NOTICE OF PUBLIC HEARING
OF THE
ORWELL PLANNING COMMISSION

PURPOSE: TO RECEIVE PUBLIC COMMENT ON THE REVISIONS OF THE TOWN PLAN
DATE: THURSDAY, NOVEMBER 16, 2023 AT 7:00 PM
LOCATION: ORWELL TOWN CLERK'S OFFICE, 436 MAIN ST., ORWELL, VT 05760

PURSUANT to 24 VSA §4384, the Orwell Planning Commission is charged with preparing or amending the town plan for the municipality. Accordingly, the Planning Commission must hold at least one public hearing within the municipality, after issuing public notice.

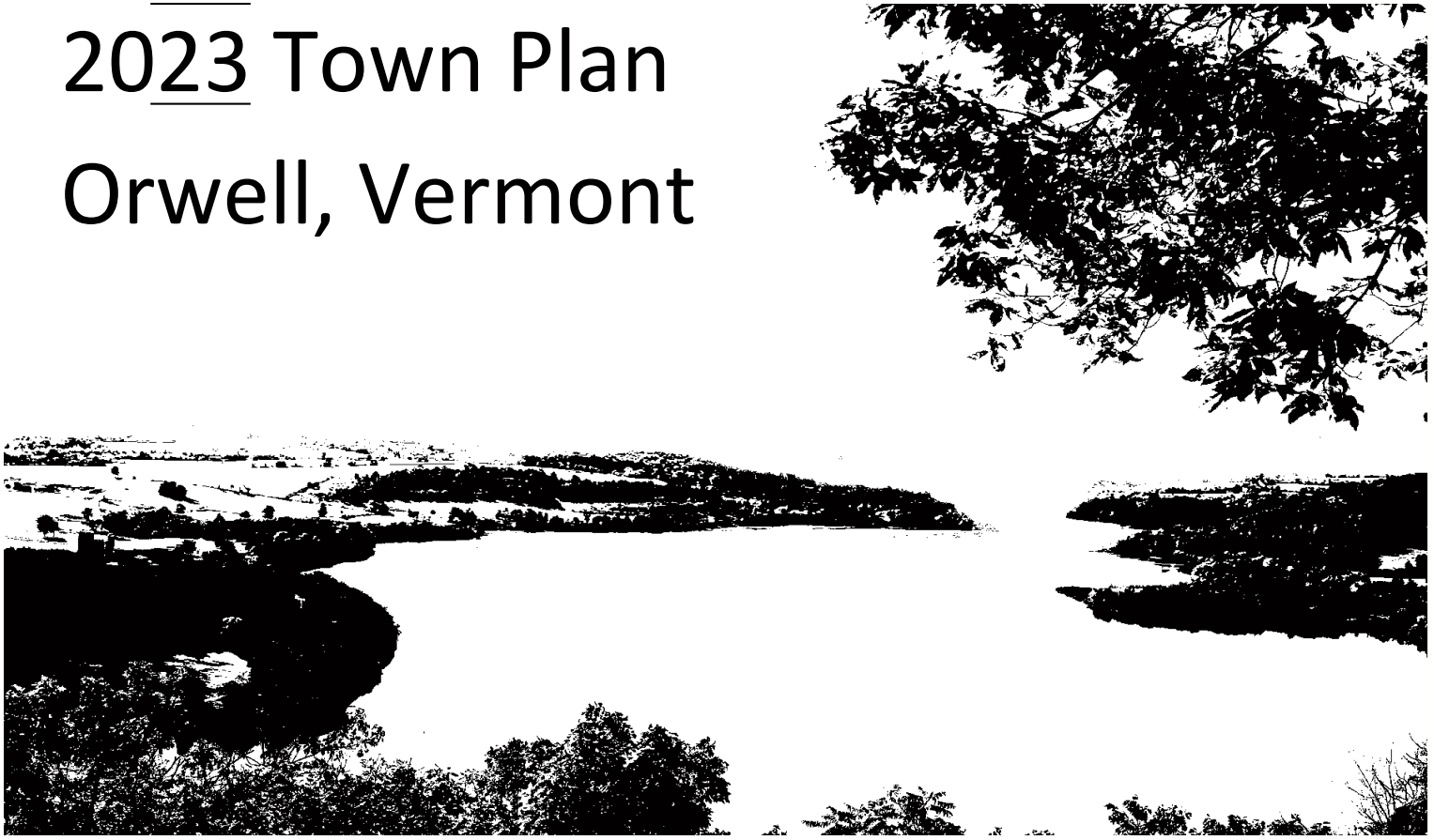
This **PUBLIC NOTICE** is to notify and interested person that the Orwell Planning Commission will hold a Public Hearing to receive public comment, consider revisions and approvals, and schedule submission to the Orwell Select Board. If adopted, the draft Town Plan would replace the current town plan, which is presently expired.

Under provisions of 24 VSA §4384, a copy of the drafted town plan is available for review in the Town Clerk's Office, and may be viewed on the Town of Orwell website at https://www.townoforwellvt.org

DATED in Orwell, Vermont this 16th day of October, 2023.

Joseph Andriano, Chair
Orwell Planning Commission

2023 Town Plan
Orwell, Vermont



Adopted by the Orwell Planning Commission_____
Adopted by the Orwell Selectboard_____

Contents

ACKNOWLEDGEMENTS

The Orwell Town Plan was adopted by the Selectboard on _____. The work on this plan update was completed by the Orwell Planning Commission:

Joe Andriano, Chair

Technical assistance for this plan update was provided by:

Addison County Regional Planning Commission
14 Seminary Street
Middlebury, Vermont 05753
802.388.3141
www.acrpc.org

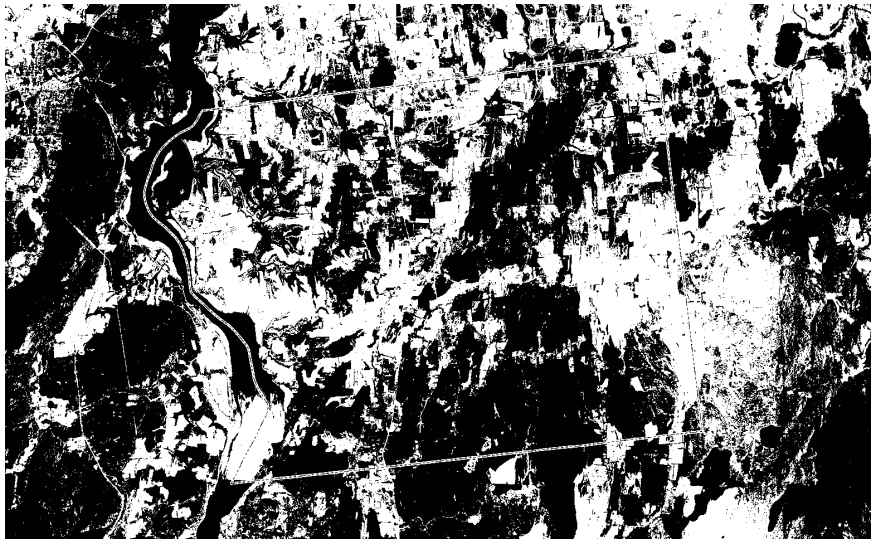
This plan update relied heavily upon and retained much of the character of the 2007 Town Plan, including many of the photographs and figures, and which was developed with technical assistance from *PlaceSense*, Brandy Saxton, AICP.

This plan update was funded by a 2023 VT Department of Housing and Community Development Municipal Planning Grant

Cover Photo: Looking south from Mount Defiance. Photo credit; Brandy Saxton

1. Introduction

1.1. General Description



The Town of Orwell is located on the shores of Lake Champlain in the southwestern corner of Addison County, Vermont. Orwell has a land area of approximately 47 square miles with around 10.5 miles of shoreline. The terrain is fairly level in the northern and western parts of town with rolling hills that become more pronounced to the south and east of Route 22A. Elevation ranges from 95 feet above sea level at Lake Champlain to 988 feet atop Knox Hill. Two major streams, East Creek and the Lemon Fair River, flow through town, in addition to numerous small tributaries. The lowland marshes around the North Fork of East Creek constitute a distinguishing feature of the town.
Orwell's year-round population as measured by the 2019 American Community Survey (ACS) 5-year estimate is 1,209 people. Two state highways pass through town - Route 22A and Route 73. Orwell's historic village center includes a K-8 public school, several churches, community buildings, a bank, shops, offices and eateries – in addition to approximately 50 homes. Orwell remains a rural community with nearly 7,400 acres of land conserved to ensure its continued agricultural use. While much of the town 's land area is devoted to farming, the number of residents dependent on the land for their livelihood has declined dramatically over the past 50 years. The majority of residents commute to jobs outside of town, many to Middlebury – around 20 miles to the northeast.

1.2. Authority and Purpose

A. Statutory Framework

Orwell's Selectboard has the authority under the Vermont Planning and Development Act, Title 24 V.S.A., Chapter 117, to adopt a town plan. The town plan must be consistent with the 14 state planning goals and include the 12 required elements enumerated in statute.

To be valid, the town's land use regulations require the policy and data foundation of a town plan. Land use regulations must be in conformance with the town plan, which is defined in statute as:

- Making progress toward attaining, or at least not interfering with, the goals and policies contained in the town plan.
- Providing for proposed future land uses, densities, and intensities of development contained in the town plan.
- Carrying out, as applicable, any specific proposals for community facilities, or other proposed actions contained in the town plan.

So that town plans may accommodate changing conditions, state law requires that municipalities review, update, and readopt, or, if necessary, amend and readopt their town plan at least every eight years. The Orwell Planning Commission has reviewed the town's conditions and facilities, and has stated its public goals and objectives in the following 2023 Town Plan.

B. Purpose

This Town Plan is the principal statement of policy for the Town of Orwell. No community is static and the Orwell Town Plan recognizes the need to accommodate future change in a manner that protects those aspects of the town valued by residents.

This plan presents a vision for the town's future, and a series of recommendations for achieving that vision. It is intended that this plan guides the town's efforts in land use planning, the provision of public facilities and services, environmental protection, economic development and land conservation. This plan will be implemented through town ordinances and regulations, town participation in state and federal regulatory processes and the town's approach to raising and spending public funds.

A town plan should state the town's aims in terms broad enough to allow application to a wide range of situations, yet with sufficient detail to serve as a strong foundation for land use regulations and other implementation tools. The plan should allow for flexibility and creativity in its application in order to achieve an appropriate balance between competing objectives.

The Orwell Town Plan is based on a long-term vision for the future of the town. This vision will not be achieved in the next eight years; rather, it is something for which the town will strive for several decades. By taking this long view, the Town of Orwell will be able to pursue strategies that over time will achieve the vision set out in this plan.

C. REFERENCES AND RESOURCES

Solid Waste Implementation Plan; Addison County Solid Waste Management District, 2009.

State of Vermont 2006 Water Quality Assessment Report; Vermont Department of Environmental Conservation, 2006.

An Ounce of Prevention: A Groundwater Protection Handbook for Local Officials; Vermont Department of Environmental Conservation, 2005.

Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont; Elizabeth H. Thompson and Eric R. Sorenson, 2005.

The Shoreline Stabilization Handbook for Lake Champlain and Other Inland Lakes; Northwest Regional Planning Commission, 2004.

10 Reasons Why Vermont's Homegrown Economy Matters and 50 Proven Ways to Revive It; Stacey Mitchell, 2003.

Vermont Better Backroads Manual; Windham Regional Commission, 2002.

Conserving Vermont's Natural Heritage: A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity; Vermont Fish and Wildlife Department, 2004.

A History of the Town of Orwell; the Orwell Historical Society, 2001.

Champlain Valley Clayplain Forest Natural History and Stewardship; Champlain Valley Clayplain Forest Project, 2000.

Community Planning for Flood Hazards; Vermont Department of Housing and Community Affairs, 1998.

Preserving Rural Character (PAS Report #429); Fred Heyer, 1990.

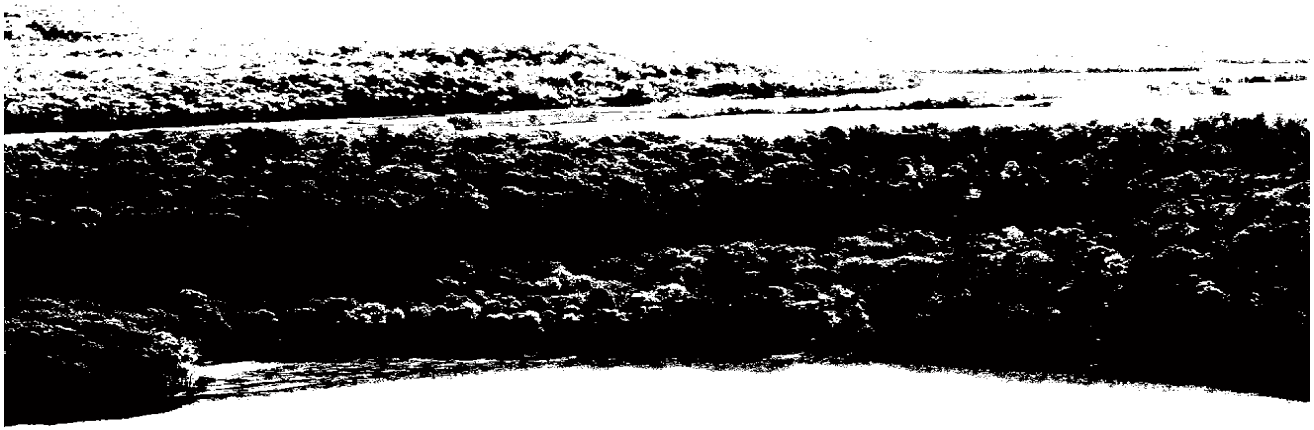


Figure 3: Watery Inlet, East Creek

1.3. Town History

A. BEFORE 1609

Native Americans inhabited the lands that now comprise the Town of Orwell for thousands of years; archaeological evidence of some of these ancient residents has been found near the mouth of the East Creek. Lake Champlain and its tributary streams were the main transportation routes through the forested landscape and settlements were generally located in close proximity to water. By the time of Samuel de Champlain's voyage in 1609 down the lake that now bears his name, the lands along the lake were part of the territories of two Native American tribes, the Algonquian and Iroquois.

Figure 4 Historic Views of Mount Independence from Mount Defiant by Ernest Haas

B. EXPLORATION AND EARLY SETTLEMENT

No Europeans settled on the lands that would become the Town of Orwell for more than 150 years after Champlain's exploration of the lake and its environs, although trappers, missionaries and others traversed the disputed tract of wilderness that separated French colonial communities to the north from English holdings to the south and east. During the Seven Years War, soldiers traveled through on a military road built in 1759 to connect fortifications on Lake Champlain to those on the Connecticut River. That conflict ended with the English victorious over the French and subsequent English colonization of their newly won territory.

On August 18, 1763, the Town of Orwell was chartered and its lands granted to 64 men. No settlement occurred in town for eight years, however. The first settler is recorded as John Charter, a Scotsman who took up residence near what was then known as Rattlesnake Hill, now Mount Independence, in

1771. By the mid-1770s, a few families were living in town, clearing land for fields and building rudimentary shelters for themselves and their livestock. With the start of the Revolutionary War, most residents returned to the safer, established communities to the south. Further settlement did not commence until the close of the war. The British burned nearly all the buildings in town – and indeed the entire area – before the end of the war. No structures from before the Revolution survive in Orwell today.

C. Revolution and Nationhood

Waterways were the main transportation routes in what was then a vast, forested wilderness and from the earliest European exploration of the continent; the shorelines were fortified with military outposts to control access to these vital travel corridors. The narrow section of lake between Ticonderoga and Orwell provided an opportunity to control this transportation artery thus making it a strategic location during periods of conflict. Atop Orwell's rugged promontory overlooking Lake Champlain, American Revolutionary War troops built a fort complex to guard against a British attack from Canada. The troops named it Mount Independence in honor of the Declaration of Independence. The fort faced north and stood across the lake from the fort at Ticonderoga.

Under orders from General Philip Schuyler, American troops began clearing land at Mount Independence in June of 1776. During that historic summer, 12,000 soldiers were stationed in Orwell making it one of the largest communities in North America at the time. By fall, a large shore battery and a horseshoe-shaped battery were completed and a picket fort was under construction. So impressive was the combined sight of Mount Independence and Fort Ticonderoga that British General Guy Carleton quickly retreated to Canada, abandoning an attempted invasion in October 1776.

Many American troops and staff went home for the winter of 1776, reducing the force at the Mount to just 2,500. Those that remained faced extremely harsh conditions; many did not survive the winter, succumbing to disease or the bitter cold. Over the winter, a bridge connecting Mount Independence to Fort Ticonderoga was constructed; the remains of this bridge were
documented in the survey of the lake bottom recently completed by the Lake Champlain Maritime Museum. In the spring of 1777, new troops arrived but not enough to properly garrison the forts. On July 5, they evacuated the site when British General John Burgoyne's forces overwhelmed the area. British and German forces remained at the Mount until November when they burned and destroyed the fortifications after learning of Burgoyne's surrender at Saratoga.

The Mount remained largely abandoned, with most of its materials and relics plundered until the turn of the 20th century. In 1908, the Daughters of the American Revolution erected a monument on the property and the Pell family, which owned and was reconstructing Fort Ticonderoga, acquired much of the site in 1912. In 1961, the state acquired the remaining land as the nation was celebrating its bicentennial and opened the property to the public. In the early 1990s, a series of archaeological digs were completed at the Mount. This was part of a community-led effort to improve the site and increase recognition of Orwell's important historic landmark. In 1996, a Visitors Center was opened. Mount Independence is designated a National Historic Landmark and has been called one of the most interesting and important historic sites in Vermont.

D. THE TOWN DEVELOPS

After the war ended, some pre-war settlers returned to resume their efforts to clear land for farming and build homes for their families in the wilderness. Some soldiers, who had been stationed at Mount Independence or passed through town, decided to settle in Orwell. By 1791, there were 778 people living in town; churches had been established, schools were opened, mail was being delivered, and businesses had been started. Around 1800, the lakeshore was the focus of development and commerce with the largest settlement being at what is now Chipman's Point (then Sholes Landing). Joseph Sholes, who was shortly joined by Walter Chipman, established this settlement; each man opened a store and Sholes operated a

tavern as well. Chipman's Point had a school and a church in the early 1800s, in addition to at least eight homes. The stagecoach made a daily stop, as did the passenger steamers that operated on Lake Champlain. Freight barges docked at the Point and teams relayed goods between the lake and Brandon. Ferries operated from Chipman's Point to Wright's Landing in Putnam, New York and Montcalm Landing in Ticonderoga, New York.

A second commercial hub was formed at what is now known as Mud Dock, when a disgruntled Mr. Leonard decided to run the Chipman Point operation out of business and started a competing wharf. While no significant settlement grew up around Leonard's Wharf, the business thrived for many years at what is now the site of the Plunder Bay Marina.

Orwell's village center also formed during the first half of the 19th century. Raising merino sheep brought an era of agricultural prosperity to the town between 1825 and 1860 that spurred development in the village. The bank was established in 1832, and was originally housed in the bank president's brick residence; an addition to that building was constructed in 1878 to house the bank. Two churches, one Congregational and one Methodists, were built in the 1840s. Most of the village homes were constructed between the 1860s and 1910s. Orwell's settlement pattern – the location of homes,

farms and businesses – reflects the town's history. Like many Vermont towns, Orwell has a village center defined by a cluster of homes, businesses, and public buildings situated around a town green, with scattered settlements in the surrounding rural land. This settlement pattern reflects the relatively flat terrain, productive agricultural soils and transport corridors used by early settlers. The swampy wetlands associated with East Creek and the rocky hills in the south have tended to restrict development and are not well suited for farming.

E. AGRICULTURE

The town's early settlers arrived in a forested wilderness and began clearing land for agricultural use. These were subsistence farms, which had to provide for a family's basic needs. By the early 1800s, Orwell's land had been sufficiently cleared for grazing and sheep farming became the town's primary agricultural activity. About 1815, the first merino sheep were brought to Orwell. The breeding and raising of merino sheep quickly became the economic engine of agricultural communities throughout Addison County and other areas of Vermont. The state became well known for the high-quality wool produced from this breed of merino sheep, which came to be known as Vermont Merinos. Today the Vermont Merino breed is very rare and there are no flocks in the state. The agricultural economy in Orwell began changing just before the Civil War as area residents began to migrate westward and market for wool, then for a number of reasons the town's primary agricultural product declined. Merinos were exported to newly opened lands in the west and places around the world including Australia. At the end of the 19th century, technological changes such as new mechanical spinning machines made the fine Merino wool less marketable.

In the decades after the Civil War, the town's agricultural economy shifted to dairy production. At first milk was manufactured into butter and cheese, products that could be stored and shipped more easily. Cheese as a commodity began being manufactured in Orwell by local farmers after the Civil War. Several cheese factories operated in Orwell from the late-1860s into the early 20th century. With development of the railroad, Orwell's raw milk began to be collected at local creameries and shipped by rail to cities in southern New England. Milk continued to be shipped by rail into the 1950s when transport switched to trucks. After World War II changes in regulations, the rising costs of farm machinery and the lack of farm labor led to the loss of a number of the town's small, marginal farms. As farms began to go out of business, the remaining farmers bought land and buildings to expand their operations. This trend continues to the present day.

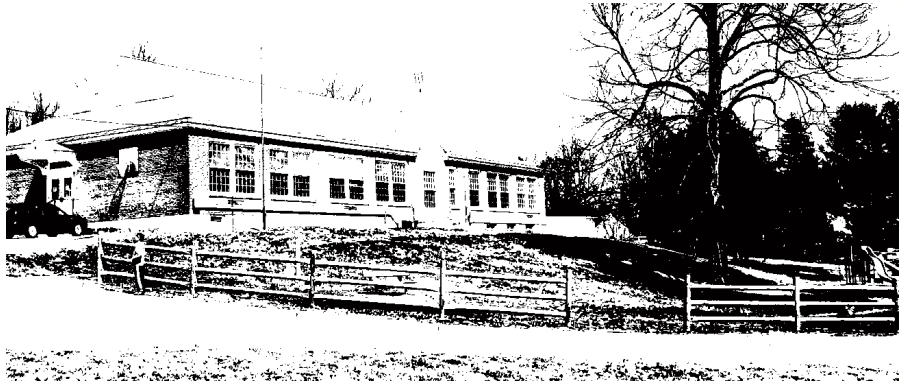
Apples became another important agricultural product in Orwell at the turn of the 20th century. Early on, apples were picked, sorted and packed into barrels to be shipped by rail. In 1947, area growers formed the Shoreham Cooperative and established a storage and packing facility that remained in operation until 1996. While many acres of orchards in Orwell have been abandoned or removed over the last century, currently four commercial apple orchards remain in operation in town.

F. SCHOOLS

The first school district organized in Orwell was the Center School in 1797, which came to be known as the Village School. By 1831, the town had nine districts; the size of a district was based on the distance children could reasonably walk to the school. Over the years, buildings came and went as enrollments generally declined and districts consolidated. The last outlying schoolhouse, the Young School, ceased operation in 1960.

The Village School was housed in several buildings over time and saw many renovation projects. In 1939, work commenced on a new Village School, which is the building that continues to serve the town's children today, and the old Grammar School was torn down. The Village School has been

enlarged several times including in 1949, 1974 and 1989. In 1969, the adjacent Town Hall was renovated to provide the school with a gymnasium, stage and cafeteria. Orwell village offered high school courses starting in 1910 and for 50 years students could receive two years of high school education in town. When Orwell joined the Union School District in 1962, high school students began being bused to the Fair Haven School.



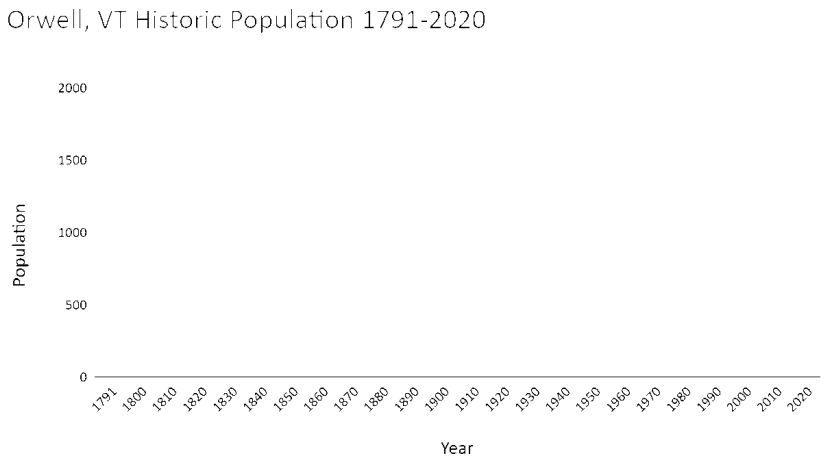
Orwell Village School (OVS) consolidated with Slate Valley Unified Union School District (SVUUSD) in 2019. The Town no longer owns the school, the historic Town Hall building or the/ballfield. After the consolidation, the SVUUSD Board put up a bond vote for major/physical and organizational changes to the school and existing Town Hall. The bond went to vote twice and did not pass. Due to the Covid-19 pandemic the bond vote has been put on hold. Currently, the Village School goes to 6th grade while 7th and 8th grade students commute to Fair Haven.

2. The People

2.1. Demographic Profile

A. POPULATION AND ETHNICITY

Orwell's population dynamics followed a pattern typical of agricultural towns throughout Vermont. Due to its location on Lake Champlain, then a vital corridor of commerce and industry, the town's population reached a peak of 1,849 people in 1810. Population levels then declined fairly steadily for 150 years as residents left rural communities like Orwell to the nation's expanding western frontier drawn by the promise of better land, or to booming industrial cities seeking factory jobs. By 1960, only 826 people lived in town (see Figure 8).
In the 1960s and '70s, Orwell's population grew modestly as younger couples moved into town and started families. However, the number of residents moving out of town offset much of the growth due to births exceeding deaths. During the 1980s, the town added more residents than any decade since 1810 as people moved into Orwell and families continued to expand.

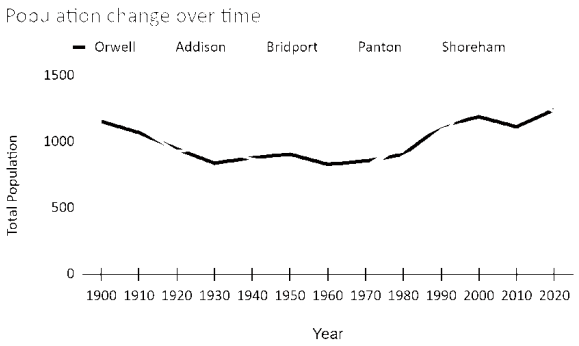


Since 1990, population growth in Orwell has slowed as fewer people have been moving into town. The number of births in town appears to have peaked in the early-1990s, although the actual number each year is highly variable due to the town's small population. The Census Bureau counted Orwell's population to be 1,239 people in 2020.

The Census estimates that males and females make up 50% of the population each, and that the vast majority of Orwell's residents, about 96%, are white. Blacks, Asians and American Indians make up the remaining 4% of the population. French, French Canadian, Irish, German, English, Scottish and Italian are the most populous "first ancestry" residents reported for European settlers.

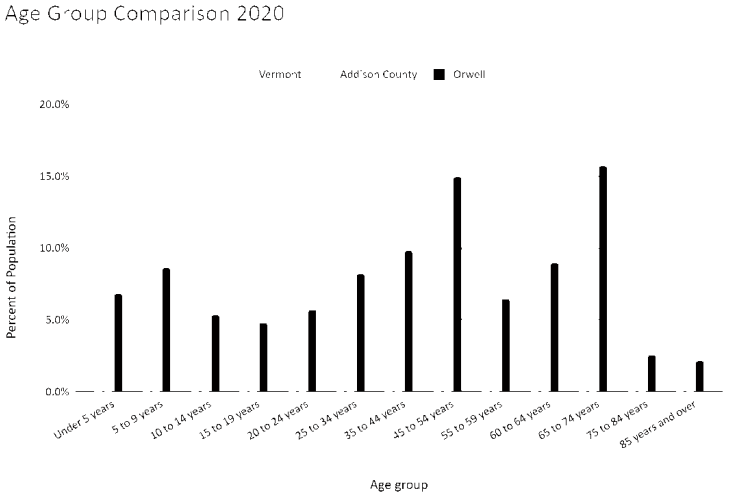
Note about population comparison

between towns



B. AGE DISTRIBUTION

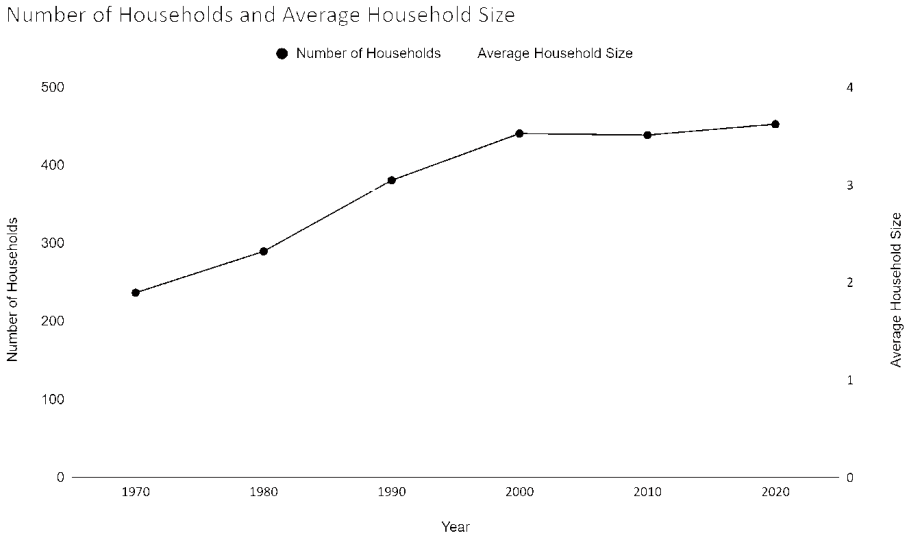
The median age of Orwell's residents is slightly older than county or state averages (48.8 in 2019 compared to a county average of 43.5).
The percentage of the town's population composed of children under age 18 declined during the 1990s and 2000s, while the percentage age 65 or older increased significantly. The aging population trend affecting much of the state is visible in Orwell, as one of the town's largest population segments is composed of baby-boomers who are moving out of their childbearing years and nearing retirement.
The age distribution in Orwell is fairly similar to that for state and county, although the town has smaller percentages of residents ages 25-35 and a slightly higher population of residents ages 50-70).

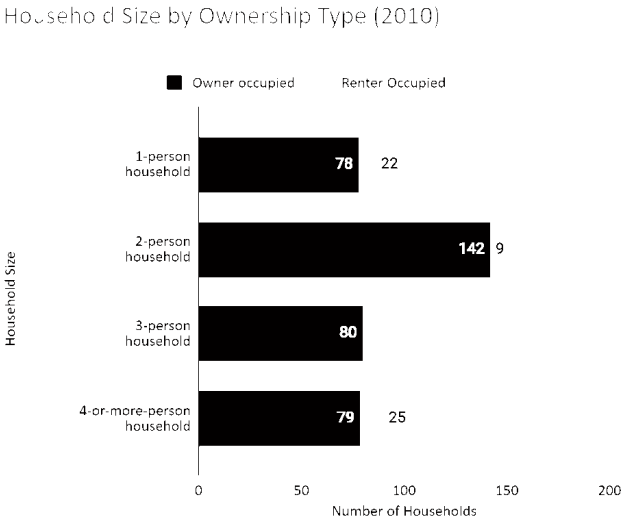


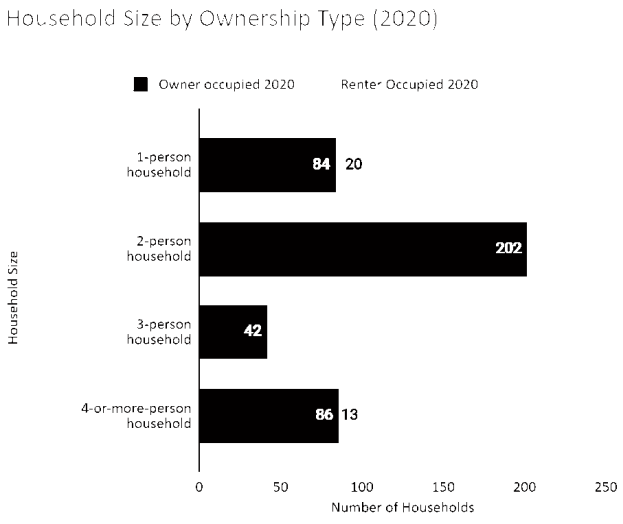
C. HOUSEHOLDS

Nationwide, less than 10 percent of households consist of a couple with two children. The Census Bureau found that the 65-and-older population grew by 34.2 percent in the last decade. The Census Bureau also projects that by 2035 Americans over the age of 65 will outnumber American children the number of Americans over age 65 will reach 23.5% of the total population. The fastest growing age group in the country is composed of those ages 65-75.

Declines in household size amplify the effects of population growth as the number of households then increases at a greater rate than the number of residents, and households drive demand for housing and services. The 2020 Census counted 453 households residing in Orwell, an increase of 14 households since 2010. Orwell's 2020's household size is slightly smaller than 2010 (2.49 vs. 2.53). Orwell should anticipate the declining household size trend to continue, given the current demographics of residents and the country as a whole. Average household size in Orwell, however, has consistently been greater than county or state averages.



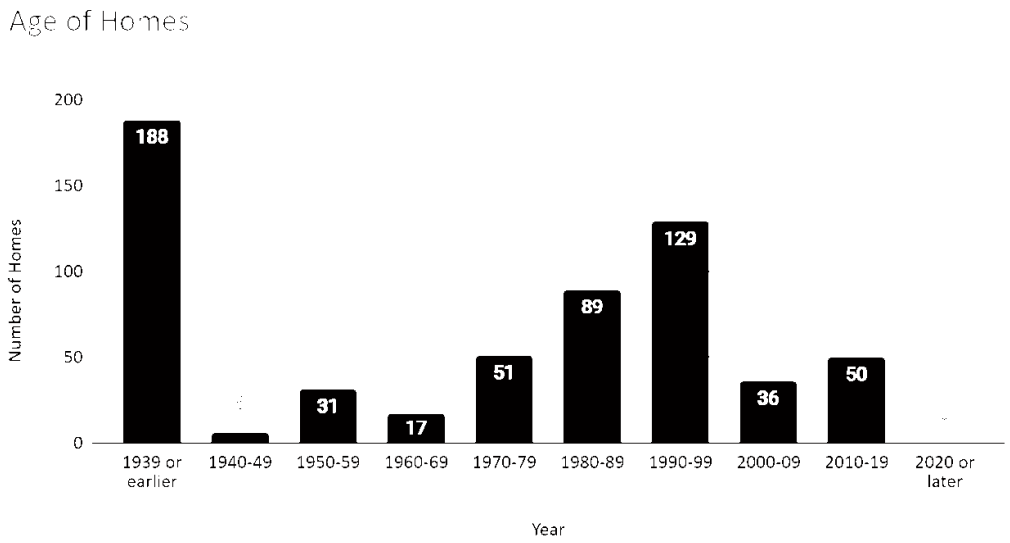




According to the 2020 Census, two-person households in Orwell continued to be the predominant household composition at 45%, with all of these households being owner occupied. In 2010, 34% of the total households were 2-person with 94% being owner occupied while 6% were rental. Three-person households fell from 19% in 2010 to 11% in 2020. The total 2010 number of 4-or-more- person households is similar to the 2020 total but the percentage of renter occupied households of this size, decreased from 24% to 13%. Over the same time period, single-person households have stayed relatively constant.

A. HOUSING STOCK

Housing in Orwell reflects a sharp contrast of the old and the new. The first Census of housing units in 1940 counted 300 homes in Orwell, most of which were built in the early- to mid-1800s. The number of homes actually declined in the 1940s and '50s, but rebounded during the 1960s and grew to 656 in 2010. Since 2000, approximately 86 homes have been built in town, a significant increase, given that the population grew only slightly. Many of Orwell's older homes are structures of historical significance.



As with most rural Vermont municipalities, Orwell's year-round homes are largely owner-occupied and single-family. About one-third of Orwell's year-round dwellings were constructed before 1940 (and many well before that year), and about 45% were built in 1970-1990 as new residents moved into town. Since 2000, 86 new homes have been built, 50 of those were constructed after 2010. No new homes have been built since 2020. The town has a smaller percentage of rental units than most of its neighboring communities, according

to the 2020 census, there are 39 rental units down from 60 in 2010. Due to its location on Lake Champlain and picturesque landscapes, Orwell has a significant number of seasonal homes. The 2020 Census counts 185 vacant housing units in Orwell. This plan presumes these housing units are camps or seasonal homes and not part of the available housing stock. Some of Orwell's recent residential growth may have been the result of the conversion of seasonal units to year-round use. This trend is expected to continue as some property owners retire to their summer homes and others sell their camps as the value of lake frontage continues to rise.

As seasonal homes are converted to year-round use, many are being upgraded and enlarged. Conversion places greater demand on the water and wastewater infrastructure of lakeshore homes, which in older camps may have not have been built to modern standards. Due to the proximity of many camps to the lake, it is important that conversions are reviewed and receive all required permits to ensure that their infrastructure is adequate for year-round use and to limit the potential for increased pollution, erosion and run-off from lakeshore property.

Traditionally, many farm employers have provided housing for their workers. Orwell's orchards need to house temporary labor during the picking and packing seasons. Dairy farms commonly employ one or more hired hands on a year-round basis; employment of immigrant workers is becoming more common on Vermont farms. To remain economically viable, it is important that Orwell's farms are able to attract employees and ensure that they have safe, adequate housing. The town's regulations have restricted the number of residences on a lot to one structure, thus preventing the traditional practice of providing on-farm housing. Orwell should continue to ensure that its regulations provide options for worker housing on farm parcels.

The overall quality of the town's housing stock is good and the number of substandard dwellings has been declining according to each census count. Currently, Orwell has a very limited number of housing units that would be considered substandard due to overcrowding or lack of plumbing facilities. Low- or fixed-income households, however, may be struggling to keep their homes in good repair; the Champlain Valley Office of Economic Opportunity and Neighborworks of Western Vermont have programs to assist income-eligible homeowners with maintenance and efficiency improvements. Orwell should support efforts to maintain or improve the quality of the town's existing housing stock, especially affordable units, to ensure that all residents have an adequate, safe place to live.

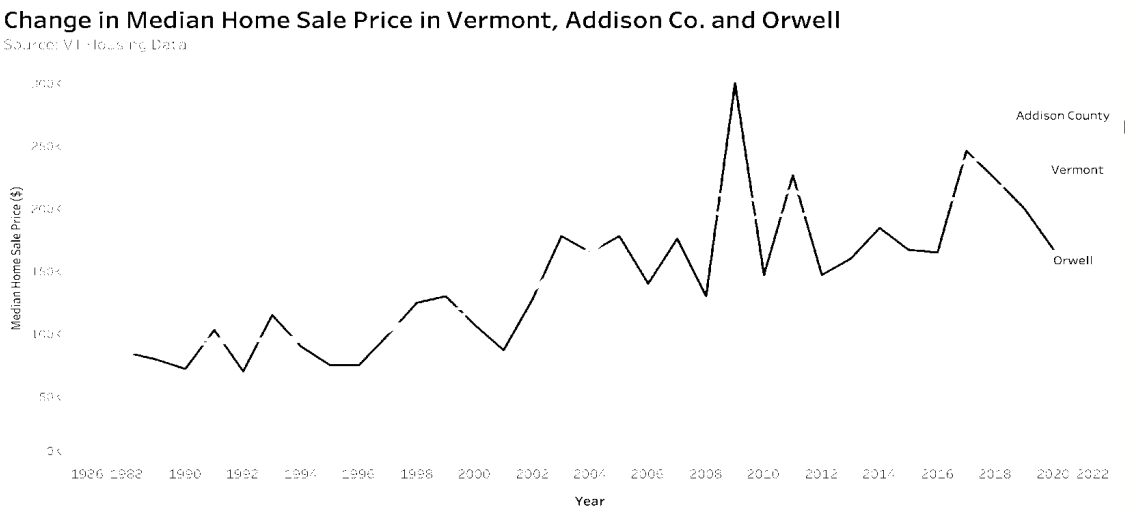
B. Housing Values

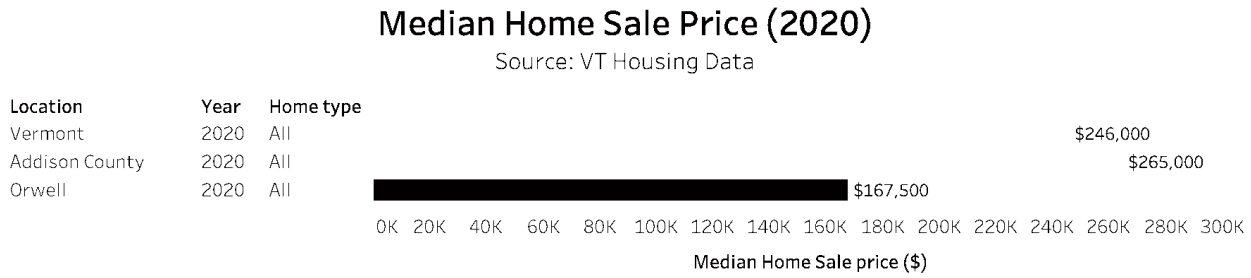
From the late 1990s-2006, the tight real estate market throughout Addison County drove sale prices, and the assessed value of property, higher. Between 2000 and 2004, the assessed value of homes (not including mobile homes) in Orwell increased approximately 30 percent after adjusting for inflation. In 2004, the average R-1 (non-farm residences on less than 6 acres) was assessed at $122,000 and the average R-2 (non-farm residences on 6+ acres) was valued at $185,000 on the town's Grand List. In 2012, the average R-1 (non-farm residences on less than 6 acres) was assessed at $175,000 and the average R-2 (non-farm residences on 6+ acres) was valued at $285,000 on the town's Grand List.

Market values appear to tell a different story. Although, prices for homes in Orwell have typically run about $20,000 less than the county average the chart below shows a high degree of variation in the median sale price over time.

According to the 2020 US Census, the median sale price of owner-occupied housing in Orwell dropped to $167,500 from $214,300 in 2019.

This value was significantly lower than the county's and state's median home price for the same period, $265,000 and $246,000 respectively. However, this data. may be deceptive, as only 14 homes sold In Orwell in 2020.





As is typical in many rural communities, mobile and modular homes have become a common form of affordable housing. About 2.4% of Orwell's Housing stock are mobile homes. While these structures can be significantly less expensive than traditional 'stick built' homes, new homeowners still need to buy land and install infrastructure. The chart below breaks down total home sales in 2020 by purchase price.

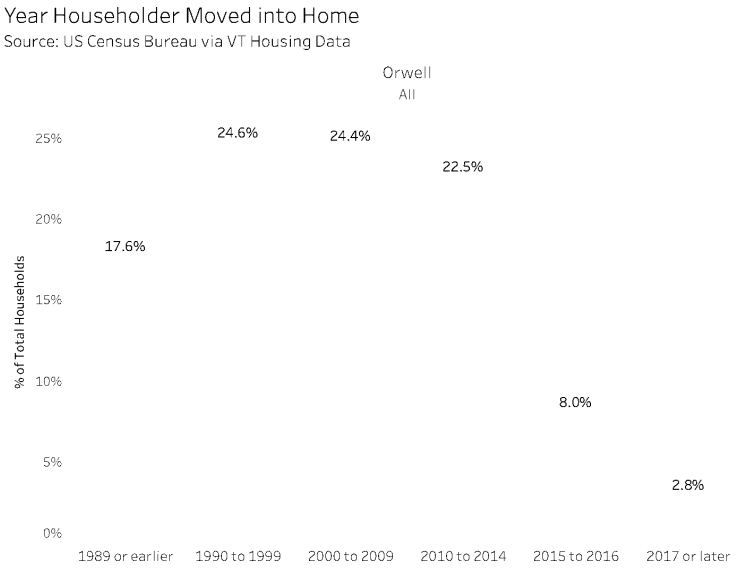
2020	Less than $50,000	$50,000 to $99,999	$100,000 to $149,999	$150,000 to $199,999	$200,000 to $299,999	$300,000 to $499,999	$500,000 to $999,999	$1,000,000 or more
VT (#)	7868	11752	22397	33734	53163	43023	13468	1969
VT (%)	4.2%	6.3%	12.0%	18.0%	28.4%	23.0%	7.2%	1.1%
Addison Co. (#)	589	274	808	1661	3625	3124	787	149
Addison Co. (%)	5.32%	2.48%	7.30%	15.01%	32.76%	28.23%	7.11%	1.35%
Orwell (#)	14	9	26	98	143	103	18	3
Orwell (%)	3.38%	2.17%	6.28%	23.67%	34.54%	24.88%	4.35%	0.72%

Since its last plan, which called for Orwell to reduce lot sizes, especially around its Village area, the Town of Orwell has been acting to increase the density and viability of promoting housing within its village area and the area immediately surrounding it. Orwell's land Use Regulations, passed in March, 2019, enable three zoning districts, The Village District, Neighborhood Commercial District and the Medium Density Residential District, that promote conventional housing development on lots as small as 1/4 or 1/2 acre. Similarly, outside the village in the rural district the Regulations have promoted density-based zoning, which concentrated on limiting density, but allowing smaller residential lots to preserve agricultural property. As the housing market improves, Orwell hopes that its regulations will increase the supply of homes in town on smaller lots, which may result in housing that is more affordable for residents, while converting less land from productive to residential use.

C. LENGTH OF RESIDENCY

According to the 2019 American Community Survey, about 71% of Orwell's households had lived in their current home for more than 10 years and about 40% had lived in the same place for more than 20 years.

About 29% percent of town residents in 2019 had moved into Orwell since 2010; of those halves moved from another community in Addison County, about one-quarter moved from elsewhere in Vermont, and another quarter from outside Vermont. Since the late 1990s, the town has averaged around 13 residential sales annually. Sales in the first part of the decade were substantially more numerous than those in the years from 2005 through 2019. During the pandemic home sale increased throughout Vermont.



2.3. Economic Profile

A. LABOR FORCE

In 2019, the Census found that Orwell had a labor force of around 672 people, up from 614 in 2010. Of the 672 people in the labor force, 659 were employed. A little over two thirds of Orwell's workforce works in Addison County. Approximately 97% work in the State of Vermont and 70% stayed within Addison County. In addition, 11% of employed individuals work from home.

Around 34% of residents 25 years of age or over have a college degree, as compared to county and state rates of 38 percent and 38 percent respectively. Most Orwell residents work in one of the following industries: agriculture and forestry (9%), healthcare, education and social services (27%), manufacturing (8%), construction (11%) or retail trade (12%). The percent of the population working in agriculture has been declining for several decades as farms have consolidated and become more mechanized. That trend continued in 2019, with agriculture and forestry employees dropping from 12% of the total employed labor force in 2010 to 9% in 2019. The previously identified decrease in the percentage of Orwell workers in the manufacturing industry has slowed as employment in this industry has remained at about 8% since 2010.

B. INCOME AND WAGES

The median household income in Orwell was around $60,300 a year according to the 2019 American Community Survey (ACS), which was similar to the state median and about $8,000 lower than the county median. According to the 2019 ACS, approximately 7.8 percent of the town's population was

living at an income level below the poverty line, up from 6.1% in 2010. Also, those living in poverty appear to have shifted. In 2000, this plan noted "Children in Orwell are more likely to be living in poverty than adults (19 percent of those under age 18 were in households with incomes below the poverty line as opposed to 7 percent of those 18 or older).". Between 2010 and 2019, the number of children in poverty increased from 2% in 2010 to 9.4% and this is roughly equal to the proportion of adults (9.3%) currently living in poverty. In 2019, poverty appeared to impact young adults the most, with 14.9% of 18–34-year-olds, 7% of 35–64-year-olds, and 2.3% of adults above age 65 living below poverty level.

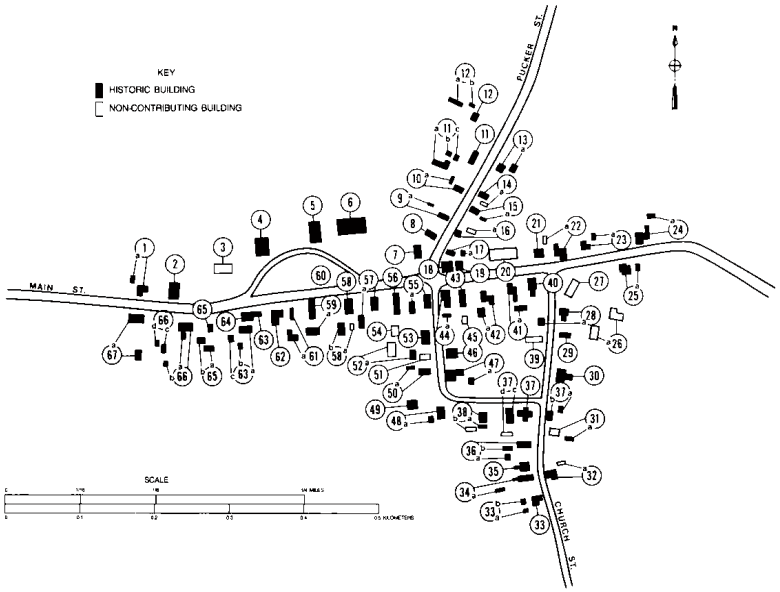
The average annual wage paid by an Addison County employer in 2010 was approximately $37,000 per year according to the Vermont Department of Labor. That increased to $49,000 by 2019. In comparison, Orwell's average wage for 2019 was $46,000.

Around 23% of employed individuals from Orwell reported themselves as self-employed on the 2019 Census. Additionally, many people work less than full-time, year-round, which is not reflected in the Department of Labor statistics. The difference between household income and wages suggest that more than one worker supports most Orwell households.

3. The Community

3.1. Historic & Archaeological Resources

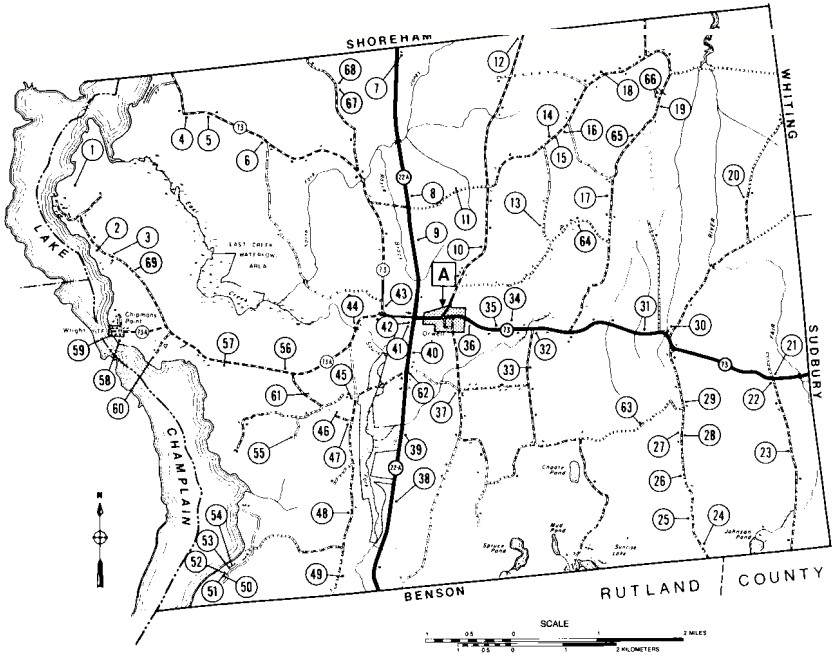
Orwell's rich heritage is visible in the array of historic farmhouses, barns and outbuildings, lakeshore camps, civic buildings, and village homes that dot the landscape. There are more than 150 buildings listed on the State Register of Historic Places, including around 70 buildings that comprise the Orwell Village Historic District.



Mount Independence, the largest undisturbed Revolutionary War site in the country, is a National Historic Landmark owned by the Fort Ticonderoga Association and the Vermont Division for Historic Preservation.

The impressive Wilcox-Cutts house has been placed on the National Register of Historic Places and that building along with the Congregational Church, Chipman's Point, and the Town Hall are recorded in the Historic American Buildings Survey. Significant archaeological resources have been discovered along the Lake Champlain and East Creek shoreline, and a prehistoric site on East Creek has been placed on the National Register.

The town encourages the owners of historic structures to respect the community heritage that is expressed in these buildings and maintain them in a manner that will ensure that they can be lived in and appreciated by future generations. The town should discourage the demolition of historic homes and substantial modifications to their exterior appearance that would result in the loss of their architectural integrity. Orwell's regulations should offer flexibility for the adaptive reuse of historic structures to ensure that they can be renovated for a new use when their original purpose is no longer relevant or economically viable.



3.2. Town Facilities and Lands

A. Municipal Buildings

The Orwell town office was constructed in 1975 and is the center of town administrative and legislative activity. The office is used by the town clerk, as well as by numerous other officers and boards of the town. A paved parking area was constructed adjacent to the office in 2005. In 2017, the Orwell Town Clerk's office had some renovations done including interior painting, replacement of the carpet, and the repair/ replacement of the partial foundation. The town office meeting room seats around 20 people comfortably. Larger meetings are held at the town hall in either the downstairs cafeteria or the upstairs gymnasium. The town hall is primarily used by Orwell Village School, but also hosts a range of community activities. The green, located in front of the town hall is an approximately two-acre area with a historic gazebo (see Map 1. Community Facilities).

B. Libraries

The Orwell Library is located in Orwell Village in a building that is managed as a gift to the community from the Wright family. In addition to housing a collection of books and other media, the building is home to the Historical Museum and provides public meeting space. The library is focusing on telecommunications and additional programs to re-establish itself as a center of the community.

C. Cemeteries

There is one active cemetery and a number of historic burial grounds in Orwell.

D. Other Facilities and Lands

The town highway garage, and fire and rescue garage are located east of the village on Route 73. The town also has a sewage treatment plant on land off Route 22A. In 2020, the Town acquired the Town Green, subdividing it from the school district lands.

3.3. Economy

A. AGRICULTURE

For more than 200 years, Orwell's economy has been based on agriculture. In 2017, the Census of Agriculture counted 84 farms in Orwell's zip code (05760), 57 full time operators and 19 part time operators. This constitutes a significant increase in farms over both the 49 farms estimated in Orwell in 2006 and over the 2002 Census of Agriculture, which counted 35 farms in the Orwell zip code (05760). The full-time operators only increased from 36 who reported farming as their primary occupation in 2007 to 44 full time operators in 2017. Additionally, 19 operations reported receiving income from government programs. Four operations had reserved 100 or more acres of pasture land in 2017. The number of farms earning more than $50,000/yr. actually increased from 17 in 2007 to 22 in 2017. A total of 62 farms reported income less than $50,000. In 2017, a total of 41 operations claimed to produce income with the support of federal programs. Finally, 7 operations reported holding Organic certification in 2017 compared to 8 in 2007.

In 2010, a large proportion of the town's land area remained part of a large (50+ acre) parcel. Nearly 7,400 acres were conserved, mostly through the Vermont Land Trust, to ensure its continued agricultural use. In 2010, 78 property owners in Orwell, controlling 16,495 acres of land, had enrolled that land in the state's Current Use Program, gaining a total tax savings of $324,368.

The trend towards consolidation into fewer, larger farms, which has been ongoing for more than 150 years, continues. In recent years, a new trend in small agricultural businesses that produce high-quality, specialty products seem to be emerging. While dairy farming remains the largest segment of the town's agricultural economy, over the past several decades, Orwell's farms have clearly diversified. Unfortunately, most of these new farms have not grown enough to make incomes significant enough to allow their owners to operate the farm full time. If the town is to retain a viable agricultural economy in the 21st century, it will need to support diversification of farm businesses and development of associated value-added enterprises that allow these small farm operations to produce enough Income to support the farms continued operations.

B. NON-FARM BUSINESSES

While farming remains an important component of the community's character, it is no longer the only significant source of income generated in the town. Over the past several decades, Orwell's non-farm economy has grown. However, this growth has seen a recent decline. According to the Vermont Department of Labor (VDOL), in 2019 a total of 167 individuals worked in 36 Orwell establishments. The number of people working in Orwell grew from fewer than 100 employees in the early 1980s, to a high of 288 people in 2002. By 2010 it had dropped to 173 people and has dropped another 6 people between 2010 and 2019.

The VDOL figures do not fully capture the amount of economic activity occurring in town, since they do not include the self-employed and most agricultural workers. Nearly one quarter of Orwell's employed individuals reported some self-employment income on the 2019 Census.

The number of people working from home in Orwell is substantial, especially if you include part-time self-employed Individuals working second jobs to supplement their income. In the past, this trend was likely due to a combination of small business development, telecommuting and self-employment driven by a slow economy. In 2020, there has been a significant increase in individuals working from home as employees and businesses adjust to the new environment created by the Covid-19 pandemic. It is expected that many in-person jobs prior to the pandemic will remain remote in the future.

This has created, among other things, an increase in computer and internet access throughout the state and in the Town of Orwell.

Home businesses offer their operators and the community as a whole many benefits including eliminating the need to commute, promoting a sense of community as residents do not leave town for work each day, providing alternatives for working parents, and increasing economic activity in town. However, businesses can have an impact on their neighbors especially if they are located in a compact residential area or involve activities that increase noise, traffic, etc. It is also important to recognize that a successful home business can outgrow its location in a residential setting over time. To ensure that businesses can be carried on in a manner that is compatible with the area in which they are located, Orwell needs to support the ability of residents to work from home while protecting neighbors from potential adverse impacts. Orwell should also provide options that would allow for successful home businesses to grow while remaining in town.

3.4. Education and Childcare

A. SCHOOL FACILITIES

Orwell maintains its own local K-6 school, the Orwell Village School, while the town's junior high and high school students attend Fair Haven Union High School in Fair Haven. Residents of Orwell have access to vocational education and training at the Stafford Technical Training Center in Rutland or by tuition to the Hannaford Career Center in Middlebury.

The Orwell Village School is housed in an approximately 23,600 square foot brick building constructed around 1945 in the village center. An addition to the school was completed in 1989, which raised the absolute maximum capacity of the school building to 195 students. The bond for that project was paid off in 2009.

The school building currently contains 15 classrooms for kindergarten through eighth grade students. School administration has identified a lack of storage space throughout the school and within individual classrooms as a concern. The bus barn is used for storage; however, space is limited when the buses are parked in the garage during the winter months. Space is also needed for individual and small group tutorials and an ADA accessible restroom. Additionally, there is limited space for the school custodian to complete a variety of construction/maintenance projects.

The adjacent Town Hall, a former Methodist Church, provides space for physical education, assemblies and a lunchroom. Located next to the school is a bus barn used for storage of buses and equipment. The playground area and several small ball fields located away from the school proper comprise the remainder of the school facilities.

The Village School is also a large employer in Orwell, employing around 26 people. The school's 2011 budget was approximately $1.9 million and the town spent more than $527,000 to send high school students to Fair Haven during the 20011-12 school year.

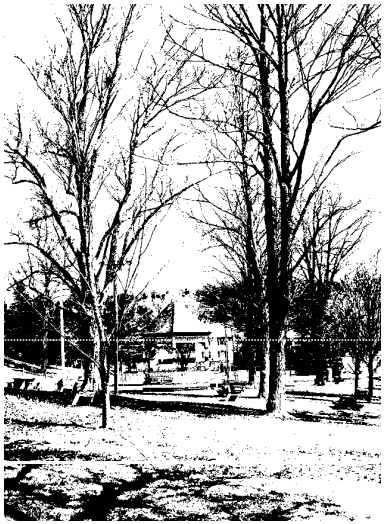
B. ENROLLMENT

The 2011-12 enrollment at the Village School was 131, while 56 students attended Fair Haven High School. Hence, enrollment at The Village School Is down 20 students or about 86% of what it was in 2005-2006. However, due to the relatively low student population at the Orwell Village School, small changes in enrollment numbers can have a significant impact. The percent change in enrollment from year-to-year has recently been as much as 10 percent.

School enrollment trends have fluctuated over the years. Generally, any change in enrollment is heavily influenced by a significant increase or decrease in the age cohort entering kindergarten in a given year. Monitoring birth rates and school enrollment is important for planning to meet education needs. In 2022 9 births were registered to Orwell residents. However, adoption or external factors causing a significant number of families to move into or out of the community can have an impact that is often not possible to foresee.

C. CHILDCARE

There are four registered childcare homes operating in town; there are also a number of accredited childcare centers and registered child care homes in neighboring communities. The majority of Orwell's parents are working outside the home, 85 percent of Orwell's preschoolers and up to 77 percent of school-age children likely require day care or after-school care while parents' work.



3.5. Recreation

Recreation resources and facilities in Orwell include the half-acre ball field and recreation area off Route 22A, the Orwell Village School playground and the Town Green.

There are around 24 miles of Vermont Association of Snow Travelers (VAST) trails in Orwell, which are located on private property. These trails may only be used in the winter and in accordance with VAST regulations. The E.A.S.T. Club, to which a number of Orwell residents belong, is responsible for signing and maintaining the trails each year. Two of the Lake Champlain Bikeways routes pass through town and the Lake Champlain Paddlers' Trail travels along Orwell's shoreline.

The Mount Independence State Historic Site and three Wildlife Management Areas – East Creek, Richville and Pond Woods WMAs – are located in town (for more information on the WMAs, see page 45). There are several public access points within the WMAs. Mount Independence has a well-developed trail system on their roughly 160-acre property. There are currently two private campgrounds operating in town at the Plunder Bay and Chipman's Point marinas.

There is an informal access point to Lake Champlain at the end of Singing Cedars Road and three private marinas on Lake Champlain in town. In 2005, a state boat launch site was established at Chipman's Point. Given the quantity and quality of the lakes, ponds and streams in town, the number of publicly owned access points is limited. Improved public access to Lake Champlain and Sunrise Lake would be desirable. Orwell and Benson have jointly explored the possibility of providing public access to either Sunrise or Sunset Lake in the past. Orwell should continue to cooperate with the Town of Benson to improve public access and to establish a public beach and services at Sunset Lake.

Access to outdoor recreation is a critical component of the rural character valued and rural lifestyle enjoyed by Orwell's residents. Vermont law allows people to hunt, fish, and walk on private property without permission unless the land is legally posted. Access to many of the town's outdoor recreation resources has traditionally been by permission of private property owners, but in many rural towns as property changes hands or is subdivided and developed more 'no trespassing' signs are posted.

A 1998 amendment to Vermont's Landowner Liability law increased landowner protection for allowing recreational users on private land. Vermont law clearly states that no owner is liable for any property damage or personal injury to a person who uses the property for recreation, providing a fee is not charged. The strong landowner liability protection laws make it very difficult for a party to bring a successful suit unless the landowner has intentionally created a danger or engaged in willful or wanton misconduct. Orwell encourages rural landowners to allow recreational use of their property and encourages respectful, responsible recreational use of such lands.

3.6. Transportation

There are more than 75 miles of public roads in Orwell, as well as an additional five miles of private roads. The town's major transportation corridors are two state highways – Route 22A, classified as a minor arterial, and Route 73, classified as a major collector. The State Highways constitute a little over 11 miles of the roadways in Orwell, leaving 64 miles of roadways for which the Town Is responsible.

A. STATE HIGHWAYS

Route 22A runs north-south along the western side of town and travels 9.66 miles through Orwell between the Benson and Shoreham town lines. The 2017 Vermont Truck Route Map shows Route 22A as one of the preferred truck routes, alongside U.S. Route 7, U.S. Route 4 and other major highways. A 2019 study showed that approximately 30 tractor trailer trucks an hour along VT 22A occur from 6am to 8pm, or about one truck every two minutes. Large truck traffic persisted through all hours of the day with at least ten trucks per hour overnight. In 2017 and 2019, counts were conducted of truck traffic carrying hazardous materials as it traveled through the region. The study included monitoring on 22A in Vergennes as one of the major truck routes in the region. Since most traffic on Route 22A in Vergennes originates from New York and enters Route 22A south of Orwell, most of the trucks counted in Vergennes also passed through Orwell. The majority of hazardous cargo consisted of petroleum products (Methane/Natural Gas, Diesel Fuel,

Butane/Propane, Gasoline/Gasohol, and Kerosene) as well as corrosive chemicals, refrigerated liquid Nitrogen, and some Hazardous Waste. As of 2023, the average daily traffic (ADT) on 22A south of the Route 73 intersection was 3,569 vehicles, a decrease from the peak ADT of 3,863 in 2019. VTrans repaved 22A south of Route 73 in the autumn of 2022. Shoulder reconstruction and widening of the roadway south of Route 73 is scheduled for 2025. A road rehabilitation project north of Route 73 is anticipated for 2026.

As a state highway, Route 73 runs east-west approximately five miles between the Sudbury town line and Route 22A. West of Route 22A, Route 73 becomes a Class 2 town road, which travels northwest to the Shoreham town line eventually ending at Route 74 near Larrabee's Point and the Fort Ti Ferry landing. ADT on the state highway portion of Route 73 outside the village center was 1,130 vehicles in 2018. ADT within the village center was 1,297 in 2022. At both locations, traffic decreased dramatically during the peak of the Covid pandemic, but has rebounded since. There are no other discernible trends in traffic volumes. Pavement conditions along the state highway portion of Route 73 are rated as Good in the east to Fair in the west based on data collected in August 2022. .

The 22A-73 intersection was identified by VTrans in the early-1990s as a high crash location, resulting in a project to raise the road to improve sight distance. Given the increased amount of high-speed traffic, especially truck traffic, on Route 22A, improving safety along this stretch of highway continues to be an ongoing concern. In 2012 VTrans and the Rutland Regional Planning Commission conducted a Corridor Study of Route 22A up to its intersection with Route 73 in Orwell. The Town of Orwell and Addison County Regional Planning Commission also participated in the Study. The Study reconfirmed the inadequacies on Route 22A noted above. The High Accident location data from VTrans for the years 2012-2016 no longer listed the Route 22A intersection with Route 73 as a high accident location. In the last five years (February 2018 to February 2023) 54 crashes have been reported in Orwell to the VTrans Public Crash Data Tool with 36 of these crashes taking place along 22A. Of these crashes, 24 took place south of the Route 73 intersection, four in the vicinity of the intersection, and eight north of the intersection.

Access management techniques can be used to reduce congestion and maintain safety levels on heavily traveled roads as adjacent lands are developed. The Vermont Agency of Transportation controls access to state highways and requires permits for new access points. Orwell should support the state's access management efforts by promoting use of shared drives and carefully reviewing the traffic patterns, access points and parking areas proposed for new development near the state highways and heavily traveled town roads.

Route 73 is also Orwell village center's Main Street. The speed limit on the road from just east of the town garage to the 22A intersection is 35 miles per hour. Busy roads are both a blessing and a curse for downtowns and village centers. The traffic may help support a vital commercial area, but it can also

bring unwanted noise, dirt and pollution, and discourage people from parking their cars and walking. Traffic calming techniques should be used on Main Street to create a safe, pleasant environment for the village center.

There are historic, slate sidewalks within the village center, which the town would like to restore. Additionally, there are plans to construct additional sidewalks within the center. As village-scale development proceeds outward from the village center, the sidewalk network should be extended.

B. Town Roads and Highway Department

Orwell has around 64 miles of town roads, 49.46 of which are Class 3. Another 14.5 miles of town road are Class 2. In the late 1990s, the townspeople voted to not have any additional sections of road.

The town's road network has remained largely unchanged for more than a century. The few new roads built in town during the 20th century were private and it should be anticipated that most of the roads built in town in the future will be private as well. It is unlikely that the town will change its policy on accepting development roads as long as doing so is a financial liability to the taxpayers.

Whether new roads are public or private, it is critical that all roads are built to basic standards appropriate for the town's climate in order to protect public safety, infrastructure and the environment. The town will require new roads be constructed to A-76 or B-71 state standards. The town will utilize the standards and practices recommended by the Better Backroads Program on local roads and encourage their use by those constructing and maintaining private roads as well.

Orwell has a two-person Highway Department, which is responsible for maintaining town roads and facilities. Regular maintenance and repair of the town's road network represents a significant portion of the municipal budget.

In 2005, Orwell received a grant to inventory the condition of their highway infrastructure, prioritize road projects and prepare a capital budget. A culvert inventory was completed for Orwell in 2009 and 2018, which provided detailed assessment of the condition of culverts and identified those most in need of replacement. These inventories should be used to provide a rational basis for scheduling and budgeting road maintenance and improvement projects, and should be regularly updated so they remain useful tools for capital planning.

C. Other Transportation Facilities

In 2009 Orwell designated all of Route 73 and the Mount Independence Road as portions of the Lake Champlain Byway. The purpose of the Byway in Orwell is to encourage economic development by supporting the intrinsic resources of the Lake Champlain Byway within the Town of Orwell. Some of these resources include Orwell's historic village and businesses adjacent to Route 73; Mt. Independence, the State Park surrounding the colonist's fortifications along the shores of Lake Champlain during the Revolutionary War, and other numerous opportunities for recreational and tourism activities available in Orwell. Orwell benefits from the tourism and marketing offered through the byway, including the State and Lake Champlain byway websites for travelers, signage and brochures.

There are no public transportation facilities located in Orwell, although there is public transit available in Addison County through Tri-Valley Transit (TVT). TVT coordinates transportation for a number of human service agencies serving Orwell residents. TV Maintains a pool of volunteer drivers who use their own vehicles (and who are reimbursed for their mileage) to provide the majority of trips for passengers in outlying communities. In 2021, 71 %

of Orwell's workers drove alone to work, while only a little more than 5% carpooled and another 5% walked to work. The average commute was 25 minutes. A park-and-ride location in Orwell would be desirable.

There are no air or rail transportation facilities in town. Passenger rail service is available from Amtrak stations in Middlebury, Rutland, and Ticonderoga, N.Y. There is a general aviation airport in Middlebury, but the nearest passenger air service is out of Burlington International Airport. There are three marinas in town located on Lake Champlain (see page 22).

3.7. Utilities and Energy

A. Water Supply

Currently, there are no municipal or public community water systems in Orwell. There are four public water supplies, as defined by the Vermont Agency of Natural Resources, serving the Orwell Village School, Chipman's Point Marina, Mount Independence State Historic Site, and the Town Office. The rest of the town relies on private wells. For further discussion of groundwater supply, quality and protection see section 4.3.

In response to droughts in the 1960s, several of Orwell's neighboring towns formed water districts and cooperatives that brought piped water to homes and farms. Instead of installing a public water supply, Orwell decided to use available federal funding for the installation of a municipal wastewater treatment system to serve the village. In the decades since, interest in a public water system has resurfaced several times

B. Wastewater Treatment

Orwell has a small municipal sewer system serving the village center, which discharges into East Creek. There are approximately 94 hook-ups on the system, most of which are single-family homes but also including businesses and public buildings. The small lagoon system is currently discharging between 5,000 to 13,000 gallons per day. The facility has a permitted flow of 33,000 gallons per day.

The plant is allocated an annual phosphorus discharge of 0.228 metric tons under the 2002 Phosphorus TMDL (Total Maximum Daily Load) for Lake Champlain, which is about three times what the plant currently discharges. This number has been confirmed in the 2016 TMDL plan for Lake Champlain.

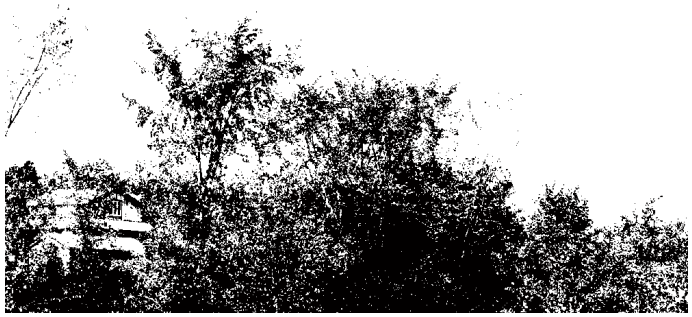
Outside the village, property owners rely on onsite septic systems, which require specific soil conditions to adequately treat wastewater. The Vermont Agency of Natural Resources has rated soil types based on their suitability for septic systems resulting in four major classifications – well suited, moderately suited, marginally suited and unsuited/unrated.

Examining the county soil maps prepared by the Natural Resources Conservation Service indicates that 46 percent of Orwell's soils are marginally suited for onsite septic systems and another 40 percent are unsuited. Only eight percent are well suited and the remaining six percent are moderately suited. While this soil information is not site specific, it does clearly indicate the constraints to development dependent on onsite systems in Orwell.

C. Solid Waste

There are no solid waste management facilities in Orwell and the town does not provide trash collection or disposal. These services are provided by private haulers and the Addison County Solid Waste District (ACSWD), of which the town has been a member since 1989. Currently, the district trucks its waste to sanitary landfills out of the county. Recycling is mandatory and the burning of household trash is illegal.

In 2009, ACSWD estimated the per capita solid waste generation rate in the district to be approximately 4 pounds per person per day. However, while the total number is an increase over previous years, for the first time, the amount of trash being diverted or recycled exceeded the amount of trash merely being landfilled. The average person in the district recycled about 2.06 pounds of waste per day and threw away about 2.03 pounds of waste per day. Orwell residents and businesses recycled nearly 101.5 tons of solid waste, according to ACSWD, or more than 667 pounds per household each year.



D. Electricity and Telecommunications

Electricity is supplied in Orwell by CVPS. There are no electrical substations or transmission lines in town. As new electric distribution and telecommunications lines are required in town, they should be installed underground wherever feasible. This will promote aesthetically pleasing development and increase the reliability of the infrastructure.

Telecommunications services in Orwell include landline phone service provided by Shoreham Telephone Company (Recently sold to OTT Communications), which also offers high-speed internet access over DSL. The Library and several local businesses in the village provide open Wi-Fi access. The school is also adopting technology to promote broadband use and literacy. Cellular phone service is provided by a number of national companies, but service remains spotty in some areas of town.

Orwell is a participating member of the Addison County Communications Union District (operating as Maple Broadband) to increase available broadband resources to community members.

There is an existing telecommunications tower located atop Knox Hill, which currently hosts antennas for several service providers and has recently been improved. It is Orwell's policy to promote co-location at this existing tower location or use of existing structures such as silos or steeples over the construction of new telecommunications towers in town. Applicants proposing to construct a new telecommunications tower will be asked to prove that the current tower or other existing structure in town cannot be used before new structures will be considered.

E. Energy

Energy consumption is an essential component of our modern way of life; it has and will continue to influence land use and development patterns. As fossil fuel energy prices appear to be headed higher than the peak prices of the 1970s and with increased public awareness of the impact of our fossil fuel use on our society and the environment, energy efficiency is becoming an increasingly important factor in many personal and community decisions. The cost of fossil fuels, both through price and impact on our environment will require changes to our daily lives such as living closer to where we work, using services that are conveniently located, seeking transportation alternatives, living in more efficient homes, and buying more efficient appliances. Some of these changes have already begun as alternative energy and energy efficiency technologies become widely available and competitively priced. However, current conditions indicate greater changes to come in the interest of energy security and environmental safety.

After transportation, the other major form of residential energy consumption is for heating and cooling; around two-thirds of the energy used in Vermont homes is for space heating/cooling and making hot water. Currently, more than 49 percent of Orwell's residents heat their homes with fuel oil and another 18 percent rely on propane; approximately 31 percent heat with wood.

Efficiency Vermont has programs and resources to help customers reduce their monthly electric bills, including information about rebates and tax incentives available for energy-saving purchases (information available at www.efficiencyvermont.com). Income-eligible households in Orwell can participate in the Weatherization Assistance Program, as well as the Fuel Assistance Program, offered by the Champlain Valley Office of Economic Opportunity (information available at www.cvoeo.org).

Vermont has a Residential Building Energy Code that sets a minimum standard of efficiency for new homes and residential additions over 500 square feet. Additionally, simple site planning such as locating buildings to maximize southern exposures and providing windbreaks can reduce the amount of energy required to heat and cool structures. For more information on energy efficiency and renewable energy sources contact the Vermont Department of Public Service (publicservice.vermont.gov).

As technology costs decline and oil prices climb, there is increased interest in renewable energy sources including residential-scale wind and solar power. Orwell could further promote energy efficiency, renewable energy sources and construction of green buildings through performance standards and incentives.

Orwell supports property owners who want to install residential-scale alternative power generation on their property to the extent that such a project does not have the potential to cause adverse physical or environmental impact on neighboring property. Small-scale energy generation facilities should be encouraged in all districts where single-family residential uses are allowed.

3.8. Public Health and Safety

A. Fire and Rescue

Orwell has a local volunteer fire department, the Orwell Fire Department, and a first response rescue squad. Middlebury Volunteer Ambulance Association responds to medical emergencies in town as well.

The fire department and first response squad are based from a station on Route 73 east of the village center. The building was constructed in 1966 with a 2006 addition.

The fire department has around 22 active members and responds to approximately 35 calls each year. The first response squad numbers have dropped from around a dozen to only about eight members. They have been responding to an increasing number of calls in recent years averaging about 100 calls per year (see Figure 41).

B. Law Enforcement and Crime Rates

The Vermont State Police and the Addison County Sheriff provide police protection in town. Crime rates in Orwell are low; the majority of crimes reported in 2008 were property offenses such as burglary, larceny or vandalism.

C. Emergency Management

Orwell had actively participated in Addison County's Community Emergency Response Team (CERT) program, which had resulted in a number of town residents becoming better trained to assist their neighbors during an emergency or disaster. However, after the State failed to call the CERT teams into action during tropical storm Irene, the majority of Orwell's members quit in protest. Most will not return unless CERT is coordinated into Vermont Emergency Management's response efforts.

D. Healthcare and Human Services

While there are no medical facilities in town, residents have access to medical care in nearby communities, including the Shorewell Clinic in Shoreham and Porter Medical Center in Middlebury. Most town residents have to travel more than 30 minutes to visit a healthcare provider. The federal government has identified the Towns of Orwell and Shoreham as Medically Underserved Areas since 1981, a designation that was last updated in 1994, based on the ratio of primary medical care physicians per 1,000 population, infant mortality rate, percentage of the population with incomes below the poverty level, and percentage of the population age 65 or over. This need should be addressed by the new clinic to be built in Shoreham, Orwell's neighboring town to the north. The new Shoreham clinic opened in 2015 built with a $1,300,000 federal grant and serving 2,000 people within the region.

There are a number of human service organizations in the area that assist Orwell residents, some of which receive financial support from the town as appropriated at town meeting.

Around 18 percent of Orwell residents reported some form of disability on the 2019 American Community Survey; 10 people reported that their disability made it difficult to care for themselves, and 31 individuals had difficulty living independently. A total of 35 percent of residents identified as having a disability in 2019 were seniors over the age of 65 while the greatest number of individuals who identified as disabled were between the ages of 35 and 65, representing 36% of the total disabled population. Given that Orwell's population is aging, one also expects the disability numbers among Orwell's elderly population to increase at a corresponding rate.

As the number of elderly people in town increases, there will be greater demand for supportive services that will allow residents to remain in the

community, living independently as they age. Improved medical care has resulted in longer, healthier lifespan, but it also has increased the number of senior residents requiring care – a trend that is expected to continue. Residents have expressed their support for building elderly housing in Orwell's village center that would meet the needs of the town's older residents and allow them to remain in the community as they age.

3.9. Fiscal Condition

Orwell's 2022 total taxes raised and voted on at Town Meeting was about $833,404.47 raised from a grand list of $151,983,500.00 for an effective town tax rate of .5484. The greatest proportion of that money was spent on road maintenance and repair, while another five percent funded the fire department and first response squadFees, licenses, state aid, grants and similar income sources funded the remainder of the budget.

Vermont's towns and school districts are largely dependent on property taxes to fund their budgets and the rates of these taxes impact land use decisions at the household and community level. In 1997, Act 60 significantly overhauled the state's school property tax system, which the legislature further tweaked in 2003 with passage of Act 68. The former introduced a statewide property tax, and the latter created two separate tax rates, one for residential property and another for nonresidential property.

Under these laws, many property owners became eligible for property tax relief. Owners of primary residences whose 2011 household income was less than $97,000 qualified for reduced school taxes on their home and up to two acres. Primary homeowners with incomes less than $47,000 qualified for a reduction in their assessment or a significant rebate on their total property taxes, including municipal taxes.

Orwell's effective tax rate in 2022 was $1.8135 for homestead property and $2.0046 for nonresidential property per $100 of assessed value.

For many years, the common wisdom in Vermont was that increasing the town's grand list (attracting development) would decrease tax bills. This has been shown not to be the case by numerous fiscal impact studies in communities around the country. As development proceeds, the cost of providing existing services and the demand for new services increases. Some towns believed that by attracting commercial, as opposed to residential, growth they could grow their tax base without increasing expenditures.

While this approach may have worked in a few Vermont municipalities, it generally did not achieve the intended outcome. The creation of the state education property tax guarantees that such an approach will not work as an increased tax base means an increased tax liability to the state. Undeveloped agricultural or forestry lands remain tax winners for communities, paying more in taxes than they cost in services.

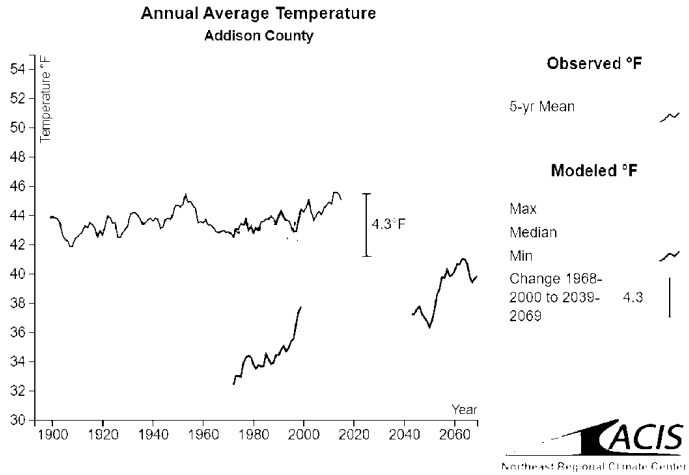
Recognizing that property taxes can be an especially heavy burden for farmers and other large landowners, owners of 25 acres or more of farm or forestland may significantly reduce their property taxes by enrolling in the state's current use program. This program was established to provide relief from the burden of large property tax bills in exchange for commitment to keep land in productive use; if enrolled property is developed, the state levies a land use change tax on it. Enrolled property is assessed based on its agricultural or forestry value instead of its value for development. In 1987, there were approximately 8,200 acres enrolled in the program.

4. The Environment

4.1. Air

A. CLIMATE

Vermont's climate is best described as variable; temperatures range greatly throughout the year and can change considerably in a given day. There can be great differences in the weather during the same seasons in different years, and considerable diversity from place-to-place. Orwell's climate is shaped by the town's location on the shore of Lake Champlain with the Adirondack Mountains to the west and the Green Mountains to the east. Moderately warm summers, cold winters and ample rainfall are characteristic of the regional climate. While Vermont is set in a belt of generally prevailing westerly winds, the direction of surface winds is considerably influenced by the north-south orientation of the Champlain Valley.



The Champlain Valley is warm and dry as compared to other regions in Vermont with an average growing season of 130 to 150 days. Average annual temperatures range between 20°F in January and 70°F in July, although periods of significantly lower winter and higher summer temperatures regularly occur. The average temperature in Addison Co. is expected to increase by 4.3°F over the course of the next 40 years leading to an increase in growing degree days and stronger storm events.

Given Orwell's location near the lake, the town's temperatures are somewhat warmer and precipitation amounts lesser than places further from the lake. The last spring freeze is typically in early May while the first fall freeze is generally after October 1. The moderating influence of the lake protects adjacent areas from early fall and late spring freezes, although some areas in the valley are susceptible to frost on calm, clear nights as cold air drains and settles into the lowlands.

Average annual precipitation is around 35 inches, including the water equivalent of snowfall. Depth of snowfall ranges considerably from year-to-year, but averages around 60 inches over the season. The period of continuous snow coverage is typically from early December to early March, although up to 20 percent of winters may not have a period of continuous snow cover longer than one month. Average temperatures have risen over historic norms in recent years. While this has brought less severe winter weather, it has also resulted in prolonged periods of summer heat and storms of greater intensity. While these changes have been attributed as a result of global warming caused by industrialization and development, exactly how much is

due to normal fluctuations in climatic conditions is unknown.

B. Air Quality

Air quality is generally high throughout Vermont, especially in rural towns like Orwell. The federal Environmental Protection Agency requires each state to monitor the levels of six criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, airborne lead particles, and total atmospheric particles.

Vermont measures criteria pollutants at seven locations around the state: Burlington, Rutland, Bennington (two sites), Underhill, Barre and Brattleboro. The Vermont Air Pollution Control Division monitors these six along with many other pollutants in accordance with the state's Hazardous Ambient Air Standards. Levels of air pollution in Vermont currently meet federal standards. (More information available from the Vermont Department of Environmental Conservation Air Pollution Control Division).

Acid rain, which is caused by air pollution, is affecting environmental quality in Vermont. Acid rain causes acidification of lakes and streams and contributes to damage of trees, especially at high elevations. In addition, acid rain accelerates the decay of building materials such as stone and metal. Power plants, industrial manufacturing and motor vehicles are all sources of pollutants that are ingredients of acid rain. These pollutants become part of the air masses circulating in the upper atmosphere, which flow predominantly into the Northeast. Prevailing winds transport the polluting compounds, sometimes hundreds of miles, across state and national borders. The industrial Midwest is responsible for about half the sulfur dioxide emissions east of the Mississippi.

Unlike more industrialized places, motor vehicles are the largest source of air pollution in Vermont; vehicles emit ozone, particulate matter and chemical compounds. While technology and emission controls have greatly reduced the amount of pollution vehicles produce, the number of vehicle miles driven in Vermont has doubled since 1972.

The Federal Highway Administration estimated that the total number of vehicle miles driven in Vermont during 2009 was approximately 15000 miles per licensed driver (in 1950, the average number of miles driven per person in Vermont was around 3,100). The 2019 American Community Survey reported that 50% of Orwell households have access to two vehicles, with nearly 1/4 of households having access to 3 or more vehicles.

Places where traffic is congested or vehicles sit idling often have very low air quality. Weather patterns can also influence whether pollutants will disperse or remain concentrated close to the ground. Lower air quality has been linked to human health problems and can impact the natural environment as well.

International Paper's test burned tire-derived fuel (TDF) at its Ticonderoga Mill In 2006, which brought increased focus on air quality and its connection to human health. While it appears that IP will not be proceeding with its plans to burn TDF in one of its boilers, the Town of Orwell maintains its position that International Paper should not be permitted to increase its air pollution above its current permitted emission levels.

4.2. Land

A. Geology and Landform

Orwell straddles two of Vermont's biophysical regions – the Taconic Mountains and the Champlain Valley. These regions are largely defined by their geologic histories and resulting landforms (see Figure 46). The bedrock of the Champlain Valley originated some 500 million years ago during Ordovician times and is largely composed of limestones, dolomites, and shales. These are some of the oldest rocks in the northeast and many contain fossil evidence of their marine origin. Most of Orwell's bedrock consists of limestones and dolomites. The bedrock that makes up most of the Taconic Mountains are metamorphosed mudstones that originated in Cambrian and Ordovician times that were later thrust westward during the Taconic Orogeny, a period of great geologic activity about 450 million years ago. These rocks include slate, phyllite and schist and can be found in the higher elevation areas of town. The region is well known for its colorful slate, most of which is located south and west of Orwell. Younger limestones and marbles that were buried by the Taconic mass underlie the older metamorphic rocks; there is abundant water moving through these stones feeding numerous springs and streams.

In more recent geologic time, glaciers transformed the town's landscape. The glacial ice advanced and retreated, reshaping the surface by scouring some areas and depositing material (boulders to fine clay particles) in other locations. Approximately 13,000 years ago as the glaciers began to melt; the valley was filled up to approximately 650 feet in elevation with the south-flowing Glacial Lake Vermont. After the glaciers receded, between 12,500 and 10,000 years ago, the Atlantic Ocean flowed south into the depression caused by the weight of the ice. Seawater filled the Champlain Valley up to an elevation of approximately 300 feet to form the Champlain Sea.

Fine-grained clay and silt were deposited on the bottom of Lake Vermont. These clays and silts have low permeability and water runs rapidly off of them. Sand deposits were created where streams of glacial melt-water flowed into the lake. Sands have higher permeability and infiltration rates, but unlike clay deposits, they are not cohesive and are easily eroded. This geologic history means that Orwell's surficial deposits are primarily unconsolidated and prone to erosion with relatively low infiltration and high runoff potential. On the hills above the shoreline of Glacial Lake Vermont, the bedrock is blanketed with glacial till, a conglomerate of many different sizes of rock that was laid over the bedrock at the base of the glacier.

Elevation in Orwell ranges from approximately 100 feet above sea level at the Lake Champlain shoreline to 988 feet atop Knox Hill to the north of Sunset Lake (see Map 4). While most of Orwell's land is fairly level, along the Lake Champlain shoreline and on the hillsides in the southern part of town there are areas with steep slopes. Slope is a significant constraint to development; it can limit the capacity of soils for treating wastewater, as well as increase the potential for unwanted erosion and stormwater run-off. Slopes in excess of 15 percent require special consideration if they are to be developed and those in excess of 25 percent are generally unsuited for development (see Figure 48). Most of the town's steepest lands are currently forested, which prevents soil loss (tree leaves slow and disperse rainwater, while root systems hold soil in place). Shoreline erosion and slumping is an ongoing concern for Orwell's lakeshore property owners. Retaining woody vegetation and limiting the amount of impervious surface on and adjacent to the town's steep slopes and shorelines will reduce the potential for erosion and associated water pollution.

Commented [14]:
Do we need a slope map too?

B. Soils and Earth Resources

Soils form the natural medium for plant growth, absorb rainfall and runoff, and naturally filter and purify water. As described above, Orwell's soils

originate from two main sources: materials deposited when the Champlain Valley was underwater and glacial till deposits. The soils are grouped into associations of major and minor soils with similar characteristics (see Figure 50). An understanding of the town's soils – their potential for and constraints on agriculture, development and other activities – is an essential component of land use planning. Orwell has a limited amount of land with soils that are well suited to treating wastewater with conventional, soil-based septic systems.

The Natural Resource Conservation Service has assessed Orwell's soils based on their potential for agricultural productivity. There are approximately 1,570 acres of prime farmland in town. There are another 13,750 acres of land in town with soils of statewide importance. Soils that are generally better suited for onsite septic disposal are often high-quality farmland, which has led to the loss of agricultural soils throughout Vermont. Through Act 250's Criteria 9B, the state has a policy to preserve primary agricultural soils (Map 9).

The Natural Resource Conservation Service has also analyzed Orwell's soils to determine their forest productivity. Through Act 250's Criteria 9C, the state has a policy to preserve important forest soils. There are approximately 8,300 acres of non-agricultural soils assessed as having the potential to support commercial forestry in Orwell (Map 9).

There is no commercial resource extraction currently occurring in Orwell, the town's last sand and gravel business has been inactive for several years. There are two small areas with deposits of sand or gravel, according to state maps, and some parts of town are underlain by shale bedrock. Historically, stone was quarried for local building needs and there are some indications that veins of marble may run through town. It is unlikely that the earth resources in Orwell would be considered for large-scale extraction. Still, the town should continue to regulate resource extraction to ensure that any extraction that does occur in the future does not unduly impact environmental quality or the character of the community.

C. Land Cover

The natural state of most of the town's land is forest; before European colonization, most of the lowlands would have supported a clayplain forest composed of red maple, beech, hemlock, swamp white oak, bur oak, white oak, white ash and shagbark hickory. Near the lake on calcareous soils, northern white cedar would have been common. The northern hardwood forest would have blanketed the upland hills with sugar maple, American

beech, yellow birch and hemlock predominating.

For about the first 200 years following European settlement, the agricultural areas of the Champlain Valley had a relatively stable land use pattern. The original native forest had been largely cleared and turned into farmland by the early-1800s. Hilltops, wet areas and other places not as useful for growing crops or pasturing herds were left as woodlots, which provided firewood, lumber and a potential source of income in time of need. Hedgerows defined the fields, running along the edges of roads, property lines and small streams. The hedgerows were essential to the survival of some of the native forest species as they allowed for connections and movement between the relatively small woodlots.

This pattern began to change in the 20th century as some of the less viable farmland was abandoned. This was followed by the transition to larger farm machinery, which led to the merger of smaller fields, often resulting in the elimination of hedgerows. The woodlot ceased to be a necessary part of a farm and thus often became the most expendable land to be sold for development. Over the second half of the century, residential development began to occur in and around the edges of wooded areas throughout the Champlain Valley. So despite increases in the total amount of woodland over the past century in the valley, the ecological functions of the forest have in many places declined resulting in a poorer quality habitat for wildlife.

4.3. Water

A. GROUNDWATER

Groundwater recharges wetlands, streams, rivers, lakes and ponds; it is a fundamental component of the natural environment. The quality of groundwater varies due to both natural and human influences. There has not been a systematic assessment of the quality or quantity of Orwell's groundwater supply, despite the fact that the entire town relies upon this resource for potable water – the same situation is found throughout Vermont as no statewide assessment of groundwater has been completed.

The information available from the state's 1976 Geology for Environmental Planning map series indicates that the potential for obtaining large volumes of groundwater in Orwell is generally low, except in a small area just to the east of Chipman's Point and continuing north to the town line and in a narrow area that runs parallel to the town line with Sudbury and Whiting.

These maps provide a general picture of groundwater potential, but they are not suitable for regional or town planning due to their scale and lack of

topographic detail. More detailed information about the location and quantity of groundwater, as well as groundwater recharge areas, would be beneficial when planning for appropriate growth and development in the town.

The majority of Vermont's groundwater is classified as Class III, which means it is suitable as a source of water for individual water supply, irrigation, agricultural use, and general and commercial use. Most groundwater in Vermont is potable with little or no treatment and with the exception of several notable periods of drought, potable water is generally plentiful. All activities within a recharge area directly affect the quality and quantity of groundwater. Increases in impervious surface and filling of wetlands reduce the amount of rainfall and snowmelt that can percolate through the soil to recharge groundwater supplies.

Non-point pollution from developed lands or agricultural run-off, leaking underground storage tanks, or accidental spills can contaminate groundwater. As concerns over contamination and inadequate drinking water supplies in some areas increase, the state is taking steps to increase the understanding and protection of this vital resource. The prime focus of groundwater regulation has been on monitoring, treatment, operation, and infrastructure needs of public water systems. Additional regulations that address groundwater are often in reaction to contamination. The state Agency of Natural Resources Water Supply Division requires water quality monitoring at public community and non-transient non-community water systems.

The town's public water supplies have state-mandated SPAs and Source Protection Plans. The state began regulation of potable water supplies in the 1970s. Beginning in 1982, Wellhead Protection Areas were delineated for public water supplies. A decade later, that program has evolved resulting in the delineation of Public Water Source Protection Areas (SPAs) and development of Source Protection Plans for community water supplies.

Source Protection Plans identify potential sources of contamination within delineated SPAs, assess the risk of contamination, and describe how risks and emergencies will be managed. In order to limit the potential for contamination within the town's SPAs, Orwell should enact regulations within a groundwater protection overlay district to provide additional review of land uses within the SPAs and restrict development that could contaminate the water supplies.

Unlike its many neighboring communities in the 1960s, Orwell constructed a municipal wastewater treatment system to serve its village center and chose not to become part of a water district that would have provided piped water throughout town. Currently, there are approximately 265 private wells in Orwell, which provide virtually all the potable water consumed by town residents. Property owners with onsite wells typically do not regularly test their drinking water to ensure its quality. The same issues with contamination that affect community supplies can also endanger individual wells.

B. WETLANDS

The 2006 Vermont Significant Wetlands Inventory identified approximately 1,450 acres of wetlands in Orwell. A large percentage of these wetlands are

associated with and located adjacent to East Creek and the Lemon Fair River (see Map 5).

Wetlands serve a number of important ecological functions, but for many years their value was not recognized. As a result, wetlands have been drained and filled for development or agricultural use. Currently, both federal (Army Corps of Engineers) and state governments regulate wetlands in order to prevent further loss of these critical environmental areas. Orwell should support efforts to protect significant wetlands by ensuring that adjacent land uses do not impair the important habitat, filtration and flood control functions of the town's wetlands.

C. Surface Water

Two major streams – East Creek and the Lemon Fair – as well as numerous smaller creeks and brooks flow through Orwell. The Lemon Fair originates at Johnson Pond in the southeastern corner of town and flows northward crossing over into Shoreham where it is impounded to create Richville Pond and continuing north until it ultimately empties into the Otter Creek in Weybridge.

East Creek, with its North and South Forks, is one of the town's distinguishing features. East Creek flows north, draining a low-lying part of the Champlain Valley. Mt. Independence borders the west bank of the river mouth. Other small, steep hills separate the river valley from Lake Champlain. Near the mouth of the creek, the adjacent lands form a natural emergent marsh. The state has dammed the South Fork of East Creek with three impoundments, which provides extraordinary waterfowl habitat in the low-lying lands adjacent to the creek. Agricultural runoff carries nutrients into the water, causing profuse aquatic plant growth including pondweed, bur-reed, narrow-leaved arrowhead, narrow-leaved cattail, bulrush, reed, sedge, duckweed, smartweed and purple loosestrife (invasive). Some uncommon plants occurring in the East Creek marshlands are lake cress, slender naiad, green dragon, sweet joe pye weed, false hop sedge and cat-tail sedge. The area contains Vermont's largest narrow-leafed cattail marsh, with a good deal of wild rice as well. Approximately 400 acres of land along East Creek is part of a state-owned Wildlife Management Area.

Small mammals are numerous near East Creek and include wetland species such as the star-nosed mole and water shrew. Beavers, muskrat and otter ply the wetland; while fox, coyote, mink, white-tailed deer and cottontail rabbit inhabit the nearby upland. This rich wetland supports a large number of birds and a great variety of wetland species including rails, American and least bitterns, green and great blue herons, common moorhens, ospreys and northern harriers. Canada geese, black and wood ducks, mallards, blue and green - winged teal and hooded mergansers inhabit the marsh. Marsh wrens, red-winged blackbirds, eastern kingbirds and Baltimore orioles are some of the many songbirds that can be found. Ospreys are beginning to nest by the creek and bald eagles may also be seen. The large aquatic salamanders known as mudpuppies may be found in East Creek. Also present are snapping, painted and northern map turtles, bullfrogs, green and pickerel frogs, and northern water snakes. Near the edges of the wetland, newts, northern two-lined salamanders, milk, smooth green, garter, and brown snakes may be encountered. East Creek has a variety of warm water fish

associated with Lake Champlain. This includes large-mouth bass, northern pike, channel catfish, yellow and white perch, and black crappie. The forks of East Creek contain brown bullhead and smaller species such as the golden and black chin shiner.

There are a number of ponds in town, the largest of which is Johnson Pond at approximately 19 acres in area. A series of ponds are located along the town's southern boundary including: Spruce Pond, Mud Pond and Choate Pond. Many of these ponds occur in conjunction with streams and wetland areas. A small portion of the southern land area flows into the Hubbardton River and on to the Poultney River. The northern tip of Sunrise Lake crosses into Orwell, although the majority of that water body and all of the adjacent Sunset Lake are located in Benson

There are approximately 1,800 res of land identified as within the flood hazard area according to the Federal Emergency Management Administration. These lands comprise the 100-year floodplain and include wetlands, lakeshore and stream bank areas that are considered to have a one percent chance of being inundated in any given year. The past decade has seen an increase in flooding in Vermont. Precipitation trend analysis suggests that intense, localized storms, which can cause flash flooding, are occurring with greater frequency. Recognizing at-risk locations is crucial to avoiding future property damage or loss of life. Taking preventive measures, such as prohibiting development in floodplains and requiring setbacks from shorelines can reduce the extent of property damage that occurs during a flood event. Such measures also can protect surface waters from pollution and related impacts associated with development.

D. Lake Champlain

Lake Champlain, which forms Orwell's western border, is the sixth largest freshwater lake in the United States; it is 112 miles long with many bays and over 70 islands. The mean water level of Lake Champlain is 95.5 feet above sea level, and the Federal Emergency Management Agency (FEMA) sets flood level in Orwell at an elevation of 102 feet above sea level.

Orwell is situated at the southern end of the lake, which is significantly narrower and shallower than the northern end. The lake is generally less than one mile wide in Orwell and it narrows at Chipman's Point to approximately 900 feet. The average depth off the town's shoreline is approximately 15 feet and the deepest point is less than 30 feet. Orwell's shoreline is approximately 10.5 miles long.

Lake Champlain is an extraordinarily important environmental, recreational and economic resource. Although only a limited number of Orwell residents rely on Lake Champlain as the source of their drinking water, it serves as a potable water supply for many communities throughout the basin. The lake's relatively clean water and aesthetic beauty continue to draw business and tourists to the region. Thus, water quality is critical for the lake to continue as a major regional drinking water supply and to sustain a healthy fishery and activities such as swimming and boating. Lake Champlain provides ecologically significant habitats for rare, endangered and threatened species. Shoreline protection against habitat loss, erosion and pollution of all types

is critical for both native plant and animal species and for sustainable agricultural, residential and recreational use by humans.

Lake Champlain is nationally renowned for its fisheries in terms of numbers of fish, size and species diversity. This fishery is a multi-million-dollar business; it should be noted however that the Vermont Department of Health has issued Health Advisories for fish caught in the lake. The risk comes primarily from heavy metals such as mercury, and from PCBs. Some of these pollutants were deposited many decades ago, others, such as mercury continue to be deposited from industrial regions outside Vermont.

Invasive species have become a serious problem in Lake Champlain including zebra mussels, Eurasian milfoil, water chestnuts, sea lamprey and alewife. In the southern sections of the lake, zebra mussels now cover nearly all suitable surfaces resulting in the eradication of native mussels. The southern part of the lake, East Creek and its south fork are infested with water chestnuts, which are currently being controlled by the Nature Conservancy's hand-pulling program.

With the construction of the canal system in the early 1820s, Lake Champlain became part of a large, inland water system. Twenty-seven states in the U.S. and six Canadian provinces can be reached through the inland waterways and canals that link Lake Champlain, the Hudson River, the St. Lawrence River, the Mississippi River and its tributaries, the Great Lakes and Long Island Sound. There is renewed interest in maintaining these water connections and rehabilitating their infrastructure, initially developed for commercial use, to better accommodate recreational boat traffic.

4.4. Special Features

A. Wildlife Habitat

The Vermont Department of Fish and Wildlife has identified nine deer wintering areas in Orwell, with a total area of approximately 1,600 acres. The largest is a 560-acre area south of Mt. Independence Road between Lake Champlain and Old Stage Road. There is also a 350-acre area along the south North Fork of East Creek (see Map 6).

There are 102 mapped Natural Heritage sites in Orwell; these are known locations of a rare or endangered plant or animal species or natural

communities. Most of these were found along Lake Champlain and East Creek. Given the number of important natural communities and species found along Orwell's shorelines, maintaining natural habitat in these areas is a critical concern.

A well-vegetated lakeshore protects the soil from erosion, filters runoff and keeps nutrients from over fertilizing the lake; it also provides essential wildlife habitat to both terrestrial and aquatic species. Undisturbed vegetation should be maintained along Orwell's shorelines and stream banks to the greatest extent feasible to provide habitat, prevent erosion and reduce the number of pollutants entering surface waters.

B. Forest Blocks

The Town of Orwell is located in a nationally recognized corridor between the Adirondacks and the Green Mountains that is projected to become increasingly important for landscape resilience in the face of climate change. Several examples of forested community types located in Orwell are rare or unusual, and are specifically cited in "Wetland, Woodland, Wildland" by Elizabeth Thompson, Eric Sorenson, and Robert Zaino. Forest fragmentation is one of the most significant threats to Vermont's natural heritage, so maintaining large habitat blocks and connections between blocks is one of the best ways to ensure conservation of forest-reliant species.

The town of Orwell contains several large areas of contiguous forestland that have been identified as **"Highest Priority"** and **"Priority" Forest Blocks** with a range of ecological and ownership characteristics described below.

"Forest Block" means a contiguous area of forest in any stage of succession, not currently developed for other uses. These areas can include recreational trails, wetlands, and agricultural and silvicultural uses currently exempt from municipal land use regulation.

Habitat Connector" means land or water that links wildlife habitat within a landscape, allowing the movement and migration of animals and plants and the functioning of ecological processes. These may include recreational trails, wetlands, and agricultural and silvicultural uses currently exempt from municipal land use regulation.

"Forest Fragmentation" means the division or conversion of a forest block by land development other than by a recreational trail or use exempt from municipal land use regulation.

Highest Priority Forest Blocks:

These blocks are identified as 'highest priority' across the State due to the size of the contiguous interior forest land. These are the largest forest blocks, from all biophysical regions, and provide the foundation for interior forest habitats and associated ecological functions.
The highest priority areas are those that are critical for maintaining an ecologically functional landscape.

East Creek Block
Lower East Creek is a slow-moving, nutrient-rich stream that flows into Lake Champlain and serves as the lifeline for 800 acres of wetlands. The creek

drains 21,000 acres of surrounding land. The East Creek marsh, located near the mouth of the stream, contains one of the largest stands of narrow-leaved cattail in the state, and is a haven for nesting waterfowl, such as the American Bittern and the Common Moorhen. At the confluence of the main creek and the north fork, there is a prime example of the floodplain forests that once dominated riparian areas in the Lake Champlain Valley. This forest block includes Mount Independence and riparian areas along East Creek. The State of Vermont owns parcels within this Block as Wildlife Management Areas, as does The Nature Conservancy (TNC), specifically sections of the East Creek Natural Area. Within the block there is an Oak-Maple Limestone Talus Woodland natural community, potential habitat for several rare reptile species. Crevices and caves provide denning sites for porcupine and bobcats. Hackberry, which occurs in few other locations, is found in this community and provides food for two rare butterfly species.

Pond Woods Block/ Arnolds Ledge Block/Johnson Pond Block
These three forest blocks extend into Benson to the south and are separated only by Sunset Lake Road and Young Road. The Pond Woods Block contains part of the Pond Woods Wildlife Management Area, owned by the State of Vermont and managed by the Vermont Fish & Wildlife Department. The forest block contains a diversity of upland and wetland natural communities which supports a variety of wildlife. There are White-tailed deer, snowshoe hares, cottontail rabbits, squirrels, red foxes, coyotes and bobcats. The wetlands support habitat for beavers, minks, weasels and otters. Birds associated with the ponds and wetlands include Great blue herons, bitterns, rails, red-winged blackbirds, eastern kingbirds and marsh wrens. The forested habitat supports barred owls, pileated and downy woodpeckers, least flycatchers, ruffed grouse and woodcock. In addition, the block contains a Red Maple-Sphagnum Basin Swamp natural community, which provides habitat for the rare four-toed salamander and blue spotted salamander. Several species of birds breed in these areas, including great-crested flycatcher, winter wren, northern waterthrush, and veery.

White Ledge Block
This is the smallest of Orwell's highest priority forest blocks, and extends into Benson to the southwest. It contains several rare or threatened plant species, and a large deer wintering area.

Priority Forest Blocks
These forested blocks are also important resources, but there is more flexibility for conserving the ecological integrity of these areas. However, their protection remains critical for maintaining species habitat and ecological function. In Orwell, these include:

- **Murray Hill/Daigneau Hill/Hibbard Hill Blocks-** contain several endangered animal species, wetlands, and deer wintering areas.
- **Sanford Brook Block**- contains several small streams and wetland areas.
- **Needham Hill Block**- contains a large deer wintering area.
- **Big Brook Block**- contains several rare or threatened animal species, state significant natural communities, and deer wintering areas.

C. Habitat Connectors

Habitat Connectors are the forest, riparian and surface waters that provide connectivity at a local and regional scale (across Vermont and to adjacent states and Québec) and connectivity between all Vermont biophysical regions. It is important to protect and enhance the margins of these habitat connectors especially where they intersect other habitat and forest blocks by maintaining natural stream buffers, shrub and

tree cover and limiting development in these areas of connectivity. The largest of these areas in Orwell is located just north of the Pond Woods Forest Block, enclosed by Conkey Hill Road, Raymond Hill Road, Burke Road, Parks Road, and Sanford Road. It contains a large area of forested wetland, as well as apple orchards and annual cropland. Other important habitat connectors to maintain and enhance are the small forested areas between Old Stage Road and VT Route 22-A, and east of Horton Road. Also found in this area are Clayplain Forests, an uncommon ecological community that provides excellent wildlife habitat and supports more tree species than in any other forest type found in northern New England.

There are several areas identified as important wildlife road crossings, specifically across VT Route 22-A, primarily south of the Cook Road/Mutton Road intersection, and along VT Route 73 east of the Village Area.

D. Critical Resources

The Town of Orwell has identified the following as critical resources in need of special protection and consideration:

- Lands with slopes in excess of 25 percent.
- Wetlands as delineated in the Vermont Wetland Inventory including a 50-foot buffer.
- Lake Champlain and East Creek including a 75-foot buffer.
- Sunrise Lake, including a 50-foot buffer.
- Other mapped surface waters, including a 30-foot buffer.
- Mapped deer wintering areas.
- Natural Heritage sites including a 500-foot buffer.

Within these identified special areas, development should be reviewed to ensure that it does not adversely impact environmental quality.

4.5 Flood Resilience and Mitigation

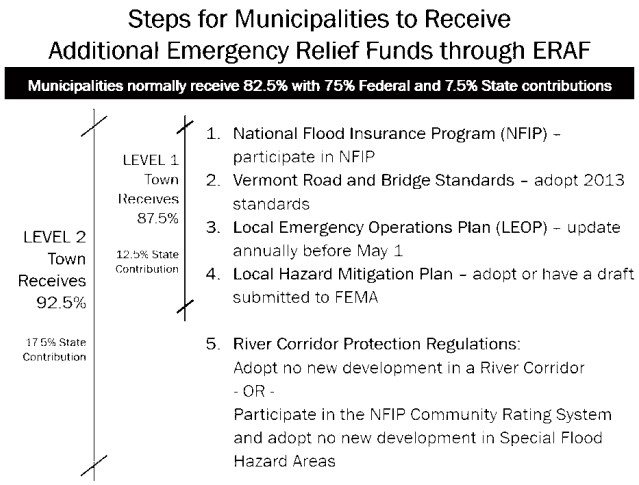
Vermont State Statute 24 VSA Chapter 117 §4302 and §4382 requires municipalities to include a Flood Resilience Element in municipal development plans adopted after July 1, 2014. In general, the statute encourages towns to identify and avoid development in flood hazard, fluvial erosion, and river corridor protection areas. If new development is to be considered in such areas, it should not increase the possibility of flooding and fluvial erosion. The statutes also promote the protection and restoration of floodplains and upland forested areas that attenuate and moderate flooding and fluvial erosion. The development and implementation of flood emergency preparedness and response planning are critical for mitigating potential flood related risks to public safety, critical infrastructure, historic structures, and municipal investments.

The Federal Emergency Management Agency created maps in 1985 that identify areas of concern for inundation. The Town of Orwell has accepted

these maps as the basis for the Special Flood Hazard Area within its municipal boundaries. FEMA and the USGS are currently in the process of updating these maps and they should be available in 2027. The Town of Orwell, through its municipal planning and regulations, has worked to become a flood resilient community through the following actions.

A. Emergency Relief and Assistance Fund

In the event of a Federally declared disaster, the Town of Orwell can make a claim for funds to assist in post-disaster relief. The Emergency Relief and Assistance Fund (ERAF) provides state funding to match federal public assistance after such disasters. Orwell's eligible public costs are reimbursed by federal taxpayers at 75%. For disasters after October 23, 2014, the State of Vermont will contribute an additional 7.5% toward the Town's costs. For communities that take specific steps to reduce flood damage, the State will contribute 12.5% or 17.5% of the total cost. At this time (2021), the Town of Orwell qualifies for 17.5% State contributions through the Emergency Relief and Assistance Fund. Orwell participates in the National Flood Insurance Program, complies with Vermont Road and Bridge Standards, has an annually updated Local Emergency Management Plan and has adopted a Local Hazard Mitigation Plan (2018). Orwell interim river corridor protection regulations are currently in place.



B. National Flood Insurance Program

The National Flood Insurance Program is administered through the Federal Emergency Management Agency and provides a source of flood insurance for buildings in communities that choose to participate. Nearly ninety percent of communities in Vermont participate in the National Flood Insurance Program. Flood insurance is available for buildings and their contents anywhere in participating communities. Without access to the National Flood Insurance Program, flood insurance from private sources may be unavailable or prohibitively expensive. To participate in the National Flood Insurance Program, a community must regulate all new development in high-risk Special Flood Hazard Areas to ensure that new development is safe from flood damage. The Town of Orwell has been a member of the National Flood Insurance Program since 1985 (September 18, 1985). At this time, 27 private buildings (structures) appear to be located in the Special Flood Hazard Area. No resident has obtained an insurance policy from the National Flood Insurance Program and no claims have been made since the Town of Orwell has been a member of the program. No critical or public buildings (structures) are located in the Special Flood Hazard Area.

C. *Town Road and Bridge Standards*

The Town of Orwell has adopted and meets the Vermont Agency of Transportation Town Road and Bridge Standards. The Selectboard of the Town of Orwell most recently passed and adopted the standards on August 12, 2019.

D. *Local Emergency Management Plan*

The Local Emergency Management Plan (formerly Local Emergency Operations Plan), establishes lines of responsibility during a disaster as well as vulnerable (high risk) populations, hazard sites, procedures and resources. The Local Emergency Management Plan should be updated every year after Town Meeting. The Town of Orwell updated its Local Emergency Management Plan (Short Form) on June 10, 2019 and will continue to do so annually.

E. *Local Hazard Mitigation Plan*

The Local Hazard Mitigation Plan helps communities identify important local hazard issues, prioritize next steps, and provide access to funding through the Federal Emergency Management Agency Hazard Mitigation Assistance Program. The Local Hazard Mitigation Plan also is one of the mitigation actions needed to qualify for additional post-disaster funding through the Emergency Relief and Assistance Fund. The Town of Orwell adopted its All-Hazards Mitigation Plan on September 24, 2018, which subsequently was approved by the Federal Emergency Management Agency on September 27, 2018. See the plan here: http://54.172.27.91/public/Orwell/

The Town of Orwell's Hazard Mitigation Planning Committee conducted a risk assessment and assessed, among other hazards, risks associated with Flash Flood, Landslide/Erosion, Dam Failure and Inundation Flooding. Results indicated that the community vulnerability rating for a Flash Floods and Inundation Flooding are 1 out of 4 (with a rating of 1 being the least vulnerable and 4 being the most vulnerable) and would be considered Low Priority.

Much of the mapped floodplain lies along the Lake Champlain shoreline and its associated marshes. These areas flood on a regular basis and therefore have been unattractive to development. The area of greatest immediate concern is the Sewage Treatment Plant for the village which lies within the mapped floodplain. Floodproofing measures have been taken to protect this critical infrastructure but failure of these would result in no sewage treatment for those served by the community system.

F. *River Corridor Protection Regulations & Special Flood Hazard Area*

According to the Vermont Agency of Natural Resources, Flood Ready website, River Corridors encompass the area of land surrounding a river that provides for the meandering, floodplain, and riparian functions necessary to restore and maintain the naturally stable or least erosive form of a river thereby minimizing erosion hazards over time. The river corridors are mapped using calculations that rely on in-field and map-based measurements. Lands within and immediately abutting a river corridor are at higher risk to fluvial erosion. The Agency of Natural Resources advises that measures, such

as stream armoring and berming, used to protect development within these corridors often lead to increases in erosion upstream and downstream and adversely affect public safety, riparian landowners, and river ecosystems. Giving river courses room to move is critical in maintaining equilibrium and avoiding the dangers of flood erosion to property and lives.

Orwell adopted a **Flood Hazard Overlay District on December 27, 2011**. This overlay district includes areas identified as being within the 100-year floodplain on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), dated November 1, 1985 and as amended. The Flood Hazard Standards stipulate that no dwellings can be built within the Flood Hazard Overlay District and that all other development within the Flood Hazard Overlay District is prohibited unless a registered professional engineer certifies that the proposed development will not result in any increase in flood levels during a 100-year flood.

The Special Flood Hazard Areas are delineated based on the 1985 work of the Federal Emergency Management Agency for the National Flood Insurance Program. See Flood Hazard Areas Map. The Special Flood Hazard Areas are the areas where the National Flood Insurance Program floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. This is also commonly referred to as the base flood or “100-year flood” area. Much of the damage that does occur is due to the erosive power of water causing damage to critical public infrastructure such as roads and stream-crossings. Homes, businesses, and community buildings have also been damaged by flooding-related erosion.

5.0 Land Use

5.1 Planning Areas

Orwell is divided into four planning areas as shown on the Land Use Map; **Village Center, Rural, Champlain and Sunrise Lakeshores and Conservation**. These areas are not zoning districts, but areas that share similar existing features, landscape characteristics and development patterns. The process of identifying and understanding existing land use aids municipalities in future planning decisions, such as, allowed uses, type and scale of buildings and patterns of land development.

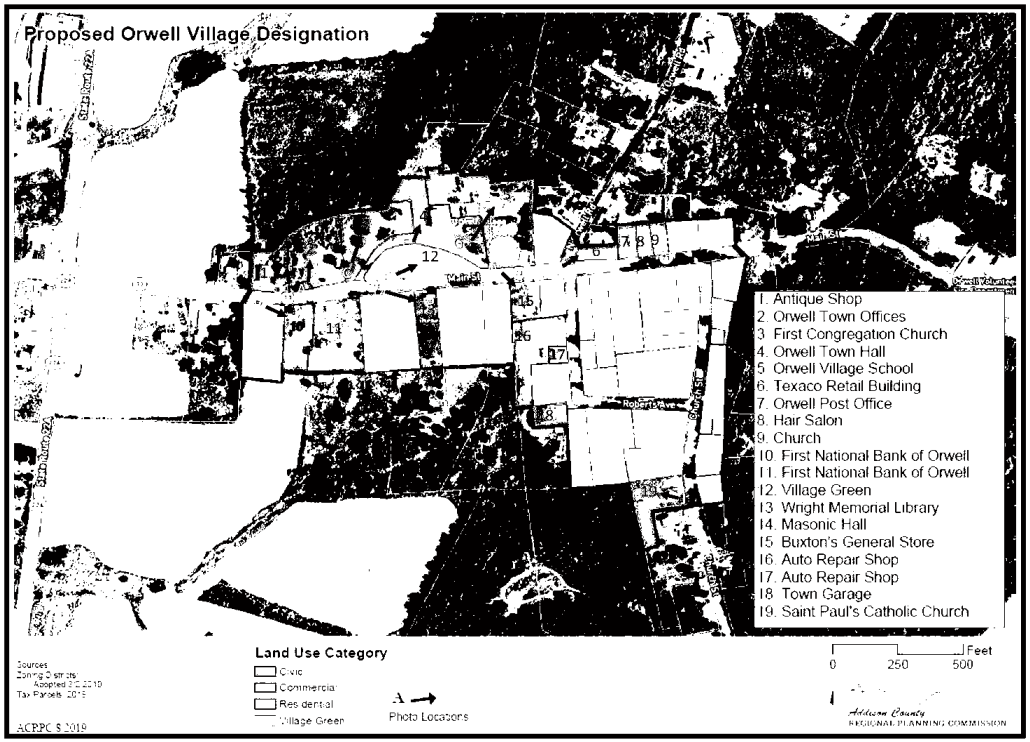
5.2 Village Center

The **Village Center Planning Area**, its hub the village historic district, includes open lands west to the Route 22A /73 intersection and the abutting neighborhoods to the north, west and south. (see map) The historic village center sits on a plateau between the lower elevation of the rt 22A corridor and the rolling hills and steeper slopes to the east and south. These changes in topography create a natural boundary to the village center, defining its perimeter and directing future growth.

*The **Village Historic District**, located within this planning area, is described by the State of Vermont Division of Historic Sites as, "…not only an excellent example of a typical village green-centered New England community, but also presents an unusually complete display of the development of 19th century architectural style. The major entries to the village provide a sense of discovery as one must travel up or down a hill and round a turn to enter the tree-lined streets and follow the slate sidewalks which lead to the green. The semi-circular green slopes up to and is dominated by the brick Congregational Church and white frame Town Hall, formerly the Methodist Church."* The architecture along the south side of Main Street is described as "a variable museum of architectural style residences," including the First National Bank, an unusual and outstanding example of High Victorian Gothic.

The Heart of the Town

The Orwell village center contains a number of public and commercial buildings, intermixed with residences. The post office, library, school, churches, the town hall, a general store and a variety of shops serve the communities basic needs. Lot sizes and setbacks vary, creating a diverse settlement pattern characteristic of a 19th-century New England village. The irregular lot shapes in the village center are the result of large parcels being incrementally subdivided over the years, producing a unique pattern that would be difficult to duplicate in a new development. Many yards are quite deep, but the houses are not hidden away. Instead, they are almost all located fairly close to the street. This makes for an attractive and welcoming streetscape that promotes walkability and easy interaction among neighbors. Any new development in this district should fit within this traditional settlement pattern and its mix of uses. The existing municipal wastewater system will support infill development allowing increased residential density throughout the Village Center Planning Area.



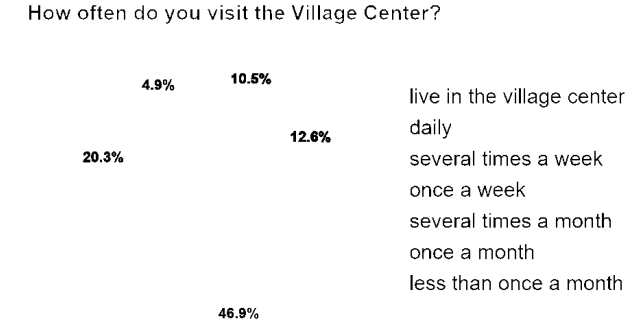
In 2019, Orwell renewed its Village Center designation from the State of Vermont. The designated area is contained within and slightly smaller than the Village Center Planning Area, only including the commercial core of the village, not its residential areas. The benefits of this designation are access to financial incentives for business owners that choose to invest in rehabilitating their commercial buildings and priority status for towns in future state grant applications. In 2018, Orwell acquired the Town Green from Slate Valley Unified School District and

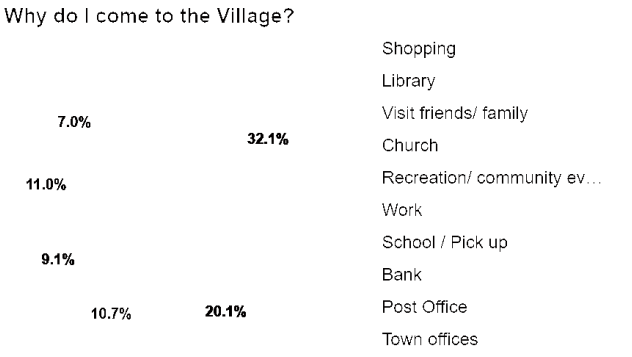
In 2021 a Town Green committee was established to address issues related to the historic gazebo, as well as plan for future site and programmatic improvements. Through this process, it became clear that many of the concerns related to the Green, such as safety, parking, accessibility and circulation, were concerns throughout the whole Village Center. With a 2021 Department of Housing and Community Development Municipal Planning Grant (mpg), the town took a comprehensive look at the safety and infrastructure needs and developed new policies and implementation actions for the Village Center. By improving the accessibility and walkability of the Village and the Green, Orwell hopes to revitalize and invigorate the community, creating new opportunities for residents, visitors, small businesses, and increasing the overall quality of life.

As part of the MPG work, the Orwell planning commission conducted a survey which focused on the village center planning area, but touched other planning areas as well, addressing issues, such as, traffic, safety, parking, housing, amenities and services. **Below are some general and specific results of the survey**. The overriding tone from the survey was that folks enjoy living in Orwell and Orwell Village!
Dislikes of the Village were few, but consistent; slippery sidewalks or none at all, traffic speeding through the village on route 74 and a lack of retail options.

Village Center Visits and Amenities

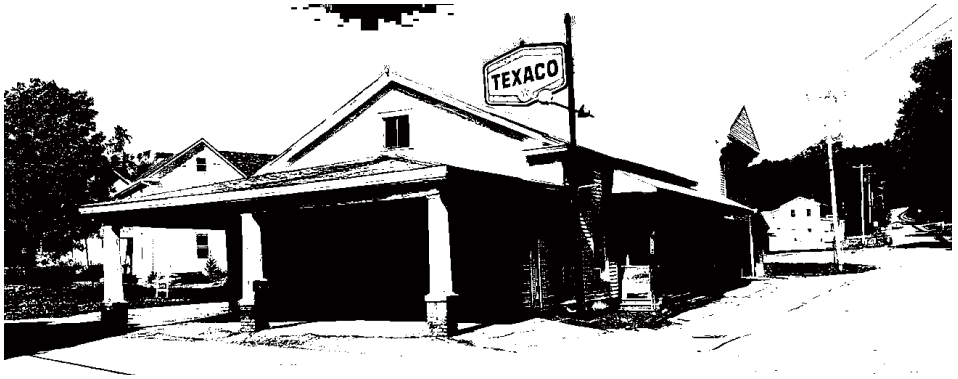
- **79.8% of respondents said that they visit the Village at least once a week and 59.5% visit multiple times a week.**
- **Over 50% of the visits are for "shopping" or "Library". About 10% of the responses were split between post office, town offices, bank and school pick up.**
- **A significant % of people come in for church, to visit friends and community activities.**
- **Businesses people would like to see are:** A small restaurant, café or pizza place, bakery, pub, coffee shop. A hardware store, pharmacy, yoga studio





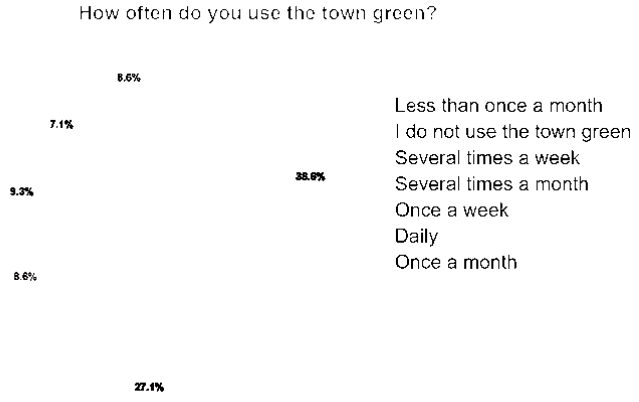
Parking, Accessibility and Safety

- Generally, respondents feel "safe" but think traffic goes too fast through the village and is dangerous.
- Many respondents mentioned that the old sidewalks are in disrepair and slippery.
- In some cases, sidewalks are only on one side of the road. Sidewalks do not connect to the Green.
- Most respondents would like to see some type of traffic calming measures on RT 74: stop signs, offset crosswalks, permanent radar signs.
- 84% of respondents felt there was sufficient parking in the Village and on the Green.



The Green

The Orwell Green is a classic Vermont green, the historic center of the town's settlement pattern and a front lawn for the community's original churches. This space was not designed for the uses, passive or active, that are desired and needed in community greens today. Currently, there is a lack of usable and accessible space on the Green. There are no pathways through or sidewalks along the perimeter. Benches and picnic tables are available but placed randomly on the site. There are no crosswalks along this section of Main Street. The southern side of the Green along RT 74 slopes steeply towards the road creating unsafe conditions especially for families with small children. From the survey, it is clear that Orwell residents are not using their town green. We hope that by improving our green and making it more accessible and functional for the community it will become a centerpiece for our town and a destination for residents and visitors.



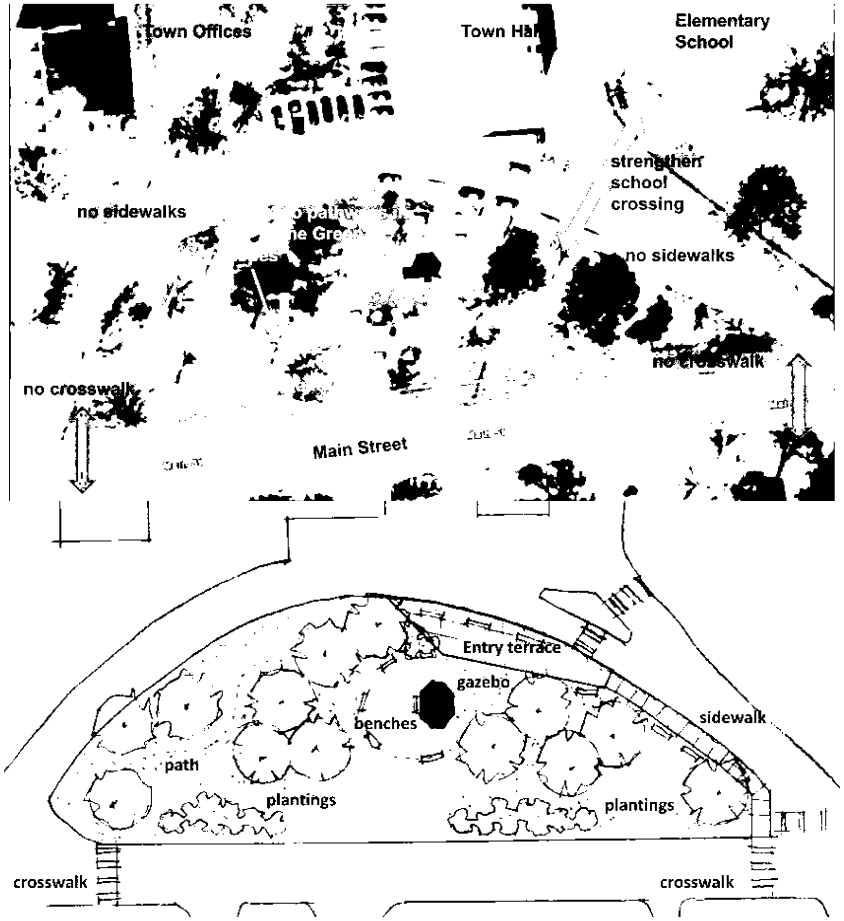


Figure XX is an analysis of the existing site, identifying some of the safety and access issues. Below is a list of additional design and programmatic suggestions for the Green generated from the survey.

- New gazebo
- Accessible pathways
- Connecting Sidewalks
- Picnic tables
- More seating/benches
- Better drainage
- Events program/ Music

As of the Spring of 2023, the Green Committee was in the process of developing plans for a new, larger gazebo that would accommodate band concerts, graduation and special events and would be accessible from the northern edge of the space. Orwell hopes this is just the beginning of the successful revitalization of this important space.

Other potential improvements for the Green would be to;

-Develop a sidewalk that encircles the Green and connects this space with the village sidewalks,
-Identify a clear entry to the Green, providing accessible access and space for gathering,
-Delineate a level gathering space within the green to watch performances or other events,
-Develop a landscape site plan for future planting and maintenance.
-Investigate the installation of signal/flashing crosswalks on Main Street.
- Delineate an edge/ barrier along the southern length of the Green to address safety issues in regards to the slope and road.

Figure XX is a design sketch to illustrate how these site improvements could be implemented

Route 22/73 intersection

At the Route 22a /73 intersection there is a limited area zoned for commercial uses appropriate for class 2 highway corridors. Conditional use review is required for any new development in order to ensure safe, appropriate businesses that fit the character of the surroundings. Access to all highway commercial areas should be limited and use of shared drives should be promoted to improve safety and maintain traffic flow on the highway. Commercial development outside this area is strictly limited within the town's land use regulations.

5.2 Rural

This planning area encompasses the bulk of Orwell's land and is used primarily for agriculture or low-density, single-family homes on large lots. Maintaining the town's rural character and agricultural economy is a critical concern of residents. It is also recognized that a sufficiently large, unfragmented land base is important to supporting the viability of local farm and forestry operations.

In Orwell, much of the developable land has been zoned for five-acre lots for many years, and until they were recently amended, state septic regulations had promoted development on lots larger than 10 acres. The effect of these regulations is evident in Orwell's outlying areas. There are approximately 185 residential parcels in town that are between 10 and 25 acres in area, which represent around 10 percent of the town's land area. Nearly all of these were developed over the past 25 years. By comparison, there are around 560 lots smaller than 10 acres, which together comprise less than four percent of the town's land area.

In towns like Orwell where growth pressure is modest, the conversion of productive land to residential lots often happens incrementally as farmland is lost one lot at a time. The impacts of this type of development are more difficult to remedy through land use regulations than those associated with large development projects.

Traditional rural development patterns are complex, not simple; they include areas of relatively clustered development separated by large areas of productive farmland, forests, wetlands, rivers and hills. In Orwell, there are locations with dense concentrations of settlement along the shores of Lake Champlain and along many of the rivers. Buildings of different sizes are located on lots of variable areas at various distances from the roads based on the character of the land and its intended use.

Traditional zoning standardizes these elements resulting in a regularized pattern of new development that often does not fit into rural surroundings. Additionally, the easiest lands to develop are agricultural fields that provide level, open places on which to locate structures. Homes built in the middle of former fields fragment agricultural land and frequently are not related to the landscape in which they sit.

Traditional zoning and subdivision regulations mandate a consistent, regular pattern of development. There is an inherent conflict in zoning rural land because it is difficult to write regulations that would result in the diverse development pattern typical of the desired rural landscapes. Traditional zoning provides two basic options for rural areas, requiring large or small lots. Large lots maintain low densities, but consume more farmland than necessary and promote sprawl. Small lots can result in development that is too dense resulting in loss of rural character and a suburban landscape.

There are, however, techniques that can allow for development while maintaining rural character. These tools are commonly called 'cluster

development', 'conservation design', or 'planned unit development' (PUDs). The underlying principle of all these systems is to encourage a property's allowable development to be grouped together on smaller lots with a significant amount (usually at least 50%) of the original parcel set aside as open space or productive land.

The use of such innovative planning techniques in Orwell can provide for development while preserving agricultural land, open space, and the scenic and cultural resources that define the town's rural character, enhance residents' quality of life, and attract seasonal residents and visitors. These techniques can also be used to provide opportunities for the affordable homes needed to maintain a diverse population in Orwell, as well as vibrant small businesses that can provide jobs within town.

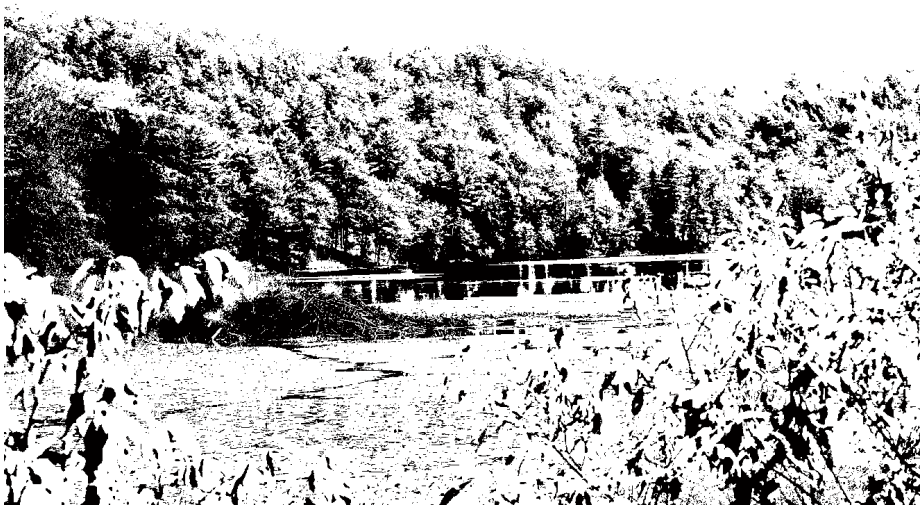
Orwell promotes the use of planned unit development (PUD) provisions and provides appropriate standards and incentives to achieve development patterns appropriate to their surroundings in conformance with the goals of this plan. The town needs standards that respond to the unique character and special concerns of the areas described in this land use plan. Using bonuses and other incentives should be considered to ensure that the town's PUD provisions are regularly used.

The Rural Area also contains most of Route 22A. As described earlier in this plan, Route 22A has been designated as a truck route and is heavily traveled. Limiting strip highway development in the Route 22A corridor is critical to maintaining the town's rural character, residents' quality of life and the safe function of the highway. People's sense of a place is often largely based on the 'view from the road' that they see while traveling on their daily commute or while touring on vacation. This plan prohibits strip development on Route 22A outside of the Village Planning Area.

5.3 Lake Champlain & Sunrise Lake Shoreline

This planning area includes Orwell's Lake Champlain and Sunrise Lake shore lands, which are mixed use areas that include seasonal camps typically on small lots, year-round homes, water-based recreation businesses, the Mount Independence historic site, and significant amount of open agricultural land much of which is conserved. Lands within this area are recognized for their environmental quality, habitat value, recreation opportunities, historic and archaeological resources, and agricultural potential.

Sections of the shoreline are also densely developed with what were once small, summer camps generally located quite close to the shoreline. In recent years, the value of waterfront property has been increasing as more people desire to live near the lake year-round. This has resulted in conversions of the older seasonal housing stock, frequently accompanied by significant renovations or additions to the former camps.



Additionally, a few large, non-conserved parcels with Lake Champlain frontage have considerable development potential if adequate water and wastewater systems could be provided. Town residents do not desire additional high-density residential areas along the shorelines. While there is recognition that there will be further development along the shorelines, densities should not be allowed to significantly exceed current levels.

There is support for the existing water-oriented businesses on Lake Champlain, as well as a desire for more public access to both lakes and some additional small-scale commercial activities on Lake Champlain that would bring visitors to town and provide recreational opportunities for residents. However, given the unique character and fragility of the shorelines, all types of development in these areas require planning and review that is more detailed than elsewhere in town.

New development of or significant renovation to existing uses, including camps and single-family residences, should be reviewed to determine potential impacts of sewage, water, access, frontage and scenic considerations. All development along the shorelines should be reviewed as conditional uses based on detailed standards and clear conditions that address issues such as riparian setbacks, soil erosion, wastewater and stormwater impacts on surface water or surrounding wetlands, vegetation, wildlife habitat and corridors, and scenic vistas and visual character. As of July 1, 2014, changes to land use within 250 feet of a lake's mean water level (also known as the Protected Shoreland Area), such as any new development, redevelopment, or vegetation removal, may require a permit.

5.4 Conservation

This planning area includes areas of conserved and public land, as well as environmentally fragile areas including wetlands, floodplains, steep slopes, significant habitat and unsuited soils. The general boundaries of this planning area, as illustrated on Map 7, do not include all identified critical resources as listed on page 48 of this plan. More detailed mapping and site-specific information should be used to determine whether a specific piece of property

contains critical resources or other environmentally fragile areas.

Conserved and public areas are not available for future development. These lands will continue to serve as open space, wildlife habitat and productive agricultural lands ensuring that the rural character of the town will be maintained for future generations.

Not all lands in this planning area are so protected, however. When reviewing development on or adjoining lands with identified critical resources as listed on page 48 of this plan, the impacts on the identified resources should be assessed and prevented to the greatest extent feasible. When impacts cannot reasonably be avoided, they should be adequately mitigated.

Additional development should be prevented in floodplains to allow these lands to serve their natural function of buffering surrounding lands from the impacts of annual snow melt and severe storms. Special consideration should be given to development on steep slopes where clearing and tree removal should be limited to prevent soil erosion and protect visual character. The presence of a seasonally high-water table or Class II wetlands constrains development on some of these lands – notably these areas adjacent to East Creek and its North and South Forks.

Wastewater regulations will limit development of these lands in the near future. However as new treatment technologies are accepted by the state, marginal lands may become available for development. Therefore, the town should not rely solely on wastewater regulations to provide land use development control on these lands. The least suited lands in town should have the lowest development densities and other mechanisms that would direct development away from these areas should be explored.

6. The Future

6.1. Natural and Historic Features

A. GOALS

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

(A) Significant natural and fragile areas;

(B) Outstanding water resources, including lakes, rivers, aquifers, shorelands and wetlands;

(C) Significant scenic roads, waterways and views;

(D) Important historic structures, sites, or districts, archaeological sites and archaeologically sensitive areas.

State Planning Goal 5

To maintain and improve the quality of air, water, wildlife and land resources.

(A) Vermont's air, water, wildlife, mineral and land resources should be planned for use and development according to the principles set forth in 10 V.S.A. § 6086(a).

State Planning Goal 6

B. POLICIES

1. Identify, protect and preserve the town's critical resources and promote their proper stewardship.
2. Identify, protect and preserve important soils, particularly those currently in agricultural use and those of high potential productivity, from development.
3. Use the resources of the Addison County Regional Planning Commission to develop a database, maps, and narratives on all the important land, natural and cultural resources in the town, as well as a list of agencies and organizations with interests in protecting those resources.
4. Conserve and promote stewardship of existing forest blocks and habitat connectors within the town.

7. and protection of the functional integrity of all deer wintering areas within the town.

8. Support the continued management of the East Creek area to provide bird nesting, breeding and migration stop-over habitat.

10. Encourage long-term stewardship and protection of wetlands that have significant functions and values for rare species habitat, wildlife habitat, or natural communities.
11. Prevent additional loss of significant wetlands within the town and where feasible promote the restoration of wetlands previously altered by human disturbance.
12. Protect existing high-quality riparian habitat within the town by establishing or maintaining undisturbed, naturally vegetated riparian buffers along the town's streams to protect water quality, prevent erosion, reduce the amount of pollutants entering surface waters, and provide habitat and corridors that connect habitats.
13. Protect lakes, ponds, rivers and streams from encroaching development, including roads and driveways, by incorporating development setbacks and standards into the town's land use regulations that require the maintenance or establishment of naturally vegetated riparian buffers.
14. Require the restoration of riparian habitat when reviewing site plans or subdivisions by designating "no mow" zones along surface waters, allowing for the natural regeneration of woody vegetation, or requiring active planting of native woody vegetation in the riparian area.
15. Encourage protection of wetlands and natural areas in their current state to provide wildlife, recreational and aesthetic benefits.
16. Pay special attention to aquifers and groundwater protection and explore the development of regulations that would provide additional review of land uses within designated Source Protection Areas and restrict development that could contaminate public water supplies.
17. Require management of stormwater in a manner that mitigates increases in a property's rate or volume of discharge from pre-development levels.

21. Orwell's cultural and historic resources and rural settlement patterns that are important components of the town's heritage and character.
22. Support the Village Center Designation for Orwell's village and encourage property owners to use the program's tax credits and other features to maintain Orwell's historic character, promote its role as the town's commercial center, and improve its public buildings and spaces.
23. Explore options for encouraging appropriate maintenance and continued use of the town's historic structures
24. Continue to support efforts to improve and operate the Mount Independence Historic Site and consider ways this important resource could be further integrated with the community and used as a building block for the town's economy.

25. Encourage the owners of historic structures to respect the community heritage that is expressed in their buildings and maintain them in a manner that will ensure that they can be lived in and appreciated by future generations.
26. Discourage the demolition of historic structures and substantial modifications to their exterior appearance that would result in the loss of their architectural integrity.
27. Offer flexibility for the adaptive reuse of historic structures to ensure that they can be renovated for a new use when their original purpose is no longer relevant or economically viable.

6.2. Agriculture and Forestry

A. GOALS

To encourage and strengthen agricultural and forest industries.

(A) Strategies to protect long-term viability of agricultural and forest lands should be encouraged and should include maintaining low overall density.

(B) The manufacture and marketing of value-added agricultural and forest products should be encouraged.

(C) The use of locally-grown food products should be encouraged.

(D) Sound forest and agricultural management practices should be encouraged.

(E) Public investment should be planned so as to minimize development pressure on agricultural and forest land.

State Planning Goal 9

B. POLICIES

1. PROMOTE Orwell's agricultural heritage and rural quality of life.
2. Conserve agricultural and forest lands and prevent development of viable agricultural lands presently being used for agricultural purposes. .
3. Support development of diverse agricultural and forestry.
4. Recognize that agriculture and tourism are closely linked and important to the town's tourism sector Allow for farm worker housing.
5. Support the diversification of farm businesses and development of associated value-added enterprises to ensure that the town's agricultural economy remains viable.
6. Protect the viability of working lands associated with a sustainable forest products' economy.
7. Encourage eligible landowners to enroll in Vermont's current use program.

6.3. Extraction of Earth Resources

A. GOALS

To provide for the wise and efficient use of Vermont's natural resources and to facilitate the appropriate extraction of earth resources and the proper restoration and preservation of the aesthetic qualities of the area.

State Planning Goal 10

B. POLICIES

1. Continue to regulate resource extraction to ensure that any extraction that does occur in the future does not unduly impact environmental quality or the character of the community.

6.4. Recreation

A. GOALS

To maintain and enhance recreational opportunities for Vermont residents and visitors.

State Planning Goal 8

B. POLICIES

1. Support efforts for improved public access to water-based recreation opportunities, such as Lake Champlain, Sunrise Lake and Sunset Lake.
2. Establish an Orwell recreation department to program classes and events for all ages, utilizing the Village Green and other town facilities.
3. Continue to work on implementing a multi-use trail (hiking, skiing, biking) around town, including a link between the school and ball field.
4. Improve and/or create recreational venues in the village, such as a skate park, tennis courts (pickleball), playground and skating rink..
5. Cooperate with the Town of Benson to establish a public beach and services at Sunrise and/or Sunset Lake.
6. Support recreation-related businesses that capitalize on the town's attractive scenic and historic resources.
7.
8. Encourage rural landowners to allow recreational use of their property.
9. Encourage respectful and responsible recreational use of unposted private lands.
10. Retain town rights-of-way over Class 4 roads and legal trails for recreational use so long as it does not become an undue financial burden on the town.

6.5. Transportation

A. GOALS

To provide for safe, convenient, economic and energy efficient transportation systems that respect the integrity of the natural environment, including public transit options and paths for pedestrians and cyclists.

(A) Highways, air, rail and other means of transportation should be mutually supportive, balanced and integrated.

State Planning Goal 4

B. POLICIES

1. Support the state's access management efforts by promoting use of shared drives and carefully reviewing the traffic patterns, access points and parking areas proposed for new development near the state highways and heavily traveled town roads.
2. Minimize the number of accesses connected to state and local highways to maintain traffic safety.
3. Keep development set back an adequate distance from Route 22A to prevent reductions in sight distance and to increase safety.
4. Ensure that no driveways or private access roads are constructed in a manner that would require drivers to back out onto Route 22A or Route 73.
5. Support projects that would calm traffic on Main Street and Route 22A near the village center to create a safe, pleasant environment for pedestrians and promote non-motorized modes of travel.
6. Improve the sidewalk system within Orwell Village.
7. Extend the sidewalk network outward from the village center as village-scale development proceeds.
8. Require that all roads, whether public or private, be built to basic standards appropriate for the town's climate in order to protect public safety, infrastructure and the environment.
9. Construct all new drives serving residential or commercial subdivisions to B-71 state highway standards.
10. Construct all new Roads pursuant to the standards contained in the Vermont State Standards for the design of transportation construction, reconstruction and rehabilitation on Freeways Roads and Streets dated July 1, 1997 as it may be amended from time to time.
11. Adopt and utilize Codes and Standards for road repair that adequately size culverts and other infrastructure to minimize repetitive damage.
12. Maintain town roads in a manner consistent with the principles of the Vermont Better Backroads program and require new roads be constructed to the standards outlined in the Better Backroads Manual.
13. Recognize the importance of good roads for transportation, economic activity, schools, recreation and all-around quality of life for residents.
14. Encourage roads to be maintained in excellent condition.

15. Use highway infrastructure inventories to provide a rational basis for scheduling and budgeting road maintenance and improvement projects.
16. Update highway infrastructure inventories as needed so they remain useful tools for capital planning.
17. Identify and publicize key animal crossings on local roads to protect animals and promote driver safety.
18. Work with the state to provide a park-and-ride location in Orwell that would increase the convenience of carpooling for area residents.
19. maintain our local road maintenance program identifying areas where road repair and maintenance needs are the greatest and where future needs are most likely to develop given expected rates and patterns of growth.
20. Explore the possibility of sharing resources, such as equipment and personnel, with surrounding towns to facilitate more effective and efficient management of town highways.

6.6. Public Facilities and Services

A. GOALS

To plan for, finance and provide an efficient system of public facilities and services to meet future needs.

(A) Public facilities and services should include fire and police protection, emergency medical services, schools, water supply and sewage and solid waste disposal.

(B) The rate of growth should not exceed the ability of the community and the area to provide facilities and services.

State Planning Goal 12

B. POLICIES

1. Plan for facilities and services to meet the needs and goals of the community.
2. Provide a range of necessary services and facilities while maintaining a stable tax rate.
3. Limit growth to a rate that does not exceed the town's ability to provide services.
4. Encourage the use of existing facilities to reduce demand for new services due to growth.
5. Develop a capital management program to prioritize and help meet the most important town service needs.
6. Recognize that the town's tax rate will not necessarily decrease if the grand list increases.
7. Investigate the development of a centralized water supply, especially one that would serve Orwell Village.
8. Extend public sewer lines to undeveloped property adjoining the village center to help relieve pressure for large lot development in the rural parts of town, as well as to more efficiently utilize the sewage treatment facility.
9. Encourage extensions of sewer lines by private developers within or adjacent to Orwell Village.

10. Encourage residents to reduce their generation of waste, to recycle and reuse the waste they do generate.
11. Encourage the development of Fiber Optic internet lines to all addresses in Orwell.
12. Encourage the use of modern low earth orbit satellite internet services where fiber optic is not available.

Develop an emergency storm shelter facility.

6.7. Energy

A. GOALS

To encourage the efficient use of energy and the development of renewable energy resources.

State Planning Goal 7

B. POLICIES

1. Encourage use of alternative or renewable energy resources.
2.
3. Promote reduced energy consumption at individual household and community levels.
4. Investigate creating a PACE district to help owners finance renewable generation projects and conservation improvements.
5. Minimize the impact of energy transmission and generation infrastructure.
6. Maintain town review where allowed by law and participate in state review processes for energy transmission and generation facilities.
7. Work with the Power Company to remove high risk objects from over power lines.

6.8. Economic Development

A. GOALS

To provide a strong and diverse economy that provides satisfying and rewarding job opportunities and that maintains high environmental standards, and to expand economic opportunities in areas with high unemployment or low per capita incomes.

State Planning Goal 2

B. POLICIES

1. Encourage the development and diversification of the town's economic base.
2. Support the development of businesses. Encourage the development of home occupations, home businesses, small businesses and the expansion

of local businesses. Support the ability of residents to work from home while protecting neighbors from potential adverse impacts.

3.

4. Encourage commercial development in Orwell Village.

6.9. Education

A. GOALS

To broaden access to educational and vocational training opportunities sufficient to ensure the full realization of the abilities of all Vermonters.

State Planning Goal 3

B. POLICIES

1. ENCOURAGE THE DEVELOPMENT OF PROGRAMS FOR LIFELONG LEARNING FOR ORWELL RESIDENTS OF ALL AGES.
2.

6.10. Childcare

A. GOALS

To ensure the availability of safe and affordable child care and to integrate child care issues into the planning process, including child care financing, infrastructure, business assistance for child care providers, and childcare workforce development.

State Planning Goal 13

B. POLICIES

1. Support the town's existing childcare providers and promote provision of additional childcare facilities to meet the needs of the town's working parents.

6.11. Housing

A. GOALS

To ensure the availability of safe and affordable housing for all Vermonters.

(A) Housing should be encouraged to meet the needs of a diversity of social and income groups in each Vermont community, particularly for those citizens of low and moderate income.

(B) New and rehabilitated housing should be safe, sanitary, located conveniently to employment and commercial centers, and coordinated with the provision of necessary public facilities and utilities.

(C) Sites for multi-family and manufactured housing should be readily available in locations similar to those generally used for single-family conventional dwellings.

(D) Accessory apartments within or attached to single family residences which provide affordable housing in close proximity to cost-effective care and supervision for relatives or disabled or elderly persons should be allowed.

State Planning Goal 11

B. POLICIES

1. Support the development of affordable housing.
2.
3. Support efforts of local community land or housing trusts to provide affordable housing.
4. Emphasize to prospective developers of affordable housing the fact that the town has the services necessary to accommodate multi-unit housing and the interest among residents in providing elderly housing in Orwell Village.
5. Work to provide housing in Orwell's Village that would meet the needs of the town's older residents.
6. Support the development and provision of housing for the elderly.
7. Support efforts to maintain or improve the quality of the town's existing housing stock, especially affordable units, to ensure that all residents have an adequate, safe place to live.
8. Encourage cluster housing and planned unit developments to minimize the impact of residential growth on the town's open landscape.

A. GOALS

To plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside.

(A) Intensive residential development should be encouraged primarily in areas related to community centers, and strip development along highways should be discouraged.

(B) Economic growth should be encouraged in locally designated growth areas, or employed to revitalize existing village and urban centers, or both.

(C) Public investments, including the construction or expansion of infrastructure, should reinforce the general character and planned growth patterns of the area.

State Planning Goal 1

B. POLICIES

1. Publicize and support the Village Center Designation for Orwell's village center. Encourage businesses to use the tax credit benefits to improve their historic storefronts, buildings and spaces.
2. Allow for a greater density within the village center. Encourage the inclusion of at least 20% affordable units in every housing development creating greater than 10 units of housing.
3. Encourage the development of affordable and/or elderly housing in the village area Encourage the planting of new and maintenance of existing trees in Orwell Village.

5. Retain rural features such as (1) existing farm roads, which should be incorporated into subdivision design, (2) stone walls, fence lines and hedgerows, and (3) existing structures such as farmhouses, barns, silos and outbuildings.
6. Minimize site disturbance and design rural roads to follow existing contours.
7. Discourage the creation of extensive lawn areas in wooded areas and preserve the maximum amount of natural vegetation on newly created lots in the rural planning area.
8. Encourage tree planting on newly created open residential lots.
9. Maintain undisturbed vegetation along Orwell's shorelines and stream banks to the greatest extent feasible to provide habitat, prevent

erosion and reduce the number of pollutants entering surface waters.

10. Review most development along the shoreline as a conditional use.
11. Promote provision of additional public access points or recreation areas along the shoreline.
12. Keep development densities and lot coverage along the shoreline low to reduce the amount of impervious surface and associated stormwater impacts on the lake.
13. Review camp conversions and see that they receive all required permits to ensure that their infrastructure is adequate for year-round use and to limit the potential for increased pollution, erosion and run-off from lakeshore property.

This plan is intended to guide future decision-making and actions; it does not make decisions or dictate actions. Orwell realizes that attainment of the town's goals cannot be rigidly prescribed. The plan has to be clear about the goals the town wishes to achieve, but flexible about how it does so. Implementation of the plan must be left to the discretion and willpower of the state, regional and municipal officials, as well as individual citizens. This is a long-range plan, and Orwell recognizes that not all of its goals may be immediately achieved, and that others – for example, maintaining open land – may require financial commitments.

Policies have been written to help public officials make decisions consistent with our broad goals. They are the official standards that should be applied when decisions are made. If decisions involve conflicting goals and policies our public officials will have to strike the right balance among them.

A. The Past Five Years

The Town of Orwell has undertaken a number of community projects. Notably, the Planning Commission engaged the public in a process of reviewing the town's land use regulations and drafting revisions.

Citizen groups continue to work to improve the town ballpark. The Town secured a byways designation for Route 73 along its village and for the Mount independence Road, leading to the Mount Independence Historic Site. It also renewed its Village Center Designation for the commercial portion of Orwell Village In 2019.

B. The Next Five Years

To implement the goals and policies of this plan, the Planning Commission recommends that the following actions be undertaken during the next five

years.

1. Encourage businesses to use the benefits provided by the Village Center Designation for Orwell's village center.
2. Support development of elderly housing in the village center.
3. Slow speeds to improve the safety along Route 22A and route 73 near the village.
4. Pursue Vtrans bike/pedestrian grant program opportunities to improve the village's streetscape and increase safety along Main Street.
5. Revise Orwell's Land Use regulations to make them easier for the general public to use.(and to increase opportunities for additional housing in the Village Center.)
6. Improve and revitalize Orwell's Village Green, creating an accessible and safe space for the community. Develop a recreational/ arts programming for the Orwell Village Green. (Band stand)
7.

C. Over the LONG-Term

Many of the goals of this plan will require the long-term efforts of the town in cooperation with its neighbors, the state, and townspeople. The Planning Commission recommends that Orwell continue to strive to meet the following needs:

1. Expand Orwell sewer lines to service additional sites.
2. Rebuild or replace village sidewalks.

It is important to consider how this plan for Orwell's future fits with the plans of neighboring communities, the larger region and even the state. Few of the goals or purposes of this plan can be achieved by Orwell alone; this plan may impact or be impacted by the actions of others.

State law requires towns to review whether their plan is compatible with those of their neighbors and the region. Additionally, the town's plan must be in conformance with state planning goals. The Orwell Planning Commission has completed that review and has found this plan to be compatible as described below.

A. With Neighboring Communities

Orwell is the southernmost town in Addison County. Lake Champlain borders Orwell to the west. The town of Shoreham lies to the north, Whiting and Sudbury to the east, and Benson to the south. Sudbury and Benson are located in Rutland County. All of these towns have an agricultural heritage, which still provides an economic base in their rural landscapes. This Town Plan proposes goals, policies or suggested actions, which are compatible with its neighboring towns.

Orwell supports the principle of keeping land open for agricultural use. This plan supports the protection of surface waters and other natural resources. This plan and the town's land use regulations support the development of a core village area surrounded by rural, largely agricultural areas. Support of growth and development is centered on the village center. The continued viability of agricultural land uses that preserve the town's rural character is encouraged. Protecting natural, cultural and historic resources will enhance the quality of life for residents. Shoreline regulations in the town will help protect the region's surface waters.

Support of development within a village core is similar to the plans of neighboring towns in both Addison and Rutland Counties. Orwell's Rural Planning Area borders similar areas in Shoreham and Whiting. The Town of Sudbury has a small residential area (Sudbury Hill) zoned for one-acre lots near Orwell's border on Rte. 73. Orwell's land use is compatible with the shoreline district and the agricultural districts proposed by the Benson Town Plan.

B. With the Region

The Orwell Town Plan contains goals and objectives similar to the Addison County Regional Plan. The Regional Plan adopts the land use plans of its member municipalities as its own, so there can be no conflict between local and regional land use plans.

Regionally significant features lying within the Town of Orwell are Lake Champlain, Sunrise Lake, East Creek and the Lemon Fair River, as well as the highway corridors of Routes 22A and 73.

C. With State Law

To encourage the appropriate development in Orwell, this plan strives to attain consistency with the state's planning goals. This revision to the plan ensures that the town's decisions will be guided by a coordinated, comprehensive planning process and policy framework. Citizen participation has been and will continue to be encouraged at all levels of the planning process. As evidenced throughout this plan, consideration has been and will continue to be given to the use of resources and the consequences of growth.

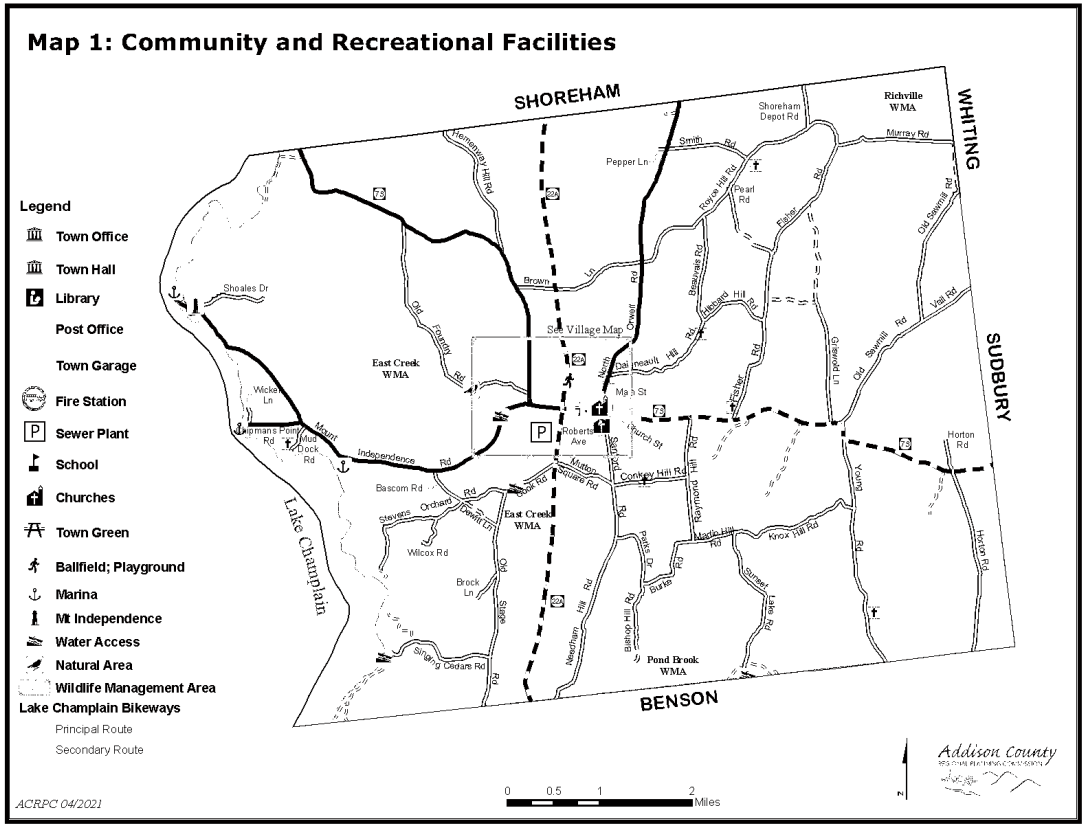


Figure 31 Community and Recreational Facilities

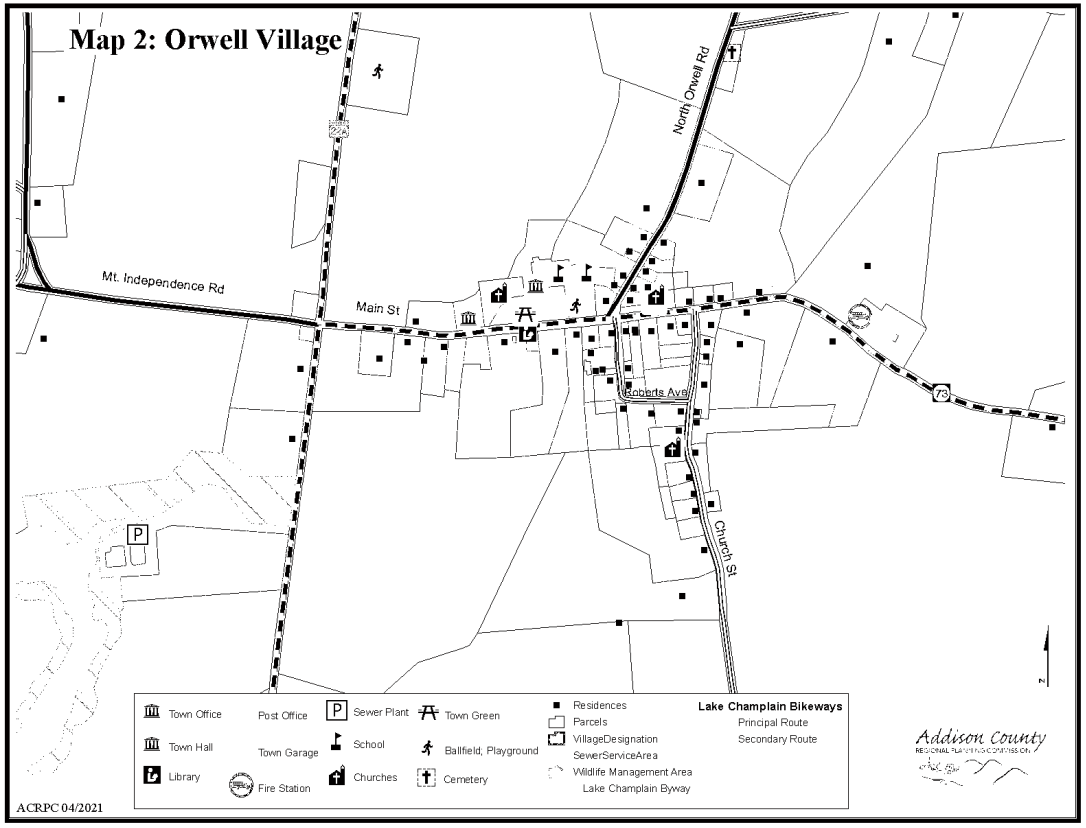


Figure 32 Orwell Village

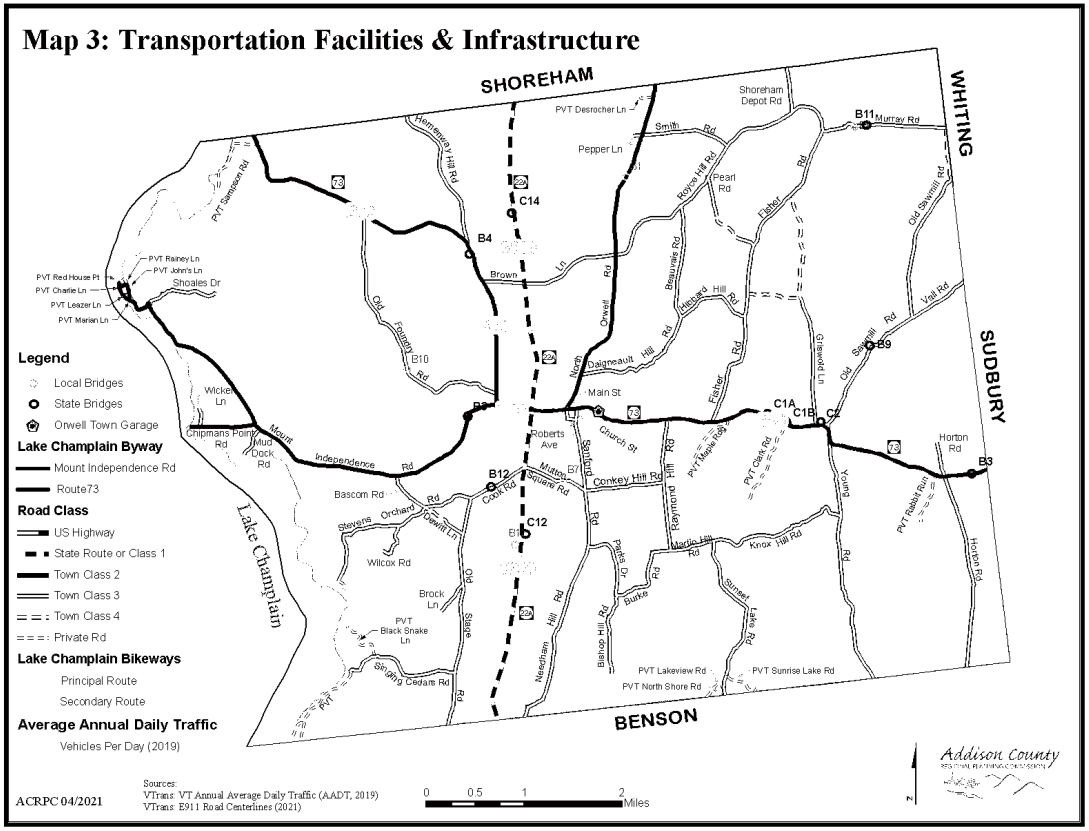


Figure 33 Transportation Facilities and Infrastructure

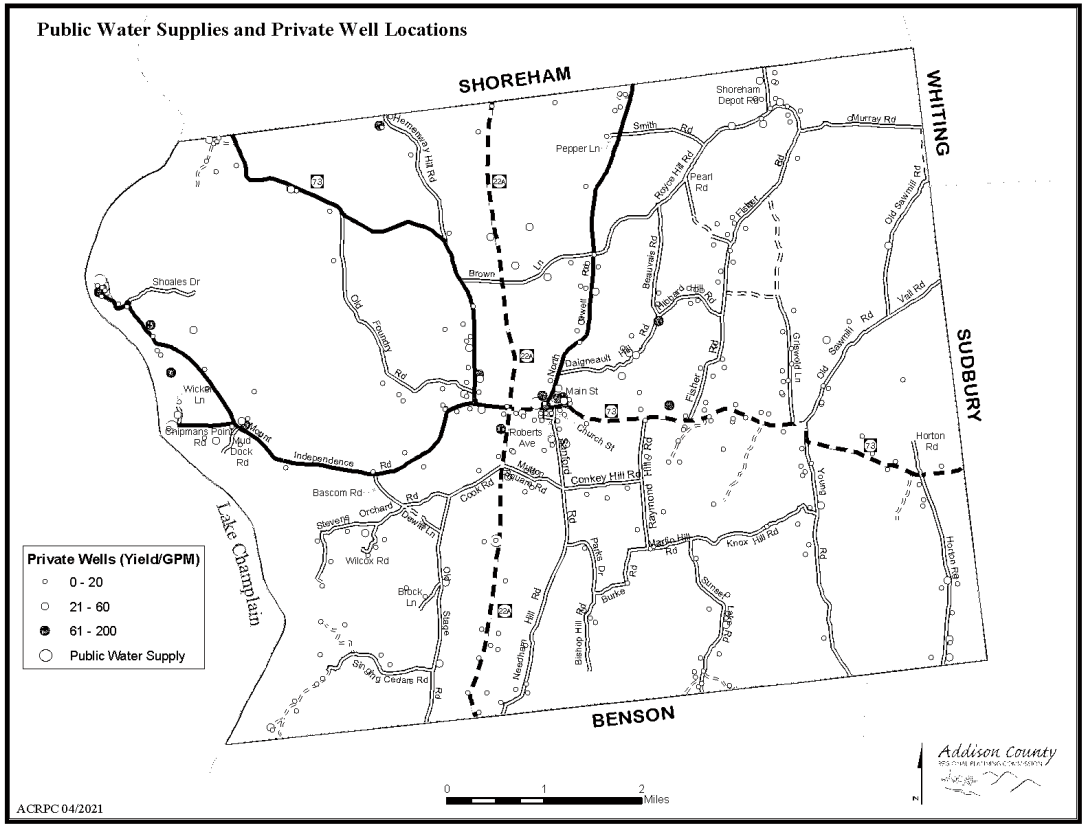


Figure 34 Public Water Supplies and Private Well Locations

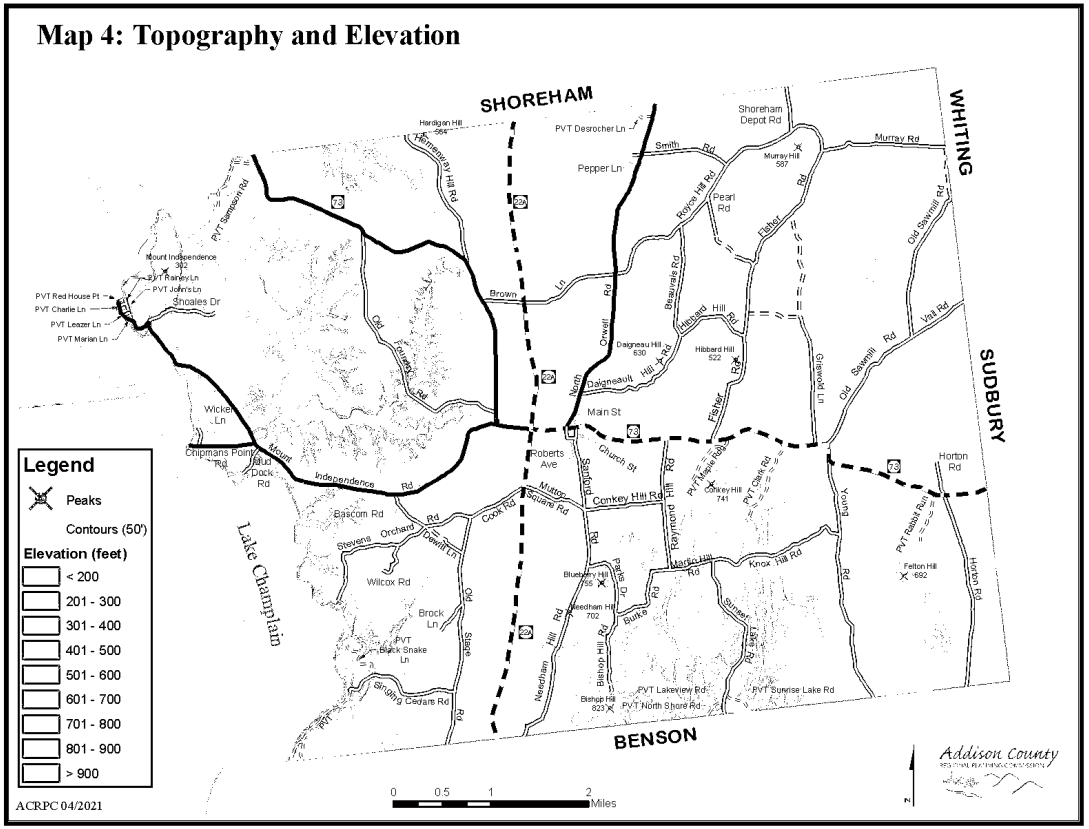


Figure 35 Topography and Elevation

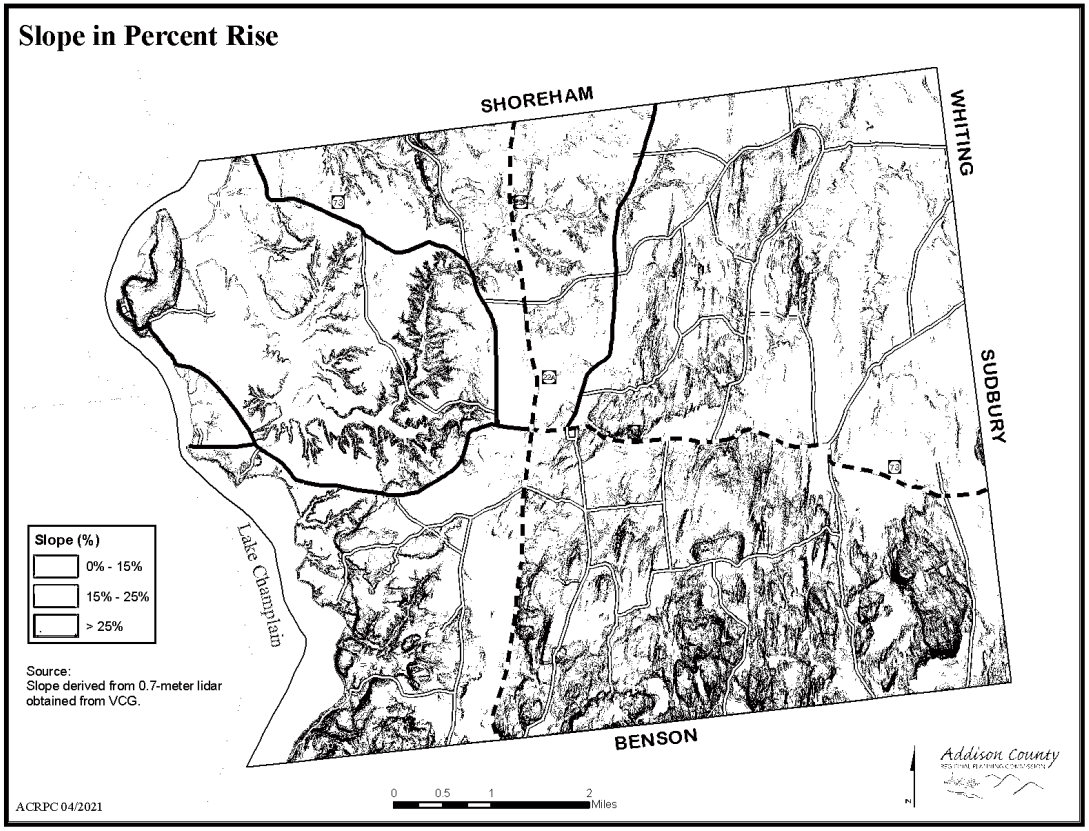


Figure 36 Slope in Percent Rise

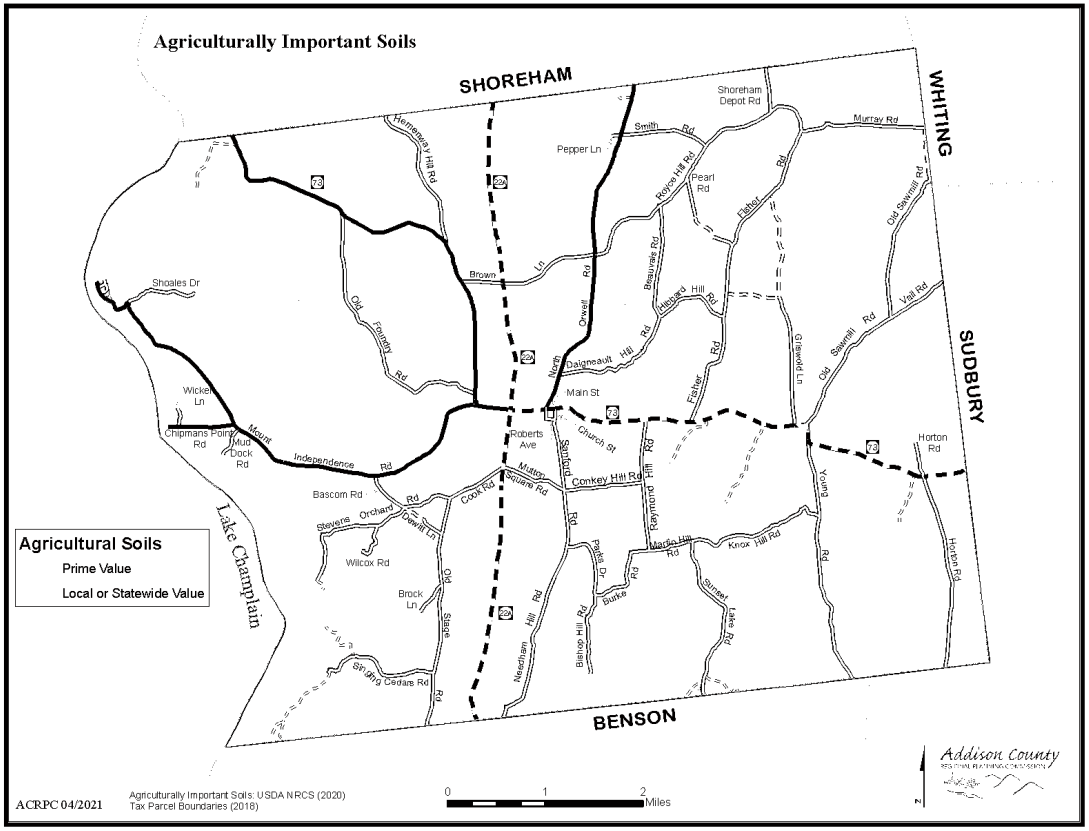


Figure 37 Agriculturally Important Soils

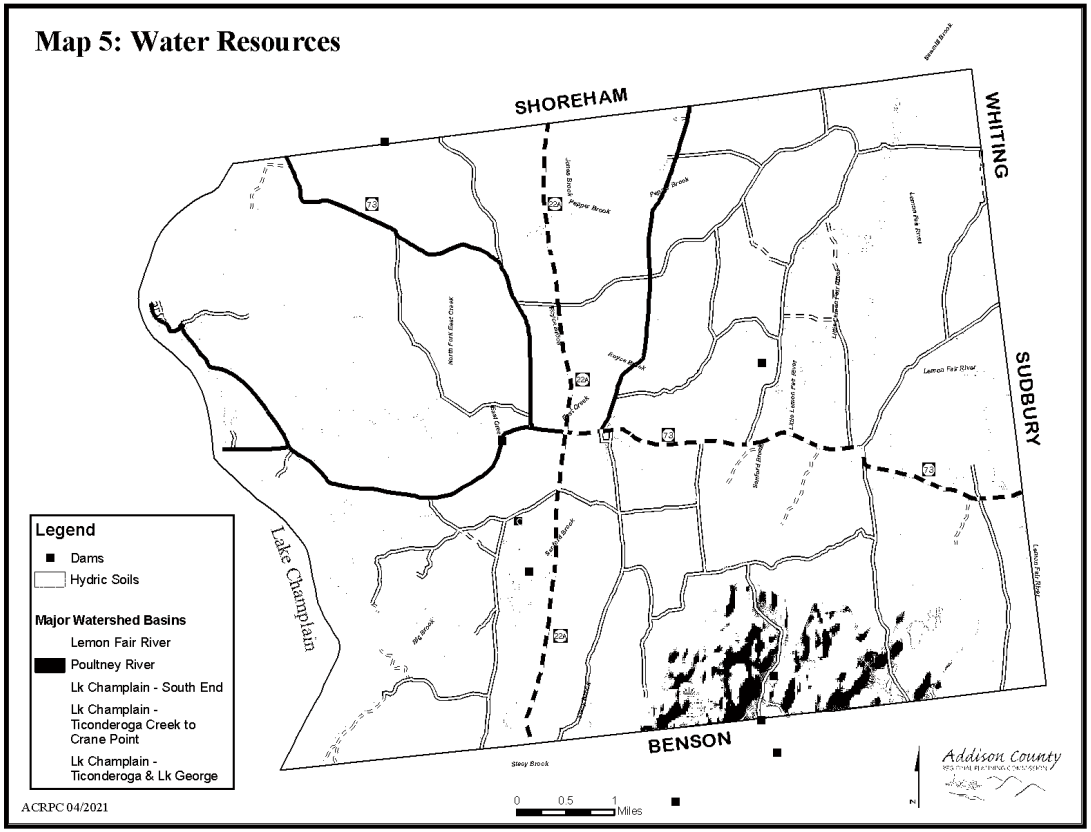


Figure 38 Water Resources

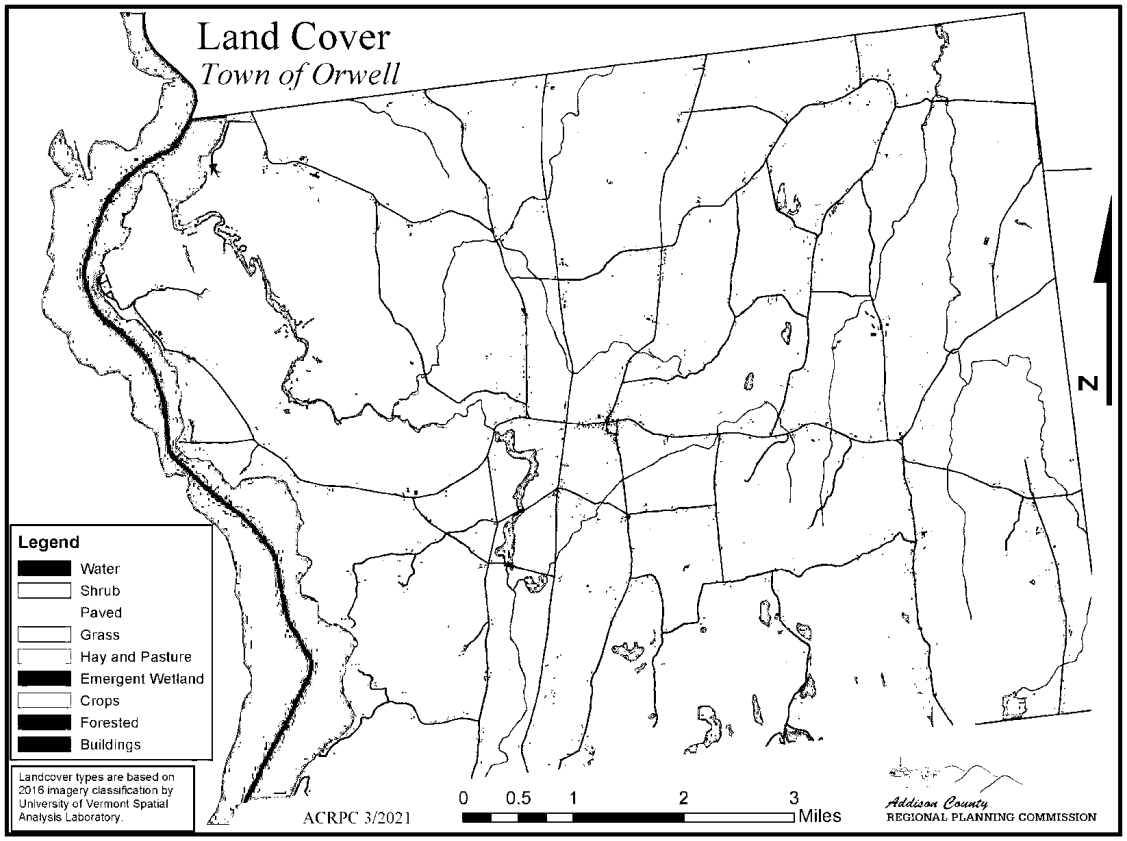


Figure 39 Land Cover

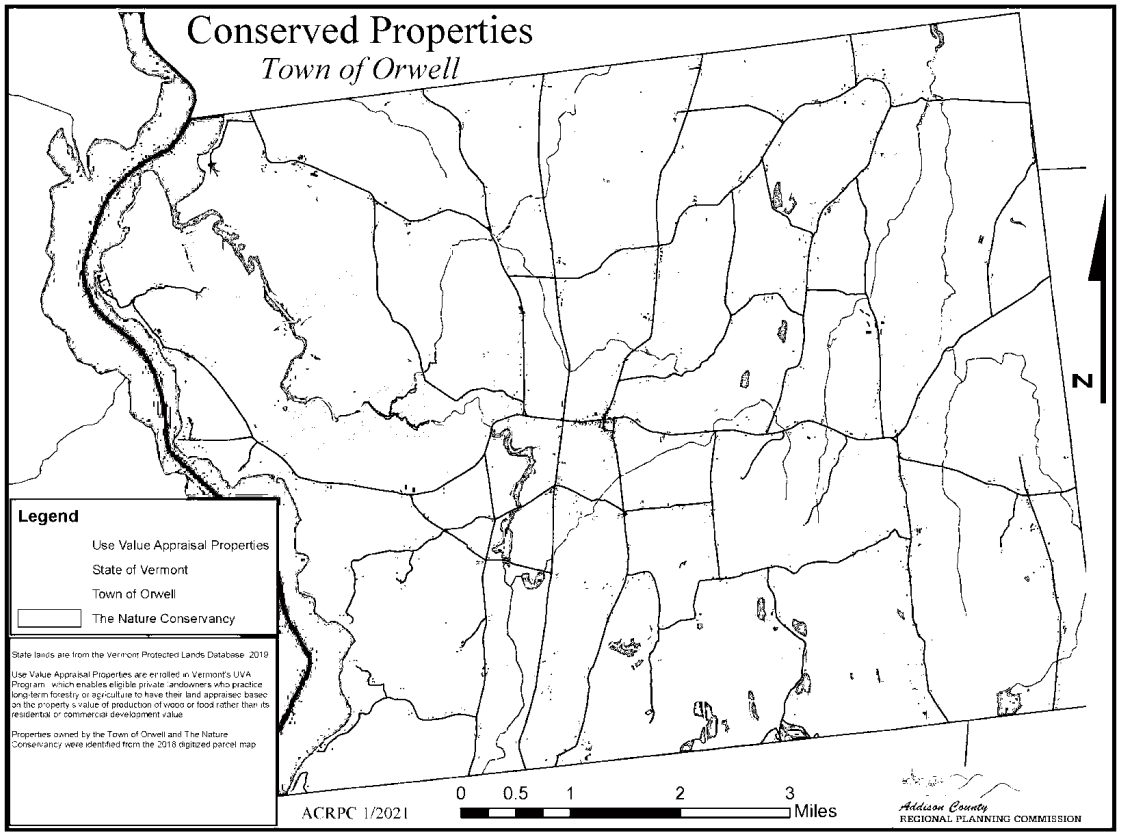


Figure 40 Conserved Properties

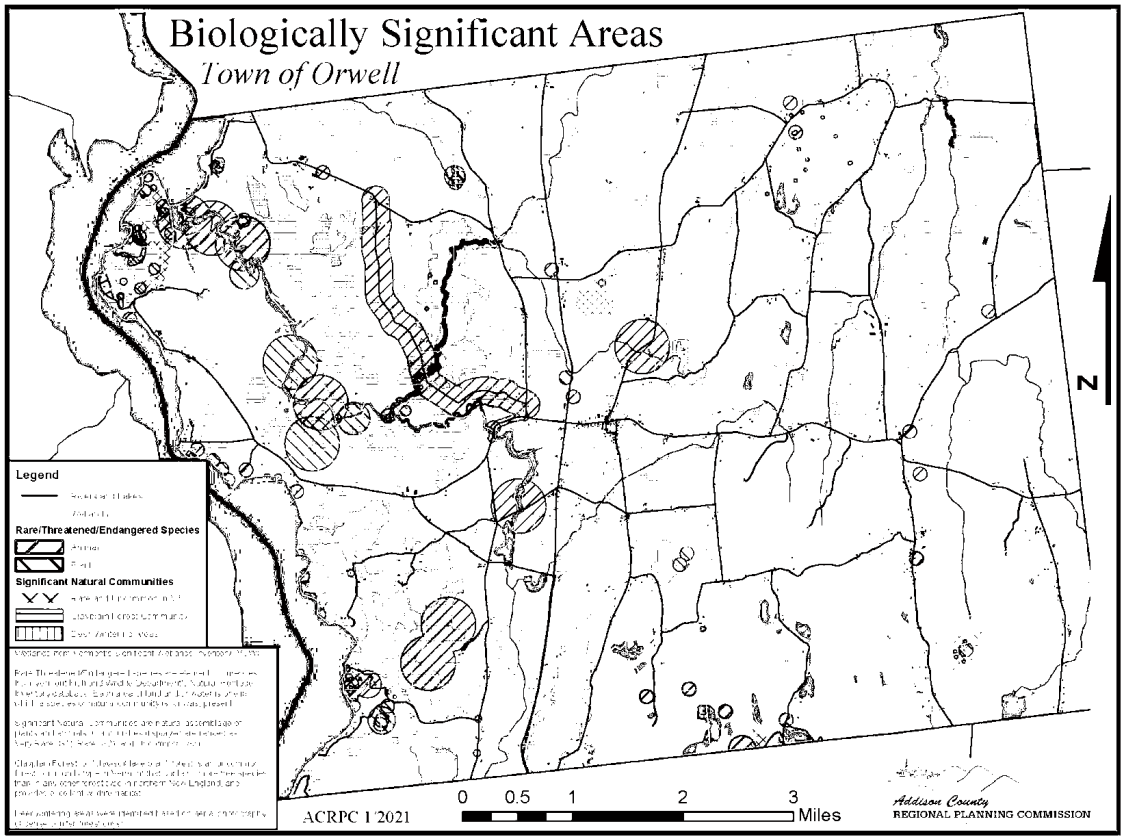


Figure 41 Biologically Significant Areas

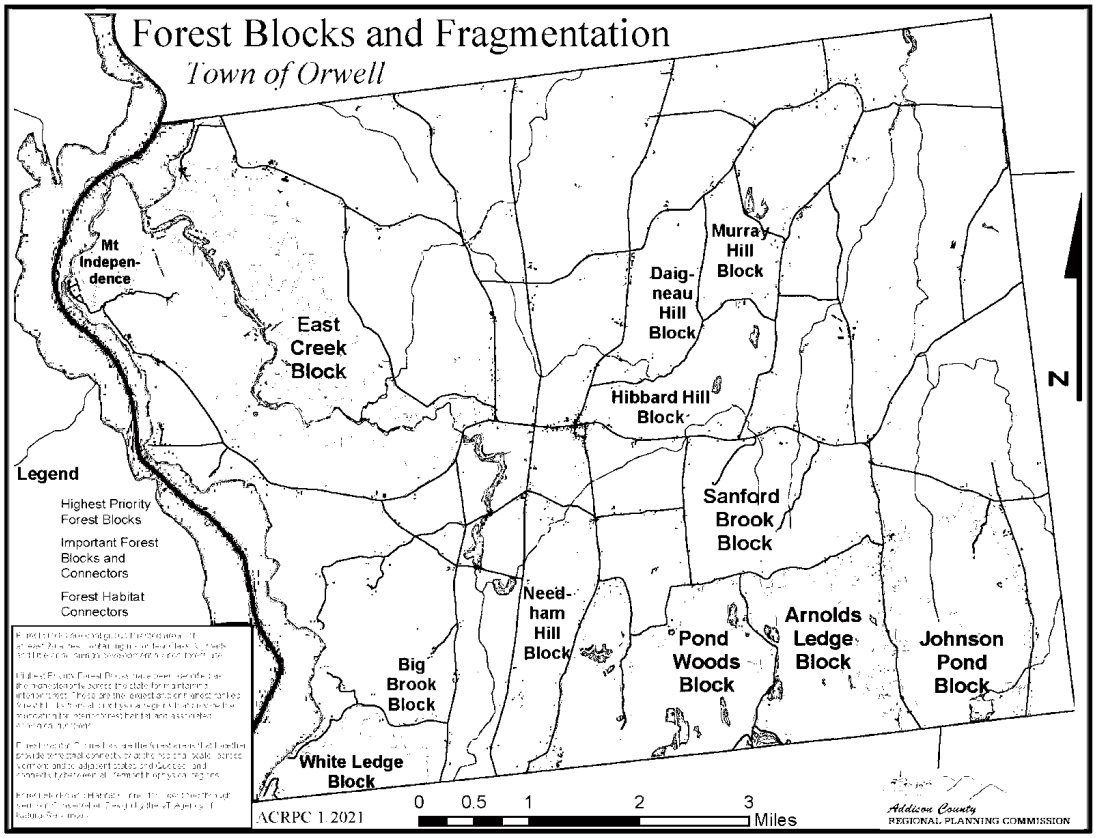


Figure 42 Forest Blocks and Fragmentation

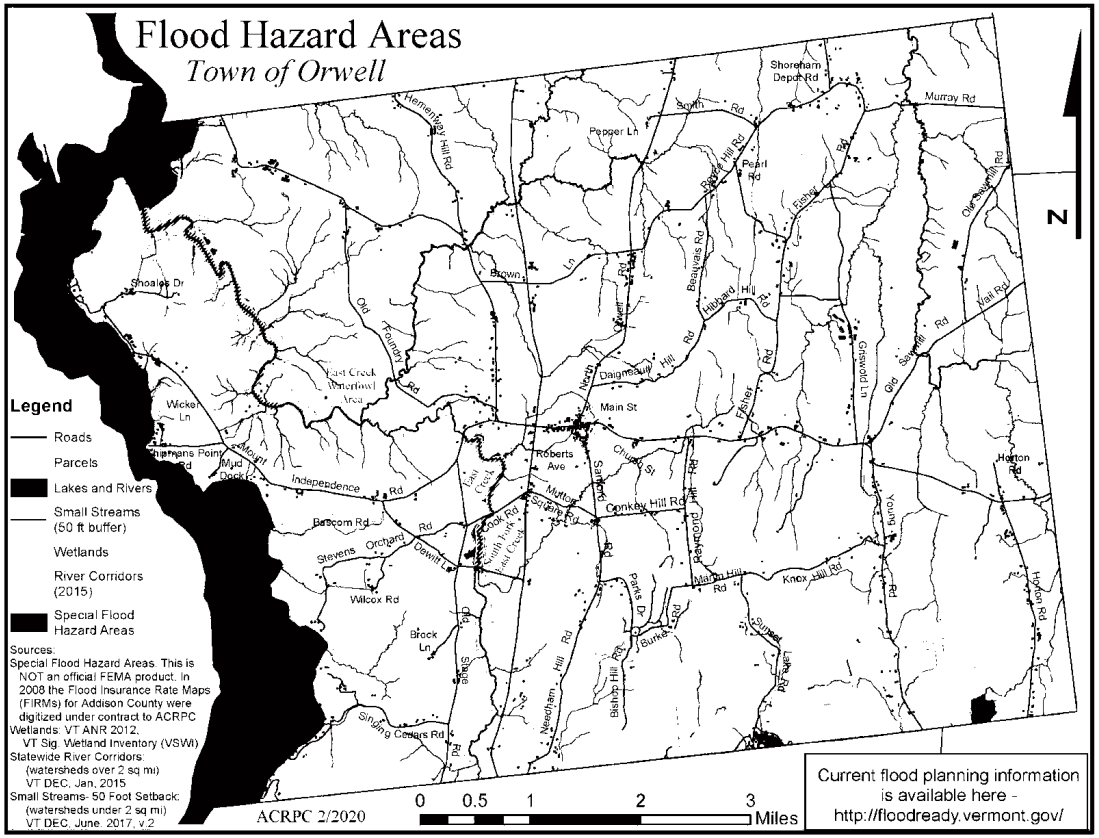


Figure 43 Flood Hazard Areas

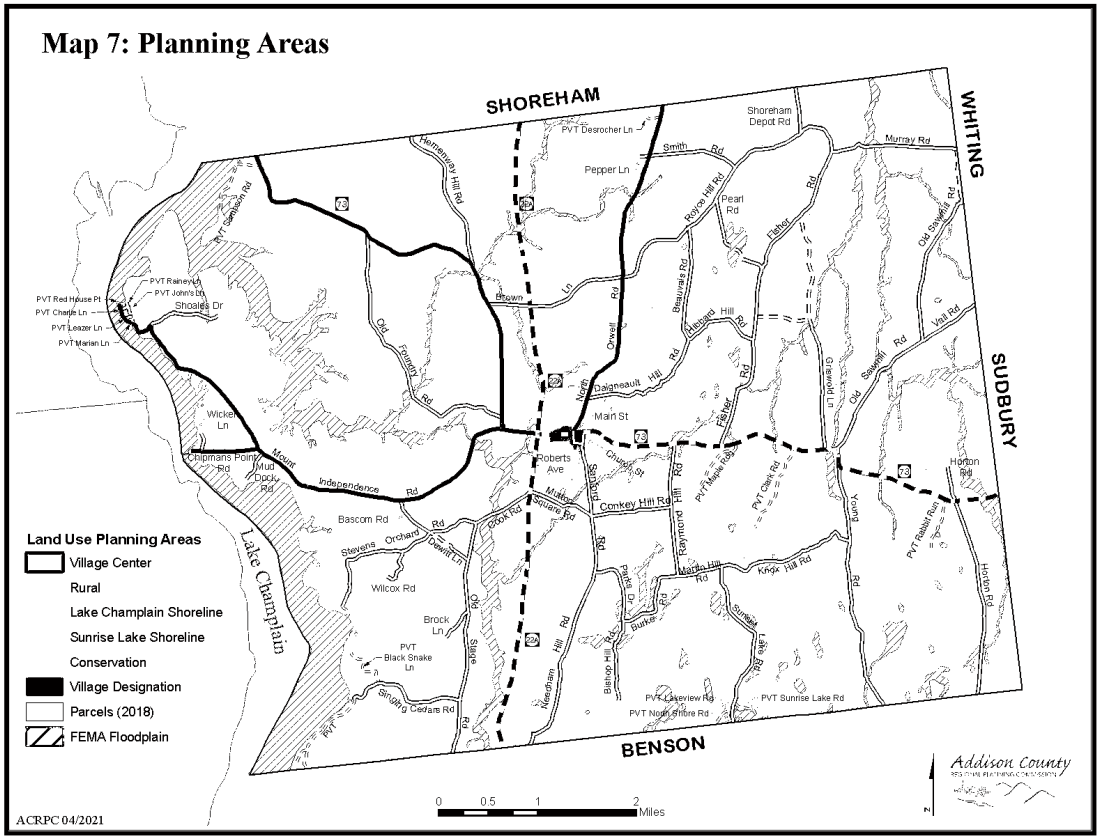


Figure 44 Planning Areas

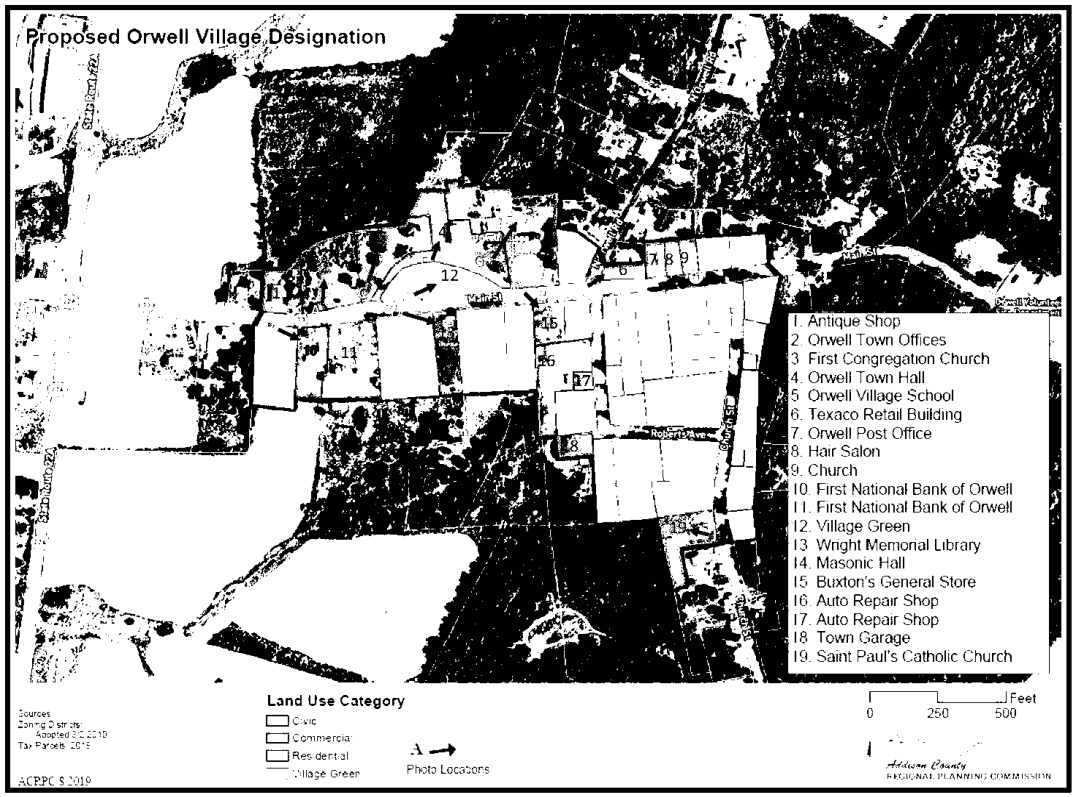


Figure 45 Proposed Village Designation