

Bradford Town Plan

Adopted September 10, 2009

Prepared by the Bradford Planning
Commission

With assistance from the
Two Rivers Ottauquechee Regional Commission
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I. 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 2006 population numbered 2,714 compared to a population of 2,619 in 2000, resulting in a growth rate of only 3.6% over the seven year period. This rate of growth was significantly lower than the 8% rate of growth achieved by the State of Vermont, Orange County and the Two Rivers–Ottauquechee Region.

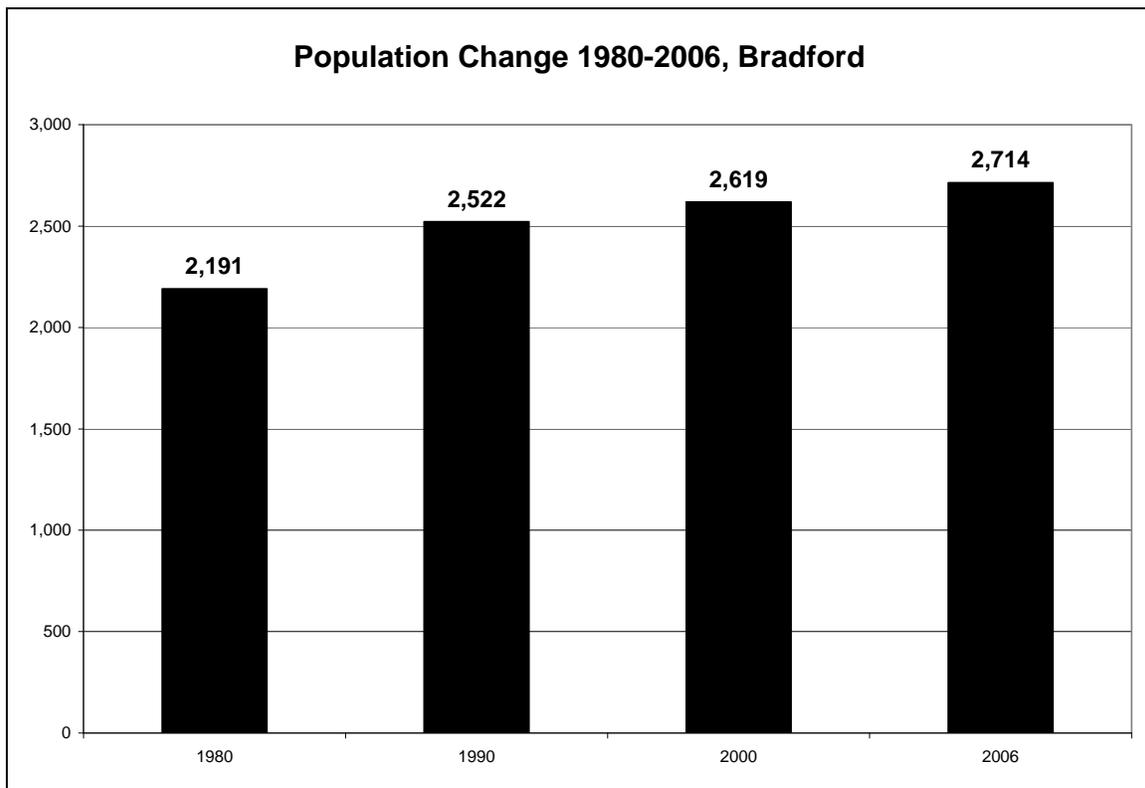


Figure I - Source: Center for Rural Studies, 2000 U.S. Census
Note: Combined population figures for Bradford Town and Bradford Village

During the decade between 1980-1990 most towns in Vermont experienced an increase in population. Since 1990 increases have slowed in many towns including Bradford. In the past decade Bradford's population growth has slowed dramatically, with only Newbury, which actually lost some of its population between the years of 1990-2000, having a

lower growth rate. Bradford is nearly 5% behind the twenty-year growth patterns in Orange County (24%) generally.

Percent Population Change 1980-2000 Bradford and Surrounding Area					
	1980	% change	1990	% change	2000
BRADFORD	2,191	15.1%	2,522	+3.8%	2,619
NEWBURY	1,699	+16.8%	1,985	-1%	1,965
FAIRLEE	770	+14.6%	883	+9.5%	967
W. FAIRLEE	427	+48%	633	+14.7%	726
CORINTH	904	+37.6%	1,244	+17.4	1,461
THETFORD	2,188	+11.4%	2,438	+7.3%	2,617
NORWICH	2,398	+30%	3,093	+14.5	3,544
O. COUNTY	22,739	+15%	26,149	+8%	28,226

Figure 2 - Source: Center for Rural Studies, 2000 U.S. Census

In recent years, much of Vermont has experienced an increase in people from out of state buying residences in the more rural areas of the state. However, Bradford does not appear to be attracting these families and individuals as much as other towns in the area. Bradford’s distance from the Upper Valley’s major centers of employment like Hanover, White River Junction and Lebanon also affects home purchases.

Population Projections, Bradford, VT				
2000	2005	2010	2015	2020
2619	2656	2699	2742	2786

Figure 3 - Source: Vermont Department On Aging, 2003

According to the Vermont Department on Aging’s population projections, which were conducted in 2003, Bradford is actually slightly ahead of estimates. When the 2005 population was estimated some years ago, it was expected that the population would be 2,656. The actual population in 2006 was 2,714, approximately 1% higher than the previous estimate. Projections continue to suggest a slow rate of growth in the future.

When responding to the 2007 Town Plan Survey residents made it clear that they want to live in a thriving community. There is little doubt that towns need a steady but manageable influx of new residents to create an economy and an atmosphere that will flourish. As such, efforts may need to be made to encourage new residents to move to town.

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.

However, as is the case with much of Vermont, the population in Bradford aged 25-44 has 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). For example, when the Bradford Veneer and Panel Company closed in early 2000, 125 jobs were lost. 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 adults either are not able or are not choosing to return to Bradford to work after they attend college. Lack of work opportunities, and high land and housing costs often prevent young people from returning. According to the UVM Center for Rural Studies, the median cost of single-family houses sold in Bradford during 2006 was \$146,500, less than the Orange County median of \$165,000. However, as of the writing of this plan in 2007, the same statistics reflect the inconsistency of housing sales year-to-year. In 2007, the median cost of homes sold (35 sold) in Bradford was \$182,000, which is substantially higher than the county median of \$171,250. Young professionals 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 1990 and 2000 population increases have occurred primarily in the 45-54-year-old range, which reflects the ongoing effect of the baby boomer generation. Overall for Vermont, the number of residents 25-44 years of age dropped 5% as baby boomers continued to move into their late 40s to 50s.

The comparison between the 1990 and 2000 census information also indicates that many of Bradford's new residents are between the ages of 45-54. The increase of population at this age group may in part explain declining enrollment in the Bradford school system as families in their late 40s to mid 50s often have children who are in high school or college.

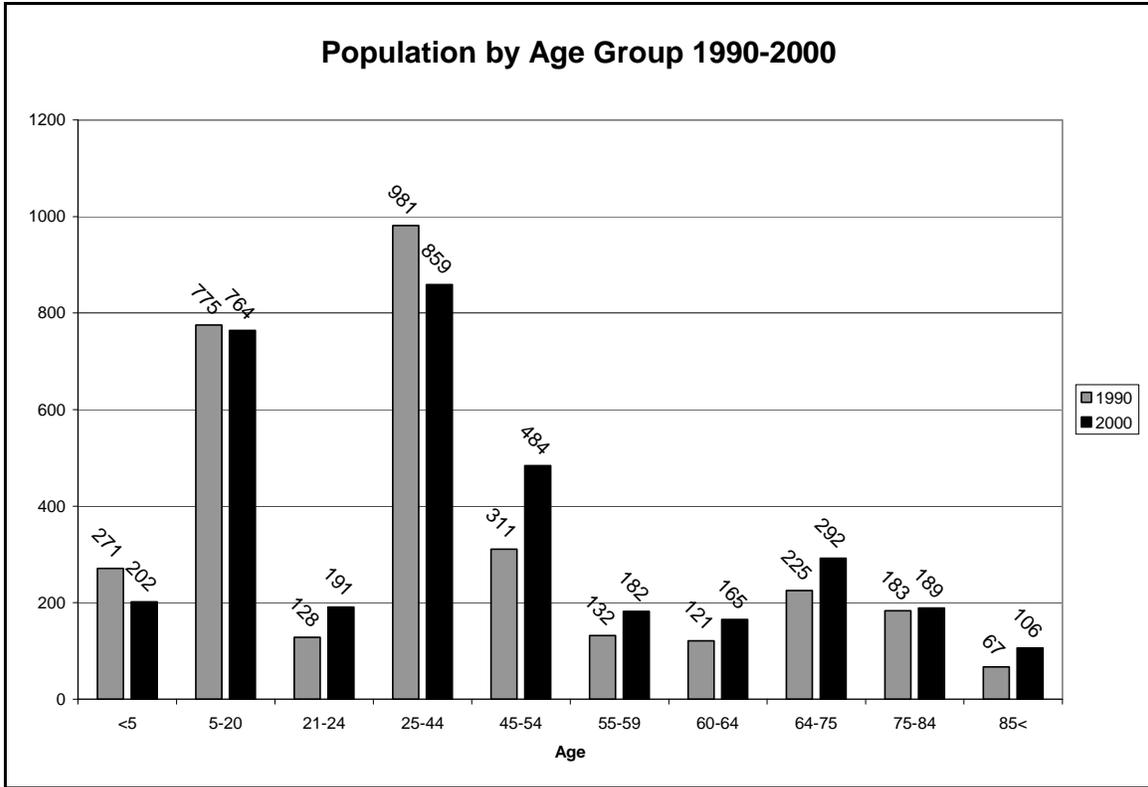


Figure 4 - Source: 1990 & 2000 U.S. Census

Bradford also has an aging population. In 2000, 14.8% of Bradford residents were over 65 years of age, which was higher than both Orange County and Vermont at 12.4%. An aging population will need services that are not readily available in a town like Bradford. The need for elderly housing will increase.

C. Relative Income of Population

2005 Income Data, Bradford and Surrounding Area				
Town	Returns Filed	Adjusted Gross Income	Average Gross Income	Median Adjusted Income Per Family
NORWICH	1,816	\$203,679,342	\$112,158	\$105,562
THETFORD	1,433	\$76,957,580	\$53,704	\$61,845
FAIRLEE	586	\$26,453,044	\$45,142	\$54,466
NEWBURY	806	\$31,403,918	\$38,963	\$46,447
BRADFORD	1354	\$54,763,548	\$40,446	\$45,479
W. FAIRLEE	257	\$11,657,894	\$45,361	\$44,654
VERSHIRE	354	\$13,885,724	\$39,225	\$42,462
RYEGATE	594	\$21,333,652	\$35,915	\$40,748
TOPSHAM	544	\$18,902,430	\$34,747	\$40,438
CORINTH	656	\$25,394,034	\$38,710	\$40,121
O. COUNTY	14,128	\$593,653,243	\$42,020	\$48,056

Figure 5 - Source: Vermont Department of Taxes, 2005

The Vermont Department of Taxes annually publishes *Vermont Tax Statistics*, which includes a summary of personal income tax returns filed with the State. In 2005, 1,354 personal income tax returns were filed by Bradford residents. Twenty-five hundred and eleven (2,511) exemptions were claimed. Total adjusted gross personal income reported for Bradford residents was \$54,763,548. Based on the information in Figure 5, Bradford's average gross income is lower than four of its neighbors: Norwich, Thetford, Vershire, Fairlee and West Fairlee. Bradford's numbers are also lower than the average of Orange County as a whole.

For 2005, 47% of the total personal income generated in Bradford was by filers earning \$30,000 or more while 52.6% were earning less than \$30,000.

II. Economic Base

A. Employment and Jobs

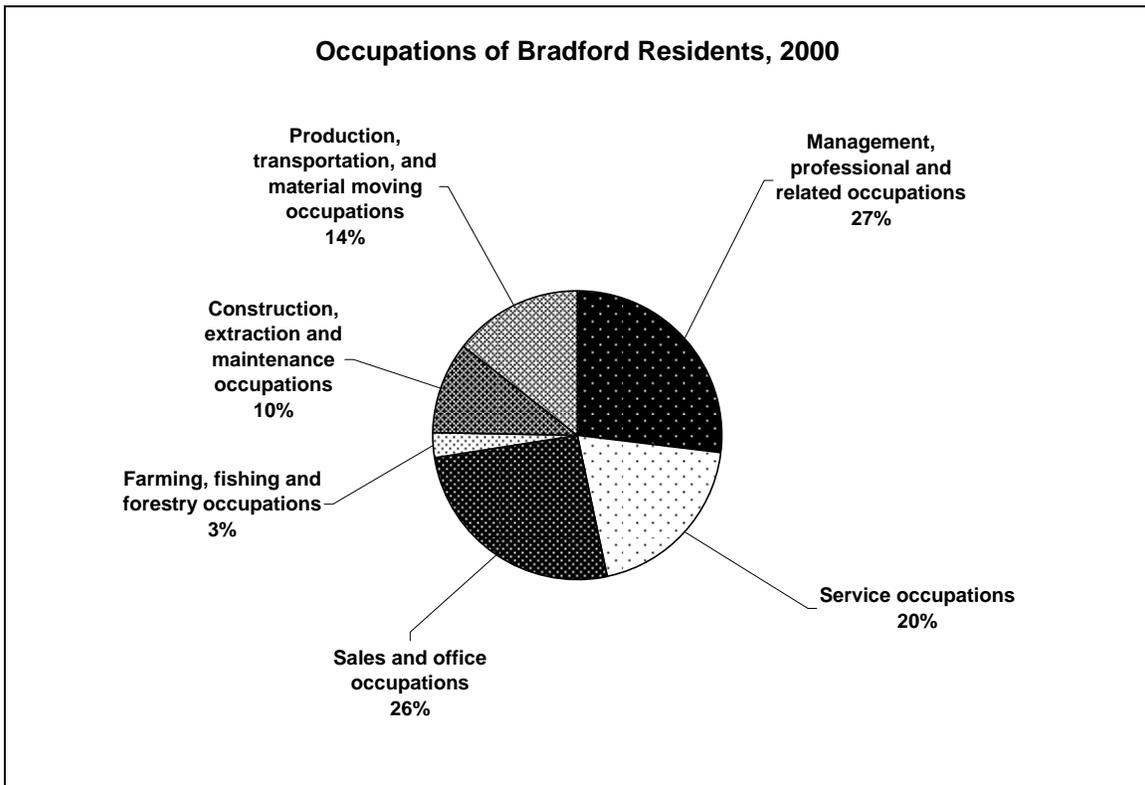


Figure 6 - Source: 2000 U.S. Census

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. Ninety-five percent (1,585) of Bradford's resident work force 16 years and older reported their occupations as part of the 2000 Census. At

the time of the 2000 census, 2.7% of the population 16 and over indicated that they were unemployed. As of December 2007, that number increased to 3.8%.

The pie chart above indicates that over half the population of Bradford is employed evenly across management, sales and service occupations. Based on the “journey to work” data provided by the last census, at least 40 percent of Bradford residents work in Bradford.

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, only 3% of the population is involved with farming, fishing or forestry (this figure does not include non-resident workers). This follows a statewide trend of declines in the farming industry.

B. Historic Wages of Population

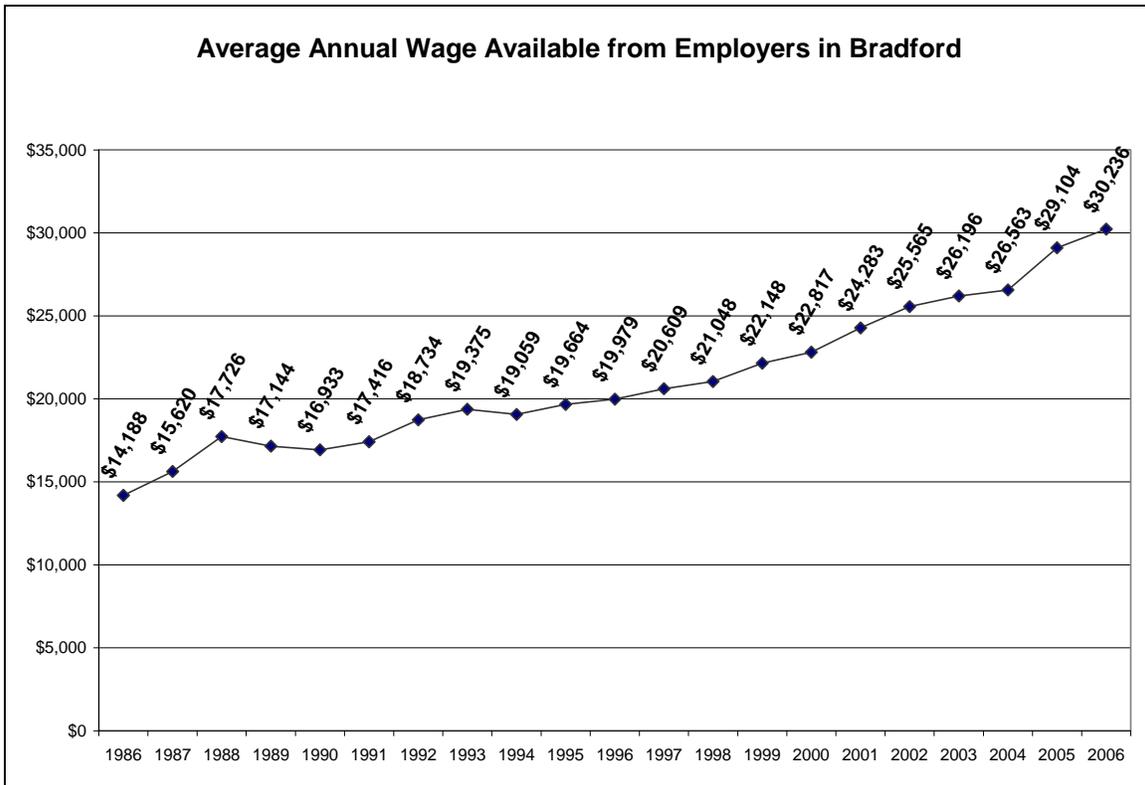


Figure 7 - Source: 2000 U.S. Census

The average yearly wage offered by employers in Bradford in 2006 was \$30,236, which was less than the statewide average of \$35,535, but greater than the Orange County average of \$29,781.

C. Taxes

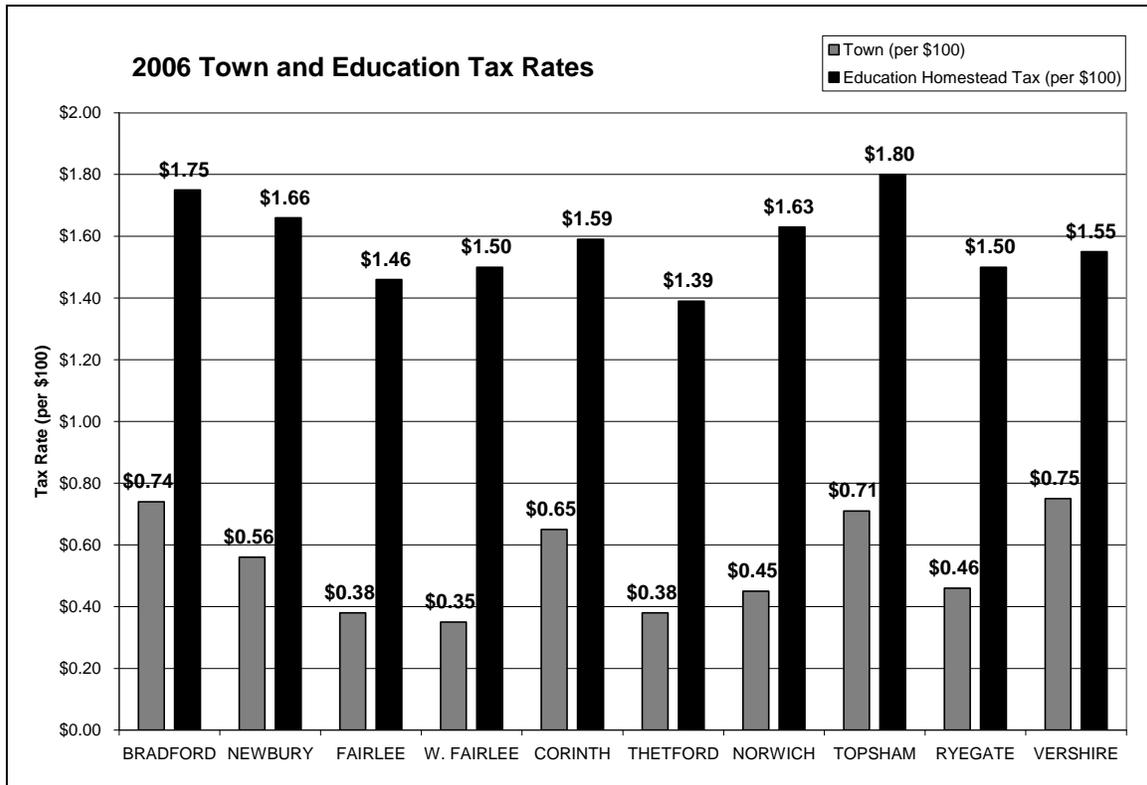


Figure 8 - Source: Vermont Department of Taxes, 2006

Many of the handwritten comments that were received as part of the 2007 Town Plan Survey 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 2006 data from the Vermont Department of Taxes in Figure 8, it is clear that these concerns are well founded. High property taxes as well as rising property values 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.

III. Housing

A. Introduction

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 affect the rural character of the Town.

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

B. Number of Housing Units

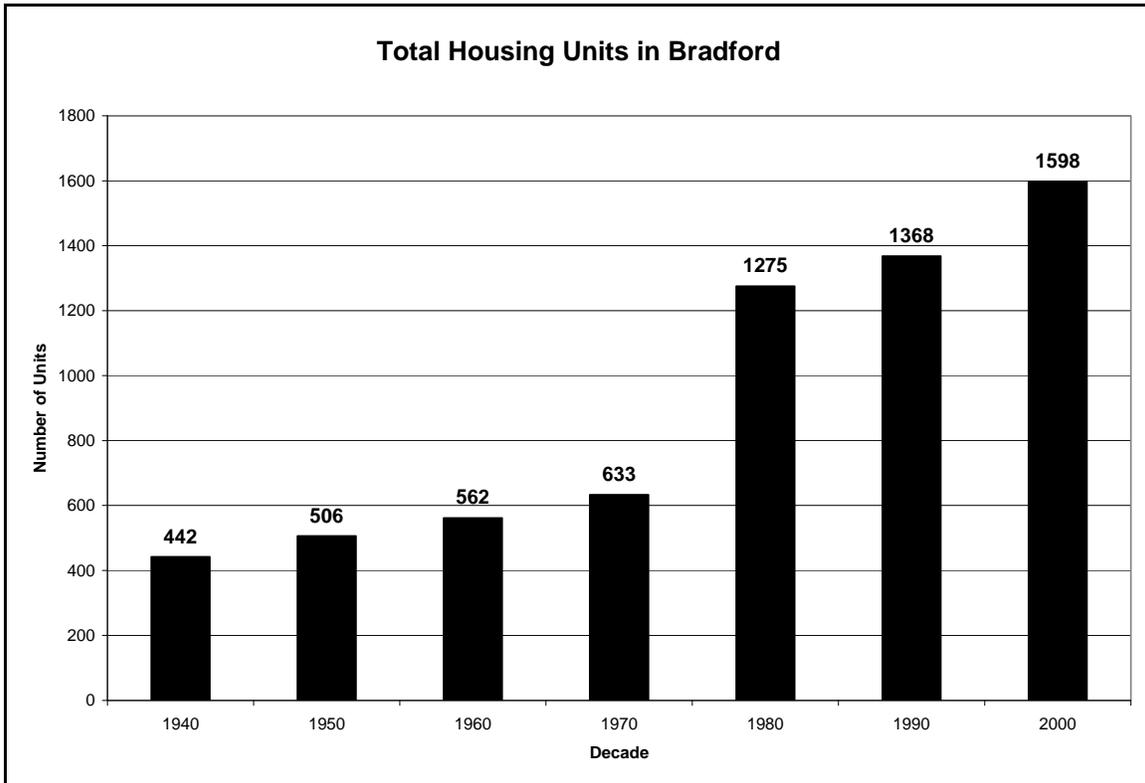


Figure 9 - Source: Vermont Housing Data

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. However, between 1980 and 1990 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 last decade though, the number of new homes jumped by 16.8%, more than doubling the 8% totals for Orange County. 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.

C. Types of Housing

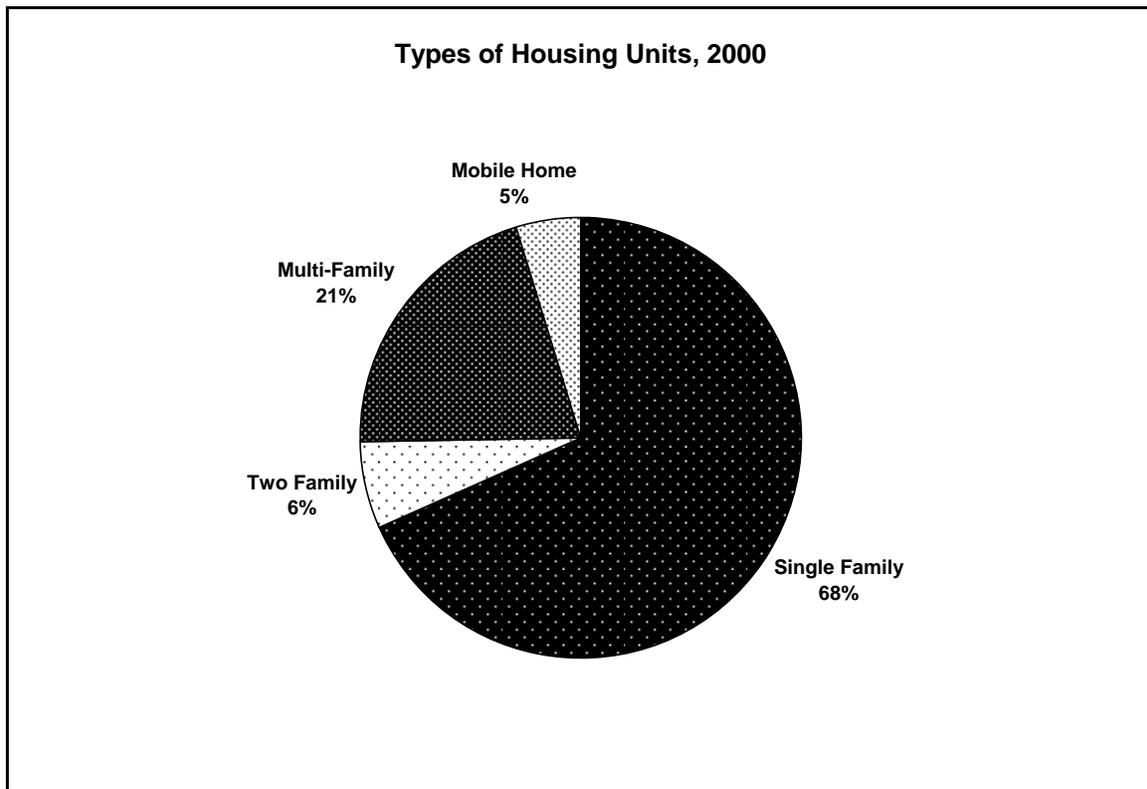


Figure 10 - Source: 2000 U.S. Census

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-homes being a distant second.

As indicated by Figure 11, 62% 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.

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.

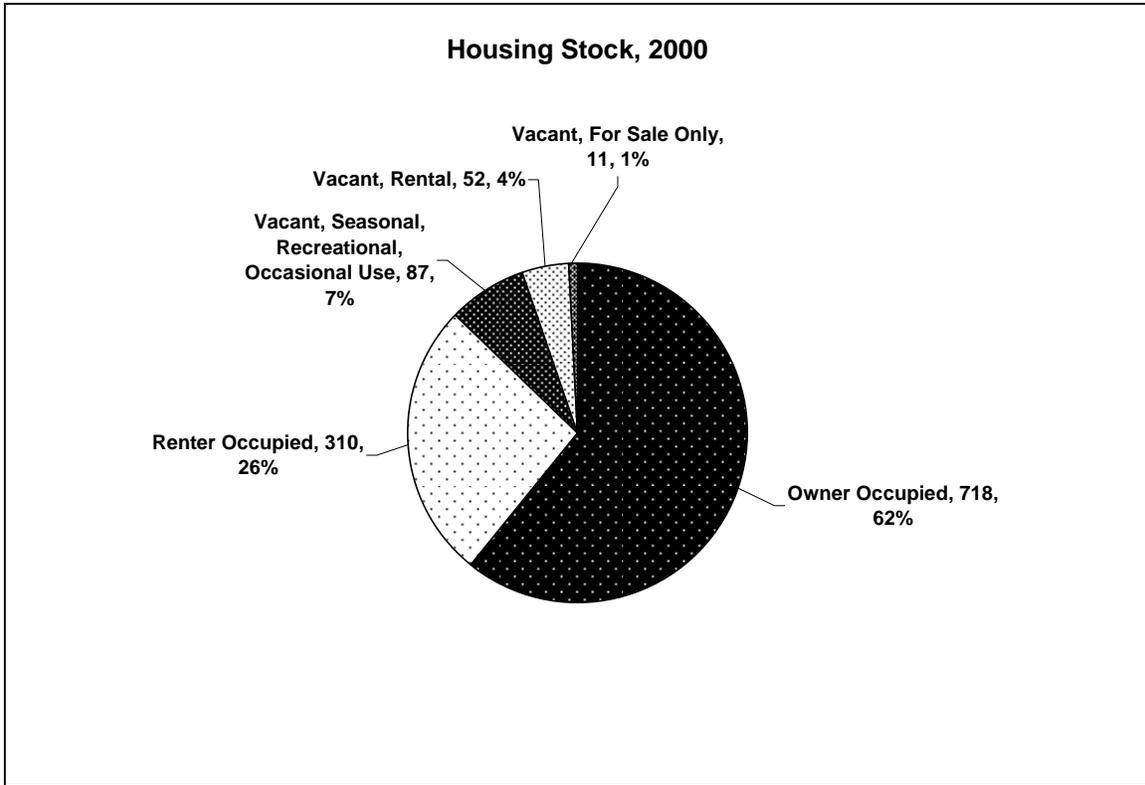


Figure 11 - Source: Vermont Housing Data, 2000

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.

D. 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.

Affordable Rental Units, 2006			
Town	06 Est. Population	Affordable Rental Units	# of units per 1000 residents
RANDOLPH	5091	154	34
WILLIAMSTOWN	3285	88	26
NEWBURY	2199	54	24
HARDWICK	3261	59	18
BRADFORD	2714	42	15
BETHEL	1950	25	13
HARTFORD	10829	95	8
NORWICH	3551	24	6
MORRISVILLE	5550	30	5
Orange County	29440	390	13

Figure 12 - Source: Vermont Housing Data, 2006

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, as shown in Figure 11, 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.

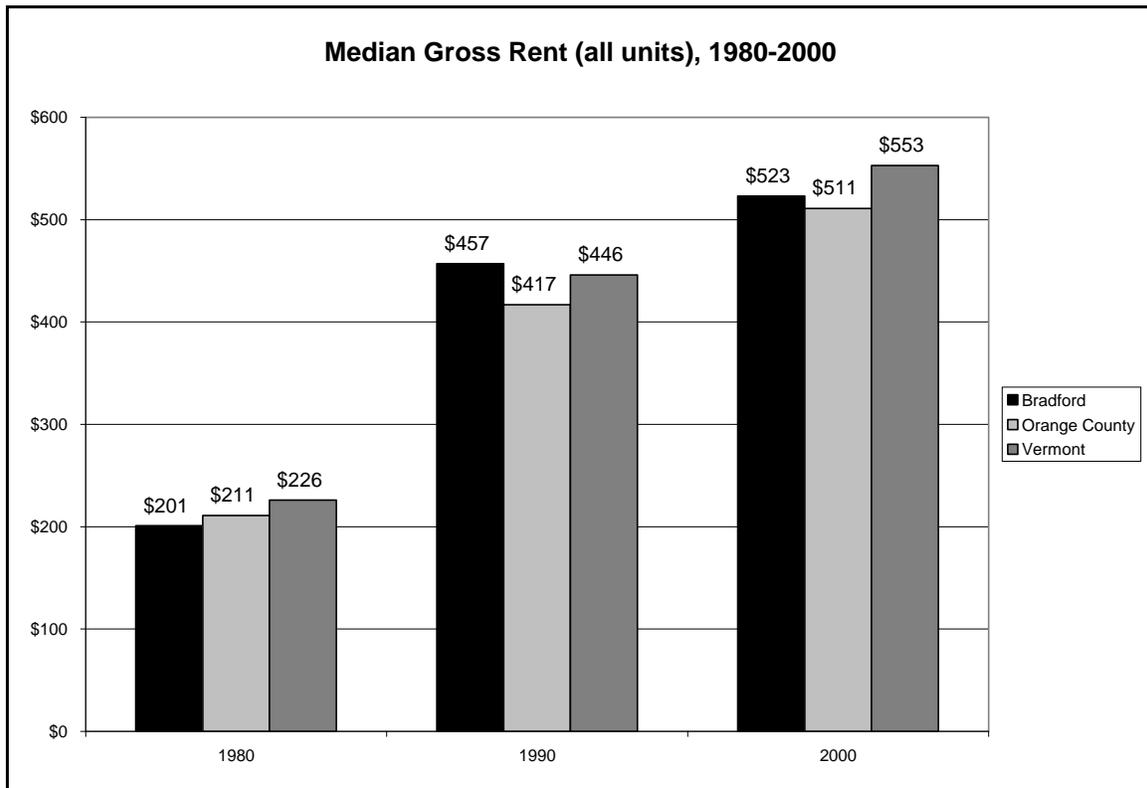


Figure 13 - Source: Vermont Housing Data

Residents in Bradford making the average yearly wage offered by local businesses (\$30,236) are paying 20% of their income for the average gross rental rate, which means the rental properties in Bradford are, on the average, affordable. Unlike much of the Upper Valley, Bradford does not appear to have a shortage of rental units. The number of occupied rental units in Bradford is 26% of the total housing stock.

E. Elderly Housing

Nursing and Residential Care Facilities, 2003			
Total beds by provider type, by town.			
	Nursing Care Level II	Residential Care Level III	Residential Care Level IV
BRADFORD	0*	5	18
NEWBURY	0	0	15
FAIRLEE	0	5	0
W. FAIRLEE	0	0	0
CORINTH	0	0	0
THETFORD	0	0	0
NORWICH	0	7	0

Figure 14 - Source: TRORC Inventory of Nursing and Residential Care Facilities, 2003

*2003 data updated to reflect the closing of the Brookside Nursing Home in 2004

According to the 2000 U.S. Census, there were 587 individuals in Bradford who are 65 or older. Of homeowners in Bradford, just over 56% are 65 or older. Thirty-two percent (32%) percent of renters in Bradford are 65 or older.

As 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 Figure 14, Bradford has the largest number of total beds in the surrounding area. 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 and 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.

F. Childcare

Child Care Facilities, 2003

Total seats by provider type by town

	Registered In-Home	Licensed In-Home	Center	Kindergarten- Nursery School
BRADFORD	48	24	78	0
NEWBURY	18	0	79	0
FAIRLEE	18	12	0	0
W. FAIRLEE	0	0	18	0
CORINTH	12	0	30	0
THETFORD	6	48	0	16
NORWICH	0	0	100	20

Figure 15 - Source: TRORC Childcare Facilities Inventory, 2003

According to TRORC's 2003 inventory of registered childcare facilities, Bradford offers more options for childcare than most towns in the surrounding area. At the time of the 2000 U.S. Census, there were 411 children between the ages of 1 and 9 in Bradford. Given that the number of registered in-home and licensed homes and centers only total 150 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 figure 15 include full and part-time seats, which implies that there may be even fewer seats than the numbers reflect.

G. 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.

Policies

1. 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).
2. 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.

3. 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.
4. It is the policy of the town that safe bicycle parking facilities be provided in new residential or commercial developments.

Recommendations

1. The Town of Bradford should explore the creation of a Bradford Housing Authority with the purpose of purchasing and renovating substandard rental housing.
2. The Town should consider assessing impact fees in order to defray the cost of increases in municipal services caused by development.
3. 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).

IV. Education

A. Introduction

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, 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.

B. Student Enrollment at Bradford Elementary School and at Oxbow/Riverbend

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:

Educational Enrollment Bradford Elementary	
Fiscal Year	Students Enrolled
2007-2008	218
2006-2007	225
2005-2006	230
2004-2005	233
2003-2004	247
2002-2003	240
2001-2002	247
2000-2001	239
1999-2000	273
1998-1999	286

Figure 16 - Source: Vermont Department of Education, 2007

At Bradford Elementary School, enrollment has been slowly declining, which is consistent with the experience elsewhere in Vermont. While Bradford Elementary School serves only the Town of Bradford, Oxbow High School is a union school with Newbury and appears to be seeing resurgence in enrollments since the ADM dropped to 448 students during the school year 2005-2006. Oxbow also serves multiple tuition paying towns including Corinth, Topsham, Orange, Washington and Piermont, NH.

Educational Enrollment Oxbow	
Fiscal Year	Students Enrolled
2007-2008	495
2006-2007	463
2005-2006	448
2004-2005	472
2003-2004	497
2002-2003	492
2001-2002	578

2000-2001	600
1999-2000	612
1998-1999	595

Figure 17 - 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.

C. 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.

D. 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.

E. 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 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.

V. 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.

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 and Selectboard for their regularly scheduled meetings. Former classrooms are leased to tenants as offices and studios. The Bradford Historical Society occupies space on the third floor.

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 2,000 adjacent to the old reservoir, a 1,000,000-gallon open reservoir which is not in service. 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.

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.

The Town of Bradford owns roughly 579 acres of forestland and watershed management property in the towns of Fairlee and West Fairlee. 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.

Future plans include finding a second source of water to be used for back-up and supplemental water supply, expanding the current reservoir, and expanding the reservoirs on Mink Hill and Fairground Road.

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. As of August 2007, the facility treated a six-year annual 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 260 users presently on the system. Ten users have been added to the system since 1998.

The year 2007 saw the completion of a 5-year project to update the sewage treatment plant. 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.

Between 2000 and 2006, the Town of Bradford has conducted an ongoing dialogue with voters regarding the extension of the sewer line into the Lower Plain area of town. On five different occasions, voters (in some cases sewer users) have been asked questions relevant to a sewer line extension. The results of those votes were:

- 11/14/00 – Bradford Village Bond Vote on Treatment Plan improvements totaling \$1,056,000. 40 in favor, 9 against.
- 7/2/05 – Sewer users vote to continue the discussion on whether to extend the sewer to the Lower Plain. 24 in favor, 17 against.
- 2/21/06 – Town of Bradford was petitioned for a bond vote (including residents' not utilizing water and sewer) to fund the sewer extension totaling \$600,000. 218 in favor, 349 against.
- 8/15/06 – Town of Bradford was petitioned a second time for a bond vote (including residents not utilizing water and sewer) to fund the sewer extension totaling \$600,000. 312 in favor, 322 against.
- 11/17/06 – Water and sewer users vote on whether to extend the sewer. 60 in favor, 46 against.
- 3/5/09 – Town of Bradford Held a Special Meeting for a Bond Vote for an amount not to exceed \$700,000 or such lesser amount not to exceed 25% of the cost to extend the sewer line to the Lower Plain District. 333 in favor, 278 against.

The results of 2006 town wide votes in February (40% for, 60% against) and August (49% for, 50% against) of 2006 indicate that voters are relatively split regarding the concept of extending sewer service into the Lower Plain. This split was further demonstrated with the results of the 2007 planning survey. When asked if survey takers felt that the sewer line should be extended in order to encourage businesses to be developed in Bradford, 44% were in favor, 40% were against and among the remaining respondents 16% were undecided.

Solid Waste Facilities

The Town is a member of the Central Vermont Solid Waste Management District (CVSWMD) that manages and plans for solid waste disposal for its member towns. Presently, the District and Town jointly operate a transfer station and recycling facility in Bradford. Local resident Steve Rogers accepts trash for disposal at Waste, USA in Bethlehem, New Hampshire. Also at the transfer station, a private hauler, under contract to CVSWMD, collects recyclable metals. CVSWMD hauls all other recyclables to Casella in East Montpelier, from whence they go to the Materials Recovery Facility in Williston, Vermont, for processing. CVSWMD also provides special collections for electronics and hazardous materials. Dates and locations for these special collections are shown on the website: www.cvswwmd.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:- P & C Supermarket, Colatina Exit and Perfect Pear 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. 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 now houses the Orange East Senior Center, the Bradford Teen 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.

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.
- Bradford Municipal Forest (owned by the Town of Bradford) – This property is a 584-acre forest owned by the Town of Bradford managed by the Water and Sewer Commission as a potential back-up water supply. Located in the towns of Fairlee and West Fairlee, this land provides wildlife habitat and is used for hunting, recreation, and timber harvest. A network of roads and trails is available to the public for recreational use. The Bradford Water and Sewer Commission is considering ways in which the Municipal Forest might be permanently conserved to protect the potential water resources there.

- Wright's Mountain and Devil's Den (owned by the Town of Bradford and managed by the Conservation Commission) - In 1994, through the work of the Bradford Conservation Commission, the Town voted to purchase 216 acres high on Wrights Mountain. Funds for the land were obtained from the Vermont Housing and Conservation Trust Fund, Town funds, and private contributions. The land will remain open and undeveloped for forestry, conservation, and recreational uses. In 2003, the Bradford Conservation Commission purchased and conserved an additional 60 acres of forestland abutting the Town-owned property on Wright's Mountain. The Vermont Housing and Conservation Board (VHCB), with a 1/3 match from the Town and the Bradford Conservation Fund, provided funding for the purchase of this land. The land acquired in 2003 includes the historic Devil's Den cave and ravine. The Town Highway Department constructed a trailhead parking area on Chase Hollow Road. In 2006, 165 acres of abutting forestland was acquired with funds from VHCB, the Bradford Conservation Fund, and an allocation from the Town, bringing the total to 443 acres of land conserved for public use. The Bradford Conservation Commission's Stewardship Committee, with assistance from many volunteers, has constructed and maintained several miles of well-marked hiking trails. Information kiosks have been constructed at the Wright's Mountain and Devil's Den trailheads, and the Appleton cabin at the summit of Wright's Mountain has been restored.
- 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 Recreational 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.
- Denny Park (owned by the Town of Bradford and managed by the Parks and Recreational 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 library is currently involved in a fundraising campaign to finance extensive exterior 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

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.

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 waste-free by 2020.

Policies

1. It is the policy of the Town to continue to conserve open and undeveloped land. Productive farmland and forests are particularly important for their contribution to Bradford's economy and environmental quality.
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, particularly, compact fluorescent light bulbs.
3. The Town should encourage the Central Vermont Solid Waste Management District to expand their recycling program to include commercial businesses in Bradford.
4. The Town should encourage the Central Vermont Solid Waste Management District to redesign the Bradford recycling center to allow for better circulation and functionality of service.
5. The Town should adopt a Capital Budget and Program in order to plan for anticipated infrastructure maintenance and improvement.
6. The Low-St. John Forest Committee should work together with the Bradford Parks and Recreation Commission to improve recreational use of the forest.
7. The Bradford Conservation Commission and the Bradford Parks and Recreation Commission should coordinate efforts to enhance recreational opportunities on Wright's Mountain.

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.

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 are currently two level III residential care homes 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%).

Currently, most of the elderly go to Grafton County Nursing Home in Haverhill, NH or Gifford Medical Center in Rutland, VT for nursing home care.

C. Bradford Volunteer Fire Department

The Bradford Volunteer Fire Department (BVFD) serves Bradford and is part of the mutual aid network. It also responds to all automobile-related rescue calls. In 2007, the Bradford Volunteer Fire Department responded to over 100 calls, which included

structural fires, chimney fires, motor vehicle accidents and mutual aid calls. In 2008, the BVFD responded to over 157 calls.

Staff

The Bradford Volunteer 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 four 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 excellent condition, needing only routine maintenance such as painting. Storage however, is at a premium in the firehouse, and the department has plans to add some sort of structure for equipment storage.

Vehicles

The Bradford Volunteer Fire Department owns five trucks:

- A 1986 E1 ladder tower
- A 1997 Middlesex engine
- A 2008 E1 Pumper/Rescue truck
- A 2000 tanker (lacks pump)

The BVFD is making plans to replace the oldest vehicle, and buy a combination pumper/rescue vehicle. The BVFD would like the Town to establish a capital budget plan for the purpose of replacing vehicles on a six-year rotational basis.

Funding

The Bradford Volunteer Fire Department is a municipal department. The Selectboard appoints chiefs and officers upon the recommendation of the BVFD. The Department budget is included as part of the annual municipal budget.

D. Police Protection Services

Bradford has two constables, at a special Town meeting held on March 5, 2009, it was voted to have the constables appointed by the Selectboard rather than elected at Town Meeting.. At present, the First Constable also holds the position of Bradford Chief of Police. The Police Department receives policy advice and oversight from the Bradford

Police Commission. The Commission is also the point of contact for any complaints regarding the Police Department. At Town Meeting in March of 2009, the townspeople approved the hiring of a second officer.

In addition to the constables, the Town contracts with the Orange County Sheriff's Department to provide expanded coverage. A portion of any fines or tickets issued by the Sheriff's department in Bradford are returned to the Town in order to offset the cost of the service. Supplemental police coverage in Bradford is provided by the State Police from the Bradford barracks.

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 the rescue truck and are trained in vehicle extrication skills. Like the Fire Department, the FAST squad is a Town organization receiving 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.

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. Goals, Policies and Recommendations

Goals

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

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.

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 car pooling, thus reducing the consumption of energy and the need for additional parking facilities.

B. Energy Trends

Society uses energy to heat, cool, ventilate, and light homes and offices, to power an industrial economy, and to transport people, goods, and services from place to place. In Bradford, the primary sources of energy are fossil fuels (oil, gas, coal, and liquid petroleum gas) electricity generated by nuclear fission, local and imported hydropower, landfill methane, and biomass (fuel wood). Bradford is fortunate to host the CVPS hydroelectric station at the Waits River Dam. Out-of-state hydropower is supplied by facilities in New York State and Quebec. Renewable energy sources, such as solar and wind, account for only a small proportion of total energy used.

Local energy sources, (wood, wind, solar thermal and electricity, and hydropower) offer distinct advantages over non-renewable energy sources. For every dollar spent on fuel wood, only 18-20% of that dollar leaves the local community. The rest remains in our own region, creating jobs and buying goods locally. On the other hand, for every dollar spent on non-renewable energy sources, 85% of that dollar flows out of the community.

The most abundant local energy "source" available to Bradford is conservation. Every kilowatt of electricity, or BTU (British Thermal Unit) of fuel that we don't use is that much more money in our pockets, and that stays in the local economy. Increased efficiency means more viable businesses and greater economic security with no reduction in the quality of service, or the standard of living, and with no degradation of our natural environment.

Home Heating

% Home Heating Fuels Used in 2000		
	Bradford	Orange County
Propane	24.6%	17.2%
Electricity	1.8%	2.0%
Fuel Oil	57.9%	60.5%
Coal	0.0%	0.1%
Wood	12.8%	19.0%
Solar	0.0%	0.1%
Other	2.0%	0.1%

Source: U.S. Census

Bradford's fuel uses in 2000 were relatively similar to those of Orange County.

Electric Utilities

Two electric power companies serve Bradford. Central Vermont Public Service Corporation (CVPS), the region's largest provider of electric power, serves the majority of the Town. CVPS maintains contracts with Entergy (Vt Yankee Nuclear), and Hydro Quebec. CVPS 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.

Fossil Fuels

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

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.

Cow Power (Biogas)

Another alternative energy source emerging in Vermont is "Cow Power". This system capitalizes on Vermont's farming industry by utilizing "biogas" (methane) produced in the breakdown of cow manure. An anaerobic digester is constructed on a farm. The digester holds the farm waste at roughly 100 degrees for more than 20 days. Methane gas is produced by the bacteria in the digester and delivered to a modified natural gas engine. The gas is then burned to generate electricity. "Cow Power" is a logical source of power for small scale farms. Some farms in Vermont utilize "Cow Power" to offset their power costs. This system reduces the amount of methane released into the environment, a key advantage since methane is a potent greenhouse gas.

Nuclear Energy

Vermont Yankee Nuclear Power Station has been generating electricity since 1971. The plant is licensed for operation until March 2012. Vermont Yankee is pursuing a license extension. The nuclear power industry has not completely resolved safety issues regarding safe storage of radioactive waste or decommissioning. Regardless of whether the license of Vermont Yankee is extended, the cost of that energy is likely to increase.

Hydro-Power

As of 2002, Vermont received approximately 42% of its energy from hydropower: 7% from small in-state sources, and 35% from Hydro-Quebec and New York Power Authority. The CVPS Dam in Bradford produces an average of 7200 KWH per year. This is enough energy to serve approximately 500 Bradford homes, or double the number of homes in Bradford's Downtown. Because most environmentally sound and economically effective sites have been developed, the potential for expansion of in-state hydropower lies largely in increasing the generation capacity and efficiency of existing sites, and in the local installation of smaller and micro hydro sites in smaller streams and rivers.

The power output from a given stream must be moderated by environmental considerations. State law requires a minimum stream flow, adequate to support aquatic life forms, to be maintained and impoundments must be designed with water quality, land use, and recreation considerations in mind.

Biomass

Forest land represents approximately 80% of Bradford's total land area. The Bradford Town Forest and the Low-St John Forest have been sustainably managed for biomass for the past 30 years. The newly conserved lands in the Wright's Mountain area are also enrolled in sustainable management programs.

The generation of electricity from biomass over the past twenty years has grown, and holds the potential to benefit both the economy and the natural environment of Bradford.

Wind Generation Facilities

Wind energy offers the prospect of creating an increasing share of electrical production with greatly reduced effects on air pollution compared to conventional methods. In the 2007 Town Plan Survey, just over 80% of respondents indicated that they would encourage wind power in Bradford. Although the benefits of wind power are substantial, no Bradford elevations meet the preferred height for larger scale wind machines. 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.

Permitting Requirements: Hydro, Wind, Fossil Fuels

Wind generation facilities are land uses subject to state and local permitting requirements. Distributed power generation facilities, such as hydropower dams, fossil fuel plants and wind power systems owned by utilities generally are subject to review and approval by the Vermont Public Service Board (30 VSA §248). A Section 248 review of these projects addresses environmental, economic, and social impacts associated with a

particular project. In making its determination, the Public Service Board must give due consideration to the recommendations of the Town of Bradford and the regional plan.

Wind power facilities needing Public Service Board approval under Section 248 are exempt from municipal review and are therefore not subject to local zoning or subdivision regulations. Smaller wind generation facilities set up solely for owner consumption of power onsite are protected from exclusion from zoning regulations by state statute [§4412(6)], however towns can regulate them if specific standards are set within the town's land use regulations. They cannot be prohibited. Generally, such uses are considered accessory uses or structures incidental to a primary use.

Alternative Energy Sources

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.

Solar Energy

Solar energy has potential for providing clean, reliable, and safe energy, even in Vermont's climate. The application of both active (systems which collect, store, and distribute solar energy within a building) and passive (systems which utilize a building's structure to trap sunlight and store it as heat) solar technologies have demonstrated their cost effectiveness and value in Vermont, particularly in rural areas. As active solar technologies improve and costs decrease, solar thermal collectors and photovoltaics (technologies which can convert sunlight to electricity) are likely to become more competitive in the marketplace.

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.

Transportation

Approximately one-half of the State's current energy demand is consumed in transportation, and the costs of public and private transportation are increasing at rates faster than other sectors of the economy. Therefore, the transportation section of this plan complements this energy section.

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 is an inexpensive and environmentally benign “source” of electricity.

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.

C. Summary

Despite the need to change both the pattern and magnitude of energy consumption, the Vermont Department of Public Service predicts that energy consumption in Vermont will continue to grow and that fossil fuel consumption will grow as a portion of total energy consumption. It is projected that the bulk of the increase in energy consumption will be for space and water heating, and transportation. To the extent that the Town of Bradford acts to reduce its dependency and the dependency of its residents on fossil fuel, and to the extent the Town and its residents can maximize their efficient use of energy, the viability of Bradford, as a community will be enhanced. Fossil fuels will need to be replaced by renewable energy resources. International fossil fuel experts predict that worldwide supply of fossil fuel reserves will peak during this decade, and as supplies start to decline and worldwide demand continues to grow, prices will continue to soar. Sustained economic health and avoidance of continued environmental degradation will most likely require a shift to renewable energy resources, improved energy efficiency, and carbon dioxide neutrality.

D. Planning Implications

By promoting appropriate land use patterns, participating in energy development decisions, facilitating alternative transportation options, and encouraging energy conservation strategies, the Town of Bradford can provide leadership toward a position of sustainable energy use which will help to maintain a healthy environment and build a foundation for economic health and stability.

Local Planning and Zoning Bylaws

It is the intent of this Plan to promote settlement patterns that minimize transportation requirements, encourage land use that conserves energy, and to develop policies that encourage the efficient use of energy resources.

The Vermont Municipal and Regional Planning and Development Act (24 VSA Chapter 117) enables Bradford to adopt regulatory bylaws for the town plan.

Encouraging high density and diverse uses in and around existing built-up areas will lead to more compact settlement patterns, minimizing travel requirements. At the same time, the Zoning Bylaws must be flexible enough to recognize and allow for the emergence of technological advancements which encourage decreased energy consumption, such as increased use of solar and wind power, and telecommunications technology.

Through setback and height requirements, zoning also controls the size and relative location of new structures. Chapter 117 permits communities to exempt moderately-sized wind and solar energy devices from these restrictions. The Bradford Zoning Bylaws should encourage the consideration of solar access (exposure to sun) in reviewing projects at the local level.

The Zoning Bylaws should also permit the creation of 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 the 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).

Subdivision regulations govern the creation of new building lots, as well as the provision of access and other facilities and services to those lots. Subdivision regulations, like PUDs, involve the Town Planning Commission in the design process. As with PUDs, the Planning Commission has the opportunity to ensure that the conservation of energy is considered in subdivision development.

The State of Vermont has a residential energy code, 21 VSA Chapter 3 §266. The Vermont Residential Building Energy Standards require that all new homes and additions over 500 square feet and built after July 1, 1998, meet minimum efficiency standards. A

similar Commercial Building energy Standard was enacted in 2006, and became effective on January 1st, 2007.

The Zoning Bylaws should monitor compliance with these laws by requiring submission of a Vermont Residential Building Energy Standards Certificate or Builder's Statement in all appropriate residential permits, and submission of a Commercial Building Energy Standards (CBES) Certificate and a CBES Affidavit for commercial buildings and over-4-story residential buildings.

Additionally, the Vermont Energy Star Homes Program offers technical and financial incentives to new homes that use at least 30% less energy than conventional homes. Act 250 requires that the "best available technology" for energy efficiency and recovery be used in construction. In its review of development proposals, Act 250 applies a life cycle cost test to determine the "appropriate level" of energy efficiency. The appropriate level standard requires the developer to invest in energy efficiency up to the economic break-even point for a particular structure, occupant, and usage pattern. This standard allows for flexibility in design without sacrificing the energy efficiency of specific measures. The Town should recommend Energy Star compliance for new homes and provide assistance in achieving energy conservation for existing homes.

Transportation and Land Use

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 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, 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. The existing I-91 Park and Ride lot is too small 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.

Bradford should research and determine if the use of biodiesel for use with Town highway vehicles would 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 use.

Buildings and Structures

Energy costs incurred in the operation of Vermont's residential and nonresidential buildings and structures accounts for a substantial portion of statewide energy consumption. The Department of Public Service reports that, of non-regulated fuel use, the costs of operating buildings and structures absorb 28% of the oil, 100% of propane, 100% of coal, and 80% of the wood consumed statewide. (Vermont Public Service Department, Vermont Comprehensive Energy Plan, page 131, January 1991.)

Improving existing structures and building new structures with a vision toward increased energy efficiency is a critical way to promote energy conservation and lessen or postpone the need for costly sources of additional energy. Enhanced energy efficiency in buildings and structures can lessen the amount spent on energy costs, decrease per capita consumption of non-renewable sources of energy, and decrease the emission of both acid rain precursors and greenhouse gases. Reducing the consumption of costly, imported forms of energy and increasing the use of renewable emission-free energy can reduce reliance on global markets, stimulating local economies. Overall, investments in energy efficiency have the potential to more than pay for themselves by reducing the economic, social, and environmental costs associated with the inefficient use of energy.

When a proposed development is subject to Act 250 approval, the Public Service Department may participate in the permit process under sub-criteria 9(F) and 9(J), which address energy conservation and the project's impact on public utilities. Under sub-criterion 9(F), an Act 250 permit will only be granted after the applicant demonstrates that the planning and design of the project incorporates the "best available technology for efficient use or recovery of energy." The Department has defined the "best available technology" to mean any proven building design, and any equipment and materials that can be obtained through normal construction supply channels.

E. Goals, Policies and Recommendations

General Goals

Overall Goal: Sustainability

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.

Goals

1. To encourage patterns of land use and development that use energy most efficiently, and that do not increase the use of non-renewable energy.
2. To promote the construction of energy efficient homes and buildings to lessen or postpone the need for sources of costly additional energy.
3. To increase use of public transportation coordinated with other modes of transport.
4. To increase the use of non-motorized transportation.
5. To participate in regional and statewide strategies and approval processes which reduce the requirement for non-renewable energy.
6. To increase awareness and use of energy conservation practices.

Policies

1. Because smaller houses consume less material in their construction and require less energy in use, it is the policy of the Town to encourage construction of compact, well-planned homes incorporating technologies that create efficient use of energy resources.
2. Consideration should be given to expanding the use of biomass to generate electricity or provide direct heat.
3. The Town of Bradford supports investigation of the economic feasibility of producing biomass for use in the Ryegate Woodchip Generating Station.
4. To investigate wood-for-fuel harvesting possibilities on Town land, including the Town Forest.
5. Bradford supports the Cow Power opportunities for local dairy farms.

6. As the power source of solar technologies is inexhaustible, and solar energy neither contributes pollutants to the atmosphere nor adds to our reliance on foreign energy suppliers, Bradford should encourage the use of solar power.
7. Bradford should strongly encourage and support the use of solar tempering in new building construction.
8. The I-91 Park and Ride is beyond capacity and additional parking needs to be provided for ridesharing commuters.

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 should 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.
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.

Transportation Policies

1. The Town of Bradford endorses transportation practices that promote energy efficiency, which include cycling, walking paths and sidewalks, public transportation, and rideshare programs to reduce the region’s dependency on single vehicle trips.
2. The Town of Bradford should require private land use development to invest in transportation infrastructure and services that promote public transportation and/or provide the necessary right-of-way to allow public investment in those facilities.
3. The Town of Bradford encourages the development of existing transportation systems incorporating design and location principles so as to complement the recommendations set forth in the Land Use Element of this Plan.
4. The Town of Bradford encourages the development of appropriate alternatives to gasoline consumption such as ethanol, which can be sustainably produced from local renewable resources and local municipal wastes.
5. The Town of Bradford encourages the maintenance, continued operation and expansion of the Connecticut Valley railway line to include passenger service.
6. The Town of Bradford encourages employers to support the use of public transit and non-motorized transit by their employees.

Development Patterns/Land Use/Housing Policies

1. Practical energy conservation measures should be taken during the siting, design, construction or renovation, and maintenance of buildings. Building designs incorporating the use of solar energy and other renewable energy technologies shall be required in Permitting regulations. At a minimum:
 - a. New homes should meet Energy Star requirements
 - b. New subdivisions should lay out building sites to take best advantage of passive and active solar gain; if not possible, then homes should meet higher energy efficiency standards.
 - c. New non-residential projects (commercial, industrial, municipal etc, should complete a LEED score card.
 - d. Larger non-residential structures should employ some sort of renewable energy; e.g., rooftop solar, solar trackers, wind, geothermal.
2. The Town of Bradford encourages development patterns resulting in more energy efficient transportation patterns.
3. The two Bradford school districts should be encouraged to include energy efficiency and conservation in their plans and daily operations.
4. 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.
5. The Town of Bradford encourages the establishment of incentives for developers to accommodate public transit in their plans.
6. The Town supports the expansion of business-related telecommunications.
7. The Town encourages a program to assist landlords to achieve energy efficiencies, especially those in which tenants are responsible for their own utility expenses.

Recommendations

1. The Town should adopt subdivision regulations allowing siting of homes in a more energy efficient manner.
2. The Town should investigate converting public buildings in Bradford to renewable energy heating systems.
3. The Town of Bradford should use its Revolving Loan Fund to provide low interest capital to homeowners, landlords, institutions, and businesses to assist in making cost effective investments in energy efficiency and renewable energy (if that's allowable by the regulations of the original grantor of the fund).

4. The Town of Bradford should encourage local lending institutions to adopt energy efficiency standards for new construction as well as for existing housing coming on the market.
5. The Town of Bradford should support efforts to expand the Home Weatherization Program.
6. Encourage Bradford schools to include cycling and other viable transportation alternatives, true costs of various energy using options, and energy efficient driving techniques.
7. Conduct a survey to determine where park and ride lots should be located.
8. The Bradford Conservation Commission should investigate programs such as the 25 by 25 program to ensure that there is by 2025 a marked reduction in CO2 emissions by the town of Bradford.
9. The Bradford Conservation Commission should investigate education programs to ensure that there is a marked reduction in energy consumption by the Town of Bradford.
10. The Town should investigate the possibility of using stoker boilers at Oxbow High School.
11. The Town of Bradford should pursue available 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.

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. A 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.

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.

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.

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. The Town also holds title to the Bradford Town Forest land located in Fairlee and West Fairlee that protects the Mill Pond Brook watershed. 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. In 2008, the Bradford Water and Sewer Commission studied ways the Municipal Forest might be permanently conserved in order to protect the potential water resources available in the forest. The Commission is also 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 and Vernal Pools

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. According to the final report, the wetlands inventory identified 267 wetlands. The wetlands within the study area cover approximately 873 acres, which represents approximately 4% of the total land area of Bradford (including the Bradford Municipal Forest located in West Fairlee). 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.

- Bradford Municipal Forest Wetlands – There are three wetlands, covering approximately 34 acres, which make up the large wetland complex in the Bradford Municipal Forest. Because the town owns the municipal forest, these wetlands are significant for use as an outdoor classroom. It provides significant wildlife habitat and erosion control, improves water quality, retains sediment, supports vegetation unique to wetlands, and provides open space. Because the

soils in this area are generally too wet to support motorized vehicle trails or logging equipment, management of this wetland complex should continue to exclude these uses.

- 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 North 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.

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 related maps should be available to Bradford citizens in the town offices.
3. The Conservation Commission should develop a parcel map delineating the location of significant wetlands, and this map should be given to the Zoning Administrator, the Planning Commission, and Zoning Board of Adjustment, to aid the permitting processes.

4. Wetlands should be protected via municipal enforcement of existing bylaws and ordinances.
5. Appropriate state officials should be notified of violations to municipal ordinances.

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 fire fighting 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 thirteen significant floods since 1973. Twelve of these were declared federal disasters and caused significant economic loss. 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.

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.

Goals

1. To enhance and maintain use of flood hazard areas as open space, greenways, non-commercial recreation and/or agricultural land.
2. To ensure no net loss of flood storage capacity.
3. To maintain accurate flood hazard maps to assist in appropriate land use decisions.
4. 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.

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.
4. The Planning Commission should amend section 5-25 of the Bradford Zoning Bylaws to include all rivers and streams in Bradford, and shall reconcile section 5-25 with section 5-15 so that the greater of the two setbacks described therein will be applied in situations where both sections apply.

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 1,000 acres. Private residents have conserved over 900 acres of forested land. As of May 2007, 3,000 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 the Town's forest resources.
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 appropriately sited and designed businesses promoting local processing, sale and distribution of timber products.
3. 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.
4. Trees might be planted along US Route 5 from Merry Meadow Farm to Shearer's Greenhouse.

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.

Estimates of agricultural revenue in Vermont vary from \$476.6 million to \$2.6 billion per year, depending on the methodology of the estimate. Many businesses in Vermont depend on the “farm economy.” “Just under one third of all of Vermont’s farm production, or \$196 million in food, is used directly for bottled milk, cider, ice cream, cheese, meats, yogurt, etc. by Vermont’s farm-related food industry, which produced \$1.05 billion worth of products in 2000” (Source VT. Sustainable Agriculture Council, 2005). The farm-related food industry is clearly connected to the farm economy.

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. The Vermont Land Trust has conserved more than 590 parcels of farmland in throughout the state, totaling 145,109 acres. Upper Valley Land Trust has conserved approximately 14,384 acres of farmland in the Upper Valley of which 9,643 are in Vermont, and 906 in Bradford.

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 discourage development on prime agricultural land.

6. To support the creation and maintenance of a physical, social, regulatory, and fiscal environment that encourages entrepreneurship in agricultural activities including those that add value to the region's agricultural products.
7. To support programs that educate citizens on principles of sustainability.
8. To discourage fragmentation of agricultural lands.

Policies

1. It is the policy of the Town to support agriculture 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 Department of Agriculture and other agencies and groups to develop viable farming opportunities in Town.
3. It is the policy of the Town to consider offering property tax incentives to farming endeavors. 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 in the case that off-site mitigation techniques are used to compensate for proposed non-agricultural uses of agricultural lands, the preservation of 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.
8. It is the policy of the Town to support local marketing and value-added agricultural industry.
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 Town should conduct an inventory and assessment of all farm and forest land in Bradford.
2. The Town should consider the stabilization of property taxes for farmers enrolled in the Current Use program by agreeing to pay the difference that the State does not fully fund under the Current Use program.
3. 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. The State of Vermont and the local game wardens have the 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. In

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

2009 Bradford will be part of a wildlife corridor mapping program. It is hoped that the results of this program will help guide the Planning Commission toward the creation of conservation areas that preserve open space and wildlife corridors.

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.
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

Figure #1 - 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 minor northwest/southeast route from Central Vermont to Portland, Maine, serving Bradford residents who commute to central Vermont 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 and other outdoor recreation.

In addition to Class 4 roads and legal trails, Bradford also may have "ancient roads", historic town roads or rights-of-way that are forgotten or long disused and not commonly known or shown on maps. The town can still own these roads and rights-of-way. With recent legislation (Act 178, 2006 session) towns must act by 2010 to clarify if any such roads or rights-of-way exist. The Act provides a process for this undertaking, a grant source for research, and a deadline after which any such roads or rights-of-way that have not been officially established shall terminate.

B. 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.

1. Road Maintenance

Maintaining the network of roads in Bradford is time-consuming and represents a substantial part of the Town's annual budget. In 2007, the total expenses in the Bradford highway fund were \$745,211. 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-Ottawaquechee 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.

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.

2. 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.
- Maple Street. - Maple St, near the veneer mill needs to be repaired and resurfaced.
- 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.

3. 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.)

4. 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

Figure #2 - Source: Two Rivers-Ottawaquechee Regional Commission, 2006

The results of the study (see figure #2), conducted by the Two Rivers-Ottawaquechee 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.

5. 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.

In the spring of 2008 the Bradford Health Coalition and the Bradford Elementary School (with the support of other community organizations) applied to the State Department of Transportation and received a Safe Routes to School planning grant to help identify barriers to the pedestrian and bicycle routes for children traveling from their homes to the Bradford Elementary School. (The grant process is open to elementary schools and middle schools but not high schools.) The Safe Routes to Schools planning process will provide the Town with suggestions for improvements to the bicycle and pedestrian network for routes from neighborhoods to the elementary school. At the conclusion of this grant process, it may be possible for the elementary school and the Bradford Health Coalition to obtain an implementation grant as well.

The following bicycle/pedestrian projects have been identified:

- Routes 5 and 25 to Piermont Bradford Bridge – 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.

6. Goals, Policies and Recommendations

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 well-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. Major employers and public facilities should be required to provide covered bike racks through the site plan review process.
12. It is the policy of the Town to address the need for adequate off-street parking in developmental review.
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.
15. It is the policy of the Town to encourage the elimination of large 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

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. If the Town adopts subdivision regulations, such regulations should incorporate appropriate requirements to ensure that new private roads and rights-of-way will be constructed to town road standards.
9. 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.
10. The Town should inventory parking and pedestrian needs within the downtown and formulate a plan to make upgrades in the future.
11. The Town should consider redesigning Main Street (Route 5) to enhance its appearance and functionality. The surface of the road could be returned to its original grade. Additionally, such enhancements as placing all utilities underground, correcting drainage, constructing more visually obvious crosswalks and upgrading 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.
12. 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.
13. 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.
14. The Town should consider developing a design for a pedestrian network.

15. The Town should petition the federal government to increase the weight limit for truck traffic on interstate 91.
16. The Selectboard should appoint a committee to investigate ancient roads.
17. The Planning Commission should amend the zoning bylaws to reduce the number of parking spaces required for commercial development.
18. The Town should investigate other options for the expansion of park-and-ride facilities in Bradford.

X. 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. A third, and smaller, area of development has historically been located at Cassville (Bradford Center).

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 2001 - 2007	2007	2001
Residential	10.70%	869	785
Mobile Homes	-7.46%	62	67
Vacation	-18.67%	61	75
Apartments	0.00%	12	12
Commercial	-1.33%	74	75
Industrial	0.00%	8	8
Utilities	0.00%	6	6
Farm	11.11%	10	9
Woodland	-17.54%	47	57
Miscellaneous	0.00%	146	146
TOTAL:		1,295	1,240

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. There does not appear to be a consensus on extending development in the Lower Plain beyond areas already developed. When asked if they supported encouraging economic development by extending the sewer line into the Lower Plain, 44% of respondents indicated support and nearly 40% did not. 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.

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.

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.

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.

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.

There is the potential for increased density within the Central Business District. At present, the minimum allowable lot size within this area is 8000 square feet, with a maximum allowable building footprint of 40% of the lot. Clearly, an increase in lot coverage would allow for expansion and concentration of development in this district and would reflect much of the existing pattern of development. Building height is also limited to 35ft in this area. This height threshold might be limited by the capacity of the Bradford Fire Department's equipment. If the fire department has the ability to reach heights higher than 35ft, an increase in this parameter might, for instance, allow a landowner to add a story to an existing structure in the main commercial block. Any such changes should complement the historic assets of the area.

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.

Goals – Central Business District

1. To provide a thriving and robust commercial and civic center that benefits all residents of Bradford.
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 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.
3. 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.
4. It is the policy of the Town to retain the architectural aesthetics of the Central Business District.
5. It is the policy of the Town to retain a post office in the Central Business District.
6. It is the policy of the Town to encourage complementary infill development within the downtown.
7. 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 consider altering the zoning requirements with regard to height in the Central Business District 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. The district currently designated Lower Plain Commercial is expansive. Existing uses are concentrated north of the junction of Routes 5 and 25, with additional development around that intersection. South of that junction, land uses become more rural in nature, consisting of residences, a working farm, 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 relatively flat with 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 stormwater 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 30,000 per commercial building. Additionally, formula businesses³ 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.”

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.

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 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.

Recommendations – Lower Plain Commercial District

1. In an effort to encourage infill development the Planning Commission should alter the boundaries of the Lower Plain Commercial zoning district.
2. The Planning Commission should amend the Zoning Bylaws to prohibit new commercial buildings with a footprint in excess of 30,000 square feet in the Lower Plain Commercial Zoning District.
3. 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.

4. 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-Ottawaquechee 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 street scaping.
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 (approximately¹/₄ 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. One method of increasing density might be to allow development to be higher than 35ft as is presently allowed, provided that increases in building height do not negatively impact the historic character of the area.

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 access to the downtown should be provided.

Recommendations – Village Residential District

1. The Planning Commission should consider reducing the number of conditional and permitted uses in an effort to encourage primarily residential uses within this area.

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.

I. 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.

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-Ottawaquechee 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.

L. Cassville Hamlet District (Bradford Center)

Information collected from the public in 2007 suggested that there is interest in Bradford to allow the redevelopment of the historic Cassville Hamlet. Hamlets are usually groupings of buildings, smaller than a village or downtown. They historically have served as the location for single-family homes, but also maintain a few essential commercial businesses that serve the immediate area, such as general stores.

The purpose of the Cassville Hamlet District is to allow for the growth of a Hamlet within the Town of Bradford. Development in this area could be denser than the surrounding residential area, but should still be primarily residential in nature. Commercial development in this area should be allowed, but only at a small scale that is compatible with residential and historic uses. The size of commercial developments in the Hamlet Residential District should not exceed 1,500 sq. ft.

Goals

1. To encourage the development of Bradford Center as a hamlet of mixed use that does not negatively impact residential or rural uses.

Policies

1. It is the policy of the Town that commercial development within the Cassville Hamlet should not exceed 1,500 square feet.

XI. 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 and Newbury currently have town plans in effect: Corinth (2007), West Fairlee (2005) and Newbury (2005). At the time of this writing, the town of Fairlee does not have a town plan in effect.

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-Ottawaquechee 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-Ottawaquechee 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.

XII. 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.