Braintree Town Plan

Adopted December 5, 2017

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I. Introduction

A. Vision Statement

The Braintree Planning Commission hopes for a town where people respect and use the land well, where forestry and wild lands, agriculture, small businesses and commuters live comfortably together. We hope for a town that feels like a home to come back to, for both vacationers and year-rounders, where children are brought up to care about the town, it's history, heritage and land, and where all work together for the Town's betterment. We have written this plan to further this vision.

B. Why Have A Plan? – Purpose

Planning is the process of projection. A community imagines what the future should be, and then starts putting these ideas into action. Communities with little or no planning are more likely to experience problems of over-development, high property taxes and increased demands for community services. We, like every town, have choices in the way we provide for orderly growth and in the way we balance our natural and built environments. Planning is done to meet the needs of the people who are here now in the face of change and for those in the future.

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

Here are some specific reasons to have a Town Plan:

- A guide for our community - Information in the plan can be used for developing the recommendations contained in a capital budget and program, for establishing a community development program, and for providing direction to the Selectboard for such things as community services, emergency services, recreation and municipal facility development to name a few. It also serves to guide the decisions made by the Development Review Board when permits come before them.

- Support for grant applications and planning studies - Many of the state run grant programs available to Braintree consider whether or not the town has stated a need for its grant request. Studies are often called for within a plan, and the funding for such projects can come from state sources as well.

- A guide for future development - The District Environmental Commission considers Town Plans during an Act 250 hearing under Criterion 10. The Plan should clearly define what is and is not appropriate in terms of development within the community.

C. Defining Rural Character

The District Environmental Commission will often look to a Town Plan for guidance with regard to the issue of "rural character." Too often this concept is poorly defined and/or too vague to be useful in a legal proceeding under Act 250. Therefore, for the purposes of this document, it is necessary for the Planning Commission to attempt to define what residents view as the "rural character" of Braintree.

In his book, "The History of Braintree", H. Royce Bass[1] describes the community thusly:

"*The Town of Braintree is situated in the western extreme of Orange County, forming a projection bounded in part by the counties of Windsor, Addison, and Washington. It is more particularly bounded, north by Roxbury and Brookfield, east by Randolph, south by Rochester, and west by Granville. The center of Braintree is about fifteen miles due south from the geographical center of Vermont, about twenty-five miles from Montpelier, the capital, and about twenty miles east of the ridge, or principal range, of the Green Mountains.*

By the terms of its charter, signed on August 1, 1781 by Gov. Chittenden, Braintree is about six and one-half miles long by about five and one-half miles wide. By act of the legislature, Nov. 10, 1824, ten lots and four gores in the southwest corner of the town, about two square miles in area, were annexed to Rochester, leaving the present area of Braintree about 35.5 square miles.

The valley of the third branch of the White River, known as the "Branch", through which runs the Central Vermont Railroad, divides Braintree into two principal divisions. That part south and west of the branch is rough, rocky, with many bold and precipitous peaks, much of it incapable of tillage. Riford's brook and Thayer's brook, both tributaries of the branch, are its largest streams. The branch flows southeasterly through the whole width of the town. The part north and east of the branch is nearly equally divided by the high ridge, commonly called Braintree hill, extending north and south through the town, just east of its center. Spurs jut out eastward and southward from it, diversify the surface. The chief points in this ridge are Neven's hill, Belcher hill, Oak hill, and Quaker hill. Its highest point is also called Alban's hill. Its largest streams are Ayer's brook, through Snowsville, and Spear's brook, its tributary. Spear's brook is the outlet of Mud pond, the only natural pond in Braintree.

[1] H. Royce (Henry Royce) Bass, Katharine F. DuClos, The History of Braintree, (University of Michigan, 1883)

Few localities afford a view of so many points of interest as the hill tops of Braintree. From the top of Quaker hill can be seen, to the east Mt. Washington and other principal peaks of the White and Monadnock Mountains in New Hampshire, fifty to sixty miles distant; to the south, Mt. Ascutney in Windsor, forty miles away; to the southwest, Killington and Shrewsbury peaks of the Green Mountain range; to the west, a section of that range; and in various directions, numerous less elevated prominences within a radius of twenty to thirty miles. Oak hill commands a view no less extensive and interesting. A broad, beautiful landscape view ten miles in extent, checkered with forest and field and dotted with farm-houses, are seen from the belfry of the Braintree hill meeting house."

As H. Royce Bass indicates, Braintree is defined in great part by its natural landscape. Braintree residents value open, working lands that are hospitable to both recreation and outdoor work. It is essential to the community that this landscape be protected as it is the fundamental cornerstone to why residents choose to live in Braintree. Residents want to maintain the quality of their landscape for the future, to protect the natural world they value, while

allowing the land to be worked safely and harmoniously.

The landscape helps guide the way Braintree residents live in the community as well. Residents value the rural tradition of neighbors helping neighbors, where the commitment is not so much out of legality, but instead out of the desire to help one another. The community values the skills which develop from practical traditional rural living, skills which work with the land, and not against it. This practicality has shaped the way that Braintree has been developed over the life of the town. We are an active community that enjoys the outdoors and values the natural environment for work and for recreation.

Braintree is unique in that it has no defined village center. H. Royce Bass notes that "*the position of Braintree is not favorable to the growth of large villages within it*", as such residents utilize the businesses and services in nearby Randolph and Northfield. Braintree is primarily a "bedroom" community where residents commute out of town for work. Because of this lack of a defined center, Braintree remains almost entirely rural in nature, which makes its character that much more

unique and desirable to those that live here.

Bass's image of Braintree, while still accurate in its capturing of the rural nature of the community, does not entirely reflect Braintree in the present. During the period of time when Bass described the community, most residents made their living off of the land and stayed in the community. While the rural character of the town remains, the nature of farming in Braintree has changed and most residents no longer make their living working on the land. Much of the community works outside of Braintree. However, residents continue to derive a great deal of satisfaction from the working landscape. Hunting, gardening, small-scale farming creates a daily connection with that the community values greatly.

As described above (and visually represented in photographs), Braintree is located in a very beautiful section of Vermont and its residents are blessed with a high quality of life attributable to its rural scenic environment and the rural way of life. This updated plan helps sustain and protect residents' daily connection to the land and community while providing guidance for appropriate growth and development.

D. General Planning Goals

Braintree is a beautiful, scenic rural and village community that provides the opportunity of a lifestyle valued by its citizens. The citizens of Braintree desire to preserve that lifestyle through a town plan that provides for growth in a manner that will sustain and protect the rural and village environment that supports it.

In an effort to preserve the community's rural character, and to promote a safe, healthy, pleasant and manageable environment, the plan has the following over-arching goals:

1. To protect the rural character of Braintree in order to maintain quality of life for its citizens.
2. To encourage the availability of safe and affordable housing that respects the rural landscape;
3. To protect existing and future high quality water resources;
4. To maintain an affordable, sustainable and high quality school system;
5. To provide residents with an adequate and energy efficient road network that protects the scenic environment;
6. To encourage and maintain outdoor recreational opportunities;
7. To protect historic landmarks and culturally significant places;
8. To encourage and support small scale businesses; that are appropriate for the rural landscape;
9. To ensure that the rate of growth does not exceed the ability of Braintree to provide the community with the necessary resources, facilities and services.
10. To provide an energy section which analyzes the Towns current energy use, scarcities costs, and problems as well as sets targets to help guide energy conservation as well as increased renewable energy use

II. Demographics

The demographic nature of a town tells the reader a great deal about who the town is and what trends define its direction. To get a real-time snapshot of the town it is important to have the most up-to-date data available. In the case of this Town Plan, we have used the most up-to-date data available from the US Census and American Community Survey, or more recent state-level data whenever possible.

A. Population

Population, when considered in term of past, present, and future growth patterns and trends, comprises an important factor in the development of Braintree. Rapid or unanticipated growth can create a demand for new and expanded municipal services straining the financial ability of the Town to provide public services economically or equability. This is particularly true when new residents are of school age and schools are at or near capacity. Accordingly, it is in the public interest to monitor population changes and to direct these changes in a manner that does not burden the Town's ability to provide services. Outlined below are some basic population statistics for the Town of Braintree compiled by the U.S. Census Bureau and the UVM Center for Rural Studies.

According to the data in figure 1, Braintree's year 2010 population numbered 1246 compared to a population of 1194 in 2000, resulting in an increase in population of over 4%. During the same seven-year period, Orange County also experienced an increase in population, but it was only 2.5%.

Like much of Vermont, Braintree's population increased during the decades between 1970 and 2000. However, a number of Braintree's neighbors lost population during the last decade (2000-2010) while Braintree continued its moderate growth. The primary factor influencing population growth was new residents moving into Braintree, rather than unusual rates of birth or death.

Unlike many Vermont communities, though Braintree is rare in that it has surpassed the population peaks of the mid 1800's. Vermont on the whole experienced a massive exodus of citizens in the late 1800's and most rural communities have never reached those peaks again. This likely speaks to the appeal of Braintree's landscape and the opportunities for employment that is available in nearby communities.

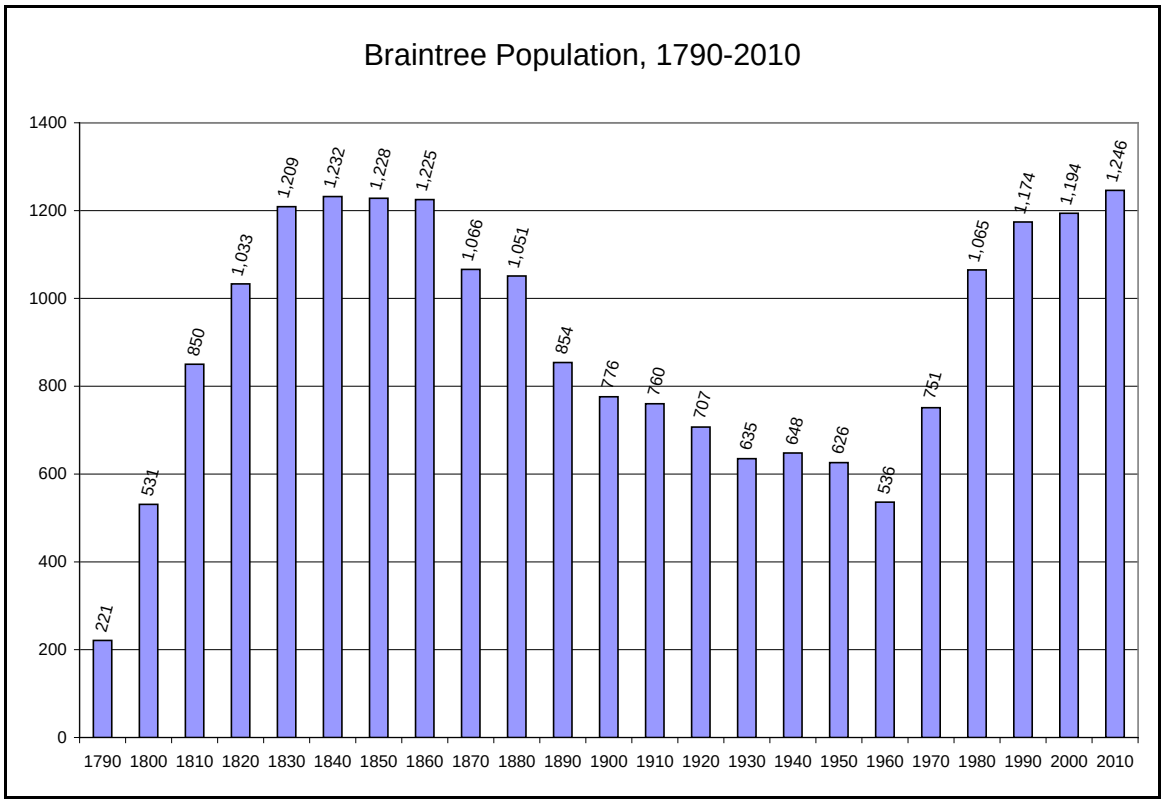


Figure 1: Braintree Population, 1790-2010 (*Source: UVM Center for Rural Studies/US Census*)

Population Growth, Braintree and Surrounding Area				
	1980	**1990**	**2000**	**2010**
Brookfield	959	1,089	1,222	1,292
% Change		*13.50%*	*12.21%*	*5.72%*
Braintree	**1,065**	**1,174**	**1,194**	**1,246**
% Change		***10.23%***	***1.70%***	***4.35%***
Granville	288	309	303	298
% Change		*7.29%*	*-1.90%*	*-1.65%*
Randolph	4,689	4,764	4,853	4,778
% Change		*1.59%*	*1.86%*	*-1.54%*
Rochester	1,054	1,181	1,171	1,139
% Change		*12.04%*	*-0.87%*	*-2.73%*
Roxbury	452	575	576	691
% Change		*27.21%*	*0.17%*	*19.90%*

Figure 2: Population Growth, Braintree & Surrounding Area, 1980-2010 (*Source: US. Census*)

Population Projections			
	2005	**2010**	**2015**
Brookfield	1,272	1,308	1,338
Braintree	**1,200**	**1,201**	**1,208**
Granville	317	325	331
Randolph	4,849	4,845	4,855
Rochester	1,168	1,162	1,156
Roxbury	610	636	637

Figure 3: Population Estimates, Braintree & Surrounding Area (Source: MISER, 2003)

In 2003, the Massachusetts Institute for Social and Economic Research (MISER) created population projections for Vermont (Figure 3). Population projections are functions of two components; an estimate of natural changes in population that considers births, deaths, and estimates of migrations - people moving in or out of the community. These projections have generally proven to over-estimate the amount of population growth in the Braintree area with the exception of Roxbury and Braintree, which both exceeded the 2010 population estimates.

B. Age of Population

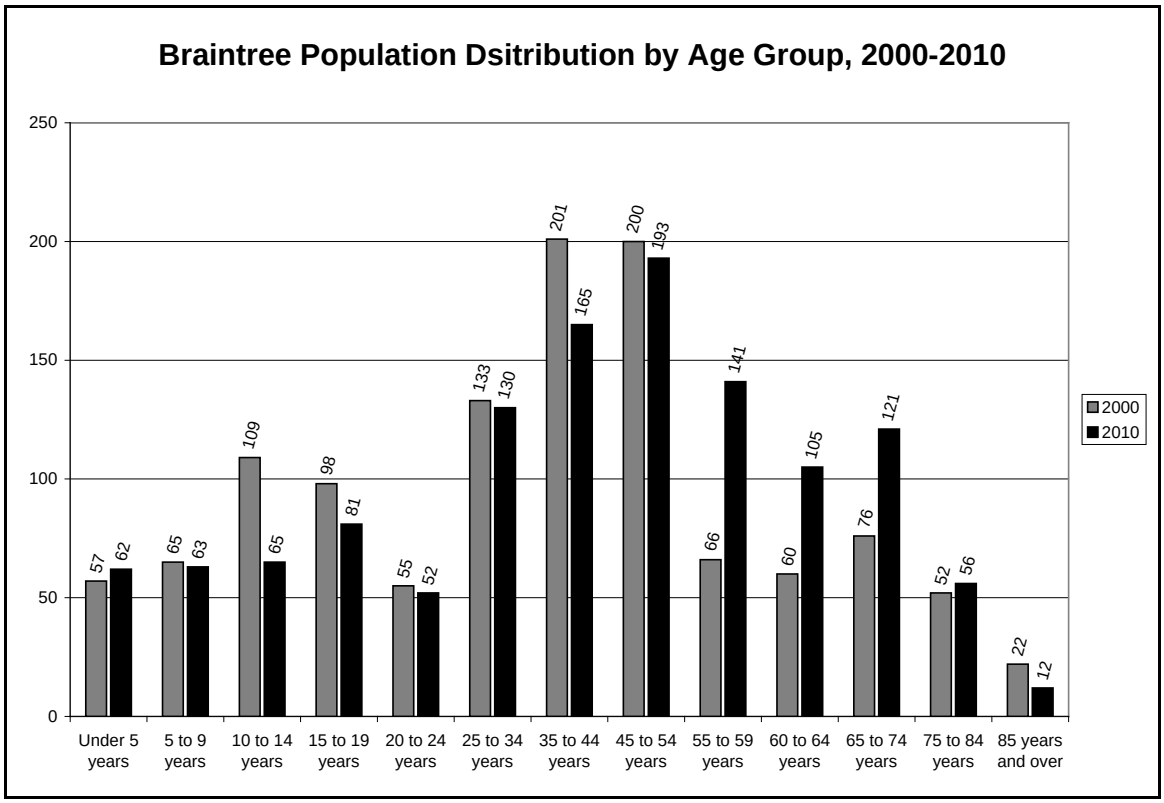
In general, the age of Braintree's population is similar to that of Vermont as a whole, with much of our population over the age of 35. Unlike many Vermont towns, Braintree did not experience a dramatic loss of young adults between 2000 and 2010. In the 20-24 age group, Braintree only lost 5% of its population. In the 25-34 age cohort, the loss was similar. This could be attributed to Braintree's proximity to Vermont Technical College and nearby communities with good employment opportunities.

The loss of young adults (generally between the ages of 25-35) has been a concern throughout Vermont during the past decade. Often referred to as a "brain drain" the out-migration of young adults raises concerns on both economic and social levels. Without a talented and well-educated pool of young workers, there are worries that the state will find it increasingly difficult to attract and retain well-paid jobs, which in turn can have serious repercussions for the state's capacity to raise tax revenues and pay for essential services. Young adults who leave their rural communities often do so because communities lack the resources commonly sought after by people of their age group, such as reliable high speed internet access, clear cell phone reception and opportunities for social interaction with others of their age group.

According to the Department of Economic Development's (DED) 2007 Report "Growing Vermont's Next Generation Workforce", Vermont ranks at the bottom nationally for the percentage of its citizens between the ages of 25 and 29, and at the top in the percentage aged 50-54. While it is common, and perhaps desirable, for young adults to venture beyond their home state after college, the biggest concern is that many are not returning. During interviews for the DED report in 2007, young adults explained that their primary

reason for leaving Vermont was to find better paying jobs. Likewise, the biggest hurdle for young adults wanting to return to Vermont was the availability of well-paying jobs and affordable housing.

However, it should be noted that those young adults who choose to return to, or relocate to, Vermont have indicated that their primary motivation for moving to Vermont is the lifestyle associated with the working landscape. Outdoor recreation, agriculture and the importance of community often encourage these citizens to return, but in Braintree this does not appear to be the case.



In another trend that mirrors statewide trends, Braintree also has an aging population. In 2010, 15% of the population was over 65 years of age, which is marginally higher than Orange County (14.8%) and Vermont (14.6%). However, what is of note is the increase in the number of residents age 55 and older between 2000 and 2010. In this decade, Braintree added 159 individuals aged 55 years or older, an increase of 57.6%. This trend was supported by the age of residents who responded to the Planning Commission's 2010 survey, 58% of which indicated they were over the age of 55.

Vermont also has the lowest birth rate in the nation (10.4 births per 1,000 of population, compared with 14.2 for the U.S[2]) which, when coupled with immigration of residents

[2] Number of Births per 1,000 Population. Centers for Disease Control and Prevention, National Center for Health Statistics. 2006.

over 55, results in an aging population that will need services that are not readily available in a town like Braintree. The need for elderly housing will increase.

III. Economic Development

A. Braintree's Past Economy

Economic growth and change is another factor that affects community development and future land use. During the early nineteenth century, Braintree evolved as a small community, largely independent of economic forces from the outside. There was a strong dependence on the local agriculture based sheep farming economy. Most persons worked within the Town as roads were unimproved and traveling was often difficult. Most manufacturing and small mills were located along the major streams where waterpower was readily available. Life was one of large families and self-subsistence.

Beginning in the late nineteenth century and on into the early years of this century, the trend of prosperity and economic stability began to change. The once successful hillside sheep farmers could no longer be assured of a market for their wool. The people of Braintree became frustrated with working the rocky soil hillside of the farm and headed for more fertile land in the Midwest. Once open land then began to revert to brush and, finally, to trees. At this time, there was a massive migration of people leaving Braintree and Vermont for better economic opportunities.

This trend of population decline lasted until about 1970, when, according to the U.S. Bureau of the Census, population just about equaled the 1900 census count. During this period of population decline, land values remained relatively stable. In the mid-1960's, however, the construction of the Interstate system made Vermont more accessible to outsiders interested in relocating or purchasing vacation homes.

With the loss of many of its farms, and the small mills and manufacturing enterprises, Braintree is no longer an independent community. Due to the complexities of modern society and the strong influences of state and national economic policies and activities, Braintree's economic future will continue to be determined largely by factors outside of its direct control.

B. Braintree's Present Economy

Unlike many of its neighbors, Braintree lacks a key element essential to a strong community economy – a village center. Without a village center, residents utilize neighboring communities (primarily Randolph) as the location for many services, including banking, professional, and health services. When asked if they commute to work, over 80% of the respondents to the survey indicated they commute to areas outside of Braintree. The majority of them commute to Randolph, Bethel and the Montpelier

area. Braintree is a bedroom community in that a major portion of its working resident population is employed outside of the community. While the community supports a strong local economy, this lack of a village center is a barrier that cannot be surmounted. But, the town recognizes that improvements to communication infrastructure such as high-speed internet and cell phone service may allow residents who are currently commuting to telecommute. Any opportunity to improve these services would have the support of the town.

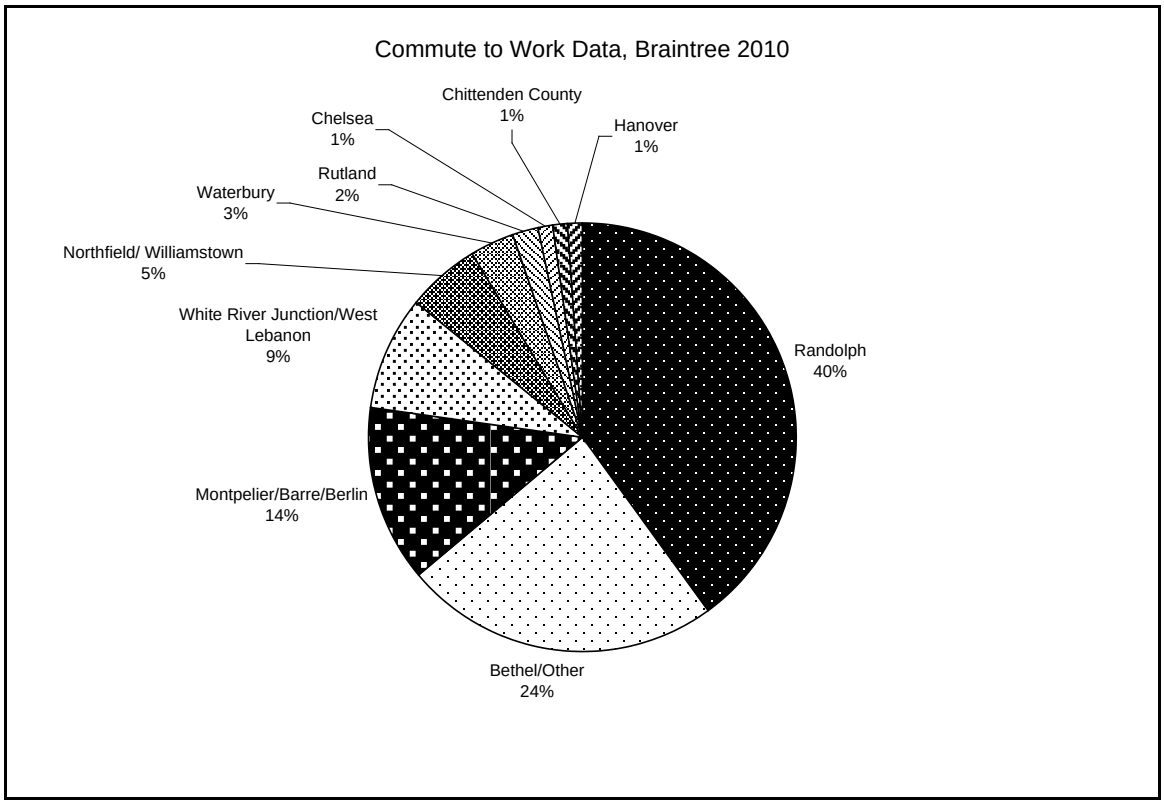


Figure 4: Commute to Work, Braintree 2010 (*Source: Braintree Community Survey, 2010*)[3]

Despite this fact, the community continues to do what it can to support the development of small business enterprises within the Town that employ area residents. 15% of the respondents to the 2010 Braintree Community Survey who are working indicated that they work in town. Most commercial development in Braintree is of a scale that is appropriate in the rural countryside, and is consistent with this plan. Through sensible planning and good land use regulations these enterprises are located throughout Braintree and are found in the hamlet areas as well as on farms and in private homes.

The community will continue to encourage the development of small businesses as long as they do not negatively impact the rural character of Braintree and are at a size and scale that live harmoniously with surrounding homes and other businesses. Businesses in town should not put an undue burden on community services, in particular roads.

[3] Note that the totals collected in the Commute to Work Data exceed 100% because respondents were allowed to select multiple commute locations. Some people commute to multiple places.

Commercial development that requires trucking and freight handling should only locate on roads which can effectively handle the size of vehicle needed, and should not have an adverse impact on the rural nature of the community.

C. Employment Characteristics

Population, employment characteristics, and housing trends are factors that are considered when planning for economic development. As previously noted, Braintree has no center of commerce, and therefore a majority of residents commute outside of town for employment. Braintree is not the self-sufficient employment center that it was in the 19th century. Even though the advances of the technological age of computers, automobiles, telecommunications and other conveniences have allowed for some residents to work from their homes, many Braintree residents commute to surrounding communities.

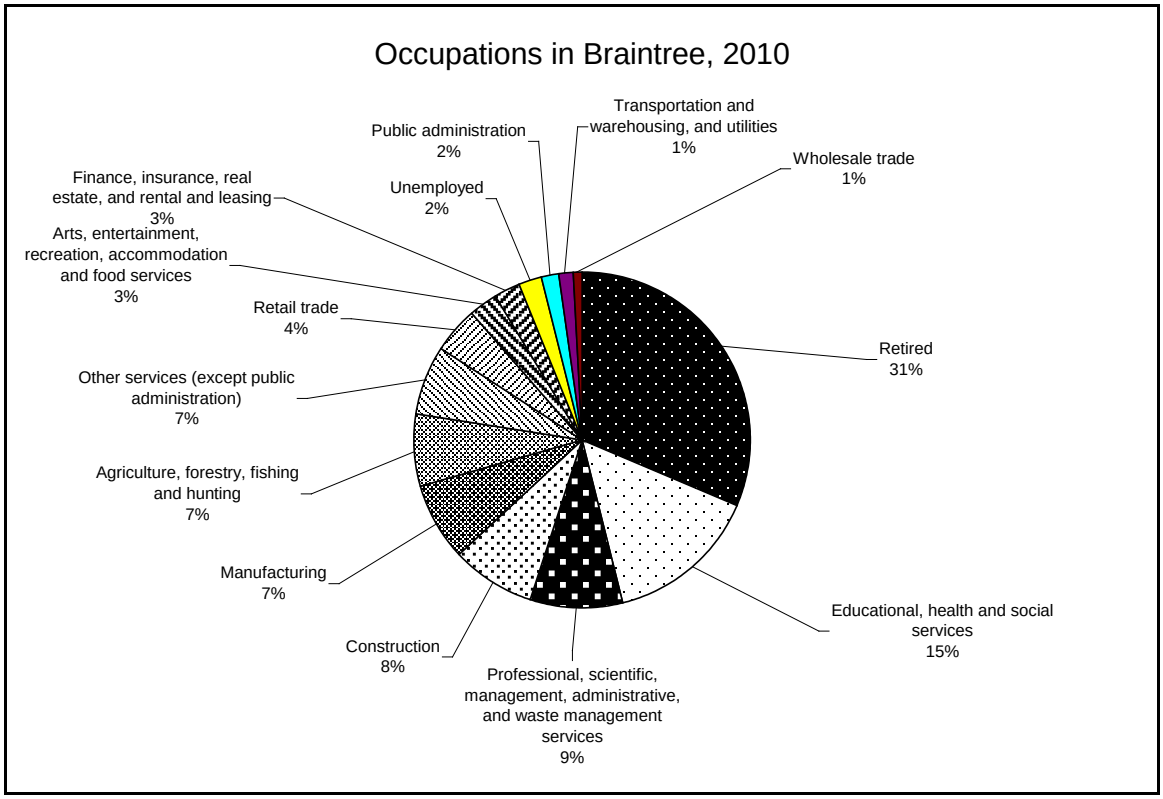


Figure 5: Occupations in Braintree, 2010 (*Source: Braintree Community Survey 2010*)

Responses to the 2010 Braintree Community survey indicate that a substantial amount of Braintree citizens are retired, which is supported to some extent by 15% of the population being 65 years or older. Utilizing the sample of occupations in the 2010 Braintree Community Survey, it is logical to assume that the population employed in "educational, health and social services" most likely work in Randolph at either Gifford Medical Center or Vermont Technical College, two of the area's largest employers.

D. Income of Population

The Vermont Department of Taxes annually publishes *Vermont Tax Statistics,* which includes a summary of personal income tax returns filed with the State. In 2009, six hundred and three (603) income tax returns were filed from residents in Braintree. Eleven hundred and ten (1110) exemptions were claimed. Total adjusted gross income reported for Braintree residents was $21,480,880. Based on the information below, Braintree's average adjusted gross income per family is lower than most of its neighboring communities.

2009 Income Data, Braintree and Surrounding Area			
Town	**# of Returns Filed**	**Total Adjusted Gross Income**	**Average Gross Income**
Brookfield	574	$31,187,349	$54,333
Braintree	**603**	**$21,480,880**	**$35,623**
Granville	166	$5,403,548	$32,551
Randolph	2,150	$92,825,596	$43,175
Rochester	583	$25,935,336	$44,486
Roxbury	319	$14,168,258	$44,415

Figure 6: 2009 Income Data, Braintree and Surrounding Area (*Source: VT Dept. of Taxes*)

For 2009, 43.5% of the total family income generated in Braintree was by filers earning $30,000 or more and 56.5% were earning less than $30,000. The US Census Bureau sets the national poverty level on an annual basis. In 2009, the poverty level for a family of four was $22,050 in income. During that year, between 209-259 (roughly 35-40%) of the 603 filers in Braintree reported an income below that threshold.

According to the Vermont Department of Taxes, Braintree's average adjusted gross income per family in 2000 was $30,601. Since 2000, this figure has risen an additional 16.4% to $35,623. Braintree's income in 2009 was lower than the Orange County average gross income of $44,169. The percentage of growth since 2000 of Braintree's average gross income (16.4%) was substantially less than Orange County (30%).

E. Goals, Policies and Recommendations

Goals

1. To encourage the creation of new and improved job opportunities while maintaining the rural character and natural environment in Braintree.

2. Support the maintenance of existing businesses and the development of new businesses in Town including home-based businesses.

3. To nurture a strong and diverse regional economy that provides satisfying and rewarding employment opportunities for residents while maintaining environmental standards.

4. To strengthen and maintain the Town's agricultural and forest economies and to ensure continuance of Braintree's rural character.

Policies

1. It is the policy of the Town to protect the long-term viability of natural resource based industries by preserving rural open spaces and through good stewardship of the land.

2. It is the policy of the Town that economic development activities shall occur in harmony with the Town's historic physical environment, and traditional development pattern.

3. It is the policy of the Town that non-agricultural development shall be directed away from prime agricultural to marginal soils.

4. It is the policy of the Town to cooperate with neighboring towns, regional planning commissions, and economic development groups to plan for and maintain a balance between the type and number of jobs created and population growth in the region.

5. It is the policy of the Town to support the development of local enterprises that create markets for locally produced goods and services.

6. It is the policy of the Town to encourage new business development in appropriate locations where services such as roads, fire protection, and power supply are available or planned.

Recommendations

1. The town should look into applying for state village designation for West Braintree and East Braintree.

IV. Housing

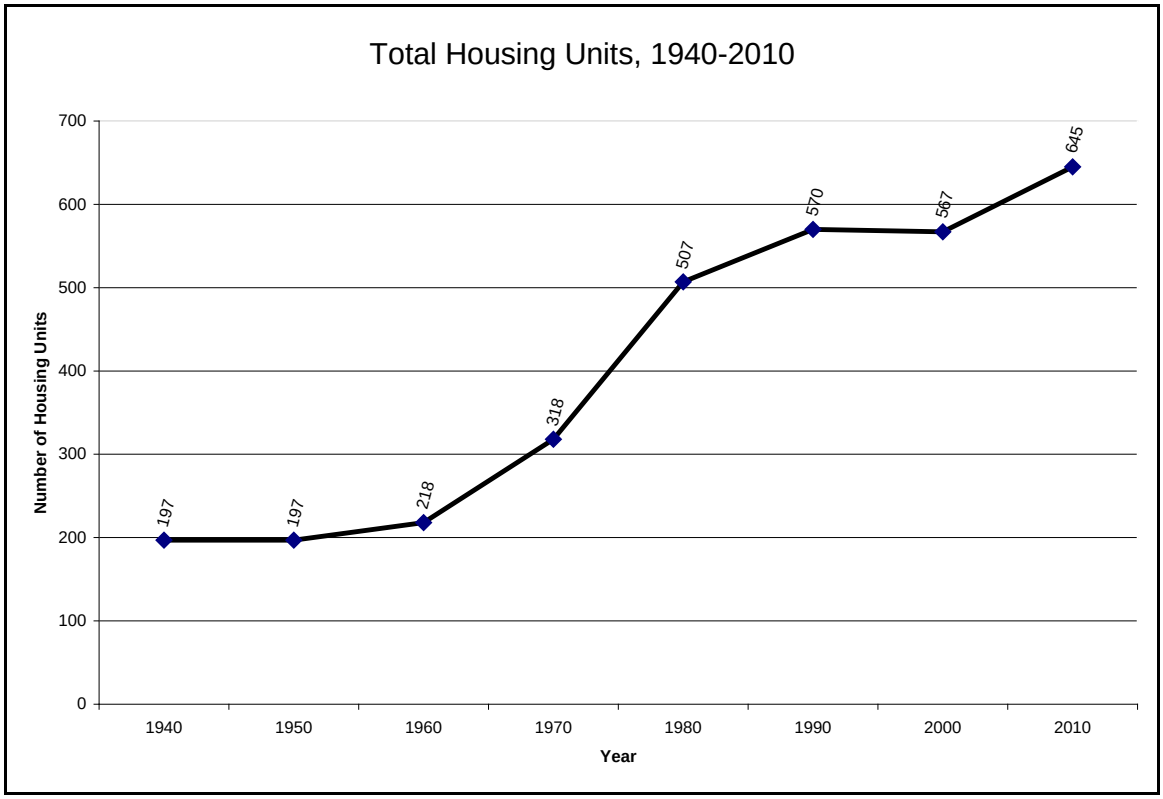


Figure 7: Total Housing Units, 1940-2010 (*Source: US Census*)

Many towns in New England have experienced rapid economic growth and residential sprawl over the last 40 years. Quite often, their present appearance bears little resemblance to the historical development of the town. While Braintree has not yet experienced a great deal of dislocated development, residential development has been rising over the past decade, indicating that the potential pressures for such development are present. A key element in the character of the Town is its housing - the quality, availability and variety of places for its residents to live. Housing has a large influence on the rate and direction of business and commercial growth.

A major goal of this plan is to encourage planning that meets two important community objectives:

1. To encourage, safe, energy efficient, adequate, and affordable shelter for present and future populations; and

2. To have a density and distribution of housing throughout the town that allows for the continued maintenance of the working landscape.

Although the provision and maintenance of a town's housing stock is primarily a private sector activity, the growth and development of housing affects the environment of the town and the facilities and services it provides or will provide. Housing constructed in the absence of adequate planning for public facilities can overburden schools, soils important to safe sewage disposal, roads, and other municipal services. Poorly located housing can pollute a water supply or destroy an important wildlife habitat. Housing outside of village centers requires that residents spend a large part of their income on driving, decreases the ability of public transit to serve the residents, and is hard for seniors or others that cannot drive. Housing that is inadequate to meet the demand in a town or region can strain adjacent towns and prevent people from living close to their jobs.

A. Housing Profile

According to the U.S. Census, there were 645 housing units in Braintree in 2010 (see figure 7). In 2000, there were 567 housing units. This amounted to an increase of 78 units or 13.7% over the ten year period or an average of almost eight units per year. A housing unit, as defined by the U.S. Census, includes houses, apartments, mobile homes, and rooms for occupancy. The majority of Braintree's homes are owner-occupied with less than 25% either being rented or used for seasonal, recreational or occasional use (second homes).

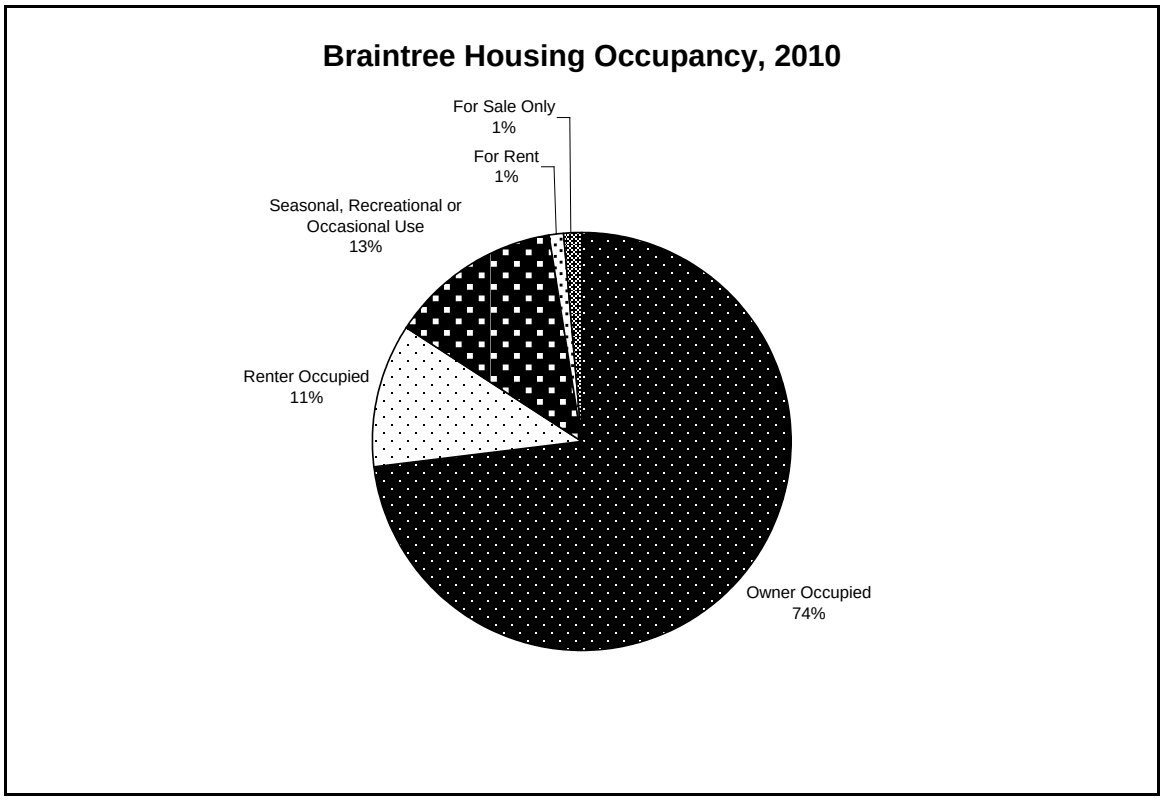


Figure 8: Braintree Housing Occupancy, 2010 (*Source: US Census*)

As is the case for most Vermont towns, the bulk of Braintree's housing units comprise of single-family homes. Braintree also has a fairly high percentage of mobile homes (18%), most of which are located in the Mobile Acres mobile home park. When compared to the neighboring towns of Roxbury and Granville, however, this percentage is comparable.

The percentage of second homes (13%) in Braintree is substantially less than the neighboring towns of Brookfield (19%), Rochester (30%) and Roxbury (27%). Only Randolph (4%) has a smaller percentage of second homes. 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, communities which have volunteer fire department depend 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. Fortunately, this is not an area of concern in Braintree.

The low percentage of homes that are currently unoccupied (for sale or for rent) indicate that in 2010 Braintree was experiencing a shortage of available housing stock. Anything below 5% is functionally considered a zero.

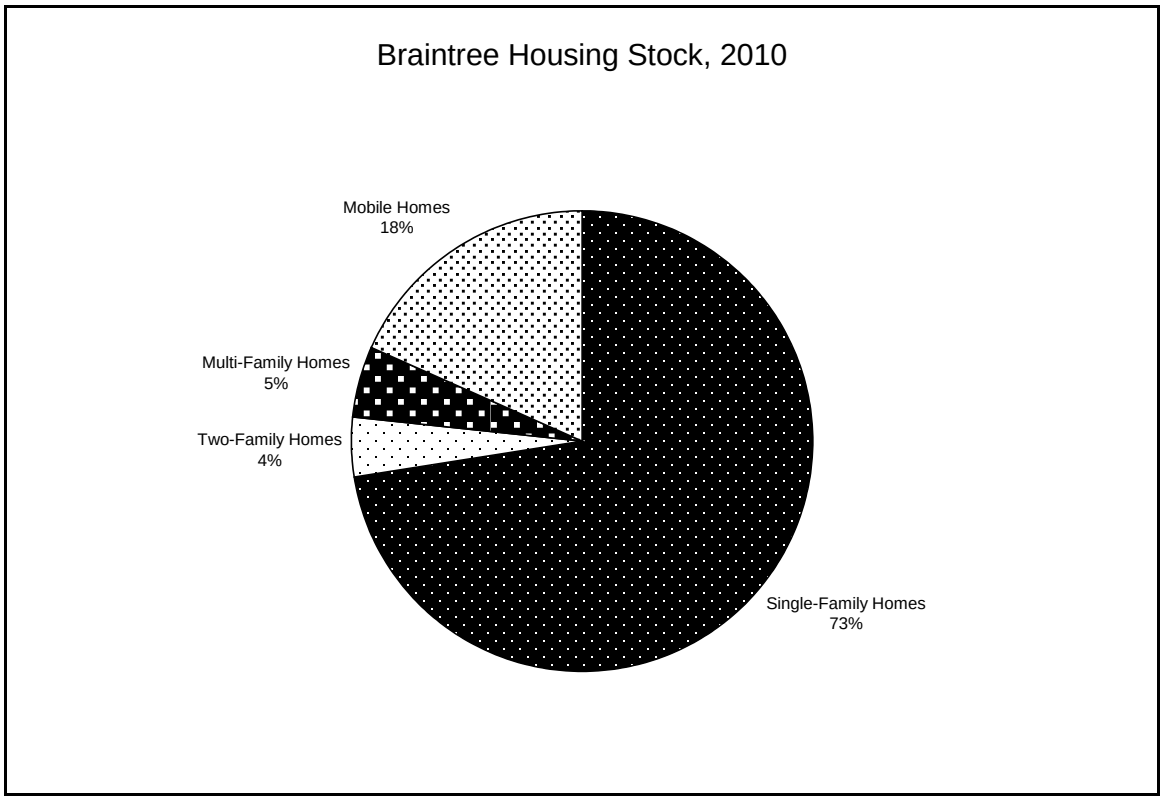


Figure 9: Braintree Housing Stock, 2010 (*Source: US Census*)

B. Rental Housing

Only 11% of Braintree's housing stock in 2010 were rentals. The tight housing market and lack of unoccupied apartments continues to drive up rental costs. In 2000 the US Agency of Housing and Urban Development (HUD) calculated the fair market rent for a modest two bedroom apartment in Braintree at $571 per month. In 2011, that cost had risen 50% to $859. In order for a renter in Braintree to be able to afford rent at this rate, he/she would have to make roughly least $25,000 annually[4]. Given that 42% of Braintree's households make $25,000 or less, it is likely that it would be difficult to find affordable rental housing in Braintree.

C. Affordable Housing

Price of Residential Homes* in Braintree and Surrounding Area (2000 and 2010)

		2000 # Sold	2000 Average	2000 Median	2010 # Sold	2010 Average	2010 Median
Brookfield	Under 6 Acres	5	$83,700	$86,000	2	$193,574	n/a
	6 or More Acres	5	$63,300	$4,000	7	$196,128	$210,000
Braintree	**Under 6 Acres**	**6**	**$151,766**	**$90,000**	**9**	**$192,740**	**$151,000**
	6 or More Acres	**2**	**$100,000**	**n/a**	**2**	**$192,000**	**n/a**
Randolph	Under 6 Acres	43	$106,416	$95,000	31	$121,151	$125,000
	6 or More Acres	17	$159,918	$150,000	15	$244,306	$175,000
Rochester	Under 6 Acres	10	$80,431	$76,000	8	$108,751	$117,500
	6 or More Acres	1	$100,000	n/a	2	$143,750	n/a
Roxbury	Under 6 Acres	6	$70,000	$71,000	3	$51,276	$72,000
	6 or More Acres	3	$88,906	$97,000	4	$113,750	$87,500

Figure 10: Price of Residential Homes in Braintree and Surrounding Area (Source: VT Dept. of Taxes)
* Data does not include mobile home sales

During the past decade housing prices have dramatically increased statewide. This is illustrated in figure 10 which compares the price of residential homes in 2000 with 2010. In 2000, the average sale price for a primary residence (not including mobile homes) on six acres of land or less in Braintree was $151,766; by 2010 that value had increased almost 30% to $192,740. In 2010, the median price of a residential home under six acres was the highest of surrounding communities where median data could be collected.

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

[4] Estimate based on American Community Survey data 2005-2009

Property values in Braintree have increased 30%. This, coupled with the mortgage crisis of 2008, has made it much more difficult for someone making an average wage to afford a home in Braintree. The increase of property values is not unique to Braintree, this trend is consistent with that of the State of Vermont. In its annual publication "Between a Rock and A Hard Place: Housing and Wages in Vermont", the Vermont Housing Council notes that the median purchase price of a primary home in Vermont in 2010 reached $195,000. A Vermont household would need an annual income of $58,000 as well as $16,000 in cash (for closing costs and a 5% down payment) to purchase a home at that price. It should be noted that the housing market has changed substantially over the past decade due to the national recession. While housing prices have not dropped dramatically in the last decade, income and employment opportunities have dramatically decreased, making housing even less affordable.

The cost of housing has been driven up in great part due to the tight housing market. As is noted in Figure 9 in 2000 Braintree's vacancy rate was only 1% which is consistent with the rest of the State and, according to "Between a Rock and A Hard Place", the lowest in the nation.

Braintree, like many communities, has experienced a trend toward fewer home occupants. This trend is unlikely to be reversed. The trend results in an increase demand for housing. The elderly, single households and other special populations are oftentimes in need of special types of housing including that which is affordable and readily accessible.

Because of the lack of affordable housing, the community needs to encourage what opportunities for affordable housing do exist. Mobile Acres, Braintree's only mobile home park, offers residents the ability to have a home at a reasonably affordable price. This establishment is consistent with the character of the community, and supports Braintree's desire to provide affordable housing.

Another barrier to affordable housing is the age of homes in Braintree. "Between a Rock and A Hard Place" points out that on the whole, "Vermont's housing stock is among the oldest in the United States. 63% of owned homes and 74% of rentals in Vermont were built in 1979 or earlier, before newer energy efficiency technology was available, housing codes were more lax and the use of lead based paint was wide-spread. These factors make an important impact on the cost of operating housing, assuring the health and safety of all residents, and providing access to Vermonters with different abilities."

The up-front cost of energy efficiency improvements and building-scale renewable energy generation remains a challenge. Despite the demonstrated long-term savings benefits, the capital needed to significantly reduce energy consumption and add renewables can be a significant barrier to implementation. When surveyed as part of the East Central Vermont Sustainability Project, 39.5% of those who responded indicated that they could not afford to make their home more energy efficient. Another 33.8% were unable to make energy efficiency improvements because they rent instead of own.

Cost is an issue for all homeowners, but especially for low- and moderate-income homeowners, since cost is a social equity issue. At the commercial and public sector levels, capital and operating budgets are often set independently of each other.
Current financing programs include:

1. Vermont's Heat Saver Loan: http://heatsaverloan.vermont.gov/

2. Property Assessed Clean Energy (PACE) - available for towns that have adopted a PACE district. Repayment of PACE financing is tied to the property, not to the owner.

3. Neighborworks of Western Vermont Energy Loan: https://www.nwwvt.org/energy-loan/

4. Vermont State Employees Credit Union VGreen Energy Savings Solutions loans: https://www.vsecu.com/energy-savings/about/about-vgreen/what-is-vgreen

5. Vermont Economic Development Authority offers energy loans to commercial enterprises http://www.veda.org/financing-options/vermont-commercial-financing/commercial-energy-loan-program/
and small business https://www.veda.org/financing-options/vermont-commercial-financing/small-business-energy-loan-program/

6. United States Department of Agriculture Section 504 Home Repair Program https://www.rd.usda.gov/programs-services/single-family-housing-repair-loans-grants

7. Efficiency Vermont rebates for central wood pellet furnaces and boilers- $2,000 cash back https://www.efficiencyvermont.com/rebates/list/central-wood-pellet-furnaces-boilers-residential

These financing programs offer key features such as great interest rates and, flexible terms, and ease of application. The loans can also be combined with Efficiency Vermont incentives.

D. Elderly Housing

Section B of Chapter 1 discussed Braintree's trend toward an aging population. The Baby Boomers (people born between 1946 and 1964) are beginning to retire, and the oldest ones will be 84 in 2030. This shift in demographics will put added pressure on an already tight housing market. Expanding health care costs may leave seniors with even less money to spend on housing.

As the elderly (citizens aged 65 or older) become less comfortable with the tasks involved in managing their own home, they often turn to some sort of elderly housing. If health is an issue and some form of constant care is required, seniors will need to enter a nursing home or a residential care facility. As is indicated in Figure 11, there are very few options in Braintree or the surrounding area for this type of care. Elderly Braintree residents in need of full-time care are forced to move away from their community. This is, of course, not just a local issue. There is a lack of elderly housing throughout the State of Vermont.

Nursing and Residential Care Facilities , 2011 Total beds by provider type, by town.			
	Nursing Care Level II	Residential Care Level III	Residential Care Level IV
Brookfield	0	0	0
Braintree	**0**	**0**	**0**
Randolph	30	18	0
Rochester	0	0	0
Roxbury	0	0	0

Figure 11: Nursing and Residential Care Facilities, 2011
(Source: VT Dept. of Independent Living)

Within Vermont there are several types of elderly care facilities which are subject to State regulation, nursing homes and residential care facilities. Nursing homes provide nursing care and related services for people who need nursing, medical, rehabilitation, or other special services. They are licensed by the state and may be certified to participate in the Medicaid and/or Medicare programs. Certain nursing homes may also meet specific standards for subacute care or dementia care. Residential care homes are state licensed group living arrangements designed to meet the needs of people who cannot live independently and usually do not require the type of care provided in a nursing home. When needed, help is provided with daily activities such as eating, walking, toileting, bathing, and dressing. Residential care homes may provide nursing home level of care to residents under certain conditions. Daily rates at residential care homes are usually less than rates at nursing homes.

The Vermont Department of Disabilities, Aging and Independent Living classifies residential care homes in two groups, depending upon the level of care they provide. Level III homes provide nursing overview, but not full-time nursing care. Level IV homes do not provide nursing overview or nursing care. Nursing homes, which have full time nursing care, are considered Level II. At present, there are no options for elderly care located in Braintree. The nearest options are in Randolph (Number of beds: 30 Level II, 18 Level III) and Northfield (Number of beds: 50 Level II, 85 Level III, 0 Level IV). However, given the size of the populations in both Randolph and Northfield, it is likely that there is a large population waiting for vacancies at these locations.

Locally, the Park House of Rochester offers Park a shared living residence, with no onsite medical care. Park House is equipped, primarily, to serve the needs of people over age 60. Residents have their own bedroom furnished with their own furniture and either a private or semi-private bathroom. Meals are served in the Park House's common area. There is a regular waiting list for individuals wanting to reside in the Park House.

In the Vermont Housing Finance Agency's issue paper "Housing and the Needs of Vermont's Aging Population", it is acknowledged that more seniors today want to "age in place," which means choosing to remain at home or in a supportive living community as they grow older without having to move each time their needs increase. Considering the

lack of availability of nursing homes in Braintree and Vermont as a whole, this may be the optimal way to address elderly housing in the future. Having the right housing includes the ability to stay active and engaged in community life, which is a great benefit not only to the individual, but to the community as a whole. Considering the high costs of housing in Braintree, however, aging in place in Braintree may not be an option that can be considered by older residents.

Several municipalities have benefited from planned retirement communities which provide for older persons. Innovative land use policies and controls to direct special needs are encouraged. Such land usages are best located in close proximity to existing hamlet centers where basic services are available and not in rural areas. As of the date of completion of this plan, Gifford Medical Center is undergoing Act 250 permitting for a 165 bed senior living community on a 26 acre campus in Randolph Center. If completed as planned, the campus would have independent living apartments, assisted living facilities and end of life care, all in one place. This facility, while not in Braintree, would serve the entire Central Vermont area.

E. Goals, Policies and Recommendations

Goals

1. To provide the opportunity for Braintree residents to have access to decent and affordable housing.

2. To encourage retention of existing housing and construction of new housing which meets population growth.

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

4. To encourage the creation of additional rental properties throughout Town, provided that they do not put an undue burden on Town services and facilities.

5. To encourage the use of accessory apartments.

6. Reduce the use of fossil fuels to heat homes.

Policies

1. It is the policy of the Town to ensure that the timing and rate of new housing construction or rehabilitation 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 accommodate housing that is permanently affordable for a mix of households having moderate, low, and very low incomes.

3. It is the policy of the Town to keep housing affordable by planning for appropriately sized lots, accessory apartments, and clustered developments, consistent with the desire to maintain its rural quality.

4. It is the policy of the Town to work with businesses and non-profit housing corporations to help Braintree better meet the demands for affordable housing.

5. It is the policy of the Town to encourage the provision of housing for special needs population, such as the elderly and physically handicapped.

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

7. 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.

8. It is the policy of the Town to support a town wide shift away from fossil fuel as a source for heat.

Recommendations

1. The Planning Commission should consider ways to reduce zoning restrictions to encourage the development of senior housing in appropriate areas.
2. The town should work with others to conduct outreach and education to inform both home owners and renters on available financing mechanisms for weatherization assistance, including information about the financial advantages of energy improvements.

V. Education

A. Introduction

Braintree is a member of the Orange Southwest Supervisory Union (OSSU) along with Brookfield and Randolph. Each town, through its School Board, governs its own elementary school. A High School Board, containing members from each of the towns, governs the High School and the Junior High School. Randolph Technical Career Center is governed by an interlocal Board, consisting of three representatives from Randolph Union High School, one representative from each of the sending towns and three other representatives from the business community. The members of these four boards constitute the OSSU Board. Several functions have been consolidated within the OSSU, such as accounting and purchasing. Curriculum is coordinated through the OSSU office.

B. Student Enrollment

Yearly Enrollment Braintree Elementary	
2010-2011	78
	-9.30%
2009-2010	86
	-8.50%
2008-2009	94
	-12.50%
2007-2008	107
	5.90%
2006-2007	101

Figure 12: Yearly Student Enrollment (*source: VT Dept. of Education*)

Enrollment at Braintree Elementary has been steadily declining since 2008, a trend that is mirrored by many of the surrounding communities. Several of Braintree's neighbors (Hancock & Granville) have chosen to close their small elementary schools due to declining enrollment and the increasing costs of education. The closing of a local school can be a difficult decision for a community as the local school often acts as a community center. In a town with no village center, this loss can be even more pronounced. Any decision to close down the school should be preceded by an extensive process of public discussion and outreach, and should only be considered if the school is no longer sustainable.

It should be noted that a majority of the students who attend Braintree Elementary reside in the Mobile Acres Mobile Home Park. This significant population of students makes Mobile Acres a key element of sustaining Braintree Elementary. Therefore, it is

important that the health and safety of Mobile Acres is protected. Any major loss of the population in Mobile Acres could be a harmful blow to the Elementary School.

C. Educational Facilities

Braintree Elementary School

Braintree's children aged 5-12 attend Braintree Elementary school, which was built on Bent Hill Road near Route 12A in 1992. The school was designed for a capacity of 150 students.

The school building is in good shape and has been upgraded in the past several years including the replacement of the roof. It does not need any significant improvements at this time. School budgets continue to be an important topic of discussion in Vermont communities as they are one of the largest energy users in town. To help reduce the fluctuation in variable cost for the school district the 2013 Thermal Efficiency Task Force's Report to the General Assembly notes "Investing in thermal efficiency improvements- primarily air sealing, insulation, and heating system replacements- can dramatically reduce heating energy use in a building"[5]. Similar to many other town own buildings, an energy audit of the building can help identify the specific investments that can be made to the building.

The Elementary School building is owned by the Town of Braintree. In the event that student enrollment declines beyond sustainability, the existing school building would become vacant. This facility could potentially become a new location for the Braintree Town office which eventually may need to move. This location might also be an appropriate location for senior housing. The priority, however, is to keep the Elementary School operating as long as possible.

Secondary Schools

Secondary school students attend Randolph Union High School. This facility was erected in 1956 and a Junior High School for grades seven through nine was added in September 1968. Costs for this school are apportioned to each town according to the number of students from each town. For the 2004-2005 school year Braintree sent 113 students to Randolph Union High School, making up 20% of the school's enrollment. The Randolph Technical Career Center was added to the above facility in 1971 and serves as the Vocational School for 19 towns in the Central Vermont area.

The secondary school buildings are modern facilities and are adequate for the near future. While the high school experiences growth, the elementary school populations decline.

[5] http://www.leg.state.vt.us/reports/2013ExternalReports/285749.pdf

D. Adult Education

The lack of a defined community center makes it challenging for adults to seek educational opportunities within the town of Braintree. Most adults take advantage of the opportunities that are available in Randolph as an alternative. These include:

Vermont Technical College (VTC) - Vermont Technical College is located in nearby Randolph Center. VTC is part of the Vermont State College system and offers full and part time educational opportunities that range from computer technology, to agriculture to health services. Attendees may choose a two-year program that leads to an associate's degree, a four-year program that leads to a bachelor's degree, or the college's one-year program that leads to a Practical Nursing certificate.

Randolph Technical Career Center (RTCC) – Located in Randolph village, the RTCC is part of Randolph Union High School. RTCC offers adult education courses that range from the traditional tech center focuses of mechanical and woodworking, to computer technology, small business management, bookkeeping as well as arts, crafts and languages. RTCC's adult education classes are open to all for a fee.

E. Childcare

An inventory of registered childcare facilities reveals that Braintree has a very limited amount of childcare available to the community. The State of Vermont has two classifications of childcare that are regulated, they are:

- Registered Family Child Care Home: A child care program approved only in the provider's residence, which is limited to a small number of children based on specific criteria.

- Licensed Program: A child care program providing care to children in any approved location. The number and ages of children served are based on available approved space and staffing qualifications, as well as play and learning equipment. A Licensed program must be inspected by the Department of Labor and Industry's Fire Safety Inspectors and must obtain a Water and Wastewater Disposal Permit from the Agency of Environmental Conservation. A Licensed program is considered a public building under Vermont Law. Types of licensed programs include: early childhood programs, school-age care, family homes and non-recurring care programs.

Childcare , 2011
Childcare providers, by town.

	Registered	Licensed
Brookfield	1	0
Braintree	**2**	**0**
Randolph	7	6
Rochester	0	1

Roxbury	1	2

Figure 13: Childcare Facilities, Braintree and Surrounding Towns, 2011
(*Source: VT Bright Futures Childcare System*)

There are currently only two registered childcare services in Braintree. Most residents currently arrange for care with relatives, or take their children to childcare facilities beyond the borders of Braintree to neighboring towns like Randolph. Because Braintree has such a small population of day care aged children, this lack of childcare may not be an area of concern for the community.

F. Goals, Policies and Recommendations

Goals

1. To encourage the creation of affordable childcare facilities that meet the established needs of residents in Braintree.

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

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

Policies

I. It is the policy of the Town to support efforts to keep Braintree Elementary School open as long as it does not put an undue burden on taxpayers

II. It is the policy of the town to support continued efforts to reduce energy use and supply electric and heating needs at the school from renewable energy sources.

III. It is the policy of the Town to support the private development of additional facilities to meet the childcare needs of its residents and may assist with seeking funding to develop these facilities.

IV. It is the policy of the Town to support private sector efforts to seek funding to assist with the development of childcare infrastructure. Ensure that no barriers to increasing childcare capacity are created by future changes in zoning regulations.

V. It is the policy of the Town that Land development which is likely to result in large numbers of school children must be phased or planned so as to not place an undue financial burden on the capacity of the Town to provide educational services.

VI. Utilities and Facilities

The provision of services and maintenance of facilities is one of the key roles of any municipal government. The cost of services and public facility maintenance can represent a substantial amount of a municipality's yearly budget (not including transportation, which is generally the largest portion).

G. Capital Budget and Program

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

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

At present, the town of Braintree does not have an adopted Capital Budget and Program to help guide investments in community infrastructure and equipment, although in June 2012 the Selectboard did pass a policy to develop such a plan. The Planning Commission may make recommendations to the Selectboard with regard to what capital investments should be considered annually.

H. Municipal Buildings

Braintree Town Offices

The Town offices are located at 932 Route 12A adjacent to the Town Garage, near the Braintree Randolph town line. The building, erected in 1978 and enlarged in 1995, has a walk-in vault for the storage of town records, a Town Clerk and Town Treasurer office area, an office used by the Lister, and a meeting room for the town officers used by the Administrative Assistant to the Selectboard, the Highway Supervisor, and the Zoning Administrator.

The Braintree Town Office building is aging and it is possible that the community will eventually have to find an alternative location or rebuild it entirely. In the next five years the most immediate repair that will need to be made to the Town Office is to replace the roofing material as it is nearly at the end of its life.

An energy audit was conducted on the Braintree Town Offices in 2010. The audit indicated that the best return on investment for this building would be to focus any investments on insulation and sealing the building envelope to restrict the inflow of colder air and replacing building's fluorescent lighting. It was estimated that the improvements that could be made to the building would cost approximately $10,000.

Braintree Town Garage

The town garage was built in 1973 and is located at the site of the former Town Barn on Route 12A near the Braintree Randolph town line. This facility provides storage for highway equipment. The former town barn is used for storing additional supplies.

There are concerns about the drainage around the Town Garage. Due to the slope and the poorly drained soils, it is common for water to infiltrate the building which can cause issues and creates a potential hazard if it is icy.

The Town Garage building had an energy audit in 2010 which identified priority areas of investment that would have a positive return. In particular, the improvements included sealing the building envelope and improving insulation, replacing the older furnace within five years, putting the school bus block heaters on timers and replacing the current fluorescent lighting. It was estimated that this effort would cost approximately $20,000-$24,000 to implement. As town maintenance vehicles need to be replaced and an increase in alternative fuel vehicles is readily available, one path to help reduce the operating cost and overall fossil fuel could be the purchasing of biofuel town vehicles.

Braintree Town Hall

The Town Hall is located on Route 12A in West Braintree. It was deeded to the Town in 1877. The first floor is used for town meetings and other community functions. In 1981, a new foundation was built and rotted sills were replaced and the downstairs windows were replaced with double-glazed windows. After much frustration over the need for water and sewage and more additional land for the Town Hall, the voters approved the purchase of an adjacent house and land in 1985. The house, being in a very dilapidated condition, was razed and the land used for a well and parking facility.

In 1987, the voters approved the spending of $40,000 to erect an addition to the Town Hall for modern kitchen and bathroom facilities. Braintree has been most fortunate to have had the Building Trades students of the Randolph Technical Career Center do this construction, which began in the Spring of 1988. The project was completed in the fall of

1990 by the Hearth and Heath Extension Homemakers Club funding for painting and floor covering.

Braintree does maintain a reserve fund to assist in the maintenance and upkeep of the Town Hall, but the amount of funding in this account is insufficient to meet the needs of the facility. The Town Hall is currently in need of a significant amount of repair and restoration, both structural and aesthetic. However, the building has not had an organized analysis that is required to set up a plan for repair, so the cost of any potential repairs is unknown at this time. Additionally, an energy audit should be conducted on this building as well.

I. Cemeteries

Braintree has eleven town maintained cemeteries. These cemeteries are managed by five commissioners elected at town meeting. These commissioners oversee the maintenance and burials in these cemeteries. There is adequate space available in the town maintained cemeteries.

J. Public Library

Braintree does not have a public library. Instead, citizens are encouraged to use either Kimball Public Library located in Randolph, Vermont or the library located in Randolph Center on the campus of Vermont Technical College. On a yearly basis, Braintree allocates funding to support Kimball Public Library. In 2010, the total amount allocated by special appropriation for the library was $6500.

K. Public Lands

Braintree has no public lands of its own, but there are opportunities for use of public land in neighboring communities. The Town of Randolph has several public forests, Allis State Park is located in Brookfield, and much of the Route 100 corridor is part of the Green Mountain National Forest.

When residents were surveyed in 2011, it was noted that a large tract of forestland on the border of Braintree and Granville which could potentially become a good recreational asset for the community if purchased. Over 60% of the respondents were in favor of the community exploring ways to conserve the parcel for public use.

Information collected in the 2011 survey supported the creation of a town Conservation Commission. After an affirmative vote by the citizens of Braintree, the Selectboard created and appointed members of a Conservation Commission in 2012. The

Conservation Commission could maintain a town Conservation Fund that could contribute to the purchase of lands for public use. For more information on Conservation Commissions, see section Chapter IX, Section J.

L. Public Sewer Systems

To date, there are no publicly owned sewer systems in the Town. Homeowners and businesses presently provide their own disposal system, most frequently consisting of a septic tank-soil leaching arrangement. Private septic systems are regulated by the State of Vermont under the Potable Water and Wastewater permitting program.

M. Public Water Systems

There is no publicly owned water system in the Town. Because of the high costs associated with the construction, operation and maintenance of community water systems, even with the aid of federal and state funding, Braintree will likely continue to rely on individual and/or private water systems. It is therefore critically important that all private water sources be protected from existing or potential contamination.

N. Communication Facilities

Telephone

Landline Communications - Most of the telephone related services in Braintree are still offered via the traditional telephone lines and poles (landline). Coverage over landlines in Braintree is provided exclusively by Fairpoint Communications, Inc.

Internet

Internet - There are presently five ways to access the internet in Braintree, they are: landline, DSL, cable, satellite and cellular internet.

Dial-up - Dial-up access is the most commonly available service 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, it is not practical for more than checking email. The faster and more stable options available to some residents are via cable, satellite, DSL and cellular services.

Cable Internet – Comcast offers internet through their existing cable TV system. Speeds are generally considered good for home users, and businesses can acquire higher speeds through business specific packages. Home cable internet can be subject to slow-downs at peak hours when many users are accessing the internet at the same time. Cable is most commonly available along main roads or near the Randolph town line, but not throughout Braintree.

DSL (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 Fairpoint Communications, but only within three line miles of the Fairpoint switching station in Randolph. Residents who live close to the Randolph town line are more likely to have DSL.

Satellite Internet - Provided by companies such as Dish Network, Direcway 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 location. 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.

Cellular Internet – With the growing amount of bandwidth available to smartphone users via cellular phone networks, cellular providers are offering the ability to utilize their network for internet access. The nature of cellular connections is such that they are less susceptible to disruption from weather conditions as is the case with satellite internet. However, a clear and strong connection to a cellular tower is required in order to utilize this service. The State of Vermont has put a substantial amount of support behind the notion of providing internet access via this medium to those areas that are currently underserved.

It is likely that as many as two-thirds of the households in Braintree have access to the internet only via landline or satellite modem. Because of the difficulties in convincing cable and DSL providers to extend their coverage areas, other towns 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 the past three years, East Central Vermont Community Fiber (EC Fiber) Network has approached towns in the Upper Valley and surrounding areas including Braintree. This organization has developed a long-term plan to extend fiber optic cable throughout the region. Fiber optic cables offer the fastest connection speed available. When asked to become an active participant in the EC Fiber project, the Town of Braintree declined.

Providing Braintree residents with access to fiber optic cables will allow the opportunity for telecommuting options. On average Vermonters drive 15 miles to work each way. Assuming a telecommuter works one day a week from home, with two weeks of annual vacation time, telecommuting could decrease round trip commuter travel by roughly 1500 miles per year per commuter. This also increases the desirability of homes for new families.

Cellular Communications

There are no cell towers located in Braintree, and coverage is poor at best. When surveyed in 2010 residents were asked if the town should “encourage the placement of

cell towers in Braintree"; 75% of the responses were in favor of this support. Braintree has a cell tower ordinance that guides the design of any towers that might be developed; however, any cellular provider who is creating a network of cell towers is exempt from local land use regulations under V.S.A Title 30, Chapter 5, §248a. While these facilities are exempt from local regulations, due consideration to the municipal plan is supposed to occur as part of the permitting process.

While residents are supportive of expanding cellular service within the community, they do not want to do so to the detriment of the rural character of the town. It would be inappropriate to site a cell phone tower in the following areas:

- Mud Pond
- Braintree Meeting House

Any cell tower that is proposed for development in Braintree must be designed so as to not have an undo impact on the rural character of the area in which it is located, this may be achieved by some of the following concepts:

- siting the tower below the ridgeline
- using stealth design to have it blend in with surrounding trees
- altering the color of the tower to reduce visibility
- use of landscaping to effectively screen the view of the equipment shelters, necessary structures or access roads from adjacent public ways, public property and residential property

Towers must be capable of supporting multiple antennae/cell service suppliers in order to limit the total number of towers located throughout the town, and thereby limiting the impact on the rural character of the community.

O. Solid Waste Management

Braintree is a part of the Tri-Town Alliance with the towns of Randolph and Braintree. Solid waste from the three towns is collected at the Randolph Transfer Station and transported to the Waste USA Landfill in Coventry, VT for permanent disposal. The three towns utilize the Randolph Transfer Station for self-hauling of trash, recycling, special wastes, and hazardous household waste (the latter during planned semi-annual events). At the Randolph transfer station it costs $1.50 per small bag and a minimum of $3.00 per large bag to dump household trash.

Additionally, all municipal solid waste and recyclables collected by private haulers conducting curbside pickups in each town are brought to the Randolph Transfer Station. Residents may also bring their trash and recyclables to a fast trash temporary trash drop located in Randolph. The waste accumulated at the fast trash drop is then transported to the Randolph Transfer Station. Presently, there is a charge for recycling at the Randolph

Transfer Station. Private haulers also provide curbside pickup of recyclables; however, a service fee is charged.

Self-Drop Off or Private Collection

Braintree and Brookfield have participated in the past with Randolph in solid waste matters. About 20% of the population of the three towns drops off their wastes and recyclables at the Randolph transfer station, the remaining 80% contract for collection of their solid waste through one of the eight independent haulers that serve the area. It is assumed that the majority of the commercial, institutional, and manufacturing activities in the region also contract for waste collection.

Recycling Services

Some of the independent waste haulers offer curbside collection of recyclables and some do not. Casella Waste Management offers a weekly curbside pick-up service for recyclables to all its customers. Casella's pick-up service charge is based on a maximum number of bags that may be left at the curb each week. A bag of recyclables may be substituted for a bag of garbage under the contract.

Recycling drop-off is also available to residents and businesses at for a fee at the Town of Randolph transfer station. Containers are leased from Casella Waste Services for use at the transfer station. All metals are managed separately by the transfer station attendant who collects it for the salvage value and applies it to the transfer station's operating budget. Newsprint and paper is also recycled. All other recyclables (glass, HDPE and PET, ferrous and aluminum cans, and office paper) are handled by Casella Waste Management that picks up the materials when the containers are full. Corrugated cardboard is also collected at the transfer station.

Special Wastes

Special wastes, defined as bulky wastes (such as appliances), scrap tires, and construction and demolition debris, are all collected at the Randolph transfer station. These wastes are either dropped at the transfer station by the generators or picked up by one of the eight private haulers that serves the region and then dropped off at the landfill. Lead acid batteries and used oil are both collected at the Randolph transfer station. The lead acid batteries are picked up regularly for their salvage value. Electronic wastes are also collected.

There is no regular program for household hazardous waste collection at the Randolph transfer station. Watch the local paper for dates when household hazardous waste is to be collected.

P. Goals, Policies and Recommendations

Goal

To provide public services and public facilities that meet the needs of the community without creating an undue burden on taxpayers.

Policy

To provide residents with safe, effective, responsive and affordable municipal infrastructure, facilities and services consistent with other town goals and whenever possible, to encourage and work with other public and private utility or service providers to do the same.

Recommendations

1. The Planning Commission, with assistance from the Selectboard and Budget Committee, should create a Capital Budget and Program to guide future investments in infrastructure.

2. The Planning Commission should conduct a poll of the community to determine where the most appropriate locations for cell phone towers would be in Braintree.

3. The Selectboard should conduct energy audits on all town buildings and use data collected in capital budgeting for future improvements.

4. The Selectboard should work with the Planning Commission to find ways to enhance cellular and internet services in Braintree to allow the opportunity for telecommuting.

5. The town should support efforts to switch municipal medium and heavy duty vehicles to biodiesel blends.

6. The town should research the feasibility of installing solar panels on town owned buildings.

VI. Health and Emergency Services

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 that they offer. Rural locations such as Braintree 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 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 to arrive than in more populated locations, risking potential loss of life.

Because of Braintree's limited population, there are no options in terms of town-based health care services. Fortunately, Gifford Medical Center is located in the neighboring town of Randolph. Gifford Medical Center offers a wide range of services to serve most medical needs. In addition to Gifford, there are several smaller health centers in Randolph. There are large-scale community hospitals in Rutland and Berlin, and a tertiary care facility in Lebanon, NH.

B. Fire Protection Services

Braintree does not have its own fire department. Instead, the community contracts on a yearly basis with the Randolph Village Fire District (RVFD) for fire protection services. The cost to Braintree is calculated using a formula based on the equalized municipal grand list value. In 2010 the total cost was $54,488.04, which is funded through municipal taxes. The community has long wrestled with the choice to sub-contract fire protection services, but to date has not determined that maintaining a fire department of its own would be cost effective. Additionally, there are a limited number of potential volunteer fire fighters in the community.

The RVFD is staffed with volunteer fire fighters who are notified of a needed response by a paging system maintained by the department. The RVFD meets the needs of the community in terms of fire protection services.

Burn permits for all outdoor burning are required by State Law. Burn permits are available from the Town Forest Fire Warden. These permits do not relieve the applicant from any liability should the fire damage public or private property, and are good only for

the date and time stated on the issued permit. There is a fine for burning without a permit.

C. Police Protection Services

Braintree has a Constable who is elected each year at Town Meeting. The elected Constable is not a Vermont certified law enforcement officer. Accordingly, the Constable may perform limited functions such as responding to dog complaints calls, assisting the State Police with traffic control at the scene of an accident. On occasion the Constable may be requested by the State police to perform a non-law certification required function on their behalf.

The Vermont State Police force at the Royalton station on Vermont Route 107 is the town's first line of law enforcement protection. Full time law enforcement services are to be provided to Braintree residents by the State Police from the Royalton Station.

D. Emergency Medical Services

Upper Valley Ambulance

White River Valley Ambulance, Inc. (WRVA), is a not for profit emergency ambulance and rescue service composed of paid full-time, part-time and volunteer staff. Emergency medical service is provided to a geographical area encompassing 280 square miles and approximately 10,000 residents. In addition to Braintree, WRVA covers Barnard, Bethel, Braintree, Brookfield, Granville, Randolph and Stockbridge. The Town of Braintree pays WRVA for its services. In 2010, the Braintree budget reflected a cost of $66,179.28 for ambulance coverage. It should be noted that those who use the ambulance will be charged for WRVA's service on an individual basis in addition to the fees paid by the town.

Dartmouth-Hitchcock Advanced Response Team (DHART)

The Dartmouth-Hitchcock Advanced Response Team is based in Lebanon, NH at Dartmouth-Hitchcock Medical Center. DHART crews provide air medical transportation services to the medical communities of Northern New England. In addition, DHART flight crews respond to public safety agency requests for medical evacuation of trauma patients from scenes of injury, and will transport to the closest Trauma Center in the region's five states. Operating 24 hours a day and seven days a week, DHART Crews transport adult, pediatric and neonatal patients to ANY appropriate medical facility in New England.

E. Emergency Access

Any new property development in Braintree should be designed so as to allow safe access for emergency services. Poorly designed driveways that are too steep or too narrow can limit access, particularly in the winter, and may represent a safety hazard for the emergency responder. The Braintree Unified Bylaw contains provisions to ensure that land development shall be designed to ensure adequate provision of facilities necessary for emergency services.

In new subdivisions, the design of such drives or similar facilities shall be done in consultation with the Randolph Fire Department. On major subdivisions, the Development Review Board may require the provision of storage ponds and dry hydrants necessary for adequate fire protection.

F. Goals, Policies and Recommendations

Goals

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

2. To ensure the protection and safety of the citizens of Braintree against crime and violations of law.

3. To maintain appropriate fire and ambulance service.

Policies

1. It is the policy of the town to support and encourage the development of local health care facilities and counseling services to help residents obtain health care as close to home as possible.

2. It is the policy of the town to support programs that expand medical coverage or improve medical services for Braintree residents.

3. It is the policy of the town to support the development of assisted living or other facilities or services dedicated to supporting the elderly in Braintree.

4. 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.

5. It is the policy of the town to support efforts to decrease response times for emergency services.

6. It is the policy of the town that the law enforcement needs of the town and its citizens be reviewed and assessed on an annual basis by town officials with input from the citizens to determine the adequacy of police protection provided and to provide greater protection if determined to be inadequate.

7. It is the policy of the town that a partnership with the state police be formed to ensure adequate citizen protection within a timely and, if necessary, exigent manner.

8. It is the policy of the town that the need for additional equipment or facilities for the elected Constable be considered as an important part of the annual assessment.

9. It is the policy of the town that Braintree provide for adequate fire protection services for its residents by maintaining its agreement with the RVFD.

10. It is the policy of the town that road and driveway access to proposed developments for fire trucks and other emergency vehicles be evaluated as part of the permit review process.

11. It is the policy of the town to maintain its relationship with White River Valley Ambulance.

Recommendations

1. That Braintree provide for adequate fire protection services for its residents by maintaining its agreement with the RVFD and by conducting an annual review of the service contract for adequacy.

2. That road and driveway access to proposed developments for fire trucks and other emergency vehicles be evaluated as part of the permit review process.

VII. Energy

Energy use and generation plays an important role in the environmental, economic, and social well being of our community. Energy is a major component of the cost of living and as we continue to use more energy, those costs continue to rise. Given that there is a finite amount of oil available globally, collectively in Braintree we must alter everyday activities such how we heat and power our homes or how we travel to work or the grocery store. As we continue to use petroleum based fuels, the negative impacts on the environment that contribute to the global climate change problem further emphasize the need to plan for conserving energy as well as fuel switching to renewable resources.

While there are pragmatic reasons to start shifting away from fossil fuels, the use of such fuels and their contribution to global warming is undisputed in any serious way. If we want to have a climate that resembles what we think of as Vermont, then we have to start drastically reducing the emissions from fossil fuels. Even now, our past emissions have led to warmer winters, less snow, and increased storms. Due to the endurance of greenhouse gases in the atmosphere and the lag time for the warming effect of these to fully take place we can expect additional warming to occur for the foreseeable future. Prudent risk management dictates that we avoid worsening the situation.

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

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

"Energy" as used in this Plan and the state's Comprehensive Energy Plan (CEP) is not the same as electricity. It is **all** forms of energy used by people. This is commonly broken down into four sectors: commercial (this involves running machinery, heating and lighting), residential (mainly heating and lighting), industrial (process energy such as smelting or concrete production), and transportation (mainly gasoline and diesel).

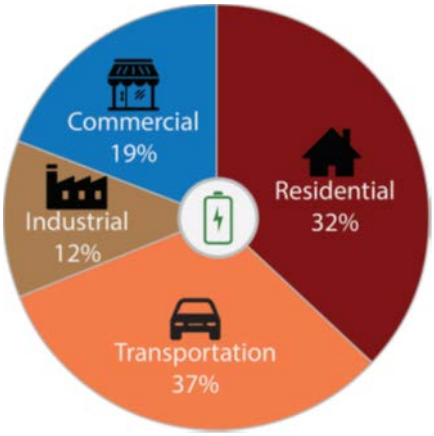


Figure 1Vermont Energy Consumption by Sector, 2013
(Source - US Energy Information Administration)

As Braintree continues to plan for the future, it is important that the town understands its current energy use as well as set targets to help reach the municipalities and ultimately the state's energy goals. From the targets the town must plan on how it will reach the targets as well as provide a guide to renewable energy development in town.

Estimates of Current Energy Use

Current Energy use is important to evaluate where Braintree needs to go with our energy future. This section will provide the background data on existing renewable energy generation in town, estimated transportation, home heating, commercial, and electricity use.

Renewable energy generation sources include wind, solar, hydroelectric, and woody biomas. Through information from the Vermont Department of Public Service(DPS), as of June 2015 there are an estimate 34 sites in Braintree that are producing 208 megawatt hours of renewable energy generation. This was about 4% of the annual energy consumption in town in 2015.

Existing Renewable Generation	**MW**	**MWh**
Solar	0.17	208
Wind	0.00	0
Hydro	0.00	0
Biomass	0.00	0
Other	0.00	0
Total Existing Generation	0.17	208

The table below shows existing renewable generation in the municipality as of 2015, in MW and MWh, based on information available from the Vermont Department of Public Service.

Current Municipal Transportation Energy Use	
Transportation Data	**Municipal Data**
Total # of Vehicles (ACS 2011-2015)	854
Average Miles per Vehicle (Vtrans)	11,356
Total Miles Traveled	9,698,024
Realized MPG (2013 - VTrans 2015 Energy Profile)	18.6
Total Gallons Use per Year	521,399
Transportation BTUs (Billion)	63
Average Cost per Gallon of Gasoline (RPC)	2
Gasoline Cost per Year	1,204,432

This table uses data from the American Community Survey (ACS) and Vermont Agency of Transportation (VTrans) to calculate current transportation energy use and energy costs.

Current Municipal Residential Heating Energy Use				
Fuel Source	**Municipal Households (ACS 2011-2015)**	**Municipal % of Households**	**Municipal BTU's**	**Municipal BTU (in Billions)**
Natural Gas	0	0.0%	0	0
Propane	74	13.5%	7,401,840,000	7
Electricity	3	0.5%	303,840,000	0
Fuel Oil	312	56.8%	30,747,960,000	31
Coal	0	0.0%	0	0
Wood	147	26.8%	14,764,320,000	15
Solar	0	0.0%	0	0
Other	9	1.6%	911,520,000	1
No Fuel	4	0.7%	343,200,000	0
Total	549	100.0%	54,472,680,000	54

This table displays data from the ACS that estimates current municipal residential heating energy use.

Braintree residents rely on a variety of heating sources with a majority heating either through oil, wood based systems, and propane. Residents do not experience a scarcity of heating sources but the variability in costs especially in the winter can create barriers for residents. To help limited income residents with the costs of weatherization upgrades and heating costs programs through Efficiency Vermont and community action agencies provide assistance.

Current Municipal Commercial Energy Use			
Column1	**Commercial Establishments in Municipality (VT DOL)**	**Estimated Thermal Energy BTUs per Commercial Establishment (millions) (VT Dept. of Public Service)**	**Estimated Thermal Energy BTUs by Commercial Establishments in Municipality (in Billions)**
Municipal Commercial Energy Use	9	725	7

The table uses data available from the Vermont Department of Labor (VT DOL) and the Vermont Department of Public Service (DPS) to estimate current municipal commercial establishment energy use in the municipality.

Current Electricity Use (KWH)			
Sector	**2014**	**2015**	**2016**
Commercial & Industrial	689,333	774,804	764,339
Residential	3,930,053	4,125,732	4,021,571
Total	**4,619,386**	**4,900,536**	**4,785,910**
Count of Residential Premises	**680**	**676**	**675**
Average Residential Usage	**6,518**	**6,876**	**6,714**

This table displays current electricity use within the municipality with data provided by Efficiency Vermont.

In Braintree the electric energy demand has been consistent over the last three years between both residential and commercial/industrial customers in town. With only 4% of the need being met by renewable energy generation, there is a lot of potential for energy consumers to switch. As more renewable energy generation is produced in town to meet the 2050 targets power companies will need to increase the pace of system wide updates. These include, line upgrades, and once technology becomes readily available, the provision of storage technologies such as Tesla's new Powerwall battery system. Electric

bill savings can be possible through energy efficiency improvements. According to Efficiency Vermont, Braintree electric customers saved $16,816 in 2016 through measures such as hot water efficiencies, light bulb swaps, and space heat replacements.

Targets

With the baseline information set, targets need to be set for the municipality to provide milestones along the way toward a path of meeting 90% of our total energy needs with renewable energy. The target years of 2025, 2035, and 2050 were in conjunction with the 2016 Vermont Comprehensive Energy Plan benchmarks. Most of the information in this section was developed using the Long- Range Energy Alternatives Planning (LEAP) model from the Vermont Energy Investment Corporation (VEIC).

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

Residential Thermal Efficiency Targets	**2025**	**2035**	**2050**
Residential - Increased Efficiency and Conservation	33%	67%	125%
Commercial - Increased Efficiency and Conservation	6%	9%	18%

Renewable Energy Use			
	2025	**2035**	**2050**
Transportation Renewables	9.6%	23.1%	90.3%
Heating Renewables	48.7%	61.3%	93.1%

The Two Rivers Ottauquechee (TRO) Region currently produces 88,588 MWh of renewable electric energy generation. All of the existing or permitted generation capacity as of 2015 was factored and pooled together for the region. Based on the regions share of the overall state population and the current renewable energy generation, the regions target is 349,307 MWh. Reaching this goal is not just Braintree's responsibility but setting a goal for in town production will help reduce the reliance on energy produced elsewhere. In Braintree the target for renewable energy generation in 2050 is between 6,995- 8,550 MWh. This information was generated based on data provided by the Department of Public Service and information developed by TRORC.

1Q. Renewable Generation Targets	2050
Total Renewable Generation Target (in MWh)	6,995- 8,550

In order to meet the various overall targets above, residents will have to convert to more efficient technologies such as cold climate heat pumps or switch to electric vehicles. While the targets below only set targets for three system types, there are many ways in which a homeowner or business could convert to more efficient technologies. These targets provide a way for the town to track progress towards meeting the goals and setting a system in place to do that will help adjust targets and goals in the future.

Thermal Fuel Switching Targets (Residential and Commercial)			
	2025	**2035**	**2050**
New Efficient Wood Heat Systems (in units)	0	0	0
New Heat Pumps (in units)	56	146	309

Due to LEAP model forecasting a large decrease in wood use resulting in negative number for target numbers of efficient wood heat systems. Residents are encouraged to switch to more efficient wood heat systems.

The rural nature of our region leads to longer commutes for work, shopping and services. This impacts the number of vehicle miles traveled which directly relates to how much fossil fuel is being burned to power all the cars in the region. The transportation sector is responsible for 37% of the total energy consumed in Vermont, powered mostly from gasoline(76%) and diesel(20%). To reach local, regional and statewide renewable energy goals, residents will need to shift away from petroleum powered vehicles to electricity and biofuels. The table below identifies the number of electric and biodiesiel vehicles are needed in town to meet the overall renewable energy goals.

Transportation Fuel Switching Target			
	2025	**2035**	**2050**
Electric Vehicles	79	561	1166
Biodiesel Vehicles	139	262	442

The traditional Vermont landscape is defined by densely populated villages and downtowns, surrounded by open countryside. This pattern came into being before cars were invented, and now requires enormous amounts of energy to sustain. The more that development can occur in ways that can utilize transit services or walking for transportation needs, the lower the energy needs will be for Braintree and the easier to meet out energy goals.

Energy and Land Use

Communities with zoning can utilize the Planned Unit Development tool to offer incentives to developers such as ‘density bonuses’ if they build units in an energy efficient manner that conserves open space. Through subdivision regulations, planners can influence where buildings are located on a parcel so that they are able to take

advantage of solar gain. Likewise, subdivision regulations can require screening that reduces the effects of prevailing winds, thus conserving heat. On the non-regulatory side developing a capital budget plan that puts focus on projects in the towns villages such as sidewalks or water and sewer lines can help signal where the development in town should happen.

The Braintree Unified Bylaw does not currently require energy efficient siting as a subdivision standard, it is currently optional. To encourage energy efficient siting, the town may want to consider potential tax incentives for residential development that chooses energy positive locations.

New technology, demand-side management and renewable generation alone will not be sufficient to achieve the state's energy goals. Gains in efficiency can be made through appliance standards, building energy codes, customer economic decisions, and publicly funded programs. In order to achieve the state's energy goals, people will have to alter their behavior patterns, to use electric appliances, lighting, and heat with greater thought given to conservation. Large-scale energy savings can be achieved by effectively encouraging many people to make small individual changes such as turning down thermostats, air drying clothes and turning off lights and electronic devices when not in use. The table below identifies the electric efficiency improvement targets needed for the town by 2050.

Electricity Efficiency Targets	**2025**	**2035**	**2050**
Increase Efficiency and Conservation	-0.6%	5.7%	9.9%

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

Using the data from the renewable resources maps, Braintree has significantly more land then is required to meet the towns renewable generation target (6,995 MWh- 8,550 MWh). The table below identifies the potential generation for solar and wind in town.

Local Renewable Energy Resources

1P. Renewable Generation Potential	**MW**	**MWh**
Rooftop Solar	1	728
Ground-mounted Solar	525	644,013
Wind	467	1,430,289
Hydro	0	0
Biomass and Methane	0	0
Other	0	0
Total Renewable Generation Potential	992	2,075,031

There are no numbers in Hydro as there are no potential Hydro sites according to the Community Hydro study done in 2008. Biomass sites are not restricted by resource location

In Braintree the generation potential of renewable energy generation is 2,075,031MWh. This shows that there is 26595% more land that has potential then land needed for the town to meet the renewable generation target in Table 1Q

The Vermont Energy Atlas is an online tool that can be used by anyone to gather information on existing and potential renewable energy resources by counties, towns, or individual parcels in the state. The following data for the Town of Braintree was collected at www.vtenergyatlas.com in 2011:

Solar - Most locations in Vermont are capable of generating solar energy through photovoltaic panels or solar thermal systems. At present Efficiency Vermont reports that Braintree has at least 34 net-metered photovoltaic (used to generate electricity) sites.. Additionally, it is estimated that the Town of Braintree has 138 residences with the potential for rooftop solar capacity of 674 MWh, 2 commercial locations with the potential for rooftop solar capacity of 61 MWh.It is important to note that the renewable generation targets cannot be attained from just rooftop solar but installing ground mounted solar can help reach that target.

Passive Heating and Lighting – Good building and site design are essential to taking advantage of the sun's energy through passive methods. Braintree could encourage use of solar in this fashion by drafting language for zoning bylaws and subdivision regulations that require the appropriate placement of buildings, landscaping and building design.

Water Heating –

Electricity Generation – Decreasing costs of equipment have made solar electric generation systems more prevalent. Solar systems are no longer utilized exclusively by "off-grid" buildings. The advent of net-metering allows buildings to be connected to the grid while utilizing renewable energy. Systems that are net-metered are overseen by the Public Service Board and are exempt from local permitting.

There are no commercial-scale solar electricity generation facilities in Braintree. Because of the nature of solar arrays, they are in some ways more desirable than wind towers. This is primarily due to the fact that they do not need to be located on high ground and are therefore less visually prominent. In addition, these facilities can be located in areas that are less rural in nature, requiring fewer access roads and reducing adverse impacts on wild lands. It takes roughly 8 acres of solar collectors to produce one megawatt of electricity.

Wind Generation –

Similar to solar, wind energy is an intermittent resource and its generation fluctuates in response to environmental conditions, however from a supply perspective it can often generate when solar is not generating, evening out the supply available to the grid.. The amount of energy produced by a specific wind tower can depend greatly on location, height of the tower and proximity to other obstructions, but they are generally in the 2-5 megawatt maximum capacity range. Most modern wind turbines (when properly sited) are able to generate electricity much more of the time than solar arrays, and hence have a higher "capacity factor" (the ratio of actual production to maximum possible production).

There are multiple levels of potential wind energy generation, ranging from Class 1 (10-11 mph) to Class 7 (19-25 mph). Many towns in Vermont are unlikely to have commercial generating capacity due to topography; however, there are potential opportunities for residential, small-commercial and large commercial facilities in Braintree in some locations.

Potential Wind Development Areas in Braintree (Acres)							
	Class 1 (10-11 mph)	Class 2 (12-13 mph)	Class 3 (13-14 mph)	Class 4 (15-16 mph)	Class 5 (16-17 mph)	Class 6 (17-18 mph)	Class 7 (19-25 mph)
Residential (30-meter)	3975	456	101	121	101	32	0
Small Commercial (50-meter)	0	837	509	214	61	179	112
Large Commercial (70-meter)	0	0	29	396	129	125	228

Figure 14: Potential Wind Development in Braintree in Acres
(Source: Vermont Energy Atlas, 2012)

The most viable location for small and large scale commercial wind development would be on Braintree Mountain, along the border between Braintree and Rochester. Locations for small commercial or residential scale wind energy generation are greater and include Braintree Hill, Oak Hill, Ferry Hill and Thresher Hill. It should be noted that much of the land that would be most appropriate for commercial wind development is located within the areas designated as Conservation in this plan.

Given that interest in the development of small and large commercial wind projects in Vermont is growing. Although state law exempts commercial energy generation facilities from local land use regulations, Braintree would be wise to establish development standards with which to review future proposals. Such standards could ensure that that the environment and landscape would be properly protected against any adverse impacts. In general, developers should make every effort to minimize damage to important natural areas as identified in the Natural Resource section of this Plan. Additionally, wind

facilities should be located as close to existing roads as possible to avoid the fragmentation of wildlife habitat, agricultural soils, and forestlands. This strategy is also useful because it can minimize the need for extending costly town services.

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

Many homes use biomass for heating individual buildings in the winter, and sometimes to provide electricity. According to the 2016 Vermont Comprehensive Energy Plan, those using wood for primary heating consumed about 4.8 cords in 2014-15, while those using wood as a supplementary source used 2.1 cords. In that same year, Vermont households burned about 126,000 tons of wood pellets, with primary-heat-source consumers burning 4.4 tons and supplementary-heat-source consumers burning 3.3 tons for the season. A slight reduction in the number of cords of wood burned from 2007-08 data could be a reflection of Vermonters installing more efficient wood heating systems. The large increase in use of wood pellets also shows that there is great potential and demand for the utilization of wood resources as heating fuel.

Commercial biomass energy generation facilities should be located close to available biofuels to reduce transportation impacts and costs. A biomass power plant would require a great deal of space to accommodate the various stages of collection and conversion of the mass into fuel before burning it to produce electricity. Water can also pose a problem as biomass facilities require large quantities to handle the recycling process of waste materials. Materials would have to be transported to and from the facility, so truck traffic should be a consideration in selecting a site. Additionally, before a biomass energy generation facility is located in Braintree, developers should prove that their proposed project will not negatively impact the rural character of the community or the local road system.

If a biomass energy generation facility is located in Braintree, it will be essential for the community to monitor biomass production for sustainability. It is possible that with a well-managed source of biomass, the community could generate income.

Biofuels: In addition to using biomass for heating, the use of biofuels, particularly biodiesel, is becoming an increasingly popular option for municipalities attempting to cut costs and reduce the environmental impacts associated with vehicle emissions.

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

production of biodiesel to meet expected energy demands for heavy vehicle transport.

Growing biomass to use in biofuels may be a viable way to encourage farming in Braintree; however, balance should be sought between growing for energy demands and for human and animal consumption.

Hydropower: There are no hydropower facilities located in Braintree. While large hydro facilities are more commonplace in Vermont, advances in technology are making it increasingly viable for small-scale residential use. Micro hydropower has the potential to generate enough electricity to power a home, provided that the essential ingredients – water and vertical drop – are available. Hydro can be an excellent complement to a solar system, because water flow is often greater during the winter season when solar is less effective. At all times, the health and stability of the river ecosystem needs to be prioritized above the generation of energy.

A. Meeting the Local Energy Demand – Increasing Awareness and Efficiency

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

Decreasing Energy Use by Changing Behavior

Raising awareness about wasteful energy behaviors and energy saving behaviors reduces the strain on existing energy resources, and helps residents and businesses save money, making the town a more affordable place to live with a higher quality of life.

Examples include:

- Turning off lights when you leave a room.
- Using a programmable thermostat.
- Use a laundry line.
- Use a cold-water laundry wash.
- Don’t make multiple car trips for errands.

Decreasing Energy Use by Implementing Energy Efficiency

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

- Insulating with high R-value (or heat flow resistance) material,
- Using high efficiency windows,

- Installing energy efficient appliances like refrigerators, freezers, front loading washing machines, gas heated clothes driers and heating systems without blowers,
- Using high efficiency lighting,
- Using gas and/or solar hot water heaters,
- Siting buildings to make use of existing wind blocks and natural cooling patterns derived from the landscape's topography.
- Siting buildings with maximum southern exposure to capture passive solar energy.

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

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

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

B. Making Changes and Implementing Solutions at the Municipal Level

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

Form an Energy Committee

Braintree does not have an energy committee, but towns are statutorily enabled to create one. An energy committee (EC) is a volunteer group that is formed for the purpose of establishing and implementing the town's energy goals; the group can act independently or request to be formally appointed by the Selectboard. The work that can be done by an EC includes conducting energy audits on municipal buildings, tracking energy use for

these buildings, working with the Planning Commission on the Energy Plan. Most importantly, an active EC can help the town save money while saving energy.

Auditing Municipally Owned Buildings

Many towns in Vermont own buildings that are old and inefficient in many respects. For instance, older buildings often have insufficient insulation, wasteful heating and cooling systems, and out-of-date lighting. These kinds of infrastructure problems result in higher energy use with the resulting cost passed onto taxpayers.

Municipal officials should consider conducting audits on additional town buildings in order to determine what improvements are necessary, and which projects would have the highest cost-benefit ratio in terms of energy and financial savings.

Property Assessed Clean Energy (PACE)

Vermont enacted legislation in May 2009 (Act 45) that authorizes local governments to create Clean Energy Assessment districts. Once created, municipalities can offer financing to property owners for renewable energy and energy-efficiency projects. Eligible projects include the installation of solar water and space heating, photovoltaic panels (PV), and biomass heating, small wind, and micro-hydroelectric systems. Property-Assessed Clean Energy (PACE) financing effectively allows property owners to borrow money to pay for energy improvements. The amount borrowed is typically repaid via a special assessment on the property over a period of up to 20 years; if the property owner wishes to sell the parcel before fully repaying the obligation, then the obligation is transferred to the new property owner at the time of sale.

Capital Budget Planning

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

When planning for routine major facilities investments, such as roof replacements, foundation repairs, etc., it is important to also consider making energy efficiency improvements at the same time. The cost to replace or renovate a community facility will

only be slightly higher if energy efficiency improvements are done at the same time, rather than on their own.

At present, the town of Braintree is working toward the creation of a Capital Budget and Program to help guide investments in community infrastructure and equipment. The Planning Commission may make recommendations to the Selectboard with regard to what capital investments should be considered annually. Braintree should strongly consider creating a Capital Budget and Program.

Policy Making for Change

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

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

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

Through policy making, local government can set a clear example for townspeople and encourage sustainable behavior that will ultimately result in both energy and financial savings. Please see the recommendations section (J, below) for more ideas.

OUTREACH

Schools are a great opportunity to educate kids about renewable energy as well as get them interested in the science behind it. One organization that can help bring that education to the classroom is The Vermont Energy Education Program which provides in class workshops to classrooms around Vermont.

Permitting

Energy generation in Vermont is subject to a number of different permitting requirements, most of which are limited to state level permitting. Towns are prohibited

from regulating energy generation facilities, from house-scale to commercial projects, if they connect to the grid. But there are two ways that the town can make its voice heard in the state review process. These facilities require a Certificate of Public Good as part of their Section 248 permitting, and this Plan is considered during the state review. Towns are also empowered under to craft a local bylaw with siting standards, though the siting standards cannot have the effect of prohibiting under the bylaw they may not issue a permit, only a recommendation to the PSB.

Section 248

Distributed power generation facilities, such as hydropower dams, fossil fuel plants as well as wind power or solar systems owned by utilities, are subject to review and approval by the Vermont Public Service Board (30 VSA §248). Under this law, prior to the construction of a generation facility, the Board must issue a Certificate of Public Good. A Section 248 review addresses environmental, economic, and social impacts associated with a particular project, similar to Act 250. In making its determination, the Board must give due consideration to the recommendations of municipal and regional planning commissions and their respective plans, unless these plans have been written to a higher standard, in which case they are afforded "substantial deference". This Plan has been updated so that now the Public Service Board gives any clearly stated policies herein "substantial deference" in their proceedings. For polices to have that effect, they cannot be ambiguous or optional, and they can't be written in such a way that treats energy facilities differently that other types of development or that has the effect of prohibiting them. Accordingly, it is appropriate that this Plan address these land uses and provide guidance to town officials, regulators, and utilities.

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

1. **Preferred Locations**: The Town supports the placement of new generation and transmission facilities in the following areas
    - Roof Mounted Systems, on landfills, on brownfields outside of the village center, on reclaimed quarries or gravel pits, on a site that was previously covered by a structure or impervious cover, and on specific areas identified as preferred on the accompanying map:
        - Along Rte 12 and 12A in the areas identified as West Braintree, East Braintree and Rural 2 as identified on the Future Land Use Map
        - Along Battles Brook Rd within 1000 horizontal ft.
    - Additionally, the Town, by joint letter of the Planning Commission and Selectboard, may designate a site as preferred if it is not visible in the growing season from town or state highways, is not actively in agriculture, and is not part of a priority or high priority forest block or habitat connector.

2. **Prohibited Locations**: Because of their distinctive natural, historic or scenic value, energy facility development shall be excluded from the following areas:
    - FEMA Floodways
    - National Wilderness Areas
    - Class 1 Wetlands
    - Wind Development shall not occur at elevations above 2,000 ft
    - Additionally as identified in Land Use Chapter policies
3. **Constraint Areas**: All new generation, transmission, and distribution facilities shall be sited and designed to reasonably avoid or, if no other reasonable alternative exists, to otherwise minimize and mitigate adverse impacts to the following:

    a. Historic districts, landmarks, sites and structures listed, or eligible for listing, on state or national historic registers

    b. •State or federally designated scenic byways, and municipally designated scenic roads and viewsheds

    c. •Special flood hazard areas identified by National Flood Insurance Program maps (except as required for hydro facilities)

    d. •Public and private drinking water supplies, including mapped source protection areas

    e. •Primary agricultural soils mapped by the U.S. Natural Resources Conservation Service

    f. •Agricultural Soils (VT Agriculturally Important Soil Units)

    g. •Protected Lands (Updated 07/26/2016 – State Fee Lands and Private Conservation Lands)

    h. •Deer Wintering Areas (as Identified by ANR)

    i. •Act 250 Agricultural Soil Mitigation areas (as Identified by ANR)

    j. •ANR's Vermont Conservation Design Highest Priority Forest Block Datasets

    k. •Priority Forest Blocks – Connectivity, Interior and Physical Land Division (as Identified by ANR)

    l. •Hydric Soils (as Identified by ANR)

    m. •River Corridor Areas as identified by the Vermont Department of Environmental Conservation

    n. •Class 2 Wetlands as indicated on Vermont State Wetlands Inventory maps or identified through site analysis

    o. •Vernal Pools (as Identified by ANR or through site analysis)

    p. •State-significant Natural Communities and Rare, Threatened, and Endangered Species

C. Energy and Transportation Policy

It is important that communities recognize the clear connection between land use patterns, transportation and energy use. Most communities encourage the development of residences in rural areas, and these are in fact coveted locations to develop because of the aesthetics that make Vermont special. However, this rural development requires most of our population to drive to reach schools, work and services.

Because transportation is such a substantial portion of local energy use, it is in the interest of the community to encourage any new developments that are proposed in Town should be encouraged to locate adjacent to existing roads. In particular dense residential developments should be located within or adjacent to existing village centers or within designated growth areas. Commercial development that requires trucking and freight handling should only locate on roads which can effectively handle the size of vehicle needed. The town is generally reluctant to take on additional roads, therefore new development in areas that are not presently served by town roads should be discouraged.

D. Goals, Policies and Recommendations

Goals

1. To encourage a continued pattern of settlement and land use that uses energy efficiently.

2. To promote the design, siting and construction of buildings and structures that are energy efficient and minimize the need for costly sources of energy.

3. To encourage the responsible development of local renewable energy sources and to reduce dependence on outside energy sources.

4. To increase awareness and use of energy conservation practices through educational efforts.

Policies

1. It is the policy of the Town that major public investments, such as schools, public recreational areas, and municipal facilities, as well as major commercial or residential developments need to be situated within or in close proximity to state highways.

2. It is the policy of the Town to that rehabilitation or development of new buildings and equipment should use proven design principles and practices with the lowest

life cycle costs (cost of owning, operating, maintaining, and disposing of a building or a building system over a period of time):

a. Where land development or subdivisions are proposed, design plans shall reflect sound energy use minimization principles, such as solar and slope orientation and protective wind barriers. An example would be the cluster planning concept, which is an approach that encourages energy conservation and efficiency; and

b. Visual effects of electrical generation, transmission, and distribution facilities shall be minimized whenever feasible.

3. It is the policy of the Town to generation, transmission, and distribution facilities or service areas shall be encouraged only when they complement the recommended land use patterns set forth in this plan.

4. It is the policy of the Town to reduce commuting, promote the development of broadband services, energy efficient home occupations and small-scale home business is encouraged.

5. It is the policy of the Town to promote energy efficient commuting, the community supports state and regional transportation programs serving Braintree.

6. It is the policy of the Town to provide input on behalf of the citizens of Braintree in any Public Service Board Certificate of Public Good application relative to the generation of energy.

7. It is the policy of the Town that any commercial energy generation facility proposed in Braintree should be developed so as to avoid negative impacts on the rural character of the area in which they are proposed to be located. Developers should make all possible efforts to minimize damage to important natural areas as identified in the Natural Resource section of this Plan. Additionally, such facilities should be located as close to existing roads as possible to avoid any increase in the services provided by the town.

Recommendations

1. The Town should consider creating a Town Energy Committee to increase public awareness and use of energy conservation practices through educational efforts and consider alternative energy sources in public facilities.

2. The Town should continue to investigate ways to reduce the cost of municipal energy use.

3. The Planning Commission should identify areas in town that are appropriate for large and small scale energy production such as wind and solar.

4. The Town should investigate tax incentives that would encourage energy efficient siting of residences.

5. The Town should consider requiring a reimbursable fee (as part of a zoning permit) to ensure that developers properly file their Residential Building Energy Standard Certificate.

6. The town should support K-12 schools to bring energy ideas and solutions into the classroom by working with organizations such as Vermont Energy Education Program (http://veep.org)

7. The town will support programs such as Weatherize Upper Valley with Vital Communities to help provide outreach and education to residents about ways to conserve energy.

VIII. Natural, Scenic and Cultural Resources

A. Background

The rural landscape is of the utmost importance to the Braintree community, both for its utility and its scenic value. Braintree residents value open, working lands that are hospitable to both recreation and outdoor work. It is essential to the community that this landscape be protected as it is the fundamental reason why residents choose to live in Braintree. Residents want to maintain the quality of their landscape for the future, to protect the natural world they value, while allowing the land to be worked safely and harmoniously.

Goals

1. To protect the natural, scenic and historic character of Braintree.

2. To maintain the quality of their landscape for the future, to protect the natural world they value, while allowing the land to be worked safely and harmoniously.

Policy

1. It is the policy of the town to protect the natural, scenic and historic character of Braintree's working landscape, through careful land use planning.

B. Water Resources

Water resources include aquifers (the supply of fresh water beneath the ground) and surface waters (includes streams, ponds and lakes). Sustainable yields of quality water are necessary for the lives and livelihood of citizens of Braintree. Braintree has no mapped groundwater information.

The process for mapping groundwater is complicated. It involves multiple scientific methods including using technology to create a detailed picture of groundwater situations and use patterns, analysis of well data provided to the state by well drillers and site specific analysis. Unfortunately, there is no easy method.

The health of Braintree's surface waters is essential to maintaining quality groundwater, as well as an important element for outdoor recreation and natural beauty. There are a number of state and federal programs that help fund stream-management projects, such as the Conservation Reserve Enhancement Program (CREP). CREP provides funds to farmers for the purpose of preserving lands once used for agriculture, with the goal of

introducing and encouraging plant life to prevent erosion and provide habitat. Stream instability can lead to excessive flooding and other types of damage due to increased flow velocity.

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. The Plan maintains that no structures shall be allowed within 50 feet of the top of the bank of designated permanent streams, except those that by their nature must be located near streams (hydro facilities, for example). No ground disturbance is allowed within 35 feet, with the exception of bridge or culvert construction, or bank stabilization as is necessary for hazard mitigation purposes. These setback restrictions may be changed based on Planning Commission review of recent flood hazard events. Damages from Tropical Storm Irene have indicated a need for larger stream buffers, particularly in areas outside of the Flood Hazard Area.

Goals

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

2. To allow use of groundwater resources by new development in such a manner to protect the public right to adequate quality and quantity of the resource.

3. To consider surface water and groundwater impacts and effects related to proposed or existing uses of land.

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

Policies

1. It is the policy of the Town that land use activities which potentially threaten groundwater quality must be carefully reviewed and monitored to prevent undue loss of groundwater quality.

2. It is the policy of the Town that the maintenance or enhancement of water resources for recreation, fisheries, necessary wildlife habitats and quality aesthetics be high priorities.

3. It is the policy of the Town that the location, sizing and density of on-site sewage disposal facilities must be determined by the capacity of the soil, the natural limitations of the site, and underlying substrata conditions, such as depth to bedrock and seasonal high water tables. For the most current information regarding permitting, see http://www.anr.state.vt.us/dec/ww/rules.htm.

4. It is the policy of the Town that preservation of the natural state of streams should be encouraged by,

    - Protection of adjacent wetlands and natural areas;

- Protection of natural scenic qualities; and
- Maintenance of existing stream bank and buffer vegetation including trees, together with wildlife habitat.

5. It is the policy of the Town that no structures shall be allowed within 50 feet of the top of the bank of designated permanent streams, except those that by their nature must be located near streams. No ground disturbance is allowed within 35 feet, excepting that incidental to bridge or culvert construction, or permitted bank stabilization. Buffers may be expanded to protect against severe flooding events.

6. It is the policy of the Town that development in Braintree shall be permitted only if it does not cause any significant environmental degradation and does not result in the pollution of ground or surface waters or cause unreasonable reductions in supply.

7. It is the policy of the Town that no development of any kind which is potentially detrimental to water quality shall be allowed by any brook, stream or tributary or in a well head recharge area.

8. It is the policy of the Town that all proposed development must be reviewed for appropriate location away from brooks streams, tributaries and well head recharge areas and for adequate protection of the recharge environment of these resources.

9. It is the policy of the Town to monitor all large water withdrawals in the regional area that have a potential to effect the private water sources of Braintree residents and enter into negotiations with the withdrawer of large quantities of water to protect resident water supplies if necessary.

Recommendation

The Planning Commission should review the current stream buffer requirements against damages from Tropical Storm Irene and other severe flooding events and consider expanding these requirements to protect the community and water resources.

C. Forestry and Farming

Forests cover the majority of the acreage in Braintree and commercial forestry is a small part of the local economy. Forestry and farming together currently employ only 7% of Braintree's residents, up from 2% in the 2000 Census. As a key part of this Plan, residents recognize the value of Braintree’s working landscape, and seek to maintain and encourage agricultural and silvicultural development in the community.

According to the 2012 Grand List, there are 10 farms located in Braintree. Because of the limited number of farms, agriculture has a fairly limited impact on the local economy. However, it has a more pronounced impact on the rural landscape. The open spaces available to the community for recreation and scenic beauty are only open because they are actively being worked.

The Plan encourages agriculture and silvicultural enterprises as long as they follow accepted agricultural and silvicultural practices as outlined by the Secretary of Agriculture. Although Braintree does not have a substantial amount of large, commercial farms, there are a number of small "hobby farms" in the community. These farms produce such products as maple products, eggs, vegetables and meats on a small scale. Many of these goods are sold locally. The town also supports the development of locally-produced, value added products, including wood as a heating fuel. The lack of a village center in Braintree makes local sale of these products somewhat challenging, but neighboring Randolph has a weekly outdoor farmer's market during the summer where local farms can sell their products. Additionally, a number of farms sell in farm stands located on their property.

Prime Agricultural Soils

Prime agricultural lands are an important component of Braintree. Like neighboring Randolph, Braintree has a higher amount of prime ag soils than many other communities. Most of these soils tend to be located in river valleys along streams, but in Braintree they

are present in upland areas such as Braintree Hill and Peth as well. Maintaining these prime soils as farmland is important to the current and future viability of farming in Braintree. Farms provide open space for wildlife habitat, scenic views and a connection to the land that is hard to find in other places. They also help maintain distinctive rural character of Braintree, which is based strongly in the working landscape.

Many landowners in Braintree have their land enrolled in the Use Value Appraisal Program which involves these properties in forest or farm management activities in exchange for a property tax benefit. Undeveloped forest land provides many benefits to Braintree including wildlife habitat, recreational opportunities, abundant clean water, and forest products.

Agriculture and Land Use Regulation

Land use regulation has a definite impact on farming. For example, a zoning ordinance that allows for large tracts of land to be sold for single-family residential purposes could conceivably help protect open space, but that open space might no longer be available for agricultural use without considerable forethought and design. The same ordinance calling for much smaller lot sizes (such as one acre) would, over time, lead to an incremental decrease in the amount of useable farmland.

Regulating development on agricultural soils is challenging, as land is often a farmer's primary source of capital. It is far more preferable to preserve the working landscape through non-regulatory means whenever possible. Through its Unified Bylaw, Braintree is attempting to protect valuable farmland with varied lot sizes and uses that do not conflict with agricultural or silvicultural uses without posing an undue burden on farmers.

Goal

To strengthen and maintain the Town's agricultural and forest economies and to ensure continuance of Braintree's rural character.

Policies

1. It is the policy of the Town to avoid the fragmentation of valuable agricultural and forest lands by maintaining flexible zoning that encourages development at a scale that protects the working landscape.

2. It is the policy of the Town to support efforts to preserve the working landscape through public and private means.

Recommendation

The Town should create a conservation fund that can be used to assist farmers with the purchase of development rights or conservation easements through a land trust.

D. Wetlands

Wetlands are ecologically fragile areas and how these lands are managed have a direct bearing on the quality and quantity of water resources. The Vermont Water Resources Board estimates that wetlands comprise less than 5 percent of the surface area of Vermont. In addition to being Vermont's most productive ecosystem, wetlands serve a wide variety of functions beneficial to the health, safety and welfare of the general public, including the following:

- Retaining storm water run-off, reducing flood peaks and thereby reducing flooding;
- Improving surface water quality through storage of organic materials, chemical decomposition and filtration of sediments and other matter from surface water;
- Providing spawning, feeding and general habitat for fish;
- Providing habitat for a wide diversity of wildlife and rare, threatened or endangered plants; and
- Contributing to the open space character and the overall 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 in the bulleted list above.

Under the Rules, if land development can be expected to impact a protected wetland, such activity cannot commence unless the Vermont Agency of Natural Resources first grants a Conditional Use Determination (CUD). A CUD will be granted when the proposed use will not have an undue adverse impact on the function of the wetland. In many cases, such approvals are granted with conditions to mitigate impacts and to more readily protect wetlands.

For Braintree, as well as the State, the most significant wetlands have been mapped and are included as part of the National Wetlands Inventory (NWI) prepared by the U.S. Fish and Wildlife Service. These wetlands have been delineated on USGS topographic maps, and by reference are made a part of this Plan (see Map 5, Natural Resources). Other smaller wetlands often do not show on these maps, so a field determination by a qualified biologist is needed for most activities that involve state permits. There are approximately 213 acres of mapped wetlands in Braintree, the largest of which are located near or adjacent to Mud Pond.

In those towns such as Braintree, that have zoning or subdivision regulations, 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]. It is important to note that future investigations of wetlands within Braintree may result in additional areas being determined as significant or important for conservation. Setback requirements for wetlands vary as required by ANR staff, but communities are allowed to set more stringent requirements. Some communities have opted to create a standardized buffer around wetlands of up to 100 feet.

Goal

1. To identify and encourage land use development practices that avoid or mitigate adverse impacts on significant wetlands.

Policies

1. It is the policy of the Town that structural development or intensive land uses shall not be located in significant wetlands or within buffer zones to significant wetlands.

2. It is the policy of the Town that development adjacent to wetlands should be planned so as not to result in undue disturbance to wetland areas or their function. Mitigating measures to protect the function of a wetland are an acceptable measure.

3. It is the policy of the Town that no development is to be located in or allowed to fill in or alter any wetland area.

Recommendations

1. The town Conservation Commission should conduct an inventory of wetlands to determine where, if any, wetlands that have not been mapped by the State of Vermont are located.

2. The Planning Commission should develop clear buffer rules for wetlands.

E. Flood plains

Floods are inevitable and uncontrollable natural events which occur sporadically and affect lands adjacent to watercourses. It is therefore in the public interest to plan for floods, and to implement land use strategies which will protect these areas and minimize the risks to public health, safety, and property.

Floodplains, lands adjacent to watercourses (streams, brooks or rivers), are periodically inundated by heavy rains or during spring thaws. They are porous and can absorb considerable water before reaching flood stage. Floodplains make excellent agricultural land but are poorly suited for development, both because of their propensity for flooding and because of their proximity to watercourses, which creates the potential for pollution. Approximately 465 acres in Braintree are within the floodplain area.

Vermont has experienced fifteen statewide and regional floods since 1973. All but one of these were declared federal disasters, and economic losses were significant. Damage was not limited to designated floodplains, but often occurred along unstable river systems and steep streams, and in areas where stream debris was excessive. In some cases, recovery costs to the Town of Braintree alone amounted to several million dollars per flooding event. Public interest dictates that every reasonable attempt should be made to avoid or reduce such exposure to flood damage.

National Flood Insurance Program (NFIP)

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

FEMA has prepared a Flood Hazard Boundary Map for the Town of Braintree, which includes flood hazard areas for the Third Branch of the White River and for major streams and ponds. This map is on file at the Town Office and at the Regional Commission. The Flood Hazard Area is indicated in Map #2, Future Land Use. If in doubt when developing, contact the Braintree Zoning Administrator.

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

Two Rivers-Ottauquechee Regional Commission has determined that approximately 10 buildings in Braintree 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. Because of the potential for severe damage to public health and safety, Braintree maintains that no new primary structures shall be developed in the FEMA Floodplain. Other structures, such as accessory structures, are

allowed but only if they are properly flood-proofed and do not raise the existing flood level more than one foot.

Fluvial Erosion Hazards

Much flood damage in Vermont is associated with stream channel instability, also known as the fluvial erosion hazard (FEH), as opposed to inundation related losses. This is a reflection of Vermont's natural geography and its man-made landscape consisting of steep, relatively narrow valleys with agricultural land uses, highway infrastructure, private residences and commercial properties located in close proximity to stream channels. River channels that are undergoing an adjustment process as a result of historic channel management activities or floodplain encroachments oftentimes respond catastrophically during large storm events.

Historically, landowners and local government have relied on the standards and the flood hazard boundary maps provided by FEMA though the National Flood Insurance Program (NFIP) to determine areas within river corridors susceptible to flood damage. The maps are also used to delineate the allowable (floodway) limits of river corridor encroachments and human land use investments. However, the NFIP maps address only inundation issues by applying a water surface elevation based standard. For this reason the NFIP maps are often inadequate as an indicator of flood hazards, especially erosion. The NFIP standards do not recognize the danger present in unstable channels which may be undergoing a physical adjustment process. The stream bed may be eroding or it may be actively aggrading due to erosion occurring upstream.

The NFIP standards often allow for significant encroachment within floodplain areas and river corridors that may prevent the stream from ever reestablishing its stability. Special mapping and geomorphic assessments can identify FEH areas along rivers, more comprehensively defining high-hazard areas. Braintree has one FEMA mapped FEH area, which is located along Route 12 in East Braintree. This area is subject to specific regulatory conditions in the Braintree Unified Bylaw that are intended to protect development against fluvial erosion hazards.

Severe Flooding Events

In 2011, Vermont was struck by Tropical Storm Irene, which inundated the region with heavy rains and severe flooding. Regional damage was severe enough to warrant a federal disaster declaration. In Braintree, the most significant impacts were felt on Riford

Brook, Thayer Brook, Farnsworth Brook and parts of the Third Branch of the White River.

Surprisingly, the bulk of the impact of Irene's inundation was not in the area mapped by FEMA as flood plain or fluvial erosion hazard areas. Instead, the flood waters did their greatest damage along streams such as Riford brook and Thayer brook. Stream valleys are common locations for rural roads, and as such, much of the damage that occurred in Braintree was to roads.

This disparity between the mapped areas of potential flood hazard and areas that were damaged during Tropical Storm Irene highlights the need for additional restrictions on development near streams. Braintree's current policy establishes a 50 foot stream buffer, but the impacts of Tropical Storm Irene indicate that a larger buffer may need to be considered.

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 in an effort to minimize potential negative impacts. These impacts include the loss of life and property, disruption of commerce, and demand for extraordinary public services and expenditures that result from flood damage.

3. To maintain maps that reflect as accurately as possible the flood hazard areas to assist in appropriate land use decisions.

Policies

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

2. It is the policy of the Town that any land use activity (filling, or removal of earth or rock) within flood hazard areas which would result in net loss of flood storage or increased or diverted flood levels or increased risk to adjacent areas shall be prohibited.

3. It is the policy of the Town that utilities or facilities serving existing development (e.g. water lines, electrical service, waste disposal systems, roads, and bridges) may be located within these areas only when off-site options are not feasible and provided that these utilities or facilities meet the flood proofing requirements in

Braintree's Unified Bylaw.

4. It is the policy of the Town to maintain its membership in the National Flood Insurance Program.

5. It is the policy of the Town to recognize that upland areas adjacent to unstable rivers and to steep streams may be at risk of erosion during floods.

Recommendations

1. The Planning Commission should update the Braintree Unified Bylaw to ensure that it meets the standards required by the Federal Emergency Management Agency so that Braintree may continue to participate in the NFIP.

2. The Planning Commission may want to consider increasing the setback requirement for developments adjacent to streams to protect against flooding and erosion in areas that are not in the mapped floodplain.

F. Flora, Fauna and Natural Communities

In Braintree, there are a broad range of communities that exist in the older forests, early successional forests, open fields and valley floors. The breadth and diversity of wildlife and plant communities indicate a healthy, thriving ecosystem. Yet, natural communities are usually strongly affected by the surrounding environment. Plants respond to soil structure and chemistry, hydrology, and climate. The effects of unmanaged development can have a negative impact on plant communities, which in turn will harm the overall ecosystem in the area affected. Good management practices, such as requiring developers to locate their projects in less sensitive areas, maintain buffer areas and protect against silt runoff from excavating, are a few of the ways that these communities can be maintained.

Braintree's fields, forests, wetlands and streams provide habitat to a diversity of flora and fauna that includes an estimated 16 amphibians, 9 reptiles, 152 nesting and migratory birds, 47 mammals, thousands of insects and other invertebrates, and hundreds of plants. Although nearly all undeveloped land in the town provides habitat for these plants and animals, there are some areas which provide critical habitat that should remain intact. These areas include wetlands, vernal pools, and deer-wintering areas.

In addition, the Vermont Department of Fish and Wildlife recently completed a Wildlife Action Plan that identifies species of Greatest Conservation Need (GCN) in Vermont. At least 49 GCN species (including 20 birds, 22 mammals, 3 reptiles, 2 amphibians, and 2 plants) are potentially found in Braintree; however, inventory work to determine the locations for these species has been limited. Development or logging in or adjacent to critical habitats should consider the potential impacts during the planning process.

Wintering areas are an important habitat requirement for deer during the critical winter months when snow depth and climate are limiting factors to survival. Typically these areas consist of mature softwood stands, at low elevations or along stream beds, which provide cover and limit snow depths. Southerly facing slopes are also beneficial due to good sun exposure and may be utilized even in areas of limited softwood cover. More specific factors, such as percent canopy closure, species of softwoods, and stand age, also figure into the quality of the wintering area. Braintree has in excess of 3500 acres of deer wintering yards.

Most important when considering development and its impact on wildlife is the concept of habitat fragmentation. Forests provide habitat to a diverse population of wildlife, which are negatively impacted when forested land is fragmented through development. Forest fragmentation affects water quality and quantity, fish and wildlife populations, and the biological health and diversity of the forest itself. When many small habitat losses occur over time, the combined effect may be as dramatic as one large loss. Forest fragmentation can disrupt animal travel corridors, increase flooding, promote the invasion of exotic vegetation, expose forest interiors, and create conflicts between people and wildlife. Habitat loss reduces the number of many wildlife species and totally eliminates others.

To help mitigate the effects of human population growth and land consumption, many scientists and conservationists urge governments to establish protected corridors, which connect patches of important wildlife habitat. These corridors, if planned correctly, allow wildlife to move between habitats and allow individual animals to move between groups, helping to restore or maintain genetic diversity that is essential both to the long-term viability of populations and to the restoration of functional ecosystems. Because of its generally low density, Braintree maintains some areas of good quality wildlife habitat. In particular, the area around Mud Pond, Thresher Hill and Ferry Hill; and the Eastern slope of Braintree Hill. These areas are designated as low-density conservation areas and a conservation overlay has been proposed for the Mud Pond Area.

Goals

1. To sustain the natural diversity of flora and fauna found in Braintree.

2. To restore populations of species of Greatest Conservation Need in appropriate habitats.

3. To maintain or improve the natural diversity, populations, and migratory routes of native fish.

4. To allow sport and subsistence hunting in accordance with seasons and bag limits determined by the State Department of Fish and Wildlife.

Policies

1. It is the policy of the Town that native wildlife populations and natural diversity should be sustained and enhanced.

2. It is the policy of the Town that long-term protection of critical habitats through conservation easements, land purchases, leases and other incentives be encouraged.

3. It is the policy of the Town to protect deer wintering areas from development and other uses that adversely impact these areas.

4. It is the policy of the Town that development, other than isolated houses and camps, should be designed to preserve continuous areas of wildlife habitat whenever possible. Fragmentation of habitat is discouraged. Efforts should be made to maintain connecting links between such areas.

5. It is the policy of the Town that preference shall be given to development that utilizes existing roads and whenever possible preserve existing agricultural use.

Recommendations

1. The Conservation Commission should initiate inventories to determine the location and habitat requirements for GCN species in Braintree.

2. The Conservation Commission shall identify and map natural communities, critical habitats and wildlife corridors in Braintree.

3. The Conservation Commission should encourage owners of critical habitat for GCN species to contact the State for assistance in developing a management plan for these sites.

4. The Planning Commission should enact land use regulations that protect the valuable natural resources in the Mud Pond Area.

G. Invasive Species

Invasive non-native species are a growing problem throughout Vermont. Invasive plants are defined as those exotic species that typically spread from disturbed areas into natural communities, but many of these species are also impacting yards, agricultural fields, and working forests. In Braintree the spread of invasives is negatively impacting the rural character of the town, reducing native plant populations and consequently affecting wildlife populations, creating economic impacts by dominating other plants in agricultural fields and inhibiting reproduction of trees in sugarbush areas and other forests, destroying the scenic quality of roadsides, reducing property values, and potentially posing health risks. At the present time, the greatest threats are posed by wild

chervil (fields, roadsides and recently logged areas), Japanese knotweed (streams, rivers, roadsides, yards), and Japanese barberry (forests), but there are increasing threats throughout the region from garlic mustard, giant hogweed, and other invasives.

Some of these invasives, especially wild chervil and knotweed, have proliferated to such an extent that eradication from many sites is impossible, but there are still portions of the town that have not been infested. Diligence is necessary from town residents and employees to prevent the further spread of these species, and the introduction of new species that could pose more serious threats. For example, giant hogweed has been identified from several towns in Central Vermont. This Federally listed noxious weed produces a sap that, in combination with moisture and sunlight, can cause severe skin and eye irritation, painful blistering, permanent scarring and blindness.

One of the more common ways in which invasive species spread to new locations is when seeds or root segments are transported on vehicles, especially construction and logging machinery, mowers, etc. Best management practices have been identified for reducing the accidental spread of invasives including avoiding using fill from invaded sites, washing of equipment before leaving infected sites, stabilization of disturbed sites, timing of mowing, etc.

Goal

1. Reduce the impact of invasive species on agricultural native ecosystems.

Policy

1. It is the policy of the Town that new occurrences of invasive species should be controlled to prevent further infestations.

Recommendations

1. Town employees and contractors should become familiar with the best management practices to prevent the accidental spread of invasives. The Conservation Commission should conduct workshops for town employees and residents on identification of invasives (to promote early detection) and control methods.

2. The town should consider developing criteria for new development projects that reduces the potential for new invasive plant infestations. (e.g., source of imported materials such as fill, hay bales, ornamental plantings, etc.)

3. The Town should time roadside mowing to minimize the spread of invasive species.

4. The Conservation Commission should conduct an inventory of invasive species that can be used as baseline data to assess the future spread.

H. Mineral Resources

The use and management of Braintree's earth and mineral resources are matters of public good. Maintenance of sustainable quantities of gravel, sand, crushed rock, and other materials are essential for business development, as well as state and local highways. In spite of this, public and private interests are oftentimes in conflict over use of the resource. It is in the interest of the Braintree business owners and residents to enable utilization of these resources when such uses do not significantly inhibit or conflict with other existing or planned land uses, or are in conflict with other stated goals in this Plan.

Goal

1. To support extraction and processing of mineral resources only where such activities are appropriately managed and the public interest is clearly benefited. Any support shall be balanced against the need to maintain the rural character valued by the citizens of Braintree.

Policies

1. It is the policy of the Town to consider pollution, noise and vehicle traffic as part of the decision making process when reviewing proposed gravel extraction projects.

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

I. Significant Natural and Historic Areas

While Braintree residents would agree that the entirety of the community is significant for its beauty and its rural landscape, there are several areas that represent the most

significant places in town. These lands are what most residents agree make Braintree the place it is today. These areas include:

- Braintree Hill – This area is valued in particular for its scenic views, forest and agricultural landscape, making it a valuable area for wildlife. Additionally, this area has historic significance in that it was once a thriving village in its own right. There are still cellar holes and remnants of the old village in this area.

- Mud Pond – The Mud Pond area is one of the more natural areas in Braintree, offering residents the opportunity for outdoor recreation in a peaceful environment. In 2011 Town Plan survey, respondents indicated that they were highly supportive of protecting the Mud Pond area from damaging land development and supported a number of methods for implementation. These concepts have been utilized in creating the Mud Pond Overlay area (see chapter XI Land Use). Within the Mud Pond area is what is known as Rolling Rock, which features a large stone left by the retreating glaciers that formed much of the Vermont landscape. Rolling Rock acts as a good starting point for hikers who are travelling to Mud Pond as it can be accessed by a local trail.

- Town Hall – The Braintree Town Hall has been a significant historic community resource since it was deeded to the Town in 1877. Community meetings, such as Town Meeting are often held at the Town Hall.

- Meeting House - The Braintree Meeting house was the original community center for Braintree. It now houses the Braintree Historical Society and museum. It has been a church in the past and still serves as the location for Braintree's annual Old Home Day service.

- Peth – This is one of Braintree's original villages, that was largely destroyed during the flood of 1927. Prior to the flooding, Peth served as a key location for milling services in the area. It is now primarily a residential cluster, but features an exceptional scenic and historical value.

J. Conservation Commission

Vermont statute enables communities to create a Conservation Commission (CC), a volunteer board that focuses specifically on the natural, scenic and cultural resources within a community. A CC may conduct inventories of natural resources, recommend the purchase of or the receipt of gifts of land to the Selectboard, assist the planning commission with natural resource planning and maintain a conservation fund.

In 2011, residents who responded to the Planning Commission's Town Plan survey indicated that they were in favor of the creation of a Conservation Commission. As a result of this input, the Town voted in 2012 to form a Conservation Commission.

Those that supported the creation of a CC were also supportive of funding a conservation fund. The CC, at the discretion of the town, can manage a fund which is to be used to assist with the purchase or conservation of property with the intention of protecting natural resources and implementing the town plan. Any use of such a fund requires support from the Selectboard.

K. Land Protection Strategies

Methods of protecting significant lands are varied. In general, there are two ways to encourage the preservation of culturally and naturally significant areas: regulatory & voluntary. Voluntary methods include:

- Preserving land by placing restrictions on its use, through such tools as conservation easements or mutual covenants.
- Transferring land to a conservation organization (such as the Vermont Land Trust) through donation.
- Selling or donating land with conditions attached, like deed restrictions or conditional transfers.

Braintree could become an active participant in land conservation through the creation of a conservation fund. This fund, which is generally funded on a yearly basis, would contain funds that the Conservation Commission could use to purchase land outright, or assist a land conservation organization with the purchase of a conservation easement. It is safe to assume that there will never be sufficient funding for land protection strategies to acquire conservation easements or ownership for all of the unprotected identified areas of value.

Regulatory methods use zoning and/or subdivision rules to regulate the location, density and design of development within selected areas to minimize harmful impacts while allowing for a reasonable level of development. Regulatory methods include:

- **Overlay Districts** - The creation of overlay districts is the most common method of regulating specific areas for the purpose of protecting cultural or natural resources. Overlay districts can be used to exclude development on or to impose resource protection or conservation standards within overlay areas. These districts can be used to protect many types of resources. An overlay district has been proposed for the Mud Pond Area (see chapter XI Land Use).

- **Resource Protection Districts** - protect resource and open space areas or resource-based uses such as farming, forestry, recreation from incompatible development.

- **Large Lot Zoning** - Large lot zoning refers to the designation of a very large minimum lot size within certain zoning districts to accommodate resource-based uses, such as farming or forestry, or to require a pattern of very scattered, low-density development to limit, for example, impervious surfaces and protect surface and groundwater quality.

- **Fixed Area & Sliding Scale** - Fixed area and sliding scale zoning are two zoning techniques (typically applied in association with subdivision regulations) that are used to differentiate allowed densities of development from district lot size requirements.

- **Conservation (Open Space) Subdivision Design** - Conservation or open space subdivision design is a subdivision design process wherein subdivisions are intentionally designed to protect rural character and open space.

Each of these methods has its own set of benefits and pitfalls and all of them should be thoroughly evaluated before they are implemented. However, there are many examples of successful regulatory land protection strategies in Vermont. The key to success is to ensure that the community on a whole supports the regulations.

L. Goals, Policies and Recommendations

Goals

1. To identify and protect those natural and historic resources that are unique to Braintree and make it special.

3. To preserve and protect Braintree's important cultural and natural resources for future generations.

4. To allow for reasonable development without sacrificing important cultural and natural resources.

Policies

1. It is the policy of the town to ensure careful review of all development projects to minimize the impact on Braintree's natural and cultural resources.

2. It is the policy of the Town to protect unique resources by careful planning.

3. It is the policy of the Town to support the work of the Braintree Historical Society in its efforts to renovate the Braintree Meeting House.

Recommendations

1. The Conservation Commission should complete a wetlands and natural communities inventory of Braintree in order to determine where the unmapped wetlands and natural communities are located.

2. The Selectboard should consider the creation of a conservation fund, to be administered by the Conservation Commission for the purposes of conserving naturally or culturally significant areas in Braintree.

3. The Planning Commission should analyze potential types of conservation subdivision design tools and consider including them in future revisions of the Braintree Unified Bylaw.

IX. Recreation

The rural character of Braintree lends itself most readily to outdoor recreation. Excellent hiking, hunting, mountain biking, snowmobiling, cross-country skiing, horseback riding, and fishing are available within the Town and in much of the surrounding region. Braintree does not own or maintain any recreation facilities or provide any organized recreational activities. Much of the outdoor recreation done by residents takes place on private property (such as hunting) or on public roads and trails. The Vermont Association of Snow Travelers (VAST) maintains a series of trails on private land that residents can use seasonally. There is one privately owned campground located along the Third Branch of the White River. Other outdoor opportunities for residents can be found nearby in Randolph and along Route 100 in the Green Mountain National Forest.

In the 2011 Town Plan Survey, residents were asked if they supported efforts by the town to find a way to preserve land on Braintree Hill, and they responded positively. This property, which is almost entirely undeveloped, would serve as an excellent location for a town forest, one that could provide recreational opportunities as well as a potential income generator for the town. Because of the potential expense a purchase of this size would represent, the community should be cautious and only act when the opportunity is most advantageous for the town.

The Mud Pond Area, as indicated also offers a substantial amount of recreation to the community, but the majority of the property is privately owned. If landowners in this area were interested in preserving the natural character of the area, it might be possible for some form of private conservation effort to keep this land available for public recreation. This might include the purchase of development rights or conservation easements.

A. Goals, Policies and Recommendations

Goal

1. To maintain and enhance recreational opportunities for Braintree residents and visitors.

Policies

1. It is the policy of the Town that any development shall be at a scale and density that it does not significantly diminish the value and availability of outdoor recreational activities.

2. It is the policy of the Town that public access to noncommercial outdoor recreational opportunities, such as lakes and hiking trails, should be identified, provided, and protected wherever appropriate.

3. It is the policy of the Town to support private efforts to conserve land that can be used for public recreation, particularly in the Mud Pond Area.

Recommendation

1. That public access to private land for non-intrusive recreational uses be encouraged while seeking assurances outside of town government for the private landowner of freedom from liability.

X. Land Use

A. Introduction

In terms of planning, one of the most complex discussions is about how land will be used in the future. 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 impacts of future development in Braintree does not have unintended consequences, the town's growth must be managed to reflect the vision of this 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 the plan through 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 Plan is designed to be used by Braintree's decision makers to guide growth to the most appropriate locations. The citizens of Braintree have both a need and a right to review and assess proposed development, and to regulate new building to insure appropriate location and that too rapid expansion of Braintree does not unreasonably and adversely affect the rural scenic quality of the town or its ability to pay for the services that increased development requires.

It is the intent of this Plan to provide for the maintenance of the high quality of life in Braintree by protecting the rural, scenic quality of the town through the appropriate use of land for residential, agricultural/forestry, small business and recreational use. Future development within Braintree should be guided by and related to the existing settlement patterns and the citizens' desires to maintain the rural scenic quality of the town, as well as by natural environmental constraints, and the ability of the taxpayers and the land to support the proposed growth.

B. Current Land Use

The Town of Braintree has a distinct pattern of settlement which has emerged over time in response to cultural and social attitudes and changes, as well as to natural processes and formations of the land. This pattern features the establishment of two small and localized village centers with relatively high-density development and limited commercial uses. The villages are surrounded by very sparsely settled rural, agricultural and forest lands. Over the years, this pattern of settlement worked well for the sociological, psychological and aesthetic benefit of Braintree.

The primary purpose of this Plan is to maintain this pattern of settlement while protecting rural character and to fit the needs and desires of people living in Braintree.

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 necessarily required to mimic the historic character of land use, but instead should reflect Braintree's vision of the future, even if the proposed land use settlement pattern suggested differs from the present pattern. However, residents indicate that they are content with the present pattern of development and wish to maintain this into the future. The Planning Commission recognizes that they need to continually analyze Braintree's land use regulations to ensure that they are capable of maintaining this vision into the future. The following Land Use Areas are indicated on the Future Land Use Map.

a. Flood Hazard Area

Adjacent to branches of the White River and its tributaries are lands subject to periodic flooding. Floodplains and Fluvial Erosion Hazard Areas are unsuitable for development because of the high loss potential for life and property as well as the limited ability of septic systems to perform adequately during periods of high water. Only agriculture, recreation and open space uses are allowed in floodplains.

The damages caused by Tropical Storm Irene in 2011 highlighted the need for Braintree to reevaluate the requirements of the Flood Hazard Area, both in terms of uses allowed and in terms of the area designated as Flood Hazard Area. Much of the flood damage from Irene occurred in locations outside the mapped flood hazard area. Because FEMA mapped floodplains are not as accurate as the community would like, alternative ways of interpreting the flood hazard area, including improved maps or expanded stream buffers may need to be considered in the future.

It is the purpose of this land use area to:

1. Implement the goals, policies, and recommendations in this plan;
2. Avoid and minimize the loss of life and property, the disruption of commerce, the impairment of the tax base, and the extraordinary public expenditures and

demands on public services that result from flooding related inundation and erosion;

3. Ensure that the selection, design, creation, and use of development in hazard areas is reasonably safe and accomplished in a manner that is consistent with public wellbeing, does not impair stream equilibrium, flood plain services, or the stream corridor;
4. Manage all flood hazard areas designated pursuant to 10 V.S.A. Chapter 32 § 753, the municipal hazard mitigation plan; and make the Town of Braintree, its citizens, and businesses eligible for federal flood insurance, federal disaster recovery funds, and hazard mitigation funds as may be available.

Goal

1. To protect the citizens of Braintree by using good planning practices within designated Flood Hazard Areas and Fluvial Erosion Hazard Areas.

Policy

1. That only agriculture, recreation and open space uses are allowed in floodplains.

Recommendations

1. The Planning Commission should regularly review the Flood Hazard section of the Braintree Unified Bylaw to ensure that it remains up-to-date with the requirements of FEMA and the NFIP.

2. The Planning Commission should examine additional protections for the Flood Hazard Area, and areas outside the FHA that are prone to flooding or flood damage. These should be incorporated into the Unified Bylaw.

3. The Planning Commission should work with the community to determine whether or not a complete prohibition of development (excluding agriculture and recreation) in the floodplain would be acceptable.

b. Village Areas

Braintree's two village areas, West Braintree and East Braintree, are the only existing high concentration settlement areas in Braintree. These two areas, to varying degrees, serve as the focal point to their respective locations in Braintree, in contrast to the outlying countryside. Their more concentrated density of development, the mix of private, public and community facilities, and their location give residents a desirable "sense of place" and add immeasurably to the social well-being of the community. In order to preserve the existing residential character of these areas and prohibit

inappropriate development and rising municipal costs, a higher density standard has been established. Minimum density in this area should be less than one acre.

Although their role as community centers has changed due in large part to improved transportation, these hamlet settlements continue to provide desired community facilities and services, such as churches, town meeting hall, country stores, and commercial services, to the residents. Any growth in Braintree should encourage the villages to continue to function as the centers of Town activity. Government facilities should, whenever possible (and when consistent with the character of the area), be located within these land use areas.

Their higher density of buildings and people, however, poses a problem in balancing the requirements of safely disposing of wastewater without endangering water supplies on adjacent lands. Despite this potential problem, the Village areas are appropriate for development that increases density. Uses allowed in the villages include agriculture (where it does not pose health risks), residential, retail stores of a type that will primarily serve the Braintree community, professional offices, schools, government buildings, light industry and churches.

Goals

1. To encourage the growth of Braintree's villages in keeping with the rural character of the community.

2. To provide a location for higher density residential and commercial development at a scale that does not negatively impact Braintree's ability to provide services or the rural and natural character of the area.

Policies

1. It is the policy of the Town that the establishment of small scale commercial uses and higher density multi-family housing in the existing villages while balancing the requirements of safely disposing of increased volumes of wastewater and septage without endangering water supplies on adjacent lands be encouraged.

2. It is the policy of the Town that all development within the village areas must be consistent with the existing character of the neighborhood.

c. Rural Areas II

The purpose of this land use area is to house the majority of the community's permanent residents and to provide a location for appropriately scaled commercial and light industrial development in close proximity to existing services. Much of the land in this category borders existing State and Town highways and generally features soil and slope conditions which will provide for easier installation of on-site wastewater facilities, and will avoid the negative impacts of commercial development on Braintree's more rural

roads. Also, the Rural Areas II sections of Braintree are located along the public utility networks where there are fewer impediments to development activities.

The primary uses for this area are residential and home businesses. Non-residential uses, including home businesses, light industrial, agriculture, forestry, public utilities, outdoor recreation, small service businesses, small professional offices and inns are acceptable land uses for this area, provided that they are not primary or dominant uses in the area, do not unduly conflict with existing or planned residential, forestry or agricultural uses, and do not unduly affect rural character. Uses that are generally associated with strip development or sprawl are prohibited from this area. Density in this area should be less than the village areas, but higher than other, more rural areas in town. Appropriate lot size for this area would be roughly two-acres.

Sprawl - Dispersed auto-dependent development occurring outside of compact urban and village centers, along highways, and in rural countryside. Sprawl is typically characterized by:

- excessive land consumption;
- low densities in comparison with older centers;
- lack of choice in ways to travel;
- fragmented open space, wide gaps between development and 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 acres of parking;
- lack of public spaces and community centers.

Goal

To maintain the rural character of Braintree and preserve agricultural and open space features by minimizing sprawl and strip development along roadways.

Policies

1. It is the policy of the Town that when economically viable agriculture is adjacent to low to moderate density residential growth within Rural Areas II, clustered development techniques be utilized for larger project development to maintain the rural character of Braintree, and preserve agriculture and open space features of these areas.

2. It is the policy of the Town that medium to low-density affordable housing be encouraged in this district.

3. It is the policy of the Town that agricultural and forestry lands be protected by discouraging the fragmentation of large land blocks through flexible zoning.

d. Rural Areas I

The purpose of this area is to provide a location for non-intensive land uses such as agriculture, forestry, low-density residential development and outdoor recreation. This

area includes those lands that exhibit limitations for development based principally on physical criteria, such as steeper slopes, typically more shallow soils, or poor drainage. Access and proximity to existing utility services is limited or non-existent in these areas.

The land contains physical limitations which hamper the ability of Braintree to provide services to them at reasonable costs, particularly road maintenance. Non-intensive land uses such as agriculture, forestry, low-density residential development and outdoor recreation are allowed in this area. To ensure that the purpose of this land use area is met, lot sizes should be no smaller than ten acres in size.

Goal

1. To maintain and preserve the more rural areas of Braintree and encourage the continued vitality of the working landscape.

Policies

1. It is the policy of the Town to maintain the pattern of sparsely populated development that protects the natural and working landscape from fragmentation.

2. It is the policy of the Town to prohibit high density development or intensive uses that would require the provision of additional services (such as extending roads) or have an undue adverse impact on the rural character of this area.

Recommendation

1. That low density residential use that does not adversely impact the environment be considered while commercial and industrial uses in Rural Areas I be prohibited.

e. Rural Scenic

The purpose of this land use area is to protect the scenic quality of Braintree's upland areas. The attractiveness of these areas is derived from and directly attributable to a variety of elements that make-up the land use patterns of the area. These factors, both natural and manmade, provide a rich visual experience for both residents and visitors in Braintree. Characteristics that comprise such scenic values include the mixed pattern of open spaces to wooded areas, the prominence of clear, unobstructed panoramic views of distant ridges and ravines and the non-intensive nature of the use of the land.

Another integral element comprising the scenic features of this area is the type of roads and roadsides throughout the area. These byways consist of narrow gravel roadways with roadsides of diverse and contrasting features. These back road features, combined with sequence of openings and closings in the roadway canopy, provide an experience that is not obtainable in most areas.

Development in this area can only occur in a manner that serves to maintain or enhance the visual focus on important scenic features. This shall be accomplished through screening of aesthetically displeasing objects, the maintenance of visual diversity and contrast through the placement of structures which will not adversely modify the views to and from other areas. Non-residential uses should be limited to agriculture, silviculture, home enterprises, inns or bed and breakfasts and public or private recreation. Non-agricultural commercial development that requires trucking and freight handling is prohibited in this land use area.

Goal

To preserve the unique scenic quality of Braintree's upland areas by limiting the scale and density of development.

Policies

1. It is the policy of the Town that development in this area occurs only in a manner that serves to maintain or enhance the scenic qualities of this area. Characteristics that comprise such scenic values include the mixed pattern of open spaces to wooded areas, the prominence of clear, unobstructed panoramic views of distant ridges and ravines and the non-intensive nature of the use of the land.

2. It is the policy of the Town that non-agricultural commercial development that requires trucking and freight handling is prohibited in this land use area.
3. It is the policy of the Town that lot coverage from any structure or solar facility must not exceed half an acre.

Recommendations

1. That an ordinance requiring that the exceptional scenic quality of the rural scenic areas be protected by limiting Residential development and other types of development within this area to a manner that serves to maintain:

    - the visual focus on important scenic features through the screening of aesthetically displeasing objects,
    - the visual diversity and contrast through the placement of structures that will not adversely modify the sequences and views to and from other areas, and
    - the back road byway features be adopted.

f. Conservation Area

It is the purpose of this land use area is to provide for the conservation of certain natural areas that have been identified as relatively undisturbed, consisting of large tracts of quality timber and serving as Braintree's best source of wildlife habitat. Such areas of the community are currently not serviced and lack such facilities as roads and utilities.

Generally sub-soil and slope conditions within these areas impose great limitations on extensive development. In order to provide a fair level of community services within these areas, large amounts of public investment would be necessary.

These lands should be developed at very low densities because the physical limitations in these areas are so great and difficult to overcome and to protect the significant natural and scenic resources in these areas. Only those land uses that will not have an undue adverse impact on the environmental quality of these areas should be allowed, these would include camps or single family dwellings. Non-residential uses should be limited to agriculture, silviculture, home enterprises, and public or private recreation.

Goal

1. To preserve large tracts of relatively undisturbed land and the scenic and natural resources they contain.

Policies

1. It is the policy of the Town that the scope and scale of land use in this area will be very low density and have no undue adverse impact on the natural and scenic resources in the area.

2. It is the policy of the Town that development that is of a type and scale that will require the extension of town services (such as roads) shall not be located in this land use area. Renewable Energy Generation must be limited to 15kw or less

Recommendation

1. That conservation lands be protected and that only those recreational land uses that will not impact or affect the environmental and scenic quality of these areas be allowed.

g. Mud Pond Overlay Area

Mud Pond has been identified by Braintree residents as having a unique and significant value to the community due to its relatively untouched nature and its exceptional natural and scenic resources. Residents who were surveyed in 2011 strongly supported the creation of an additional level of land use protection for this area.

Camp - Defined by the Agency of Natural Resources as a habitable structure "on its own individual lot with no interior plumbing consisting of no more than a sink with water that are used for no more than three (3) consecutive weeks per year and no more than a total of sixty (60) days per year."

The purpose of the Mud Pond Overlay Area is to protect the culturally and naturally significant resources in and around mud pond. This land use area incorporates the watershed which feeds Mud Pond in order to ensure that no contamination of the pond or its surroundings occurs.

Uses in the Mud Pond Overlay Area are limited to camps and recreational facilities. All uses shall be subject to strict conditions and review under the Braintree Unified Bylaw. These conditions may include:

- Expanded wetlands buffer – The largest mapped wetlands in Braintree are located within the Mud Pond Overlay Area. In order to protect and maintain the valuable characteristics of these wetlands, development in this area may be subject to a (minimum) 100-foot buffer requirement.

- Shoreline buffer – In order to protect Mud Pond against erosion and the impacts of development on water quality and pond wildlife, the planning commission may subject development to a (minimum) 100-foot buffer.

- Steep slope limitation – Mud Pond is fed by runoff from the steep valley topography that is the slopes of Mount Nevins, Ferry Hill, Thresher Hill and Oak Hill. Although technology has advanced far enough to allow for innovative septic design on steep slopes, this land use area may prohibit development on slopes greater than 15% in order to protect Mud Pond area from water contamination and erosion hazards.

- Wildlife corridor protection – Mud pond is one of Braintree's relatively untouched wildlife habitat blocks. Development in this area may be expected to accurately demonstrate that it will not have an undue adverse impact on wildlife habitat and related wildlife corridors in this area.

Goal

1. To protect Mud Pond and its watershed, ensuring that it remains a valuable recreational and cultural resource for future generations.

Policies

1. It is the policy of the Town that all development within this overlay area be subject to strict conditions and review under the Braintree Unified Bylaw.

2. It is the policy of the Town that development be limited to seasonal camps and recreational facilities. Renewable Energy Generation must be limited to 15kw or less. Such development shall be designed so that it has no undue adverse impact on the natural and scenic character of the area.

Recommendation

1. The Planning Commission should add the Mud Pond Overlay Area to the Unified Bylaw and create Development Review Criteria that implements this plan as outlined above.

XI. Transportation

Land use, energy, and transportation are related. Land use, both within and outside Braintree'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.

A. Public Highway System

Miles of Roads in Braintree	
Class 1	0
Class 2	9.32
Class 3	32.9
Class 4	10.8
Total Town Roads	53.02

Figure 15: Roads in Braintree *(Source: Vtrans)*

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 two 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.

Nineteen percent (18%) of Braintree's roads are Class 2. 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 (62%) of Braintree's roads are Class 3. 20% of Braintree's highways are Class 4. Class 4 highways are generally in poor condition and are limited in maintenance due to their relative low level of use or seasonal nature. No state aid is available for work on Class 4 highways.

It is the current practice of Braintree 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.

B. Road Maintenance

Apart from education costs, public roads have been and will continue to be Braintree's largest town asset requiring significant financial investments paid through municipal taxes. Transportation funding sources come from numerous combinations of the local tax base, state and federal gas tax receipts, state and federal allocations and registration fees. The most significant funding resource comes from the federal transportation bill which passes through the State of Vermont and is distributed to towns by the Agency of Transportation. The federal and state government pays a percentage of project costs and the community pays the remainder. This funding applies only to Class 1-3 roads. Maintenance of Class 4 roads is funded exclusively by the community.

Gravel

One of the largest expenses in road maintenance is gravel, which is used to maintain and create roads. The cost of trucking large amounts of aggregate long distances can be cost prohibitive, particularly when fuel prices are on the rise. It is in the best interest of the community to establish sources of gravel in town whenever possible, because this reduces the cost of trucking. Braintree currently utilizes a gravel pit on Riford Brook Rd. but this supply is limited. The community should support the creation of additional pits provided that they do not have an undue adverse impact on the environment or the rural character of the community. The town may be able to offer incentives to potential gravel pit developers who would lease the supply to Braintree by offering to cover permit fees. It is generally in the financial interest of the community to own these sources of gravel outright, as it allows exclusive access to the materials and reduces costs.

C. Class 4 & Trails

Class 4 roads and trails primarily offer access to Town and conservation resources and provide unique insights into an agrarian landscape long abandoned. Many Class 4 roads have been incorporated into the natural landscape whereby very little development has occurred along these roads. It has been the policy of the town to maintain culverts and bridges on Class 4 roads to ensure access for emergency vehicles. The town does not plow these roads during the winter. Public utility services or other municipal infrastructure that typically accompany roads are nearly nonexistent. Often these roads are scenic travel corridors for hikers and bicyclists and provide limited access to hunting and conservation lands.

The town also has 6.8 miles of legal trails. Trails are used exclusively for recreational purposes and are not intended for vehicle access, therefore they are not maintained.

D. Scenic Roads

Development proposals on those Braintree roads that are located within the Rural Scenic Land Use Area shall be designed in such a fashion that they do not have an adverse impact on the scenic qualities of this area. This shall be accomplished through screening of aesthetically displeasing objects, the maintenance of visual diversity and contrast through the placement of structures which will not adversely modify the views to and from other areas. The intent is to minimize any interference with views or vistas afforded from the scenic road and to maintain the rural scenic byway quality.

E. Development Review Road Standards

The Town currently uses highway rules and regulations based on state standards that were adopted by the Selectboard in March of 2011. This policy details road construction standards and policies for road classifications, right-of-way, access, road acceptance, and numerous other construction and maintenance related activities. The responsibility of ordinance implementation rests with the Selectboard and the Braintree Road crew. Insofar as guidelines for development review can contribute to this process, the following planning considerations should continue or be expanded upon in future policy updates:

- Emergency management services will have guaranteed safe access to all development.
- Roads should be designed with multi-modal transportation safety (pedestrian, bicycle, etc.) in mind.
- Since local and state road construction follows State of Vermont design standards, private roads should be constructed to those standards, thereby minimizing changes if the road is accepted by the Town at a later date.
- Road design and construction should adhere to the relevant Town Plan goals and objectives - land use, natural resources and transportation elements.
- All roads will reflect a context-sensitive design that preserves and enhances the adjacent land uses and transportation system.
- Private road and driveway standards should be adopted to ensure stormwater is not discharged onto public highways or drainage systems.
- The development of private roads shall be approved by the Selectboard after review of the proposed road by the town road Supervisor and a designated representative of the Fire Department that serves the town.

Major transportation projects often place a greater emphasis on contemporary engineering design standards. However, in some instances, the design and engineering of our roadways and bridges fail to consider the Town's unique historical and natural landscapes. The design of a transportation project should account for a road being historic, scenic, pleasant to drive, or respectful to the people and businesses living alongside it. While engineering sufficiency criteria are important factors for road and

bridge improvements, compatibility with existing and future development patterns also are important considerations.

F. Access Management

According to the Vermont Agency of Transportation (VTrans) definition, access management is a process that provides or manages access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity needs, and speed. Access management is an important process to provide reasonable accessibility to adjacent land uses while maintaining a safe and efficient flow of traffic. Transportation professionals have established that a single, well-designed access to a public highway presents few concerns for the traveling public. However, if access has been poorly designed and/or its frequency increases, the road's health declines proportionally. The result is increased traffic congestion, crash rates, and road maintenance obligations to handle surface water improperly channeled to the road surface or shoulders. Ironically, these factors eventually compromise access to all land uses along the affected roadway. In many instances, towns are forced into costly highway expansion projects.

Braintree has an informal access policy for private roads. The Town recognizes the value of access management and can implement access management strategies through its planning and public works related ordinances and policies. The following are some of these strategies for all public and private transportation and development projects impacting local and state public roads as well as private roads:

- Utilize State of Vermont design standards for all temporary and permanent access, to include emphasis on drainage, sight distance, and access for emergency services;
- Encourage use of shared driveways and/or permitting access that may result in a future shared driveway;
- Require the review of access for existing development whenever a change of use, ownership, or other application process is brought before the Town;
- Encourage commercial properties to use existing development nodes in order to preserve or create road segments with few accesses;
- When practical, approve subdivisions with private and public road designs that allow shared access with other adjacent subdivisions and/or have the private rights-of-way reserved so an access may be built to connect to existing and future development;
- Encourage permanent landscaping and roadside enhancements to visually define access points and contribute to the roadway's aesthetic character;
- 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 Town will work with the Regional Planning Commission to obtain the appropriate data.

G. Other Modes of Travel

Bicycles and Pedestrians

Many residents bike or walk on town roads in Braintree. The rural nature of most of Braintree's roads makes bike/ped travel reasonably safe. However, bike/ped travel along the primary roads in Braintree (Route 12 and Route 12A) is less safe due to higher traffic volume and speed and a lack of available shoulders.

Braintree has 6.8 miles of legal trails, all of which can be used by the public for hiking. Additional recreational opportunities can be found using trails maintained by VAST.

Public Transportation

Braintree, like most Vermont towns, lacks public transportation. Transit services reduce energy use, provide transportation at a fraction of what driving a car for the same trip would be, and increase health. Stagecoach, Inc. offers limited public transportation in the form of special requests for individuals who need transportation for medical reasons, etc. Although there is no Stagecoach bus route in Braintree, there are a number of routes that depart from nearby Randolph where Stagecoach is located. As Stagecoach continues to update routes to meet the demand of riders input from residents and local leaders are invaluable to the transit providers when deciding on new routes. Braintree residents can take advantage of Stagecoach's "Ticket to Ride" Program which helps pay a substantial percentage of the cost of rides for senior citizens (60+) and persons with disabilities when there is not available transportation in the household or the person requesting the trips is unable to drive on the day of the trip. Ticket to Ride is available for a broad array of destinations, such as medical services, shopping, errands, and social purposes.

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

While there is currently a lack of public transit in the region utilizing other ways to reduce single occupancy vehicles is critical to reducing greenhouse gas emissions. Braintree currently has one park and ride facility in town that has 13 spaces and no ev charging stations. Promoting this town resource in combination with carpooling programs such as Go Vermont's carpooling social network Zimride will encourage residents to reduce their gas emissions. Another way that the park and ride can help with the targets that were set in the energy chapter is through the installation of ev charging stations. Currently the range of electric vehicles is limited to about 120 miles with a few models reaching to 200 miles. Given the distance between our communities and centers of employment, it is essential that the ability to recharge EVs is readily available to the EV owner.

H. Goals, Polices and Recommendations

Goals

1. To maintain the rural and scenic character of the back roads and byways thereby protecting the rural scenic quality of the town.

2. 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 to consider public input prior to a decision to substantially change the maintenance level, surface treatment, or class of a town road.

2. When determining which roads to pave 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

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

9. It is the policy of the Town to require development on private roads to adhere to town access standards and to provide safe year-round access for town services, particularly fire and rescue.

10. It is the policy of the town to support programs and initiatives that will reduce single occupancy trips throughout the region.

Recommendations

1. That all development proposals on all Town roads be reviewed by the Town to ensure that the location of any proposed structure and any site or roadside alteration, including grading, filling, removal of trees, stonewalls or other existing landscape features does not degrade the scenic quality of the road or roadside.

2. That in keeping with the Town's desire to maintain its rural and scenic character, efforts to add additional lanes for vehicular traffic to scenic routes and to increase the speed limits on scenic roads should be vigorously opposed.

3. The Selectboard should formally adopt an access management policy.

4. The Selectboard should develop a town highway capital plan and schedule that will guide maintenance and road infrastructure investments in the future.

5. The town should work with the public transit provider in the region to promote full utilization of existing routes and where necessary, identify and develop new transit routes.

6. The town should provide an assessment of the location and number of park and ride spaces and explore opportunities to provide a connection between the transit provider and park and ride location.

7. The town will promote the Drive Electric Vermont Webpage, which connects users to financial incentives, dealers, and recharging stations for EVs

XII. Flood Resilience

A. Background

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

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

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

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

Causes of Flooding

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

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

Historic Flood Events

One of the worst flood disasters to hit the Town of Braintree, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by up to 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground. A more recent flood event that devastated the region and the state was the result of Tropical Storm Irene, which occurred on August 28, 2011. Record flooding was reported across the state and was responsible for several deaths, as well as hundreds of millions of dollars of home, road, and infrastructure damage. Due to the strong winds, some in an excess of 60 mph, 50,000 Vermont residents were initially without power, and many did not have electricity restored to their homes and businesses for over a week.

Tropical Storm Irene caused widespread damage to property and infrastructure in the Town of Braintree due to an estimated 6-7 inches of rain that fell during the storm, some of the highest precipitation totals in Orange County. It is thought that the flooding that occurred as a result of Tropical Storm Irene was close to or equal to a 500-year flood, or a flood that has a .2% chance of occurring every year. Much of Braintree's road infrastructure was damaged by the storm, including Vermont Route 12A, Riford Brook Road, Thresher Road, Thayer Brook Road, Rochester Hollow Road, Bear Hill Road, and West Street. The county-wide damage for Orange County totaled $5 million. The storm damage for Braintree totaled $2,228,085 according to FEMA's public assistance database, which captures at least 70% of the total damage.

Another significant flooding event occurred in Braintree in August and August of 2013.Thunderstorms with heavy rainfall in a moist atmosphere moved through central and southern Vermont during the afternoon and evening hours. 2-3 inches of rain fell on already saturated soils, resulting in flooding. This flooding event caused $80,902 in Braintree according to FEMA's public assistance database.

B. Flood Hazard and River Corridor Areas in Town

Flood Hazard and River Corridor Areas

There are two sets of official maps that govern development in floodplains in Vermont. They are the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) and VT Agency of Natural Resource's River Corridor area maps. The FIRMs show the floodplain that FEMA has calculated would be covered by water in a 1% chance annual inundation event also referred to as the "100 year flood" or base flood. This area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show expected base flood elevations (BFEs) and floodways (smaller areas that carry more current). FIRMS are only prepared for larger streams and rivers. Braintree has FEMA FIRM maps that are used in the administration of their Flood Hazard Bylaw administration. FEMA FIRM Maps were last updated for the Town of Braintree on September 27, 1985. No Flood Insurance Studies (FIS) have been conducted for Braintree. FEMA FIRM Maps are available for the Third Branch of the White River and Ayers Brook. Braintree contains 372 acres of floodplain, 212 of which are mapped floodway, the deepest, fastest flowing area in a flood. The floodplain comprises 1.5% of the town.

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

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

In the Town Braintree, 11 total structures reside in the special flood hazard area, meaning they have 1% of flooding every year. This includes 3 structures that are located in the mapped floodway. These structures consist of 6 mobile homes, 2 commercial structures, 1 structure offering lodging services, and 1 structure classified as other. If all of the structures in the Special Flood Hazard Area were damage or destroyed in a flooding event, the damage would total approximately $1,968,332.

Additionally there are 37 structures that reside within the mapped River Corridor. These consist of 3 mobile homes, 1 multi-family dwelling, 8 camps, 1 commercial structures, and 24 single-family dwellings. If all of these structures were damaged and destroyed, the damage would total approximately $5,739,744. In an effort to help reduce the risk to health, structures, and road infrastructure, it is important to restore and improve the flood storage capacity of existing floodplains and to increase the overall area for retention of floodwaters in Braintree.

Flood Hazard Regulations

The Town of Braintree has a Unified Bylaw, which includes the Floodplain Overlay District, that was adopted on March 4, 2010. The Town's current bylaw prohibits new development in the Special Flood Hazard Area and the Fluvial Erosion Hazard Areas, which are not know as River Corridor Areas. For specific details on the Town of Braintree's regulations, please refer to the Unified Bylaw.

National Flood Insurance Program (NFIP)

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

FEMA has prepared a Flood Hazard Boundary Map for the Town of Braintree, which includes flood hazard areas for the Main Branch of the Ompompanoosuc River. This map is on file at the Town Office and at the Two Rivers-Ottauquechee Regional Commission. It can also be found online through FEMA's website and the Vermont Agency of Natural Resources. Contact the Braintree Town Clerk to determine if a proposed development is in the Flood Hazard Area.

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

Insurance Program, which it has been enrolled in since September 27, 1985.

C. Promoting Flood Resilience

Flood Hazard Regulation

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

1. Require the elevation of existing structures in the Special Flood Hazard Area to be elevated 2 feet above base flood elevation.

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

Non-regulatory approaches

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

Culvert Maintenance
Braintree maintains an up-to-date list of culverts and culvert condition, and completed a comprehensive culvert inventory in summer 2016. As part of this process, priority projects were identified and cost estimates were generated to prioritize culvert upgrades for damaged and undersized structures.
Vermont Agency of Transportation Codes and Standards, which the Town of Braintree adopted on March 7, 2013, require a minimum size of 18 inches for new culverts. The process of upgrading culverts is ongoing underway.

D. Goals, Policies, and Recommendations

Goals

1. Maintain and improve the quality of Braintree's surface and ground waters.

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

3. To ensure no net loss of flood storage capacity in an effort to minimize potential negative impacts. These impacts include the loss of life and property, disruption of commerce, and demand for extraordinary public services and expenditures that result from flood

damage.

4. To allow Braintree to be resilient in the event of a severe flood.

5. To protect municipal infrastructure and buildings from the potential of flood damage.

Policies

1. Use sound planning practices to address flood risks so that Braintree's citizens, property, economy, and the quality of the town's rivers as natural and recreational resources are protected.

2. Braintree prohibits all new fill and construction of buildings in mapped floodways (*Mapped areas, unless corrected by FEMA).*

3. Limit permitted land uses within Braintree's River Corridor Areas to non-structural outdoor recreational and agricultural uses due to the dangerous erosive risk in these areas.

4. Prohibit commercial, industrial, and residential uses within ANR's mapped river corridor areas outside of designated village areas. New development within designated village areas should not be closer than current structures.

5. Move or abandon roads that often experience serious flood damage.

6. Design culverts and bridges, at minimum, to meet VTrans Hydraulics Manual, ANR Stream Alteration Standards, VTrans Codes and Standards. Maintain culverts to ensure they are effective during severe weather events.

7. Do not build Braintree's emergency services, power substations, and municipal buildings in the Special Flood Hazard or River Corridor Areas.

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

9. Maintain Braintree's upland forests and watersheds predominately in forest use to ensure high quality valley streams and to ensure that flood flows reduced.

10. All wetlands which provide flood storage functions shall remain undeveloped. In the long term, restoration and enhancement of additional wetlands should be pursued in order to improve Braintree's flood resilience.

11. After flood events, recovery and reconstruction within the river area should be managed according to the Vermont River Program's best practices in order to avoid negative impacts downstream.

Recommendations

1. All substantial improvements to structures should be elevated 2 feet above base flood elevation (BFE).

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

3. Braintree should continue working to update hazard mitigation plans and emergency preparedness and recovery procedures.

4. The Selectboard should continue to send a representative to regularly attend and participate in the region's Local Emergency Planning Committee (LEPC #12).

5. The town should continue to maintain and update town bridge and culvert inventories. This information should be used to develop a schedule to replace undersized culverts.

XIII. Relationship to Other Plans

Braintree, in Orange County, is bounded, clockwise from the south, by Rochester, Hancock, Granville, Roxbury, Brookfield, Randolph and Bethel. The land use decisions made by neighboring communities can have an impact on Braintree if they are not monitored. For example, a failure to properly regulate development in a neighboring floodplain, can result in damage beyond that community's borders. To ensure that neighboring communities are aware of planned development patterns, copies of draft municipal plans must be distributed to neighbors in order to allow comment and review. Braintree has reviewed neighboring municipal plans and has found no obvious conflicts in terms of land use patterns along its borders. In general, most of Braintree's neighbors value the open, rural landscape and choose to encourage intensive development in village centers.

Town	Town Plan	Zoning	Subdivision	Flood Hazard
Granville	2010	no	no	yes
Rochester	2012	yes	yes	yes
Bethel	2011	yes	yes	yes
Randolph	2010	yes	yes	yes
Brookfield	2011	yes	yes	yes
Roxbury	2007	no	no	yes

Figure 16: Municipal Planning Status of Surrounding Towns, 2012
(Source: Two Rivers-Ottauquechee Regional Commission)

Braintree shares numerous activities and services with surrounding towns, including school services, rescue squad and fire protection. The town is a member of the Two Rivers-Ottauquechee Regional Commission (TRORC). Braintree also maintains membership in the Tri-Town Alliance, a solid waste district that includes Randolph and Brookfield.

TRORC's regional plan covers 30 towns including Braintree. Since the preparation of the Braintree 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.

A. Goals, Policies and Recommendations

Goal

To cooperate with neighboring communities by addressing shared concerns in a regional context.

Policies

1. Maintain the distinct rural character and natural beauty of the region while guiding appropriate growth.

2. Support regional solutions to shared problems.

Recommendations

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

2. To continue participation in the Two Rivers-Ottauquechee Regional Commission.

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

XIV. Implementation

A. Putting the Plan into Action

The character of Braintree, its people, and landscape has 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 are 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 Braintree desires for the future. One thing is certain – the community will change. The opportunity is that 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 Braintree Town Plan.

B. Adoption of the Plan

Adoption of the Braintree 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 that the principles and policies set forth in this Plan are in the public interest and are a guide for the future growth and development decisions affecting Braintree.

C. Ongoing Planning

Planning for change is a continual process for Braintree 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 Braintree.

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 Braintree.

The Braintree 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 the Planning Commission will need to again evaluate the plan in light of new conditions and needs.

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)].

- is consistent with the goals established in section 4302
- is compatible with the Regional Plan
- is compatible with approved plans of other municipalities in the region
- contains all the elements included in subdivisions 4382(a) (1-10)

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

D. Implementation Tools

Vermont law enables Braintree to implement the adopted Braintree Town Plan through a variety of ways. Regulation of land use and development through rules adopted by the voters is one possible method. Any regulations that apply to the Town of Braintree must be consistent with the goals, policies and recommendations of this plan. Well recognized and utilized means include, but are not limited to, zoning bylaws and subdivision regulations. Examples of potential implementation tools include:

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

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

Zoning generally involves partitioning the town into districts or zones that have a different set of uses, densities, and other standards for development. Zoning districts must be reasonably consistent with the land use areas described in the Town Plan. In this version of the Braintree Town Plan several changes have been made that will require the Planning Commission's attention. They include:

- Establishment of the Mud Pond Overlay area
- Clarification of uses appropriate in each land use area

These changes will be implemented as appropriate by the Planning Commission through changes to the Braintree Unified Bylaw.

Subdivision Regulations - Braintree does have subdivision regulations as part of their Unified Bylaw, which is administered by the Development Review Board. Such

regulations govern the division of parcels of land and the creation of roads and other public improvements. Furthermore, subdivision regulations ensure that land development reflects land capability and that critical open spaces and resources are protected from poor design or layout.

Unified Bylaw – State statute allows communities to combine their Zoning and Subdivision regulations into a single document that unifies the permitting process. Braintree adopted their Unified Bylaw in 2010.

Flood Hazard Area Zoning Ordinance - Under Vermont law [24 V.S.A., Section 4412], the Town of Braintree may regulate the use of land in a defined flood hazard area adjacent to streams and ponds. These 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 Braintree unless the Town has in effect a Flood Hazard Area Zoning Ordinance which, at present, Braintree has incorporated as part of their Unified Bylaw.

Highway Policies - Braintree has in effect a Town Road and Bridge Standards of the Town of Braintree setting forth minimum standards and conditions for the construction of roadways, ditches and slopes, culverts and bridges and guardrails. The Town follows state statutes regarding the reclassification of Town Highways as well as the discontinuance, laying out and acceptance of its highways.

Lastly, Braintree does have, through its Selectboard's Highway Access Policy, the ability to regulate private access to municipal roads through the issuance of "curb cut" permits to landowners. "Curb cuts" are places where a private driveway or road connects to a town highway. In granting a cut onto town roads, the Selectboard can give consideration to safety issues such as adequacy of sight distance and proximity to intersections as well as conformance with this Plan.

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. Under the capital budget, a project is selected (e.g. bridge refurbishment), a funding source determined (e.g. general taxes or general obligation bonds) and a priority year given for each activity (e.g. construction in 2015). Collectively these capital projects make clear where public facilities will be placed to accommodate projected growth. 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 Plan.

While Braintree has an informal system of capital programming, it is recommended that a Capital Budget Committee be established to work with the Select Board in the development of a list of capital needs and expenditures, and to formally present a Capital Budget and Program for adoption.

Vermont Community Development Program - Since the mid-1970s, the Vermont Community Development Program (VCDP) has made grant funds available to towns for community projects. Historically, the major focus of the program has been on housing rehabilitation and affordable housing projects benefiting low and moderate-income families.

Braintree should investigate the Vermont Community Development Program and its potential to assist the community in addressing its housing needs. The Regional Commission and the Vermont Agency of Commerce and Community Development are resources available to assist. (PH: 802-828-3217).

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 qualifies.

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

These criteria relate to the environmental, economic, and social impacts of the proposed project on the community and region. Parties to Act 250 proceedings include Braintree, 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 Braintree 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 Braintree and to offer testimony, as appropriate.

Coordination of Private Actions - Citizens and private enterprise have a vested interest in the well-being of Braintree. 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 Braintree, 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.

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 between 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 and the Nature Conservancy are particularly well-recognized organizations. Several organizations are also involved in water quality protection. It is the intent of this Plan to implement its policies through coordination and the involvement of these organizations and others dedicated to public purposes.

Other methods of encouraging land conservation include Transfer of Development Rights (TDR). The Planning Commission can allow, through revisions to the Braintree Unified Bylaw, development rights to be transferred from one property in a sending district to another property(ies) in a receiving district(s). TDR's are commonly used in areas where there is a substantial amount of development potential in more densely populated areas.