

Strafford Town Plan

~~Adopted by the Strafford Select Board
(with revisions)~~

~~09/27/2017
2021
DRAFT~~

Prepared by the Strafford Planning Commission

~~Steve Campbell, Chair~~
~~Steve~~Stephen Willbanks, Chair
Martha Walke

~~John Echeverria~~
Donald Graham
Michael Scanlan
Christina Jamieson
Gregory Colling
Stuart Crocker
Thomas Scull
Jason Schumacher

~~_____~~ ~~Chrissy Jamieson~~
~~_____~~ ~~Mike Scanlan~~
~~_____~~ ~~Bob Bushway~~

Brent Cadwell (former member)
Kevin Grady (former member)
Brian Johnson (former member)

With assistance from the Two Rivers-Ottauquechee Regional Commission-
~~and a grant from the Department of Housing and Community Development~~

Table of Contents

I.	INTRODUCTION	1
II.	DEMOGRAPHICS	3
A.	POPULATION PATTERNS	3
B.	AGE OF POPULATION	4
III.	HOUSING	6
A.	GENERAL HOUSING DATA	6
B.	RENTAL HOUSING	7
C.	AFFORDABLE HOUSING	7
D.	ELDERLY HOUSING	9
E.	STRAFFORD SENIOR HOUSING PROJECT	11
F.	CHILDCARE	11
	<i>Housing Goals, Policies and Implementation Tasks</i>	<i>11</i>
IV.	EDUCATION	13
A.	STUDENT ENROLLMENT	13
B.	SCHOOL FACILITIES	14
C.	HIGHER EDUCATION	14
	<i>Education Goals, Policies and Implementation Tasks</i>	<i>14</i>
V.	UTILITIES & FACILITIES	16
A.	CAPITAL BUDGETING & PLANNING	16
B.	SOLID WASTE	16
C.	CEMETERIES	17
D.	TOWN-OWNED PUBLIC LANDS AND RECREATION	17
E.	PUBLIC BUILDINGS & CULTURAL RESOURCES	19
F.	INTERNET AND TELEPHONE	23
	<i>Utilities & Facilities Goals, Policies and Implementation Tasks</i>	<i>25</i>
VI.	HEALTHY COMMUNITY	26
A.	HEALTH AND EMERGENCY SERVICES	26
B.	STRAFFORD VOLUNTEER FIRE DEPARTMENT	27
C.	EMERGENCY MEDICAL SERVICES	28
D.	POLICE PROTECTION SERVICES	28
E.	EMERGENCY PLANNING IN STRAFFORD	28
	<i>Healthy Community Goals, Policies and Implementation Tasks</i>	<i>29</i>
VII.	TRANSPORTATION	30
A.	PUBLIC HIGHWAY SYSTEM	30
B.	ROAD MAINTENANCE	31
C.	CLASS 4 ROADS	31
D.	DEVELOPMENT REVIEW ROAD STANDARDS	32
E.	ACCESS MANAGEMENT	32
F.	PARKING	33
G.	TRAFFIC REGULATION	33
H.	OTHER MODES OF TRAVEL	34
	<i>Transportation Goals, Policies and Implementation Tasks</i>	<i>35</i>
VIII.	NATURAL RESOURCES	37

A.	WATER RESOURCES	37
B.	BASIN PLANNING.....	38
C.	WETLANDS.....	39
D.	FLOOD RESILIENCE.....	40
E.	FLOOD HAZARD AND RIVER CORRIDOR AREAS IN TOWN.....	42
F.	PROMOTING FLOOD RESILIENCE	45
G.	FORESTRY AND FARMING	47
H.	FOREST FRAGMENTATION	48
I.	WILDLIFE HABITAT.....	50
J.	PLANT COMMUNITIES.....	52
I.	AIR QUALITY.....	53
II.	MINERAL RESOURCES.....	54
J.	ELIZABETH MINE ENVIRONMENTAL CLEANUP.....	54
K.	CULTURALLY AND NATURALLY SIGNIFICANT OPEN SPACE AREAS.....	56
IX.	LAND USE	62
	INTRODUCTION	62
	<i>Overall Land Use Goals, Policies and Implementation Tasks</i>	<i>62</i>
A.	CURRENT LAND USE.....	64
B.	REGULATIONS AND DEVELOPMENT TRENDS	64
C.	PROPOSED LAND USE SETTLEMENT PATTERN	65
D.	FUTURE LAND USE.....	66
E.	VILLAGE CENTERS	66
F.	RURAL RESIDENTIAL I (RRI).....	68
G.	RURAL RESIDENTIAL II (RRII).....	70
H.	LAND & FOREST CONSERVATION	71
I.	RIVER VALLEY CONSERVATION.....	72
J.	MILLER POND SHORELINE	73
K.	ELIZABETH MINE PROTECTION AREA, HISTORIC, AND CONSERVATION DISTRICT	74
L.	OTHER ISSUES RELATING TO DEVELOPMENT.....	74
X.	ENERGY	77
	BACKGROUND.....	77
	ELECTRICITY GENERATION.....	81
	TRANSPORTATION AND THERMAL ENERGY	81
	CURRENT ENERGY USE.....	82
	TRANSPORTATION.....	82
	THERMAL: APPROACHES AND TECHNOLOGIES TO REDUCE FOSSIL FUEL USAGE	84
	PERMITTING CONSIDERATIONS	88
XI.	ECONOMIC DEVELOPMENT	96
A.	ECONOMIC CONDITIONS	96
B.	ECONOMY AND WAGES	98
	<i>Economic Development Goals, Policies, and Implementation Tasks.....</i>	<i>99</i>
XII.	RELATIONSHIP TO OTHER PLANS	101
	<i>Relationship to Other Plans Goals, Policies and Implementation Tasks.....</i>	<i>101</i>
XIII.	IMPLEMENTATION.....	102
A.	PUTTING THE PLAN INTO ACTION.....	102

B. ADOPTION OF THE PLAN102

C. ONGOING PLANNING102

D. IMPLEMENTATION TOOLS.....103

E. IMPLEMENTATION TASKS AND TIMELINES.....106



I. INTRODUCTION

The Planning Commission has developed this Plan based on the premise that the majority of the citizens of the Town wish to preserve the rural, small-town character of Strafford while accommodating redevelopment and development that respects the character of the town and provides shelter, promotes commerce, facilitates the delivery of public services and meets other public needs. A well-grounded Town Plan is the foundation for ensuring appropriate development and conservation of the community's resources. Effective town planning and subsequent implementation of policies and recommendations will reduce conflicts arising from change.

This Plan includes:

1. Descriptions of the Town's present state,
2. A description of elements of the Town that should be preserved,
3. Implementation tasks for future growth and development, and
4. How the implementation tasks should be implemented.

The Strafford Town Plan provides a framework to be used for accomplishing our community's aspirations over the next several years. It gives specific guidance while retaining enough flexibility to be useful when faced with unforeseen circumstances. The Plan will need to be reviewed and revised in eight years to ensure it is still an appropriate vision for the Town.

This Plan should be viewed as a whole, with goals, objectives, and implementation tasks viewed as an integrated, interdependent system of statements. For example, this Plan supports development in certain areas and the preservation of undeveloped areas based on a variety of criteria.

The Plan aims to help the citizens of Strafford better define and direct the future of their community. The Plan is to be used by the Town boards, commissions, departments, residents, developers and businesses in a number of ways to:

1. Provide a framework for planning the future of the Town;
2. Assist in the development of a capital budget and program;
3. Direct the formulation of departmental policies and strategies;
4. Serve as a basis for responding to Act 250 and Act 248 permit requests;
5. Guide decision making in site plan review and conditional use review;
6. Present a framework for developing Zoning Bylaws and subdivision bylaws;
7. Engage in sensible energy planning;
8. Supply data and solutions to planning issues.

Each Plan section will begin with relevant background information, and then have goals, objectives and implementation tasks. For the purposes of the Strafford Town Plan:

Goals express broad, long-range community aspirations relative to one or more category of topics. They should be considered aspirational statements for the community.

Policies are statements of the town's position with regard to specific issues or topics. In certain settings, such as Act 250 proceedings, policy statements will serve as the basis for determining a project's conformance with the Strafford Town Plan.

Implementation Tasks are specific actions that may be taken by identified entities to support one or more policies and achieve the community's goals. This implementation program is aspirational in nature and it is not anticipated that all of the suggested tasks will necessarily be undertaken during the eight-year duration of this plan. Tasks that require an expenditure of Town funds will be evaluated through the Town's normal budgeting process. Priorities for implementing the tasks are identified as ongoing, short-term (to be completed within one year of plan adoption), mid-term (2-5 years of adoption) and long-term (5+ years from adoption). The groups and/or individuals responsible for each task are identified.

It is important to note that policies and implementation tasks found in individual chapters may relate to other chapters. For example, an implementation task within the Energy chapter may be: Designate a ride-share parking area in the village centers to facilitate car-pooling. This implementation tasks would relate to the Transportation chapter as well.

The goals of this Plan are to:

1. Protect the rural character of the Town;
2. Continue Strafford Village and South Strafford Village as town centers;
3. Promote safe and healthful building practices;
4. Promote housing affordability for all segments of the population;
5. Promote environmentally sound development practices.

To accomplish these goals, the plan seeks to:

1. Provide adequate space for needed types of land use, both public and private, in locations that minimize the adverse impact of one land use on another;
2. Protect and allow for the judicious use of the Town's soils, minerals and stone, forests, agricultural lands, waters and other natural resources;
3. Support the adequate and economical provision of transportation facilities, schools, parks and other public requirements in relation to development; and
4. Protect the Town's historic sites, which are significant contributors to the Town's essential character.

II. Demographics

Population, when considered in terms of past, present and future statistics, represents an important factor in the overall development patterns of a town. Rapid population increases can create a demand for new and expanded municipal services, and can strain the financial ability of a town to provide public services economically, which is important to our citizens and taxpayers. Strafford seeks population growth consistent with historical settlement patterns and town resources.

A. Population Patterns

According to the 2010 United States Census (Census), Strafford’s population was 1,098, compared to a population of 1,049 in 2000, resulting in a 4.7% growth rate. (See Figure 1).

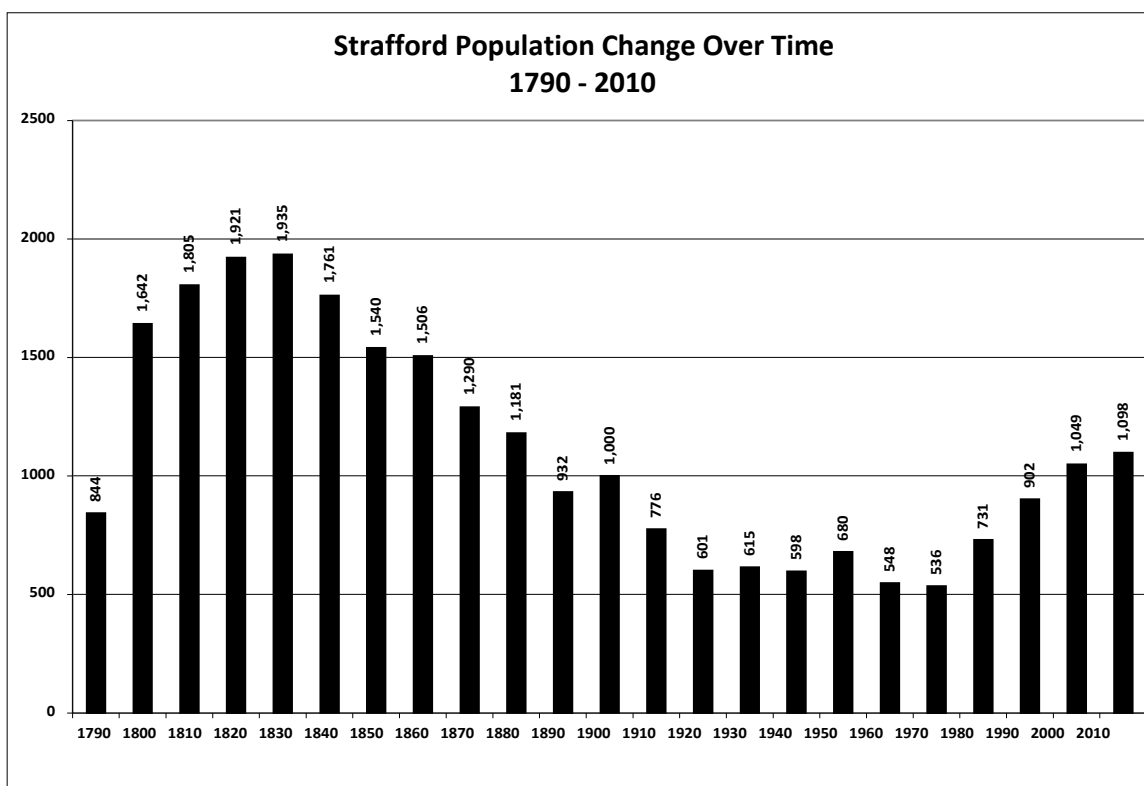


Figure 1: Strafford Population Change Over Time | Source: U.S. Census

While a 4.7% growth rate is certainly not as high as the previous decade (16%), Strafford’s growth rate is higher than (see Figure 2):

- Most of the surrounding towns,
- Orange County
- The Two Rivers-Ottawquechee Region, and

- The State of Vermont.

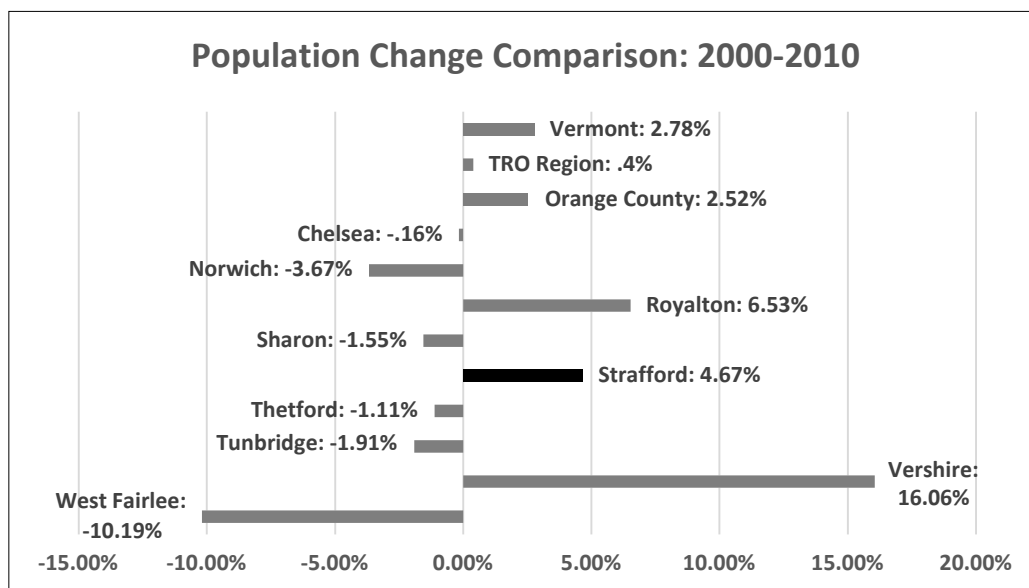


Figure 2: Population Change Comparison: 2000-2010 | Source: U.S. Census 2000 and 2010

B. Age of Population

As indicated in Figure 3, between 2000 and 2010, significant population increases occurred in three of the age cohorts: 55–59, 60–64, and 65–74, which reflects the ongoing effect of the “Baby Boomer” generation (people born between 1946 and 1964). In 2000, the median age in Strafford was 40.6; in 2010, the median age moved up to 45.9. The number of Strafford residents over the age of 65 is climbing:

- In 1990, 10% of Strafford’s population was 65 and over
- In 2000, 12% of Strafford’s population was 65 and over
- In 2010, 15% of Strafford’s population was 65 and over

In general, the age of Strafford's population is similar to that of Vermont as a whole, with much of the population over age 35.

An aging population will need services that are not readily available in a town like Strafford (see Figure 8), and the need for elderly housing will increase.

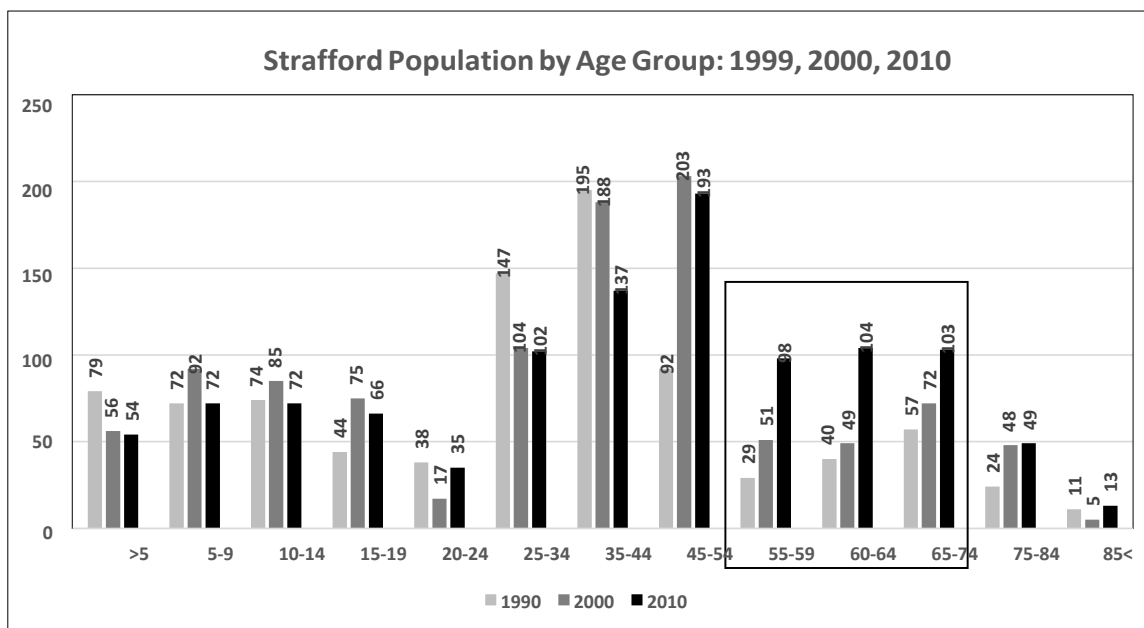


Figure 1: Strafford Population by Age Group: 1999, 2000, 2010 | Source: U.S. Census

The loss of young adults (generally between the ages of 25–35) has been a concern throughout Vermont for many years. The out-migration of this particular population 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. That said, from 2000 to 2010, Strafford gained back almost the same number of 20–24-year-olds it had lost in the previous decade; and while Strafford lost about 29% of its 25–34-year-olds between 1990 and 2000, those numbers have held steady in the 2000–2010 decade.

A 2016 analysis of both IRS migration patterns and census data by the Public Assets Institute—a think tank in Montpelier—reveals that while a certain number of young people leave, just as many move into Vermont, resulting in a net population loss of zero.

~Report: Young people do leave Vt., but they move in.
Times Argus. January 31, 2016

In 1999, K–8 enrollment was 153 students. By 2005, that number had dropped nearly 24% to 111. From 2006–07 through the 2015–16 school years, K–8 enrollment has averaged 122 students per year, with a high of 134 in 2011 and a low of 110 in 2007.

III. Housing

A. General Housing Data

Vermont Housing Data indicates that there has been an 8% growth in the number of housing units¹ between 2000 and 2010 (Figure 4). Of the 586 housing units, 387 (66%) were owner-occupied, 66 (11%) were renter-occupied, and 133 (23%) units were vacant: 111 for seasonal, recreational, occasional use; three for rent; and four for sale.

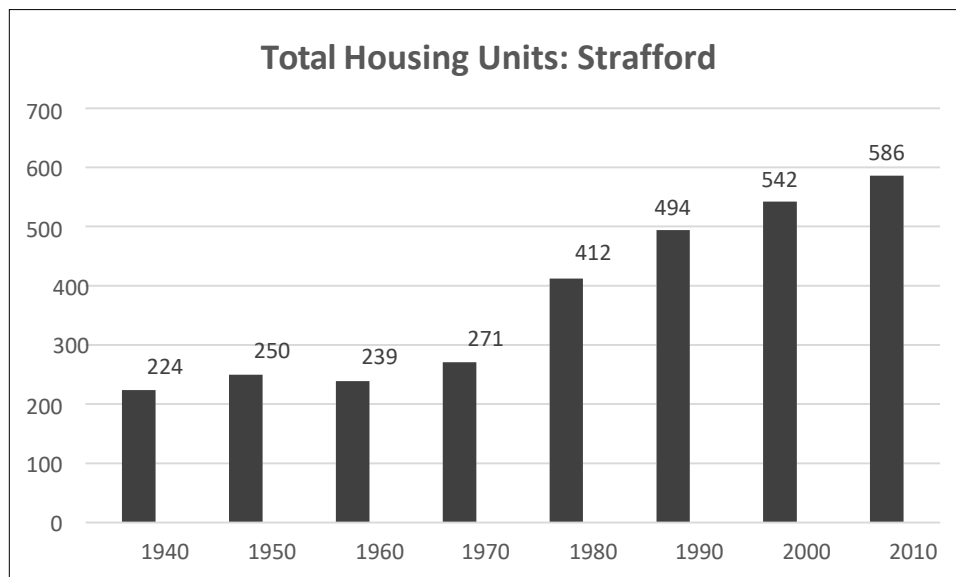


Figure 2: Total Housing Units: Strafford | Source: Vermont Housing Data

As shown in Figure 5, in 2015, the number of residential sales in Strafford for properties under six acres were similar to the recorded sales in 2008, but average and median prices were higher in 2015. Residential sales for properties over six acres was double in 2015, but average and median prices were both lower.

¹ A housing unit is a house, an apartment, a group of rooms, or a single room occupied or intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants do not live and eat with other persons in the structure and which have direct access from the outside of the building or through a common hall.

Price of Residential Homes in Strafford and Surrounding Area (2008 and 2015)							
		2008 Number Sold	2008 Average	2008 Median	2015 Number Sold	2015 Average	2015 Median
Chelsea	<6 Acres	4	\$97,131	\$110,000	9	\$82,417	\$75,000
	>6 Acres	2	\$624,950	\$0	9	\$225,802	\$133,000
Norwich	<6 Acres	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	55	\$415,448	\$382,500
	>6 Acres	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	26	\$670,779	\$565,925
Royalton	<6 Acres	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	17	\$140,505	\$149,000
	>6 Acres	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	11	\$282,363	\$250,000
Sharon	<6 Acres	7	\$182,071	\$185,000	12	\$216,354	\$185,250
	>6 Acres	7	\$296,785	\$288,000	13	\$399,846	\$335,000
Strafford	<6 Acres	6	\$179,250	\$156,500	7	\$234,914	\$230,000
	>6 Acres	4	\$350,250	\$350,500	8	\$240,687	\$201,500
Thetford	<6 Acres	20	\$224,992	\$191,250	30	\$141,237	\$102,000
	>6 Acres	16	\$454,075	\$376,950	14	\$178,773	\$152,000
Tunbridge	<6 Acres	4	\$192,500	\$192,500	7	\$142,142	\$174,000
	>6 Acres	10	\$320,550	\$306,500	11	\$268,636	\$205,000
Vershire	<6 Acres	2	\$151,500	\$0	3	\$82,822	\$110,000
	>6 Acres	2	\$252,500	\$0	8	\$215,125	\$181,250

Figure 3: Price of Residential Homes in Strafford and Surrounding Area: 2008 & 2015 | Source: Vermont Department of Taxes

B. Rental Housing

Vermont Housing Data also reflects that only 11% of Strafford's housing stock in 2010 was rentals. The tight housing market continues to drive up rental costs. In 2009, the U.S. Agency of Housing and Urban Development (HUD) calculated the fair market rent (FMR) for a modest two-bedroom apartment in Strafford at \$795 per month. In 2014, that cost had risen to \$814. While this is only an increase of 2%, in order for a renter in Strafford to be able to afford rent at this rate, he/she would have to make at least \$32,560 annually. Tax return data from 2014 indicates that 35% of Strafford's population makes less than \$30,000; therefore, it is likely that many find renting in Strafford unaffordable. The 2016 FMR for Strafford is \$920, an increase of 13% from 2014; while tax return data for 2016 is not available, many probably still find rental rates in Strafford unaffordable.

C. Affordable Housing

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. While the American

Community Survey² data often does not provide a large-enough sample size to determine exactly the number of cost-burdened residents in Strafford, available data indicates the Town has far more households with low-to-moderate income than it has housing at low-to-moderate prices. To ensure that housing in Strafford does not become entirely unaffordable, it is important for the community to maintain diverse types of housing stock. A reasonable mix of single family (including mobile homes), multifamily and rental units is necessary to provide housing options for residents with varying income levels.

In the *2013 Housing Needs in East Central Vermont* report, the Vermont Housing Finance Agency (VHFA) reported that recent declines in primary home sale prices and interest rates had put the median-priced homes in Orange County within reach of median-income households at the county level. In 2012, the median-income household in Orange County could likely afford the median primary-home price of \$156,000 assuming a five percent down payment, average taxes, insurance, and interest rates. However, VHFA also reported that some individual towns had home prices out of reach of the median income resident, with the most extreme being Hancock, **Strafford**, Pittsfield and Norwich.

The cost of housing is often driven up in great part due to a tight housing market. According to the 2010 Census, the rental and homeowner vacancy rates³ for Strafford was 1% and 4.3% respectively.

According to VHFA, estimating the prevalence of true vacancies in Vermont communities is made difficult by the state's rural nature, the high proportion of vacation homes and the lack of a system to collect and analyze the data.

Strafford, like many communities, has also experienced a trend toward smaller household sizes⁴ (see Figure 7). This trend is likely to continue and likely to create a demand and/or need for smaller housing units. The elderly, single person households, and other special populations are oftentimes in need of special types of housing, including that which is affordable and readily accessible.

2 The American Community Survey (ACS) is an ongoing statistical survey conducted by the U.S. Census Bureau.

3 Vacancy rate is the percentage of built space in the markets that are currently unoccupied or are available for rent.

4 Household size refers to the number of people per household.

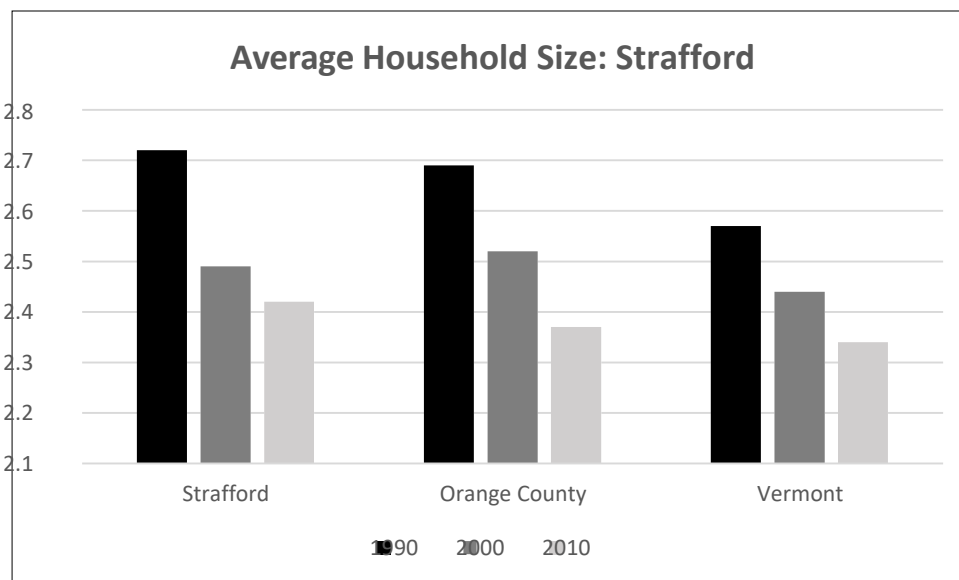


Figure 6: Average Household Size: Strafford | Source: Vermont Housing Data

D. Elderly Housing

As discussed in the previous chapter, Strafford is trending toward an aging population. The Baby Boomers are beginning to retire, and the oldest ones will be 84 in 2030.

Senior housing demand is typically focused on a relatively small geographic area, reflecting a preference for remaining within or close (10 to 15 miles) to the community where they spent their adult/working lives and where they have established family, community, and religious ties. Unlike more urban communities whose housing inventories include both rental and ownership units and some subsidized units, these smaller communities generally have little or no rental housing. Seniors living in the community almost always own their homes. When the time comes to downsize, these seniors are forced to make a choice of either maintaining a property that is beyond their means or moving to another community where alternative forms of housing are available.

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 8, there are no options in Strafford and few options in the surrounding area for this type of care. This is, of course, not just a local issue. There is a shortage of elderly housing throughout the State of Vermont.

Within Vermont there are two 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. Level III homes provide nursing overview, but not full-time nursing care. There are Level III homes that are designated as Enhanced Residential Care (ERC) providers. The ERC designation allows the residential care home to designate a number of beds for residents requiring a higher level of care. Level IV homes provide neither nursing overview nor nursing care. Daily rates at residential care homes are usually less than rates at nursing homes.

Nursing and Residential Care Facilities, 2016			
Total beds by provider type, by town			
Town	Nursing Care	Residential Care	Residential Care
	Level II	Level III	Level IV
Chelsea	0	21	0
Norwich	0	0	0
Randolph	30	18	0
Royalton	0	0	0
Sharon	0	0	0
Strafford	0	0	0
Thetford	0	0	0
Tunbridge	0	0	0
Vershire	0	8	0

Figure 7: Source: Vermont Department of Disabilities, Aging and Independent Living

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.

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 Strafford and Vermont as a whole, aging in place 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 Strafford and the increasing cost of healthcare, however, aging in place may not be an option that can be considered.

Several municipalities have benefited from planned retirement communities that 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 village/hamlet centers where basic services are available.

E. Strafford Senior Housing Project

In 2008, the Town of Strafford hired a consultant to conduct an analysis of the market demand for senior subsidized housing in the village of South Strafford. The market study focused on the development of five-to-eight (5–8) senior housing units to be located on an already identified site. The conclusion of the study was that there is a need for independent senior housing in Strafford and the surrounding communities based on a number of factors including: the current and projected senior population, percentages of seniors who are income eligible, extensive waitlists at existing facilities, and a critical housing shortage in the Upper Valley region. The study determined that the need cannot be met by the existing housing market or by the region's housing inventory particularly for the fifty-eight percent (58%) of senior households who would qualify for housing assistance.

F. Childcare

As of late 2016, Strafford has no in-home childcare providers in town and two licensed childcare providers (including one after school program) that are registered with the State of Vermont. Several other registered homes and licensed centers are located in neighboring towns. According to the 2010 Census, there were 126 children under the age of 10 in Strafford. In 2010, according to the Census, 39 children were enrolled in some kind of preprimary school. Other child care services are provided within familial relationships.

Area Child Care Facilities: 2016			
	Licensed Provider	Registered Home	Capacity
Chelsea	2	1	60
Norwich	4	0	127
Royalton	3	1	110
Sharon	2	0	95
Strafford	2	0	45
Thetford	5	3	147
Tunbridge	2	0	93
Vershire	0	1	10

Figure 8: Area Child Care Facilities: 2016 | Source: Vermont Child Care Information System

Housing Goals, Policies and Implementation Tasks

Goals

1. Strafford senior citizens have access to decent, affordable in-town housing.
2. The rate of construction of affordable housing does not exceed the Town's ability to provide services.
3. Strafford residents have access to affordable childcare facilities.

Policies

1. Support efforts to provide a location for development of quality, safe, sanitary, affordable and energy efficient housing for low- and moderate-income senior citizens in or near one of Strafford's villages.

2. Conversion of larger homes to two and multiple family units to meet the needs of the community's elderly is appropriate where the historic character of a building or neighborhood is not unnecessarily destroyed or diminished.
3. To provide affordable and energy efficient housing to low- and moderate-income families and for senior citizens.
4. 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.
5. 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.
6. To permit and encourage in-home daycare programs, licensed or registered, through the home-occupation zoning permit process.

Implementation Tasks

1. A local affordable housing trust should acquire property suitable for re-sale to qualifying low- and moderate-income senior citizens from Strafford.
2. A local affordable housing trust should be organized to acquire properties suitable for resale to qualifying low- and moderate-income families.
3. Encourage larger home conversions to multi-unit.
4. Encourage accessory dwelling units.

IV. Education

Introduction

Strafford’s only school, the Newton School, located in South Strafford Village, offers education for grades K–8. The Strafford School District does not maintain a high school nor is it part of a union high school district. High school students must, therefore, attend school outside the town. The school district pays full tuition for high school students to attend Thetford Academy—Strafford's “designated” high school—or a technical (vocational) center with an associated high school.

Parents may petition the school board to have their child attend another approved school if Thetford Academy or available technical centers do not meet their child's needs. The board may, at its discretion, approve such petitions and authorize payment of tuition. For approved public high schools in Vermont or a neighboring state, the board may authorize no more than the amount charged by Thetford Academy for nonresident students and for private schools, no more than the average amount charged by Vermont union high schools. Because performance testing has become the means of evaluating a school's effectiveness, The Newton School should continue assisting children to succeed.

The total staff at The Newton School consists of 34 employees, 12 of whom are full-time teachers.

A. Student Enrollment

During each fiscal year, the Vermont Department of Education collects enrollment data from Vermont’s supervisory union and school districts. Enrollment of students in The Newton School in recent years are:

Newton School Enrollment	
School Year	# Students
2009-10	122
2010-11	125
2011-12	131
2012-13	129
2013-14	120
2014-15	120
2015-16	117

Figure 9: Newton School Enrollment Source: Town of Strafford Town Report, 2015

B. School Facilities

Newton School consists of eight classrooms, an arts room, a library, a lunchroom and an office, as well as seven smaller rooms for the nurse and various special services. The private Creative Preschool classroom and the gymnasium are located in the Rosa B. Tyson Gym across Rte. 132. The library is located in an adjacent building, renovated for that purpose in 1999.

There are a variety of recreation areas in the immediate vicinity of the school and the gym. Those areas maintained by the school include both paved and grassy open spaces that surround the school and a playing field above the school. They include a climbing structure, swings, a slide, a basketball hoop, tether balls and other playground equipment. The South Strafford Recreation Area, adjacent to the gym is maintained by the Town and includes a larger playing field (Murray Field) with a baseball diamond and soccer nets, tennis court, playground, and pocket park.

These are maintained by the Strafford Recreation Board and made available to the school for physical education activities Barrett Hall, across Rte. 132 as it proceeds up the Sharon Hill, and also separately owned and administered, is available for school assemblies, concerts and plays. The school district, in return, makes a contribution toward the upkeep of the building.

C. Higher Education

Strafford has no opportunity for residents to acquire education beyond high school. Because of the size and location of the town of Strafford, it is unlikely that additional adult education opportunities will be available locally. Available options in the Upper Valley are within a 30–40-minute commuting range. These options include Vermont Technical College in Randolph; Community College of Vermont in Hartford; Granite State College in Lebanon, NH; Franklin Pierce University has a campus in West Lebanon, NH. and Dartmouth College in Hanover, NH.

Education Goals, Policies and Implementation Tasks

Goals

1. Free and appropriate public education is available to all children who live in Strafford, as is their right under state and Federal law. The mission of the Newton School, the only school owned by the Town of Strafford and operated by its school district, is as follows: "The fundamental aim of The Newton School is to provide educational opportunities which promote academic excellence, social responsibility and love of learning; develop unique talents and personal interests; reinforce positive self-image and an appreciation of the world around us; and establish effective, functional and responsible citizens of a global community of learners."
2. The Newton School continues as a community center and a point of educational excellence.

Objective

1. To realize the maximum benefit of Town and school district resources in the provision of a full and rich education for its students.

Implementation Tasks:

1. A plan addressing the long-term needs and options for providing high school education for Strafford students should be analyzed and formulated.
2. Encourage measures that will bring greater energy efficiency to the Newton School, including reductions in traffic during the times when students are being dropped off or picked up.

V. Utilities & Facilities

A. Capital Budgeting & Planning

State statutes enable communities to create a Capital Budget and Planning (CB&P) 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 CB&P as described in state statute (24 V.S.A §4443). A capital budget outlines the capital projects that are planned 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 CB&P must be consistent with the Town Plan and shall include an analysis of what effects capital investments might have on the operating costs of the community. An adopted CB&P must be drafted with assistance from the Planning Commission to ensure consistency with the Town Plan. While the Planning Commission is designated in statute as the “preparer” of the CB&P it is essentially the responsibility of the members of the Selectboard and a designated Budget Committee to develop the CB&P.

The Selectboard has the ultimate decision as to whether or not such a budget and program is adopted. 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 may only be slightly higher if energy efficiency improvements are done at the same time, rather than on their own. In addition to providing a more comfortable building for occupants, including properly installed energy efficiencies at the time of building improvements may also save money on utilities and operational costs in the future. Other elements that may be considered in a CB&P include investments in transportation infrastructure and upkeep, as well as municipal expenses such as information technology systems.

At present, the Town of Strafford does not have a CB&P. However, this plan does include an implementation to develop a CB&P.

B. Solid Waste

Waste Disposal

The Greater Upper Valley Solid Waste District (GUV) currently provides recycling opportunities and trash hauling by private firms. Through GUV, Strafford residents have local access to household hazardous waste and other waste collections, in other District towns and at the Hartford Community Center for Recycling. These include construction and demolition disposal, metal recycling, used electronics and a still wider range of other recycling options at special recycling events.

The GUV bonded to purchase land and build an access bridge over the Interstate for a lined landfill. Strafford’s share of indebtedness due the GUV for the landfill and bridge as of December 31, 2016 was \$109,072. However due to economic conditions there are no plans for opening the landfill in the next eight years. A Sustainability Park is being

considered and Green Mountain Power (GMP) is currently in the process of getting approval for a 5mega watt solar facility to be built on the site. GMP plans to sell the renewable energy credits from the solar project to other states. GUV will receive the revenue from the solar project which will help reduce the Towns tax burden for the bond.

Strafford supports GUV through a per capita fee for the annual bond payment and with a waste generation fee paid to the hauler which places more of the financial burden on those individuals who produce the most trash.

Recycling

Strafford, through membership in GUV, contracts with the Northeast Resource Recovery Association, which provides hauling and marketing of recyclables. Profits from the sale of the recyclables offset the hauling charges.

Strafford's Recycling Program, including participation in GUV's special recycling collection events, has been one of the most successful in the region. Strafford's rate of recycling is well above the State of Vermont's goal of recycling 50% of the community's waste stream. Recently the Strafford Area Lions Club purchased a 30-yard dumpster and the Town purchased two 30-yard dumpsters for hauling recycling materials. These dumpsters hold more and reduced the number of hauls which reduced the cost of running the facility. Strafford's Recycling Program is staffed entirely by volunteers, who participate on a rotating or as-needed basis.

Objectives

1. Support and comply with Vermont's Act 148: Universal Recycling and Composting Law.
2. A long-term, cost-effective, environmentally sound regional solid waste solution, beginning with the development of GUV's lands as a Sustainability Park and the construction, under favorable economic conditions, of GUV's proposed landfill in Hartland.

C. Cemeteries

Strafford has two organizations that are responsible for various cemeteries throughout the town. Eight old town cemeteries are under the supervision of the Cemetery Commissioners. The Strafford Cemetery Association manages the Strafford Cemetery in the upper village. The Evergreen Cemetery in South Strafford is the responsibility of the Town. The greatest challenge facing Strafford's cemetery organizations is an increasingly critical shortage of space, which might be best addressed if the commissions agreed to explore solutions cooperatively.

D. Town-owned Public Lands and Recreation

Recreational Fields

Varney Ball Field: Varney Ball Field, a gift from the Paine family in 1975, is located on Rte. 132 east of South Strafford.

South Strafford Recreation Area – located in South Strafford, this field was acquired and developed under the auspices of Bureau of Outdoor Recreation with funding from the Land and Water Conservation Fund, the State of Vermont and the Town of Strafford. It includes the tennis courts, Robert Murray Recreation Field, the Red Barn a playground area and the Pocket Park.

The South Strafford Recreation and Varney Field are used for various athletic and recreational activities such as baseball, tennis, soccer, basketball, picnicking, etc.

Other Recreational Areas and Opportunities

The Newton School grounds, occupying three acres in South Strafford, offer extensive play activities and includes the Field of Dreams soccer field located above the school.

In Strafford Village, the Town House hill and common provide open space for community activities.

Old City Falls and its ravine, a unique natural and historical area, was purchased and developed with Bureau of Outdoor Recreation funds. This recreation area includes a picnic shelter and fireplace, and a path to the falls.

The Strafford Area Lions Club sponsors a wide variety of recreational activities. The club leases and maintains a one-third acre pond with a 100-foot beach, as well as a 500- foot rope ski tow. Swimming and ski lessons are available in season.

Membership and participation are open to all. The Lions Club completed a ~~four~~0.4 mile bicycle and pedestrian path between the Varney Ballfield and Our Lady of Light Chapel.

The Strafford Athletic Association, often in conjunction with the Strafford Recreation Board, supports local recreational activities, including an ice hockey rink at the Varney field and the utilization of the Rosa B. Tyson Gym, which is owned by the Newton School and used for indoor recreation. The basement of the gym is used as the space for the Creative Preschool program.

The Justin Morrill Drift Skippers Snowmobile Club maintains a network of trails with the permission of property owners and at considerable expenditure of time, money and labor by club members. Membership is open to anyone with a properly registered snowmobile. Associate membership is also available to cross-country skiers who wish to use the trails. All members, regular and associate, assist in the upkeep of the trails. The Club owns a Snow cat trail groomer for use on local trails.

The State of Vermont's Fish and Game Department owns 1400 acres, principally in the Podunk Wildlife Management Area, and maintains the fishing access on Miller Pond.

The Clover Hill and Kibling Hill Wildlife Management Areas are available to the public for hunting. ~~Dr. Gardner Cobb gifted Strafford the 14 acres that became the town forest.~~

~~Dr. Gardner Cobb gifted Strafford the 115 acres that became the Cobb Town Forest with trails and extensive wetlands. Whitcomb Hill, a 26-acre, donated parcel, accessible from several trails, provides a dramatic scenic overlook of the Connecticut River Valley.~~ The town also owns several other small parcels of land that have the potential to be developed for recreational purposes.

As of ~~2016, 22~~2021, 26 miles of trails have been laid out, including the interconnected Cross- Town Trail, the Town House Trail and the Morrill Link Trail. There is also the mile-long Town Forest Trail. All are under the auspices of the Conservation Commission and involve numerous landowners who made their properties available for these publicly accessible trails. This system is a testament to the community's support of outdoor recreation, as private landowners have chosen to allow public access to their property.

Other hiking opportunities can be found using trails maintained by VAST.

When repairs and maintenance are needed for town-owned recreational areas, private fund-raising has been successfully utilized.

E. Public Buildings & Cultural Resources

~~There are a number of historic buildings in Strafford that are used for various public purposes.~~

Municipal Buildings/Town Office

~~The Municipal Building, or Town Office, is located in Strafford Village. The upstairs, which is not handicapped accessible, was renovated in 2007 and a conference room was created as well as an office for the listers. The downstairs accommodates office space for the town clerk, town treasurer, zoning administrator, selectmen, and the general public, all in a confined space. In the future, the building may become too small to continue to function as the town office. The roof was replaced and energy-efficiency improvement measures were taken, including insulating the vault. The Municipal Building is receiving net-metering credits from a community solar array installed in July of 2015, owned and operated by Strafford Energy LLC. The town receives credits to cover about 90% of their electrical usage through this program.~~

~~The Municipal Building, or Town Office, is located in Strafford Village. The upstairs, which is not handicapped accessible, was renovated in 2007 and a conference room was created as well as an office for the listers. The downstairs accommodates office space for the town clerk, town treasurer, zoning administrator, selectmen, and the general public, all in a confined space. In the future, the building may become too small to continue to function as the town office.~~

~~The roof was replaced and energy-efficiency improvement measures were taken, including insulating the vault. The Municipal Building is receiving net-metering credits from a community solar array installed in July of 2015, owned and operated by Strafford Energy LLC. The town receives credits to cover about 90% of their electrical usage through this program.~~

Needed improvements: Stairway replacement and handicap-accessibility to the upstairs.

Strafford Town House

~~Strafford's Town House, built in 1799, celebrated its bicentennial in 1999. Although in appearance a traditional New England-style religious meetinghouse, it has had, from the outset, both a secular and a religious purpose. Its constitution, passed in 1798, specified that "1st it shall be a free and open house for the Town to meet in to do public business" and "2 nd it shall be a free and open house for all the different Religious Denominations of People in said Town to meet in for worship..." It has, since 1801, served as the venue for Town Meeting. Except for state and national elections, its use throughout the year is limited to special events in the warmer seasons. In 2005, the Town House tower was repaired and strengthened. Prior to this work, during 1993-94, under the auspices of the Strafford Historical Society, a successful fund-raising campaign was launched which resulted in the restoration of the Town House tower clock. In 2009, the wood stove 20 Strafford Town Plan 2017 – Adopted 9/27/2017 heating system was replaced by a much safer propane heating system and the network of stovepipes was removed, restoring the interior to its original configuration. Strafford's Town House, built in 1799, celebrated its bicentennial in 1999. Although in appearance a traditional New England-style religious meetinghouse, it has had, from the outset, both a secular and a religious purpose. Its constitution, passed in 1798, specified that "1st it shall be a free and open house for the Town to meet in to do public business" and "2nd it shall be a free and open house for all the different Religious Denominations of People in said Town to meet in for worship..." It has, since 1801, served as the venue for Town Meeting. Except for state and national elections, its use throughout the year is limited to special events in the warmer seasons. In 2005, the Town House tower was repaired and strengthened. Prior to this work, during 1993-94, under the auspices of the Strafford Historical Society, a successful fund-raising campaign was launched which resulted in the restoration of the Town House tower clock. In 2009, the wood stove heating system was replaced by a much safer propane heating system and the network of stovepipes was removed, restoring the interior to its original configuration. Renovations and maintenance are ongoing and most recently included a new, detached bathroom facility.~~

Needed improvements: steeple renovation.

A combination of grants and donations will be used to fund the renovation efforts.

Barrett Memorial Hall

Barrett Hall in South Strafford, originally built in 1897, was rebuilt in 1939 after fire destroyed the original structure. It serves the Town as an all-purpose site for meetings, private celebrations and other sponsored events such as Pre-Town Meeting, the Lords Acre Supper, various talent shows and performances, and in particular, a site for various Newton School plays and assemblies. Barrett Hall also serves as a meal site for the weekly senior lunch. Under the guidance of an independent Board of Trustees, Barrett Hall has been dramatically improved, with a new kitchen, bathrooms, boiler, granite steps, an elevator for handicap-access and a new floor. Barrett Hall is also part of net-metering credits program discussed under the “Municipal Buildings/Town Office” section.

~~Barrett Hall in South Strafford, originally built in 1897, was rebuilt in 1939 after fire destroyed the original structure. It serves the Town as an all-purpose site for meetings, private celebrations and other sponsored events such as Pre-Town Meeting, the Lords Acre Supper, various talent shows and performances, and in particular, a site for various Newton School plays and assemblies. Barrett Hall also serves as a meal site for the weekly senior lunch.~~

~~Under the guidance of an independent Board of Trustees, Barrett Hall has been dramatically improved, with a new kitchen, bathrooms, boiler, granite steps, an elevator for handicap-access and a new floor.~~

~~Barrett Hall is also part of net-metering credits program discussed under the “Municipal Buildings/Town Office” section.~~

Town Garage

The town garage is located at 287 Route 132 as of 2007, and is located on .22 acres of a 7.2 acre parcel. It is a five-bay garage, and includes an enclosed office space. It also has a salt shed, sand pile, and outdoor storage for culverts, etc. Park-n-Ride The Strafford Park-n-Ride is located at 233 Route 132. It is paved and has 23 lined spaces. The old town garage is located here and is currently used for storage. The Town owns and maintains the Park-n-Ride. Morrill Memorial and Harris Library The Morrill Memorial and Harris Library in Strafford Village, completed in 1929, holds 15,000 items, including books, periodicals, records, audio and video cassettes. 21 Strafford Town Plan 2017 – Adopted 9/27/2017 The library collection is supplemented by the State of Vermont's inter-library loan system. Enlargements to building were made between 1993 and 2003.

~~The town garage is located at 287 Route 132 as of 2007, and is located on .22 acres of a 7.2-acre parcel. It is a five-bay garage, and includes an enclosed office space. It also~~

~~has a salt shed, sand pile, and outdoor storage for culverts, etc.~~

~~Park-n-Ride~~

~~The Strafford Park n-Ride is located at 233 Route 132. It is paved and has 23 lined spaces. The old town garage is located here and is currently used for storage. The Town owns and maintains the Park n-Ride.~~

~~Morrill Memorial and Harris Library~~

~~The Morrill Memorial and Harris Library in Strafford Village, completed in 1929, holds 15,000 items, including books, periodicals, records, audio and video cassettes. The library collection is supplemented by the State of Vermont's inter-library loan system. Enlargements to building were made between 1993 and 2003.~~

Justin Smith Morrill Homestead

The Justin Smith Morrill Homestead, the picturesque and historic home of U.S. Senator Morrill, author of the Land Grant College Act, is owned and maintained by the State of Vermont and is a registered National Historic Landmark. The Homestead's Education Center, constructed on the footprint of the original Horse Barn and financed in part with public donations, is a year-round heated facility that provides visitors with an opportunity to view special exhibits and the contents of his personal library. This space is an important community resource and greater public utilization is being encouraged. The house and grounds are opened Wednesday through Sunday from mid-May through October. Although the State owns and maintains the Homestead, it is available for town municipal governance.

~~The Justin Smith Morrill Homestead, the picturesque and historic home of U.S. Senator Morrill, author of the Land Grant College Act, is owned and maintained by the State of Vermont and is a registered National Historic Landmark. The Homestead's Education Center, constructed on the footprint of the original Horse Barn and financed in part with public donations, is a year-round heated facility that provides visitors with an opportunity to view special exhibits and the contents of his personal library. This space is an important community resource and greater public utilization is being encouraged. The house and grounds are opened Wednesday through Sunday from mid-May through October. Although the State owns and maintains the Homestead, it is available for town municipal governance.~~

Cultural Resources

Quality of life, as a cultural resource, is not easily defined, but it is an important aspect of any community. There are the formal municipal offices, commissions and boards whose task is governance and there are also the volunteer organizations and groups that enhance any community, which often fill in the gaps in services that exist in any small community. Below is a list of volunteer groups that enhance

the quality of life in Strafford.

Neighbors Helping Neighbors—assisting house-bound individuals and the elderly by providing meals and transportation.

Seniors Lunch Program—a weekly opportunity for seniors, many of whom are isolated, to socialize and be exposed to presentations on programs that may be of interest to them.

Strafford Athletic Association—a group of volunteers devoted to supporting and developing recreational opportunities for the children of Strafford.

Strafford Area Lions Club—serving Strafford for more than three decades, the Lions Club was an early sponsor of the recycling program and through the national organization’s insurance coverage has been able to provide swimming and ski programs for local youth while its members have raised funds for a variety of worthy causes.

Strafford Historical Society—dedicated to the preservation and appreciation of the town’s rich history and culture with an extensive collection of documents and artifacts.

Friends of the Morrill Homestead—volunteers dedicated to preserving the memory and homestead, a national landmark, of Senator Justin Smith Morrill and his many contributions to the nation.

Strafford Trail Volunteers—an adjunct to the Conservation Commission, helping maintain more than twenty miles of foot-trails and three Town-owned recreation areas.

Cabin Fever University—a non-profit adult education program relying on the shared knowledge, experiences and expertise of local residents.

F. Internet and Telephone

For a rural community such as Strafford, the ability to communicate on a regional and national level has become increasingly important. The better the access via phone and internet, the more likely that residents will be able to conduct business by telecommuting. The following telephone and internet services are available in Strafford:

High-speed Internet

There are presently five ways to access the internet in Strafford:

- Fiber Optic Network: ECFiber is a community-owned network working to provide state-of-the art, high-speed internet to homes in 24 towns in Vermont. Strafford is one of those towns. Fiber is already in place in several areas in Strafford, and, due to some outside investment, ECFiber plans to extend lines to all homes in Strafford by 2017.
- DSL (Digital Subscriber Line): DSL is very similar to cable in speed. This service 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 South Strafford.
- Satellite Internet: Satellite internet is an option for residents who are unable to access the internet via cable or DSL and provided they have a clear view of the southern sky from their location. Bandwidth over satellite is on average three times faster than a dial-up connection, but it is more expensive than other methods of access and can be affected by heavy weather such as torrential rains and blizzards.
- VTEL: A wireless provider of internet services with limited range from its repeater pole on the Turnpike Road in South Strafford.
- WaveComm Wireless Internet: Strafford has a small wireless network that serves a few residents. Wireless networking can allow access in more remote areas, but it is still susceptible to topography and line-of-sight.
- Dial-up: 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.

Cellular Communications

There are no cell towers located in Strafford, but there is spotty coverage in some areas in town.

Landline Communications

Most of the telephone related services in Strafford are still offered via the traditional telephone lines and poles (landline). Coverage over landlines in Strafford is provided by Fairpoint Communications, Inc. and by ECFiber for many of its internet customers.

Strafford Facilities Improvement Inventory					
Facility	Specific Area	Issue	Timeframe	Cost	Funding
Barrett Hall	Ceiling	Moisture issues caused by improperly installed venting and insulation in 2006.			

Municipal Building/Town Office	Stairway	Needs to be replaced.	
Town House	Steeple	In need of restoration	Private Fund-raising/grants
Municipal Building/Town Office	Building	Size may become an issue in the future. Re-location or addition to the existing space should be considered.	

Figure 9: Strafford Facilities Improvement Inventory | Source: Strafford Planning Commission

Utilities & Facilities Goals, Policies and Implementation Tasks

Goal

1. Community facilities and services meet the needs of the residents of Strafford.

Policies:

1. Manage and maintain quality public services and public facilities that meet the needs of the community without creating an undue burden on taxpayers.
2. Growth and development should not exceed the capacities of local facilities and services.
3. Any increase in infrastructure should be designed to have minimal negative aesthetic impact on the community.
4. Any upgrades to municipal buildings should include energy efficiency measures.

Implementation Tasks:

1. The Strafford Recreation Board should develop a management plan for each parcel under its authority.
2. Working with the Road Foreman/Public Works Supervisor, the Selectboard should develop a maintenance plan for the Town Garage.
3. The Town should plan for effective cell phone coverage.
4. The two cemetery organizations should work cooperatively to plan for future space needs.
5. The Selectboard should consider the creation of a policy that provides criteria for the acceptance of gifts of land to the town that addresses under what criteria the town may or may not accept such gifts.
6. The Conservation Commission, should develop a maintenance plan for the Old City Falls Nature Preserve, its trail system and other lands under its control. Working with the Selectboard, seek to establish a village to village trail to provide an alternative to walking on the Justin Morrill Highway.

VI. Healthy Community

A healthy community as described by the U.S. Department of Health and Human Services is one that continuously creates and improves both its physical and social environments, helping people to support one another in aspects of daily life and to develop to their fullest potential. Healthy places are those designed and built to improve the quality of life for all people who live, work, worship, learn, and play within their

borders—where every person is free to make choices amid a variety of healthy, available, accessible, and affordable options.

By all accounts, Strafford is a “healthy community;” however, as evidenced by the “Population by Age Group” (Figure 3), our fastest-growing populations are in the 60 to 84 age cohorts and Strafford does not have the appropriate infrastructure or an adequate range of available services to support our rapidly aging population. Well-being can be promoted through sustainable aging-in-place, which involves helping older residents remain in their community while also addressing the long-term economic, social, and health needs of both current and future generations at every age.

Successful multi-generational planning comprises several essential components, such as ensuring that all age groups have an opportunity for community and civic engagement; access to a variety of affordable housing options; access to adequate transportation; safe, walkable neighborhoods; and access to essential goods and services.

A. Health and Emergency Services

Facilities and Services

Due to Strafford's population and location, there are limited options in terms of health care services within town. However, the Strafford School-Based Health Clinic (located in the Gardner Cobb Health Room at The Newton School), which is affiliated with the South Royalton Health Center, does offer services (primarily to children) several days a week. The clinic's professional staff provides physical, mental and dental health services, including health education. Strafford residents also have access to the Sharon Health Center in Sharon and the Gifford Hospital System in Randolph. The Dartmouth Hitchcock Medical Center in Lebanon, NH, is the largest hospital near Strafford. Strafford residents also have access to the Clara Martin Center in Randolph, which provides comprehensive mental health and substance abuse services.

A senior program that offers opportunity for camaraderie and a weekly meal is located at Barrett Hall.

B. Strafford Volunteer Fire Department

Firefighting services in Strafford are provided by the Strafford Firemen's Association. This incorporated entity is not a part of town government, but a substantial portion of its operating expenses are provided through an agreement with the town on a yearly basis.

Although the most common hazard in Strafford is structural fire, the fire department also assists with other events, including motor vehicle accidents, flooding, and storm related hazards such as downed power lines.

Staff

The 15–20-member staff of the Strafford Fire Department is entirely voluntary. Training for the Strafford Firemen's Association will, in the future, be conducted largely at a training site in Thetford. The training site includes a 'burn building' and a 'propane gas' facility.

Fire Stations

The main firehouse, in Strafford Village, has two bays with an area of approximately 650 square feet and a hose-drying tower. The building also contains meeting room space. As with any old building, the structure always needs repair. Energy efficiency improvements are needed, and storage capacity is an issue for growing equipment needs.

A second three-bay sub-station, completed in 1976, is located on Rte. 132 a half-mile east of South Strafford. It shares with the main fire station concerns about sufficient capacity for equipment storage.

It should be noted that both fire stations are located within the flood plain.

Finances

Except for an annual appropriation by the Town, equipment and maintenance are financed by the fundraising efforts of the firemen. Fire protection in Strafford is a significant service provided at minimal cost in tax dollars. Because state and federal regulations are becoming more stringent, additional training time will be necessary, thus reducing the time firemen have for fund-raising.

C. Emergency Medical Services

Strafford FAST Squad

Emergency medical calls are answered initially by the Strafford Fast Squad, which has between 5–6 members trained in handling situations of a medical nature. The Fast Squad has combined operations with the Firemen’s Association. The purpose of the Fast Squad is to provide immediate response to emergencies while an Upper Valley Ambulance is in route to the accident or situation. Like the Fire Department, the FAST squad is a private organization receiving funding through the annual municipal budget.

Upper Valley Ambulance

Housed in Fairlee, VT, the Upper Valley Ambulance (UVA) is a not-for-profit emergency ambulance and rescue service composed of paid full-time and volunteer staff. UVA covers an area consisting of nine towns in Vermont and several towns in New Hampshire. In addition to emergency services, UVA offers non-emergency services, including transportation to hospitals, nursing homes and other residences, as well as trainings in CPR and first aid. On a regular basis, more intensive EMS training is offered for fast squads and fire departments. In 2015, Strafford paid UVA \$34,430 for ambulance services. It is anticipated that rising costs for goods and services will have an impact.

D. Police Protection Services

While Strafford has one constable who is elected by town vote, the constable has limited law enforcement capabilities. In addition to the constable, the Town contracts with the Orange County Sheriff’s Department to provide expanded coverage. A portion of any fines or tickets issued by the Sheriff’s department in Strafford are returned to the town in order to offset the cost of the service. Supplemental police coverage in Strafford is provided by the State Police.

E. Emergency Planning in Strafford

Strafford maintains an Emergency Management Director as one of its appointed officers. The role of this individual is to coordinate local and regional emergency services and to ensure that the town is prepared in the event of an emergency. The town keeps an up-to-date Emergency Operations Plan as well as an Emergency Operations Manual and Rapid Response Plan. These tools help determine the chain of command during major emergencies and provide local officials with the information they need to safely handle such difficult situations.

Strafford is home to four certified American Red Cross (ARC) shelters:

1. Barrett Memorial Hall in South Strafford, equipped with a generator, a kitchen, an elevator, bathrooms and dining facilities, as well as a handicapped accessible auditorium.
2. Tyson Gym in South Strafford, equipped with a generator, a kitchenette, showers, bathrooms and an auditorium with limited handicapped accessibility.

Cots, pillows, sheets and miscellaneous ARC materials are stored at this location.

3. Newton School in South Strafford, equipped with kitchen and dining facilities, bathrooms, and an elevator and is handicapped accessible. Classroom sized areas offer limited sleeping facilities.
4. United Church of Strafford in Strafford Village, equipped with a kitchen, bathrooms, and a sizable space attached, Parish Hall, which is handicapped accessible. While there are limited facilities, cots, sheets and pillows are stored here.

The bulk of the ARC equipment is stored in the town garage in South Strafford within .25 miles of Barrett Memorial Hall, Tyson Gym, and Newton School. Strafford does have an ARC team who have had the requisite training.

Healthy Community Goals, Policies and Implementation Tasks

Goals

1. Health, safety, and well-being is advanced for all Strafford residents.
2. High quality medical care is available to all Strafford residents.
3. Try to get some medical services in Strafford.

Policies

1. Support and encourage the development of local health care facilities and mental health care services to provide residents access to health care as close to home as possible.
2. Support programs that expand and improve medical services and recreational opportunities.
3. Support and continuously update the Rapid Response Plan and Emergency Operations Plan.

Implementation Tasks

1. Work with Strafford Volunteer Fire and Rescue to define the equipment needs and fire station requirements of the Strafford Fire Department; address future changes in response call volume, types of calls and emergency staffing levels; create a basic fire station design criteria to meet the minimum requirement of the Strafford Fire Department; to perform a cost analysis of the current stations compared with possible scenarios; research the cost change to the citizens of Strafford in regard to Insurance Services Office, Inc (ISO) insurance ratings and insurance premiums.
2. Work with community members to explore options for adequate senior services and housing.

VII. Transportation

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

Roads in Strafford	
Type	Miles
Class 1	0
Class 2	15.74 (8.261 paved, 7.479 gravel)
Class 3	51.85 (5.71 paved, 46.14 gravel)
Class 4	12.38
Total Town Roads	79.97*
<i>Only 67.59 miles are reflected in VTrans Town Highway Mileage Maps (class 2 + class 3 mileage totals get state aid)</i>	

Figure 10: Roads in Strafford | Source: Vermont Agency of Transportation

As indicated in Figure 11, there are a total of 79.97 miles of roads in Strafford. Unlike most towns in the Upper Valley, none of the town's total miles is state maintained, which has direct impact on road maintenance expenses. Highway classifications determine the amount of state aid available to assist with repair and maintenance. The Vermont Agency of Transportation (VTrans) and the Strafford Selectboard determine road classes. Criteria include traffic volume, road condition and function. Class 2 highways are the major connectors linking villages with each other and with state highways, and they receive a higher rate of State aid than Class 3 highways. Twenty-three percent (23.3%) of Strafford's roads are Class 2, of which 8.261 miles are paved. Class 3 highways are other town roads that are maintained in a manner enabling them to be driven under normal conditions in all seasons by a standard car. The majority (76.7%) of Strafford's roads are Class 3, and of those, 5.71 are paved.

Strafford has 12.38 miles of Class 4 highway. According to the Town's Policy Regarding Class 4 Highways and Town Trails, the Town is obliged to keep those Class 4 town highways routinely used by adjacent landowners traversable by four-wheel drive and high clearance vehicles during the months of May through October. No state aid is available for work on Class 4 highways. 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 Strafford's largest town asset, requiring significant financial investments paid by every taxpaying resident. The burden of cost is exacerbated by the fact that none of Strafford's roads is state maintained, meaning taxpayers pay for all transportation expenses. 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, U. S. Congressional apportionments, and private financing sources. The most significant funding resource comes from the federal transportation bill. The federal and state governments pay a percentage of project costs and the community pays the remainder.

Costs of asphalt and other highway construction materials make maintaining asphalt roads too expensive for towns of Strafford's size. It is functionally three times more expensive to reconstruct a paved road than it is to reconstruct a gravel road (including the addition of geo-textile fabric). This expense creates a dilemma when considering the maintenance and reconstruction of paved roads. Clearly, thought needs to be given to the road surface based on analysis of traffic and road quality.

C. Class 4 Roads

Class 4 roads primarily offer access to Town and conservation resources, and they provide unique insights into an agrarian landscape long abandoned. Many Class 4 roads have been incorporated into the natural landscape and very little development has occurred along these roads. Even though the Town owns the Class 4 roads and rights-of-way, there is no legal obligation to maintain their road surfaces. The Town is required to maintain culverts and bridges on these roads. Class 4 roads can also be sources of drainage erosion, and the Municipal Roads General Permit will likely require Towns to address erosion and water quality problems where they are present on Class 4 roads.

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 question of how Class 4 roads were created is important to the policies set forth in this Town Plan. Class 4 roads were created by the state's local road classification system which required that towns identify Class 1, 2, and 3 roads for state aid. Local roads not identified by members of the Town Selectboard to receive state aid are, by default, Class 4 roads. As funding was involved, municipalities were diligent in identifying and mapping local roads for the State of Vermont. But since Class 4 roads were not eligible for state aid, they were not as consistently identified or mapped. A common misconception is that since automobiles cannot use these roads, then the Town no longer requires a public right-of-way. This auto-centric attitude fails to recognize that the

public travel ways often are used by other traveling constituencies, such as walking, bicycling and equestrian users.

D. Development Review Road Standards

The Town currently follows state standards that were first adopted by the Selectboard in April 2001 (Town Road and Bridge Standards) and subsequently revised and re-adopted on May 23, 2015. This policy details construction standards for roadways, ditches and slopes, bridges and culvert and guardrails. State statutes are followed in regard to changes in road classification, rights-of-way, road acceptance and discontinuance. The Town of Strafford Highway Access Policy, adopted in April 2004, governs driveway and private road access. The responsibility for policy implementation rests with the Selectboard and the Strafford Road Foreman. 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 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 including 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 storm water is not discharged onto public highways and is not discharged in sufficient volume to damage existing drainage systems.

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 and 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.

E. 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 towards

providing reasonable accessibility to adjacent land 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 usage increases, the road's health declines proportionally. The result is increased traffic congestion, crash rates, and increased and improperly channeled surface water to road surfaces 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.

The Town recognizes the value of access management and can implement access management strategies through its planning and public works-related 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 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.

F. Parking

The parking needs of the businesses and recreational activities in the lower village create additional concerns. Some relief has been felt by the conversion of the old town garage to a parking area. There is further concern because of the movement of children back and forth between Newton School and Coburn's' Store.

In 2009, a park & ride facility was created in South Strafford Village to help with parking congestion issues, particularly related to the use of the gym and Murray Recreation Field.

G. Traffic Regulation

The current Strafford Traffic Ordinance is focused primarily on Strafford's villages and the area between them.

H. Other Modes of Travel

Bicycles and Pedestrians

Many residents bike or walk on town roads in Strafford. The rural nature of most of Strafford's roads makes bike/pedestrian travel reasonably safe. However, bike/pedestrian travel along the primary roads in Strafford (Route 132 and parts of the Justin Morrill Highway) is less safe due to higher traffic volumes, speed, and a lack of available shoulders. At some point, the town may want to consider extending the sidewalks in South Strafford Village northeast along Route 132 toward the recreational areas of Varney Ball Field and southwest toward the swimming pond.

An informal trail system, known as the Cross Town Trail and Town House Trail, is available for non-motorized travel. These trails are located primarily on private land. Fortunately, these landowners have been willing to allow public access to their property. Other hiking opportunities can be found using trails maintained by the Vermont Association of Snow Travelers (VAST).

Sidewalks

Using a Transportation Enhancement Grant from the Agency of Transportation, Strafford designed a new sidewalk system for safer pedestrian travel in the Lower Village and to improve parking at Coburn's Store. This project completed in 2011.

The Two Rivers-Ottawaquechee Regional Commission will complete a comprehensive sidewalk inventory in 2016 through 2017, and will map sidewalks in the Town of Strafford.

Air and Rail

While there are no rail lines or airports in Strafford, there are several options available for Strafford residents to access. Residents can access Amtrak at the station in White River Junction to go north to Burlington or south to access New York City and Washington D.C. West Lebanon, New Hampshire has a small airport where residents can take a Cape Air flight to Whitehall Plains, New York or Boston, Massachusetts to connect to larger airlines. Typically, residents access the airport in Boston, Massachusetts through the Dartmouth Shuttle Bus, Burlington, Vermont or in Manchester, New Hampshire.

ATVs

Some ATV use is allowed on town roads, but it is limited to Class 4 roads or other roads that are not maintained in the winter.

Public Transportation

Strafford, like most Vermont towns, lacks public transportation. Stagecoach Transportation Services offers limited public transportation in the form of special requests for individuals who need transportation for medical reasons. Given that

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

Transportation Goals, Policies and Implementation Tasks

Goals

1. Transportation in Strafford that is safe, energy efficient, cost effective, integrates all modes of travel (auto, pedestrian, bicycle, and mass transit) and meets the needs of the public in a manner consistent with the other goals, policies and implementation tasks of this Town Plan.

Policies

1. Consider public input prior to a decision to change the maintenance level, surface treatment, or class of a town road.
2. When determining which roads to pave (or remove pavement from) and when, 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. 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. Encourage access management techniques that limit the number of access points during new development along highways.
5. 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. Consider the relationship of a road to surrounding features of the landscape when planning improvements needed to safely accommodate increasing traffic.
7. 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. Retain some Class 4 roads, trails, and other public rights-of-way as public resources.
9. 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.

Implementation Tasks

1. Geo-textile fabric should be used in a systematic fashion to reduce maintenance costs on unpaved Town roads.
2. The bicycle and pedestrian path between the Varney ball field and the Our

Lady of Light Chapel should be extended to connect with the South Strafford Recreation fields to reduce the risk of accidents.

3. A bicycle, horse and pedestrian path along the Ompompanoosuc River should connect South Strafford and the Upper Village to reduce the risk of accidents on the Morrill Highway.
4. Creative solutions to the parking problems in South Strafford, as a matter of safety as well as convenience, should be explored and implemented.
5. The town should develop a long-range management plan for public highways, perhaps as part of a capital budgeting process.

VIII. Natural Resources

A. 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 Strafford. Strafford has no mapped groundwater information.

The health of Strafford's surface waters is essential to maintaining quality groundwater, and is an important element for outdoor recreation and natural beauty. In 2006, the Strafford Conservation Commission conducted a river corridor management plan for the West Branch of the Ompompanoosuc River. The results of the phase 1 and 2 studies indicate that many reaches of the West Branch are suffering from instability, usually due to man-made activities. The River Corridor Management Plan makes recommendations to restore stable channel conditions by providing a structure for identifying and prioritizing river restoration and corridor protection project opportunities and for developing effective approaches. An overriding objective of the study was to reduce the need for maintenance of traditional channel management applications along the West Branch, and to shift the focus of management projects from short-term control to long-term equilibrium and stability.

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. The Conservation Commission has approached landowners along unstable reaches of the West Branch about participating in programs of this type, but there has been little interest in participating. Stream instability can lead to excessive flooding and other types of damage due to increased flow velocity.

The River Valley Conservation district provides examples for the purpose of improving river quality through better zoning. Requiring riparian buffers within the River Valley Conservation district would help protect shoreline areas that are fragile. 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 proximity of town roads to streams and the use of salt on paved roads can also impair water quality.

Water Resources Goals, Policies and Implementation Tasks

Goals

1. Plentiful high-quality drinking water
2. Groundwater resources are used by new development in such a manner that protects the public right to adequate quality and quantity of the

resource.

3. Surface water and groundwater impacts and effects related to proposed or existing uses of land are considered.
4. Surface water drainage from roadways containing road salt and sediment should be minimized whenever possible.

Policies

1. Land use activities which potentially threaten groundwater quality shall be carefully reviewed and monitored to prevent undue loss of groundwater quality, including excessive drainage carrying sand and sediment from town roadways.
2. Maintenance or enhancement of water resources for recreation, fisheries, necessary wildlife habitats and quality aesthetics are high priorities.
3. Preservation of the natural state of streams should be encouraged by:
 - Protection of adjacent wetlands, floodplains, and natural areas;
 - Protection of natural scenic qualities; and
 - Maintenance of existing stream bank and buffer vegetation including trees, together with wildlife habitat.

Implementation Tasks

1. The Planning Commission should facilitate possible methods of zoning relief for multi-user water and wastewater systems in Strafford, particularly in the villages.
2. The Planning Commission should develop water resource policy and practices to protect ground and surface waters with assistance from the Conservation Commission.
3. The Planning Commission should examine updating the Flood and Fluvial Hazard Ordinances to better protect the West Branch and its tributaries.
4. The Conservation Commission should continue educational and project-development work outlined in, or as an outgrowth from, the River Corridor Management Plan for the West Branch of the Ompompanoosuc.
5. The Road Foremen/Public Works Supervisor should continue to explore effective options that would reduce the amount of salt needed on paved roads.

B. Basin Planning

The Town of Strafford lies within the White River Basin (Basin 9) and the Ompompanoosuc River Basin (Basin 14). The majority of Strafford lies within Basin 14. This Basin Plan encompasses the Stevens, Wells, Waits, Connecticut, and Ompompanoosuc Rivers. The West Branch of the Ompompanoosuc lies within Strafford's boundaries. Recently updated in 2020, the Basin 14 Plan provides an assessment of watershed health and defines on-going and future strategies to address high-priority surface water stressors and opportunities for protecting high quality waters. The Basin 14 Plan states that the waters in Strafford are of good quality for

aquatic life.

The White River Basin encompasses 710 square miles in Vermont, draining portions of Addison, Orange, Rutland, Washington, and Windsor Counties. The basin covers significant portions of 20 individual towns. The portion of the White River Basin in Strafford is relatively small and does not include much detail.

Goal

1. Preserve, restore, and manage Strafford’s river and streamside resources.

Policies

2. Work with community and region-wide organizations to implement the recommendations of the Basin 9 and Basin 14 plans.

B.C. Wetlands

Wetlands are ecologically fragile areas. How these lands are managed has 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.

There are approximately 17 acres of wetlands in Strafford. (Classes I & II, i.e.,

'significant,' wetlands are protected.)

For Strafford, 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 #4 of 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.

In towns that have zoning or subdivision regulations, such as Strafford, 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 Strafford may result in additional areas being determined as significant or important for conservation.

Wetlands Goals, Policies and Implementation Tasks

Goal

1. Land use development practices that avoid or mitigate adverse impacts on significant wetlands.

Policies

1. Structural development or intensive land uses shall not be located in significant wetlands or within buffer zones to significant wetlands.
2. Developments adjacent to wetlands should 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. These measures are avoidance, minimization and compensation.
3. A 100-foot buffer zone must be maintained surrounding a Class I wetland, and a 50-foot buffer zone must be maintained surrounding Class II wetlands.

Implementation Tasks

1. The town should consider conducting 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 zoning regulations that require landowners to provide the DRB with evidence that their proposed development will not negatively impact wetlands.

C.D. Flood Resilience

Background

Following 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 Strafford 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 floodwaters 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 floodwaters 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, Strafford 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 floodwaters 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 Strafford, 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 Strafford 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 Strafford’s road infrastructure was damaged by the storm, including Alger Brook Road, Old City Falls Road, Brook Road, Hemenway Road (formerly Sawyer Mountain Road), Route 132, Tyson Road, Maple Hill Road, and Taylor Valley Road. The county-wide damage for Orange County totaled \$5 million. The storm damage for Strafford totaled \$2,466,782.77, according to FEMA’s public assistance database, which captures at least 70% of the total damage.

Another significant flooding event occurred in Strafford in August and September of 2008. 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 and washouts on portions of Ames Hill, Clover Hill Road, Carpenter Hill Road, Maple Hill Road, and Brook Road. This flooding event caused damage totaling \$79,819 in Strafford according to FEMA’s public assistance database.

D.E. 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. Strafford has FEMA FIRM maps that are used in the administration of their Flood Hazard

Overlay Zoning administration, and FIRM and Flood Insurance Studies (FIS) were last updated for the Town of Strafford on February 03, 1993. FEMA FIRM Maps are available for the West Branch of the Ompompanoosuc River, Old City Falls Brook, Abbott Brook, several unnamed tributaries of the West Branch of the Ompompanoosuc River, and an unnamed stream near Miller Pond. Strafford contains 600 acres of floodplain, with no mapped floodway, the deepest, fastest flowing area in a flood. The floodplain comprises 2% 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. Much flood damage in Vermont is associated with stream channel instability 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.

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 while small, mountainous streams may not be mapped by FEMA in

NFIP FIRMs (Flood Insurance Rate Maps), flooding along these streams is possible, and such flooding should be expected and planned for. FEMA-mapped Special Flood Hazard Areas often do not recognize unstable stream channels that may be undergoing a physical adjustment process, actively eroding, or actively aggrading due to erosion occurring upstream. 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 stream bank/mountainside undercutting. Change in these areas may be gradual or sudden.

Furthermore, precipitation trend analyses suggest that intense, local storms are occurring more frequently. Vermont ANR's River Corridor maps show the areas that may be prone to flash flooding or erosion 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 flood-proofing alone may not be protective in these areas as erosion can undermine structures. Rivers, streams, and brooks that have mapped River Corridors include the upper reaches of the Ompompanoosuc River, several streams near the Tunbridge town line, as well as the rivers and brooks that have mapped Special Flood Hazard Areas, including the West Branch of the Ompompanoosuc River, Old City Brook, Abbott Brook, several unnamed tributaries of

the Ompompanoosuc River, and an unnamed stream near Miller Pond and Abbott Brook.

Special mapping and geomorphic assessments can identify erosion hazard areas along rivers. The 2006 River Corridor Management Plan identified fluvial erosion hazard areas along the West Branch of the Ompompanoosuc River. Approximately four miles of the river, from north of Strafford's Upper Village to South Strafford Village, have been classified as having very high instances of fluvial erosion. The Planning Commission can strengthen the regulations within the River Valley Conservation district to include language that discourages development within the mapped River Corridor areas.

In the Town and Village of Strafford, 27 total structures reside in the special flood hazard area, meaning they have 1% of flooding every year. These structures consist of 21 single family dwellings, 2 camps and the Strafford Post Office. Eight of these structures have flood insurance policies worth \$1,900,000. If all of the structures in the Special Flood Hazard Area were damaged or destroyed in a flooding event, the damage would total approximately \$5,205,033.

Additionally, there are 30 structures that reside within the mapped River Corridor. These consist of the Coburn General Store, Strafford fire station, the South Strafford fire substation, Our Lady of Light Catholic Church, 22 single family dwellings, and three other properties. Disruption of the fire stations within the floodplain could drastically hamper future response and relief efforts in the town, and would cause major disruption to the continuity of operations. 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 Strafford.

Flood Hazard Regulations

The Town of Strafford has a Flood Hazard Area Zoning Ordinance that was adopted on March 6, 1990 and was last amended on March 2, 1993.

The Flood Hazard Area Zoning Ordinance applies to all lands in the Town of Strafford, and specifically aims to regulate development of lands in the special flood hazard area, or the areas near rivers, streams, and brooks, that have a 1% chance of flooding annually. The Flood Hazard Area Zoning Ordinance prohibits all development in the floodway. For specific details about requirements, permitting, and restrictions on development in the Special Flood Hazard Area, please refer to Strafford's Flood Hazard Area Zoning Ordinance, which can be found on the Town of Strafford's website and at the Town Clerk's Office.

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 that are subject to flooding damage.

FEMA has prepared a Flood Hazard Boundary Map for the Town of Strafford, which includes flood hazard areas for the West Branch of the Ompompanoosuc River, Old City Brook, Abbott Brook, several unnamed tributaries of the Ompompanoosuc River, and an unnamed stream near Miller Pond and Abbott Brook. This map is on file at the Town Office and at the Two Rivers-Ottawaquechee Regional Commission. It can also be found online through FEMA's website and the Vermont Agency of Natural Resources. The Flood Hazard Area has been incorporated into the River Valley Conservation Area as indicated in Map #1 of 5, Current Land Use. Contact the Strafford 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 Strafford incorporates Flood Hazard regulations as part of its Zoning Regulations, and is recognized as a participating community in the National Flood Insurance Program, which it has been enrolled in since September 27, 1985.

E.F. Promoting Flood Resilience

Flood Hazard Regulation

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

1. Discourage all new development in the Special Flood Hazard Area, which is also called the 100-year floodplain, or the area that has a 1% chance of flooding every year.
2. Limit uses in the Flood Hazard Area along rivers and streams to those that are recreational and agricultural (using Required Agricultural Practices) to help protect both public and private investments as well as the natural and scenic quality of Strafford's waterways.
3. Discourage new development in the mapped River Corridor Area.

Revisions to Strafford'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

Strafford could pursue riparian easements as a way to protect floodplain

from development and preserve flood storage.

Culvert Maintenance

Strafford 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 Strafford adopted on April 25, 2013, require a minimum size of 18 inches for new culverts. The process of upgrading culverts is ongoing underway. Residents should keep their driveway culverts clear and open.

Flood Resilience Goals, Policies and Implementation Tasks

Goals:

1. Flood hazard areas are maintained as open space, greenways, non-commercial recreation and/or agricultural land.
2. No net loss of flood storage capacity occurs 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. Strafford is resilient in the event of a severe flood.
4. Municipal infrastructure and buildings are protected from the potential of flood damage.

Policies

1. Use sound planning practices to address flood risks so that Strafford's citizens, property, economy, and the quality of the town's rivers as natural and recreational resources are protected.
2. Consider prohibiting all new fill and construction of buildings in mapped floodways (Mapped areas, unless corrected by FEMA).
3. Any land use activity (filling, or removal of earth or rock) within flood hazard areas which would result in net loss of flood storage, increased or diverted flood levels, or increased risk to adjacent areas shall be prohibited.
4. Consider limiting permitted land uses within Strafford's River Corridor Areas to non- structural outdoor recreational and agricultural uses due to the dangerous erosive risk in these areas.
5. Consider prohibiting commercial, industrial, and residential uses within the Agency of Natural Resources mapped river corridor areas outside of designated village areas. New development within designated village areas should not be closer than current structures.
6. Consider moving or abandoning roads that often experience serious flood damage.
7. Design culverts and bridges, at minimum, to meet VTrans Hydraulics Manual, ANR Stream Alteration Standards, and VTrans Codes and Standards. Maintain culverts to ensure they are effective during severe weather events.
8. Do not build Strafford's emergency services, power substations, and municipal buildings in the Special Flood Hazard or River Corridor Areas.
9. Continue to maintain membership in National Flood Insurance Program.

10. 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 are relatively protected from flooding damage.
11. 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 bio-engineering techniques may not be adequate to prevent significant loss of land or property.
12. Maintain Strafford's upland forests and watersheds predominately in forest use to ensure high quality valley streams and to ensure that flood flows reduced.
13. 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 Strafford's flood resilience.
14. 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.

Implementation Tasks

1. The Town should update the Strafford Flood Zoning Ordinance to ensure that it meets the standards required by the Federal Emergency Management Agency so that Strafford may continue to participate in the National Flood Insurance Program (NFIP). The reviewed ordinance should consider prohibiting new development in the Special Flood Hazard Area (excluding small ancillary structures).
2. Work with VTrans and the Regional Planning Commission on advocating for and improving the flood capabilities of state or town-owned transportation infrastructure.
3. 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.

F.G. Forestry and Farming

Forests cover the majority of the acreage in Strafford, and the timber industry is still a viable and important portion of the local economy. In 2010, commercial forestry and farming employed only 3% of Strafford's residents, down from 10% in the 1980 Census. Out of Strafford's total 28,278 acres, more than 9,000 acres are mixed coniferous- broadleaf, another 8,000 acres are hardwoods, and about 3,500 acres are in pine and hemlock. Strafford's forests also represent a substantial recreational venue for hunting, hiking and other outdoor pursuits.

For the purposes of property valuation, there are few working farms in Strafford. Dairy farms now number only one. Farming constitutes only a small part of Strafford's land base. Past and present agricultural lands are a small but important component of

Strafford's landscape and are often located in areas with easy road access, which makes them prone to development. Maintaining these prime soils as farmland is important to the current and future viability of farming in Strafford. The distinctiveness of the working landscape gives Strafford much of its beauty. 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 small town and village settlement patterns.
~~They also help maintain small town and village settlement patterns.~~

The Wildlife Habitat Incentives Program (WHIP) promotes voluntary implementation of on-farm management practices to develop habitat for wetland and upland wildlife, threatened and endangered species, fish and other types of wildlife.

Many landowners in town have their land enrolled in the Use Value Appraisal, or Current Use, Program. This program allows landowners to have their farm and forest land valued and taxed at their agricultural or forested uses instead of their market values, given that landowners keep these properties in forest and farm uses and actively manage these uses. The intention of the Program is to limit development, parceling, and fragmentation of forests and farmland. ~~156 total parcels in Strafford that totaled 16,264 acres were entered into the Current Use Program as of 2014. This consisted of 13,305 acres of forested land and 2,959 acres of agricultural land. Undeveloped forest land provides many benefits to Strafford, including wildlife habitat, recreational opportunities, clean water, and forest products.~~

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

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

H. Forest Fragmentation

Forest fragmentation is the breaking of large, contiguous forested areas into smaller pieces of forest. For natural communities and wildlife habitat, the continued dividing of land with naturally occurring vegetation and ecological processes into smaller and smaller areas creates barriers that limit species' movement and interrupt ecological processes. Since the 1980s, Vermont has experienced "parcelization," which is the result of larger tracts of land being divided into smaller ownerships or land holdings.

The more individuals that own smaller parcels of forest, the more likely that the land will ultimately be developed with infrastructure (such as roads and utilities) and buildings. The 2015 Vermont Forest Fragmentation Report identifies the following causes for this trend:

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

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

To help mitigate the effects of human population growth and land consumption, many scientists and conservationists urge governments to establish protected corridors, which connect patches of important wildlife habitat. These corridors, if planned correctly, allow wildlife to move between habitats and allow individual animals to move between groups, helping to restore or maintain genetic diversity that is essential both to the long-term viability of populations and to the restoration of functional ecosystems. Important corridors (high priority) have been mapped in Strafford particularly on the eastern side of Town. Priority forest blocks make up the majority of the land in Strafford.

Forestry and Farming Goals, Policies and Implementation Tasks

Goals

1. The working landscape is preserved, in particular pastures and grasslands, as they are essential to maintaining the rural character of Strafford.
2. The growth, marketing and consumption of local foods is encouraged.
3. Provide the community with access to quality forestland for recreational use.
4. Reduce the fragmentation of forest lands.

Policies

1. Support and encourage a Strafford Farmer's **M**arket.
2. Encourage the preservation of the working landscape for the purposes of protecting open space and the scenic quality of Strafford.
3. Development shall be designed so as to preserve continuous areas of wildlife habitat. Fragmentation of wildlife habitat is discouraged. Effort shall be made to maintain connecting links between such areas.
4. Preference shall be given to development that utilizes existing roads and field lines.

5. The construction of utilities, roads, or other physical modifications in the priority areas identified in this plan as important forest blocks and habitat connectors is incompatible with this plan.
6. Subdivisions and other development on large lots shall minimize impacts on forestry potential and habitat values of undeveloped areas by concentrating development at the forest edge near other development and roads; shall use small lot sizes and shapes so that most of the remaining land is in a large undeveloped tract; shall minimize clearing forest; and shall avoid the creation of additional roads or power lines that would further future development into interior areas.

Implementation Tasks

1. Strafford should consider strategies to encourage the expansion of farming and forestry uses of open space, and to further the education of town citizens with regard to the importance of these activities within the town.
2. The Town should explore various State, Federal, and Town initiatives designed to bolster farming and forestry.
3. The Planning Commission should determine whether the Unified Bylaw should be ~~edited~~ amended to further protect against forest and habitat fragmentation.

G.I. Wildlife Habitat

Wildlife is one of the popular attractions to the area and provides some citizens of Strafford with direct and indirect livelihoods from sports, tourism and direct harvest of wildlife.

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

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

Wintering areas are an important habitat requirement for deer during the critical winter months when snow depth and climate are limiting factors to survival. Typically, these areas consist of mature softwood stands, and are located 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. Strafford has in excess of 2,230 acres of deer wintering yards, principally contained in three wildlife~~

~~management areas, Podunk (506 acres), Clover Hill (882 acres) and Kibling Hill (924 acres), which together comprise more than 2,300 acres of land. Recently, large deer populations have decimated sugar maple regeneration in forests. This lack of forest regeneration will have a long-term impact on the species composition of the forest. Species that deer prefer to browse on will decline in proportion, and species not favored by deer will increase in proportion. This species shift will affect the ecological function and habitat quality of our future forest.~~

~~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.~~

~~Habitat fragmentation is the most important factor when considering development and its impact on wildlife. 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, cause 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. Encouraging healthy forests with a complex structure and a full component of native species will provide habitat opportunities for all species and allow us to practice forest management to provide ourselves with sustainably produced forest products.~~

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. Strafford has been part of the Linking Lands Alliance, a focus group comprising ten towns in the region. This group has developed maps that indicate core and priority wildlife habitat areas and potential connectivity corridors. These serve as a starting point from which the town can consider planning decisions with regards to wildlife habitat.

Wildlife Habitat Goals, Policies and Implementation Tasks

Goals

1. The natural diversity and population of wildlife, including natural predators are in balance.
2. Stable populations of endangered or threatened wildlife are restored in appropriate habitat areas.
3. The natural diversity, population, and migratory routes of fish are maintained and improved.

Policies

1. Wildlife populations and natural diversity should be maintained or enhanced.
2. Long-term protection of major habitats through conservation easements, land purchases, leases and other incentives is encouraged.
3. Protection of deer wintering areas should be protected from development and other uses that adversely impact the resources.
4. Development other than isolated houses and camps shall be designed so as to preserve continuous areas of wildlife habitat. Fragmentation of wildlife habitat is discouraged. Effort should be made to maintain connecting links between such areas.
5. Preference shall be given to development that utilizes existing roads and field lines.

~~New trail development should have a minimal impact on the environment and on wildlife habitat.~~

Implementation Tasks

1. The Conservation Commission should encourage owners of necessary habitat for threatened species to contact the State for assistance in developing a management plan for these sites.
2. The Conservation Commission should identify ~~critical-wildlife~~threatened and endangered species and their habitat and wildlife corridors in Strafford.
3. The Conservation Commission should expand and validate Linking Lands wildlife habitat connectivity mapping with on-the-ground field evaluation.
4. Wind turbines should be discouraged in wildlife conservation areas.
5. Encourage owners of necessary habitat for threatened species (see [Vermont Fish & Wildlife Department](#), for listing of current threatened and endangered species of plants and animals) to contact the State for assistance in developing a management plan for these sites.

H.J. Plant Communities

A plant community is a recognizable and complex collection of plant species which interact with each other as well as with the elements of their environment. A plant community is not a static entity: rather it may vary in appearance and species composition from location to location and over time. Community structure and distribution are dictated by the delicate balance of environmental factors: soils, climate, topography, geography, fire, time, humans and other living beings.

In Strafford, 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, plant communities are usually strongly affected by the surrounding environment. Plants respond to soil structure and chemistry, hydrology, and climate. Unmanaged development can have a negative impact on plant communities, which in turn will harm the overall ecosystem in the affected area. 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.

Human activities can be especially harmful to sensitive plant communities such as orchids, lady slippers, and wild irises. The impacts of travel, whether by vehicle or foot, uncontrolled harvesting, and other factors can cause permanent damage to fragile plant communities. Strafford has a number of plant species that have been identified as threatened by the VT Agency of Natural Resources. (See Map #4 Natural Resources)

Invasive species are a growing problem in Vermont. Invasive species are defined as those species that are not naturally occurring in an area, but were instead introduced outside of their native range. Once in the wild, invasive species may continue to reproduce and displace native species, causing biodiversity to suffer and throwing entire ecosystems out of alignment. They are able to outcompete native species because they do not have natural competitors or predators. Both federal and state governments have guidelines in place for handling invasive species, and there are resources available to interested parties through the University of Vermont. While the list of invasive species in Vermont is extensive, the most common invasive plants in Strafford are wild chervil (*Anthriscus sylverstris*), garlic mustard (*Alliaria petiolate*), Japanese knotweed (*Polygonum cuspidatum*), and poison parsnip (*Pastinaca sativa*).

Plant Communities Goals, Policies and Implementation Tasks

Goal:

1. Habitats for rare and irreplaceable native plant species are preserved.

Policies

1. Preservation of lands that provide habitat to identified rare and irreplaceable botanical species should be supported. Encourage the protection of indigenous plants.

Implementation Tasks

1. The Conservation Commission should continue to educate Strafford's citizens on special plant communities.
2. The Conservation Commission should conduct a plant communities' inventory.
3. The Conservation Commission should inform citizens to identify and practice the safe elimination of invasive plants, which can be found in the Strafford Local Hazard Mitigation Plan.

I. Air Quality

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

Goals

1. Maintain healthy air quality.

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

II. Mineral Resources

The use and management of Strafford'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 often in conflict over use of the resource. It is in the interest of the Strafford business owners and residents to enable the 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.

Mineral Resources Goals, Policies and Implementation Tasks

Goal

1. The extraction and processing of mineral resources proceed when such activities are appropriately managed and the public interest clearly benefits.

Policies

1. 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, view sheds and adjacent land uses;
 - To reclaim and re-vegetate sites following extraction and;
 - To minimize noise impacts on adjacent uses including residential areas.

J. Elizabeth Mine Environmental Cleanup

Background

The Elizabeth Mine site is a 200-year-old settlement, a copper and copperas mine, and industrial community, and a cultural resource of great local and national significance. In April 2001, the U.S. Environmental Protection Agency (EPA) placed the Elizabeth Mine on the National Priorities List for cleanup under EPA's Superfund program. The cleanup site is located on approximately 1,400 acres in rural Strafford and Thetford, Vermont, in Orange County. The Elizabeth Mine site is a 200-year-old settlement, a copper and copperas mine, an industrial community, and a cultural resource of great local and national significance. The EPA estimates that there were more than 2 million tons of metals and sulfides-rich tailings in three large exposed mine tailings piles on 42 acres of the property that comprise the site. The clean-up is in the final stage.

The Elizabeth Mine site is no longer used as a mine, having been closed by its operators in 1958. The site is a unique historic, cultural and scenic resource for the Town of Strafford. The unique historical significance of the mine is a valuable asset to Strafford. An EPA report describes the Elizabeth Mine as, "the oldest large scale mining operation in the United States. It was probably the first large mine-side smelting of copper in the country." The ways in which copper was processed after it was mined were important industrial achievements of their time. The Elizabeth Mine also played a defining economic role in Strafford for more than 200 years. The historic area is much larger than the area that is believed to be the source of the environmental problems at the site.

The Elizabeth Mine is the largest of three in the area. This is a mining district, not an isolated mineral deposit. EPA studies have demonstrated that environmental remediation was necessary to restore the water quality of the West Branch of the Ompompanoosuc River, and for the Elizabeth Mine and adjacent lands to be reused. Reuse of the Elizabeth Mine site can provide greater recreational and educational opportunities and will allow development of historic, environmental, or cultural exhibits. Maximizing the preservation of the site itself, including the landscape and buildings, and minimizing the disruption of the site should be a high priority. Purchases of land and easements at the mine can result in conservation of a corridor that can be used for historic preservation, recreation, and education.

Proposed Solar Project

Brightfields Development, a solar development company based in Wellesley, Massachusetts, ~~is in the process of developing~~ has recently developed a 5 MW solar array on the Elizabeth Mine Site in the Towns of Strafford and Thetford. The array is located on 28 acres out of the 850-acre Elizabeth Mine Site, and is sited on the historic Tailings Piles 1 and 2 of the mine. The solar array, which is arranged on ballasted racks and consists of two rows of 9 panels, will protect the integrity of the clean cap of soil that was established through remediation by the EPA.

Planning Process

Through a grant from the EPA, the Town of Strafford, in partnership with the Town of Thetford, hired a consulting firm to develop a Reuse Plan for the Elizabeth Mine site. This firm drafted a plan for the two communities to consider and implement. The Plan proposed municipal, preservation, educational, interpretive, and recreational reuse options for the Elizabeth Mine site.

Elizabeth Mine Environmental Cleanup Goals, Policies and Implementation Tasks

Goal

1. Elizabeth Mine's historic significance is preserved and utilized for appropriate recreational activities.

Policy

- ~~1.~~ 1.—Appropriate reuses of the site are encouraged.
2. In addition to the solar array, other appropriate reuses of the site are encouraged.

including the creation of a proposed mining museum on the site, installation of historical interpretive panels and establishment of recreational trails.

Implementation Tasks

1. The Planning Commission should develop an overlay that identifies the potentially contaminated groundwater area associated with the mine.
2. The Historical Society, with assistance from the EPA, shall implement the EPA's scenic overlook plan, including installation of historical interpretive panels. ~~should develop the scenic overlook plan.~~

K. Culturally and Naturally Significant Open Space Areas

Open Space lands typically have no structures and are usually in their natural state. These lands may be part of the working landscape, and are typically characterized by agriculture or forestry use. These lands may serve place-making, aesthetic, cultural or resource protection functions, and they make Strafford the place it is today.

In 2010, the Conservation Commission completed an Open Space Plan with the intention of identifying those areas that had significant cultural and natural value to Strafford's residents. This plan was developed with the understanding that the Town of Strafford should accommodate reasonable growth in many forms while working to protect these important Open Space areas. The impacts from development in these identified locations should be carefully considered and development should be designed or located in such a fashion that its impact is limited. The Open Space Plan ~~is currently being~~was updated by the Conservation Commission ~~in 2018.~~

Open Space Benefits

Open space provides many benefits to the residents of Strafford. These benefits manifest themselves across Strafford as various themes and networks. Several of these networks, such as vistas, gateways, highways, and trails, do not provide direct natural resource benefits but provide cultural benefits. Others such as the surface water network of streams and wetlands provide both natural resource benefits as well as cultural benefits that include flood control, community resilience, water quality, and recreation. Lands that exhibit several qualities listed below may be designated as a higher priority when evaluating conservation opportunities.

Open Lands

Open valley bottomlands support Vermont's working landscape, are significant riparian areas, and provide an important aesthetic function. Buffers and undeveloped river corridors in valley bottoms protect surrounding fields and hillsides from erosion, and can serve as habitat connections. Open lands in the uplands may include active farms or old hill farms that are still managed or leased for pasture or haying. These open lands provide views and edge habitat along their hedgerows. Several parts of old hill farms may be in various stages of succession and may provide several different types of habitat. While these lands are not true middle- to late-successional natural communities in Vermont, they are a critical part of Vermont's working landscape and provide many

habitats for different species of grassland birds.

Vistas and Gateways

Vistas provide central common spots offering views that tie certain neighborhoods together and contribute to Strafford's overall sense of place. Gateways also provide similar functions as they can frame entrances to villages, neighborhoods or special places.

Forest Lands

Forest lands are Vermont's most common natural and working community. There are eighteen natural community types of northern hardwood forests and oak-pine northern hardwood in Vermont; several of these forests are present in Strafford. Northern hardwood forests are the most common natural community across Strafford. Many of these forests are actively managed for various timber products, including firewood and saw logs and are currently in the forestry use value appraisal program.

Surface Water and Wetlands

Strafford's surface water network is an integral part of the community's sense of place. From Old City Falls to Miller Pond, the streams and ponds of Strafford are an important part of natural and cultural processes. Much of Strafford serves as the headwaters of the West Branch of Ompompanoosuc, and maintaining high water quality is an important function of these areas. For years, Strafford has been dealing with the water quality pollution associated with the Elizabeth Mine and the Copperas Brook, the tributary that passes through the mine complex and into the Ompompanoosuc.

Recreation and Access

Residents and visitors alike enjoy Strafford's beautiful hillsides and valleys and choose to access and experience its landscapes directly. Trails, power line rights-of-way, Class 4 roads, streams, and friendly neighbors offer ways to get around on the ground all across Strafford. Recreationists can run, hike, swim, horseback ride, bicycle, ski, snowshoe, and snowmobile among other modes. Additionally, the town highway network can provide recreation options for bicyclists, hikers, horseback riders and walkers throughout town.

Connections, Corridors, and Buffers

Connection areas include a smaller forested tract connecting two large tracts. This smaller tract may straddle a bordering highway or development. This connector serves as a plant and animal pathway between the two large habitat blocks and can help to maintain populations through seasonal and long-term migration routes. Smaller site-specific habitats exist in Strafford, as well. The bat caves near the Elizabeth Mine are an important example of this. Riparian buffers and corridors are important tools that maintain and enhance riparian habitats and provide important connections in more fragmented valley bottoms.

Important Open Space Areas

- **Taylor Valley:** Taylor Valley provides habitat and watershed protection

functions. Taylor Valley Road and Hemenway Road (formerly Sawyer Mountain Road), provide walking, hiking and bicycle routes to residents. This area borders the larger Orange County Headwaters conservation project.

- **Podunk Wildlife Management Area (WMA) – Miller Pond– Hanchett Flowage:** This area includes the 924-acre Podunk WFA and the Miller Pond and Hanchett Flowage. North of Pennock Road, the area consists of a large unfragmented forest block. The Podunk WMA is bisected by Pennock Road and can be accessed from Old City Falls Road from the west or from Miller Pond Road and Maple Hill Road from the east. A developed parking area is available from Maple Hill Road west on Podunk Road, which accesses the four-acre breached Podunk Pond in the middle of the WMA via a maintained trail. Podunk WMA is owned by the State of Vermont but the property still has mineral rights encumbrances. The state maintains 10 acres of field in five units, with the largest being a five-acre area around an old farmstead. Apple trees that the state is maintaining through release cuttings can be found in abundance in these fields. Miller Pond has a state access point on the southeast side near the outlet off of Miller Pond Road. Just to the east off of the south side of Sawnee Bean Road, the 14-acre Hanchett Flowage site is a significant wetland owned by the State.
- **Whitcomb-Richardson Hill:** The two summits of Whitcomb and Richardson Hills at 1,866 and 1,534 feet respectively form the core of this area.
- **Upper West Branch Valley:** These valley bottomlands stretch from the Upper Village into the beginning of the Taylor Valley past Old City Brook. A small hamlet at the base of Old City Falls Road above the Upper Village ties this area together.
- **Middle West Branch Valley:** These lands run between the Upper and Lower villages and form the core of Strafford’s open valley bottom lands. These lands include several working farms as well as the edges of both villages. Recreation fields are part of the river buffer in the Lower Village.
- **Lower West Branch:** These areas beginning at the Lower village and following the West Branch east to the Connecticut River Valley are much more forested than the other valley bottom lands in Strafford. These lands are the gateway to the Lower Village on the west end. Above the Copperas Brook, the river is shaded from the trees along the banks and is accessible in spots from VT Route 132.
- **Kibling Hill WMA:** The State of Vermont owns the public hunting rights on the 882-acre Kibling Hill WMA. Trapping and fishing rights remain with the landowners and require permission.
- **Clover Hill WMA:** This 506-acre Wildlife Management Area is owned by the State of Vermont, and the timber and mineral rights are privately owned. This

area consists of a northern hardwood forest with conifers in the north central area serving as a deer wintering area. Two small fields can be found in the northeast and southeast corners.

Elizabeth Mine: The Elizabeth Mine Superfund site is an abandoned copper and copperas mine in the southeast corner of Strafford. Mining continued for 150 years, from the early 1800's to the Korean War in 1958. ~~The tailings piles from the last period of production has been cleaned up by the EPA. This area offers many historical and open space opportunities. Stone foundations and other remains exist around the site from earlier structures.~~

The tailings piles have been remediated and the open cuts are currently being rehabilitated under the oversight of the EPA. As the cleanup is completed, there will be increasing opportunities to develop its historical/educational potential and its recreational uses. In addition, the old mine shaft provides significant habitat for migrating and overwintering bats.

-
- **Other areas:** Other areas include town-owned recreation properties that are outlined in the Utilities and Facilities section of this Plan.

Land Protection Strategies

Methods of protecting open space are varied. In general, there are two ways to encourage the preservation of open space, regulatory and voluntary. Voluntary methods include:

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

Strafford 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 monies that the Conservation Commission could use to purchase land outright, or assist a land conservation organization with the purchase of a conservation easement.

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. 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. Such 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. Overlay

districts can be used to protect many types of resources.

- **Resource Protection Districts:** Protect resource and open space areas or resource-based uses such as farming, forestry, and 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 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 supports the regulations.

Culturally and Naturally Significant Open Space Areas Goals, Policies and Implementation

Tasks

Goals

1. Natural resources that are unique to Strafford and make it special are identified and protected.
2. Strafford's important cultural and natural resources are preserved and protected for future generations.
3. Reasonable development that doesn't sacrifice important cultural and natural resources occurs.
4. Reasonable development that protects existing rural landscape.

Policies

1. It is the policy of the town to ensure careful review of all development projects to minimize the impact on Strafford's natural and cultural resources.
2. Protect unique resources by careful planning.
3. The Development Review Board ~~The Planning Commission will~~ should work with the Conservation Commission and the Planning Commission DRB when reviewing subdivisions to preserve open space.

Implementation Tasks

1. A scenic road and ridgeline inventory should be conducted in order to

provide data for the protection of scenic roads through the Strafford Subdivision Regulations.

2. The Planning Commission should conduct a detailed viewshed analysis in order to determine which corridors have the most scenic value.
3. The Conservation Commission should complete a wetlands and natural communities inventory of Strafford in order to determine where the unmapped wetlands and natural communities are located.
4. The Conservation Commission should conduct an agriculture field and use inventory in Strafford. Pasture lands are defined as an existing feature to be preserved in the Strafford subdivision regulations.
5. The Town should prioritize recreation corridors along the town highway network to identify safety improvements as well as other improvements that may be needed for bicycle, pedestrian and other forms of access.
6. The Conservation Commission should identify formal and informal access points to various open space and recreational areas.
7. 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 Strafford.
8. The Conservation Commission should continuously update the Open Space Plan.

IX. Land Use

Introduction

In planning for the future, land use is one of the most complex issues a town will face. 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 Strafford do 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 implementation tasks for future implementation. V.S.A. Title 24, §4411(a) authorizes towns to implement land use regulations, such as zoning and subdivision, provided that those regulations are in conformance with the Town Plan and §4302 of Title 24, which addresses the state's planning goals. State statute defines "conformance with the plan" as follows:

"All such regulatory and non-regulatory 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)]

Overall Land Use Goals, Policies and Implementation Tasks

The Planning Commission has the task of implementing the Town Plan through the wide range of tools offered in state statute. All of these tools must conform to the policies of the Town Plan. The Planning Commission is required to issue a report on how any proposed draft regulations implement the plan as part of the adoption process. Under new laws adopted in 2016, the Planning Commission and regional planning commission will periodically review the town's progress in implementing the Plan.

Accordingly, the following are recognized as key factors for determining the type, scale and intensity of future land use:

- Land topography, soils, water, and other natural resources characteristics;
- Relative ease of access to roads and other transportation facilities;
- Availability to public services;
- Desirability of avoiding land use conflicts; and
- The needs of the citizens of Strafford.

State Policy

This Plan acknowledges and implements the state policy "to plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside." 24 V.S.A § 4302 (c) (1).

Goal

1. Strafford remains a beautiful place with its distinctive rural, agricultural, cultural, architectural and scenic appeal.

Policies

1. Development shall reinforce the traditional settlement pattern of concentrated development in or adjacent to the existing two villages.
2. Development shall not increase risk from flooding.
3. No development shall require paving of town highways due to expected traffic volumes.
4. Growth must not overwhelm the Town's limited financial resources, municipal infrastructure, facilities, and services.
5. A reasonable diversity of uses should be allowed within appropriate areas of Town in order to locally satisfy many commercial needs.
6. Preservation of open land, farms, forests, wetlands, scenic ridgelines, wildlife habitat and outdoor recreation is encouraged.
7. The preservation and perpetuation of Strafford's unique historic structures must be considered in development reviews.

Implementation Tasks

1. The Planning Commission should consider adding language to the Strafford Bylaw which addresses lighting, viewsheds, and residential construction on ridgelines.
2. The Planning Commission should work with the Board of Selectmen, Development Review Board, and administrators of the Fire Department and Fast Squad to revise the bylaws so that access to proposed structures, including driveways, is done in a manner that ensures that emergency vehicles and personnel can reach the sites without unreasonable risk.
3. Planned Unit Developments, stronger subdivision standards, or waiver provisions which cluster development and preserve open land, working land, and wildlife habitats should be encouraged.
4. Information from the USDA Natural Resource Conservation Service should be maintained as a community resource to assist landowners, farmers and foresters in farmland conservation and habitat protection for wildlife.
5. The Planning Commission should merge the Strafford Zoning Ordinance and Subdivision Regulations into a single, unified bylaw in order to simplify development review.
6. The Planning Commission should update zoning language relating to telecommunications and renewable energy so that the Town's goals and policies are considered during Section 248 proceedings.
7. The Planning Commission should assure that the Unified Bylaw appropriately addresses waivers and variances.
8. In order to encourage cluster development in areas adjacent to Strafford's villages, the Planning Commission should consider ways in which it can offer incentives that encourage innovative multi-user septic systems while reducing any threat to village water supplies.

9. PUDs or lot size waivers for subdivisions that are not adjacent to Strafford's villages should be carefully considered for their impact on town services by the Planning Commission when redrafting bylaws.
10. The Town, with its limited financial resources, should encourage the restoration of historic public structures and the maintenance of significant public areas through grants and organized volunteer efforts, such as those of the Friends of the Library, Friends of the Morrill Homestead and the Town House Advisory Group.
11. Visual impacts of development should be addressed in bylaw updates.
12. Growth and development should not undermine Strafford's natural resources, scenic villages, or distinctive pattern of open fields and forest.
13. Light pollution should be discouraged in Strafford.

A. Current Land Use

Strafford's scenic charm, both as to its natural setting and its architectural treasures, can be preserved only by careful attention to growth management. Because of the steepness and remoteness of much of the terrain, a limited portion of Strafford has been developed, but the extent of the development is significant.

Residents' surveys about their vision for the future of Strafford clearly support maintaining the current pattern of development, which has been primarily dense development in Strafford's villages and more diffuse (mostly residential) development in the rural countryside.

B. Regulations and Development Trends

Strafford adopted Subdivision Regulations on June 15, 1996. Strafford's Zoning Ordinance was revised and adopted on June 5th, 2005 and most recently amended in 2007. Under current zoning, the Village Centers district has a one-acre minimum lot size due to the need for onsite sewer and water. The Rural Residential, Land & Forest Conservation, and River Valley Conservation zones have three-acre minimum lot sizes, and the Miller Pond Shoreline zone has a two- and ten-acre minimum lot size.

The Town remains concerned about the tendency for new residential construction to be located on more remote roads with the consequent straining of the Town's resources and services to accommodate demands for road maintenance, the potential need for extension of school bus routes, and a disturbing and risky lack of regard for access by emergency vehicles. Additionally, this remote development fractures larger rural parcels, creating an adverse effect on wildlife, forestry, water quality, recreation and the aesthetic character of the community.

C. Proposed Land Use Settlement Pattern

Historic Preservation and Visual Environment

Strafford was granted its charter on August 12, 1761, by Benning Wentworth, royal Governor of the Province of New Hampshire. The town was named in honor of one of the Earls of Strafford, a title first held in Wentworth's family in 1640. Prior to 1761, the land was a sparsely inhabited wilderness in which Native Americans, the Abenakis, had been present for many thousands of years. Not until the early 1600s did Europeans arrive in the area, principally French fur trappers based in Montreal. The first known permanent settlers in Strafford arrived about 1767, establishing what is now called the "Old City" settlement. By 1771, there were nine households in town and more began to arrive from Massachusetts and New Hampshire as well as Connecticut. Strafford's Grand List had grown to 64 names in the early 1780s. When Vermont became the fourteenth state in 1791, Strafford had 844 inhabitants in 148 households.

Now 250 years later, with just over a thousand residents, Strafford stands out as an architectural and aesthetic treasure of New England's Upper Connecticut River Valley. This distinction, embodied in the viewshed of the valley between the villages and crowned by the Upper Village, which has been characterized as the quintessential Vermont village, makes Strafford visually appealing and in many ways unique. Much of this viewshed and its open spaces are guaranteed to future generations through conservation easements.

The Upper Village was added to the National Register of Historical Places in 1974 and South Strafford Village was added to the Vermont Register of Historical Places in 1989. In 1991, more than 200 acres of the valley between the villages were protected from development through easements with the Upper Valley Land Trust (UVLT) in addition to a 14-acre parcel that provides the backdrop to the Town House just north of the Upper Village. In addition, in the Upper Village, the east side of the valley above the Morrill Memorial & Harris Library and the historic Coburn barn have also been protected by an UVLT conservation easement. In addition, the west side of the valley, within the floodplain of the West Branch of the Ompompanoosuc River, is protected by and held by the Connecticut River Watershed Council.

The Upper Village is a rarity in Vermont: not only is it protected from random and scattered development; it has managed to retain its historical and architectural integrity. As a result, it has been favored by both the Preservation Trust of Vermont and Vermont's Division of Historic Preservation with numerous restoration grants, including significant funding for renovations to the Strafford Town House, the United Church, the Coburn barn, the municipal building and the Justin Smith Morrill Memorial Homestead. The Town House, which is the architectural jewel in the crown of

the Upper Village, endures as one of the state's more stunning and frequently photographed historical buildings.

The quality of this visual environment is essential to Strafford's identity, and the landscape with its insets of structures all contribute to this aesthetic triumph. Attention must be paid, therefore, to all these facets if preserving what is distinctive about the topography and the character of the Villages is to be achieved.

Landscape and setting play a vital role in defining aesthetic quality. In the villages, the "streetscape" environment as a whole and the spaces in between are equally significant. The landscape elements such as plantings, fences, lighting, even driveways and parking areas, all contribute to the richness of this visual experience.

On a larger scale, the patterns of open space and forest, pasture, ponds, the winding river and roads as well as other natural elements, have evolved over time, through both natural processes and human intervention, into what we now consider to be uniquely "Vermont."

D. Future Land Use

The future land use section and future land use map of a town plan is intended to act as a guide for future development within a town, to aid local planners in the process of implementing the plan through regulatory tools, and, if specific enough, is used in Act 250 proceedings to see if developments meet Criterion 10, which requires conformance with town and regional plans. Future land use areas are not necessarily required to mimic the historic character of land use, but instead should reflect Strafford's vision of the future, even if the proposed land use settlement pattern suggested differs from the present pattern. However, when surveyed, most 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 to implement this preference requires a variety of tools and approaches.

The following Land Use Areas are indicated on the Future Land Use Map. It should be noted that the exact size, shape and location of the land use areas do not need to be duplicated precisely when translated into actual zoning districts in order to be considered "consistent with this plan," provided that they are implemented in a manner that reflects the purpose and vision outlined below.

E. Village Centers

Both South Strafford and Stafford Villages are currently and intended to be the cohesive cores of our community. The villages are the focus of many social and economic activities in the community and provide for residential, commercial, municipal, and other compatible development that serves the needs of the Town as a whole. When residents were surveyed in 2008, almost 60% of the responses supported increasing the size of the village center zoning districts so that there would be more lots for new residential building. The topographic and flood hazard constraints in Strafford's villages

limit the area available for expansion, and expansion is further limited in South Strafford and in Strafford villages by the potential for water contamination from private septic systems. Because the village centers do not have access to public sewer and water, density can only safely be moderately high here. Lot area minimum size is one acre; with the exception of Planned Unit Developments, no more than one principal building may be placed on a lot unless Conditional Use Approval has been granted.

This plan calls for expansion of the village centers in order to promote development in and adjacent to the existing villages as well as to expand the amount of land available for development at a density of one (1) unit per acre. Additionally, the plan calls for both villages to seek the designation of village centers from the state for the purposes of enhancing the safety and economic growth of the area.

Village Center Goals, Policies, and Implementation Tasks

Goals

- a. Maintenance of the scale, historic character, and vitality of Strafford's two villages.
- b. Higher density residential and commercial development of a type and scale that does not negatively impact public health and the environment and the character of the villages.

Policies

1. Commercial uses and higher density multi-family housing in the Village Centers are encouraged.
2. Primary retail establishments (excluding those retail establishments that require substantial area for storage of materials, such as lumberyards and nurseries) must be located within the Villages Centers.
3. Future development shall reinforce the traditional settlement pattern of concentrated development in or adjacent to the existing two villages.
4. In the villages, new buildings should be in keeping with the historic architecture and proportions of existing buildings, standards which can be defined by the establishment of historic districts in both villages.
5. Commercial activity, essential to the vibrancy of the village centers, shall be concentrated in the village centers, ~~including,~~

Implementation Task

1. With the establishment of a Historic Preservation Commission (HPC) in 2017 and its acceptance into the Certified Local Government Program in 2018, the Planning Commission in conjunction with the HPC shall identify and proceed with the establishment of historic districts in both villages in order to preserve the historic character of the buildings.

Primary vs. Secondary Retail

Because of the potential for poorly planned and located retail development to negatively impact the health of the villages and to create strip development, this Plan seeks to allow certain types of

retail only within the village. Therefore, two intensities of retail development are defined for the purposes of this plan: Primary retail - Primary retail establishments have only one purpose: to sell goods. Examples of a primary retail establishment include a grocery store, dry goods store, hardware store, etc.

The Plan recognizes that there are some types of primary retail development that by their nature are less appropriate in the village. These would be those businesses that require a substantial amount of space to store materials, such as lumberyards or nurseries. It will be noted in the Plan where these uses are appropriate.

Secondary retail – Secondary retail establishments have a retail presence, but that is not their primary purpose. Examples include a veterinarian’s office (which sells pet food), an eye doctor’s office (which sells eyewear) or a cabinet maker (with a small showroom). Their retail presence must be clearly subordinate to their primary purpose.

but not limited to primary retail.

Implementation Tasks

1. In order to encourage cluster development in areas adjacent to Strafford’s villages, the Planning Commission may want to consider ways in which it can offer incentives that encourage innovative multi-user septic systems while reducing any threat to village water supplies.
2. The Planning Commission should revise the bylaws to more clearly lay out what type and scale of commercial uses should be allowed in the villages and in the rural residential areas.
3. The Planning Commission shall revise the bylaws to ensure that civic buildings and public services such as the post office and schools shall only be located in or adjacent to the village centers.
4. The Planning Commission shall examine policy options for preserving the historical character of buildings in the Upper Village, including defining a historical district through Strafford’s participation in the Certified Local Government Program and the establishment of a Historical Preservation Committee.
5. The village centers shall be expanded beyond the existing boundaries in both villages. In South Strafford, the village shall be extended south along Rte. 132 to Tyson Road and from the Mine Road down Tyson Road to Rte. 132. In Strafford, the boundary shall be extended from Justin Morrill Highway up the Brook Road to the power lines and from the Common to the Old City Falls Road.

F. Rural Residential I (RRI)

The purpose of the Rural Residential land use area is to provide for low-density residential development, while allowing for continued agricultural and forestry operations, and some limited commercial uses that are in keeping with a pastoral landscape and provide services or sources of employment.

Historically, much of the area outside the village centers has been devoted to agriculture,

forestry and mining. Much of the open land has now reverted to scrub or forest. Residential construction, particularly in recent decades, has increased dramatically in these outlying areas. With lot sizes as small as three acres, many open fields and pastures have become house sites.

Planned unit development (PUD) or “clustering,” is one solution that concentrates services such as power, telephone, septic and road maintenance, and at the same time, protects open land and forest. PUDs can also allow the Development Review Board to offer density bonuses for developers who cluster their development while preserving open space or wildlife habitat. When surveyed in 2008, residents were supportive of PUDs when they protected open space. Siting houses close to each other while maintaining buffers of trees allows reasonable privacy. Such a solution preserves open lands and intact woodlands, and yields a financial benefit from the shared costs of installing the services. Simpler methods of allowing cluster development through a waiver process in subdivision also may achieve this end. Allowing clustering through some type of provision, versus mandating it, generally does not lead to clustering.

A crude but effective way of limiting the density of development is to increase lot sizes. Residents are split on the concept of increasing lot sizes beyond the present standard of three acres in this land use area. The current acreage requirement is not high enough to preserve the historically diffuse pattern of development in the Rural Residential Area, but is more than is needed for house sites, increasing land costs for new housing.

Rural Residential I Goals, Policies and Implementation Tasks

Goal

- a. A vital working landscape with appropriate low-density development.

Policies

1. Land development or subdivision in this district, shall be at a low density.
2. A mix of residential, agricultural, forestry and recreational uses in this district shall be encouraged.
3. No primary retail development shall be located in the Rural Residential I district except small-scale businesses with a secondary retail component may be allowed.
4. No commercial development shall be permitted except for the following: small professional offices, inns, development directly related to agricultural, forestry and recreational uses and home occupations such as wholesale operations, internet marketing, carpentry, woodworking and vehicle and small engine repair garages.
5. All commercial and retail development must be consistent with the purposes of the district.
6. Multi-family development of up to three living units is permitted in this district.
7. PUDs are appropriate in the Rural Residential I district. PUDs of up to ten (10) units may be allowed in this district. Senior Housing PUDs adjacent to a village may have more than ten (10) units.

Implementation Tasks

1. Revise the bylaws to define appropriate types of commercial uses and scales that would fit in this district, making permitting more predictable.
2. Develop provisions that encourage clustering of development to reduce impacts on agricultural soils and open areas.
3. Consider standards that would preserve scenic views.

G. Rural Residential II (RRII)

- a. Lands in the RRII district are more remote from the village centers and are often associated with sensitive wildlife corridors, habitats and rare plant species. These are not conserved land through special protections but are often large blocks of forest, steeper slopes and distant from roads that can provide for significant traffic.
- b. The purpose of RRII is to provide for very low-density residential development while allowing for continued use of agricultural and forested lands. Only those commercial enterprises directly connected to farming, agriculture, forestry and outdoor recreation and small-scale home occupations are to be allowed. The concentration of residential units into planned unit developments of no more than five units is encouraged to maximize the land area available for farming and forestry and wildlife habitat, including the preservation of plant species.

Rural Residential II Goals, Policies and Implementation Tasks

Goal

A large block of land for wildlife habitat and corridors and very low-density development.

Policies

1. Land development or subdivision in this district shall be at a very low density.
2. A mix of agricultural, forestry and residential uses are encouraged in this district.
3. No retail development shall be located in this district except small-scale home occupations with only a secondary retail capacity.
4. No commercial development shall be allowed except for home occupations and businesses directly related to agriculture, forestry and outdoor recreation.
5. Multi-family housing of up to two (2) living units is permitted in this district.
6. Planned unit developments of no more than five units may be considered.
7. No unpaved public roads in this district shall be improved for the purpose of accommodating new development.

Implementation Tasks

1. The Planning Commission should revise the bylaws to limit incursions into remote areas.

The Planning Commission should add language in the Zoning Bylaw that will minimize fragmentation of forest blocks and wildlife habitat and encourage the conservation of wildlife connecting areas.

H. Land & Forest Conservation

This land use area represents the most rural and remote topography in town. This district consists of land currently conserved through public ownership or other land use policies from land trusts and other organizations. Because of its more remote nature, it does not have good access to town services including roads. Additionally, the land within this area represents a substantial amount of available wildlife habitat that is only functional in large forest blocks. Both the habitat value and ability to provide lands for forestry are vital to the rural nature of the community, and development in these areas would diminish or eliminate much of these functions. Because of this, the purpose of the Land & Forest Conservation area is to only allow residential development at a very low density that protects existing natural resources, including wildlife habitat, and to sustain the rural and natural characteristics of the town and to discourage development that will burden the town by requiring the extension of roads and other town services.

The primary characteristics of lands in this area are excessively steep slopes, shallow soils, remoteness and lack of development. This land tends to be held in larger tracts. It is obvious that its most appropriate use is for appropriately sited timber production and recreation. It provides clean water to the watershed and habitat for wildlife. Residential development in this area is expensive and the cost of public services, such as road maintenance, places an enormous burden on any community. When surveyed, many citizens indicated that protecting agriculture, wildlife habitat, forests and woodlands and scenic views was important to them. It is commonly understood that the current three-acre zoning in this area does not protect wildlife habitat and corridors.

Land and Forest Goals, Policies and Implementation Tasks

Goal

1. Large blocks of intact forest and farmland that support clean water, wildlife habitat, agriculture and forestry.

Policies

1. Land development or subdivision in this district shall be at a very low density.
2. Development shall be planned to minimize the fragmentation or reduction of the resource values of the area.
3. Land development or subdivisions in this district shall minimize adverse impacts wildlife habitat.
4. No unpaved public roads in this area shall be improved to accommodate new development.
5. No Primary Retail shall be located in the Land & Forest Conservation district.
6. No commercial development shall be located in the Land & Forest Conservation district except that commercial development that is directly associated with home occupation, recreational activity, agriculture or forestry shall be allowed.
7. Conservation easements are supported in this district.
8. Multi-family development shall not be allowed in the Land and Forest Conservation district.

Implementation Tasks

1. All development in the Land & Forest Conservation district should be made a conditional use to ensure that impacts on the natural environment or scenic areas can be evaluated.
2. The bylaws should be revised to limit incursions into remote areas.
3. The Planning Commission should add language in the Zoning Bylaw that will minimize or prevent fragmentation of forest blocks and wildlife habitat, including wildlife connecting areas, in the Land and Conservation district.

I. River Valley Conservation

The purpose of the River Valley Conservation Area is to lessen or avoid the hazards to persons, the damage or loss to property caused by floods, and to ensure wise use and conservation of lands bordering rivers and streams and by maintaining the open character of the valley and avoiding channel encroachments and floodplain filling. The lands adjacent to significant rivers and streams, such the West Branch of the Ompompanoosuc River, Old City Brook or Alger Brook, are, because of their relative flatness and depth of their glacial till soils, best suited for non-structural use such as agricultural or conservation. Agriculture itself presents water quality concerns but cannot be locally regulated beyond state standards. The proximity of these lands to eroding banks and their function as flood plains make them unsuitable for development and their ecological sensitivity has a direct bearing on water quality.

River Valley Conservation Goals, Policies and Implementation Tasks

Goal

- a. Main rivers, streams and floodplains are stable and land development near them do not create hazards, pollution, or the need for flood response.

Policies

1. Only non-structural agriculture and recreational uses should be allowed in this area.

Implementation Tasks

1. The Planning Commission should regularly review the protections for these areas in the bylaws to ensure that they remain up-to-date with the requirements of FEMA and the NFIP.
2. The Planning Commission should examine additional protections for lands in river corridors outside of mapped Flood Hazard Areas, as these are at risk from flood damage.
3. The Planning Commission should revise the bylaws to prohibit new development within the floodplain.
4. The Planning Commission should address river corridors and the risk of lateral erosion in bylaw updates.

J. Miller Pond Shoreline

The purpose of the Miller Pond Shoreline Area is to protect the quality of water and to maintain high standards for permitted development so as to protect the pristine character of the pond and the scenic and recreational assets of the shore land. This was accomplished in the past by protecting and preserving the shore lands which are unsuitable for development as determined by septic suitability; maintaining a low density of development on those shore lands suitable for development; and providing compatible use of the public water by the general public. However, changes in state regulation regarding the permitting of septic systems, and improvements in septic system technology, have left this method outdated and in conflict with state regulations. Because of this, the Planning Commission will need to consider alternative methods of achieving the purpose stated above. This will require reevaluating the current setback requirements and creating a simple standard for all structures, as opposed to the current method which varies based on soil types. Likewise, any prohibition on development that occurs on steep slopes will need to apply to all development.

Miller Pond Shoreline Goals, Policies and Implementation Tasks

Goal

- a. Miller Pond remains a scenic and recreational asset with very high quality water.

Policies

1. Land development or subdivision shall be planned to protect water quality in Miller Pond.

Implementation Tasks

1. The Planning Commission should include an overlay or district in the bylaws to protect this water body.
2. The Planning Commission should revise the bylaws to create an enforceable provision that keeps structures (including any septic tanks or leach fields) at least 200 feet from the shoreline and feeder streams.
3. The Planning Commission should revise the bylaws to require an undisturbed vegetated buffer of at least 50 feet from the shoreline and feeder streams.
4. The Planning Commission should consider revising the bylaws to expand this district to the watershed boundaries that drain into this pond.
5. The Planning Commission must update the Miller Pond Shoreline district regulations to conform to state regulations and develop other techniques for protecting the Pond's scenic character.

K. Elizabeth Mine Protection Area, Historic, and Conservation District

The purpose of this proposed land use area is to ensure that residents located near the Elizabeth Mine Area have access to safe, potable water and remain free from any toxic hazards the mine might produce. Although the Elizabeth Mine occupies a specific location in South Strafford, its impact extends beyond the boundaries of the property through the water table. The Planning Commission is concerned that property within this area might be purchased without the knowledge that there is the potential that a landowner might not be able to acquire safe drinking water on the property.

Elizabeth Mine Protection Area Goals, Policies and Implementation Tasks

Goal

~~5.1.~~ Potable water is available to people on lands affected by the Elizabeth Mine.

Policies

1. Land development or subdivision in this area must have access to safe drinking water.

Implementation Tasks

1. The Planning Commission should revise the bylaws to create a requirement that uses and subdivisions that require potable water provide proof of such prior to any approval or permit.
2. The Planning Commission should create regulations that ensure a safe drinking water supply can be accessed in areas near the Elizabeth Mine. This could be done through zoning and/or subdivision or both.
3. An overlay map of the affected lands will be provided based upon the Environmental Protection Agency soil and water testing.

L. Other Issues Relating to Development

Strafford's land use regulations are currently in the form of stand-alone zoning and subdivision regulations. In 2005, State statute made it possible for towns to merge Subdivision and Zoning into a single document, called a Unified Bylaw. Having both documents integrated assures that there will be consistency between the two forms.

The Planning Commission intends to draft a Unified Bylaw for Strafford. In doing so, the Planning Commission will address issues that will ensure that the regulations are up- to-date, consistent with the Plan and consistent with state law. Updates should include adding a waiver provision that allows the Zoning Administrator or Development Review Board to waive dimensional standards under certain circumstances (such as handicapped accessibility). Minor changes, such as adjusting the document's language to account for the shift from a Zoning Board of Adjustment to a Development Review Board, will be fairly simple. Other issues, such as those outlined

below, will take greater thought and consideration.

Ridgeline Protection

In 2008, residents indicated that they would be interested in some form of restriction with regard to ridgeline development. To date, Strafford has had limited development on its ridgelines in part due to the difficulty and expense associated with building on steep slopes. However, advances in septic technology have progressed to the point that slopes are no longer a limitation in septic system design.

Ridgeline development can have a distinct impact on the scenic qualities which are considered important by many residents. Developments that are close to ridges are generally farther away from existing roads, making access for fire safety and public services difficult and costly. The Planning Commission plans to update Strafford's land use regulations to address ridgeline development.

Telecommunications and Wind Towers

Large towers utilized for telecommunications and wind generation can have an impact on the rural character of Strafford. Notwithstanding this, residents who were surveyed in 2008 strongly supported the encouragement of both types of towers in Strafford.

Although state and federal regulations have primary control over telecommunication towers and commercial wind towers, it is appropriate for a community to clearly outline their policies on these types of towers. Strafford has a telecommunications ordinance but does not have an ordinance that addresses commercial wind generation. A Vermont statute passed in 2016 gives communities that do greater planning around achieving energy goals a greater say in the state permitting process (getting a certificate of public good from the Public Service Board, also known as a 248 proceeding).

The Planning Commission will be incorporating updated language with regard to telecommunications and commercial wind towers into the Unified Bylaw.

Waivers

In 2005, the Vermont legislature enabled towns to utilize a form of regulation called "waivers." This new concept was created as a way to address desires to change review standards in certain circumstances that would not be allowed in the variance process. To get a variance is difficult and requires meeting a five-part test, and is only available to as a last resort for developers who are unable to develop their property in conformance with zoning due to an unusual hardship.

However, the state legislature recognized that there are certain instances where the requirements of the variance process are unreasonable. For example, a homeowner who is attempting to put in a handicapped accessibility ramp that falls outside the allowed setback might not be able to meet all five elements of the variance criteria. To enable such deviations from the zoning ordinance, the legislature created "waivers." Waivers

allow the Zoning Administrator or Development Review Board to waive dimensional requirements under certain circumstances as allowed by the town's zoning regulation. The Planning Commission intends to add this level of flexibility to the future Strafford Unified Bylaw.

X. Energy

Goal

In accordance with Vermont statewide goals, and reflected by Strafford’s adoption of the Climate Emergency Resolution¹ at the 2020 Town Meeting, Strafford should pursue best practices in design, siting, and construction techniques with a goal of net-zero energy use and elimination of greenhouse gas (GHG) emissions for decarbonized residential, municipal, and commercial buildings. The Town should further pursue strategies that support decarbonized transportation for both municipal and private vehicles. The Town has resolved to reduce and eventually eliminate fossil fuel use, which includes new and existing buildings and transportation. Town practices and policies need to encourage energy conservation, weatherization, transportation efficiency, and the siting of renewable energy generation in Strafford. The goals and strategies of the Energy plan are largely specified by the State and Regional Commission, as outlined in Act 174², the Vermont Comprehensive Energy Plan (CEP) of 2016,³ and the 2020 Two Rivers Ottauquechee Regional Commission’s (TRORC’s) Regional Plan.

As reflected in the Climate Emergency Resolution adopted at Town Meeting in 2020, the citizens of Strafford have affirmed that achieving these goals is an important opportunity and not an acquiescence to an obligation or burden. As Strafford plans for the future, it is important that Town officials and residents understand current energy use as part of a process of setting meaningful targets to help reach the municipality’s energy and climate goals.

Background

The Strafford Energy and Climate Committee (SECC) partnered with TRORC to update this Energy section of the Town Plan to qualify as the “Enhanced Energy Plan” for the Town of Strafford.

I NOW THEREFORE, BE IT RESOLVED THAT THE CITIZENS OF THE TOWN OF STRAFFORD:

1. Declare that a climate emergency threatens “future generations,” our town, the State of Vermont, and the whole world;
2. Commit to integrating the need to act urgently on climate into all future decision-making, while incorporating transitions that are just and equitable, and to working toward a goal of zero greenhouse gas emissions in Strafford by 2030;
3. Direct the Strafford Selectboard to ask the Strafford Energy Committee, in collaboration with other organizations and individuals, to report periodically on the Town’s greenhouse gas emissions and to present information and ideas for achieving net zero greenhouse gas emissions in Strafford by 2030; and
4. Urge the government of the State of Vermont to promptly initiate and enact legislation needed to ensure that Vermont’s goals for reducing greenhouse gas emissions are met, and take steps to mitigate any resulting harm to vulnerable populations in Vermont.

2 No. 174. An Act Relating to Improving the Siting of Energy Projects. S. 260. 2016.

<https://legislature.vermont.gov/assets/Documents/2016/Docs/ACTS/ACT174/ACT174%20As%20Enacted.pdf>

3 Vermont Department of Public Service. *Comprehensive Energy Plan 2016.*

https://outside.vermont.gov/sov/webservices/Shared%20Documents/2016CEP_Final.pdf

In May 2016, the Vermont legislature enacted legislation giving towns new and expanded authority over the siting of renewable energy facilities. The new legislation authorizes towns to write energy plans addressing the siting of renewable energy facilities. If a regional planning commission certifies a town plan as compatible with state energy goals, the town is afforded “substantial deference,” which gives the town greater say in Section 248.⁴ Regional developers must abide by the Town Plan unless there is “clear and convincing” evidence that the good of the state necessitates otherwise. The process of determining a “preferred site” for a renewable energy project will be reviewed by the Town of Strafford’s Planning Commission and Selectboard as projects arise. The reason for Strafford to approve preferred sites is that the Vermont Public Utility Commission (VPUC) will give deference to parcels the town designates for potential renewable energy development, and because VPUC Rule 5.100 creates a financial incentive for 15KW to 500KW generators on preferred sites.

Renewable Energy Sources

Electricity

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

	<u>Sector</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
<u>Strafford</u>	<u>Commercial & Industrial (kWh)</u>	<u>752,865</u>	<u>746,881</u>	<u>704,807</u>
	<u>Residential (kWh)</u>	<u>3,183,173</u>	<u>3,292,246</u>	<u>3,079,912</u>
	<u>Total (kWh)</u>	<u>3,936,038</u>	<u>4,039,127</u>	<u>3,784,719</u>
	<u>Count of Residential Premises</u>	<u>548</u>	<u>553</u>	<u>516</u>
	<u>Average Residential Usage (kWh/premise)</u>	<u>5,809</u>	<u>5,953</u>	<u>5,969</u>

The residential, commercial, and industrial electricity demand in Strafford has declined over the past three years. This data is gathered through Efficiency Vermont. The table below identifies the electric efficiency improvement targets needed for Strafford by 2050.

<u>Electricity Use Targets</u>	<u>2025</u>	<u>2035</u>	<u>2050</u>
<u>Increase Efficiency and Conservation by:</u>	<u>-0.6%</u>	<u>5.7%</u>	<u>9.9%</u>

This plan encourages residents to conserve energy and switch to more efficient systems. Note the decrease in the first target year, which is due to Long Range Energy Alternative Planning System (LEAP) modeling showing that efficiency trends are outpacing the electrification trends. The LEAP Model developed by VEIC of Vermont is an energy budgeting model that sets pathways for Vermont to achieve its goal of 90% renewable energy use by 2050.

4 Vermont Public Utility Commission (30 VSA §248): <https://legislature.vermont.gov/statutes/section/30/005/00248>

The preceding table combines expectations that the Town will reduce annual energy use due to efficiency and conservation, with simultaneous increased use from the electrification of buildings and vehicles—by conversion to electric technologies such as heat pumps for space heating and domestic hot water, and plug-in electric vehicles. Due to the scale of the electrification expectations, these goals constitute a significant and consistent efficiency and conservation effort for Town residents and municipal uses. This will come in the form of improving building weatherization, insulation, windows, equipment efficiency (hot water and space conditioning primarily), lighting efficiency and appliance efficiency. Conservation efforts will include reducing lighting and appliance use.

Targets are described in later sections for thermal and transportation sectors.

Renewable Energy Generation

As of the end of 2018, Strafford has approximately ~~500kW~~ **500 kW of grid-tied solar installations, 25 off-grid solar installations, 3 micro-hydrohydroelectric installations, and 3 micro-wind-turbine installations** totaling approx. 600,000 kWh per year (generating a total of approximately 600Mwh per year). Without adding the output of the Elizabeth Mine solar array, which is not a Strafford-specific asset, 15% of the total town's annual electricity needs are being met by locally owned renewable energy generation. The addition of half of the Elizabeth Mine generation (the other half is designated to the Town of Thetford) brings the Strafford renewable energy amount to approximately 5,100mWh/year, or over 100% of total annual electricity usage.

<u>Electricity Efficiency Targets Existing Renewable Generation as of December 2018</u>	<u>2025MW DC</u>	<u>2035MWh AC</u>
Solar (locally owned)	.50	600
Solar (Elizabeth Mine)	7	4,500
Wind	0.005	15
Increase Efficiency and Conservation Hydroelectric off-grid	-0.6% 00	5.7% 0
Biomass	0.00	0
Other	0.00	0
<u>Total Existing Generation; all sources</u>	<u>7.505</u>	<u>5,115</u>

Strafford's target for renewable energy generation (from all sources) in 2050 is 6,000–7,500 MWh. This information was generated based on data provided by the Department of Public Service and information developed by TRORC. The mean of the Strafford target range is 6,849 MWh.

<u>Renewable Generation Targets</u>	<u>2050</u>
<u>Total Renewable Generation Target (in MWh)</u>	<u>6,164-000 to 7,534500</u>

To meet generation goals, the Town and its residents must invest in distributed energy generation from a combination of solar, wind, and hydro as shown in the table below.

<u>Renewable Generation Potential</u>	<u>MW</u>	<u>MWh</u>
<u>Rooftop Solar</u>	<u>1</u>	<u>724</u>
<u>Ground-mounted Solar</u>	<u>490</u>	<u>601,089</u>
<u>Wind -(Large-scale wind: N/A)</u>	<u>-1,5420</u>	<u>-4,728,5390</u>
<u>Hydro-Hydroelectric</u>	<u>0</u>	<u>14</u>
<u>Biomass and Methane</u>	<u>0</u>	<u>0</u>
<u>Other</u>	<u>0</u>	<u>0</u>
<u>Total Renewable Generation Potential</u>	<u>2,033</u>	<u>5,330,365</u>

The Town of Strafford can meet its zero-net electricity targets by lowering demand through conservation and efficiency, and working to meet the remaining need with local, renewable energy resources.

For the municipality, individuals, or small groups of homeowners, the key to sustainable energy production will be renewable sources of energy. The term “renewable energy” refers to the production of electricity and fuels from energy sources that are naturally and continually replenished, such as wind, solar power, geothermal, hydropower, and various forms of biomass (wood, crops, manure, etc.). Strafford has numerous potential sites for additional residential solar installations as well as possible additional community solar.

Although initial set-up costs for renewable energy generation systems can be high, these systems can save users money over the long term, and they reduce the consumption of carbon-based fuels, which helps to protect our environment and reduce our reliance on centralized energy. There are also options for homeowners to invest in solar over time, thus removing the initial cost barrier. It should be noted that in recent years the financial incentive provided by net-metering rates has been volatile, subject to the Vermont Public Utilities Commission. It would be beneficial if net-metering rates and policies stabilize in the future.

Since Strafford has supported steps towards incorporating renewables into the landscape and reducing the electrical usage of the municipal buildings, the Town’s focus should be on increasing conservation measures, transition to alternative fuels for the town fleet, and alternative all-electric heating and hot-water options for the town buildings. By making these actions a priority the Town can be prepared when grant funding becomes available for various improvements.

Sources of Renewable Energy

As of 2018, Strafford’s local renewable energy sources include 110 homes using solar electricity, two homes with wind turbines and three with micro-hydro turbines, along with the Elizabeth Mine solar installation, shared with Thetford, and the Strafford Energy LLC installation providing a renewable power-purchase agreement to the town and other nonprofit entities in Strafford.

Electricity Generation–

Decreasing costs of equipment have made solar–electric generation more prevalent, both “off-grid” and grid-intertied net-metered systems, and now net-metered systems with battery storage. Systems that are net-metered are overseen by the Public Utilities Commission and are not required to get a local permit. As mentioned above, Strafford’s municipal meters are all receiving net-metering credits from a community solar array installed in July of 2015—owned and operated by Strafford Energy LLC. The Town receives credits to cover about 90% of municipal electrical usage through this program.

Solar Electricity: As of 12/31/18 there were approximately 85 residential and commercial-scale on-grid solar electricity generation facilities in Strafford. Combining these with the off-grid homes brings the total to about 110. Solar arrays may be more desirable renewable-energy generators than wind-turbine towers, since solar facilities do not need to be located on ridgelines and may be less visually prominent. In addition, solar facilities can be located in areas near existing infrastructure, requiring fewer access roads and reducing adverse impacts on wild lands. In addition to the existing solar generation, Strafford needs approximately 20 acres of land or rooftops to generate the 2050 target of 7,500 MWh.

Wind-Turbine Electricity: 3 small-scale wind turbines currently operate in Strafford. Similar to solar, wind energy is an intermittent resource, and its generation fluctuates in response to environmental conditions. Based on the Constraints established by the Conservation Commission, zoning, and the practicalities of the Town, large-scale wind does not seem to be a viable option for Strafford. Small-scale and possibly medium-scale wind can be located in areas that are rural, agricultural in nature. Sized appropriately, these facilities require minimal access and do not adversely impact wild lands. The amount of energy produced by a specific wind turbine can depend greatly on location, height of the tower, and proximity to other obstructions. Nevertheless, most modern wind turbines (when properly sized and sited) are able to generate electricity 95% of the time. There are multiple levels of potential wind energy generation, ranging from Class 1 (10–11 mph) to Class 7 (19–25 mph).

Hydroelectricity: There are presently 3 micro-hydro turbines operating off-grid in Strafford, with the potential for additional small-scale sites. Hydro-generating facilities are regulated by the Federal Energy Regulatory Commission and have stringent federal water quality standards. As a result, the regulatory process for hydro facilities is extensive and time consuming. Further, streams are public trust resources and the potential impacts of hydro projects warrant significant consideration.

Biomass: We do not see commercial biomass as a viable option for electricity production in Strafford due to the emissions impacts and the volume of wood consumed at a very low efficiency level, with negligible options to leverage the thermal energy byproduct that makes many other biomass cogeneration facilities an attractive option.

Transportation and Thermal Energy

Current Energy Use

Transportation and thermal energy (heating and cooling) are the largest contributors (67.2%) to the state's greenhouse gas (GHG) emissions. This plan assumes that the state-level analysis applies to Strafford as well. According to the 2018 Progress Report by the Energy Action Network, Vermont greenhouse gas emissions have been increasing despite significant reduction commitments. Addressing transportation and thermal energy are critical to achieving the goals for the reduction of GHG emissions and of energy consumption.

Transportation

The rural nature of our region leads to long commutes for work, shopping, and services. Long commutes impact the number of vehicle miles traveled (VMT) and correspond to the amount of gasoline and diesel fuels consumed. The transportation sector is responsible for 37% of the total energy consumed in Vermont, comprised mostly of 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.

Since transportation is a substantial portion of local energy use, it is in the interest of the community to encourage sustainable and efficient transportation. Although public transportation in Strafford is very minimal, support for alternative methods and infrastructure such as park & ride lots, car-share services, carpools, EV charging stations, and bicycling is important.

Bicycles

Bicycles are used both for transportation and recreation, and they need to be considered as a component of reducing GHG emissions. Bicycle transportation is used for work, school, and conducting errands. Recreational users include residents who see the health benefits of the sport and visitors who come to Vermont to experience the outstanding scenery. Bicyclists contribute to a better-functioning transportation system and render a community more attractive to all residential and commercial uses, with zero GHG emissions.

Bicycle facilities fall under three general categories: 1) road improvements, such as the addition of bicycle shoulders, bicycle path networks, and designated bike lanes; 2) transportation service improvements, such as bus bike racks; and 3) land use development accommodations, such as commercial-center bike-storage facilities. All these improvements encourage more citizens to bicycle.

Priorities include accommodating bicyclists along the existing roadway network, rather than providing separate facilities that are more costly, and encouraging new development adjacent to existing roads and village centers. The State of Vermont also emphasizes accommodation of bicyclists with on-street or off-street facilities, connecting bicycle paths to adjacent developments, and providing areas for bicycle parking and/or storage. The Strafford Recreation Committee and the Strafford Energy and Climate Committee have begun discussions about developing a walking/biking trail between the villages of Strafford and South Strafford. Also, active promotion of e-bikes continues in our town.

Electric Vehicles

Electric Vehicles (EVs) will play an increasing role in transportation in the coming years. Siting and planning of EV charging stations will benefit the town.

Biomass, Biofuels & Biogas Energy Generation:

The term “biomass” refers to biologically based fuel stocks (algae, food or vegetable wastes, grass, wood, methane, and more).

The use of biofuels, particularly biodiesel, is becoming an increasingly popular option for municipalities attempting to cut costs and reduce the environmental impacts associated with vehicle emissions. The agricultural sector has the potential to become a net generator of energy by growing crops that can be used for biofuel, by contributing cow manure to the process of methane digestion (also known as “Cow Power”), and by using fields for the location of appropriately scaled solar and/or wind generation installations. In addition, healthy soils are one of the best methods of capturing carbon, thus minimizing the threat of climate change. Strafford should support these methods of decarbonization, renewable energy production, and regenerative agriculture, as part of a diverse approach to reaching the Vermont Comprehensive Energy Plan (CEP) goal. While Cow Power is especially popular in Vermont, improvements in technology are required to allow it to be incorporated at a small enough scale to be suitable for Strafford farms. Growing biomass to use in biofuels may be a viable way to encourage farming, however balance should be sought between growing crops for energy demands vs. for human and animal consumption.

<u>Current Strafford Transportation Energy Use</u>	
<u>Transportation Data</u>	<u>Municipal Data</u>
<u>Total # of Vehicles (ACS 2013-2018)</u>	<u>952</u>
<u>Average Miles per Vehicle (fhwa.got.gov, 2018)</u>	<u>13,22/8</u>
<u>Total Miles Traveled</u>	<u>12,593,056</u>
<u>Realized MPG (VTrans Transportation Energy Profile 2017)</u>	<u>18.9</u>
<u>Total Gallons Use per Year</u>	<u>666,299</u>
<u>Transportation BTUs (Billion)</u>	<u>80</u>
<u>Average Cost per Gallon of Gasoline (RPC)</u>	<u>\$ 2.60</u>
<u>Gasoline Cost per Year</u>	<u>\$ 1,732,377</u>

The preceding table uses data from American Community Survey (ACS) and Vermont Agency of Transportation (VTrans) to calculate current transportation energy use and energy costs. The following table identifies the number of electric and biodiesel vehicles that are needed in town to meet the overall renewable energy goals.

<u>Transportation Fuel-Switching Targets</u>			
	<u>2025</u>	<u>2035</u>	<u>2050</u>
<u>Electric Vehicles</u>	<u>86</u>	<u>610</u>	<u>1,268</u>
<u>Biodiesel Vehicles</u>	<u>151</u>	<u>285</u>	<u>481</u>

There are several sources of information on electric vehicles, including <https://greencars.org> -

www.driveelectricvt.com.

Transportation Renewable Energy Use Targets			
	2025	2035	2050
Transportation Renewables	9.6%	23.1%	90.3%

Thermal—: Approaches and Technologies to Reduce Fossil Fuel Usage

Energy Conservation and Efficiency

Energy conservation and efficiency are key elements to sustainable energy use and reduction of GHG emissions. Strafford should continue to promote energy conservation and efficiency and sustainable living in our households, schools, and community buildings and operations while we educate, empower, and challenge our community to inspire change and drive innovation.

While it is essential for homeowners to conserve energy and manage their fuel costs, the upfront capital costs can be an initial barrier to the implementation of thermal efficiency and renewable energy improvements. Therefore, Efficiency Vermont and various loan funds provide residents with financing programs that offer key features such as great interest rates, flexible terms, and ease of application.

There are also Fuel assistance programs that support weatherization in Vermont by providing financial assistance to lower income residents. Weatherization Assistance Program (WAP) helps lower-income residents, people with disabilities, and families with children save fuel and money by improving the energy efficiency of their homes.

The WindowDressers program, which the SECC has been involved with for a few years, focuses on creating internal storm windows with volunteers and participant involvement as one avenue for lower cost weatherization.

Municipal Role in Energy Efficiency

Although Strafford is unlikely to have an impact on energy consumption on the global level, the Town can have an impact locally. Strafford is fortunate to have an active Energy and Climate Committee (SECC). The SECC acts as an advisory board to the Selectboard and Planning Commission on all aspects of energy options and climate impacts. This committee has taken an active role in auditing town buildings for energy use and creating an energy strategy for Strafford, much of which has been incorporated into this Plan. The ongoing work of the SECC continues to focus on reducing energy use in Strafford and increasing climate resiliency while helping the town reach its goal of net-zero GHG emissions by 2030.

Auditing Municipally Owned Buildings

Many towns in Vermont own buildings that are old and inefficient in numerous 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 on to taxpayers. Continuing Strafford’s effort to conduct and implement town building audits will be beneficial to the overall maintenance cost of municipal buildings.

Residential and Commercial Energy Use

Residential buildings constitute the majority of Vermont’s built environment and represent 35% of Vermont’s total energy consumption. Older homes were constructed before high-energy costs and consumption made energy conservation a priority. Strafford should strive to ensure that buildings (new and existing) are built to be energy efficient. Significant ways to reduce energy use in the home or commercial building include:

- **Improving the thermal envelope of buildings** through air-sealing, weatherization, insulating with modern materials and technologies to (at least) a certain standard R-value, and installing high-efficiency windows.
- **Installing high-efficiency electric or biomass appliances** for thermal loads. For space heating, this includes cold-climate air-source heat pumps, ground-source heat pumps, automated wood-pellet boilers or furnaces, and clean-burning wood stoves. For domestic hot water this includes heat pump water heaters and systems that co-opt a space heating appliance such as a wood-pellet boiler or a ground-source heat pump.
- **Installing energy-efficient, Energy Star certified appliances** such as refrigerators, freezers, front-loading washing machines, and heat pump clothes-dryers .
- **Use of high-efficiency LED lighting.**
- **Site selection, design, and construction** to maximize solar gain, wind blocks, and natural cooling patterns.
- **Ensuring that the Zoning Administrator or their designee has the training and resources to both enforce state Residential Building Energy Standards and issue Certificates of Compliance** on development projects greater than 800 square feet. Use of refundable fees for projects which meet the various levels of Residential Building Energy Standards is a possible mechanism to incentivize compliance.

Passive Solar Heating and Lighting

Good building and site design are essential to taking advantage of the sun’s energy through passive methods. Strafford should encourage use of solar passive heat gain and natural light in this fashion by drafting language for zoning bylaws and subdivision regulations that require the appropriate placement of buildings, landscaping and building design.

Cold Climate Heat Pumps

Heat pumps use electricity to pump heat from one source to another via a vapor-compression cycle—achieving seasonal efficiencies of 300% or more. Recent technology advances in heat pumps have brought forward a line of products often referred to as cold-climate heat pumps, which can operate with outdoor temperatures as low as –30°F, making them viable space-heating options in Vermont. Air-to-air heat pumps are the most common, with readily available technology options for homes to convert to efficient all-electric heating now, with comparable or lower operating costs to oil or propane. Cold-climate air-to-water heat pumps also exist for

hydronically heated buildings, but the current technology options require envelope upgrades or expanded hydronic distribution to function as the sole heating source.

Many homes in Strafford now have heat pumps. This technology is also available for domestic hot water tanks. Cold-climate heat pumps provide comfortable, convenient heating with zero direct emissions. Cold-climate heat pumps can also provide cooling at a higher efficiency than most traditional air-conditioning systems, especially window-units.

Geothermal

Ground source heat pumps (GSHP), sometimes called geothermal energy, use a vapor-compression cycle connected to a ground-loop of circulating fluid to harvest the ground's heat for home heating, domestic hot water, and home cooling. This technology is viable in the northeast. There is presently at least one GSHP-heated home in Strafford.

Biomass Fuels

Combined with energy conservation and efficiency, and with proper technology, wood can be burned cleanly and effectively. Safeguarding longterm forest health is critical for mitigating GHG emissions and for climate health and resiliency, therefore the town should implement carefully considered renewable and sustainable forest practices where applicable for local wood harvests. In addition to the traditional woodstoves used in many Strafford homes, automated wood-pellet systems can supply home heating via forced hot air or hydronic heat distribution. There are at least two automated wood pellet heated homes in Strafford.

Water Heating

Solar thermal water heating is the leading renewable resource for water heating and has been the most common form of residential-scale solar use in Vermont. Domestic hot water heat pumps are another option for heating water, and if renewably powered, these meet the CEP goals. Homes heated with ground-source heat pumps, air-to-water heat pumps, or automated wood-pellet boilers can use the same clean energy for domestic hot water.

Current Heating Data

According to the U.S. Census's 2015 American Community Survey (ACS) 5-Year Estimates, the major heating fuels consumed in Strafford are wood (44.1%), oil (30.2%), LPG and gas (22%), and electric (1.5%). Per capita energy consumption for residential heating and transportation purposes is about the same as elsewhere in the Northeast, where about 76% of all energy used is for these purposes. Almost 80% of residential energy is dedicated to space heating and domestic hot water. Vermont state energy officials estimate that simple conservation measures incorporated in new housing could result in a 20% to 30% reduction of energy usage statewide.

Note that the 2015 Census ACS reports that 44.1% of Strafford's households use wood as a fuel source for heating. The Vermont Department of Public Service estimates that the average household burns between three and four cords of wood each year during the heating season. Given that the total number of homes in Strafford heating with wood was 203, it is estimated that between 561 and 748 cords of wood were burned here in 2010.

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

D. Current Residential Heating Energy Use				
<u>Fuel Source</u>	<u>Strafford Households (ACS 2013–2018)</u>	<u>Strafford % of Households</u>	<u>Strafford BTU's</u>	<u>Strafford BTU (in Billions)</u>
<u>Natural Gas</u>	<u>0</u>	<u>0.0%</u>	<u>0</u>	<u>0</u>
<u>Propane</u>	<u>87</u>	<u>18.2%</u>	<u>9,796,988,200</u>	<u>9</u>
<u>Electricity</u>	<u>0</u>	<u>0%</u>	<u>0</u>	<u>0</u>
<u>Fuel Oil</u>	<u>147</u>	<u>30.8%</u>	<u>14,887,210,800</u>	<u>14</u>
<u>Coal</u>	<u>0</u>	<u>0.0%</u>	<u>0</u>	<u>0</u>
<u>Wood</u>	<u>239</u>	<u>50.1%</u>	<u>24,215,885,100</u>	<u>25</u>
<u>Solar</u>	<u>0</u>	<u>0.0%</u>	<u>0</u>	<u>0</u>
<u>Other</u>	<u>4</u>	<u>0.9%</u>	<u>435,015,900</u>	<u>0.4</u>
<u>No Fuel</u>	<u>0</u>	<u>0.0%</u>	<u>0</u>	<u>0</u>
<u>Total</u>	<u>477</u>	<u>100.0%</u>	<u>48,335,100,000</u>	<u>48</u>
<u>Per Household BTUs</u>		<u>1,050,763.04</u>		

<u>Heating Efficiency Targets</u>	<u>2015</u>	<u>2025</u>	<u>2035</u>	<u>2050</u>
<u>Residential: Increased Efficiency and Conservation (% of Strafford households to be weatherized)</u>	<u>7%</u>	<u>33%</u>	<u>67%</u>	<u>100%</u>
<u>Commercial: Increased Efficiency and Conservation (% of commercial establishments to be weatherized)</u>	<u>2%</u>	<u>6%</u>	<u>9%</u>	<u>18%</u>

The preceding table displays targets for thermal efficiency for residential structures based on a methodology developed by DPS using data available from the regional LEAP analysis and ACS. The data in this table represents the percentage of municipal households and commercial establishments that will need to be weatherized in the target years. Baseline 2015 data is based on LEAP analysis.

In order to meet the various overall targets outlined below, residents and businesses will need to convert to more efficient technologies and shift away from fossil-fuel based technologies. Table K sets the targets for the percentage of heating energy use coming from renewable sources. The targets in Table L were calculated using data from LEAP and ACS. This table provides a snapshot for two ways to meet the renewable energy use heating target through efficient wood-heating systems as well as heat pumps for residential buildings in Strafford for each target year.

<u>K. Renewables – Heating Goals</u>	<u>2025</u>	<u>2035</u>	<u>2050</u>
<u>Renewable Energy Use: Heating</u>	<u>47.8%</u>	<u>61.0%</u>	<u>92.8%</u>

<u>L. Heating Fuel Switching Targets</u>	<u>2025</u>	<u>2035</u>	<u>2050</u>
<u>Efficient Wood-Heat Systems (in units)</u>	<u>66</u>	<u>82</u>	<u>121</u>
<u>New Heat Pumps (in units)</u>	<u>47</u>	<u>123</u>	<u>259</u>

PROCESS—Permitting/Implementing Efficiency and Weatherization Standards

Residential Building Codes

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

The most recent version of the code—RBES 2019, which became effective September 1, 2020—constitutes a significant increase in efficiency and documentation standards as compared to prior residential codes. To meet the Town’s energy goals, town officials’ knowledge of the energy code and their enforcement mechanisms must be improved. This includes enforcement of permit filing for gut-rehab projects and home additions, which are currently more common in Strafford than new construction.

PROCESS—Permitting Electric Facilities: the State and the Town

Permitting Considerations

Energy generation in Vermont is subject to a number of different permitting requirements, most of which are limited to state-level permitting. On the municipal level, state statute protects residential renewable-energy generation systems from regulations that will completely prohibit their development. But there are two ways that the town can make its voice heard in the state review process: through the Section 248 process and through this municipal Plan. Towns are also

empowered to craft a local bylaw with siting standards, though the siting standards cannot have the effect of prohibiting a certain type of renewable energy facility. Under the bylaw, towns make a recommendation to the Public Utility Commission (PUC) and do not issue a permit.

Section 248

Distributed power-generation facilities, such as hydropower dams and fossil fuel plants as well as wind turbines or solar installations owned by utilities, are subject to review and approval by the Vermont Public Utility Commission (30 V.S.A. §248). Under this law, prior to the construction of a generation facility, the Commission must issue a Certificate of Public Good. A Section 248 review addresses environmental, economic, and social impacts associated with a particular project. In making its determination, the Commission must give due consideration to the recommendations of municipal and regional planning commissions and their respective plans (Vermont Act 174). Accordingly, it is appropriate that this Plan address these land uses and provide guidance to town officials, regulators, and utilities.

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

Preferred Locations: New generation and transmission facilities shall be sited in locations that reinforce Strafford's traditional patterns of growth, with compact village centers surrounded by a rural countryside, including farm and forest land. When evaluating proposed renewable energy developments, the Town will apply the following policies and standards: All renewable energy generation facilities shall comply with Strafford's zoning and subdivision bylaws.

When designating preferred sites, the Town shall consider the site impacts of generation facilities to include access roads, site clearing, onsite power lines, substations, lighting, and off-site power lines, as well as noise/sound considerations. When energy-generation facilities are going through the permitting process, the development of these elements shall be constructed in a way to minimize negative impacts to the following:

1. Viewsheds and scenic areas as laid out in this Town Plan.
2. Visibility from town and state highways.
3. Current and potential agricultural activities.

Ground-mounted installations shall use screening to reduce the visual impacts of energy generation, transmission, and distribution as seen from public roads and neighboring properties in accordance with the following:

1. Without interfering with the project's function, make the maximum use possible of preexisting vegetation, structures, and topographical features that screen the project on site.
2. Install screening such as vegetation or topographic features to distract the viewer from the project and break up the view of the project.

Energy generation facilities that generate more than 500 kW of energy shall, wherever feasible, be combined with continued agricultural use of the land or habitat management, such that soil health and fertility is maintained. Energy-generation facilities that produce

more than 500 kW of energy shall have a management and decommissioning plan that will ensure the land will be returned to its prior condition when it is no longer being actively used for renewable energy generation.

Preferred Locations–

— On top of existing buildings, landfills, parking lots, brownfields outside of the village center, reclaimed quarries or gravel pits, a site that was previously covered by a structure or impervious cover in compliance with setbacks, and any additional preferred areas set by the State of Vermont.

— A joint letter by the Strafford Planning Commission, Selectboard, and TRORC 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.-

Prime Areas

Prime areas are identified on the Town Plan maps. Prime areas exclude unsuitable areas and locations with constraints, and must be located in an area with safe, reliable access to the grid (as determined by the local power provider).

The State of Vermont defines constrained areas as those that “have the potential for renewable energy

generation, but include known or possible constraints that may make these locations less desirable on a site-by-site basis. These areas are neither preferred nor unsuitable for non-permanent renewable energy projects. Development in these areas will require more detailed mapping at the site level as well as an evaluation of the impacts on the particular resources present²²-. These areas include:

- Historic districts, landmarks, sites and structures listed, or eligible for listing, on state or national historic registers
- State or federally designated scenic byways, and municipally designated scenic roads and viewsheds
- Special flood hazard areas identified by National Flood Insurance Program maps (except as required for hydroelectric facilities).
- Public and private drinking water supplies, including mapped source protection areas.
- Primary agricultural soils mapped by the U.S. Natural Resources Conservation Service
 - Agricultural Soils (VT Agriculturally Important Soil Units)
 - Protected Lands, including State Fee Lands and Private Conservation Lands
 - Deer Wintering Areas (as Identified by ANR)
- Act 250 Agricultural Soil Mitigation areas, as identified by the Agency of Natural Resources (ANR).
- ANR’s Vermont Conservation Design Highest Priority Forest Block Datasets.
- Priority Forest Blocks—: Connectivity, Interior and Physical Land Division (as identified by ANR).

- ~~— Vernal Pools (as identified by ANR) or through site analysis).~~
 - ~~☐ — State-significant Natural Communities and Rare, Threatened, and Endangered Species.~~
 - ~~— Locations that were forested within 3 years prior to the application of the proposed development.~~
 - ~~— Locations identified as riparian buffers.~~
 - ~~— Hydric Soils (as identified by ANR).~~
 - ~~☐ — River Corridor Areas as identified by the Vermont Department of Environmental Conservation.~~
 - ~~☐~~
 - ~~— Class 2 Wetlands as indicated on Vermont State Wetlands Inventory maps or identified through site analysis.~~
 - ~~☐ Vernal Pools (as Identified — Primary agricultural soils mapped by ANR or through site analysis)~~
 - ~~☐ State-significant the U.S. Natural Communities and Rare, Threatened, and Endangered Species Resources Conservation Service.~~
 - ~~☐ Locations that were forested within 3 years prior to the application of the proposed development.~~
 - ~~☐ Locations — Agricultural Soils (VT Agriculturally Important Soil Units).~~
 - ~~— Deer Wintering Areas (as identified as riparian buffers by ANR).~~
 - ~~— Historic districts, landmarks, sites, and structures listed, or eligible for listing, on state or national historic registers.~~
 - ~~— State or federally designated scenic byways, and municipally designated scenic roads and viewsheds.~~
-

Unsuitable Areas

- Floodways shown on FEMA Flood Insurance Rate Maps (except as required for hydroelectric facilities).
- Class 1 Wetlands as indicated on Vermont State Wetlands Inventory maps or identified through site analysis.
- Wilderness Areas, including National Wilderness Areas
- Town-owned conservation areas.
 - State-owned wilderness and conservations areas.

Natural Resource Protection-

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

Protection of Wildlife

Designers must gather information about natural and wildlife habitats that exist in the project area and take measures to avoid any undue adverse impact on the resource. Consideration shall be given to the effects of the project on: natural communities, including soils and forests; wildlife residing in the area and their migratory routes; the impacts of human activities at or near habitat areas; and any loss of vegetative cover or food sources for critical habitats. -We have a responsibility to take care of the natural environment.-

Site Selection

Site selection should not be limited to generation facilities alone; other elements of the facility need to be considered as well. These include access roads, site clearing, onsite power lines, substations, lighting, and off-site power lines. Development of these elements shall be done in such a way as to minimize any negative impacts. Unnecessary site clearing and highly visible roadways can have greater visual impacts than the energy-generation facility itself. In planning for facilities, designers should take steps to mitigate their impact on natural, scenic and historic resources and improve the harmony with their surroundings.

Energy Goals, Policies and Implementation Tasks

Goals

1. A continued pattern of settlement and land use that is energy efficient.
 - The design, siting, and construction of buildings and structures that are energy

- efficient-, do not use fossil fuel energy sources (e.g. all-electric or biomass), and incorporate renewable energy resources.
- 2. — The encouragement of electrically powered municipal and personal vehicles.
- 3. Continued efforts to conserve energy and reduce fossil-fuel uses for transportation and thermal loads in buildings.
- 4. The development of local renewable energy sources is encouraged and the dependence on outside energy sources is discouraged.
- 5. A safe, reliable, and affordable energy supply that is locally available.
- 6. Apply— Promotion and use of new technologies and standards as they arise to achieve enhanced energy efficiency in the three sectors of electricity generation, thermal heating, and transportation.

Mitigate

— Active reduction in the use of fossil fuels and mitigation* of the adverse impacts of fossil fuels usage.

7.

*Mitigation of adverse impacts includes details in the Climate Action Plan being developed by the Strafford Energy and Climate Committee

Policies

- 1. Major public investments, such as in planning and infrastructure so that schools, public recreational areas, and municipal facilities shall be situated within or in close proximity to the villages of Strafford.
- 2. The rehabilitation— Rehabilitation or the development of new buildings and equipment shall use proven design principles and practices with a goal of achieving “net-zero” energy standards and elimination of all fossil fuel powered energy.
- 3. Where land development or subdivisions are proposed, design plans should reflect sound energy conservation principles, such as solar and slope orientation and protective wind barriers. An example would be the cluster planning development concept, which is an approach that encourages energy conservation and efficiency.
- 4. Visual effects of electrical generation, transmission, and distribution facilities shall be minimized whenever feasible.
- 5. Reduce— Reduction of commuting, the and development of broadband services, energy--efficient home occupations, and small-scale home business is encouragedes.
- 6. Promote— Promotion of energy--efficient commuting including bicycle-friendly options, state and regional transportation programs serving Strafford, as well as the and incorporation of electric vehicles and associated charging stations are encouraged.
- 7. Sponsor— Sponsorship of workshops and encourage the work of education to

~~promote weatherization services of homes, businesses, and municipal buildings, with special emphasis active outreach on low-income homeowners.~~

- ~~8. Support doe partnerships, strategies, and state and federal legislation that will ensure the affordable, reliable, and sustainable production and delivery of electrical power to the region, in conformance with regional and municipal goals and objectives.~~
- ~~9. Develop — Development of commercial energy-generation facilities in Strafford so as to minimize negative impacts on the rural character of the surrounding area. Developers should make all possible efforts to minimize damage to important natural areas as identified in the Natural Resource section of this Town Plan. Additionally, such facilities should be located close to existing roads to minimize new infrastructure while still providing sufficient screening and adhering to Town permitting considerations.~~
- ~~10. Developers — Requirement that developers of renewable energy facilities within Strafford should pursue, with the town officials, “preferred site” status as defined by the Public Utility Commission of Vermont.~~
- ~~11. Developments — Requirement that aredevelopments proposed under Act 250 must include measures to reduce energy consumption through site and building design, materials selection, and the use of energy-efficient lighting, heating, venting, and air conditioning systems.~~
- ~~12. Support for the development and use of renewable energy resources, including non-commercial wind, solar, biomass, micro hydro and co-generation, that which enhance energy system capacity and reliability, that promote cleaner, more affordable energy technologies, that increases the energy options available locally, and that minimize undue adverse impacts of energy development on the local community and environment.~~
- ~~13. Support for state programs designed to make energy efficiency improvements more affordable.~~
- ~~— Encourage the development of forestry and agriculture to support commercial biomass energy.~~
 - ~~i. Hydropower — Requirement that hydropower development proposed in Strafford shall not result in an undue adverse impactimpacts to river ecosystems and water quality, are subject to zoning rules, and are limited to micro-systems.;~~
- ~~14. Implementation of zoning rules regarding limitations on large-scale wind and other high-impact energy facilities.~~

Implementation Tasks

- ~~1. The Town should work to increase public awareness and use of energy conservation and renewable energy through educational efforts.~~
- ~~2. The Town should explore the potential for a commuter shuttle from the existing Park and Ride lot.~~

3. The Planning Commission should consider updating the Town's zoning and subdivision regulations to offer incentives for energy-efficient development.
4. — The Selectboard should create policies for staff, systems, and planning in use of municipal buildings ~~that~~ and vehicles to encourage energy efficiency-~~and~~, reduce energy use, and leverage non-fossil fuel energy sources.
5. — The Strafford Energy and Climate Committee should continue to identify additional areas in town appropriate for community-sponsored renewable-energy facilities; and decarbonization projects.

XI. Economic Development

Introduction

Unplanned economic growth creates adverse conditions that have materially affected many communities in a negative way. Therefore, Strafford should plan for economic growth and expansion in a manner that creates a range of employment opportunities, encourages rising incomes, and raises citizens’ living standards while considering the impact of such growth on the Town. The following economic development plan provides for economic growth consistent with the goals and policies of the Town of Strafford as set forth in other sections of the Town Plan.

A. Economic Conditions

A local economy comprises several elements: activities that occur within the town and regional economic activities in which the town’s residents are involved. Due to lack of employers in town, Strafford is considered a bedroom community because a majority of residents work outside of town. While it is likely that many residents will continue to seek employment outside of Strafford, it is one of the key goals of this plan to see economic growth occur within the town, particularly within the villages.

Establishments, Employees and Wages				
	Local Businesses ⁵	Employed ⁶	Unemployment Rate	Average Wage
2015	38	131	2.7%	\$29,744
2014	39	134	2.8%	\$30,794
2013	40	132	2.8%	\$29,657
2012	39	130	2.9%	\$30,952
2011	39	134	3.2%	\$33,523
2010	38	129	3.3%	\$30,587
2009	41	121	3.6%	\$30,979
2008	42	129	2.7%	\$29,058
2007	41	130	2.4%	\$30,495
2006	40	138	1.9%	\$27,339

Figure 12: Establishments, Employees and Wages | Source: VT Department of Labor

Data from the Vermont Department of Labor and Industry indicates that the number of establishments (employers) in Strafford has remained relatively flat for over a decade. No trend of gains or losses exists beyond this natural fluctuation. The challenge faced by

5 The Vermont Department of Labor only reports information on jobs covered by unemployment, which excludes the self-employed, most business owners and some farmemployees.

6 This number reflects the total number of employed residents who live in Strafford, not all of which are employed by local businesses.

communities such as Strafford, where many residents seek employment out of town, is creating a viable method for encouraging economic growth. Initially, a community seeking to encourage economic growth must inventory its assets. Strafford has several unique assets, including:

- South Strafford and Strafford Village Centers: Strafford has two village centers located where residents and visitors can do business, utilize services and participate in community events.
- Justin Morrill Homestead: Strafford is fortunate to have the Justin Morrill Homestead.
- The Coburn Trail – The Coburn trail starts near the Morrill Ice House and goes through the conserved side hill pasture to the top of the hill overlooking the upper village of Strafford and the Morrill Homestead

The Village Economy

While the value of tourism as part of Strafford’s local economy is undeniable, the community could benefit from a more diverse year-round economy. An economy that is consistently active year-round would provide better local job opportunities and would

increase Strafford’s draw as a destination. To encourage this type of growth, it is the intent of this Plan to focus on the village center areas as the most logical location to direct a substantial portion of future economic development. As such, it is important to recognize the need for village improvements. There are a number of locations within the village centers that could be revitalized.

South Strafford Village has been a state-designated village since 2006 and the Town plans to pursue designation for Strafford Village as well. This program offers tax credits for the revitalization of buildings within designated areas. Recognizing that the vitality of the village center areas is supported by Strafford’s existing water system, there are several state programs which relate to drinking water and wastewater which can provide financial assistance to communities for expansion and improvements of existing systems.

The potential funding is highest in areas that are designated as growth centers. To that end, this Plan designates the village center area (including the village interchange area) as a growth center. Other possible ways to encourage expanded economic development within the village is to improve the village’s aesthetics and to add traffic calming measures that would make the village more pedestrian friendly. Strafford’s existing sidewalk system is substantially smaller than it has been in the past. Returning it to its historical size and improving the quality of design would improve pedestrian travel throughout the village center. Any cost-effective method of making the village a more desirable location for businesses and visitors is worth considering.

Village Center Designation benefits:

Because of its participation in the Vermont Village Center Designation Program, Strafford’s villages would have the following benefits available:

- 10% Historic Tax Credits
- 25% Facade Improvement Tax Credits
- 50% Code Improvement Tax credit
- Priority consideration for HUD, CDBG and Municipal Planning Grants
- Priority Consideration by State Building and General Services (BGS)
- Special Assessment Districts

There is no cost to community and the designation has no regulatory effect.

B. Economy and Wages

2014 Family Income Estimate Strafford and Surrounding Towns			
Town	Returns Filed	Average AGI per Exemption	Median AGI per Return
Chelsea	304	\$22,109	\$56,241
Norwich	916	\$38,352	\$136,553
Royalton	584	\$23,776	\$56,937
Sharon	384	\$25,228	\$65,966
Strafford	303	\$29,285	\$72,453
Thetford	738	\$30,378	\$78,740
Tunbridge	319	\$22,596	\$55,197
Vershire	162	\$21,455	\$50,836
Orange County	7,400	\$23,873	\$57,554

Figure 13: 2014 Family Income Estimate, Strafford and Surrounding Towns | Source: VT Department of Taxes: 2014 Vermont Personal Income Tax returns – Family Income Estimates: Summary of Returns with Filing Status Married Filing Jointly or Head of Household

According to the Vermont Department of Taxes “Family Income Estimate by Town,” the median adjusted income per return (does not include single filers) was \$72,453. Strafford's median adjusted income per return is in the top third when compared to its neighbors and \$14,899 more annually than the Orange County median. The US Census Bureau sets the national poverty level on an annual basis. In 2016, the poverty level for a family of four was \$24,036 in income.

According to the Vermont Department of Taxes, Strafford's median adjusted gross income per return in 2014 was \$72,453. Strafford's 2014 median adjusted gross income per return was higher than the Orange County median family income of \$57,554.

Economic planning and development can assist in the creation of stable jobs as well as help produce a broader tax base. Poorly planned or executed economic development results in over development, strained public services, and regional shifts in employment, businesses, and related services. Because of Strafford's proximity to the Upper Valley,

most of the development in jobs and income or sales has occurred outside of town. Key areas include Hartford, VT; Lebanon, NH; and Hanover, NH. Primary services, such as health care and banking, are provided from these areas.

As is the case with nearly all small towns, Strafford is not a self-sufficient employment center. The advance of the technological age and other conveniences has brought Strafford's once-independent community into the economy of the region, state, and nation.

The American Community Survey provides information on the commuting patterns of residents and workers. For 2014, the mean travel time, as reported by the Census was 28 minutes.

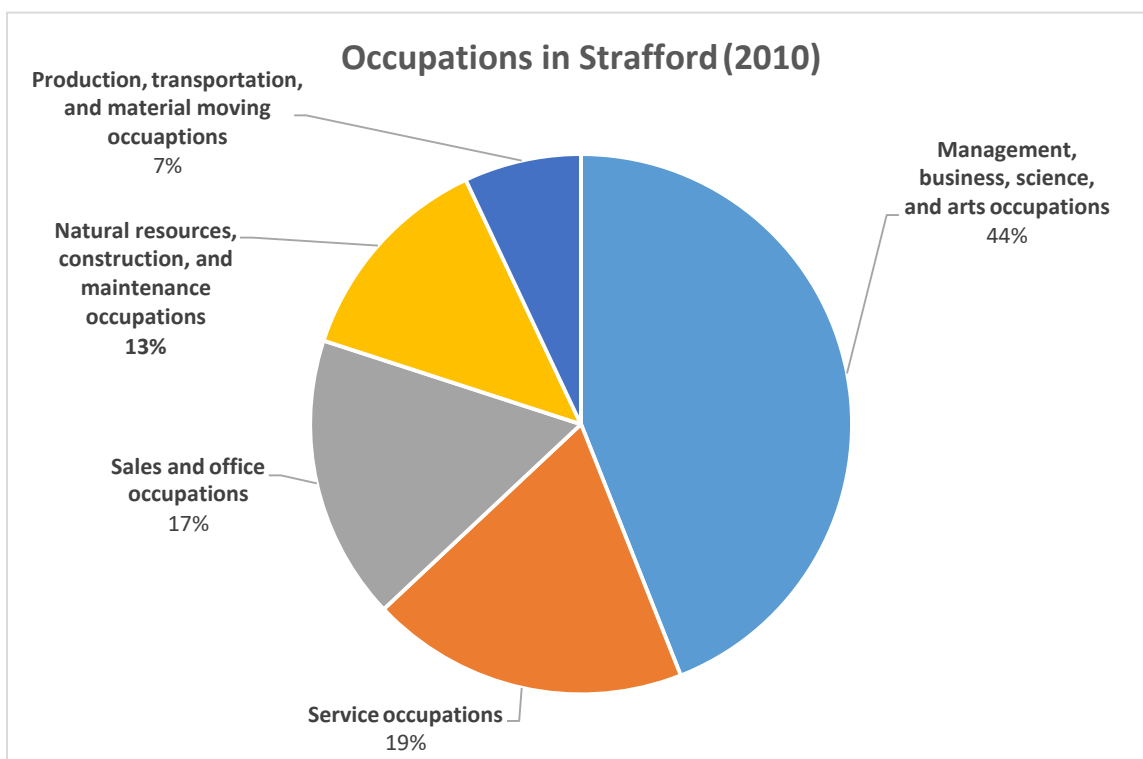


Figure 14: Occupations in Strafford (2010) | Source: US Census 2010

Economic Development Goals, Policies, and Implementation Tasks

Goal

- i. The development of businesses, professional services, and agricultural-related activities that are in keeping with Strafford's rural nature.

Policies

1. Plan development so as to maintain the historic settlement pattern of compact villages separated by rural countryside.
2. Encourage business growth that will enhance the rural character of Strafford.
3. Support home-based businesses.

Implementation Tasks

1. Pursue Village Center Designation for both Strafford and South Strafford Villages.
2. Expand the size of the village centers as recommended by the Regional Plan.

XII. RELATIONSHIP TO OTHER PLANS

Strafford is located in Orange County, bounded from the south, by Norwich, Sharon, Royalton, Tunbridge, Chelsea, Vershire, West Fairlee and Thetford. All of these towns have planning programs and Planning Commissions. All of these towns have plans in effect or are in the process of re-adopting them: Norwich (2016), Sharon (2020), Royalton (2020), Tunbridge (2018), Chelsea (2023), Vershire (2016), West Fairlee (2017) and Thetford (2017). Of these only Norwich, Chelsea, Vershire and Thetford have zoning ordinances in place.

Strafford 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-Ottawquechee Regional Commission (TRORC). Strafford also maintains membership in the Greater Upper Valley Solid Waste District, centered in North Hartland.

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

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

Relationship to Other Plans Goals, Policies and Implementation Tasks

Goal

1. Cooperation with neighboring communities by addressing shared concerns in a regional context continues.

Policies

1. Maintain the distinct rural character and natural beauty of the region while guiding appropriate growth.
2. Support regional solutions to shared problems.

Implementation Tasks

1. To encourage continued communication and cooperation between Strafford and its neighboring towns.
2. To continue participation in the Two Rivers-Ottawquechee Regional Commission.
3. To exchange planning information and development data with neighboring communities.

XIII. Implementation

A. Putting the Plan into Action

The character of Strafford, 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 wellbeing 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 Strafford 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 Strafford Planning Commission will be required to submit an implementation report to the Regional Planning Commission indicating how the plan has been implemented since the last Town Plan adoption at the time that the Town requests a Town Plan Review by the Regional Planning Commission. This is a new requirement as of 2016 under 24 V.S.A. § 4350.

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

B. Adoption of the Plan

Adoption of the Strafford 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 Strafford.

C. Ongoing Planning

Planning for change is a continual process for Strafford 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 Strafford.

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 Strafford.

The Strafford 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 readopted at least every eight years. The Planning Commission is responsible for the maintenance and amendment of the plan. Within the next eight 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)]. The plan:

- 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 Strafford to influence and integrate its planning policies with State agency planning affecting land use.

D. Implementation Tools

Vermont law enables Strafford to implement the adopted Strafford Town Plan through a variety of ways. Regulation of land use and development through rules adopted by the voters is one possible method. Because these regulations are susceptible to legal challenge and must clearly benefit the public, discretion must be used. Well-recognized and utilized means include, but are not limited to, zoning bylaws and subdivision regulations. 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 Town Plan. As an alternative to conventional methods, Strafford may opt to implement a set of measurable performance standards for specific uses as opposed to dividing the Town into districts. This technique, referred to as "performance zoning," is designed to be more flexible and to recognize the specific conditions of each site proposed for development.

Subdivision Regulations - Strafford does have subdivision regulations, which are 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.

In order to achieve the goal of natural resource protection while avoiding changes in lot size, the Planning Commission should consider updating their subdivision regulations to create maximum density requirements. As an alternative to designating multiple zoning districts within the designated Land & Conservation district, maximum density could be based upon the unique characteristics of the parcel relative to highway access, distance to the town center, and proximity to protected open space. While the total development density of a site would be presumed to be one unit per every three acres of developable area, the density would be adjusted in accordance with whatever formulas are implemented by the Planning Commission. The primary downside to this method is that it is complicated and somewhat difficult to clearly explain to those who are not familiar with non-traditional forms of zoning or subdivision. Strafford intends to create a unified zoning and subdivision bylaw.

Flood Hazard Area Zoning Ordinance: Under Vermont law [24 V.S.A., Section 4412], the Town of Strafford 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 Strafford unless the Town has in effect a Flood Hazard Area Zoning Ordinance, which, at present, Strafford has.

Highway Policies: Strafford has in effect a Town Road and Bridge, 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, through the Selectboard's Highway Access Policy, Strafford has 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 2020). 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 Strafford has an informal system of capital programming, it is recommended that a Capital Budget Committee be established to work with the Selectboard 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.

Strafford 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 six 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 Strafford, 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 Strafford 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 wellbeing of the community. Accordingly, it is in the interest of the Town to evaluate Act 250 projects affecting Strafford and to offer testimony, as appropriate.

Coordination of Private Actions: Citizens and private enterprise have a vested interest in the wellbeing of Strafford. 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 Strafford, 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 Upper Valley Land Trust and the Nature Conservancy are particularly well-recognized organizations. Several organizations are also involved in water quality protection. It is the intent of this 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 Strafford Zoning Ordinance, 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.

E. Implementation Tasks and Timelines

Housing		
Implementation Tasks	Responsibilities	Timeline

Acquire property suitable for re-sale to qualifying low and moderate senior citizens from Strafford.	Local Housing Trust	Long-term
Acquire properties suitable for re-sale to qualifying low and moderate income families.	Local Housing Trust	Mid-term
Encourage larger home conversions to multi-unit.	Selectboard and Planning Commission	Ongoing
Encourage accessory dwelling units.	Selectboard and Planning Commission	Ongoing

Education		
Implementation Tasks	Responsibilities	Timeline
A plan addressing the long-term needs and options for providing high school education for Strafford students should be analyzed and formulated.		
Encourage measures that will bring greater energy efficiency to The Newton School, including reductions in traffic during the times when students are being dropped off or picked up.		

Utilities & Facilities		
Implementation Tasks	Responsibilities	Timeline
Develop a management plan for each parcel under its authority.	Strafford Recreation Board	
Develop a maintenance program for the Town Garage.	Road Foreman/Public Works Supervisor, and the Selectboard	
Plan for effective cell phone service		

<p>The two cemetery organizations should work cooperatively to plan for future space needs.</p>		
<p>The Selectboard should consider the creation of a policy that provides criteria for the acceptance of gifts of land to the town that addresses under what criteria the town may or may not accept such gifts.</p>		
<p>The Conservation Commission, should develop a maintenance plan for the Old City Falls Nature Preserve, its trail system and other lands under its control. Working with the Selectboard, seek to establish a village to village trail to provide an alternative to walking on the Justin Morrill Highway.</p>		

Healthy Community		
Implementation Tasks	Responsibilities	Timeline
Explore options for adequate senior services and housing.	Selectboard, Planning Commission and community members	
Define the equipment needs and fire station requirements of the Strafford Fire Department; address future changes in response call volume, types of calls and emergency staffing levels; create a basic fire station design criteria to meet the minimum requirement of the Strafford Fire Department; to perform a cost analysis of the current stations compared with possible scenarios; research the cost change to the citizens of Strafford in regard to Insurance Services Office, Inc (ISO) insurance ratings and insurance premiums.	Strafford Volunteer Fire and Rescue	

Transportation		
Implementation Tasks	Responsibilities	Timeline
Geo-textile fabric should be used in a systematic fashion to reduce maintenance costs on unpaved Town roads.		
The bicycle and pedestrian path between the Varney ball field and the Our Lady of Light Chapel should be extended to connect with		

the South Strafford Recreation fields to reduce the risk of accidents.		
A bicycle, horse and pedestrian path along the Ompompanoosuc River should connect South Strafford and the Upper Village to reduce the risk of accidents on the Morrill Highway.		
Creative solutions to the parking problems in South Strafford, as a matter of safety as well as convenience, should be explored and implemented.		
Develop a long-range management plan for public highways perhaps as part of a capital budgeting process.	Selectboard, and Road Foreman	

Natural Resources: Water Resources		
Implementation Tasks	Responsibilities	Timeline
Facilitate possible methods of zoning relief for multi-user water and wastewater systems in Strafford, particularly in the villages.	Planning Commission	
Develop water resource policy and practices to protect ground and surface waters.	Planning Commission and Conservation Commission	
Examine updating the Flood and Fluvial Hazard	Planning Commission	
Ordinances to better protect the West Branch and its tributaries.		

Continue educational and project-development work outlined in, or as an outgrowth from, the River Corridor Management Plan for the West Branch of the Ompompanoosuc.	Conservation Commission	Ongoing
--	-------------------------	---------

Natural Resources: Wetlands		
Implementation Tasks	Responsibilities	Timeline
Consider conducting an inventory of wetlands to determine where, if any, wetlands that have not been mapped by the State of Vermont are located.	Conservation Commission	
Facilitate development of zoning regulations that require landowners to provide the DRB with evidence that their proposed development will not negatively impact wetlands.	Planning Commission	

Natural Resources: Flood Resilience		
Implementation Tasks	Responsibilities	Timeline
Facilitate the updating of the Strafford Flood Zoning Ordinance to ensure that it meets the standards required by the Federal Emergency Management Agency so that Strafford may continue to participate in the NFIP The reviewed ordinance should consider prohibiting new development in the Special Flood Hazard Area (excluding small ancillary structures).	Planning Commission	

Work with VTrans and the Regional Planning Commission on advocating for and improving the flood capabilities of state or town-owned transportation infrastructure.	Selectboard, Planning Commission	
Continue working to update hazard mitigation plans and emergency preparedness and recovery procedures.		
Continue to send a representative to regularly attend and participate in the region's Local Emergency Planning Committee (LEPC #12).	Selectboard	Ongoing
Continue to maintain and update town bridge and culvert inventories. This information should be used to develop a schedule to replace undersized culverts.	Road Foreman	Ongoing

Natural Resources: Forestry and Farming		
Implementation Tasks	Responsibilities	Timeline
Consider strategies to encourage the expansion of farming and forestry uses of open space, and to further the education of town citizens with regard to the importance of these activities within the town.	Planning Commission	
Explore various State, Federal, and Town initiatives designed to bolster farming and forestry.	Selectboard	
Determine whether the Unified Bylaw should be amended to further protect against forest and habitat		

fragmentation.		
----------------	--	--

Natural Resources: Wildlife Habitat		
Implementation Tasks	Responsibilities	Timeline
Encourage owners of necessary habitat for threatened species to contact the State for assistance in developing a management plan for these sites.	Conservation Commission	
Identify critical wildlife species and their habitat and wildlife corridors in Strafford.	Conservation Commission	
Wind Turbines should be discouraged in wildlife areas		
Expand and validate Linking Lands wildlife habitat connectivity mapping with on-the-ground field evaluation.	Conservation Commission	
Encourage owners of necessary habitat for threatened species (see Vermont Fish & Wildlife Department, for listing of current threatened and endangered species of plants and animals) to contact the State for assistance in developing a management plan for these sites.		

Natural Resources: Plant Communities

Implementation Tasks	Responsibilities	Timeline
Continue to educate Strafford’s citizens on special plant communities.	Conservation Commission	Ongoing
Conduct a plant communities' inventory.	Conservation Commission	
Inform citizens to identify and practice the safe elimination of invasive plants, which can be found in the Strafford Local Hazard Mitigation Plan.	Conservation Commission	

Natural Resources: Elizabeth Mine Environmental Cleanup		
Implementation Tasks	Responsibilities	Timeline
Develop an overlay that identifies the potentially groundwater area associated with the mine.	Planning Commission	
The Historical Society, with assistance from the EPA, shall implement the EPA’s scenic overlook plan, including installation of historical interpretive panels.	Historical Society, EPA	

Natural Resources: Culturally and Naturally Significant Open Space Areas		
Implementation Tasks	Responsibilities	Timeline
Conduct a scenic road and ridgeline inventory to provide data for the protection of scenic roads through the Strafford Subdivision Regulations.	Planning Commission	
Conduct a detailed viewshed analysis in order to determine which corridors have the most scenic value.	Planning Commission	

Complete a wetlands and natural communities' inventory of Strafford in order to determine where the unmapped wetlands and natural communities are located.	Conservation Commission	
Conduct an agriculture field and use inventory in Strafford. Pasture lands are defined as an existing feature to be preserved in the Strafford subdivision regulations.	Conservation Commission	
Prioritize recreation corridors along the town highway network to identify safety improvements as well as other improvements that may be needed for bicycle, pedestrian and other forms of access.	Selectboard and Recreation Committee	
Identify formal and informal access points to various open space and recreational areas.	Conservation Commission	
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 Strafford.	Selectboard	
Continue to update the Open Space Plan.	Conservation Commission	Ongoing

Land Use: Overall		
Implementation Tasks	Responsibilities	Timeline

<p>Consider adding language to the Strafford Bylaw which addresses lighting, viewsheds, and residential construction on ridgelines.</p>	<p>Planning Commission</p>	
<p>Work with the Board of Selectmen, Development Review Board, and administrators of the Fire Department and Fast Squad to revise the bylaws so that access to proposed structures, including driveways, is done in a manner that ensures that emergency vehicles and personnel can reach the sites without unreasonable risk.</p>	<p>Planning Commission</p>	
<p>Encourage Planned Unit Developments, stronger subdivision standards, or waiver provisions that cluster development and preserve open land, working land, and wildlife habitats.</p>		
<p>Information from the USDA Natural Resource Conservation Service should be maintained as a community resource to assist landowners, farmers and foresters in farmland conservation and habitat protection for wildlife.</p>		
<p>Merge the Strafford Zoning Ordinance and Subdivision Regulations into a single, unified bylaw in order to simplify development review.</p>	<p>Planning Commission</p>	

Update zoning language relating to telecommunications and renewable energy so that the Town’s goals and policies are considered during Section 248 proceedings.	Planning Commission	
Assure that the Unified Bylaw appropriately addresses waivers and variances.	Planning Commission	
Consider ways in which it can offer incentives that encourage innovative multi-user septic systems while reducing any threat to village water supplies to encourage cluster development in areas adjacent to Strafford’s villages.	Planning Commission	
PUDs or lot size waivers for subdivisions that are not adjacent to Strafford’s villages should be carefully considered for their impact on town services when redrafting bylaws.	Planning Commission	
Encourage the restoration of historic public structures and the maintenance of significant public areas through grants and organized volunteer efforts.	Selectboard and Town, Friends of the Library, Friends of the Morrill Homestead, and House Advisory Group	
Visual impacts of development should be addressed in bylaw updates.	Planning Commission	

Land Use: Village Centers		
Implementation Tasks	Responsibilities	Timeline

<p>With the establishment of a Historic Preservation Commission (HPC) in 2017 and its acceptance into the Certified Local Government Program in 2018, the Planning Commission in conjunction with the HPC shall identify and proceed with the establishment of historic districts in both villages in order to preserve the historic character of the buildings.</p>	<p>Planning Commission</p>	
--	----------------------------	--

<p style="text-align: center;">Land Use: Rural Residential I</p>		
<p>Implementation Tasks</p>	<p>Responsibilities</p>	<p>Timeline</p>
<p>Revise the bylaws to define appropriate types of commercial uses and scales that would fit in this district, making permitting more predictable.</p>	<p>Planning Commission</p>	
<p>Develop provisions that encourage clustering of development to reduce impacts on agricultural soils and open areas.</p>	<p>Planning Commission</p>	
<p>Consider standards that preserve scenic views.</p>	<p>Planning Commission</p>	

<p style="text-align: center;">Land Use: Rural Residential II</p>		
<p>Implementation Tasks</p>	<p>Responsibilities</p>	<p>Timeline</p>
<p>Revise the bylaws to limit incursions into remote areas.</p>	<p>Planning Commission</p>	

<p style="text-align: center;">Land Use: Land & Forest Conservation</p>		
<p>Implementation Tasks</p>	<p>Responsibilities</p>	<p>Timeline</p>
<p>All development in the Land & Forest Conservation district</p>		

should be made a conditional use to ensure that impacts on the natural environment or scenic areas can be evaluated.		
The bylaws should be revised to limit incursions into remote areas.	Planning Commission	
Add language in the Zoning Bylaw that will minimize fragmentation of forest blocks and wildlife habitat, including wildlife connecting areas, in the Land and Conservation district.	Planning Commission	

Land Use: River Valley Conservation		
Implementation Tasks	Responsibilities	Timeline
Regularly review the protections for these areas in the bylaws to ensure that they remain up-to-date with the requirements of FEMA and the NFIP.	Planning Commission	
Examine additional protections for lands in river corridors outside of mapped Flood Hazard Areas, as these are at risk from flood damage.	Planning Commission	
Revise the bylaws to prohibit new development within the floodplain.	Planning Commission	
Address river corridors and the risk of lateral erosion in bylaw updates.	Planning Commission	

Land Use: Miller Pond Shoreline		
Implementation Tasks	Responsibilities	Timeline
Consider including an overlay or district in the bylaws to protect this water body.	Planning Commission	
Revise the bylaws to create an enforceable provision that keeps structures (including any septic tanks or leach fields) at least 200 feet from the shoreline and feeder streams.	Planning Commission	
Revise the bylaws to require an undisturbed vegetated buffer of at least 50 feet from the shoreline and feeder streams.	Planning Commission	
Consider revising the bylaws to expand this district to the watershed boundaries that drain into this pond.	Planning Commission	
Update the Miller Pond Shoreline district regulations to conform to state regulations and develop other techniques for protecting the Pond’s scenic character.		

Land Use: Elizabeth Mine Protection Area, Historic, and Conservation District		
Implementation Tasks	Responsibilities	Timeline
Consider revising the bylaws to create a requirement that uses and subdivisions that require potable water provide proof of such prior to any approval or permit.	Planning Commission	

Consider creating regulations that ensure a safe drinking water supply can be accessed in areas near the Elizabeth Mine. This could be done through zoning and/or subdivision or both.	Planning Commission	
Provide an overlay map of the affected lands based upon the Environmental Protection Agency soil and water testing.	Planning Commission	

Energy		
Implementation Tasks	Responsibilities	Timeline
The Town should work to increase public awareness and use of energy conservation and renewable energy through educational efforts.		
The Town should explore the potential for a commuter shuttle from the existing Park & Ride lot.		
The Planning Commission should consider updating the Town’s zoning and subdivision regulations to offer incentives for energy-efficient development.		
The Selectboard should create policies for staff, systems, and planning in use of municipal buildings and vehicles to encourage energy efficiency, reduce energy use, and leverage non-fossil fuel energy sources.		

<p>The Strafford Energy and Climate Committee should continue to identify additional areas in town appropriate for community-sponsored renewable-energy facilities and decarbonization projects.</p>		
--	--	--

Economic Development		
Implementation Tasks	Responsibilities	Timeline
<p>Pursue Village Center designation for both Strafford and South Strafford Villages.</p>	<p>Planning Commission</p>	<p>Short-term</p>
<p>Expand the size of the village centers as recommended by the Regional Plan.</p>	<p>Planning Commission</p>	<p>Short-term</p>

Relationship to Other Plans		
Implementation Tasks	Responsibilities	Timeline
<p>Continue to encourage ongoing communication and cooperation between Strafford and its neighboring towns.</p>	<p>Selectboard and Planning Commission</p>	<p>Ongoing</p>
<p>Continue participation in the Two Rivers-Ottawaquechee Regional Commission.</p>	<p>Selectboard and Planning Commission</p>	<p>Ongoing</p>
<p>Exchange planning information and development data with neighboring communities.</p>	<p>Selectboard and Planning Commission</p>	<p>Ongoing</p>

