent with statewide planning goals (VSA Title 24, Chapter 117, 4302), be compatible with the Regional Plan (VSA Title 24, Chapter 117, 4350(b)(1)(B)) and other plans in the region, and contains all elements of a Plan (VSA Title 24, Chapter 117, 4382). A town plan is not a zoning document, but

it is the blueprint by which zoning is implemented. Therefore, a town's land use regulations (zoning, subdivision, etc.) must conform to the Plan. A town plan cannot affect land use in existence prior to the plan's approval. It does not have the power of law designated to a zoning regulation and should not be confused with that power. The goals, policies and recommended actions in this plan should be applied reasonably and uniformly. No specific goal or policy in this plan should be applied in isolation from other goals and policies within it. Users of this plan must accept that interpretation of the plan involves close review of the facts.

It is important for the residents of Bradford to know that all energy generation and transmission development that are linked to the electrical grid are approved and regulated by the State of Vermont through the Public Service Board under Act 30 V.S.A Section 248.Town participation in the State's review process and current Town goals and objectives is the best way to ensure that the Town of Bradford's goals and objectives are considered and weighed by the Public Service Board during the decision process

Goals of this Plan

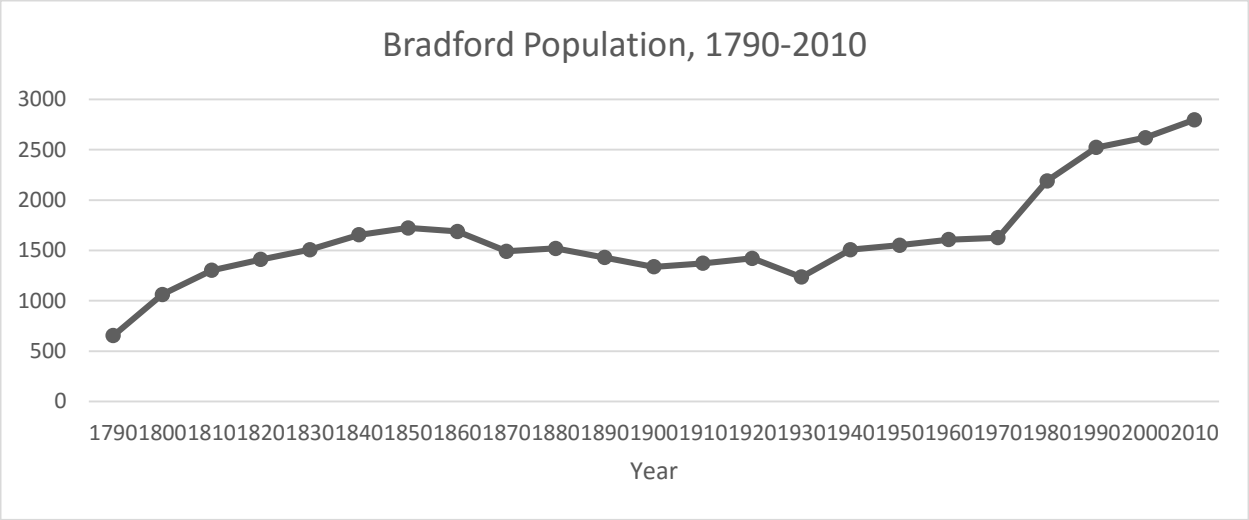
1. To protect the constitutional right of the people to acquire, possess, and protect property.
2. To balance individual property rights with the needs of the community.
3. To determine current and future land use needs.
4. To establish areas desirable and suitable for development.
5. To maintain and enhance the vitality of the designated downtown.
6. To enable efficient use and expenditure of public funds to support local governmental services.
7. To serve as a standard for the evaluation and review of proposed developments.
8. To determine current and future land use needs for Town-owned properties.
9. To encourage the continued growth and prosperity of Bradford's economy.
10. To encourage a thriving, equitable, resilient economy that preserves and honors our working landscapes, downtown and the environment.

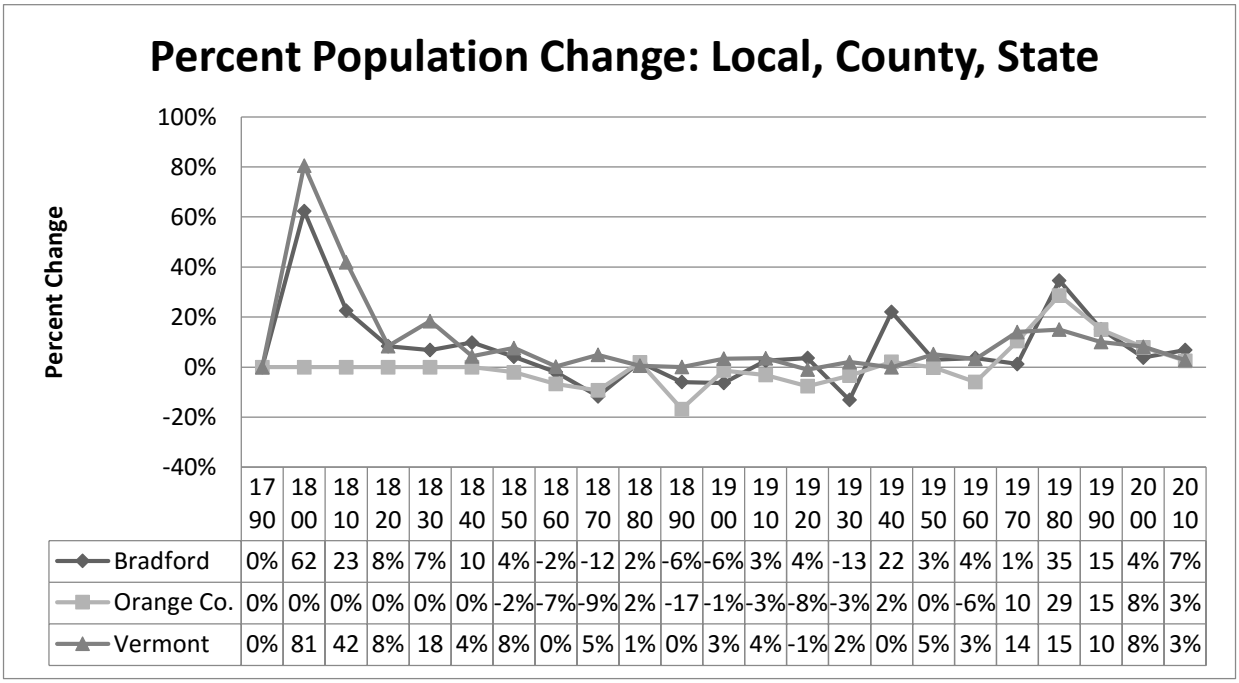
II. Population

A. Population Patterns

Statistics and projections can shed light on the overall development patterns of rural towns. Rapid population increases can create a demand for new and expanded municipal services, and can strain the financial ability of a town to provide public services economically. Decreases in population can have an impact on the cost of town services, lead to higher taxes and generally affect the culture of a community as a whole.

Shown below are population statistics for the Town of Bradford taken from the U.S. Census Bureau According to the U.S. Census, Bradford's year 2010 population numbered 2,797 compared to a population of 2,619 in 2000, resulting in a growth rate of 7% over the decade. This rate of growth was close to 8% rate achieved by Vermont, Orange County and the Two Rivers-Ottauquechee Region.



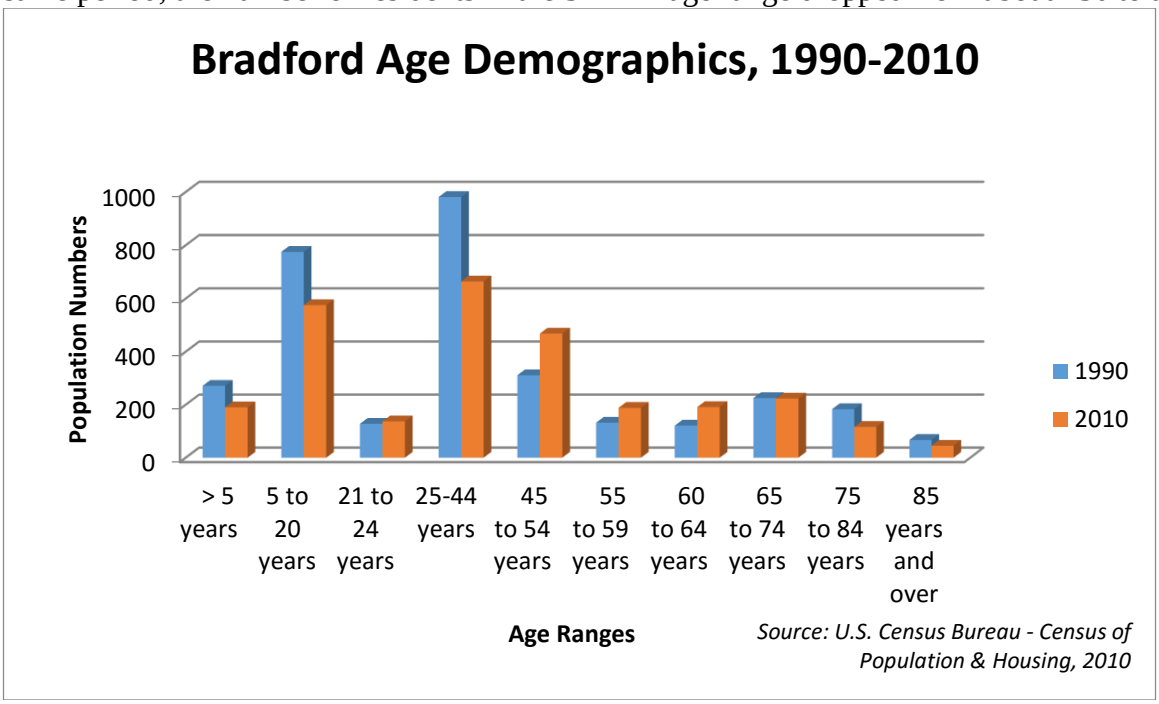


	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
Bradford	0%	62	23	8%	7%	10	4%	-2%	-12	2%	-6%	-6%	3%	4%	-13	22	3%	4%	1%	35	15	4%	7%
Orange Co.	0%	0%	0%	0%	0%	0%	-2%	-7%	-9%	2%	-17	-1%	-3%	-8%	-3%	2%	0%	-6%	10	29	15	8%	3%
Vermont	0%	81	42	8%	18	4%	8%	0%	5%	1%	0%	3%	4%	-1%	2%	0%	5%	3%	14	15	10	8%	3%

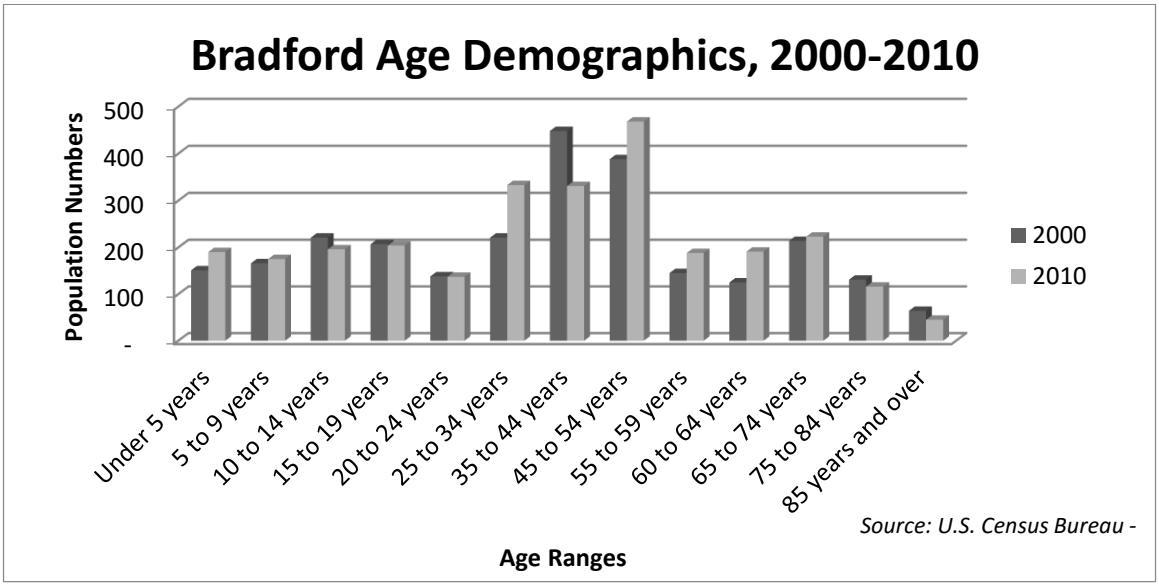
B. Age of Population

One of the most common concerns voiced in the 2007 Bradford Town Plan Survey was a lack of youth in Bradford. Residents feel that as young people graduate from high school, they are inclined to leave town and are unlikely to return. Surprisingly, though, between 1990 and 2000, Bradford experienced an increase in its population of young adults between the ages of 21-24, and that number remained relatively constant from 2000 to 2010. Between 2000 and 2010, the number of Bradford residents in

the 25-34 age range jumped dramatically, from approximately 200 to approximately 320. During that same period, the number of residents in the 34 – 44 age range dropped from about 430 to about 320.

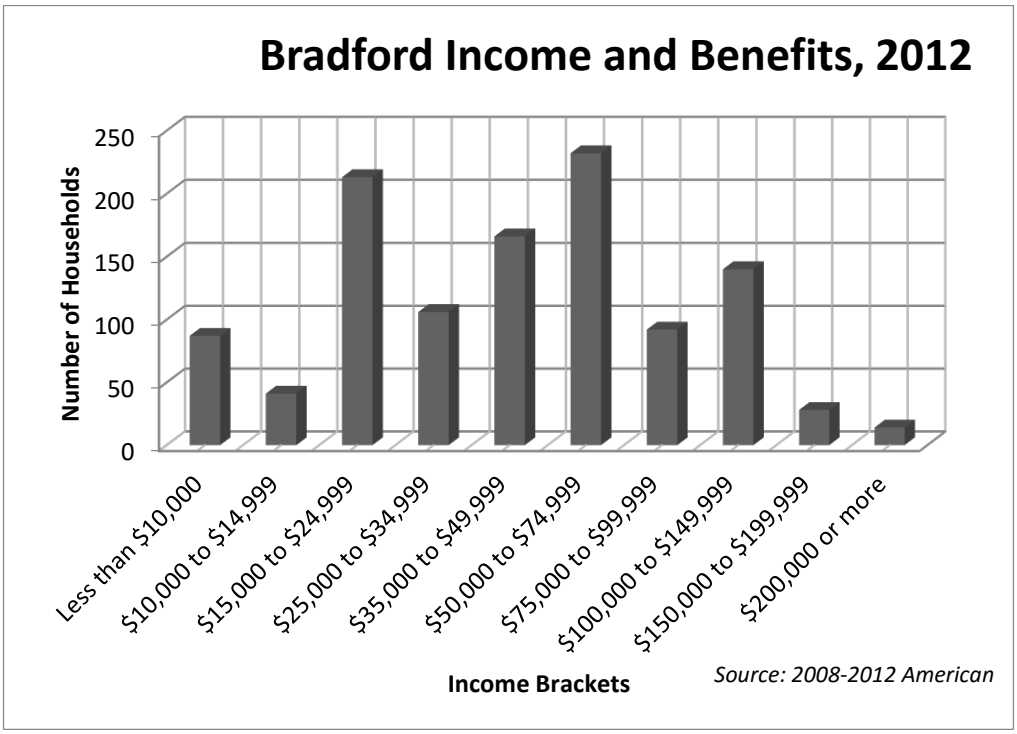


However, as is the case with much of Vermont, the population in Bradford aged 25-44 declined. Clearly, this decline is due in part to the aging of Bradford's residents, but it is also likely that some of the decline is due to younger citizens leaving town for new venues and other opportunities (such as college or jobs). This age group represents a group of people who are valuable to any town because between the ages of 25-44, it is common for individuals to solidify their careers and make steps to start a family and/or buy a home. Losses in this age group indicate that Bradford is losing much of its younger workforce. Young working residents are the key to new arrivals, new jobs, retaining old jobs, quality of life, services in rural communities, and leadership. In short, in order to have a thriving community, Bradford needs these young people.



As indicated in figure 4, between 2000 and 2010 population changes reflect the ongoing effect of the baby boomer generation. Overall for Vermont, the number of residents 25-44 years of age dropped as baby boomers continued to move into their late 50s and 60s.

The comparison between the 2000 and 2010 census information also indicates that many of Bradford's new residents are between the ages of 35-44. The increase of population at this age group may in part explain increasing enrollment in the Bradford school system as families in their 30s to mid-40s often have children who are in school.



Town	Median Non-family Income, 2012	Median Household Income 2012
Bradford	$24,355	$45,208
Corinth	$37,500	$50,893
Fairlee	$43,750	$62,542
Newbury	$33,000	$ 50,474
Norwich	$37,222	$94,342
Ryegate	$28,571	$56,071
Thetford	$50,149	$70,789
West Fairlee	$32,063	$53,438
Orange Co.	$32,436	$53,627
Vermont	$31,957	$54,168

Source: 2008-2012 American Community Survey 5-Year Estimates

Income Data for Bradford and Surrounding Areas, 2012			
Town	**Returns Filed**	**Adjusted Gross Income**	**Mean Adjusted Gross Income**
Bradford	1,369	$ 58,436,808	$ 42,685.76
Corinth	715	$ 31,072,295	$ 43,457.76
Fairlee	575	$ 26,192,164	$ 45,551 .59
Newbury	837	$ 35,968,748	$ 42,973.41
Norwich	1,718	$ 210,189,770	$122,345.62
Ryegate	536	$ 22,770,611	$ 42,482.48
Thetford	1,386	$ 93,156,526	$ 67,212.50
West Fairlee	299	$ 12,882,285	$ 43,084.57
Orange Co.	15,497	$ 690,669,232	$ 44,567.93
Vermont	311,144	$ 17,233,753,111	$ 55,388.35

Sources: Vermont Department of Taxes

The Vermont Department of Taxes annually publishes *Vermont Tax Statistics*, which includes a summary of personal income tax returns filed with the State. In 2012, 1,369 personal income tax returns were filed by Bradford residents. Total adjusted gross personal income reported for Bradford residents was $58,436,808. Based on the information in the above figure, Bradford's median household income is lower than its neighbors, the average of Orange County as a whole and of Vermont.

For 2012, the median AGI per return for the Bradford School District was 30,737 compared to Newbury at $31,391, Corinth at $30,458, Fairlee at $33,101 in contrast to Norwich at $62,995. 51% (47% in 2005) of the total personal income generated in Bradford was by filers earning $30,000 or more while 49% (vs in 2005, 53%) were earning less than $30,000.

III. Economic Base

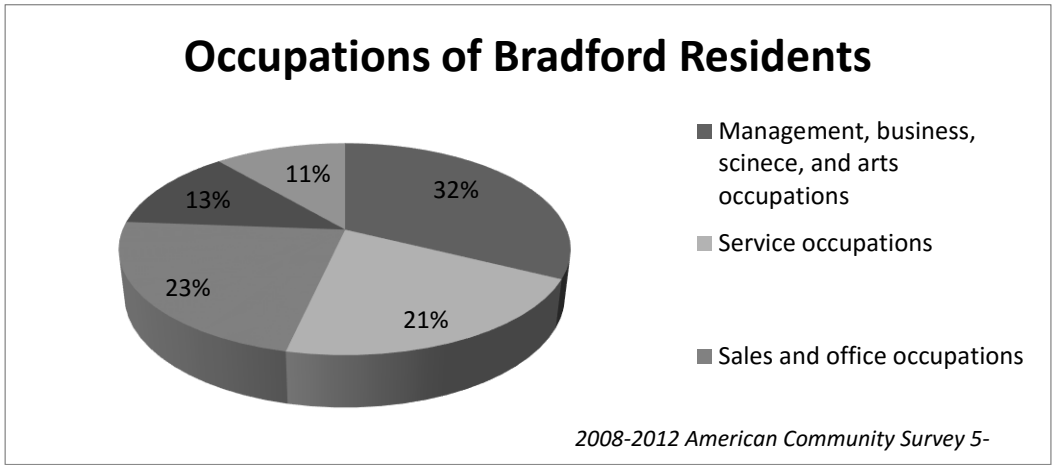
A. Employment and Jobs

Bradford serves as a small economic hub for commerce and industry. Residents use town services for a range of banking, professional, and related services, but survey results indicate that much of their retail shopping is done outside of the immediate area in the Upper Valley or New Hampshire. It is important to note, however, that the survey was conducted before the new Hannaford store was built on Bradford's lower plain. While no formal study has been conducted, anecdotal evidence strongly suggests that since the new grocery store opened (June 2013), residents from many surrounding

communities now come to Bradford for grocery shopping. Other Bradford businesses such as Farm Way, Copeland's Furniture, and many restaurants also draw people from nearby communities to Bradford.

As of the time of the 2010 Census, 61% of the Town's population over 16 years of age was employed in the civilian work force, while only 4.4% of individuals over 16 years were classed as unemployed. All other residents over age 16 were not employed for a range of other reasons, be that higher education, retirement, incarceration, or some other matter that would impede employment. The unemployment figure, while low compared with the state and national percentages (5.9% and 7.9%, respectively), is higher than the 2.7% unemployment figure reported in 2000. This may reflect a steadily-aging workforce entering retirement, the economic downturn in 2008, and a host of other factors.
Figure 4 below indicates that, as of 2010, over half the population of Bradford is employed across management, sales and office occupations. According to the 2010 Census, 44.1% of all Bradford workers work within Orange County. Nearly 30% of workers travel less than 14 minutes to their place of employment, suggesting that many workers work within the town or somewhere that is immediately adjacent to the town. Due to the close proximity to neighboring New Hampshire and its larger work centers that are in close range of I-91 (particularly West Lebanon and Hanover), it is understandable that 41.9% of Bradford's workforce responded to the Census as working outside of Vermont altogether.

Although many Bradford residents work outside of Bradford, it is worth noting that Bradford, unlike many other small towns, has services and business that can provide most day-to-day necessities. Without leaving Bradford, one can do grocery shopping, obtain medical services, eye care, dental care, purchase hardware & building supplies, etc.



One surprising piece of the U.S. Census employment information is this: as much as agriculture is considered an important part of the community by its residents, just less than 8% of the Town's workforce was reported as working in either agriculture, forestry, fishing, hunting, or mining trades in the 2010 Census. This follows a statewide trend of declines in the farming industry.

B. Historic Wages

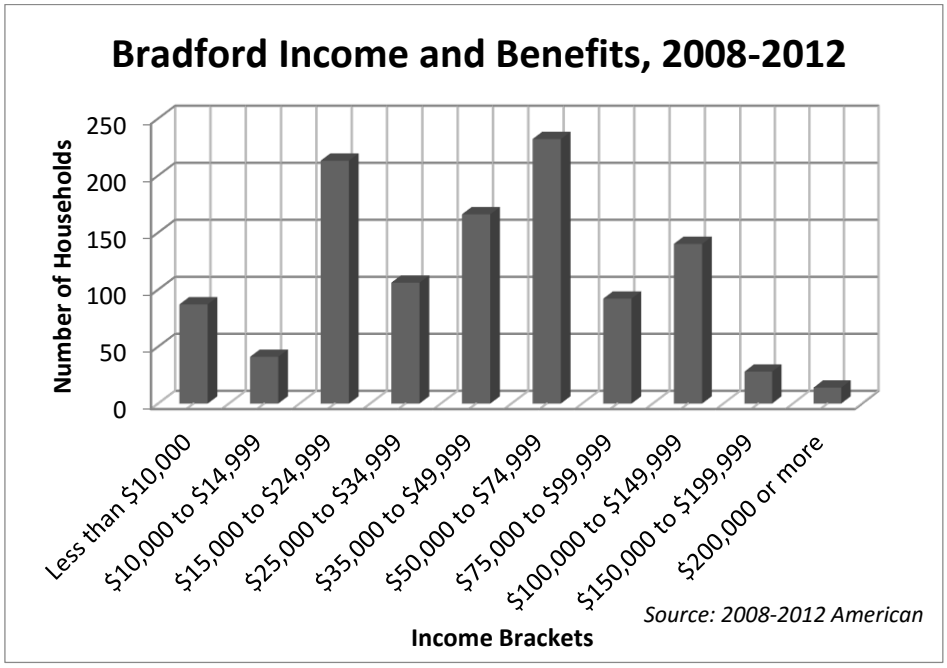
The mean adjusted gross income of Bradford residents as filed with the Vermont Department of Taxes in 2012 was $42,685.76. This is the lowest reported income when compared with neighboring towns, Orange County, and the state, as shown below in Table 5. However, it is important to note that this chart only applies to households that file tax returns. Because of that, communities with large populations whose incomes are so low that they do not need to file an income tax return may appear to have higher household incomes. Nevertheless, there is not a significant difference in the mean incomes reported for most neighboring towns and for Orange County as a whole, with the two most pronounced exceptions being Norwich and Thetford. However, the mean income reported by all Vermont residents, in contrast, was nearly $13,000 higher than that of Bradford.

Income Data for Bradford and Surrounding Areas, 2012

Town	Returns Filed	Adjusted Gross Income	Mean Adjusted Gross Income
Bradford	1,369	$58,436,808	$42,685.76
Corinth	715	$31,072,295	$43,457.76
Fairlee	575	$26,192,164	$45,551.59
Newbury	837	$ 35,968,748	$42,973.41
Norwich	1,718	$210,189,770	$122,345.62
Ryegate	536	$22,770,611	$42,482.48
Thetford	1,386	$93,156,526	$67,212.50
W. Fairlee	299	$12,882,285	$43,084.57
Orange Co.	15,497	$690,669,232	$44,567.93
Vermont	311,144	$17,233,753,111	$55,388.35

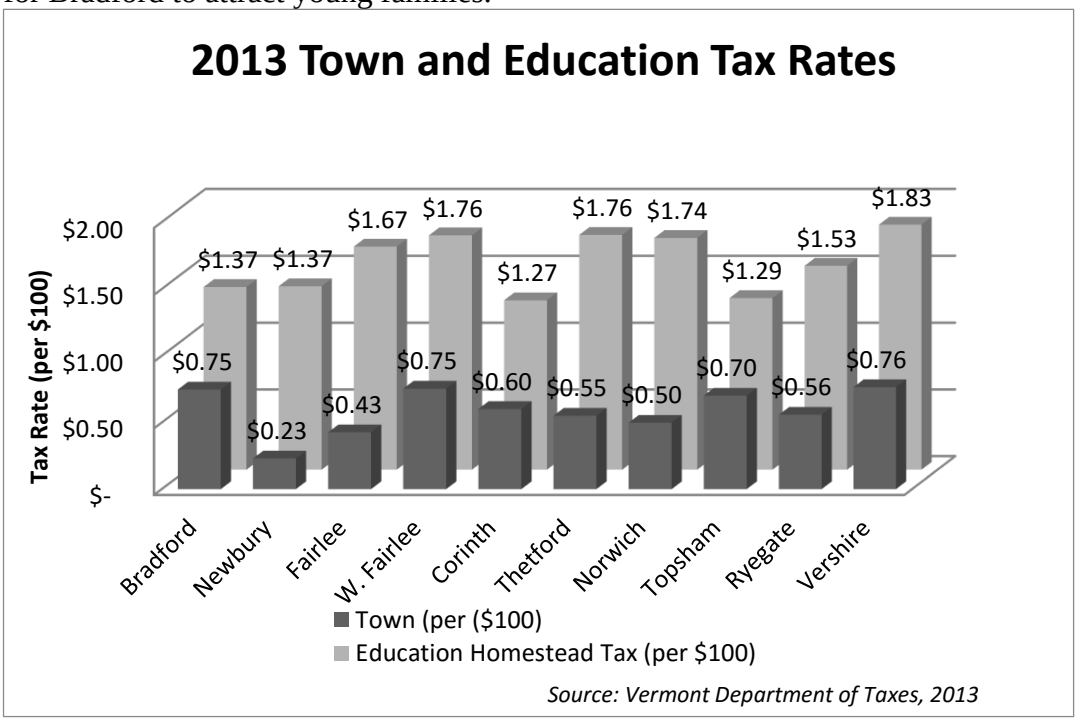
Source: Vermont Department of Taxes

The Department of Housing and Urban Development Location Affordability Index, in assessing the costs of housing and transportation for both renters and homeowners in Bradford, shows that, on average, Bradford households require over $27,000 annually to cover housing and transportation-related expenses. When viewed in terms of income brackets and earnings at the household level, it becomes apparent that many Bradford families are earning less than the mean adjusted gross income, as reported to the Vermont Department of Taxes. American Community Survey data from years 2008 through 2012 demonstrates that nearly a third of all Bradford households earned under $25,000 annually (31%; see Figure below). This would suggest that numerous families in Bradford may find covering housing, subsistence, welfare, and transportation costs a constant struggle.



C. Taxes

Many of the handwritten comments that were received as part of the 2007 Town Plan Survey, which indicated that citizens in Bradford are concerned about the continued rise of property taxes and the burden they put on individuals who make only the average wage. Based on 2012 data from the Vermont Department of Taxes in the figure below, it is clear that these concerns are well founded. High property and education taxes are making it harder for middle-class citizens to buy homes in Bradford. These costs, coupled with increases in the overall cost of living, are making it more difficult for Bradford to attract young families.



Designated Downtown: Bradford strives to have its local economy grow at a pace that benefits the community, but does not put a strain on municipal services. To encourage new growth and to improve the vitality of the downtown, Bradford has been part of the Vermont Downtown Program. Businesses within the area identified by the Vermont Downtown Program as a Designated Downtown are eligible for various tax credits, and the municipality is given priority for specific state and federal grant programs (see sidebar), including access to funds exclusively for Designated Downtowns. While to-date, businesses have not utilized the tax credits available through the program, the town has been able to take advantage of its benefits. Because of the priority consideration for grants and specific funding, the town was able to access over $40,000 in funds for sidewalk improvements as well as $30,000 for the Bradford Public Library. A map of the designated downtown is included in Map 1, 2 and 3.
In the near term, the Town intends to apply for additional funding to continue improvements to the sidewalk system.

Downtown Designation Benefits

Because of its participation in the Vermont Downtown Designation Program, Bradford's downtown has the following benefits available to it:

- 10% Historic Tax Credits
- 25% Facade Improvement Tax Credits
- 50% Code Improvement Tax Credits
- Downtown Transportation Fund
- Traffic Calming Options
- New Signage Options
- Priority Consideration for HUD, CDBG and Municipal Planning Grants
- Priority Consideration by State Building and General Services (BGS)
- Special Assessment Districts

Goal for the Designated Downtown:

A diverse economic base which provides jobs and sustains the local economy.

Policies:

To support continued economic vitality of Bradford's Downtown.

To support cost-effective infrastructure improvements to Bradford's historic downtown area that will encourage economic development and benefit existing businesses.

Recommendations:

The Town should maintain Downtown Designation for Bradford's Downtown to give local developers and business owners access to the tax credits offered by the State of Vermont for revitalization.

The Town should utilize the benefits of the Downtown Program to continue projects such as improve sidewalks and streetscapes within the Designated Downtown.

The Town should investigate obtaining Growth Center designation in order to support a diverse economic base while continuing to keep our historic downtown vibrant.

IV. Housing

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

This section discusses the amount, type, location, and affordability of existing housing as well as the needs for future housing.

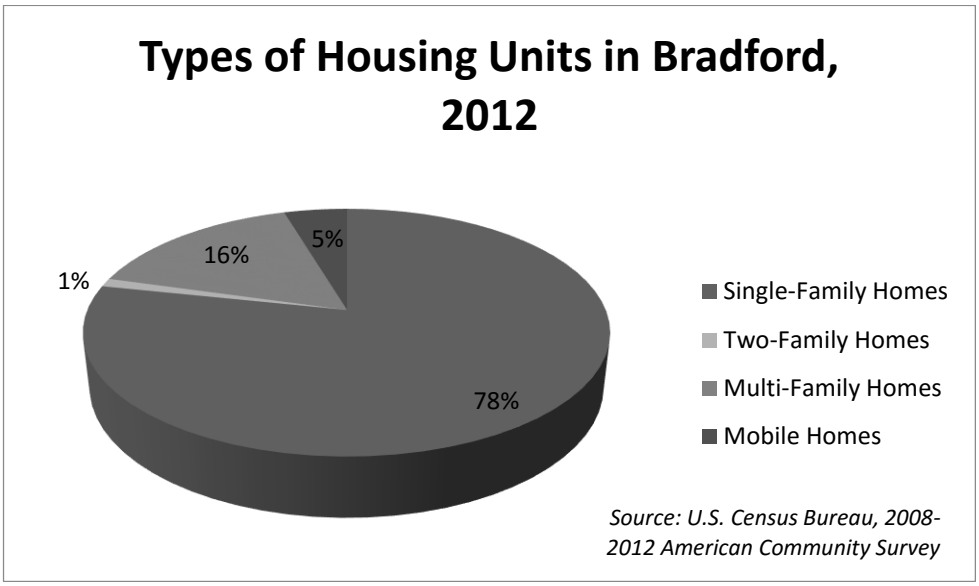
A. Number of Housing Units

Bradford's total number of housing units has been increasing since the 1940s. The 1970s and 1980s saw a large increase in the number of homes being built throughout Vermont, and Bradford was no exception, with increases in housing units reaching 50.9% in that decade alone. However, between 1980and1990 Bradford experienced just a 7.2% increase in new homes, which falls far short of the 30% increase reflected in Orange County data. Much of the increase in other towns was due to a rise in the purchase of second homes, and to individuals from out of state moving from the city to the country. During the decade from 1990 – 2000 though, the number of new homes jumped by 13.2%, roughly 5% higher than the totals for Orange County and the State. This rise in new homes in Bradford indicates the extent of the housing pressures that exist in the Upper Valley. As towns closer to the primary areas of employment (Hanover, NH, Lebanon, NH and White River Junction, VT) become increasingly more crowded, citizens find residences farther away, such as Bradford to the north and Claremont, NH to the south. However, between 2000 and 2010, new housing unit growth in Bradford slowed to just 5.3% (equivalent to approximately 13 new units every two years), which is approximately half the growth rate seen in both Orange County and the State.

The 2007 community survey clearly showed that while some people live in Bradford because it's less expensive than living closer to major employment centers, many people choose to live in Bradford because of the quality of life this community enjoys.

B. Types of Housing

The U.S. Census defines a "housing unit" to include conventional houses, apartments, mobile homes, and rooms for occupancy. According to the 2000 Census, Bradford (including the former village of Bradford) has a total of 1217 housing units. Like most of the units in towns throughout Vermont, they are predominantly single-family homes, with multi-family homes being a distant second.



As indicated by the table below, 60% of the housing stock in Bradford is owner occupied. Unlike many of the surrounding towns, after owner occupied housing, Bradford has a high percentage of rental housing (26%). Most towns in the immediate area have a much greater percentage (Fairlee, Newbury and Corinth have approximately 20%) of second homes or homes used for recreational purposes. Bradford, on the other hand, has only 7%. This number is small on a regional level as well, when compared to 13.8% in Orange County and 14.6% in Vermont as a whole.

2010 Housing Occupancy, Bradford & Surrounding Area

	Owner-occupied	*Vacation*	*Renter-occupied*
Bradford	60%	7%	28%
Corinth	59%	26%	10%
Fairlee	46%	26%	22%
Newbury	53%	23%	18%
Norwich	69%	5%	20%
Ryegate	65%	18%	12%
Thetford	70%	11%	16%
West Fairlee	58%	18%	17%
Vermont	56%	16%	23%
Orange Co.	64%	14%	17%

Source: U.S. Census Bureau - Census of Population & Housing, 2010

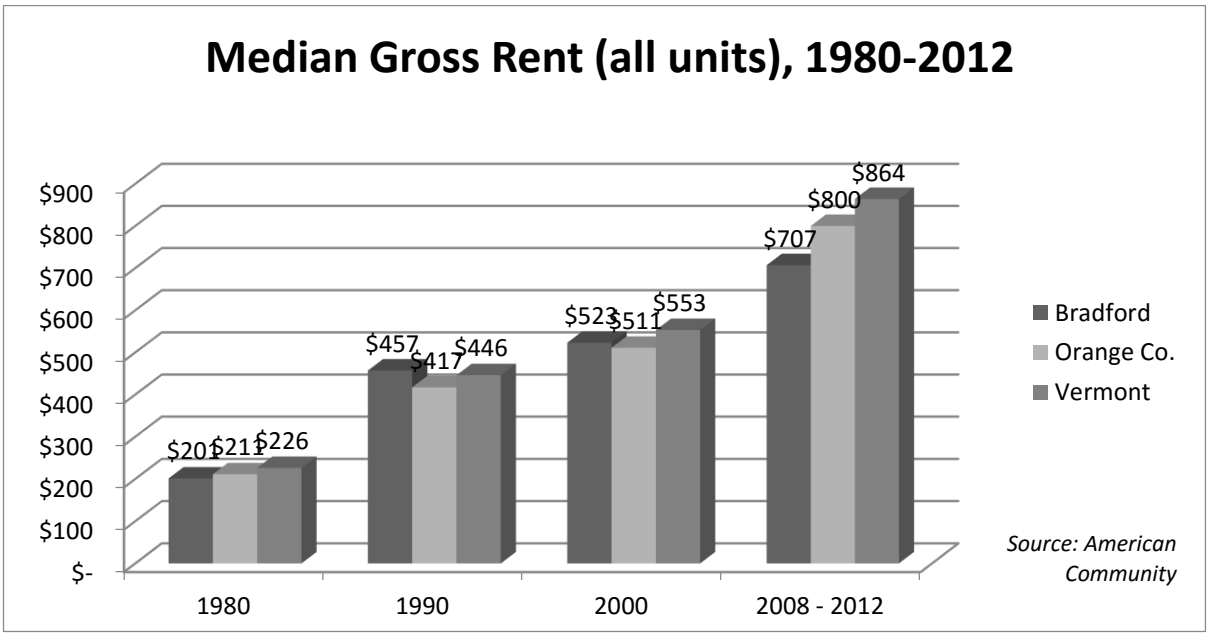
There are positives and negatives to having too many or too few second homes in a town. When a town has a large number of homes that are not occupied year-round, it can have unforeseen impacts on town services. For example Bradford, like many other Vermont towns, has a volunteer fire department. This department depends on full-time residents to staff its fire department, and a lack of full-time residents can make acquiring staff difficult because the pool of candidates is reduced. The downside of this low percentage of second homes is most noticeable in the town tax rate. Second homes are taxed at a higher rate than full-time residences. On the other hand, second homeowners do not generally utilize community services including the school system, which reduce the costs to all taxpayers.

Bradford had only 5% of its total housing stock vacant in 2000. Anything below 5% is functionally considered a zero so in general Bradford has only a small amount of available housing stock to offer, which can have a direct impact on the affordability of housing.

In the 2007 town-wide forum on land use, participants indicated an interest in allowing more dense residential development in districts within walking distance of the downtown. However, survey responses suggest that there is less support town-wide for this idea with the noted exception of housing for the elderly, which was strongly supported. The survey conducted in 2007 also revealed that residents desired any new elderly housing to be located within walking distance of the downtown.

C. Affordable Housing

Affordable housing is defined as that which a household earning the county's median income could afford if no more than 30% of its income were spent on housing costs. For homeowners, housing costs include such things as payments for principal and interest on a mortgage and taxes. For renters, housing costs include such things as rent and utilities.



With the state minimum wage standing at $8.73 in 2014, an individual earning minimum wage can expect to earn $18,158 per year when working a standard 40 hour work week. However, according to the National Low Income Housing Coalition, a Bradford resident would need to earn a minimum of $9.31 per hour in order to afford an efficiency apartment. A family of four seeking a modest three bedroom rental unit would require a minimum of $19.50 per hour in wage earnings amongst all wage earners in the unit. While these figures are high, they are even more pronounced of an issue looking at the state. What can be inferred from this data (presented below) is that Bradford is comparatively affordable, but may still be unaffordable to much of the town's workforce and the elderly.

Housing Wage Needed as a Percentage of State Minimum Wage, 2014

Town	*Efficiency*	*1 Bedroom*	*2 Bedroom*	*3 Bedroom*	*4 Bedroom*
Bradford	$ 9.31	$ 13.08	$ 15.65	$ 19.50	$ 27.73
As % of State Min. Wage	107%	150%	179%	223%	318%
Vermont	$ 13.91	$ 15.20	$ 19.36	$ 24.55	$ 29.21
As % of State Min. Wage	159%	174%	222%	281%	335%

Source: National Low Income Housing Coalition (NLIHC)

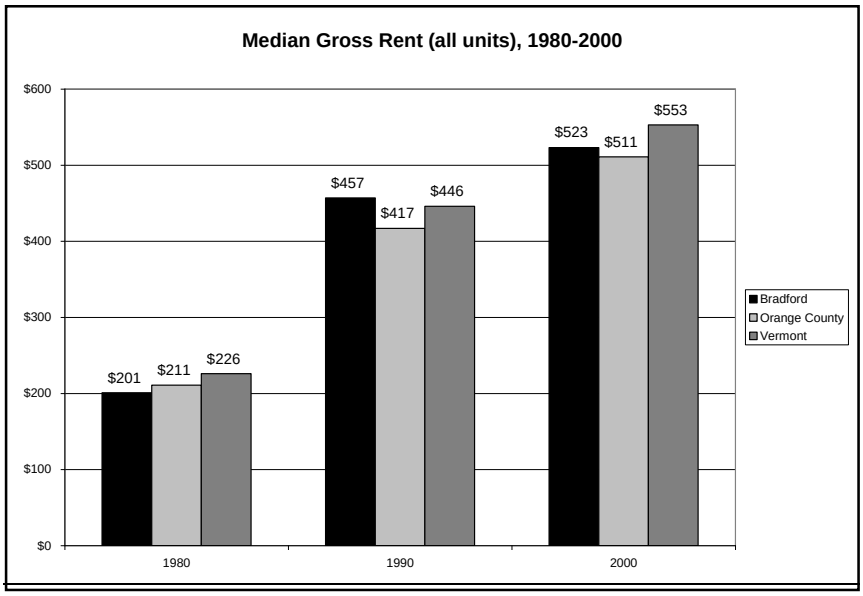
Note: housing wage is equal to the wage a household must earn while working a 40 hour week to afford a rental housing unit at HUD's Fair Market Rent (FMR) and only pay 30% of income toward housing costs. Figures not available for individual towns in the region because HD only calculates county values.

Based on responses from the 2007 Town Plan Survey, there is a substantial amount of concern on the part of residents that there is too much affordable housing in Bradford. The perception appears to be that affordable housing negatively impacts aesthetics as well as the culture of the community. While these assessments may, to some extent/, be correct in terms of the rental properties that exist in Bradford it is fair to say that this perception is not because of an excess of affordable housing. In fact, when compared to other towns in Vermont of similar size and regional significance (Bradford is a hub to surrounding towns), Bradford is only slightly above Orange County in number of units per 1000 residents.

What is more likely to have created the perception of "too much affordable housing" is that Bradford has a substantial percentage of rental property. There is little doubt that these assumptions about the affordability of these properties as a whole are incorrect. Most of the rental property in Bradford does not fall into the category of "affordable housing".

However, it should be noted that while the perception of too much affordable housing may be erroneous, citizens' feelings about the condition of Bradford's rental housing and its negative impact on the aesthetics of the village are well-founded. Many of the comments collected in the Town Plan survey singled out specific rental units in town as appearing "run down" and/or "poorly maintained". There appears to be a need to encourage owners of rental property to better maintain their properties. The aesthetic appearance of buildings in a town, particularly one with a central business district or downtown, can have either negative or positive impacts on commerce and can attract or deter new residents and businesses from moving into town. Comments provided by residents in the 2007 survey support this concept by indicating a strong displeasure with poorly maintained properties. The

renovation/rehabilitation of seven South Main Street properties seems to have encouraged overall improvement in that area of Bradford, although more needs to be done.



Source: Vermont Housing Data

D. Elderly Housing

According to the 2010 U.S. Census, there were 384 individuals in Bradford who are 65 or older, constituting nearly 14% of the overall population. Of homeowners in Bradford, fewer than 26% are 65 or older. Fifteen (15%) percent of renters in Bradford are 65 or older. These figures are lower than those recorded in 2000, highlighting a demographic shift that has brought more middle-aged residents to the town in the decade from 2000 to 2010.

As some of the elderly become less comfortable with the tasks involved in managing their own homes, they often turn to some sort of elderly housing. If health is an issue and some form of constant care is required, an elderly person may need to enter a nursing home or a residential care facility. As is indicated in the table below, Bradford has the largest number of residential care facilities in the area, with a total of 26 beds (for level III and IV residential care, according to the Department of Disabilities, Aging and Independent Living (DAIL)). Bradford is currently home to the Blue Spruce home for the Retired, Merry Meadow Farm, Bradford House and Oasis Home.. However, given that there is a state-wide shortage of elderly care facilities of all types in Vermont; it is likely that competition for beds in Bradford's facilities is high. Elderly residents in need of full-time care may not find it available in town and may be forced to move away from their community.

Bradford residents are very supportive of the creation of additional housing for the elderly. When asked if the town should "…encourage the development of independent senior housing in close proximity to the downtown", 80% of the responses were positive. Further, when asked what types of housing residents would like to see throughout Bradford, independent and assisted living facilities collectively received the largest percentage of support for a total of 35%.

In 2004, the closing of the Brookside Nursing Home in Bradford left 107 elderly persons and adults with disabilities without a facility to provide the care they needed. As has been indicated above, the number of beds within the region for the type of care provided by the Brookside Nursing Home is very

limited. In response to the closing of Brookside, the Commissioner of the Department of Disabilities, Aging & Independent Living (DAIL) began meeting with Town of Bradford officials and local service providers to coordinate the remaining capacity and identify the community's vision for the future. Through this process the Town of Bradford established an Assisted Living Committee. The group conducted a market feasibility study, which was completed in April 2005 and showed that an assisted living residence with 35 or more units was likely feasible. Several properties were considered as possible locations for a new assisted living facility, including a lot owned by the Town that is used by the Highway Department and recycling center. Residents were given the opportunity to vote to donate this property to the assisted living project, which they did not approve. The basis for this rejection was apparently the perception that the loss of a portion of the Town Highway property would create logistical issues with regard to the recycling center and the storage of road maintenance materials. Although residents rejected the location proposed, they continued to indicate support of the project itself.

According to the Planning Report for the Bradford Assisted Living Project, which was presented by The Neilson Group, LLC, pressure on remaining service providers will only grow. DAIL estimates that by 2010, the number of Orange County adults with disabilities who have a service need will increase by 30% to 935 individuals. Two hundred twenty five of these persons would qualify for nursing home care in the absence of other resources, an increase of 34%. The Department of Housing & Community Affairs Housing Needs Assessment shows a gap in the county of 202 units of affordable housing for seniors. DAIL and the Orange County Long Term Care Coalition have identified a need for additional adult day care capacity in the Bradford region.

Enhanced Living Inc. (ELI), a private non-profit, was formed to provide senior housing facilities in Bradford following the loss of Brookside Nursing Home. Working with state officials, private consultants and community volunteers, over the past five years marketing and feasibility studies have been conducted for ELI, pro-forma budgets developed, and a service provider identified. George and Hazel Pratt made a generous donation of several acres of land on Plateau Acres to house a facility anticipated to contain up to 36 beds of assisted living. Among ELI's goals are to build a sustainable, affordable facility incorporating elements of Greenhouse senior living design and utilizing green construction principles to the extent possible. At this time, ELI is not addressing the issue of senior independent housing.

While some form of housing for the elderly is essential, services available to the elderly are also very important. Programs like meals on wheels, in-home care services and an active senior center are appealing to older residents. Further their existence will provide them with more reasons to choose Bradford as their home. However, survey results indicate that, at present, the services offered in Bradford for the elderly are not meeting the needs of that age group. With the exception of the Bradford Senior Center, citizens who responded to the 2007 survey view other services available to the elderly unfavorably. The Visiting Nurses, who maintain a branch office in Bradford were not included in the survey question.

E. Childcare

Childcare Facilities in Bradford and Surrounding Towns, 2014		
Town	*Registered In-Home*	*Licensed In-Home*
Bradford	2	4
Corinth	0	2
Fairlee	2	2
Newbury	0	5
Norwich	0	6
Ryegate	5	0
Thetford	2	5
West Fairlee	1	2
		Source: Department for Children and Families

According to TRORC's 2003 inventory of registered childcare facilities, Bradford offers more options for childcare than most towns in the surrounding area. This statement still holds true in 2014, as Bradford is home to two registered in-home childcare facilities and a further four licensed in-home facilities (see table). At the time of the 2010 U.S. Census, there were 317 children between the ages of 1 and 9 in Bradford. Given that the number of registered in-home and licensed homes and centers currently total 186 seats, it is likely that many residents are finding alternative sources of childcare. Bradford residents who are unable to use local childcare facilities probably take their children to childcare facilities beyond the borders of Bradford, or they are able to have family members care for their children while they work. The numbers presented in the table include full and part-time seats, which implies that there may be even fewer seats than the numbers reflect.

Goals, Policies and Recommendations for Action

Goals

1. To encourage the retention of existing housing and construction of new housing that meets the population growth.

2. To encourage the preservation of historic structures in ways that appropriately serve the need for housing.

3. To encourage the development of affordable senior housing within the Town.

4. To encourage housing projects that strengthen neighborhoods by adding green space, promoting pedestrian traffic, and improving transportation options.

5. To encourage innovative planning, design and construction of residential housing which minimizes the cost, energy consumption and environmental impacts of housing while maintaining the character of the community.

Policies

1. It is the policy of the Town to support the development of multi-family housing within or adjacent to the Downtown, including accessory dwelling units.
2. It is the policy of the Town to ensure that the timing and rate at which new housing units are created does not exceed the community's ability to provide adequate public facilities (e.g. schools and municipal services).

3. It is the policy of the Town to encourage the location of future housing so as to complement existing or planned employment patterns, travel times, and energy requirements.

4. It is the policy of the Town that the location of housing, related amenities, and land uses should be planned with due regard to traditional settlement patterns, the physical limitations of the site, and its proximity to current or planned public and private services such as roads and commercial/service centers.

5. It is the policy of the town that safe bicycle parking facilities be provided in new residential or commercial developments.

Recommendations

1. The Town should consider assessing impact fees in order to defray the cost of increases in municipal services caused by development.

2. The Planning Commission should review the Town of Bradford Zoning Bylaws with an eye to addressing the following concerns about housing:
    a. New housing should be sited to provide safe pedestrian access to nearby open space, existing sidewalk networks, and recreation areas.
    b. Housing projects should minimize highly visible parking areas and retain as much permeable surface as possible.
    c. Housing projects should provide access to shops, services, and jobs by as many transportation methods as possible (public transit, bicycle, pedestrian, and automobile).
    d. Zoning Regulations should be modified to make Multi-family housing a permitted use Residential Service District and Village Residential.

3. The Town should investigate the benefits of obtaining Growth Center designation in order to develop affordable housing along with associated commercial and retail development.

V. Education

Bradford has two public schools: Bradford Elementary School, located on Fairground Road. north of Bradford's downtown, offers education for grades K-6, and Oxbow High School and Riverbend Career and Technical Center, located on Route 5, also north of the downtown, serving grades 7-12 and adults**.** Bradford also has an independent school, The Connecticut River Academy, located on Lower Plain, which offers an alternative education program for grades 1-12 and serves the surrounding region.

The total staff at Bradford Elementary consists of 49 employees, 18 of which are full-time teachers. There are 101 employees at Oxbow, with 46 of them employed as full-time teaching staff.

The Orange East Supervisory Union office is located on the Lower Plain in the Minimart building, that office oversees Bradford Elementary, Oxbow High School, Riverbend Career & Technical Center, Waits River School, Newbury Elementary School and Thetford Elementary School.

School transportation is provided by a private contractor. The present policy is to transport students who live a mile or more from the school.

A. Student Enrollment

Enrollments of students in the Bradford Elementary School is reported annually to the Vermont Department of Education. Based upon annual student resident counts from the Department, average daily membership (ADM) at Bradford Elementary in recent years has been as follows:

At Bradford Elementary School, enrollment has been rising in the last two years while Oxbow High School has seen steadily declining enrollments. A change in leadership at the high school will hopefully help to reverse this trend. While Bradford Elementary School serves only the Town of Bradford, Oxbow High School is a union school with Newbury. Oxbow also serves multiple tuition paying towns including Corinth, Topsham, Orange, Washington and Piermont, NH.

Educational Enrollment - Bradford Elementary	
Fiscal Year	Students Enrolled
2013-2014	242
2012-2013	239
2011-2012	194
2010-2011	206
2009-2010	218
2008-2009	212
2007-2008	227
2006-2007	235
2005-2006	230
2004-2005	255
2003-2004	246
2002-2003	240
2001-2002	247
2000-2001	239
1999-2000	273
1998-1999	286

Source: Vermont Department of Education

Educational Enrollment - Oxbow	
Fiscal Year	Students Enrolled
2013-2014	390
2012-2013	418
2011-2012	425
2010-2011	442
2009-2010	458
2008-2009	450
2007-2008	500
2006-2007	467
2005-2006	448
2004-2005	452
2003-2004	497
2002-2003	492
2001-2002	578
2000-2001	600
1999-2000	612
1998-1999	595

Source: Vermont Department of Education

In general, Bradford strives to maintain the quality of education it offers in the face of increasing costs of special education and declining enrollment. Yet it should be noted that the Bradford voters have never rejected an Elementary School budget.

B. School Facilities

Bradford Elementary School

The Bradford Elementary School is located on nine acres of land on the west side of Fairground Road and consists of a one-story building of 28,000 square feet. In 1956 the cafeteria was converted into a classroom, and in 1964 three more classrooms were added. A mobile classroom was purchased in 1978 for temporary space, and a major addition was completed in 1985. In 1991 and 1993, additional mobile classrooms with 1,792 square feet each, were added to accommodate increased enrollments. In 2003, Bradford voters approved a $4.7 million bond to renovate the existing school and add approximately 15,000 sq ft. The addition included additional classroom space, special education space, a music room, an art room, a large gymnasium with a stage, additional storage space, a cafeteria, and it created on-site parking for 100 vehicles. The total facility is now approximately 44,000 sq.ft. Barring unexpected growth in Bradford, the existing elementary school facilities should be adequate for the foreseeable future. The Bradford Academy and Graded School District also owns the so-called Ag Shop, Memorial Field and Field House (golf course club house), all located between the Bradford Academy building and the Connecticut River.

Oxbow High School and River Bend Career and Technical Center

Oxbow High School is a comprehensive high school with an area vocational center, River Bend Career and Technical Center attached to it. The combined facility was designed to accommodate tuition students and vocational-technical students from surrounding towns. Barring unexpected major growth in Bradford and Newbury, the existing facilities, capable of serving a capacity of 700 students, should be adequate for the foreseeable future. However, with growing employment opportunities in Hanover, Lebanon, and possibly Woodsville, and limited housing available especially in the Hanover/Lebanon area, growth of the Oxbow population may increase even without major growth in the Bradford population. To keep operating costs at a reasonable level for local taxpayers, the school must maintain adequate space and a quality curriculum to attract a substantial number of tuition paying students. The nearly 60-acre site provides athletic facilities and ample space for any necessary future construction.

C. Higher Education

At present, Bradford has very limited opportunities for residents to acquire education beyond high school. There are some continuing education classes offered through River Bend Career and Technical Center and the Oxbow High School. However, there are no post-secondary facilities within the town. While Bradford and the surrounding area do not have a sufficient population to make a large post-secondary school institution viable, it is possible that a small community college could be successful in town. The nearest locations for the types of education offered through a college such as the Community College of Vermont or Granite State College, are in Hartford and St. Johnsbury, which are at least a 30-minute drive. In some cases, students may not be able to take needed courses at the nearby locations, thus requiring an even longer commute.

In the 2007 Town Plan Survey, residents were asked if there should be post-secondary educational opportunity available in Bradford. The respondents indicated support, with almost 49% in favor, 28% against and 23% undecided. Handwritten comments of those opposed suggest that the concerns felt by some residents may be more commonly associated with larger educational institutions (noise, crime, etc.). suggesting that only a “community college” would be suitable for Bradford.

D. Goals, Policies and Recommendations

Goals

1. To provide a safe and secure learning environment where quality educational opportunities are provided to all students.

2. To promote the best opportunity to educate our students at the most equitable cost to the Town's taxpayers.

3. To encourage the offering of college-level and/or technical educational opportunities in Bradford.

Policies

1. It is the policy of the Town to require land development likely to result in a large increase in population of school children to be staged to avoid placing an undue financial burden on the Town's ability to provide educational services.

2. It is the policy of the Town to provide sufficient and appropriate physical space to meet current and projected student enrollments.

3. It is the policy of the Town that new educational facilities should be built to current energy efficiency standards.

Recommendations

1. The Town should look into obtaining Growth Center designation in order to increase the amount of affordable housing and sustain student enrollment.
2. The Town should look into providing access to post-secondary education and job training.

VI. Utilities and Facilities

A. Town Facilities

Bradford Town Office

The Bradford Municipal Offices moved to the Bradford Academy/Woods School Building, at 172 North Main Street, in 1974 when offices were configured and a vault added. The Woods School Building, designed by Montpelier architect George Guernsey, was constructed in 1893, and a gym, auditorium, and classrooms were added in 1935. The Bradford Selectboard manages the building under a 99-year lease with the Bradford Academy & Graded School District; the lease began in 1974 and expires in 2073.

In 1998, a renovation fund and a building committee were created to support the renovations required by the Vermont Department of Labor and Industry. Townspeople voted twice to spend tax dollars on building renovations, and the town received a Vermont Community Development grant for $516,500 to help comply with building codes and the Americans with Disabilities Act (ADA). Community groups have raised funds to replace the auditorium stage curtains and lighting as well as to restore the 295 seats remaining after an elevator installation. A back-up power generator was installed in the building in February of 2002.

In 2011 Bradford voters also authorized the expenditure of funds to make repairs to the roof over the auditorium, improve foundation drainage, and to make energy efficiency improvements to the building.

The Academy building now houses the offices of the Selectboard, the Water and Sewer Commission, Town Clerk, Treasurer, Administrative Assistant to the Selectboard, Zoning Administrator, Listers, and the Police Department. The public spaces (auditorium, gymnasium, and conference rooms) are available for community use, and are commonly used by town boards such as the Planning Commission, Conservation Commission, Parks & Recreation Commission, and Selectboard for their

regularly scheduled meetings. Former classrooms are leased to tenants as offices and studios. The Bradford Historical Society operates a small but impressive historical museum on the third floor.

Some portions of the slate roof are original, dating back to 1893. Many slate shingles have fallen off the roof, and many more are loose. The Bradford Selectboard plans to have these sections of slate roof stabilized in the spring/summer of 2015. The contractor performing that work will develop 5-year and 10-year recommended plans for more thorough repair and renovation of the slate roof. Except for repairs to the slate roof, no other major renovations are planned in next 5 years.

Bradford Fire Station -- Built ~1994, Four bays; heating system recently replaced; no major renovations planned.

Town Highway Garage -- Built ~1991; in good structural condition. Plan to build a new salt shed in the next several years, but no other major projects are planned.

Bradford Municipal Water System

Bradford is fortunate to have a high quality water system. Administered by the Bradford Water and Sewer Commission , the system has a 500,000-gallon, entirely concrete underground reservoir, which was installed in 2000 adjacent to the old reservoir, a 1,000,000-gallon open reservoir which is not in service, and another 500,000 gallon concrete tank constructed in 2012. The new reservoir was designed with direct 12 inch pipeline connections to fill the reservoir directly and to enhance the supply to the Lower Plain area. The supply for the new reservoir is two gravel packed wells. These two wells are capable of supplying a total of 800-900 gallons per minute. Bradford's system is both chlorinated and fluoridated and, except in time of emergency, is not subject to surface or air contamination; it complies with the Safe Drinking Water Act. All users have water meters so that an equitable system of charging is made possible.

In 2012 Bradford undertook a major water system upgrade. This involved the construction of a new 500,000-gallon storage tank on Farr Lane, upgrade of the Fairground Road pumping station, and replacement of 15,000 lineal feet of water mains. Some of the mains that were replaced were close to 100 years old.

The Lower Plain area is supplied by 8-inch and 6-inch mains to the southern town line. All properties in the Town of Bradford on U.S. Route 5 are served by the water system. An 8-inch main serves the Pierson Industrial Park. An 8-inch main also extends from the junctions of Route 5 and Saddleback Road, over the bridge crossing the Waits River near the Veneer Mill and eventually connects into another 8-inch main at South Main Street. An 8-inch main runs to Oxbow High School, and up Fairground Road to the northbound rest area of Interstate 91, with a pumping station on Fairground Road and a 5,000-gallon reservoir in the rest area. (See Public Utilities Map.) As development continues in the industrial and commercial areas of the Lower Plain, it will be necessary to upgrade and extend some water lines there to provide adequate water and fire protection.

As a matter of policy, both the Water and Sewer Commission and the Planning Commission think regulated land use is the key to protecting the water quality of the Waits River and to maintain the high quality of the Town water supply. In order to protect the primary aquifer recharge area for the water supply, the Water and Sewer Commission purchased the lower meadow surrounding the town wells. It is critical that groundwater drawn by these wells, and then recharged, does not become contaminated

by the discharge or seepage of chemical or biological wastes. One future goal is to find a second source of water to be used for back-up and supplemental water supply.

Bradford Sewerage Facilities

In October 1978, the Bradford sewage treatment plant started operation on a 5.4-acre site located off Depot Street. In addition to the plant construction, new sewer mains and laterals were installed at this time where they were necessary to upgrade existing sewer lines. The Public Utilities Map illustrates the sewer service area and is included as part of this Municipal Plan.

The sewage treatment plant was designed to treat 137,000 gallons of raw sewage per day to the secondary level. In 2014, the facility treated an average of 65,000 gallons per day or roughly 47% of its designed capacity. The plant's uncommitted reserve capacity is 72,000 gallons per day. There are 293 users presently on the system. Forty three users have been added to the system since 1998.

A 5-year project to update the sewage treatment plant was completed in 2007. The open lagoon was replaced by a 200,000-gallon cement storage tank. The treatment plant had significant upgrades to all operating systems and to the building. The total cost of the upgrade was $1,193,961. Funding for the upgrade included a grant from Rural Development for $633,900, a loan from Rural Development for $422,600, and a grant from the State of Vermont for $137,461. These upgrades should keep the plant operating efficiently.

In 2011, voters approved the bond necessary to finance expansion of the town's sewer system to the lower plain and the industrial park. The $2.8 million sewer expansion project was financed by a 55/45% loan/grant package from USDA Rural Development. Bradford's Lower Plain, from the junction of Carson Lane and Route 5, down almost to Lake Morey Road; and Rte. 25, from the Napa auto parts store down to Industrial Drive, as well as the industrial park itself, are now all served by Bradford's municipal sewer system. The project was completed in the fall of 2012.

Solid Waste Facilities

The Town is a member of the Central Vermont Solid Waste Management District (CVSWMD) that plans for solid waste disposal for its member towns. Earth Waste Systems, headquartered in Rutland, operates Bradford's recycling center. Earth Waste also operates a "fast trash" operation at the recycling center. As of February 2015, the Recycling Center is open on Wednesdays and Saturdays, from 8:00 am until 4:00 pm. CVSWMD also provides special collections for electronics and hazardous materials. Dates and locations for these special collections are shown on the website: www.cvswmd.org, published in local newspapers, and posted at the Bradford Academy and the Post Office. It should be noted that the recycling center only accepts material from the public; there is no recycling available to local businesses.

The Town does not provide collection services to its residents or businesses, but there are at least three private services available. Subject to CVSWMD rules, these providers are required to collect recyclables.

The state has created solid waste management districts to reduce the waste stream. CVSWMD is implementing programs under the name of "Zero Waste." These include diversion of food scraps and other organics for composting, diversion of recyclable materials, encouraging the re-use of materials instead of disposal, and urging manufacturers to reduce packaging materials and switch to re-usable or recyclable materials.

In addition to solid waste disposal, Bradford has a town-wide composting program. The Bradford Composting Project began operation with assistance from the Bradford Conservation Commission, High Fields Institute, and the CVSWMD in 2004 on a large Bradford dairy farm. Food waste was composted from 8 local commercial enterprises:- Hannaford Supermarket, Colatina Exit and other restaurants, Valley Vista Drug Rehabilitation Facility, Bliss Village Store, Bradford Elementary and Oxbow High Schools and Hulbert Outdoor Center – averaging just under 100 tons per year. During its second year of operation, it became increasingly difficult for the farm to continue the undertaking and provide for expansion of the project, so a mutual decision was made to move the composting program to a new site.

The Bradford/Corinth Composting Project began preliminary operation in 2007, at the Sandberg farm on Abe Jacobs Road in Corinth, VT, as a collaborative effort among the Bradford and Corinth Conservation Commissions, CVSWMD, and High Fields Institute. In addition to the food waste generators listed above, Robert Sandberg also collects horse manure and bedding from a local horse farm, and leaves and wood chips collected at Bradford's recycling depot.

The Bradford Conservation Commission received small grants for site preparation and technical support from 10 different sources. In-kind support in the form of volunteer hours and equipment has come from High Fields Institute, CVSWMD, and the Bradford Conservation Commission.

A planned educational component to the composting project will engage students and teachers in the process. Also, as new food waste generators join the project, staff training in proper source separation will continue to be provided.

B. Recreational Facilities

When residents were asked to rate Town services in the 2007 Town Plan Survey, they gave the Town's recreational facilities a passing grade (31% indicated "good", 28% indicated "fair"), but felt there was room for improvement. The need for improved recreation facilities and opportunities was voiced strongly in the survey's "open answer" section where residents suggested that Bradford should have such amenities as walking or biking paths, improved tennis courts, a swimming pool, and a larger skating rink. In 2007, the town established the Parks and Recreation Commission whose purpose is to consult with and advise the Administrative Assistant and Selectboard in all matters affecting recreation programs, parks or facilities including maintenance, policies, and finances. The Commission is also to assist in the development of long-range planning for recreation, park needs and funding needs.

In 2014 the town hired a part time Recreation Director (32 hours per month, or an average of 8 hours per week). The Recreation Director has begun an effort to coordinate recreational activities in the community, several of which are run by independent organizations (Bradford Youth Sports, Bradford Youth Football, school activities, scouts, etc.). The Recreation Director is also working with the Bradford Conservation Commission to organize hikes, snowshoe excursions, canoe trips, etc.

Bradford has a number of recreational facilities within its borders, although they are not all owned by the Town:

Town/School Owned Facilities

- Memorial Field owned by Bradford Academy and Graded School District (BAGSD) - Memorial Field is located east of Bradford's downtown in the floodplain of the Waits River. Formerly utilized by the Bradford Academy, it contains ball fields, fairgrounds, animal sheds and a tennis court as well as the Bugbee boat launch (see below). Groups are allowed to lease the use of the facilities through the School Board, and the Connecticut Valley Fair has traditionally been held on Memorial Field.

- BAGSD Playground – The Bradford Elementary School maintains a playground, which is open to the public. A group of community members have raised money to upgrade the playground by adding a play structure. With the help of a grant from the Wellborn Ecology Fund, the school has been working to add additional features to its schoolyard designed to enhance the curriculum and enable outdoor education. The first phase of these additions included geometrically-shaped butterfly garden, improvements to an existing woodland nature trail, an outdoor literacy classroom made from raised beds, establishment of an oak "life cycle" grove, and other plantings. The second phase of additions includes an outdoor amphitheater, plantings to attract birds and wildlife, and a living fence separating the playing fields from the school driveway.

- Bugbee Boat Launch (owned by BAGSD) – The Bugbee boat launch allows boat access to the Waits and Connecticut Rivers. There is parking for up to ten vehicles as well as a small area for camping.

Additional Locations (private)

- Bradford Golf Club – The Bradford Golf Club is located east of the downtown district adjacent to the Connecticut River. Opened in 1924, the 9-hole, par 32 golf course is a for profit corporation that is open to the public. The corporation leases the clubhouse from the BAGSD on a 10-year lease basis without charge.

- Bradford Regional Community Center - In 2004 the Bradford Community Development Corporation (BCDC) renovated the vacant Upper Valley Press Building into the Bradford Regional Community Center. The building houses the Orange East Senior Center and a commercial tenant. During 2005 the BCDC added a bus barn to the property, which is operated by the Stagecoach Service, Inc. a non-profit public transportation organization.

- Old Church Theater –Located in building behind the Congregational Church on Main Street, the Old Church Theater has presented over 28 years of summer productions geared for family entertainment. The actors are local residents from various backgrounds and some have gone on to make a career in the theater world. The theater is open to anyone wishing to act, direct, work backstage, help with set design, ticket sales and more.

C. Public Lands

The town of Bradford owns several forested properties and a number of parks. The public lands have been mapped by the Bradford Public Schools.

- Low-St. John Forest (owned by BAGSD) – Located on Goshen Road, the Low-St. John Forest consists of roughly 80 acres of woodland with trails and picnic grounds. The forest is managed sustainably for timber and has a ten-year management plan. In late summer of 2007, the lower ten acres were sprayed to control poison ivy and invasive plants such as barberry, honeysuckle, and autumn olive. The forest was selectively logged in the winters of 2007 and 2008. The Low-St. John Forest is used by the elementary school in all seasons to enhance its science education curriculum. It is also widely used by community members for outdoor recreation activities. Creating an improved parking lot, a permanent rustic outhouse, and an outdoor classroom are projects that have been discussed by the Low-St. John Forest Committee to increase the forest's potential for education and recreation.

- Wright's Mountain/Devil's Den Town Forest (owned by the Town of Bradford and managed by the Conservation Commission) - Since 1994, the Town of Bradford has acquired 516 acres on Wrights Mountain. Through the work of the Bradford Conservation Commission, with the support of the Upper Valley Land Trust, Vermont Housing & Conservation Board, Friends of Wrights Mountain, and other organizations and individuals, this effort has provided to the community an outstanding recreational and natural area. Nine miles of well-groomed and marked hiking trails have been developed and maintained, with more trails planned.

- Andrew and Ida Boch Memorial Park at Bradford Falls (owned by the Town of Bradford and managed by the Parks and Recreational Commission) - This scenic park, adjacent to the Bradford Public Library, overlooks the Waits River falls at the south end of the village.

- Elizabeth's Park (owned by the Town of Bradford and managed by the Parks and Recreation Commission) – The construction of Elizabeth's Park was a large community effort: 500 individuals worked over a weekend in September of 1988 to finish the park project. Many residents were involved in the Park's initial design. In March of 2007, the townspeople voted to accept the donation of Elizabeth's Park from private donors. Located on Fairground Road, the park is a playground for young children with a large wooden play structure designed with towers, walkways, slides, and mazes. Although the facilities at Elizabeth's Park remain in passable condition, in 2015 it is clear that some of the park's structures are due for renovation. The Parks & Recreation Commission and the Recreation Director are working together to develop a plan for these needed renovations

- Denny Park (owned by the Town of Bradford and managed by the Parks and Recreation Commission) – Denny Park is a small park on North Main Street with picnic tables and a gazebo used for summer music concerts. The Denny family donated the park to the Town in the mid 1990's to preserve the view across the floodplain at the confluence of the Waits and Connecticut rivers.

State Owned Facilities

State owned facilities in Bradford include the National Guard Armory located on Fairground Road, the State Police barracks located on Route 25, the Vermont Agency of Transportation garage located on Fairground Road, a Park and Ride lot on the corner of Route 25 and Creamery Road, and the Rest Area on Interstate 91.

D. Libraries

Bradford Elementary School Library

The Bradford Elementary School library encourages K-6th grade students, staff and community to use its collection of materials numbering around 7,000 items, including books, videos, audio-visuals, and periodicals. If materials outside this collection are needed by the school, staff, or community, the school also has access to the Vermont Automated-Library System (VALS).

Oxbow High School Library

The Oxbow High School library provides unified media services: print, audio-visual, and computer, as well as access to VALS. Available resources include: 14 computers with Internet connections, a variety of research databases and five computers providing catalog services. The Library's collection includes roughly 14,000 volumes, including the periodical collection. A major non-print collection is available. A growing collection of available resources support audio/visual digital technology. The library, like the school, is accessible to the disabled and available to the public during regular hours and by appointment. Along with the resources listed above, the local Vermont History collection draws the public to visit the library.

Bradford Public Library

Located at the south end of the village near the intersection of Routes 5 and 25B, the three-story brick building, designed by Lambert Packard, was built in 1895. The building is listed on the national Register of Historic Places. In September 1796, the Bradford Social Library Society was granted a charter making it the first chartered library in Vermont. The present library building was a gift of John L. Woods, and on July 4, 1895 the Woods Library Building was dedicated. The Bradford Public Library is owned by a not-for-profit corporation, with a nine member self-perpetuating board of trustees, with three additional trustees appointed by the Selectboard for three-year terms. The building has one reading room, a children's room, and a young adult room. The third floor is presently only used for storage, but has space for potential future use. The library offers four computers, wireless internet access, and two printers available for public use. The library's collection contains 10,000 volumes. The library is connected to the VALS, which gives it access to the libraries of all Vermont colleges, public libraries, the Vermont Legislature, and the Vermont Student Assistance Corporation (VSAC).

The Bradford Public Library is an architectural gem, and is one of the most significant buildings in Bradford's downtown area. However, the building is not handicapped accessible and is in need of substantial repair and renovation. The slate roof has leaked badly, which leads to many problems. In 2015 it was repaired with support from grants and the town. Drainage around the building's foundation is a problem, as are outdated mechanical systems. The library is currently involved in a major fundraising campaign to finance the remaining much needed renovations.

E. Communication Facilities

Landline Communications

Most of the telephone-related services in Bradford are still offered via the traditional telephone lines and poles (landline). The primary phone providers in Town are Fairpoint (previously Verizon), which covers the majority of the Town, and Topsham Telephone Company, which covers a portion of the western area of Town.

Cellular Communications

As of October, 2014, there are no cell towers in Bradford. Cell phone service in Bradford comes from towers located just south of the Bradford town line in Fairlee, north of town in Newbury, or across the Connecticut River in New Hampshire. Based on responses to the 2007 Town Plan Survey, residents feel cell coverage could use improvement and even expressed a willingness to permit cell towers in town provided they were properly sited. In March, 2014, Verizon Wireless received approval from the Vermont Public Service Board to construct a cellular tower on a hilltop off Rowell Brook Road. Construction of the new tower is expected to occur in late 2014 or early 2015. It is not clear yet how this new facility will affect cellular coverage in Bradford, though it appears likely that subscribers to Verizon Wireless services will see an improvement in signal strength.

High-speed Internet

There are presently four ways to access the internet in Bradford: landline, DSL, cable and satellite.

- Landline access is the most available to residents, but speeds over a telephone modem are very slow, and given the ever-increasing need for bandwidth in day-to-day use of the internet, they are not practical for more than checking email. The faster and more stable options available to residents are via cable modem and DSL.
- Cable offers fairly consistent bandwidths. It is substantially faster than dial-up. Cable coverage in town is limited to those areas receiving expanded cable access through Comcast and Charter and represents only a fraction of internet users in Bradford.
- Digital Subscriber Line (DSL) is very similar to cable in speed. It is less subject to decreases in speed caused by heavy internet traffic because a certain amount of bandwidth is dedicated for each user. DSL is provided to those within the service area of Topsham Telephone, or within three line miles of the Fairpoint switching station in downtown Bradford.
- Satellite Internet is provided by companies such as Dish Network, Directway and Wildblue, satellite internet is an option for residents who are unable to access the internet via cable or DSL provided they have a clear view of the southern sky from their locations. Although bandwidth over satellite is on average three times faster than a dial-up connection, it is more expensive than other methods of access and it can be affected by heavy weather such as torrential rains and blizzards.

It is likely that as many as two-thirds of the households in Bradford have access to the internet only via landline or satellite modem. When surveyed, nearly 80% of respondents indicated that they would like to see the availability of high-speed internet access increased. Because of the difficulties in convincing cable and DSL providers to extend their coverage areas, other towns in the Upper Valley have considered alternatives to those listed above. In some cases, wireless internet providers have placed towers in towns that provide wireless broadband access to those within line-of-sight.

In recent months, East Central Vermont Community Fiber Network has approached towns in the Upper Valley including Bradford. This organization is developing a long-term plan to extend fiber optic cable throughout the region. Fiber optic cables offer the fastest connection speed available. Although this project is in early stages of development, it has the potential to benefit Bradford residents.

F. Goals, Policies and Recommendations

Goals

1. To preserve, promote and enhance the cultural and recreational values of the Town in order to encourage the use of these resources by the local population and visitors to Bradford.
2. To encourage diverse and environmentally sensitive recreational opportunities.
3. For the Town of Bradford to become as close to waste-free as practical by 2020.
4. To support the Bradford Public Library's fund raising campaign to renovate and update the building for handicapped accessibility, roof repairs, foundation drainage, and updated mechanical systems.

Policies

1. It is the policy of the Town to conserve open and undeveloped land, while simultaneously promoting responsible economic development and affordable housing. Productive farmland and forests are particularly important for their contribution to Bradford's economy and environmental quality, and development should not significantly diminish the value and availability of outdoor recreation.
2. It is the policy of the Town that public buildings and newly constructed public facilities should be designed to the latest energy efficiency standards.
3. It is the policy of the Town to support all efforts to provide Bradford residents with expanded options for high-speed internet access provided those options do not have negative effects on the rural character of the town.
4. It is the policy of the Town to continue to develop and maintain active sustainable forestry management plans on woodland parcels owned by the Town and the Bradford Academy and Graded School District.
5. It is the policy of the Town to support the Conservation Commission's efforts to maintain a composting program.
6. It is the policy of the Town to educate and encourage residents concerning the concept of "zero waste" and to pursue programs enabling Bradford to become waste-free by 2020.

Recommendations

1. The Bradford Water and Sewer Commission should conduct a build out analysis of the area covered by water and sewer service to determine the capacity of the existing infrastructure. Using this information, it should adopt a procedure for allocating the reserve capacity to enable a steady growth rate for all uses and to assure the availability of service during the design period.
2. The Town should encourage the Central Vermont Solid Waste Management District to provide more opportunities for the safe disposal of household hazardous wastes, such as compact fluorescent light bulbs, mercury-containing products such as thermostats, bad gasoline, solvents, pesticides, etc.

3. The Town should explore cost effective ways to redesign the Bradford recycling center to allow for better circulation and functionality of service.
4. The Town should adopt a Capital Budget and Program in order to plan for anticipated infrastructure maintenance and improvement.
5. The Low-St. John Forest Committee should work together with the Bradford Parks and Recreation Commission to improve recreational use of the forest.
6. The Bradford Conservation Commission and the Bradford Parks and Recreation Commission should continue to coordinate efforts to enhance recreational opportunities on Wright's Mountain.
7. The Town should explore ways to expand recreational offerings to support healthy lifestyles.

VI. HEALTH AND EMERGENCY SERVICES

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

A. Health Care Facilities

Health care facilities are essential in the prevention, treatment, and management of illness, and in the preservation of mental and physical well-being through the services they offer. Rural locations such as Bradford are served by small facilities that can assist residents with general health care needs but are not suited for more complex acute care services that require specialized services and equipment.

The lower population density of Vermont's rural countryside, and the larger the area over which the population is distributed, can make providing adequate health care more difficult, particularly care for the elderly who may not be able to drive themselves to major health care facilities. Likewise in rural areas, emergency care for severe trauma or major acute illnesses such as stroke and heart attack may take longer response time compared to more populated locations, risking potential loss of life.

However, Bradford's population is large enough to allow a number of private health providers, including physicians, chiropractors, dentists, optometrists, pediatric services, a full service pharmacy, health clinic, therapeutic care, and a state licensed alcohol and chemical dependency treatment center. Major health care facilities in Bradford include Little Rivers Health Care, Clara Martin, and Upper Valley Pediatrics.

Other facilities that provide health-related services include Valley Vista, Upper Valley Services, and Veterans Inc.

B. Elderly Care Facilities

At present, Bradford does not have any licensed nursing homes. There are, however, several residential care homes. The Vermont Department of Disabilities, Aging and Independent Living classifies residential care homes in two groups, depending upon the level of care provided. Level III homes provide nursing overview, but not full-time nursing care. Level IV homes do not provide nursing overview or nursing care. There is currently one level III residential care home and one level IV residential care home.

As discussed in the chapter "Demographics, Housing, and Education", Bradford residents are very supportive of the creation of additional housing for the elderly. When asked if the town should "…encourage the development of independent senior housing in close proximity to the downtown", the majority of the responses (80%) were positive. Further, when asked what types of housing residents would like to see throughout Bradford, independent and assisted living facilities collectively received the largest percentage of support (35%).

C. Bradford Fire Department

The Bradford Fire Department serves Bradford and is part of the mutual aid network. It also responds to all automobile-related rescue calls. In 2014, the Bradford Fire Department responded to 161 calls, which included structural fires, chimney fires, motor vehicle accidents and mutual aid calls. The Fire Department receives policy advice and oversight from the Bradford Public Safety Commission. The Commission is also the point of contact for any complaints regarding the Fire Department.

Staff

The Bradford Fire Department is staffed by 25 volunteer firefighters. The department needs additional volunteers to serve as firefighters, to help raise money, and to help care for the equipment, but like many volunteer fire departments in Vermont, finding new volunteers is increasingly difficult. This is a common problem statewide. The effects of an aging population, many residents working outside the town limits, and the many State and Federal requirements for training have taken a toll on the pool of interested volunteers.

Fire Station

The Bradford Fire Station is located on 135 Carson Lane, just south of Bradford's downtown. The station was built in 1998 and contains six bays for fire and rescue vehicles, an office for the fire chief, and a large meeting room equipped with a kitchen. The building itself is in good condition, needing only routine maintenance such as painting. In February, 2014 the heating system serving the fire station's truck bays was found to be badly deteriorated and was emitting dangerous amounts of carbon monoxide. The heating system was replaced in March 2014. Storage however, is at a premium in the fire station, and soon there may be a need to add some sort of structure for equipment storage.

Vehicles

The Town of Bradford owns four fire trucks:

- A 1986 E-One ladder tower
- A 1994 E-One engine

- A 2008 E-One Pumper/Rescue truck
- A 2000 tanker (lacks pump)

The Town is making plans to sell the 1986 ladder truck, which has suffered numerous mechanical problems, and consequently, has not been a piece of equipment the fire department can rely on. Finding necessary replacement parts for that truck is also a challenge. The fire department is working closely with the Public Safety Commission to identify what the next steps should be.

Structure and Funding

The Bradford Fire Department is a municipal department. The Selectboard appoints chiefs and officers in consultation with the members of the Department. The Department budget is included as part of the annual municipal budget.

D. Police Protection Services

As of the winter of 2015, Bradford has a full-time police Chief, and three part-time police officers. The Police Department receives policy advice and oversight from the Bradford Public Safety Commission. The Commission is also the point of contact for any complaints regarding the Police Department.

Supplemental police coverage in Bradford is provided by the State Police from the Bradford barracks.

The town owns two police vehicles:
2010 Ford Explorer
2013d Expedition

E. Emergency Medical Services

Bradford FAST Squad

Emergency medical calls are answered initially by the Bradford Fast Squad, which has six members trained in handling medical emergencies. The purpose of the Fast Squad is to provide immediate response to emergencies while Upper Valley Ambulance is en route to the scene. EMTs in Bradford respond to calls using personal vehicles. (If the Fire Department also responds they usually use the rescue truck and are trained in vehicle extrication skills.) Unlike the Fire Department, the FAST squad is an independent organization and not a town department, but the Fast squad receives almost all its funding through the annual municipal budget.

Upper Valley Ambulance

Upper Valley Ambulance (UVA), located in Fairlee, provides emergency medical transportation. In 2007, Upper Valley Ambulance responded to 68 calls in Bradford. In 2008, it responded to 71 calls. (We need updated numbers here, which should be available in the Bradford Town report.)

UVA provides primary 911 ambulance coverage to nine communities, including the towns of Bradford, Corinth, Fairlee, Strafford, Thetford, Vershire, and West Fairlee in Vermont, and Orford and Piermont in New Hampshire. In addition to emergency services, UVA provides non-emergency ambulance transportation to hospitals, nursing homes and residences.

At its facility in Fairlee, UVA offers training in basic CPR and first aid as well as formal EMT training for all fast squads and fire departments in the surrounding area.

The Town of Bradford pays an annual per capita fee to UVA for its services. Residents who feel that their insurance may not cover the cost of medical transportation can become members of UVA. A household membership is available which provides unlimited necessary medical transport without additional cost above any insurance benefit payment.

F. Municipal Emergency Management

The Town of Bradford has an Emergency Management Coordinator, who oversees the town's responses to all types of emergency situations. The Emergency Management Coordinator has been trained in the National Incident Management System (NIMS), and emergency situations and future capital investments are managed in accordance with NIMS protocols.

G. Goals, Policies and Recommendations

Goals

1. High quality medical care should be available to all Bradford residents.

2. All Bradford residents should be served by well equipped and well trained emergency services personnel (police, fire, and EMS).

Policies

1. It is the policy of the Town to support efforts to provide residents with access to high quality physical and mental health care through local providers.

2. It is the policy of the Town to support programs that expand medical coverage or improve medical services in Bradford.

3. It is the policy of the Town to support the development of assisted living or other facilities or services dedicated to supporting all those in need.

Recommendations

i. The town should explore whether the Fast Squad should officially become part of the town government.

ii. All emergency response personnel should be trained in the NIMS system.

VII. Energy

A. Background

Sound local planning can play a positive and effective role in guiding energy use by promoting appropriate land use patterns, participating in energy development decisions, facilitating alternative transportation options, and encouraging energy conservation strategies. Sustainable energy use can maintain a healthy environment, and build a foundation for economic health and stability. The energy security of Bradford depends on being able to provide consistently and sustainable energy services such as heat for our homes, affordable transportation, and light and energy for our homes and workplaces.

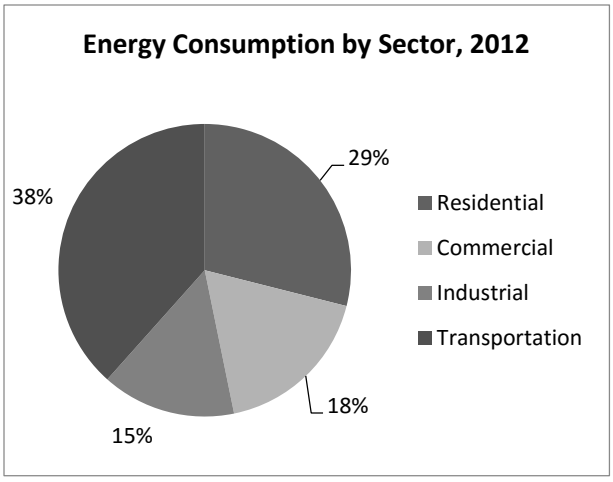
Sustainability must be the basic principle of a long-term energy plan. Bradford cannot rely on non-renewable energy sources indefinitely, as non-renewable sources are by definition unsustainable.

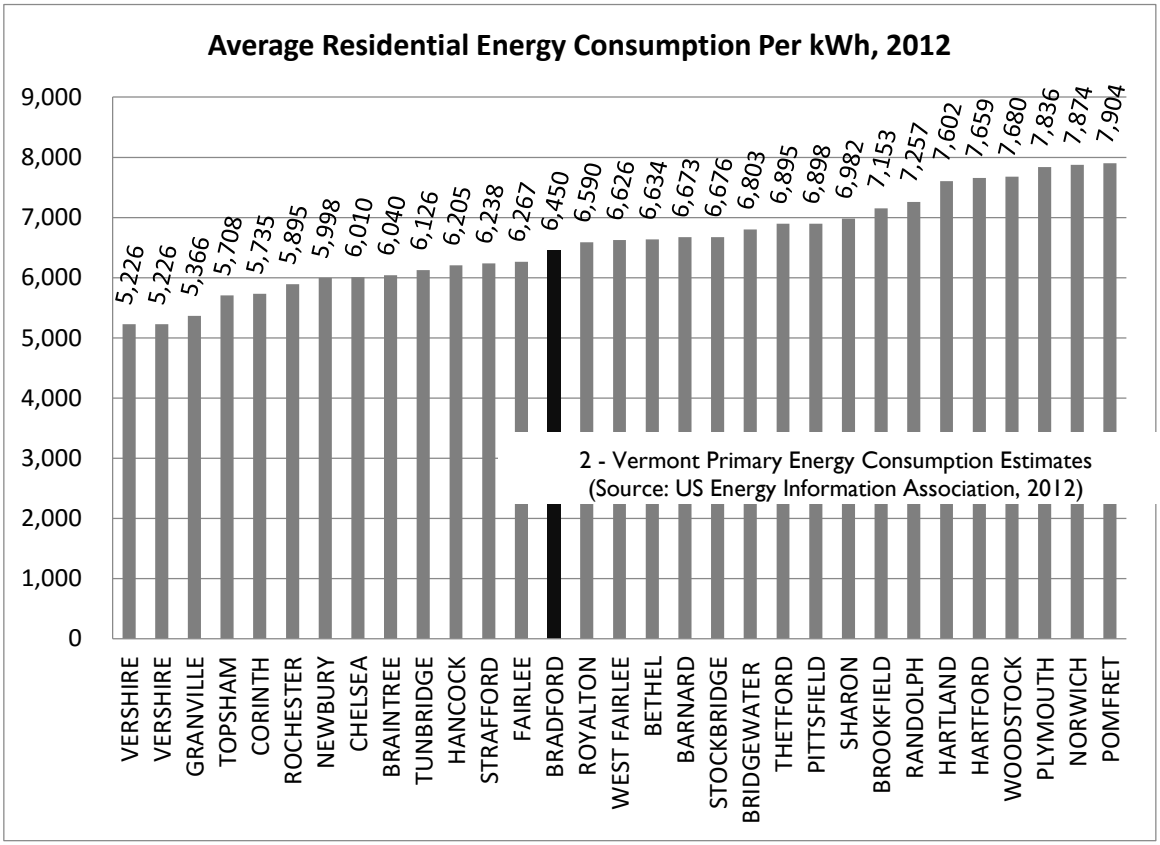
As patterns of settlement affect energy use, so the implementation of energy goals and policies affect patterns of settlement in Bradford. Highly dispersed and unplanned patterns of land use result in inefficient and uneconomic use of land and energy resources. Land use policies and provisions adopted by Bradford relative to employment location and other facilities can encourage the use of public transportation and carpooling, thus reducing the consumption of energy and the need for additional parking facilities.

Bradford residents have expressed concern over the impact of industrial scale energy developments., fearing that it could destroy the character of the town. Therefore, industrial-scale power generation and transmission facilities are inappropriate in the town. This includes, but is not limited to, industrial-scale wind turbines and their associated transmission facilties. Development of industrial wind turbines generally occurs at higher elevations, often along ridgelines. In Bradford, these areas are among the town's most sensitive ecological areas, most wild and unfragmented lands, and are highly visible from conservation lands, scenic roads and dwellings. Such large scale energy transmission facilities are inconsistent with the town's vision and goals.

B. Energy Demands

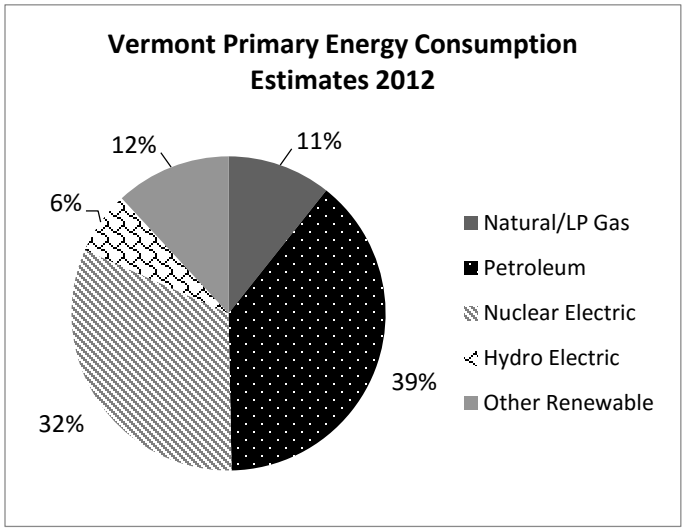
According to the 2011 Vermont Comprehensive Energy Plan (CEP), energy demand grew at 1.8% from 1990 to 1999, but has been close to 0% for the past 10 years. The combination of state energy efficiency programs and the 2007–2009 recession probably helped to reduce energy demand across most end-use sectors in Vermont. The 2010 American Community Survey indicates that the major heating fuels consumed in Bradford are oil (49%), electric (8%), wood (9%) and Propane Gas (LPG) and Light natural gas (15%). AdUministration, 2012)





Per capita energy

1– Average Residential Electricity Consumption (kWh)
(Source: Vermont Energy Atlas and Efficiency Vermont, 2012)



consumption for residential and other uses in the Northeast is similar to that in rest of the United States. In Vermont, almost 80% of residential energy is dedicated to space heating and domestic hot water. Approximately 34% of Vermont's total energy usage goes toward transportation.

Of the energy dedicated to transportation, over half is used to fuel private cars (as opposed to being used for public transit, road maintenance, or another public purpose). This fact reinforces the need for clear policies that reflect the transportation implications of land use decisions in this community.

According to 2012 data collected by Efficiency Vermont, the town of Bradford is 15th out of 30 towns in terms of average annual energy use levels in the Two Rivers-Ottauquechee Region. In 2012, this data (limited only to residential energy use) determined that Bradford the average household used 6590 kWh of energy, which is almost equivalent to the average household electricity usage of all the towns in the Two Rivers-Ottauquechee Region.

C. Current Energy Sources

Fossil Fuels

Fossil fuels produce nearly 75% of all energy consumed in Vermont. About 50% of the oil consumed in the U.S. is imported. Although Bradford hosts large oil and propane distribution companies, a disruption of interstate and international fuel deliveries would pose a severe problem to Bradford residents and businesses.

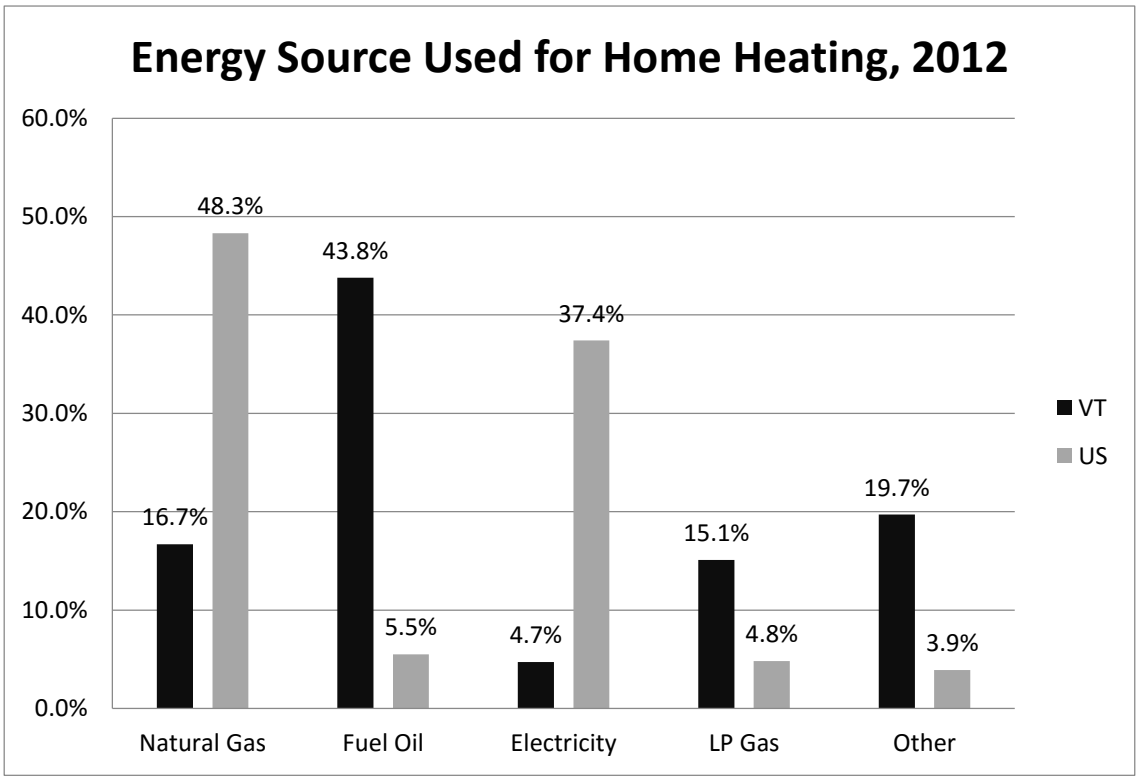


Figure 3: Vermont Energy Profile, U.S. Energy Information Administration, 2012

Bradford, like most other towns in Vermont, depends primarily on fossil fuels for heating and transportation. As shown in the chart #, fossil fuels account for 50% of all energy consumed in Vermont, much of which is used in transportation and heating.

50% of homes in Bradford heat with oil, which means a substantial portion of Bradford's homeowners are subject to the price and availability instabilities of a reliance on oil. Vermont's economic system is so closely tied to the availability of fossil fuels that even modest price increases can lead to inflation, a slowdown in economic growth, and destabilized economy. This can have unanticipated adverse impacts at the municipal and residential level in all communities, including Bradford. For example, increasing fuel prices make it more expensive for a town government to provide traditional public services and maintain existing facilities. Additionally, rising prices can also make it difficult for residents to heat their homes and put enough food on the table (the price and availability of food is usually influenced by fuel prices).

The combustion of fossil fuels has been determined to be the largest contributor of atmospheric "greenhouse gases" (primarily carbon dioxide), which accumulate within the earth's atmosphere to create a "greenhouse effect", warming the atmosphere and threatening to create coastal flooding, unpredictable climate shifts, and alteration of the viability of the earth's most significant urban and agricultural centers.

Electrical Energy

Two electric power companies serve Bradford. Green Mountain Power (GMP), the region's largest provider of electric power, serves the majority of the Town. GMP maintains contracts with Seabrook Nuclear, and Hydro Quebec. GMP owns and operates the Waits River Hydroelectric Station. The Washington Electric Cooperative serves the rural western part of the Town. This Cooperative has invested in a landfill methane plant in Coventry, Vermont, which provides close to 60 per cent of its power needs. The Coop has been at the forefront of demand side energy management, reducing its members' average energy usage to well below the state average, and is currently qualified as 100 percent renewable**.**

Renewable Energy

Seventy percent (70%) of Vermont's electricity comes from renewable resources, a larger percentage than most other states in the U.S. Although the majority of Vermont's renewable energy is generated through Hydro-Quebec (see below), some hydroelectric power is generated in Vermont. Additional sources of renewable energy include several utility owned commercial-scale wind and solar farms, and landfill and on-farm methane projects.

D. Renewable Energy Resources

The 2012 Vermont Comprehensive Energy Plan recommends that Vermont obtain 90% of our total energy from renewable sources by 2050. This is a lofty goal, but one that will benefit all Vermonters if achieved. The term "renewable energy" refers to the production of electricity and fuels from energy sources that are naturally and continually replenished, such as wind, solar power, geothermal (using the earth's heat to create power), hydropower, and various forms of biomass (trees, crops, manure, etc.).

Although initial set-up costs for renewable energy generation systems can be high, these systems can save users money over the long term, and they reduce the consumption of carbon-based fuels, helping

to protect our environment and reduce our reliance on centralized energy. In Vermont, some of these energy sources are more readily available than others, and some are more cost-effective for the individual energy producer.

Commercial scale renewable energy generation systems are a growing business in Vermont, increasing the percentage of locally generated power. However, the energy generated commercially is deposited into the national grid system, which means that the power generated here may not be utilized locally.

Residential scale renewable energy generation systems are generally regulated through the State of Vermont, requiring a Certificate of Public Good from the Department of Public Service. State statute forbids the creation of land use regulations that prohibit renewable energy generation.

The town is concerned about plans for major development within Bradford and in neighboring towns. These types of developments could threaten the environment and quality of life that Bradford residents value. The town would like ot have the option to be represented at the Public Service Board as an interested and/or average person in any and all future plans before the Public Service Board.

All Vermont electric utilities now offer Net Metering and both GMP and WEC have programs for both individual and group Net Metering programs. Residential energy systems can take advantage of net metering. Net metering allows residential and commercial customers who generate their own electricity from solar power to feed electricity they do not use back into the grid, providing the solar system owner with a credit for the unused electricity generated. Customers are only billed for their "net" energy use. The Vermont legislature updated net metering laws in 2014 with HB 702, with the provision that net metering is available until the cumulative capacity of net-metered systems equals 15% of a utility's peak demand during 1996 or the peak demand during the most recent full calendar year, whichever is greater. Net-metered systems are overseen by the Public Service Board and are not required to get a local permit.

The types of renewable energy found in Vermont are:

Solar Energy

Solar energy has the potential to provide clean, reliable, and safe energy, even in Vermont's climate. Most areas in Vermont have the potential for some solar energy production, at least at the residential scale.

> Passive Heating and Lighting – Good building and site design are essential to taking advantage of the suns energy through passive methods._One particularly simple passive solar technology is "solar-tempering" of buildings. Solar tempered buildings orient their long axis toward true south and contain an unobstructed, south-facing window area equal to 7% or more of total floor area. Coupled with proper insulation, solar tempering can offset heat costs by 40%. This passive technology requires no additional initial investment.
>
> Water Heating – Solar water heating is the most common form of residential-scale solar use in Vermont. Solar hot water (SHW) systems generally consist of a collector, a liquid medium, and a holding tank. These systems rely on the suns energy to heat the liquid medium, which in turn heats water, supplementing or supplying the hot water needs of the home. Solar hot water offers the fastest payback on investment of any type of solar.

Electricity Generation – Decreasing costs of equipment have made solar electric generation systems more prevalent in Vermont and across the U.S. Photovoltaic, or PV panels can be seen on roofs and arrays around Vermont. The suns' energy creates an electrical charge in the silicon-based solar cells in the PV panel, creating electricity that powers homes, businesses or whole communities. Residential or commercial PV panels are typically tied into a house or building's electrical supply in an arrangement called net metering, which feeds any excess power generated back to the local utilities.

Solar arrays do not need to be located on high ground and are therefore less visually prominent. In addition, these facilities can be located in already developed areas, requiring fewer access roads, requiring less infrastructure and reducing adverse impacts on wild lands.

The Town of Bradford supports responsibly sited and developed renewable energy projects within its boundaries. It recognizes that to maximize profits, developers desire projects to be located in close proximity to electric power lines capable of transmitting the load proposed to be generated and easy access from major transportation networks for construction. However, the town desires to maintain the working landscape, adopted conservation and habitat protection measures and scenic rural views important to its economy and rural cultural aesthetics. Not all commercial or community scale solar projects proposed can meet this standard. Projects must meet the following community standards in order to be considered "orderly development" supported by this plan and in order to not unduly impact the aesthetics of the rural countryside this plan intends to protect:

1. Community Standards
    i. Siting: Where a project is placed on the landscape constitutes the most critical element in the aesthetic siting of a project. Poor siting cannot be adequately mitigated. Accordingly, all renewable energy projects must evaluate and address the proposed site's aesthetic impact on the surrounding landscape.
        1. Good sites have one or more of the following characteristics:
            a. Roof-mounted systems (except in the historic district)
            b. Systems located in close proximity to existing larger scale, commercial, industrial or agricultural buildings.
            c. Proximity to existing hedgerows or other topographical features that naturally screen the proposed array from view from at least two sides.
            d. Reuse of former brownfields or otherwise impacted property.
        2. Poor sites have one or more of the following characteristics:
            a. No natural screening
            b. Topography that causes the arrays to be visible against the skyline from common vantage points like roads or neighborhoods.
            c. A location in proximity to and interfering with a significant viewshed (significant viewsheds within the Town of Bradford include I91, Route 5, Route 25, South Road, Goshen Road, Fairground Road, along the Waits River and Connecticut River
            d. The removal of productive agricultural land from agricultural use.
            e. Sites that require public investment in transmission and distribution infrastructure in order to function properly.
    ii. Mass and Scale: The historical working landscape that defines Bradford currently and that Bradford desires to preserve is dominated by viewsheds across open fields to wooded hillsides. Rural structures like barns fit into the landscape because their scale and mass generally do not impact large tracts of otherwise open land. All

commercial scale solar arrays shall also be limited in mass and scale, and/ or have their mass and scale broken by screening, to fit in with the landscape. Commercial solar projects larger than an acre are larger than any other structure within the Town of Bradford, cannot be adequately screened or mitigated to blend into the municipality's landscape and are therefore prohibited.

2. Average Person

   For the purposes of this plan, either the Selectboard or the Planning Commission shall be deemed to represent the voice of the "average person" with respect to the "Quechee Test" when evaluating the aesthetics of a proposed solar array.

3. Mitigation methods:
   i. In addition to properly siting a project, solar developers must take the following action to mitigate all project sites:
      1. Locate the structures on the site to keep them from being "skylines" above the horizon from public and private vantage points.
      2. Shorter panels may be more appropriate in certain spaces than taller panels to keep the project lower on the landscape.
      3. At a minimum all solar arrays must observe the setback restrictions contained in Act 56 governing solar installations. However developers are encouraged to increase setbacks to at least those listed in the Town Zoning Regulations within the Zoning District in which it lies.
      4. Use the existing topography, development or vegetation on the site to screen and or break the mass of the array.
      5. In the absence of existing natural vegetation, the commercial development must be screened by native plantings beneficial to wildlife and pollinators that will grow to a sufficient height and depth to provide effective screening within a period of 5 years. Partial screening to break the mass of the site and to protect public and private views of the project may be appropriate.
      6. Practice a "good neighbor policy". The siting of the array should be done in such a manner that the array creates no greater burden on neighboring property owners or public infrastructure than it does on the property on which it is sited. As an example, a landowner may not site an array on hi or her property in a location calculated to diminish the visual impact of the array from his or her residence, but places the array immediately within their neighbor's or the public's viewshed. Locating a soalr array in sucha manner designed to reduce impacts on neighbors or public viewsheds constitutes reasonable mitigation.
      7. Use black or earth tone materials (panels, supports fences) that blend into the landscape instead of metallic or other brighter colors.
   ii. Decommissioning and Restoration: All projects shall be decommissioned at the end of their useful life and the property shall be restored to its pre-project condition. Developers of all projects 100kW and greater shall provide the town with appropriate assurances to guarantee funding exists to decommission the project such as a bond. In keeping with the Town of Bradford's desires to retain our agricultural land base, a solar array's useful life shall be deemed to be at the end of the initial contract for services with the power company.

Wind Energy

Similar to solar, wind energy is an intermittent resource and its generation fluctuates in response to environmental conditions. The amount of energy produced by a specific wind tower can depend greatly on location, height of the tower, and proximity to other obstructions. Nevertheless, most modern wind turbines (when properly sited) are able to generate electricity 95% of the time. There are multiple levels of potential wind energy generation, ranging from Class 1 (10-11 mph) to Class 7 (19-25 mph).

Potential Wind Development Areas in Bradford (Acres)

	Class 1 (10-11 mph)	Class 2 (12-13 mph)	Class 3 (13-14 mph)	Class 4 (15-16 mph)	Class 5 (16-17 mph)	Class 6 (17-18 mph)	Class 7 (19-25 mph)
Residential *(30-meter)*	1096	0	0	0	0	0	0
Small Commercial *(50-meter)*	0	37	14	0	0	0	0
Large Commercial *(70-meter)*	0	0	0	0	0	0	0

4 - Potential Wind Development Areas in Bradford (Source: Vermont Energy Atlas, 2012)

In the 2007 Town Plan Survey, just over 80% of respondents indicated that they would encourage wind power in Bradford. Bradford's topography does not make it a desirable location for large-scale wind energy generation. Instead, it is better suited to small-scale residential wind energy generation. Wind technologies are changing rapidly, however, and smaller units may be feasible at some locations in Bradford. The location of lower scaled home or cooperatively based wind energy turbines and associated facilities may be appropriate at some locations in Bradford. Not all means of wind generation are appropriate to every setting and due consideration must be given to wildlife habitats.

Biomass & Biogas Energy Generation

The term 'biomass' refers to biologically-based materials such as algae, food or vegetable wastes, grass, wood, and methane. Biomass can be converted into an energy source to fuel vehicles (e.g. biodiesel), heat homes, or even generate electricity.

According to the 2011 Vermont Comprehensive Energy Plan, in 2007-2008 Vermonters using wood for primary heating source consumed about 5.4 cords, while those using wood as a supplementary source used 2.25 cords. In that same year, Vermont households with primary-heat-source consumers burned 3.8 tons and supplementary-heat-source consumers burned 1.2 tons for the season.

There are no biomass energy generation facilities in Bradford. Community-scale biomass has the potential to offer cost-effective heating in small, clustered areas. Some towns have implemented combined heat and power systems that run on biomass to heat multiple municipal buildings.

Biofuels

In addition to using biomass for heating, the use of biofuels, particularly biodiesel, is becoming an increasingly popular option for municipalities attempting to cut costs and reduce the environmental impacts associated with vehicle emissions. The Town of Bradford could revisit the possibility of using biofuels in their road crew fleet.

According to the Vermont BioFuels Association, biodiesel is a clean-burning alternative fuel, produced from domestic, renewable resources, such as soybeans, sunflowers, canola, waste cooking oil, or animal fats. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend, which can be used in colder weather. It can be used in compression-ignition (diesel) engines or oil-fired boilers or furnaces with little or no modifications.

Growing biomass to use in biofuels may be a viable way to encourage farming or forestry in Bradford as well; however, balance should be sought for land used for energy demands vs. human and animal consumption.

Hydropower

Many locations in Vermont, including Bradford, once depended on hydropower to grind grain, run mills and even supply electricity to homes. But, with the onset of centralized power, most of these small-scale power generation facilities have been replaced by massive hydro facilities, such as those owned by Hydro Quebec. There is one operational hydropower facility in Bradford which annual produces 4,335 MWh of electricity. The Vermont Energy Atlas also identifies potential hydro site on Roaring Brook (located on the Blodgett property) that could have 10-49KW of undeveloped potential.

Landfill Methane

Decay of organic materials in landfills produces significant amounts of methane, a potent greenhouse gas and potential energy source. Use of methane may provide an alternative to conventional energy production sources. Capture technologies have experienced tremendous growth in recent years rendering methane a valuable energy source, as developed by the Washington Electric Cooperative.

E. Permitting Considerations

Energy generation in Vermont is subject to a number of different permitting requirements, most of which are limited to state level permitting. State statute protects residential renewable energy generation systems from regulations that will completely prohibit their development.

Section 248

Distributed power generation facilities, such as hydropower dams, fossil fuel plants, and wind power or solar systems owned by utilities, are subject to review and approval by the Vermont Public Service Board (30 VSA §248). Under this law, prior to the construction of a generation facility, the Board

must issue a Certificate of Public Good. A Section 248 review addresses environmental, economic, and social impacts associated with a particular project, similar to Act 250. In making its determination, the Board must give due consideration to the recommendations of municipal and regional planning commissions and their respective plans. Accordingly, it is appropriate that this Town Plan address these land uses and provide guidance to town officials, regulators, and utilities.

For all commercial energy generation facilities, the following policies shall apply:

1. **Preferred Locations**: New generation and transmission facilities shall be sited in locations that reinforce Bradford's traditional patterns of growth - compact village centers surrounded by a rural countryside, including farm and forest land.

2. **Prohibited Locations**: Because of their distinctive natural, historic or scenic value, energy facility development shall be excluded from the following areas:
   - Floodways shown on FEMA Flood Insurance Rate Maps;
   - Fluvial erosion hazard areas shown on Fluvial Erosion Hazard Area maps;
   - Wetlands as indicated on Vermont State Wetlands Inventory maps or identified through site analysis; and
   - Rare, threatened or endangered species habitat or communities.
   - The Bradford Town Forests

3. **Significant Areas**: All new generation, transmission, and distribution facilities shall be sited and designed to avoid or, if no other reasonable alternative exists, to otherwise minimize and mitigate adverse impacts to the following:

   - Historic districts, landmarks, sites and structures listed, or eligible for listing, on state or national registers.
   - Public parks and recreation areas, including state and municipal parks, forests and trail networks.
   - Municipally designated scenic roads and viewsheds (see Natural Resources).
   - Special flood hazard areas identified by National Flood Insurance Program maps.
   - Public and private drinking water supplies, including mapped source protection areas.
   - Necessary wildlife habitat identified by the state or through analysis, including core habitat areas, migration and travel corridors.

4. **Natural Resource Protection**: New generation and transmission facilities must be sited to avoid the fragmentation of, and undue adverse impacts to, the town's working landscape, including large tracts of undeveloped forestland and core forest habitat areas, open farm land, and primary agricultural soils mapped by the U.S. Natural Resource Conservation Service.

5. **Protection of Wildlife**: Designers must gather information about natural and wildlife habitats that exist in the project area and take measures to avoid any undue adverse impact on the resource. Consideration shall be given to the effects of the project on: natural communities, wildlife residing in the area and their migratory routes; the impacts of human activities at or near habitat areas; and any loss of vegetative cover or food sources for critical habitats.

6. **Site Selection**: Site selection should not be limited to generation facilities alone; other elements of the facility need to be considered as well. These include access roads, site clearing, onsite power lines, substations, lighting, and off-site power lines. Development of

these elements shall be done in such a way as to minimize negative impacts. Site clearing and roadways can have greater visual impacts than the energy generation facility itself. In planning for facilities, designers should take steps to mitigate the project's impact on natural, scenic and historic resources and improve its harmony with the surroundings.

F. Demand Side Energy Management Programs

In 1990 the Public Service Board required the state's regulated utilities to carry out Least Cost Integrated Planning and implement Demand Side Management Programs. Least Cost Integrated Planning requires that each utility "meet the needs of its customers at the lowest total long-term cost and do so by giving equal consideration to all generation, transmission, and energy options" (Vermont Comprehensive Energy Plan).

Demand Side Management Programs promote the conservation of energy as an energy source available for future demand. Through these programs, the region's utilities have provided various incentives including financing and partial payment of certain efficiency improvements, energy audits, and design services. As the creation of excess generating capacity can be used to meet future electrical needs for Vermont, conservation also can be viewed as a source of electricity. Conservation generally is the least expensive and environmentally benign "source" of electricity.

G. Residential Energy Efficiency

There are a number of ways that the Town of Bradford can meet its local energy demand, first by lowering that demand, and then by working to meet the remaining need with local energy resources.

Decreasing Energy Use by Changing Behavior

Raising awareness to replace wasteful energy behaviors with energy saving ones can reduce energy use and help residents and businesses save money.

Examples include:

- Turning off lights when you leave a room.
- Using a programmable thermostat.
- Use a clothes line to dry clothes.
- Use a cold-water laundry wash.
- Reduce driving.
- Don't make multiple car trips for errands.
- Turn down the thermostat in winter and up in summer.

Decreasing Energy Use by Implementing Energy Efficiency

For those necessary or desired services that require energy, the principles of energy efficiency should be used to ensure that we use less energy to provide the same level and quality of service. Examples include:

- Having a home energy audit done to identify the greatest ways to save energy;
- Implementing the air-sealing and insulation recommendations of the energy audit;
- Not heating unused areas of your home;
- Insulating with high R-value (or heat flow resistance) material;
- Using high-efficiency windows;
- Installing energy efficient, Energy Star rated appliances like refrigerators, freezers, front loading washing machines, gas heated clothes driers and heating systems without blowers;
- Using high efficiency lighting;
- Using gas and/or solar hot water heaters;
- Siting buildings to make use of existing wind blocks and natural cooling patterns derived from the landscape's topography; and
- Siting buildings with maximum southern exposure to capture passive solar energy.

New residential development in the State of Vermont is required to comply with Vermont Residential Building Energy Standards (RBES). Commercial development is subject to similar code regulations. Some examples of the types of development the RBES applies to include detached one- and two-family dwellings, multi-family and other residential buildings three stories or fewer in height, additions, alterations, renovations and repairs and factory-built modular homes (not including mobile homes).

In order to comply with the RBES, a built home must meet all of the Basic Requirements and the Performance Requirements for one of several possible compliance methods. If the home meets the technical requirements of the RBES, a Vermont Residential Building Energy Standards Certificate must be completed, filed with the Town Clerk and posted in the home. If a home required by law to meet the RBES does not comply, a homeowner may seek damages in court against the builder.

Efficiency Vermont

Efficiency Vermont is Vermont's statewide energy efficiency utility. The Vermont Public Service Board and the Vermont Legislature created Efficiency Vermont in response to a request from the Vermont Department of Public Service, the state's twenty-two electric utilities, and a dozen consumer and environmental groups. Efficiency Vermont is funded by an energy efficiency charge on a consumer's electric bill; it is managed by the Vermont Energy Investment Corporation (VEIC), an independent non-profit energy services organization that is under contract to the Vermont Public Service Board.

Efficiency Vermont helps Vermonters reduce energy costs by making their homes and businesses energy-efficient. It provides technical assistance and financial incentives to help Vermonters identify and pay for cost-effective approaches to energy-efficient building design, construction, renovation, equipment, lighting and appliances.

H. Municipal Role in Energy Efficiency

Although communities are unlikely to have an impact on energy consumption at the global level, they do have an impact at the local level, given their demand for and use of energy. The relationship between a municipality and its energy use creates opportunities to have an impact on local energy use reduction.

Energy Committee

Bradford has an active energy committee that was formed for the purpose of establishing and implementing the town's energy goals. The work that has been done in partnership with the EC includes conducting energy audits on municipal buildings, tracking energy use for these buildings and providing outreach to homeowners on energy efficiency and renewable energy generation. Most importantly, an active EC can help the town and residents save money while saving energy.

Auditing Municipally Owned Buildings

Many towns in Vermont own buildings that are old and inefficient in many respects. For instance, older buildings often have insufficient insulation, wasteful heating and cooling systems, and out-of-date lighting. These kinds of infrastructure problems result in higher energy use with the resulting cost passed onto taxpayers. Bradford has implemented energy conservation methods that have resulted in reduced fuel consumption and is continuing to look for opportunities to conserve.

Property Assessed Clean Energy (PACE)

Bradford is a member of Property-Assessed Clean Energy (PACE) and has conducted one town meeting on the opportunities offered by this program. Such opportunities include providing low interest loans to qualified property owners for renewable energy and energy-efficiency projects. Eligible projects include the installation of solar water and space heating, photovoltaic panels (PV), and biomass heating, small wind, and micro-hydroelectric systems. Property-Assessed Clean Energy (PACE) financing effectively allows property owners to borrow money to pay for energy improvements. The amount borrowed is typically repaid via a special assessment on the property over a period of up to 20 years; if the property owner wishes to sell the parcel before fully repaying the obligation, then the obligation is transferred to the new property owner at the time of sale.

Capital Budget Planning

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

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

Policy Making for Change

In addition to reducing the energy use related to facilities, Bradford can continue to implement policies that lower energy use by town staff or encourage greater energy efficiency. Examples include:

Energy Efficient Purchasing Policy – A policy of this nature would require energy efficiency to be considered when purchasing or planning for other town investments. For example, purchasing Energy Star-rated equipment is a well-documented way to increase energy efficiency. Devices carrying the Energy Star logo, such as computer products and peripherals, kitchen appliances, buildings and other products, generally use 20%–30% less energy than required by federal standards.

Staff Policies - Towns can also implement policies that are designed to reduce wasteful energy practices. Through policy making, local government can set a clear example for townspeople and encourage sustainable behavior that will ultimately result in both energy and financial savings. Please see the goals, policies, and recommendations section (J, below) for more ideas.

I. Energy and Land Use Policy

The Vermont Municipal and Regional Planning and Development Act (24 V.S.A. Chapter 117) does not allow communities to impose land use regulations that prohibit or has the effect of prohibiting the installation of solar collectors or other renewable energy devices. However, statute does enable Vermont's municipalities to adopt regulatory bylaws (such as zoning and subdivision ordinances) to implement the energy provisions contained in their town plan. Bradford does not have subdivision regulations at this time.

Zoning bylaws can be designed to control the type and density of development. It is important to acknowledge the connection between land use, transportation, and energy, and creating zoning ordinances and subdivision regulations that encourage energy efficiency and conservation. Encouraging high-density and diverse uses in and around existing built-up areas will lead to more compact settlement patterns, thereby minimizing travel requirements. At the same time, zoning bylaws must be flexible enough to recognize and allow for the emergence of technological advancements, which encourage decreased energy consumption, and the increased use of renewable energy.

Zoning bylaws may contain provisions for planned unit developments (PUDs). PUDs are a grouping of mixed use or residential structures, pre-planned and developed on a single parcel of land. The setback frontage and density requirements of a zoning district may be varied to allow creative and energy efficient design (i.e. east-west orientation of roads to encourage southern exposure of structures, solar access protection, use of land forms or vegetation for wind breaks, and attached structures), and to encourage the construction of energy efficient buildings.

Subdivision regulations are one of the most effective tools for encouraging energy efficiency and conservation. Subdivision regulations, like PUDs, involve town review (through the Development Review Board) in the design process. Because subdivision regulations govern the creation of new building lots, as well as the provision of access and other facilities and services to those lots, a community can impose requirements that a developer site their building to maximize solar gain. Likewise, subdivision regulations can require that landscaping be utilized to reduce thermal loss.

J. Energy and Transportation Policy

According to the Vermont Comprehensive Energy Plan, the transportation sector accounts for approximately 45% of total energy demand and approximately 60% of all fossil fuels used in Vermont. The rural character and decentralized settlement patterns of Bradford create difficult circumstances in which to minimize the consumption of traditional fuels in the transportation sector. Nevertheless, strategies can be employed at the Bradford Town level.

Because any gains in efficiency may be at least partially offset by increases in population, it is in the Town's interest to continue to plan for and promote alternative and public transportation options. Improved access to, and increased use of, alternative and public transportation options such as rail, bus, river, van-pooling, ride-sharing, walking**,** and bicycling, will not only decrease energy consumption, but will also reduce the infrastructure expenditures that are associated with automobile travel. Bradford is fortunate to have access to existing rail lines, some bus service and the Connecticut River.

Another strategy to reduce the demand for transportation is to develop settlement patterns that require less travel. Concentrated settlement makes it more feasible to provide public transit, park and ride facilities, ride-share programs and similar incentives that reduce dependency on the automobile. Because transportation is such a substantial portion of local energy use, it is in the interest of the community to encourage any new developments that are proposed in Bradford to be located adjacent to existing roads. In particular, dense residential developments should be located within or adjacent to existing village centers or within designated growth areas. Commercial development that requires trucking and freight handling should only be located on roads which can effectively handle the size of vehicle needed.

The I-91 Park and Ride lot should be monitored as necessary to accommodate increased use of car pool, bus, and non-motorized transport in order to accommodate all who seek to use it. Additional commuter transit including rail needs to be developed. The concentration of employment opportunities, housing, municipal and social services, the expansion of telecommunication capacity, and the increased use of local informational handouts will help to achieve this objective. The expansion of the Park and Ride should enable further increase in its use.

Bradford should continue to research and determine how to reduce municipal use of fossil fuels for its operations, including the highway and police departments, in order to produce a net energy savings. Bradford should develop a policy requiring that new Town highway vehicle purchases begin with a comparison of the costs of fuel required for the vehicles being contemplated, calculated over the life of the vehicle

K. Goals, Policies and Recommendations

Overall Goal: Sustainability

Goals

Goal 1: To increase energy efficiency.

Goal 2: To decrease the use of non-renewable energy resources, while increasing the use of renewable energy resources, particularly those of sustainable local origin.

Goal 3: To reduce energy consumption in all Town and school buildings.

Goal 4: To reduce greenhouse gas emissions, acid rain precursor, and other environmental toxins.

Goal 5. To encourage patterns of land use and development that use energy most efficiently, and that do not increase the use of non-renewable energy.

Goal 6. To promote the construction of energy efficient homes and buildings to lessen or postpone the need for sources of costly additional energy.

Goal 7. To increase the use of public transportation in coordination with other modes of transport.

Goal 8. To increase the use of non-motorized transportation.

Goal 9. To participate in regional and statewide strategies and approval processes which reduce the requirement for non-renewable energy.

Goal 10. To increase awareness and use of energy conservation practices.

General Energy Policies

1. It is the policy of the Town of Bradford to reduce energy consumption in all municipal activities, including buildings, transportation, and Town services.

2. It is the policy of the Town of Bradford to evaluate the installation of a municipal/downtown renewable heating/energy system.

3. It is the policy of the Town of Bradford to oppose plans to locate industrial scale generation and transmission facilities in Bradford.
4. It is the policy of the Town of Bradford to participate in the Public Service Board (Section 248) review of new and upgraded generation and transmission facilities as necessary to ensure that adopted community standards are given due consideration in proposed energy facility development.
5. It is the policy of the town to have the maximum tower height for net-metered or similar off-grid wind energy facility to not exceed 125 feet in total height.
6. It is the policy of the town that power generating facilities and accessory structures must meet the minimum setback requirements for the zoning district in which they are located.

7. It is the policy of the town to encourage ground installations to 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.
8. It is the policy of the town that ground mounted solar and wind energy facilities shall not be located within the 100 year flood hazard area or fluvial erosion hazard area or within 50 hetet from the top of bank of any watercourse.

Electric Energy Policies

1. Prior to the granting of easements for the construction of additional or upgraded transmission or distribution lines or related facilities, utilities shall demonstrate that such public investments are justified to improve efficiency and to promote energy conservation for the consumer and for the Town.

2. Expansion and efficiency improvements to the Waits River Dam hydro-power generators and transmission facilities are encouraged where such investments clearly benefit the residents of the Town and the region.

3. Hydro-power development should not diminish water quality, habitat, or recreational opportunities. "Run-of-the-river" projects are preferred to projects, which require impoundments with low or minimum flows.

4. Small scale wind-power generation facilities are to be encouraged. Design plans must consider placement of such facilities in locations where reasonable measures have been employed to mitigate adverse impacts to health, public safety, and the environment.

5. Large scale wood using projects, such as power generators and wood pellet production, must demonstrate that the project's demand for wood will occur in a sustainable manner.

6. The Town of Bradford encourages the recovery of methane from solid-waste and agriculture sites for use as an energy source wherever feasible.

7. It is the policy of the Town of Bradford to encourage and support the use of solar power.

8. It is the policy of the Town of Bradford to encourage and support the conservation of the use of electricity.

Transportation Policies

1. The Town of Bradford endorses transportation practices that promote energy efficiency, which include cycling, walking, other non-motorized transport, public transportation, and ride-share programs to reduce the region's dependency on single vehicle trips.

2. It is the policy of the Town of Bradford that any private land use development shall include transportation infrastructure and services that promote public transportation and/or provide the necessary right-of-way to allow public investment in those facilities.

3. It is the policy of the Town of Bradford that all transportation systems incorporate design and location principles so as to complement the recommendations set forth in the Land Use Element of this Plan.

5. The Town of Bradford encourages the maintenance, continued operation and expansion of the Connecticut Valley railway line to include passenger service.

6. It is the policy of the Town of Bradford encourages employers to support the use of public transit and non-motorized transit by their employees.

7. The Town of Bradford encourages development patterns resulting in more energy efficient transportation patterns.

8. The two Bradford school districts should be encouraged to include energy efficiency and conservation in their plans and daily operations.

8. Social and civic services, housing, employment, and retail growth should take place in the village center or within walking distance of the village center and in the LPC district.
9.

10. The Town supports the expansion of business-related telecommunications.

11. The Town encourages a program to assist landlords to achieve energy efficiencies.

Recommendations

1. The Town should investigate converting public buildings in Bradford to economically feasible renewable energy heating systems.

2. The Town of Bradford should consider revising the guidelines for its Revolving Loan Fund to allow low interest capital to homeowners, landlords, non-profit organizations, and businesses to assist in making cost effective investments in energy efficiency and renewable energy.

3. The Energy Committee of the Bradford Conservation Commission should continue to support efforts to expand the home energy efficiency program.

4. Encourage Bradford schools to include walking, cycling and other transportation alternatives.

5. The Bradford Conservation Commission should investigate programs to encourage a reduction in CO2 emissions by the town of Bradford.

6. The Town of Bradford encourages the establishment of incentives for developers to accommodate public transit in their plans.

7. The Town of Bradford should pursue grants to promote energy efficiency and energy projects.

VIII. Natural Resources

Bradford's town center lies at the confluence of the Waits and the Connecticut Rivers. Together with surrounding steep terrain, US Interstate 91 defines the western limit of the town center, and the Connecticut River its eastern limit. Traditionally Bradford's economy was based in agriculture and forestry, and it served as a local center of mercantile business for smaller towns nearby.

Forests, farms, and open land define Bradford's rural character. While the Bradford community wishes to allow appropriate development, it also seeks to maintain its rural character. A landscape including open farmland and working forests attracts visitors and contributes to our tourism industry. A healthy environment enhances our quality of life. Access to natural areas for recreational use promotes physical and emotional well-being. Protection of Bradford's natural resources is vital to the town's cultural heritage, economic stability, and quality of life.

Respondents to the 2007 Town Plan Survey strongly encouraged sustainable development of Bradford's local food supply. Agricultural land is essential for local food production and supports a diversified economy. Over seventy-five percent (75%) of survey respondents considered "wildlife conservation", "conservation of natural habitats" and "recreation" important.

While it is the intention of the citizens of Bradford to preserve the scenic beauty and quality of wildlife habitat in all areas of the town, lands that the town places special value upon for scenic, wildlife, and recreational importance include:

The ridgelines
High elevation areas particularly Wrights Mountain.
Town's ponds, rivers and streams as well as smaller tributaries, wetlands, vernal pools and bear and deer habitat.
Scenic roads including I91, Route 5, Route 25, South Road and Goshen Road
Historic district and historic sites outside th designated Historic District including Goshen Church

Bradford values its ridgelines and other high elevation areas and recognizes the great importance of these areas to both residents and igratory wildlife. Therefore commercial and industrial development at elevations greater than 1700 feet or on ridgelines should be strictly avoided. The town discourages land development including the construction of roads and extension of utilities at these elevations with the exception of activiites related to non-commercial recreation, forest management, camps and single family residences.

These natural resources provide economic, recreational, and aesthetic benefits to both residents and visitors. Development that would compromise these benefits is inappropriate and inconsistent with the town's vision and goals.

A. Conservation Commission

Bradford's policies toward land use can have direct effects on natural and cultural resources. Uncontrolled development can upset the balance of nature. It is therefore essential for planners to consider how development will affect natural resources and to protect them whenever possible. To help guide this effort, the Town of Bradford reestablished its Conservation Commission in 2002 under

24 V.S.A Chapter 118. One primary task of the Commission is to administer the Bradford Conservation Fund. The conservation fund has been established for the following purposes:

- To maintain Bradford's rural character, aesthetics and scenic values.
- To educate the public on the value of conserving our natural resources and rural heritage.
- To stimulate the local economy through promotion and protection of our natural resources.
- To promote public access to woodlands, wetlands and open spaces.
- To promote a working landscape by promoting local farm and forest products.
- To minimize conversion of Bradford's best farm and forestland to nonagricultural and non-forestry uses.
- To enhance wildlife habitat, water quality and recreational resources in Bradford.
- To preserve open spaces.

The Conservation Commission has released the recently completed report of the Bradford Natural Resources Inventory, entitled "Upland Natural Communities and Wildlife Habitat" (Appendix B). The recommendations of that report will be used to guide land use decisions in the Town, as follows:

- Large Contiguous Habitat Units (CHUs) provide critical habitat for large, wide-ranging wildlife. Forest fragmentation in the larger CHUs should be discouraged. Roads, housing and most other human activities should be restricted to the periphery of these units. Roads built for timber harvesting should be allowed to regenerate when logging activities are completed in an area.
- Bears require extensive remote areas to meet their yearly habitat requirements. Large areas without roads must be preserved to maintain sustainable populations. Mapped beech and oak stands and forested wetlands utilized by bear should be protected from development activities with buffers ¼ mile in extent.
- Deer winter habitats are critical to the survival and maintenance of deer populations in the Bradford region. Deer winter habitats identified in this study should be protected from human activities by a 300' buffer.
- Functioning travel corridors allow for the movement of wildlife across the landscape. Recommendations include taking steps to conserve the most important travel corridors by creating isolation buffers around them to maintain wildlife movement patterns. Limit development to the outside edge of corridors and encourage screening and other actions to limit negative effects of development in or near corridors. Improve vegetative buffer conditions along rivers and streams to provide protected movement opportunities for wildlife.

Goals

1. To ensure Bradford has access to a healthy and productive natural environment.

2. To ensure Bradford residents have access to land conserved by the town.

3. To preserve, promote, and enhance the cultural and recreational values of Bradford and encourage their use by residents and visitors.

4. To maintain non-fragmented contiguous habitat blocks of upland forests, to meet wildlife needs and to provide the ecological services of flood control, erosion prevention and water purification.

Policies

1. It is the policy of the town to support the Conservation Commission and the Conservation Fund.

2. It is the policy of the town to encourage diverse recreational opportunities.

3. It is the policy of the town to encourage efforts to conserve open, undeveloped land, wetlands, and agricultural lands.

4. It is the policy of the town to encourage incorporating the results of the Town-wide Natural Resource inventory (Upland Natural Communities and Wildlife Habitat) in land use planning.

B. Water Resources

Background

Water resources include aquifers (groundwater) and surface waters. Sustainable yields of quality water are necessary to the life and livelihood of citizens of Bradford. The continued availability of clean, high-quality drinking water is a concern for everyone.

Public Water System

The Town of Bradford owns and operates a municipal water supply and distribution system. The present source of the municipal water supply is groundwater obtained from a well located north of Vermont route 25 just west of the Interstate 91 interchange. Residents and businesses outside the service area depend on private wells and springs for their water supply. The town also owns old wellheads on the Upper Plain near the railroad tracks, but these are for emergency service only.

The protection of groundwater supplying the town is critical, as this is its sole source of drinking water. Because the town's wells are located in close proximity to interstate 91, accidental spills and discharges of petroleum products and other toxic and hazardous materials are a serious concern. Protection of the wellhead area and its related aquifer from contamination is critical. The engineers who oversaw the 2012 water project discovered that the town's well field is overlain by a thick clay layer, which should preclude downward migration of hazardous contaminants. Nonetheless, protection of the town's water source should remain a high priority. The Water & Sewer Commission is searching for another (secondary/backup) source for municipal water.

Goals

1. To maintain and enhance the quality and quantity of drinking water resources.

2. To allow only sustainable use of groundwater resources by new development.

3. To protect the public right to adequate water quality and quantity.

4. To consider surface water and groundwater impacts and effects when reviewing proposed or existing uses of land.

5. To maintain or improve surface water quality and quantity.

Policies

1. It is the policy of the Town to review, monitor, and carefully control any land use activities that may potentially threaten groundwater quality to prevent undue loss of groundwater quality.

2. It is the policy of the Town to place high priority on the maintenance and enhancement of water resources for recreation, fisheries, necessary wildlife habitats and quality aesthetics. Water resource policy and practices should protect these uses.

3. It is the policy of the Town to ensure that withdrawal of surface and groundwater by one user should not interfere with the reasonable withdrawal of water by other users. Water is for use by the public and no single user has the right to diminish the quality or quantity for others.

4. It is the policy of the Town to prohibit high-risk uses within the source (wellhead) protection area. These include sanitary landfills, car washes, metal plating shops, salt stockpiles, motor vehicle repair and similar type uses which involve the manufacture, storage, use, or transportation of toxic chemicals and pollutants.

Recommendations

1. The Town should continue to support water quality monitoring and watershed planning for the Connecticut and Waits rivers.

2. The Conservation Commission and the Water and Sewer Commission should conduct a mapping study of groundwater resources in Bradford.

3. To ensure long-term protection of the resource, the Bradford Water and Sewer Commission should continue to develop a detailed protection strategy for the source (wellhead) protection area.

C. Wetlands, Vernal Pools, and Forested Bear Wetlands

Background

Wetlands and vernal pools are ecologically fragile areas important to the quality and quantity of water resources.

The Vermont Water Resources Board estimates that less than 5% of the surface area of Vermont is covered by wetlands. Despite the seemingly inconsequential land area they cover, wetlands and vernal pools serve a wide variety of functions beneficial to our health, safety and welfare including the retention of stormwater runoff, the improvement of surface water quality, the filtration of sediments and pollutants, the provision of habitats for plants, fish and other wildlife, and contribution to the beauty of the rural landscape.

In 1986, Vermont adopted legislation for the protection and management of wetlands [10 V.S.A., Chapter 37]. Determination of whether a wetland merits protection is based on an evaluation of the extent to which it serves the general functions outlined above.

By statute, if land development will have a negative impact on a protected wetland, development cannot begin unless the Vermont Agency of Natural Resources first grants a Conditional Use Determination (CUD). If granted, these CUDs often attach conditions to mitigate negative developmental impacts on wetlands.

The most significant wetlands in Bradford have been mapped and are included as part of the National Wetlands Inventory (NWI) prepared by the U.S. Fish and Wildlife Service. However, many smaller wetlands are not included in the NWI.

In 2005, the Bradford Conservation Commission conducted a local wetlands inventory. The inventory identified the largest wetlands to be those located along the Connecticut River and its confluence with the Waits River. These wetlands, plus those determined in the NWI have been delineated, and are included in this Plan.

In Bradford, final approvals cannot be granted for projects involving wetlands unless the Agency of Natural Resources has first had an opportunity to evaluate the effect of the project on the wetland [24 V.S.A., Section 4409]. Future investigations of wetlands within Bradford may identify additional areas needing protection.

Vernal pools are temporary pools of water formed in the spring from melt water collected in low depressions in the landscape. They dry out in the hottest months of summer, and refill in the autumn. Because they are free of fish, they provide shelter for the larvae of insects, frogs, salamanders, and turtles. Adults often return to the same pools in which they were born when they are ready lay their eggs.

Vernal pools offer many of the same benefits as wetlands, but they are more difficult to locate. Most seasonal pools are not identified on the Vermont Significant Wetland Inventory maps and therefore are not initially protected by state and federal regulations. Vernal pools provide important amphibian habitat, and because of this function they are protected under the Vermont Water Quality Standards (Vermont Water Resources Board, adopted June 10, 1999).

Significant Wetland Resources

The 2005 wetlands inventory highlighted several significant wetland resources and provided recommendations for management of the areas. See Map 6 – VT Significant Wetland Inventory.

- Marshes at the Mouth of the Waits River – At the confluence of the Waits River with the Connecticut River are seven wetlands. Taken together, these form the largest wetland complex in the town of Bradford, nearly 65 acres. Given the nature of these wetlands and their position in the landscape, they significantly lessen the effects of spring floods by diffusing and retaining floodwater. They also filter nutrients and contaminants from nearby agricultural fields and the golf course. These wetlands should continue to be protected by enforcing riparian buffer

regulations and discouraging the development of properties in the floodplain that might harm them.

- Vernal Pool at the North portion of Low St. John Forest – Vernal pools act as significant habitat for a substantial number of plant and animal species. The conservation of vernal pools and their surrounding habitat is important for the species that rely on them. Successful conservation of vernal pools extends beyond the pool's edge into the surrounding forest, for the life cycles of the animals inhabiting vernal pools require undisturbed forest habitat.
- The 2015 Bradford Natural Resources Inventory includes a map of potential bear wetlands in Bradford and defines them as follows: "Black bear utilize a wide variety of wetlands during the spring and summer months. Forested, shrubby, beaver-flow wetlands, and forested seeps are sought out for the flush of early vegetation that often grows in these environments. In the early spring, wetlands with ground-water discharge promote an early growth of leafy green vegetation at a time when the trees are still barren of nutritious buds and new leaves. Black bears (as well as deer and turkeys among other animals) will utilize this food source and also search out plant roots, grasses, sedges and ants in these environments.
  Throughout the Bradford area forested seeps are probably the most heavily utilized wetlands by bear. In many locations these seep wetlands are located in remote areas relatively close to bear denning areas far away from humans. As such, they warrant special protection for their wildlife value.

Goal

1. To promote land use development practices that will avoid or mitigate adverse impacts on significant wetlands.

Policies

1. Development or intensive land uses shall not be located in significant wetlands or within buffer zones to significant wetlands.
2. Developments adjacent to wetlands should not unduly disturb wetland areas or their function. Mitigating measures to protect the function of a wetland are acceptable.

Recommendation

1. In order to foster wetland protection, the town of Bradford should adopt subdivision regulations that contain provisions for the protection of wetlands. The Bradford Conservation Commission should work closely with the Bradford Planning Commission to develop these subdivision regulations.
2. The wetlands inventory and the Natural Resources Inventory Reports and related maps should be available to Bradford citizens in the town offices.
3. Wetlands should be protected via municipal enforcement of existing bylaws and ordinances.
4. Appropriate state officials should be notified of violations of state rules.

D. Ponds

There are many small ponds in Bradford that are important for agriculture and fire protection. While ponds offer many aesthetic benefits they must be constructed properly to prevent hazard to residents and the town's infrastructure. During a substantial rain event, a poorly designed or maintained dam can overflow or collapse, creating a dangerous flood hazard.

At present, under Bradford's zoning regulations, dams, ponds, impoundments, and similar structures capable of impounding more than 50,000 cubic feet of water can only be constructed, or otherwise altered after a Zoning Permit has been granted by the Board of Adjustment. The Bradford Emergency Coordinator has indicated that the ponds most likely to pose a flood threat are those with dams that can be breached. Dug ponds, which have no dam, are less likely to fail. The present regulations are consistent with state statute, but the 50,000 cubic feet of water permit threshold is larger than most private ponds in Bradford. Because of the potential hazards represented by private ponds, it is essential that regulations continue to be enforced and consideration given to decreasing the threshold for permitting should be discussed.

Goal

1. To encourage the construction of ponds, where feasible, to improve firefighting capability and provide recreational opportunities.

Policy

1. It is the policy of the town to maintain at least the current level of zoning controls over the location and building of ponds in order to ensure that they are developed and maintained in a manner that will not create a public hazard.

Recommendations

1. The Town should evaluate whether or not ponds are being properly permitted and regulations properly enforced. If it is determined that they are not, steps should be taken to correct that situation.

2. The Planning Commission should work with the Emergency Coordinator to consider adjusting the conditions under which a permit is required for the building of a pond to include smaller ponds in town.

3. The Planning Commission should consider making ponds holding under 50,000 cubic feet of water a conditionally permitted use in the Bradford Zoning Bylaws. With permits on file, the town would have a record of where they have been constructed.

E. Floodplains and Flood Hazard Areas

Background

Floods are sporadic, inevitable and uncontrollable natural events. It is in the public interest to plan for floods and devise land use strategies that will protect land adjacent to water courses to minimize risks

to public health, safety, and property. According to the U.S. Global Change Research Program, changes in climate may result in increased extreme weather events, making it even more imperative to use proper land use planning to reduce exposure to flood damage.

Vermont has experienced at least fifteen significant floods since 1973. Thirteen of these were declared federal disasters and caused significant economic loss. The most significant of these was Tropical Storm Irene, which caused billions of dollars in damage throughout Vermont, damaged or destroyed approximately 3000 homes throughout the state, and took the lives of six people. Bradford was remarkably fortunate during Irene, as it suffered only minor damage from a few small road washouts. Damage occurred along unstable river systems, along steep streams, and on floodplains. In some cases, recovery costs to the public sector amounted to several million dollars per flooding event. Every reasonable attempt should be made to avoid or reduce exposure to flood damage.

Floodplains, the lands adjacent to watercourses, are periodically inundated by heavy rains and spring thaws. They can absorb a tremendous amount of water before reaching flood stage. Floodplains make excellent agricultural land but are poorly suited for development, both because of periodic flooding and because of the potential for pollution of water sources.

Although most flooding occurs within the floodplain, upland streams (which are not located within the Federal Emergency Management Agency Floodplain) also pose a potential flood hazard. Many of these streams are very steep and during flash floods water can gain substantial momentum as it flows toward the valley. The speed of the floodwaters can damage buildings and infrastructure built too close to the stream banks.

According to the Two Rivers-Ottaquechee Regional Commission, Bradford has approximately 850 acres in flood plains, 81 of which are in floodways (the deepest, fastest-flowing areas in a flood). Approximately 4% of the town's area is in flood plain. Less than 1% may be in the developable area of the flood plain (not including wetlands). Bradford may have some areas of unmapped flood risk. There are 10 residences, 11 commercial/public buildings in the flood plain 10 flood insurance policies insuring $2.7 million.

National Flood Insurance Program (NFIP)

Under the provisions of the National Flood Insurance Act (1968), the FEMA has conducted a series of studies to determine the limits of flood hazard areas along streams, rivers, lakes, and ponds and to estimate the potential for flood damage in a given year.

FEMA has prepared a Flood Hazard Boundary Map (See Map 2 – Current Land Use, Flood Plain "FEMA FIRM") for the Town of Bradford, which includes flood hazard areas for the Waits and Connecticut rivers and for major streams and ponds. This map is on file at the Bradford Town Office (on FEMA's official flood hazard maps and on the Future Land Use Map of the Bradford Municipal plan) and at the offices of the Two Rivers-Ottauquechee Regional Commission. With the exception of areas immediately adjacent to the Waits and Connecticut Rivers, the topography of Bradford is such that there are few areas low enough to be in the FEMA Flood Hazard Area.

FEMA administers the National Flood Insurance Program, which provides flood hazard insurance at subsidized rates for property owners in affected areas. In order to qualify for federal insurance, the Town of Bradford adopted a Flood Hazard Bylaw in 1986, and is recognized as a participating community in the National Flood Insurance Program.
Approximately 21 buildings in Bradford are presently located within the mapped flood hazard areas.

Mortgage lending institutions require as a prerequisite to financing that flood insurance be purchased on property subject to flooding. Fluvial erosion hazard zones have been studied and mapped by Redstart Consulting, and these maps have been included in this plan because they show which areas are at the greatest risk for erosion, and therefore the likeliest to wash out during a flooding event. This map should be used to determine which properties would need to remain undeveloped so that risk of property loss from flooding can be reduced.

F. Flooding and Land Use

Floodplains, as with wetlands, are fragile areas at the interface between land and adjacent lakes, ponds, rivers and streams. How these lands are managed has a direct bearing on the quality and quantity of the town's water resources as well as its safety. Flood hazards can be exacerbated by poor development practices such as straightening river segments and eliminating buffer areas next to rivers and streams.

In an effort to reduce the potential for damage to public and private assets, the Bradford Conservation Commission commissioned a geomorphic assessment of the Waits River in 2007 and 2008 to determine areas at risk of flood damage and to provide local officials with guidance to make infrastructure improvements to avoid these damages. The assessment will also recommend changes to Bradford's land use regulations in order to attempt to secure a future free from major property loss during floods. In 2007 the town completed an inventory of bridges and culverts to determine the potential risks for ice jams, flooding and erosion and to identify "handling culverts" that inhibit fish and amphibian passage.

It is known that large upland forests not only provide wildlife habitat, but also slow and clean water as it flows down into the valleys. The economic value of these ecological services of flood and erosion control, as well as purifying water is significant.

Goals

1. To enhance and maintain use of flood hazard areas as open space, greenways, non-commercial recreation and/or agricultural land.

2. To maintain large tracts of non-fragmented upland forest to slow, absorb, and clean rain water and storm water runoff before it reaches the valley below.

3. To ensure no net loss of flood storage capacity.

4. To maintain accurate flood hazard maps to assist in appropriate land use decisions.

5. To identify and map unstable rivers and steep streams at risk of flood erosion.

Policies

1. It is the policy of the Town that preferred uses for flood hazard areas shall be open space, greenbelts, and non-commercial recreation or agriculture.

2. It is the policy of the Town to prohibit any land use activity (filling, or removal of earth or rock) within flood hazard areas which would result in net loss of flood storage, increased or

diverted flood levels, or increased risk to adjacent areas.

3. It is the policy of the Town to allow utilities or facilities serving existing development (e.g. water lines, electrical service, waste disposal systems, roads, and bridges) to be located within flood hazard areas only when off-site options are not feasible, and then only provided that these utilities or facilities are relatively protected from flooding damage.

4. It is the policy of the Town to extend the limits of the flood hazard area in the Bradford Zoning Bylaws to areas identified as at risk to flood erosion.

5. It is the policy of the town to discourage development or intensive land uses from locating in Class I and Class II wetlands. (See Map 6 "Wetlands, Bradford, VT" on file at the town office.)

6. It is the policy of the Town to require that developments, and their associated stormwater discharges, adjacent to wetlands shall be planned so they do not cause undue disturbance to wetland areas. Maintenance of naturally vegetated buffer strips between a wetland and a project site is strongly encouraged to prevent ground water pollution and direct discharges into a wetland.

7. It is the policy of the Town to discourage development and placement of fill within the limits of the 100-year floodplain. Where careful planning at the local level accepts development within the floodplain, the development should be designed to achieve no-net-fill, and so located that it will not impede the floodwaters and endanger the health, safety, and welfare of the public. No structural development, except bridges, should be located within the limits of a floodway.

8. It is the policy of the Town to encourage natural areas, non-structural outdoor recreational and agricultural uses as the preferred land uses within floodplains. Commercial, industrial, and residential uses are discouraged, except as noted above.

9. It is the policy of the Town to discourage locating development outside of existing or planned settlement areas immediately adjacent to watercourses, ponds or shorelines. Such areas should principally be maintained in a natural vegetative state for environmental and aesthetic purposes.

10. It is the policy of the Town to protect public and community water supply watersheds by limiting development to low densities and by encouraging forest and agricultural best management practices including high standards for erosion control and measures to minimize runoff.

11. It is the policy of the Town to prohibit new building in the 100-year floodplain, or the special flood hazard areas in order to protect citizens and businesses from damage, to avoid adding to flooding of their downstream neighbors, and to reduce the public cost of disaster relief.

12. It is the policy of the Town to encourage the preservation of large tracts of upland forests that provide ecological services of flood control, thus providing added protection to the low-lying areas of Bradford.

Recommendations

1. The Planning Commission should work with the Regional Commission and Vermont Emergency Management to ensure that their current flood hazard area requirements meet national standards.

2. When revising Bradford's flood hazard area requirements, the Planning Commission should strongly consider excluding all new building within the 100-year flood plain or special flood hazard area.

3. Town and State highway crews should take steps in a timely manner to correct or replace undersized water passageways or culverts that are at risk of flooding or limit fish and amphibian passage.

4. Town and State highway crews should take steps in a timely manner to reinforce stream banks adjacent to roadways at risk of significant erosion from seasonal flooding.

5. The town should consider creating and adopting an ordinance to control the storage of junk, garbage, or other materials which could be hazardous during a flood event, in areas identified as special flood hazard.

G. Riparian Buffers

Background

Riparian buffers are strips of bankside vegetation along waterways that provide a transition zone between water and land use. Construction or development along shorelines, or removal or disruption of vegetation within these areas can create increased water pollution, higher water temperatures, destabilization of banks, higher soil erosion rates and loss of fish or wildlife habitats.

Goals

1. To Maintain and enhance riparian buffers.

Policies

1. It is the policy of the Town to continue to require riparian buffers for all development adjacent to streams through the Bradford Zoning Bylaws and their enforcement.

2. It is the policy of the Town to require that riparian buffers be provided and maintained. If banks are unstable or waters more active, the width of the buffer should be determined by

stream morphology.

3. It is the policy of the Town that cutting of trees and other vegetation for views, vegetation management, recreational access, and silvicultural purposes should be limited and should ensure that trees regenerate, stumps remain with root zones intact, and a duff layer and tree canopy are maintained.

4. It is the policy of the Town to require that streamsides, including riprapped areas, should be vegetated with native shrubs, trees, and grasses. For stream bank stabilization, re-vegetation should cover as much of the stream bank as possible. Riprap and similar retaining structures should be used only to cover the lower portion of the bank, and only when bioengineering techniques may not adequately prevent significant loss of land and/or property.

5. Human access points to the Connecticut and Waits Rivers and their tributaries should be managed to prevent soil erosion, loss of vegetative cover, and unnecessary disruption of riparian habitats. Foot access paths should not be unnecessarily wide, or steep (greater than 15% slope).

Recommendations

1. The Conservation Commission should provide information to every new riverfront landowner to explain the special challenges of owning and managing riverfront land, including the benefits of riparian buffers and the requirements of state shore land protection laws.
2. The Zoning Administrator should distribute materials developed by the Conservation Commission to waterfront landowners who apply for a zoning permit.
3. The Town Offices should make available materials developed by the Conservation Commission to landowners when new deeds are recorded for waterfront properties.

H. Plant Communities

In Bradford, there are a broad range of plant communities that exist in older forests, early successional forests, open fields and valley floors. The diversity of plant communities indicates a healthy, thriving ecosystem. Plant communities are strongly affected by their environment. They respond to changes in soil structure and chemistry, water availability, and climate. Unmanaged development can damage plant communities, which in turn will affect animal populations and may injure the overall ecosystem. Good management practices, such as maintaining buffer areas, protecting against silting, and locating development outside of sensitive habitats are some ways to keep plant communities healthy.

Invasive species, those that spread from human settings into the wild, are a growing problem in Vermont. Once established in the wild, invasive species may displace native species, throwing ecosystems out of alignment. For instance, Norway maples planted as landscape trees reproduce prolifically and can suppress the natural regeneration of native trees such as sugar maple. Federal and State governments have guidelines for handling invasive species, and there are resources available to interested parties through the University of Vermont and private organizations.

Since 2002 the Town of Bradford has conducted a loosestrife eradication program. Additionally, volunteers join together on a yearly basis to eradicate Japanese Knotweed in Andrew and Ida Boch Park.

Goal

1. To minimize the spread of invasive plant species in Bradford.

Recommendations

1. Road crews should take care when ditch cleaning to minimize the spread of invasive species such as Japanese Knotweed, Wild Chervil, Wild Parsnip and Purple Loosestrife.
2. The Town should investigate alternative means of controlling invasive species other than the use of herbicides.
3. The Conservation Commission should develop and/or distribute materials to educate landowners about invasive plant species identification and control,

I. Forestry

Large, continuous areas of forest help sustain wildlife. About 80% of Bradford is forested. For some people, forestry is a source of income, and for many others, forests are an endless source of recreation and natural beauty. Bradford should manage its forest assets sustainably; both for the health of the forest itself, and to ensure that Bradford's forests will thrive for the foreseeable future.

Forests owned by the Town of Bradford cover 517 acres. Private residents have conserved over 1000 acres of forested land. Currently 4,360 acres of forested land in Bradford have been enrolled in Vermont's Current Use Program.

Trees outside of the forested landscape are also important. The Bradford Conservation Commission completed a street tree inventory that identified potential hazard trees needing removal and created a management plan for the Town's public trees.

Goals

1. To encourage the conservation and wise management of forests within the Town.
2. To encourage the wise management of downtown public trees with the guidance of the Tree Warden.

Policies

1. It is the policy of the Town to encourage foresters and loggers to adhere to "best management practices" for maintaining water quality and minimizing soil erosion on logging jobs.

2. It is the policy of the Town to encourage owners of forest land to enroll in the Current Use Program, which will provide assistance in getting the maximum value from their forest, while enhancing wildlife habitat.

Recommendations

1. The Bradford Planning Commission should consider designating "conservation areas" within the Bradford Zoning Bylaws to ensure that large tracts of forest located on steep slopes have minimal development.

2. The Town should implement recommendations in the 2006 tree inventory and should plant and maintain trees within the Downtown.

3. The Town Clerk should have copies of the state's Best Management Practices and information about the Current Use Program available to the public.

J. Agriculture

For the past several decades, the perception has been that Vermont is losing its farms. In fact, this isn't the case. Vermont has been losing *dairy* farms at a rapid rate (although cow numbers have remained constant); however, other types of farming have replaced those farms. Three quarters of Vermont farms are diversified farms.

Though federal law recognizes the importance of farmland and farmland protection, local planning and zoning regulations must also address conflicts arising between expanding development and successful farming.

The working landscape gives Vermont its beauty, provides open space for wildlife habitat, and connects people to the land. To continue to receive the benefits farming has to offer, a community must encourage farming. In the 2007 Town Plan survey, respondents voiced a strong desire to protect agriculture in Bradford.

Agriculture and Land Use Regulation
Development on active farmland immediately eliminates future agricultural productivity on the developed tract and affects related benefits of the working landscape. Restoring the agricultural viability of a residential subdivision is impractical because of the enormous expense.

Conservation Easements
Conservation easements are a common method used to preserve the working landscape. 1,164 acres of farm land in Bradford are conserved along with 1,000 acres of forest land are conserved.

Goals

1. To encourage the growth of agriculture, in all its forms.

2. To encourage the growth, marketing and consumption of local foods.

3. To promote self sufficiency and sustainability through agriculture.

4. To encourage the conservation, wise use and management of the Town's agricultural resources.

5. To support the creation and maintenance of a physical, social, regulatory, and fiscal environment that encourages entrepreneurism in agricultural activities including those that add value to the region's agricultural products.

6. To support programs that educate citizens on principles of sustainability.

7. To discourage fragmentation of agricultural and forest lands.

Policies

1. It is the policy of the Town to support agriculture and the production of locally grown food, provided that it is conducted at a scale consistent with historical agricultural practices in Bradford.

2. It is the policy of the Town to work with the Vermont Agency of Agriculture, Food & Markets and other agencies and groups to develop viable farming opportunities in Town.

3. Current use taxation, tax stabilization and other forms of economic reimbursement should be encouraged in order to keep agricultural lands in Bradford undeveloped.

4. It is the policy of the Town to support the use of public or private funds for the purchase of development rights, or fee purchase of agricultural land for conservation purposes from willing landowners.

5. It is the policy of the Town that when agricultural lands are developed for non-agricultural purposes, the preservation of other prime agricultural soils in Bradford shall be a priority before mitigation is considered elsewhere.

6. It is the policy of the Town to encourage that residential and other non-agricultural uses or structures will be sited on the soils least productive for agricultural use.

7. It is the policy of the Town to encourage clustering of dwelling units and accessory buildings or structures, and proposed lots for development or sale so that they conserve the maximum feasible amount of farm, pasture, or woodland and discourage fragmentation of agricultural and forest lands.

8. It is the policy of the Town to support local marketing and value-added agricultural and forest products.

9. It is the policy of the Town to encourage, where appropriate, use of carbon credits and other sustainability schemes to support local agricultural activities.

Recommendations

1. The Planning Commission should consider adopting subdivision regulations that allow for the protection of prime agricultural soils by flexible siting of buildings.

K. Wildlife Resources

Background

Bradford's fields, forests, wetlands and waterways are home to a diverse and healthy wildlife population that includes bear, bobcat, moose, deer, otter, geese, ducks, turkeys and mink. Some areas in Bradford provide critical wildlife habitat, including wetlands, deer wintering areas, bear mast stands, and edge habitats (for instance, the edge between a forest and a field). Planning for development or logging in and around these critical habitats should consider the needs of wildlife. Managing for a particular species is less desirable than managing for the entire ecosystem supporting it. Wildlife provides citizens of Bradford with direct and indirect livelihoods from hunting, fishing, trapping, and tourism.

Wintering areas are an important habitat requirement for deer during the winter when snow depth threatens their survival. Typically these areas are found in mature softwood stands, at low elevations or along stream beds where snow is not as deep and there is good cover. Southerly facing slopes may be utilized even in areas of limited softwood cover. Bradford's 2015 Natural Resources Inventory Report contains maps of the active deer yards and deer wintering areas that would need protection from development.

Most important when considering development and its impact on wildlife is the concept of habitat fragmentation. "Forest fragmentation affects water quality and quantity, fish and wildlife populations, and the biological health and diversity of the forest itself. When many small habitat losses occur over time, the combined effect may be as dramatic as one large loss. Forest fragmentation can disrupt animal travel corridors, increase flooding, promote the invasion of exotic vegetation, expose forest interiors, and create conflicts between people and wildlife. Habitat loss reduces the number of many wildlife species and totally eliminates others."[1]

To mitigate the effects of human population growth and land consumption, many scientists and conservationists recommend establishment of protected corridors connecting patches of important wildlife habitat. These corridors allow migration between different groups of animals and help restore otherwise fractured ecosystems.

Goals

1. To maintain or enhance the natural diversity and balance of wildlife, including natural predators.

2. To re-establish stable populations of endangered or threatened wildlife in appropriate habitat areas.

3. To maintain or improve the natural diversity, population, and migratory routes of fish and wildlife.

4. To allow ecologically sound intensities of hunting and trapping.

Policies

1. Long-term protection of major habitats through conservation easements, land purchases, leases and other incentives is encouraged.

[1] Albert Todd, the Environmental Protection Agency liaison, in the February 1999 issue of Journal of Forestry.

2. The Town discourages uses that would degrade deer wintering areas.

3. The Town discourages fragmentation of wildlife habitat. Development other than isolated houses and camps shall be designed to preserve continuous areas of wildlife habitat and create and maintain links between such areas.

4. Preference shall be given to development that utilizes existing roads and field lines.

Recommendations

1. Encourage owners of necessary habitat for threatened or endangered species to contact the Vermont Department of Fish and Wildlife assistance in developing management plans for these sites.

2. Identify wildlife corridors in Bradford for the purposes of revising the Town's zoning regulations to protect wildlife habitat.

3. Beaver confusers/diverters should be established to protect the river beavers along the Connecticut River and Waits River at any place the beavers locate where they may be of harm to the community.

4. The Town should update the deer wintering overlay district in Bradford's Zoning Bylaws with the most up-to-date data available.

5. Planting for migratory bird populations is encouraged and incentives could be offered to farmers for maintaining crops for this purpose.

L. Mineral Resources

Background

Maintenance of adequate quantities of gravel, sand, crushed rock, and other materials is necessary for the development industry as well as state and local highways. In spite of this, public and private interests are often in conflict over use of the resource. It is in the interest of Bradford's community to use these resources so that such uses do not significantly inhibit or conflict with other existing or planned land uses, are not in conflict with other stated goals in this Plan, and do not adversely affect neighboring properties or natural resources.

Goal

1. To support extraction and processing of mineral resources only where such activities benefit the public and are appropriately managed.

Policies

1. It is the policy of the Town that existing and proposed mineral extraction and processing facilities shall be planned, constructed, and managed so as not to adversely impact existing or planned uses within the vicinity of the project site.

2. To not interfere significantly with the function and safety of existing road systems serving the project site.
3. To minimize any adverse effects on water quality, fish and wildlife habitats, view sheds and adjacent land uses; and
4. To reclaim and re-vegetate sites following extraction.
5. To minimize noise and concussive impacts on adjacent uses including residential areas.

M. Scenic and Historic Resources

The Town of Bradford is blessed with a combination of fascinating history and outstanding scenic beauty. These assets have enormous social and economic benefits. The dominant scenic landscape features are the Connecticut River Valley, the Waits River Valley, the views of the White Mountains, and the views from Wright's Mountain.

Bradford contains many fine examples of 19th century architecture. The United States Department of the Interior accepted the Bradford Village Historic District for listing in the National Register of Historic Places in 1975. A keen interest in the restoration of many of Bradford's attractive old buildings took place during the 1976 bicentennial celebration and continues to this day.

Goals

1. To preserve the historic assets of the Bradford Village Historic District.

2. To preserve outstanding scenic areas.

Policies

1. It is the policy of the Town to preserve scenic areas.

2. It is the policy of the Town to encourage land development planned to minimize the unnecessary loss of historic or archeological resources determined to be of local, state, or federal significance.

3. It is the policy of the Town when land adjacent to areas of historic significance is developed, to encourage a design that fits the character of the area.

4. It is the policy of the Town to encourage preservation and the adaptive reuse of historic buildings complementary to the distinguishing characteristics of the structure or neighborhood.

5. It is the policy of the Town to avoid undue impacts on significant historic or archeological resources when conducting public improvements such as road rebuilding and utility construction.

6. It is the policy of the Town to preserve the view of the downtown from the crest of Bliss hill.

Recommendations

1. The Conservation Commission, in cooperation with the Planning Commission and Selectboard, should investigate the feasibility of designating exceptionally scenic Town roads as Scenic Highways under Vermont's Scenic Highway Law.

2. The Bradford Historical Society, Conservation Commission, and the Planning Commission should develop an inventory of all important historic, archeological, scenic, and cultural resources in Town. While it is recognized that a portion of the Downtown is included as part of the National Register of Historic Places, there are other sites warranting evaluation. Following completion of the inventory, implementation measures to conserve exceptional resources should be explored.

3. The Planning Commission should enable design control measures within the Zoning Bylaws to ensure that the Route 5 and 25B corridors entering into the Historic Downtown maintain its historic character.

N. SOILS AND TOPOGRAPHY

Soil characteristics and topography are primary factors influencing or limiting land development. Shallow soils, wet or poorly drained soils, or unstable soils, are critical factors in determining the type of land use that is most appropriate for an area. Steep slopes are more difficult to engineer for buildings, highways, and water disposal systems, and oftentimes are not cost effective; they can require extensive measures to overcome their environmental limitations. Upland areas generally have poor soils for development and are very steep; they are better suited for forestry and wildlife purposes. Upland areas are generally remote from public services and good public roads because the severe limitations do not warrant those investments.

Policies

1. It is the policy of the Town to discourage development on slopes exceeding 15%.

2. It is the policy of the Town to employ strict erosion control plans when development is considered in areas in excess of 10% slope.

3. It is the policy of the Town to require that installation of sub-surface sewage disposal systems follow state and local regulations.

4. It is the policy of the Town to encourage forestry and conservation uses above other uses in upland areas, given their severe limitations for development.

IX. Transportation

Introduction

Land use, energy, and transportation are related. Land use, both within and outside Bradford's borders, drives the need for improvements to the transportation system. At the same time, local land use goals must be facilitated in part by providing the necessary transportation facilities to accommodate growth

where growth is desired. In addition, a given land use can have very different impacts on the transportation system depending on how it is sited and designed. Land use and transportation are both linked to the Town's economic well being.

Poorly planned land use patterns increase transportation costs and also the tax rate, whereas well planned development can add to the tax base of the town, providing additional funds for the transportation system. This section will focus on Bradford's transportation systems. Policies and recommendations specific to transportation issues are outlined at the end of the chapter.

A. Public Highways

Local, State and Federal Roads in Bradford	
Class 1	0
Class 2	12.56
Class 3	38.87
Class 4	2.53
Total Town Roads	53.96
State Highways (VT routes 25,25B)	8.01
U.S. Highways (US route 5)	5.85
Total State Roads	13.86
Interstate (I-91)	6.42
Grand Total Mileage	74.24

Source: Vermont Agency of Transportation, 2007

As indicated in figure #1 there are a total of 74.24 miles of highways and roads in Bradford. Of this total, 20.28 are State maintained. These include Interstate 91 running north-south through Town west of Route 5 and Bradford's downtown, Route 5 running parallel to I-91 and Route 25, which runs east-west of the Lower Plain. Though development in Town has occurred around Route 5 and the junction with Route 25, as roads providing access to much of the Town without impacting the local budget, they provide a benefit to the town and the area north of that junction continues to be a logical area in which to encourage continued growth. Growth must be carefully considered for impacts on traffic and the rural character of Bradford.

Route 25 is a northwest/southeast route from Central Vermont to Portland, Maine, serving Bradford residents who commute to central Vermont and the Capital Region, and providing access to Bradford from Corinth and Topsham to the west and from Piermont, Haverhill and Warren, New Hampshire across the Connecticut River Bridge to the east. Route 25 also provides access to the towns of Chelsea and Randolph via the Goose Green/Chelsea Road.

Route 5, which runs through the Downtown area, is a U.S. route and therefore subject to State weight limits. Because of the limits on I-91, large trucks travel through the Downtown on a regular basis. In the 2007 survey, residents commented that such traffic had a negative impact on the downtown. All

State and Federal routes are subject to an 80,000-pound weight limit, with certain exceptions. The State highway weight limit for all trucks used to transport timber, milk or stone products is 100,000 pounds. Weight limits on Interstate 91 are also set at 80,000 pounds, with few exceptions. Municipalities are authorized to establish their own weight limits for local roads. Locally established weight limits must be reported to the State, so that truck traffic can be directed accordingly

Nearly 75% of the public highway miles in Bradford are Town-maintained. Highway classifications determine the amount of state aid available to assist with repair and maintenance. The Vermont Agency of Transportation (VTrans) and the Selectboard determine road classes. Criteria include traffic volume, road condition and function. Class 2 highways are the major connectors linking villages with each other and with state highways, and they receive a higher rate of State Aid than Class 3 highways. Twenty-two percent (22%) of Bradford's roads are Class 2, of which most are paved. Class 3 highways are other Town roads that are maintained in a manner enabling them to be driven under normal conditions in all seasons by a standard car. The majority (68%) of Bradford's roads are Class 3 and 15.5 miles of them are paved.

Bradford only has 2.53 miles of Class 4 highway. The Town is not obligated to maintain Class 4 roads with the exception of culvert replacement. No State Aid is available for work on Class 4 highways. It is the current practice of Bradford to grade Class 4 roads periodically, and to replace culverts and maintain bridges as needed. While not suited for regular traffic, these roads do represent a valuable asset for the Town from a recreation standpoint. Such Town-owned corridors will help ensure that there will continue to be a place to enjoy snowmobiling, cross country skiing, walking, hunting, horseback riding Private Roads
Land use regulations are needed to ensure that private subdivision roads are designed safely and properly constructed and maintained. The safety of occupants and emergency personnel depends on proper road design and maintenance. The Town currently enforces standards for new public roads, but there is no legal mechanism in place to apply the standards to privately owned and maintained roads, which may be dedicated to the Town in the future. If the Town were to adopt subdivision regulations, they could be used to apply Town road standards to all new private roads and rights-of-way.

a. Road Maintenance

Maintaining the network of roads in Bradford is time-consuming and represents a substantial part of the Town's annual budget. In 2015, the total town budget (not including state aid) for Bradford highways was $925,371. In 2007, fees for driveway permits and State Aid provided 13% of the revenue the Town needed for road maintenance. The remaining 87% of the Town's road maintenance budget was raised through local property taxes. Because of the expense of major road reconstruction, the most sensible and financially affordable method of road maintenance is proactive maintenance. A 2005 study by the Two Rivers-Ottauquechee Regional Commission showed that one town saved 75% in costs by maintaining a program of proactive maintenance over more costly large-scale rehabilitation or replacement projects. When surveyed 2007, over 60% of citizen response indicated that Bradford's roads were "adequately maintained" and similarly almost 60% categorized the quality of the roads as "good."

Culvert replacement is an important element of road maintenance. Undersized or poorly engineered culverts are subject to clogging, which can create flooding that will damage roads. In the case of the 1998 flood in Bradford, a substantial amount of damage was caused to Goshen Road due to culvert failure. Bradford has a program of culvert replacement, and a culvert inventory was conducted in 2005, which needs to be updated. An up-to-date culvert inventory benefits the Town because VTrans offers a preferential match (90% Vtrans/10% Town) in grant funding to towns which maintain the

inventory. In 2005 the Town also attempted to begin a Road Surface Maintenance System (RSMS) but the system was abandoned because it was too complicated to be implemented.

In late August 2011, Bradford's culverts and roadside ditches were put to the test, and were shown to be adequate for the job. Tropical Storm Irene struck Vermont, and wreaked havoc throughout the State. Bradford was very lucky to be spared the destruction that devastated so many other communities, but Bradford's good fortune resulted from a lot of hard work, and a good bit of luck. Since the flood of 1998 the road crew concentrated on replacing undersized culverts with larger ones. When Irene struck, the drainage system for our roads was able to handle the extraordinary water flow. On that one day all the culvert replacement work over the past decade paid for itself.

Road resurfacing makes up a significant part of the Bradford road crew's work. Although paving roads can lead to reduced maintenance costs when compared to maintaining a gravel road with high traffic volumes, paving represents a sizeable amount of Bradford's road budget. The average life of a paved road in Vermont is 7-12 years if properly maintained. Nearly 40% of the roads maintained by the Town are paved. Although VTrans periodically offers grants to towns for paving projects, this funding stream is insufficient to maintain them properly. For example, a grant from VTrans for $200,000, depending on the current cost of asphalt and related materials, might only pay to pave a quarter mile of road. As of 2008, Bradford is able to pave 1.2 miles of road per year, which does not allow the road crew to keep up with needed maintenance. Instead, roads have to be patched and re-patched in order to keep the roads safe and acceptable for public use. Before undertaking any new paving projects, the Town should conduct a cost-benefit analysis to enable prioritizing of road maintenance.

Because of the expense of major road projects, it is essential that they be undertaken in consultation with other Town departments. For example, if a road in the downtown is being torn up and redesigned, there is an excellent opportunity for other infrastructure improvements to occur. Much of the infrastructure is underground and runs under the road system. Therefore, replacement of infrastructure like aging water and sewer pipes should be coordinated with major road projects to allow the efficient utilization of Town equipment and to avoid having to re-do projects.

b. Major Projects

In addition to consulting with different Town departments, Bradford's officials should have a Capital Budget and Program that allows them to plan and save for major infrastructure investments of all kinds. Although the Town does have a Capital Fund, it is not formally organized into a Capital Budget and Program.

The following road projects have been identified as priorities:

- Bridge on Chelsea Road - The Town maintained bridge on Chelsea Rd. needs re-decking and restructuring.

- North Pleasant Street - The drainage on North Pleasant St. needs to be re-configured and the bank needs to be stabilized.

- K.D. Welch Road - KD Welch Rd. needs drainage repairs to stop erosion on the golf course.

c. Access Management

Proper siting and design of the access points of driveways and private roads is necessary to ensure the safety of users, as well as that of drivers, bicyclists and pedestrians. Adequate sight distances are essential. Drainage from a driveway is also an important issue as improperly directed stormwater runoff can damage adjacent roadways and contribute to pollution and sedimentation of nearby streams and rivers.

Access to private property from highways and local roads is an important issue to consider when assessing the potential impacts of future development. Access impedes mobility and can decrease safety. Single access driveways to multiple lots should be encouraged on new development.

Bradford can help minimize the effect of development and can decrease sprawl along highways by concentrating future development activity in existing village centers and/or specific "nodes" along local roads where adequate infrastructure exists or can be provided to support intensive development and where natural constraints to future development are minimal. Bradford can also apply specific access management techniques designed to reduce the number of curb cuts or driveways needed to serve roadside development. These techniques include:

1. Requiring driveways to serve adjoining lots;

2. Prohibiting curb cut access from the main thoroughfare for corner lot properties;

3. Requiring off-street access and traffic circulation to adjoining parking lots in commercial areas;

4. Imposing restrictions on the number, width and placement of curb cuts on major highways;

5. Requiring specific setbacks from road intersections for all new curb cuts; and

6. Requiring subdivisions adjoining major thoroughfares to provide internal street access only for all lots fronting on the thoroughfare. The resulting lots would have double frontage (along the front and rear yards.)

d. Traffic Calming and Parking

Parking within the downtown is a concern for Bradford. Anecdotal evidence suggests that some businesses with interest in locating within the downtown have declined specifically because of the lack of parking. Additionally, the 2007 Town Plan Survey contained comments regarding the lack of parking in the downtown.

Bradford’s central business district is served by parking along Route 5 with spaces aligned diagonally to the road. This configuration might be acceptable if it were reserved for customers only, but owners

and employees of downtown businesses frequently park in those spots as well, which creates a shortage of parking spaces.

Through creativity and planning, it is likely that additional parking could be found within the downtown. A parking study should be conducted for the purposes of determining how the re-configuration of roads and reclaiming of unused areas might be undertaken in order to increase the available number of spaces. For example, making one-way travel on Barton Street might allow for the creation of additional parking. Changing the parking on Main Street from diagonal to parallel parking might improve pedestrian access and green space. Such projects are expensive and time-consuming and must be well planned.

In addition to the lack of parking, residents have expressed concerns about the rate of speed with which drivers travel through Bradford, particularly in the downtown. Speeds are primarily governed by the motorists and their ability to navigate the roads using their vehicles, rather than by traffic congestion or aggressive law enforcement activities. Time of day, road conditions, trip type, proximity to origin or destination, law enforcement visibility and type of vehicle are all variables influencing the motorists' decision to drive a certain relative speed. In 2006, the Town of Bradford, through the Public Safety Study Group, requested traffic speed data be collected along South Road, Fairgrounds Road, South Main Street and North Main Street.

Study Location	Average Daily Trips (ADT)	Percent of traffic above speed limit	Posted Speed Limit
South Road	900	95%	35MPH
Fairground Road	1800	70%	25MPH
South Main Street	3000	58%	25MPH
North Main Street	6500	70%	25MPH

Source: Two Rivers-Ottauquechee Regional Commission, 2006

The results of the study (see figure #2), conducted by the Two Rivers-Ottauquechee Regional Commission indicated that the speed limit is being exceeded by a majority of drivers on all of the tested roads, but South Road, Fairground Road and North Main Street are of greatest concern. As speed increases beyond the posted limit, safety decreases. Increased speeds contribute to higher levels of road noise, vibrations and air pollution. Crashes become more severe, with the greatest risk borne by bicyclists and pedestrians. Enforcement of existing speed limits is important, but the best way to slow down traffic is to utilize traffic calming methods. The main objectives of traffic calming are to:

- Reduce the speed of car traffic
- Promote other forms of non-motorized transportation
- Minimize the negative effects of automobile travel
- Create attractive streets
- Improve the safety and convenience for pedestrians and cyclists

When asked if residents would support traffic calming through the downtown, nearly 65% of the responses were supportive. Although there are a number of methods that can be used to slow the pace

of traffic, only a few would be appropriate in Bradford's downtown, in great part due to state rules regarding vertical elements such as raised crosswalks and speed humps. These are the options that would be possible:

- Expand or Reconfigure On-street Parking – On-street parking helps slow down traffic through what is called road friction. Expanding the availability of on-street parking would achieve multiple goals.

- Chokers and Neckdowns – Chokers and neckdowns (also known as bumpouts) are effective tools for slowing traffic. The curb line is extended into the street, thereby narrowing the street width and slowing traffic.

In addition to slowing traffic, such alterations to the downtown district might be designed to improve parking and to allow improvements such as improved sidewalks, new lighting, street benches, trees, greenspace and buried utility lines.

e. Other Forms of Transportation

Railroad

The former Boston & Maine Railroad, currently owned by the State of Vermont, runs through the Town of Bradford along the Connecticut River. The line connects to an active freight section north of Wells River and to an active freight and passenger section in White River Junction. Prior to the rail line becoming inactive, freight movement and pick-ups occurred on a daily basis. Gradually, the frequency of trips declined.

The Town of Bradford views this section of rail line as vital to the Town's transportation system and long-term economic development. Rail access for the Town's industrial park is considered crucial for reinvigorating the park. Iron Road Railroad, the owner of the facility north of Wells River, has discussed possible tourism excursions on this line. Bradford strongly encourages the reactivation of this railroad line and encourages the State to repair the railroad crossings and signals for the safety of the citizens of Bradford.

Pedestrians and Bicyclists

A primary benefit of mixed-use downtowns, where development is concentrated, is the reduction in automobile use. By locating stores, services, public facilities and high-density residential development in close proximity, many residents are able to walk for trips that would otherwise require driving. It is essential that plans for future development and improvements to Bradford's downtown incorporate upgrades to the existing system of sidewalks, crosswalks and pedestrian paths. Much improvement is needed in this area.

The following bicycle/pedestrian projects have been identified:

- <u>Routes 5 and 25 to Piermont Bradford Bridge</u> – A bike lane could run along Route 25 from the Route 5 intersection to the Piermont Bridge. However, it would require a feasibility study to determine whether implementation is possible. This would connect the industrial park, the mobile home park, and the Town of Piermont to downtown Bradford.

- Downtown to Lower and Upper Plain – Residents who wish to walk or bicycle from the Downtown to the Lower Plain or Upper Plain must travel on the shoulder of Route 5. A sidewalk should be built to accommodate pedestrians. Bike lanes should be marked along both shoulders to accommodate bicyclists. The cost of extending the sidewalk should be borne by developers as they continue to expand development in the Lower Plain.

- North Pleasant St. Sidewalk – Poor drainage and a weak bank are causing this sidewalk to deteriorate at a rapid pace. Sidewalks should be restored after repairs have been made to drainage and the bank has been stabilized.

- Main Street Sidewalk - Because Main Street is the downtown core of the village, and its aesthetics reflect on the Town itself, it is important to have the pedestrian infrastructure in good working order. Projects that involve upgrading of sidewalks in the downtown should also include beautification improvements such as better lighting, burying utility lines, and streetscaping.

- Regional Connecticut River Valley Bike Route – Bradford is located along a scenic byway (U.S. Route 5). In an effort to capture additional tourist traffic and improve commerce within and around the downtown, a bike route should be considered.

Snowmobiles and All-Terrain Vehicles

The Vermont Association of Snow Travelers (VAST) maintains snowmobile trails throughout much of Vermont. VAST trails have the potential to bring additional commerce to towns provided they allow access to the Town.

All-terrain vehicles (ATVs) are used primarily in spring, summer and fall. Because ATVs are used when the ground is not frozen, they can damage woodland trails. ATVs can pose a safety hazard if they are driven on public roads. Bradford has been unwilling to take on the liability of opening public roads to ATVs. Opening public lands such as the Town Forest to ATV use should be considered only with great care. If the Town decides to allow construction of ATV trails, they should be designed in consultation with wetlands specialists and the Bradford Conservation Commission, and should be built to comply with State and Federal regulations.

Public Transportation

Bradford currently has access to a small regional public transportation system, Stagecoach, Inc. which offers regular transportation to West Lebanon, NH. Their southern route to West Lebanon (the River Route) has a
regular stops located in the village and at the newly expanded Park and Ride near the I91 interchange on Route 25. . The River Route has stops at the VA Hospital in Hartford, and connects with Advanced Transit (which offers service in NH) and Dartmouth Hitchcock Medical Center. Stagecoach also offers limited public transportation in the form of special requests for individuals who need transportation for medical reasons. Bradford residents can take advantage of Stagecoach's "Ticket to Ride" Program, which helps pay
a substantial percentage of the cost of rides for senior citizens (60+) and persons with special needs when there is not available transportation in the household or the person requesting the trips is unable to drive on the day of the trip. Ticket to Ride is available for a broad array of destinations, such as medical services, shopping, errands, and social purposes.

The Park and Ride has been significantly increased in size and a small structure has been constructed along with facilities for electric charging stations and bicycle racks.

Given that Bradford's elderly population is growing, the need to maintain an affordable source of public transportation that can bring the elderly to major medical facilities like Dartmouth-Hitchcock and larger commercial centers for day-to-day shopping needs is important.

Goals

1. To provide and maintain a safe, energy efficient, and cost effective transportation system integrating all modes of travel (auto, pedestrian, bicycle, and mass transit) and meeting the needs of the public in a manner consistent with the other goals, policies and recommendations of this Town Plan.

Policies

1. It is the policy of the Town that land development in Bradford on the State and Federal routes must be planned to be compatible with all modes of transportation discussed in this chapter. At the same time, the State's plans should take the Town's concerns into account.

2. It is the policy of the Town to focus its limited funds on preserving the existing transportation system and making necessary improvements for the general safety and welfare of the traveling public.

3. It is the policy of the Town to consider public input prior to a decision to substantially change the maintenance level, surface treatment, or class of a Town road.

4. When determining which roads to pave (or remove pavement from) and when, it is the policy of the Town to evaluate traffic volume and maintenance costs against other factors, such as the up-front cost of paving and base improvements that may be necessary to support a paved surface and the potential quality-of-life impacts to residents.

5. It is the policy of the Town that expenditures for bridge maintenance and improvement projects should be based on a detailed survey of bridge conditions followed by a long range plan for rehabilitation and replacement. State aid is available to help offset the cost of this survey.

6. It is the policy of the Town to integrate land use and transportation planning by encouraging concentrated growth in areas served by an adequate highway system, utilizing land use regulations and appropriate highway access management techniques to control the impacts of development on the transportation system, and making transportation improvements in areas where growth is desired.

7. It is the policy of the Town to encourage access management techniques that limit the number of access points during new development along highways to reduce driver confusion and traffic congestion and to minimize conflicts between through and local (turning) traffic via provisions on further subdivision in new access permits.

8. It is the policy of the Town to cooperate with other communities in the region through the TRORC and its Transportation Advisory Committee to ensure that the region's transportation

system is developed in a coordinated manner that recognizes and balances the needs and desires of each community.

9. It is the policy of the Town to consider the relationship of a road to surrounding features of the landscape when planning improvements needed to safely accommodate increasing traffic.

10. It is the policy of the Town to combine widening of roadways to accommodate safe use by bicyclists with traffic calming measures and enforcement of speed limits to ensure that traffic speeds do not increase.

11. It is the policy of the Town to incorporate state-of-the-art bike racks into plans for new developments.

12. It is the policy of the Town to address the need for adequate off-street parking in reviewing proposed developments.

13. It is the policy of the Town to retain Class 4 roads, trails, and other public rights-of-way as public resources.

14. It is the policy of the Town to preserve existing pedestrian access and connections during future development, provided this does not conflict with preserving natural resources.

15. It is the policy of the Town to encourage the elimination of large through truck traffic through the Downtown.

16. It is the policy of the Town to encourage streetscaping and widening of sidewalks Downtown to enhance pedestrian safety.

17. It is the policy of the Town to support efforts of local schools to create school travel plans.

18. It is the policy of the Town to support the creation of public transit from Bradford to Barre and Montpelier.

19. It is the policy of the Town to encourage the expansion of the Connecticut Valley Railway line to include passenger commuter service.

20. It is the policy of the Town to discourage the idling of all Town vehicles.

21. State law requires that access permits, on local or state controlled roadways, be compatible with Town, Regional, and State Plans. It is the policy of the Town to ensure that:

    - The Town utilizes State of Vermont design standards for all temporary and permanent access to include emphasis on drainage, sight distance, and access for emergency services;
    - The Town and State encourage use of shared driveways and/or permitting access that may result in a future shared driveway;
    - The Town should require a review of access for existing development whenever a change of use, ownership, or other application process is brought before the Planning Commission;

- The Town should encourage commercial properties to use existing development nodes along US Route 5 in order to preserve or create road segments with few accesses.
- The Town and State should use sight distance standards based on the actual travel speeds and not the posted speed limits. If no such data exists or is not current, then the State or Regional Commission will collect the data;
- The Town and State should utilize access or an access easement from a local road rather than a State highway.

22. It is the policy of the town to support efforts to sustain, expand and enhance public transportation.

Recommendations

1. The Town should work with VTrans and TRORC to ensure that improvements to the state highway system are sensitive to the desires of Bradford and maintain the rural character of the Town.

2. The Selectboard should review and update the Town policy regarding upgrading Class 4 roads and private roads to Class 3 town-maintained roads to ensure that:
   - adequate road construction standards are followed;
   - the landowners are required to pay for bringing the road up to Town standards; and
   - Input from the Planning Commission and Conservation Commission is incorporated in the Selectboard's review and decision process to ensure the changes would be consistent with the Town Plan.

3. The Selectboard should review and update the Town's driveway regulations and road standards to ensure that safety and drainage issues are adequately addressed. If the Town adopts subdivision regulations, incorporate appropriate requirements to ensure that new private roads and rights-of-way will be constructed to Town road standards.

4. Working with the Road Foreman, the Selectboard should prioritize and schedule the particular road segments planned for improvement.

5. The Town should consider adopting a formal Capital Budget and Program for the purposes of planning and budgeting for major transportation projects.

6. Any major highway improvement project should be analyzed in advance for its impact on land use, property values, the environment and governmental costs and services. Additionally, these projects should be coordinated with other Town infrastructure improvements to make such work as cost-effective as possible.

7. Subdivision regulations, which would give local control over the construction of roads and other public improvements, should be prepared by the Planning Commission for voter consideration, with an emphasis on well-planned access policy.

8. In the event a land subdivision or development is proposed which intends to gain access via a Class 4 Town road or a privately controlled drive, it is recommended that the zoning permit, if granted, reference road policies in effect and specify that the Town of Bradford is not responsible for upgrading or maintaining the road.

9. The Town should inventory parking and pedestrian needs within the downtown and formulate a plan to make upgrades in the future.

10. The Town should consider redesigning Main Street (Route 5) to enhance its appearance and functionality. Additionally, such enhancements as placing all utilities underground, correcting drainage, constructing more visually obvious crosswalks and further upgrading of sidewalks and streetlights could be made. This project would involve state agencies, businesses, property owners, and the Town. The Town could apply for a planning grant to determine the scope and steps involved in completing the project.

11. The Town should investigate the benefits of working with VTrans to make the area of US Route 5 in the downtown into a Class 1 road, thus taking over the maintenance. This would allow the Town to work with VTrans to apply different weight or length limits than are presently allowed, which could result in a reduction in truck traffic within the downtown.

12. The Town should continue to update and maintain a culvert inventory in Bradford in order to ensure that the 90%/10% grant match offered by VTrans is available to the Town. Additionally, the Town should develop a program for evaluating roads and bridges. The Town should work with VTrans to identify potential traffic calming options in the Downtown.

13. The Town should consider developing a design for a pedestrian network.

14. The Town should conduct a comprehensive inventory of all sidewalks and other pedestrian routes. Once inventoried, all sidewalks should be evaluated for their condition, and studied to determine the amount and type of pedestrian traffic they handle. All this information should be used to develop a priority ranking to help determine the order in which sidewalks should be renovated and repaired.

15. The Planning Commission should amend the zoning bylaws to reduce the number of parking spaces required for commercial development.

X. Flood Resilience

A. Background

Following the devastating impact of Tropical Storm Irene in 2011, the Vermont Legislature added a requirement that all communities address flood resilience as part of their municipal plans. Interpreted very broadly, "resilience" means that an entity—a person, neighborhood, town, state, region or society— when faced with a particular situation or event, has the ability to effectively return to its previous state or adapt to change(s) resulting from the situation or event without undue strain. As such, "resilience" is not necessarily an action that is taken, but an overall enhanced state of being in relation to an ongoing or future specific situation or event.
When applying the term to hazards, it is important to further articulate the meaning of "resilience." In this context, "resilience" is often discussed in terms of being resistant to the effect(s) of one or multiple hazards that could reasonably be expected to occur in a specific area. For the purposes of this chapter, flood resilience will mean the ability of Bradford to effectively understand, plan for, resist, manage and, in a timely manner, recover from flooding.

Types of Flooding

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

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

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

Causes of Flooding

Flooding is caused by a small number of distinctive types of weather, and also by the cumulative impact of a weather event and the conditions on the land at the time the flooding occurs. By far the most common type of weather event to occur in the region is a severe storm. Severe storms may include thunder, lightning, hail, high winds, and precipitation with varying degrees of intensity. Severe storms with particularly heavy precipitation have the ability to create flash flood conditions. However, over an extended period of time, severe storms may cause inundation flooding due to the cumulative effects of continuous rain, saturated soils and a high water table/high aquifer levels. As with any weather system, pockets of a severe storm may be more severe than others, leading to variability of observed impacts across the region.

The main hazards associated with hurricanes and tropical storms are high winds and flooding. By the time most hurricanes reach Vermont, they have been downgraded to tropical storms, but that is not to say they are less dangerous. Due to the steep slopes and narrow valleys in the region, heavy precipitation from a hurricane or tropical storm tends to cause severe flash flooding and widespread destruction. The speed that the hurricane or tropical storm is moving across the area and the pockets of varying severity both have an impact on the rainfall totals observed from town to town. Storm impacts can be greatly magnified by previous rains.

Both severe storms and hurricanes/tropical storms occur during the summer and into the fall months, but ice jams and the combination of melting snow and rain leave the region vulnerable to the impacts of flooding in the winter and early spring. Ice jams typically occur during the spring when river ice begins to break up and move downstream, but may occur during a thaw period in the winter months. Sheets of ice become hung up on a narrow portion of the stream or river, such as under a bridge, culvert or another obstruction, creating a "dam" and additional ice and water begin to back up behind the hung-up ice sheets. This creates inundation flooding immediately adjacent to the site of the "dam," and additional inundation flooding upstream. Once the "dam" breaks free, flash flooding may occur

downstream as well. Ice jams in the region typically cause minimal damage, but they can damage road infrastructure, and flood homes and businesses.
Finally, the combination of melting snow and rain, can lead to flooding in Bradford. Flooding is worsened by land uses that create hard surfaces that lead to faster runoff, and past stream modifications that have straightened or dredged channels, creating channel instability.

B. Flood Hazard and Fluvial Erosion Hazard Areas in Town

Flood Hazard Areas

There are two sets of official maps which can govern development in the floodplain in Vermont. They are the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) and VT Agency of Natural Resource's river corridor area maps. The FIRMs show the floodplain that FEMA has calculated which would be covered by water in a 1% chance annual inundation event, also referred to as the "100 year flood" or base flood. This area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show expected base flood elevations (BFEs) and floodways (smaller areas that carry more current). FIRMS are only prepared for larger streams and rivers. Bradford has areas of mapped flood risk by FEMA.
Recent studies have shown that the a significant portion of flood damages in Vermont occur outside of the FEMA mapped areas along smaller upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. Since FEMA maps are only concerned with inundation, and these other areas are at risk from flash flooding and erosion, these areas are often not recognized as being flood-prone. Property owners in such areas outside of SFHAs are not required to have flood insurance. Flash flooding in these reaches can be extremely erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains, and also creating landslide risk. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountainside undercutting. Change in these areas may be gradual or sudden. Furthermore, precipitation trend analyses suggest that intense, local storms are occurring more frequently.
Vermont ANR's river corridor maps will show the area needed to address these erosion hazard areas, which may be inside of FEMA-mapped areas, or extend outside of this area. In these areas, the lateral movement of the river and the associated erosion is more of the threat than inundation by floodwaters. Elevation or flood proofing alone may not be protective of structures in these areas as erosion can undermine structure. Vermont ANR is issued statewide river corridor maps in 2014.
In Bradford, there are 850 acres of floodplain, 81 acres of which are floodway (the deepest, fastest flowing area in a flood). 4% of the town is floodplain. Less than 1% of town (674 acres) may be in the developable portion of the floodplain (not including wetlands). Most towns have areas of unmapped flood risk.

Flood Hazard Regulations

The Town of Bradford Zoning Bylaws include flood regulations which prohibit new development in the floodway, but allow new structures in the floodplain and fluvial erosion/stream buffer zones. It also specifies land, area and structural requirements in the Special Flood Hazard Area. This level of flood hazard area regulation meets the minimum standard necessary for Bradford to remain in the National Flood Insurance Program.
There are 10 residential and 11 commercial/public structures in the 100-year floodplain, which equal $2.7 Million Dollars if all properties were damaged/destroyed in a severe flooding event. The flooding that occurred as a result of Tropical Storm Irene is considered to be greater than a 100-year flood.

Recent studies have shown that the majority of flood damage in Vermont is occurring along upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. These areas are often not recognized as being flood prone and property owners in these areas are not typically required to have flood insurance (DHCA, 1998). It should be noted that although small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Map), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be very erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountain side undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently.

C. Promoting Flood Resilience

Flood Hazard Regulation

As previously mentioned, Bradford's adopted Flood Hazard Bylaws set the minimum development standards allowed by the NFIP. In order to ensure the safety of the public and to protect against the loss of life and property in the Flood Hazard Area, and to access a larger portion of the disaster funds available through the Emergency Relief Assistance Fund, the Planning Commission could create more stringent regulations. Any updates to the Flood Hazard Bylaws that were more restrictive than they are now would apply only to new development; existing development would be grandfathered and could continue to operate within the area. While no changes to the Flood Hazard Bylaws are required, it should be recognized that state disaster funding increases with the level of regulation a communities applies. Strategies to improve the strength of the flood hazard ordinance (and improve flood resiliency) could include:

- **Prohibition on New Development** – Most planners would suggest that a complete prohibition on new development within the floodplain is the best way to avoid future damages from extreme events.

  Also important to consider is exactly what the definition of "new development"" will include. The Planning Commission could include additions and renovations to existing structures over a certain size. This is not a commonly used methodology in most communities as it impacts grandfathered uses and can be challenging to implement.

- **Prohibition of Specific Types of Development** – An alternative to an outright prohibition on development is to identify specific types of development that should be kept from developing within the Floodplain. In some communities, new residential and commercial development has been prohibited from developing in the floodplain. In others, only residential has been prohibited. Decisions on which types of uses to prohibit are generally made with substantial citizen input with considerations for what will most substantially reduce risks to lives and property.

- **Increasing Standards** – Communities can choose to increase the requirements for new developments in the floodplain while still allowing all or most forms of development. Increased standards could include a requirement that structures be elevated higher than the minimum standards required by the NFIP (one foot above base flood elevation). Such standards could also include more specific requirements for tying down structures or for making them more capable of allowing floodwater to pass through them.

- **Create River Corridor Protection Area** - Some communities regulate the area that extends beyond the mapped flood hazard areas. Often this River Corridor Protection Area uses fluvial erosion hazard data as part of its basis, but can also include simple setbacks from rivers in all parts of the community as a way to deter development in areas that may erode in the event of severe flooding.

Future revisions to the Bradford Flood Hazard Bylaw will require input from the community regarding the level of regulation they believe is necessary to protect citizens and their buildings from severe flood hazard events. Provided that all parts of the Flood Hazard Bylaw meet the minimum requirements of the NFIP, communities have a broad range of flexibility in which to regulate the flood hazard area. For example, a community could prohibit commercial development in the floodplain everywhere except a village, because in some communities such a restriction would be damaging to the village center.

Non-regulatory approaches

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

Home/Property Buyouts
Following the flood damage caused by the 2011 spring flooding and Tropical Storm Irene, a number of property owners in Vermont applied for property buyouts, which were funded by FEMA's Hazard Mitigation Grant Program (HMGP) and HUD's Community Development Block Grants for Disaster Recovery (CDBG-DR). Over the course of this process, over 130 damaged or destroyed residential properties in the state of Vermont will be/have been bought out with this grant funding. As a stipulation of the HMGP funding, FEMA requires that the structure(s) on each buyout property be demolished, and ownership of the empty parcel of land then be transferred to the town/municipality. Future development on these sites will be restricted.
The home/property buyout process has both positive and negative impacts on a town and the community at large. The TRORC region was particularly hard hit by the flooding caused by Tropical Storm Irene, and had the greatest number of property buyout applicants in Vermont. As of early 2014, there were 60 properties in the TRORC region involved in the buyout process. The towns in our region with buyout properties include; Bethel, Braintree, Bridgewater, Granville, Hartford, Pittsfield, Plymouth, Rochester, Royalton, Sharon, and Stockbridge. Most of these towns are located on the White River and its tributaries. As of early 2014, 21 residential properties spread across these towns were purchased with FEMA's HMGP funds. Because the properties eligible for a buyout were heavily damaged by flooding, the buyout process is an effective way to reduce a community's vulnerability to flooding and therefore improve the community's overall resilience to flooding. As a result, a number of communities in the region have been made safer.
However, while the buyout process of an at-risk home makes a community less vulnerable to flooding, there is an inherent conflict between home buyouts and the tax and housing base of a town. For many towns in the region, a fiscal issue may arise with the loss of a few homes or properties from their tax base. As a result, some towns may need to raise taxes for the remaining landowners in order to maintain the town's level of service provided to the community. Higher taxes may make a specific town less attractive to some potential home buyers.
Another consequence of home buyouts is the loss of a town's housing base. Many towns in Vermont and in the region are located in valleys surrounded by steep slopes. Some homes are built on the hillsides, but due to topographic constraints, many homes are built in the valleys, near rivers and streams. This location places the structure and inhabitants at risk of flooding damage or injury caused

by either inundation flooding or by fluvial erosion. Often times, affordable or low-income housing is located in these higher risk areas. So, during a major flooding event, these homes have a higher probability of being damaged or destroyed, and therefore may be good candidates for a home buyout. However, when the structure is razed as part of the buyout process, it is removed from a town's housing base and in addition, may be removed from a town's affordable housing base. This situation may present challenges to the town in the future.

Generally speaking, the buyout of homes at high-risk of flood damage is an important step in improving the resilience of a town and community to flood damage. If a town's home buyouts have significantly impacted the housing base, it is important that the town have a thoughtful and creative approach to rebuilding its housing base that will maintain its improved flood resilience and conform to the town's future land use visions or settlement patterns.

Culvert Maintenance

A number of culverts have been replaced or upgraded since 2011. In an attempt to improve the flow of floodwater through the Town, Bradford upgraded culverts in the last few years on the following roads: [insert roads here]

The last official culvert inventory completed for the Town of Bradford was in [insert date] Bradford routinely updates their culvert inventory with newly created and repaired culvert listings. The process of upgrading culverts is ongoing.

D. Goals, Policies and Recommendations

Goals

1. The citizens, property and economy of Bradford and the quality of the Town's rivers as natural and recreational resources are protected by using sound planning practices to address flood risks.

2. Bradford is able to recover from flooding quickly and in a manner that improves flood resilience.

3. The creation of impervious surfaces and development in wetlands or upland forests in Bradford is lessened, and where it does occur, is done in a manner that does not worsen flooding.

Policies

1. All new fill and construction of buildings in Bradford's mapped flood zones* outside of river corridors increases flood risk and are discouraged, and all structures at a minimum must comply with the standards set forth in the Bradford Flood Hazard Bylaw.

2. Natural areas, non-structural outdoor recreational and agricultural uses are the preferred land uses within Bradford's river corridor areas due to the dangerous erosive nature of these areas.

3. Commercial, industrial, and residential uses within ANR's mapped river corridor areas are strongly discouraged outside of Bradford's village and town centers.

4. New buildings within Bradford's mapped floodways shall be prohibited.

5. In order to lessen the conflict between roads and streams, Bradford supports moving or abandoning roads when there are more cost effective solutions or other routes.

6. Bradford should only rebuild/install culverts and bridges that are designed at least to VTrans Hydraulics Manual and ANR Stream Alteration Standards.

7. Bradford's emergency services, wastewater treatment plants, power substations, and municipal buildings shall not be built in the Special Flood Hazard Areas unless flood-proofed or elevated to at least 2 feet above the base flood elevation and designed to withstand erosion risk.

8. Vegetated buffer strips should be maintained in riparian zones surrounding streams and rivers. Rock rip-rap and retaining walls should only be used to the extent necessary and when bioengineering techniques may not be adequate to prevent significant loss of land or property.

9. Bradford's upland forests and watersheds should be maintained predominately in forest use to ensure high quality valley streams and to ensure that flood flows are absorbed.

10. Outside of areas of existing compact development, new development must preserve vegetated riparian buffer zones that are consistent with state riparian buffer guidelines.

11. All wetlands which provide flood storage functions should remain undeveloped or have compensatory storage constructed so as to achieve no net loss of such wetland function. In the long term, restoration and enhancement of additional wetlands should be pursued in order to improve Bradford's flood resilience.

12. Structural development or intensive land uses shall not occur in Class I and Class II wetlands unless there is an overriding public interest.

13. Emergency planning for flood response and recovery is encouraged.

Recommendations

1. Bradford should work with the Regional Planning Commission to strengthen the Town's Flood Hazard Bylaws in order to mitigate risks to public safety, critical infrastructure, historic structures and municipal investments from inundation and erosion.

2. Bradford should work with VTrans and the Regional Planning Commission on advocating for and improving the flood capabilities of state or Town-owned transportation infrastructure.

3. Bradford should continue working to develop mitigation plans, and emergency preparedness and recovery procedures from flooding.

4. Existing homes and businesses at serious risk of flood damage in Bradford should be identified and prioritized in concert with the ANR River Management Section and the Regional Planning Commission for mitigation actions such as elevation/relocation or purchase and demolition.

5. Areas not designated in either FEMA's maps or in VT ANR's maps, but which are flooded during a weather event should be added to local flood regulations.

6. Watershed-level planning should be done by towns with assistance from the Regional Commission to evaluate natural and constructed flood storage options upstream of existing areas of concentrated development that are at risk of flooding.

7. Bradford will work with ANR, the Regional Planning Commission and landowners to lessen flood risk by restoring natural channel functions through berm or dam removal or intentional lowering of streambanks.

8. Bradford should adopt road and bridge standards to the 50 or 100 year storm level for identified critical transportation routes.

9. The Planning Commission should revise the Flood Hazard Bylaw to include restrictions on development in mapped River Corridor Areas as well as 50 feet within unmapped upland streams.

XI. Land Use

A. Introduction

In terms of planning for the future, one of the most complex discussions is about land use. How a town uses its land and plans for future land development can affect a wide range of issues including the town's character and its ability to provide services adequately and at a reasonable price. In order to ensure that the impact of future development in Bradford does not have unintended consequences, the town's growth must be managed to reflect the vision of this Town Plan..

This section discusses both current and future land use patterns and provides goals, policies and recommendations for future implementation. V.S.A. Title 24, §4411(a) authorizes towns to implement land use regulations, such as zoning, subdivision and site plan preview, provided that those regulations are in conformance with this plan and §4302 of Title 24, which addresses the state's planning goals. In 2004, the state legislature passed Act 115 to define more clearly "conformance with the plan". It states that:

> *"All such regulatory and nonregulatory tools shall be in conformance with the plan, shall be adopted for the purposes set forth in section 4302 of this title, and shall be in accord with the policies set forth therein." [§4411(a)]*

The Planning Commission has the task of implementing the Town Plan through the wide range of tools offered in state statute. All of these tools must conform to the policies of the Town Plan and once drafted, the Planning Commission is required to issue a report on how the newly drafted tools implement the plan.

B. Current Land Use

Traditionally the Town of Bradford has served as a local center of commerce for the smaller communities that surround it. This pattern of settlement and development has resulted in two areas of concentrated development: the historic Bradford Village, and the area surrounding the intersection of Vermont Route 25 and U.S. Route 5. These two areas lie on opposite sides of the confluence of the

Waits and Connecticut Rivers. While this separation is a natural outcome of Bradford's topography, it poses unique challenges as the Town attempts to meet the state planning goal 24 VSA, 4302(c)(1): "to plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside." While this goal is often interpreted to mean a town has only one center of development, Bradford has long had two. Townspeople are very concerned to maintain the vitality of the historic village, and it is also important to recognize the critical importance of the intersection of Routes 5 and 25 to the economic vitality of Bradford.

Growth in Bradford has generally reflected a pattern common in much of Vermont. Within areas of more concentrated development in Bradford, the type of development has remained mixed use, including residential, commercial and industrial. Outside of those areas, land use is located along Town and State highways and is primarily residential in nature, with a wide range of home businesses and some farms.

Bradford's land use patterns have not changed dramatically since 2001. Much of the shift in land use by parcel relates to the conversion of second (vacation) homes to permanent homes. There has been little change in commercial and industrial development.

Bradford Land Use by Parcel

Type of Use	Change 2007 - 2014	2007	2014
Residential	3.3%	869	898
Mobile Homes	30.6%	62	81
Vacation	-27.0%	61	48
Apartments	8.0%	12	13
Commercial	8.0%	74	80
Industrial	12.5%	8	9
Utilities	17.00%	6	7
Farm	20.0%	10	12
Woodland	11.0%	47	52
Miscellaneous	52.0%	146	96
TOTAL:		**1,295**	**1,297**

Source: Bradford Grand List

C. Future Land Use

The future land use section of a town plan is intended to act as a guide for future development within a town, and to aid local planners in the process of implementing the plan through regulatory tools. Future land use areas are not intended to mimic the current pattern of land use, but instead should reflect Bradford's vision of the future. That is to say – even if the land is being used one way today, it can be used differently in the future.

Public input collected from participants in the 2007 survey point in directions that will reinforce many of the current land use patterns in Bradford and introduce some new patterns. The survey indicated support for focusing commercial (55% "Yes", 31% "No") and industrial development (48% "Yes", 36% "No") within areas already served by water and sewer utilities. Those areas include the designated Downtown and areas of the Lower Plain that are already developed. Comments in the town plan survey voiced concern that present development regulations would not be able to prevent sprawl.[2] Therefore development in the Lower Plain should proceed carefully with an eye toward efficient use of land already developed.

Based on the public input gathered in the town-wide survey and at forums, this plan designates the following areas and provides guidance for local planners to implement the vision expressed by Bradford residents.

D. Economic Relationship between Central Business District and Lower Plain Commercial District

In recent years, many people have expressed concerns that commercial expansion on the Lower Plain might draw economic activity away from its designated downtown. (The boundaries of the designated downtown do not correspond perfectly with the Central Business District but they are close enough that for the purposes of this discussion, the two terms can be used interchangeably.) In many cases, those concerns are justified: throughout New England there are many examples of "strip development" on the outskirts of towns exacerbating the economic decline of downtowns.
In Bradford's case, the community cannot truly flourish unless both the Lower Plain and the downtown become vibrant and prosperous zones. In short, Bradford needs both its downtown and the lower plain to host profitable businesses that draw customers from within the community and from surrounding areas.

While we desire both the downtown and the Lower Plain to prosper, the two districts are best suited to host different types of businesses. Limited parking and small store sizes make the downtown less than ideally suited for large retail businesses. But its good sidewalks, good nighttime lighting, and the close proximity of the storefronts make Bradford's downtown ideally suited for cafes, coffee shops, art galleries, specialty shops, restaurants, and similar enterprises. Meanwhile, good parking and access to

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[2] Sprawl is a pattern of land use that is characterized by dispersed, automobile-dependent development outside of compact urban and village centers, along highways, and in the rural countryside. Sprawl is typically identified by excessive land consumption, lower densities of development in comparison with older centers of development, lack of transportation options, fragmented open space, wide gaps between development, a scattered appearance, lack of choice in housing types and prices, separation of uses into distinct areas, repetitive one story development, commercial buildings surrounded by large expanses of parking, and lack of public spaces and community centers.

Route 5 make the Lower Plain well suited to larger retail businesses (not, however, “big box” stores or formula retail businesses).

One of the biggest challenges Bradford faces is integrating the economic activities in the downtown and the lower plain so that they support and reinforce each other. Several lower plain businesses draw large numbers of customers from significant distances. Farm Way, Hannaford’s Valley Floors, and to a lesser extent, Oakes Brothers and the Tool Barn are examples. But at present, few of the customers who patronize these lower plain businesses come into the downtown.

Bradford needs to adopt a strategy that will draw the people who already come to the lower plain into the downtown. One such strategy might be encouraging Farm way’s owners to open a Farm Way outlet store in one of the currently vacant Main Street storefronts. If that were to happen, it is likely that a significant number of Farm Way’s customers would head into the downtown to see what additional bargains they might find at the outlet store, and in doing so they might stop for a meal at one of the downtown’s restaurants, or do some additional shopping at one of the downtown’s specialty shops. Another strategy could be for customers of lower plain business to receive a coupon with each purchase that would provide a free appetizer or beverage at a downtown eatery. Whether or not these specific ideas ever come to fruition, it is clear that businesses in Bradford’s downtown and the Lower Plain need to work together on cross promotional efforts.

General Goals

1. To guide industrial and commercial development in a way that will provide for appropriate economic activities on a scale that largely maintains the Town's existing settlement patterns.

2. To preserve open space and the rural character and present population distribution of the Town.

3. To protect agricultural and forestry land uses by promoting practices that are economically viable and that protect natural resources and wildlife habitat.

4. To provide orderly growth in the Downtown by planning for transportation, water, sewage, and public recreation facilities through public funding.

5. To preserve natural areas, unique habitats, and the quality of ground and surface waters.

6. To retain the essential rural character of the Bradford community while fostering its growth and economic vitality.

7. To protect the visual entrances into the downtown.

8. To enhance the walkability and bikeability of the more densely developed parts of town, by renovating, maintaining and expanding sidewalks, bike lanes, and other non-motorized methods of transportation.

D. Central Business District

At present, the land designated as Bradford’s Central Business District is dedicated to a moderate density mix of uses. Many commercial establishments, including retail, restaurants, and services exist in relative harmony with some residential uses. The size of the Central Business District is not large

when compared to other land use areas in Town, and most lots are already developed. However, there are options for future development.

As a hub of Bradford's community on both a cultural and economic level, maintaining a healthy central business area is important to the citizens of Bradford. Bradford's Downtown should invite and provide for community gatherings and interaction. The purpose of the Central Business District is to promote commerce in Bradford, while offering a mix of uses and concentrated density. The types of uses that are appropriate for this area are retail establishments, restaurants, professional offices, public buildings and high-density residences. Such uses should be developed at a scale, type, density, and character that maintain or enhance Bradford's historic Downtown as the prime central business area for the municipality.

Bradford's Central Business District is contained within Bradford's Designated Downtown. (Other parts of the Designated Downtown are in the Residential Service and the Village Residential Districts.) Every five years, Bradford's designated downtown status is reviewed by the Vermont Agency of Commerce and Community Development. If ACCD's review committee is not convinced a community is working to maintain and improve its downtown, the Agency may revoke a community's designated downtown status. Maintaining Bradford's Designated Downtown is essential, as it opens up more opportunities for grant funding for infrastructure improvements and makes tax credits available to property owners who improve their facades, and make improvements such as handicapped accessibility, and code compliance.

Goals – Central Business District

1. To provide a thriving and robust commercial and civic center that benefits all residents of Bradford and draws people from surrounding communities.

2. To encourage a mix of uses in the Central Business District

3. To maintain and enhance Bradford's Downtown as the pedestrian-friendly center of community life.

Policies – Central Business District

1. It is the policy of the Town to support creative and adaptive re-use of existing buildings within the Central Business District.

2. It is the policy of the Town to support and maintain Bradford's Designated Downtown, by actively supporting the MainStreet Alliance, and by dedicating resources to maintaining and improving infrastructure in the designated downtown.

3. It is the policy of the Town to encourage a maximum amount of commercial growth in the Central Business District, provided that it maintains or enhances the historic character of the Downtown and creates no undue burden on taxpayers with regard to public services.

4. It is the policy of the Town to encourage the development of street scaping, including the addition of green space, benches, lighting, sidewalks, and façade improvements.

5. It is the policy of the Town to retain the architectural aesthetics of the Central Business District.

6. It is the policy of the Town to retain a post office in the Central Business District.

7. It is the policy of the Town to encourage complementary infill development within the downtown.

8. It is the policy of the Town to encourage new businesses to locate where properties are already served by public water and sewer.

Recommendations – Central Business District

1. The Planning Commission should revise the lot coverage requirements of the Zoning Bylaws in the Central Business District to allow for greater density.

2. The Planning Commission should encourage development of second floor offices and other commercial activities to encourage second and third floor development provided such development creates no undue burden on emergency services or other municipal services.

3. The Town should investigate options for the creation of street scaping including green space, façade improvements, sidewalks, benches, and buried utility lines.

E. Lower Plain Commercial District

The Lower Plain commercial area is a large area located south of the designated Downtown which runs as far south along U.S. Route 5 as Wakefield Drive. Like the Central Business District, the Lower Plain Commercial District is vital to the economic vitality of Bradford. As such, it is important to encourage commercial development in this area. Existing uses are concentrated around the junction of Routes 5 and 25, South of that junction, land uses consist of residences, a working vegetable farm with a retail market, hardware store, car wash, tool rental and repair shop, mental health clinic and a church. Development north of the intersection is primarily commercial in nature, although zoning for the entire district does allow for all types of housing, including residential care facilities, treatment centers and the like. Because the land in this area is flat, has good access to Route 5, is served by both municipal water and sewer, and has well-drained soils, it is a desirable location for development.

Feedback from residents in the 2007 survey and forums indicate a general level of comfort with the present location of businesses in the Lower Plain. However, a number of comments highlight a concern with the nature of this development, and about the potential of extending that development beyond the junction of Routes 5 and 25. In addition to local concerns, inconsistencies exist between Bradford's land use areas and those of the Regional Plan. While conformance with the Regional Plan is not mandated by state statute, a number of State programs require conformance with the Regional Plan.

Although much of the land within the Lower Plain Commercial District is already developed, the land could be used more efficiently, particularly on properties behind those, which front directly on either Route 5 or 25. Planned commercial subdivisions and developments utilizing common access roads, and cluster site planning principles, are encouraged and should be given high priority. At present, 50% of the lot may be dedicated to the building footprint. Increasing the allowed building coverage and decreasing parking requirements would expand opportunities for infill development, although the potential for storm water disposal and parking area issues might arise with larger coverage areas.

Mixed uses should continue to be encouraged in this district. The scale of proposed development proposed must be considered carefully.

The purpose of the Lower Plain Commercial District is to provide space for concentrated commercial development that does not unnecessarily consume land. Although a mix of uses, this area is intended to be primarily commercial in nature. Land use activities planned for this area should be of a type, scale and design that complements rather than competes with the Downtown. No uses should impose a burden on the financial capacity of the town to accommodate the growth caused by the project.

Results of the 2007 survey very clearly showed that residents are not interested in large scale, or automobile-centered development anywhere in Bradford. Such large scale development as big box stores must be restricted. This could be achieved by setting a maximum square footage of no greater than a foot print of 36,000 square feet per commercial building. Additionally, formula businesses[3] should be discouraged because residents indicated they wished to develop commercial enterprises that complement the designated Downtown. Restricting this type of business has been successful using several methods, including a ban on drive-through facilities and/or prohibiting formula retail through zoning regulations.

One of the distinct disadvantages to encouraging formula business is that it creates a homogenous and unnatural landscape. The architecture used by nationwide chains does not generally represent the traditional architecture of the area in which it is built. Additionally, businesses of this nature are often set back from the road with large expanses of parking, which is not representative of the traditional pattern of development in Vermont. In order to ensure that new development reflects the desired character in a town, state statute has enabled the creation of "design control" districts.[4] These districts specifically regulate the siting, layout and design of new development and construction. According to the Vermont Land Use Implementation Manual (2006), "design regulations have been shown to have economic benefits – they allow for higher densities of development, increase property values and create attractive neighborhoods and communities that encourage new investment."

While the entire area is designated as being suitable for commercial development, some types of commercial development should be encouraged in certain areas, while other commercial activities should be encouraged in other parts of the Lower Plain Commercial Area. Specifically, businesses that are primarily retail in nature should be encouraged primarily to locate North of Route 25 around existing commercial development. This area is referred to as Lower Plain Commercial 1. The portion of the Lower Plain Commercial Area south of Route 25 (or south of existing retail development

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[3] Formula businesses include retail stores, restaurants, hotels and other establishments that are required by contract or other arrangement to adopt and maintain a standardized array of services, merchandize, methods of operation, uniforms, logos, standardized architecture and decor, or other features virtually identical to businesses located in other communities.

[4] Several communities have banned certain types of formula businesses. A design control ordinance would be one way to regulate formula business. These laws do not prevent a chain store from coming in, but they do require that the incoming chain look or operate in a way defined by the community rather than by the business formula. This may prove a deterrent to chains, which may refuse to veer from their standardized, cookie-cutter approach. When enacting a formula business ordinance, a community should articulate within the ordinance and its legislative history the public purposes the law will serve and specify how the restrictions will fulfill those purposes. This is key to crafting a sound ordinance. Bradford residents have expressed a clear desire to retain the rural nature of the town and to protect the historic character of the Downtown. Bradford seeks to maintain vibrant and diverse commercial districts, and the unregulated proliferation of formula businesses would frustrate this goal and lessen the commercial districts' appeal.

immediately adjacent to the southern side of Route 25) is best suited for professional offices and commercial enterprises that are not primarily retail in nature. This area is referred to as Lower Plain Commercial 2.

In the last several years, the water system has been greatly improved and the sewer has been extended. In particular the water and sewer infrastructure on Route 5 has been built to a very high standard. It should also be noted that the parcel commonly known as Bradford Square is in what is designated as Lower Plain Commercial 2 but has an Act 250 permit which allows for primary retail.

Goals – Lower Plain Commercial District

1. To encourage a mix of land uses which complement the vitality of Bradford's Downtown and employ residents within the Bradford area in well-paying jobs.

2. To protect and expand the economic engine that is the Lower Plain District, while incorporating scenic and natural resources.

3. To maintain and enhance traffic safety on Routes 5 and 25.

4. To facilitate non-motorized transportation.

5. To conduct careful site planning and administration of design standards for development.

6. To encourage the development of businesses that meet the needs of Bradford's population and contribute to Bradford's self-sufficiency.

Policies – Lower Plain Commercial District

1. It is the policy of the Town to encourage the development of businesses in the Lower Plain Commercial District that are compatible with and complimentary to those located in the Central Business District.

2. It is the policy of the Town to provide opportunities for concentrated growth within the Lower Plain Commercial district, without putting an undue financial burden on municipal services.

3. It is the policy of the Town to encourage cluster development whenever possible within the Lower Plain Commercial District.

4. It is the policy of the Town to encourage development of sustainable low-carbon commercial enterprises.

5. It is the policy of the Town to encourage primary retail establishments to locate north of Route 25, while allowing other types of commercial development to locate in all parts of the Lower Plain Area.

Recommendations – Lower Plain Commercial District

1. The Planning Commission should amend the Zoning Bylaws to prohibit new commercial buildings with a footprint in excess of 36,000 square feet in the Lower Plain Commercial Zoning District.

2. The Planning Commission should amend the uses within the Lower Plain Commercial District (and the Central Business District) to restrict formula businesses and other similar establishments.

3. The Planning Commission should implement design review within the Lower Plain Commercial District (and the Central Business District) in order to better define the desired aesthetics of commercial development in this area.

F. Residential Service District

The area presently designated as "residential service" is located just north of the Central Business District. It is a relatively small area designed to accommodate residential and small commercial establishments while maintaining the historic character of the district. Most structures within this area are older homes with classic architectural features.

The primary difference between the Residential Service area and the Village Residential district (see below) is the allowance of professional offices as a permitted use. Such uses are generally low impact and do not negatively affect surrounding residences. These uses should continue to be encouraged. In an effort to encourage continued mixed-use development within the Downtown and immediately adjacent areas, it would be logical to increase the size of this area to the north. The area north of Village, particularly near the elementary and high schools has the potential for greater development. Its proximity to the Central Business District makes it very walkable, which is of importance to the State and Two Rivers-Ottauquechee Regional Commission from a land use perspective.

The Planning Commission should increase the size of this district to include properties along Route 5, running northerly to Wrights Avenue. The Planning Commission should consider decreasing the minimum lot size to allow for more dense development. Lot coverage is currently 50%, which is likely to remain appropriate for this district.

The purpose of this area is to allow for additional service establishments to locate adjacent to the Downtown, while maintaining the present residential nature of the area. Businesses allowed in this area should be appropriate in an area that is primarily residential and should not negatively impact the historic character of the Residential Service District.

Goals – Residential Service District

1. To encourage an area of transition between the Central Business District and the Village Residential District while protecting the historic residential character of the Downtown.

Policies – Residential Service District

1. It is the policy of the Town to support the rehabilitation and reuse of historic residential structures for the purpose of small-scale mixed use.

2. It is the policy of the Town to encourage the establishment of green spaces, gathering places, and streetscaping.

3. It is the policy of the Town to promote safe pedestrian and non-motorized traffic within this area.

Recommendations – Residential Service District

1. The Planning Commission should consider expanding the size of the Residential Service District.

G. Village Residential District

This area is primarily residential in nature and represents the historic pattern of development, which grows around a downtown or village center. The uses allowed in this area are those, which are most likely to be compatible with residential development. Density of development within the Village Residential area is reasonable, with a minimum lot size of 10,000 square feet (approximately¼ acre) and maximum lot coverage of 50%. In the 2007 survey and forums, residents suggested that this area might be ripe for higher density. However, increasing density further than what is allowed at present should be done cautiously, with an eye toward maintaining the present character of the neighborhoods.

The purpose of this development area is to provide Bradford with a densely populated residential area with access to public sewer, water, and transportation connections that are available.

Goals – Village Residential District

1. To provide an area for densely populated residential development within walking distance of the Downtown.

Policies – Village Residential District

1. It is the policy of the Town to encourage new and concentrated residential development in areas adjacent to the Downtown, provided that they are served by municipal services.

2. It is the policy of the Town that development in this area should provide for uses that are of a scale, type, density, and character that maintain or enhance Bradford's Historic Downtown.

3. It is the policy of the Town that, as development increases in the residential area, pedestrian and bicycle access to the downtown should be provided.

Recommendations – Village Residential District

4. The town should do an inventory of the sidewalks and establish a schedule for repair and maintenance.

5. The town should repair the retaining wall along North Pleasant Street.

6. The Planning Commission should reduce the lot size in the zoning bylaws based on access to public water and sewer.

7. The Planning Commission should increase lot coverage in the zoning bylaws.

H. Residential District

The bulk of Bradford's land, is located within the Residential District. This area is made up almost exclusively of residential uses and it represents the classic "open countryside," outlined in state planning goals.

Although the pattern of development in the Residential District is mostly one and two family dwellings, the present Zoning Bylaws allow for a wide- range of uses, some of which are more appropriate for areas with greater density of development or immediate proximity to the Downtown. For example, larger more concentrated residential development like nursing care facilities or assisted living facilities should be encouraged to locate closer to the downtown. This concept was strongly supported by residents in the 2007 Town Plan Survey. When asked if the Town should encourage the creation of independent senior housing within close proximity to the Downtown, over 80% responded affirmatively. Likewise, public buildings should be encouraged to develop close to the Downtown because of the benefit they bring to commercial establishments.

Given that the classic pattern of development in Vermont is lower density outside of the traditional village centers, the Planning Commission should consider increasing the minimum lot size from 40,000 square feet (approximately one acre). If houses were actually built on every acre, Bradford would no longer be a rural town. Instead, it would appear similar to the types of suburbs found near cities like Burlington, Vermont. Such high density residential development will have a detrimental effect on rural character as well as a negative impact on wildlife, their habitats, and the corridors they use for migration. At the very least, areas with highly sensitive natural or scenic resources should be preserved from the Residential area in an effort to reserved wildlife corridors. Another possibility is that the Planning Commission could create multiple residential zones of differing density.

The purpose of the Residential Area is to provide locations for residential uses while maintaining Bradford's rural character. Uses allowed in this area that are not residential in nature should only be allowed if they create low-impact changes to the land. Additionally, all uses should preserve the agricultural, forestry and recreational assets that are present, and should not place an undue burden on the Town to provide municipal services. Uses that are public in nature, such as schools, post offices and town buildings should be discouraged from developing in the Residential District.

Goals – Residential District

1. To encourage residential growth in a pattern and density that reflects the traditional rural pattern of development.

2. To protect open space, agriculture and forestry.

3. It is the basic premise of this Town Plan that future land uses be sensitive to both the physical limitations of a site and to the overall rural character of the Town.

Policies – Residential District

1. It is the policy of the Town to ensure that residential uses be planned so as to concentrate development and maximize open space and provide privacy.

2. It is the policy of the Town to continue to encourage the establishment and operation of small entrepreneurial enterprises and home businesses because they are consistent with the general purpose of this district.

3. It is the policy of the town to ensure that any home business or rural small enterprise shall be sited on a large enough lot, and that the project shall be adequately screened to prevent significant odor, visual, or audible effects from extending past the property boundary. Any use shall comply with state pollution and land use laws. These enterprises should not cause an undue burden on the ability of the Town to provide services such as highways and fire protection.

Recommendations – Residential District

1. In an effort to protect open space and the working landscape in Bradford, the Planning Commission should consider increasing the minimum lot size in the Residential District and creating areas of varying density.

2. The Planning Commission should consider increasing frontage requirements in this district.

3. The Planning Commission should consider adopting subdivision regulations.

l. Industrial District

Bradford has three areas designated as Industrial as of 2008, the Lower Plain Industrial Park, Mill Street in an area around the Bradford Veneer and Panel Company, and sections of Depot Street. When surveyed, residents appeared to be very comfortable with the existing locations of industry.

The purpose of this district is to provide for employment opportunities in manufacturing, warehousing, research and development, and related uses. Commercial uses could also be appropriate for this area provided that auto, pedestrian and bicycle safety are maintained. Residential uses should be discouraged. The town supports efforts to promote industrial development in this area where they provide ongoing employment of its citizens.

The Town of Bradford regards large scale industrial structures that exceed 125 feet in height as inappropriate and inconsistent with the town's vision and goals.

Goals – Industrial District

1. To allow for the growth of industrial development in a fashion that is in harmony with the surrounding area.

2. To protect natural resources, including wildlife, wetlands and groundwater, from environmental hazards.

Policies – Industrial Area

1. It is the policy of the Town to encourage industrial development in appropriate locations provided that such development does not pose an environmental issue or health hazard to the community or put an undue burden on municipal services.

2. It is the policy of the Town that the density, scale and design of development in this area should reflect the existing settlement patterns, land capability and the availability of utilities for expansion.

3. It is the policy of the Town to encourage rehabilitation and renovation of structures and buildings of historic merit.

Recommendation – Industrial District

1. The Planning Commission should consider allowing appropriate commercial uses within the Industrial District particularly the parcels in the Lower Plain Industrial Park.

2. The Planning Commission should evaluate current site plan requirements within the industrial area to ensure that auto, pedestrian and bicycle safety are appropriately managed.

J. Flood Hazard District

This district contains lands that are subject to inundation hazard during a 100-year flood, a flooding event having a one-percent chance of happening or being exceeded in any given year. Development in this district should not increase flooding. Only uses not requiring structures, (such as agriculture, forestry, and recreation), should be permitted in order to minimize losses of public and private property and retain residential eligibility for flood insurance.

Goals

1. To preserve the natural flood mitigating effects of the flood hazard area.

Policies

1. It is the policy of the Town to discourage any new development within the limits of the 100-year floodplain.

2. It is the policy of the Town to allow improvements to existing structures in the floodplain, provided such improvements are planned to ensure against public endangerment and unnecessary loss of property.

3. It is the policy of the Town to limit uses within the flood plain to those that do not require structures such as agriculture, forestry and recreation. . It is the policy of the Town to continue to participate in the National Flood Insurance Program through the administration of the Bradford Flood Hazard Ordinance.

Recommendations

1. The Planning Commission should work together with the Two Rivers-Ottauquechee Regional Commission to draft updated Flood Hazard Regulations that are compliant with FEMA standards and reflect the latest understanding of flood risks.

K. Low-Density Residential District

It is a purpose of this plan to encourage the protection of open space, including agricultural and forested lands. High-density residential development can have negative effects on the rural character of a town and on its wildlife and open space. Dense development in extremely rural areas can greatly increase the cost of municipal services as steep slopes and long distances can make road maintenance expensive. Steep slopes have the potential to make emergency response difficult if not impossible. The Low-Density Residential District is located in two areas, one around Wright's Mountain and the other north of Narrow Hill between Kenyon Rd. and Hackett Hill Rd.

The purpose of the Low-Density Residential District is to require that residential uses at a lower density than that allowed in other districts. Uses allowed should be primarily residential, recreational, agricultural, or silvicultural in nature. Because of the distance from Town, and the steep nature of the terrain in this area, commercial uses should be prohibited. Some parcels within the Low-Density Residential District might be appropriate for conservation.

Goals – Low-Density Residential District

1. To allow for residential development while protecting important natural and scenic resources, including (but not limited to) topography and wildlife habitat.

Policies

1. It is the policy of the Town to encourage development that is built in such a manner as to avoid fragmentation of large forest tracts to maintain habitats between two or more land developments or subdivisions.

2. As it is the policy of the Town to promote lower density in the Low-Density Residential District, the minimum lot size within this area should be 10-acres.

3. It is the policy of the Town to protect all open and active deer wintering areas and wetlands.

4. It is the policy of the Town to encourage sustainable forest management practices.

Recommendations

1. The Planning Commission should consider adoption of subdivision regulations to allow for prudent placement of structures and roads in the Low-Density Residential District.

XII. Relationship to Other Plans

Bradford is bounded by the Vermont towns of Corinth, West Fairlee, Fairlee, and Newbury, and by Piermont, New Hampshire to the east of the Connecticut River. All of the Vermont towns have planning programs and planning commissions. Corinth, West Fairlee, Fairlee and Newbury currently have town plans in effect: Corinth (2007), West Fairlee (2005), Fairlee (2014) and Newbury (2005).

These towns have land use regulations as follows:

- Corinth has subdivision regulations. These regulations were revised in 2002.

- Fairlee has zoning and subdivision regulations. Their zoning regulations were last updated in 2003 and their subdivision regulations were amended in 1992.

- West Fairlee does not have any land use regulations.

- Newbury has both zoning and subdivision regulations. The Newbury zoning ordinance was revised in 2007 and their subdivision regulations were last adopted in 1996.

Bradford shares numerous activities and services with surrounding towns, including school services, ambulance service and fire protection. The Town is also a member of the Two Rivers-Ottauquechee Regional Commission (TRORC).

TRORC's regional plan covers 30 towns including Bradford. Since the preparation of the Bradford Town Plan was done with the assistance of the Regional Commission, no conflicts between the two have arisen. In fact, the two plans have similar policy statements regarding the need for development that does not overburden services. In addition, no specific development goals in this Plan conflict with any regional goals.

The neighboring plans have been read in the context of the proposed Bradford Town Plan. Once again, no conflicts exist in either general philosophy or specific development proposals along town borders.

Recommendations:

1. To encourage continued communication and cooperation between Bradford and its neighboring towns.

2. To continue participation in the Two Rivers-Ottauquechee Regional Commission provided TRORC continues to serve the needs of the Town of Bradford.

3. To exchange planning information and development data with neighboring communities.

XIII. Implementation

A. Putting the Plan Into Action

The character of Bradford, its people and landscape have been created over the years through the individual and collective decisions of its citizens and public officials. The efficiency, attractiveness, and well-being of the community is determined, in part, by the ability of the Town to plan for its needs and to find a mechanism to put planning goals into action.

Previous elements of this Plan have been centered on existing conditions, probable trends and policy development which, when combined, represent a vision for the kind of town Bradford desires for the future. One thing is certain: the community will change. Citizens and town officials together can direct this change, consistent with their desires, using a variety of mechanisms.

The following sections describe the tools and techniques that could be used to implement the Bradford Town Plan.

A. Adoption of the Plan

Adoption of the Bradford Town Plan by the Selectboard, in accordance with the procedures outlined in the Vermont Planning and Development Act [24 V.S.A., Chapter 117], is the first step in putting this Plan into action. Through its adoption, the Town accepts the principles and policies as set forth in this Plan as in the public interest and as a guide for the future growth and development decisions affecting Bradford.

B. Ongoing Planning

Planning for change is a continual process for Bradford and will require the involvement of the Planning Commission and the public to ensure that the goals and policies of the Plan are integrated into the decisions affecting land use, taxation, and public investments in Bradford.

The quality of a Town Plan is reflected in the amount of public involvement in its creation. Regular community meetings, held by the Planning Commission, that discuss important issues relevant to the Town plan will ensure that the document truly reflects the vision of the residents of Bradford.

The Bradford Town Plan is a dynamic document reflecting the community's visions and values. By statute [24 V.S.A., Section 4387] the plan must be revisited at least every five years to be kept relevant. The Planning Commission is responsible for the maintenance and amendment of the plan. Within the next five years following adoption of the plan, the Planning Commission will need to evaluate the plan in light of new conditions and needs. Adoption of an updated plan will require notice to the townspeople and action by the Selectboard.

At any time following adoption of the plan, the Selectboard may request the Regional Commission to approve the Plan or amendments to a plan. Before approving a plan, the Regional Commission shall find that the plan meets four basic tests [24 V.S.A., Section 4350(b)].

Approval of the plan provides an improved legal standing for Bradford to influence and integrate its planning policies with State agency planning affecting land use.

C. Implementation Tools

Vermont law enables Bradford to implement the adopted Bradford Town Plan through a variety of ways. Regulation of land use and development through rules adopted by the voters is one possible method. Because these regulations are susceptible to legal challenge and must clearly benefit the public, discretion must be used. Well recognized and utilized means include, but are not limited to, zoning bylaws and subdivision regulations.

Much of the work required for implementing the Plan will be the responsibility of the Planning Commission. Throughout this document there are recommendations that the Planning Commission take action or at least investigate the potential impacts of action. However, other boards, such as the Conservation Commission, Selectboard and Water and Sewer Commission may also have a role to play in the implementation of this plan. The following text outlines the tools that should be used to implement the recommendations of this plan.

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

- Uses of land (including density of use)
- The placement of buildings on lots,
- The relationship of buildings to open space, and
- The provision of parking, landscaping and open space.

The Town of Bradford has had zoning regulations for many years. However, changes in the patterns of land use, the economy and demographics all influence the way land use regulations should be implemented. What may have been appropriate 20 years ago may no longer be the best choice for Bradford's citizens. In several sections of this Town Plan, there are recommendations for the Planning Commission to implement changes or additions to the zoning that would allow for the creation of new zoning areas, the protection of natural resources and adjustments in density, lot coverage and size of existing zoning districts.

State statute requires that zoning regulations be in "conformance" [24 V.S.A. §4411(a)] with the plan. Therefore, the Planning Commission should be diligent in its efforts to revise the Zoning Bylaws to meet the goals, policies and recommendations of this Town Plan.

Subdivision Regulations - Bradford does not currently have subdivision regulations. These regulations, if adopted, would be administered by the Planning Commission. Such regulations govern the division of parcels of land and the creation of roads and other public improvements. Recommendations in this Town Plan call for the creation of subdivision regulations to ensure that land development reflects land capability and that critical open spaces and resources are protected from poor design or layout. Subdivision regulations would be developed by the Planning Commission.

Flood Hazard Bylaws - Under Vermont law [24 V.S.A., §4411], the Town of Bradford regulates the use of land in a defined flood hazard area adjacent to streams and ponds. Flood Hazard Bylaws can be established to ensure that design and construction activities within the limits of the 100 Year Flood Plain are designed so as to minimize potential for flood damage and to maintain use of agricultural land in flood-prone areas. As noted in the Natural Resources section of this Plan, property owners are eligible for federal flood insurance on buildings and structures at relatively low federally subsidized premium rates. However, such insurance cannot be obtained for properties in Bradford unless the Town has in effect a Flood Hazard Bylaw.

Capital Budget – A capital budget and program is a financing approach that benefits the Town greatly in the selection, prioritization and costing of capital projects. Bradford does not currently have a Capital Budget and Program. Under the capital budget, a project is selected (e.g. bridge refurbishment), a funding source determined (e.g. general taxes, and general obligation bonds) and a priority year given for each activity (e.g. construction in 2009). When used in conjunction with the Town Plan and local bylaws, it can be a powerful mechanism for limiting the rate of growth in accordance with the fiscal capacity of taxpayers and other funding sources.

In addition, it is noted that under Vermont's Act 250 law, in granting a Land Use Permit for a major development or subdivision, the District Environmental Commission must first find that the project is in conformance with the town's capital budget. [See 10 V.S.A. Section 6086(a)(10).] Accordingly, this mechanism gives the town an indirect method of implementing its policies and priorities as set forth in the Town Plan.

While both Bradford and the school district have an informal system of capital programming, it is recommended that a Capital Budget Committee be established to work with the Selectboard and School officials to develop a list of capital needs and expenditures, and to formally present a Capital Budget and Program for adoption.

Act 250 - Since 1970, Vermont has had in place a statewide review system for major developments and subdivisions of land. Exactly what constitutes a "development" or "subdivision" is subject to a rather large and involved set of definitions. However, generally, commercial and industrial projects on more than one acre of land; construction of 10 or more units of housing; subdivision of land into 6 or more lots; construction of a telecommunication tower over 20 feet in height; and development over 2,500 feet in elevation are subject to Act 250 review.

Prior to these activities being commenced, a permit must first be granted by the District Environmental Commission. In determining whether to grant a permit, the Commission must evaluate the project in relation to 10 specific review criteria.

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

Coordination of Private Actions - Citizens and private enterprise have a vested interest in the well being of Bradford. The actions of the private sector, such as the construction of homes and businesses, land conservation, and the use of land for recreation and agriculture, should relate positively to the goals and policies as set forth in this Plan.

It is in the interest of Bradford, through the Planning Commission and Selectboard, to develop a cooperative relationship with private investment activities that may have a significant impact on the community values and policies set forth in the Plan. By working together in a cooperative venture early in the process of planning for a project, an adversarial relationship can be avoided. Contacts that should be maintained include at least the following:

- Green Mountain Economic Development Corporation
- Vermont Land Trust and Upper Valley Land Trust
- Twin State Housing Trust
- Owners of significant properties of high resource or development value, and
- Major employers in Bradford.

Conservation Activities - Conservation programs are an effective means of securing protection of valuable farm and forestland or significant natural resources. Techniques available involve voluntary direct work among non-profit conservation organizations and affected landowners such as donation of conservation easements, bargain sales of land, and limited development schemes.

The land trust movement has grown immensely during the past twenty years, particularly in Vermont. Land trusts offer viable means of bringing together the needs of property owners with the community interests. The Vermont Land Trust, Upper Valley Land Trust and the Nature Conservancy are particularly well-recognized organizations. Several organizations are also involved in water quality protection. It is the intent of this Town Plan to implement its conservation policies through coordination and the involvement of these organizations and others similarly dedicated to public purposes.

Bradford has an active Conservation Commission that administers the Town's Conservation Fund. Continued investment in this fund by taxpayers will allow the Town to ensure that land will be conserved into the future.

Appendix A: Glossary

Accessory Unit: Outbuilding or other structure subordinate to the primary use or structure on the lot; examples would include storage buildings, garages, sheds, tanks, towers, or small living unit.

Adverse Impact: Inadequate, unsafe, or unhealthy conditions that result from a Land Development

Bylaws: Municipal regulations applicable to land development adopted under the authority of Chapter 117 (including Zoning, Subdivision Regulations, Flood hazard bylaws, Official Map). See 24 VSA 4303 (4).

Building: A structure with a roof supported by columns or walls used to shelter persons or property.

Character of the neighborhood: Qualities that make a neighborhood distinct relative to factors such as architectural styles, structures, look, physical components, street designs, etc.

Cluster Development: Land Development that concentrates Land Uses on lots that sometimes have been reduced in size below the minimum size required by Zoning, to allow the remaining land on a site to be used for recreation, common open space, or the preservation of environmentally sensitive features.

Compatibility: The characteristic when multiple land uses may be located next to or near one another without causing significant adverse impacts on one another.

Density: The number of dwelling units or units of nonresidential use that are authorized or planned for a unit of land area.

Design Standard: A minimum or maximum standard prescribed by a bylaw that governs a physical characteristic of a Land Development, Building or Structure (such as its size or shape).

Development Review Board (DRB): Development Review Boards are quasi-judicial, citizen volunteer bodies created under Vermont Statute 24 VSA Chapter 117, that are the municipal body intended to interpret and uphold zoning ordinances of their municipality.

Economic Development: The sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area.

Flood Hazard Area: The land subject to flooding from the Base Flood. See 24 VSA 4303 (8).

Fragmentation: Dividing areas used by wild-life for habitat with land uses or development into areas that are too small or lack all of the needed features to continue to serve as habitat for specific species.

Hazard Area: Land subject to landslides, soil erosion, earthquakes, water supply contamination, or other natural or human-made hazards as identified within a local mitigation plan in conformance with and approved pursuant to the provisions of 44 C.F.R. 201.6 See 24 VSA 4303 (8)(C).

Impact: A consequence of an effect generated by a Land Use. An impact is most often considered to be significant when it is experienced off of the Lot of the Land Use that generated the effect.

Infrastructure: Facilities (such as streets and utilities) that are necessary for the use and development of land. The term sometimes refers only to public facilities.

Land Use: The purpose for which land or the structures on the land are being utilized (e.g., commercial, residential, or retail). Also used as a description of activities found throughout an urban area.

Mixed Use: Development of land, a building, or a structure with a variety of complementary and integrated land uses. See 10 VSA 6001 (28).

Municipal Services: Bradford municipal water, sewer, street lighting, policing, snow clearance, transfer station and Town offices.

Natural Area: An area of land or water that is not dominated by man-made features, containing significant flora, fauna, geological features.

Neighborhood: An area that shares a common function and/or character. It may refer specifically to (1) an area whose residents regard it to be a separate community or (2) a collection of residential, commercial, and institutional land uses that form a basic unit of community planning.

Parcel: An area of land containing one or more lots under common ownership or control.

Permitted Use: A residential Land Use that does not require action by an appropriate municipal panel before a Zoning Permit is issued or commercial land use only subject to site plan review.

Planned Unit Development (PUD): One or more lots, tracts, or parcels of land to be developed as a single entity, the plan for which may propose any authorized combination of density or intensity transfers or increases, as well as the mixing of land uses. The plan, as authorized, may deviate from bylaw requirements that are otherwise applicable to the area in which it is located with respect to lot size, bulk, or type of dwelling or building, use, density, intensity, lot coverage, parking, required common open space, or other standards. See 24 VSA 4303 (19) and 24 VSA 4417.

Policy: Any goal, objective, strategy, or action that is recommended in a Comprehensive Plan or a Special Plan as a guide for subsequent decision making.

Primary Retail: A business whose primary purpose is the sale of goods. (Examples would include but would not be limited to a grocery store, a pharmacy, a flower shop, etc.)

Residential Development: One or more homes or structures intended to be used as a residence or residences along with accompanying accessory structures such as garages, sheds, storage buildings, etc.

Scale: The size and proportion of a Building, Structure, or Land Development in comparison with nearby development.

Site Plan: A plat that depicts the general layout of a proposed Land Development.

Site Plan Review: The process by which the Planning Commission (or a to be formed Design Review Board) reviews the Site Plan for a proposed development to ensure that the development will conform to applicable regulations. See 24 VSA 4416.

Sprawl: A scattered, untimely, and poorly planned development. It is an inefficient planning practice, which is usually Auto dependent and consumes land necessary for agricultural or natural resource protection. "Sprawl" typically manifests in the form of: "Leapfrog" development, "strip-malls" or "Ribbon" development, and large-lot single family units, strip development commercial land development so each individual establishment has direct access to road and parking areas.

Streetscape: The visual elements of a street, including the road, adjoining buildings, street furniture, trees and open spaces, etc., that combine to form the street's character

Subdivision Regulation: A municipal bylaw that may (1) regulate the procedures and requirements for the submission and processing of plats, and (2) establish standards for the design and layout of streets, curbs, gutters, street lights, fire hydrants, shade trees, water, sewage and drainage facilities, public utilities and other necessary public improvements. See 24 VSA 4418 and 4463.

Watershed: An area of land that drains water, sediment, and dissolved material to a common outlet at some point along a stream channel.

Wetland: A wetland is an area of the state that is inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. See 24 VSA 4303 (32).

Zoning: A type of land use regulation governing the location, tyupe, and density of development within a community through the delineation of one or more zones or zoning districts, as depicted on a zoning map. Local zoning regulations must conform to the municipal plan, oincluding the plan's land use goals and recommendations, and proposed land use map.

Zoning Administrator (ZA): Local administrator in charge of enforcing municipal zoning regulations. The ZA also is responsible for providing information to the public, reviewing plans and documentation for compliance, and assisting applicants with their requests for variances.