Selectboard draft Town Plan
Accepted May 23,2018

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Introduction

The Norwich Town Plan provides a format to help decision-making related to the possible future town growth, or the diminishment of development, and which takes into account: existing conditions, trends and resources within the town; the local, regional and global forces that will affect the town both in the near- and long-term future; the vision of a sustainable future for the town; and the goals and objectives of town residents to include the viability of the community in a manner that maintains its social, economic, and physical fabric allowing an affordable environment for a diverse community.

About Our Town

Norwich is a town in Windsor County, Vermont with a population of approximately 3,414 (per 2010 census). Norwich lies on the western bank of the Connecticut River (Vermont's boundary with New Hampshire) and has close ties with its neighboring towns, including Hanover and Lebanon in New Hampshire and Thetford and Hartford in Vermont. The Ledyard Bridge connects the two communities. Norwich is part of the bi-state Upper Valley region, which includes towns along the Connecticut River in Vermont and New Hampshire.

Norwich is approximately 45 square miles in area. The Ompompanoosuc River flows into the Connecticut River in the northeastern part of the town. The level floor of the river valley is fairly narrow and most of the town's landscape is hilly with a combination of wooded uplands and open space.

Major transportation routes, which run in parallel through the Connecticut River valley, include Interstate 91, U.S. Highway 5 and the former Boston and Maine Railroad right-of-way, now owned by the State of Vermont. Other important routes run southeast toward Boston along Interstate 89. Other important routes run southeast toward Boston along Interstate 89. In addition, local commuting routes include town roads such as Beaver Meadow Road, New Boston Road and Route 132. These commuting corridors are entirely maintained by the towns through which they pass.

About Our Plan

Purpose and Authority

This plan for the Town of Norwich is intended to reflect our citizens' collective goals and objectives, and offers recommendations for future action to achieve those aims. The plan will help the Selectboard, Planning Commission, Conservation Commission, Norwich citizens and organizations as they define and direct the nature, quality and quantity of growth and development in Norwich over the next five to ten years. Fundamentally, the plan will serve as the foundation for any revision of the town's land use regulations, which are regularly subject to change by State and Federal regulations. It is a template and a resource for any proposed community development programs, and for the direction and content of other local initiatives.

The plan may be used by Vermont's District Environmental Commission for review of development projects in Norwich under the jurisdiction of Act 250. It will also be a source of information and a long-term template by which to measure and evaluate public and private proposals that affect the physical, social, and economic environment of the community.

This plan is being developed under the guidelines of Vermont State law, both as to procedure and to the substance of the plan. The Vermont Municipal and Regional Planning and Development Act, Title 24 of the Vermont Statutes Annotated, Chapter 117, enables Vermont municipalities to establish Planning Commissions and to prepare municipal plans. Through the Act, the Planning Commission is empowered to implement the plan once the Town of Norwich legally adopts it.

Planning History and Process

This town plan builds on previous planning efforts that involved considerable public input over the course of the past 40 years.

1968: First Town Plan adopted
1971: Zoning Regulations adopted
1975: Town Plan adopted
1975: Zoning Regulations adopted
1980: Town Plan adopted
1981: Zoning & Subdivision Regulations adopted
1986: Town Plan adopted
1990: Zoning & Subdivision Regulations adopted
1992: Zoning & Subdivision Regulations amended
1996: Town Plan adopted
2001: Town Plan re-adopted
2002: Subdivision Regulations adopted
2006: Town Plan re-adopted
2008: Zoning Regulations adopted
2009: Zoning Regulations amended
2011: Town Plan adopted

Norwich first adopted a plan in 1968, which was revised and readopted four times over the next 18 years. In 1989, the town embarked on a project to redraft the plan, largely from scratch. The process took seven years and resulted in the 1996 adoption of a new town plan. In 2005, Norwich again tackled the challenge of re-examining its plan, resulting in the adoption of this 2011 town plan. These two planning processes are described in greater detail here.

1996 Plan. The process for preparing Norwich's fifth Town Plan began in 1989 with the formation of seven committees to create a vision statement, gather information, make inventories, and propose goals, objectives, policies, and recommended actions. The committees were Land Use, Transportation, Community Facilities, Town Services, Community Development, Environmental and Natural Resources, and Capital Budget. More than 200 Norwich residents

participated on these committees, attending regular meetings and spending many hours collecting data and researching issues.

In 1990, a four-page questionnaire was distributed to Norwich residents to determine their attitude towards various town growth issues. There were 546 responses, which helped guide the work of the planning committees. The final reports and inventories of the committees were presented to the Planning Commission in 1991. The Planning Commission began an evaluation of the reports in conjunction with committee chairpersons.

In the process of evaluating this information, particularly regarding growth and property tax issues, the Planning Commission decided more information and research were needed and retained Douglas Kennedy & Associates to prepare a report utilizing 1990 U.S. Census data and other data that had not been available to the committees. Several chapters in the plan were based on that report, while the others were based on the reports of the Town Plan committees.

2011 Plan. In 2005, the Norwich Planning Commission began the process of updating the 1996 plan by distributing another survey to residents addressing a range of planning and growth issues in town. The results were overwhelming, with 990 surveys returned. One question that was asked related to growth and development was what residents wanted the population to be in the future. Summaries of the survey results were used throughout the plan. The complete results are available from the town's Planning Office. Also in 2005, the town held a charrette (design workshop) to explore residents' preferences and concerns related to mixed-use development. The input from the charrette was used to develop preliminary design guidelines for consideration as the land use section of this plan was revised.

In 2006, Norwich again sought assistance from Douglas Kennedy's firm, LandVest, to collect and present updated demographic, housing, economic, land use and fiscal statistics for use in the town planning process. In 2007, the town contracted with PlaceSense to facilitate a series of public workshops and assist the Planning Commission in gathering all the data and input into a first draft of the revised plan. The Planning Commission then distributed the draft plan to various town committees, staff and organizations, as well as to a series of working groups made up of interested citizens. The recommendations of these groups and individuals were used by the Planning Commission to develop the 2011 plan.

2017 Plan The 2017 Town Plan represents a minor update to the 2011 Town Plan, rather than a comprehensive rewrite such as occurred in 2011. This continues the longstanding practice in Norwich of alternating between comprehensive rewrites and minor updates of prior town plans, and helps manage the substantial workload associated with comprehensive revisions.

The 2017 Town Plan builds on the past efforts of the Planning Commission, including many years of public outreach, particularly beginning in 1996. In the late 1990s, the commission created two subcommittees that ultimately facilitated significant changes to the plan and regulations to reduce potential development in areas that lack infrastructure and are expensive for the town to serve, and focus it where infrastructure exists and services are more easily provided.

Pursuant to legislative requirements, the Two Rivers-Ottauquechee Regional Commission (TRORC) provided an Enhanced Consultation in 2013 with a summary memorandum listing recommendations for additions to the 2011 Town Plan to more thoroughly address current state planning goals. The Planning Commission believes it has addressed these recommendations in the 2017 Town Plan, though discussions will continue into 2018 and beyond.

As described in more detail in the Land Use section, the Planning Commission prepared a 2015 study and conducted public forums related to development options for the Route 5 South/River Road corridors. The Planning Commission also worked closely with the Norwich Energy Committee to make updates to the energy section of the plan. The commission plans to consider further updates to the energy section to keep pace with the evolution of state and legislative requirements.

The Planning Commission conducted a public hearing on July 13, 2017 to seek public comment about the latest Town Plan draft. The June 6, 2017, draft of the updated Town Plan was distributed to adjacent towns, TRORC, the state, and made available to the public prior to the July 13 public hearing. Approximately 80 people attended the hearing and approximately 20 people spoke. A number of changes to the draft plan were made in response to public input. In addition, there was a February, 2017 public meeting to gauge public sentiment for a proposed new zone on Route 5 South. Approximately 100 people attended and based on the many speakers and comments the Planning Commission decided to postpone consideration.

Format of the Town Plan

The plan is organized into chapters, which include the statutorily required elements of a town plan. A summary of goals, objectives and actions is included at the end of most chapters. The use of these terms is defined as:

Goals. Statements of aspirations that have an attainable end.

Objectives. Specific, measurable targets for accomplishing goals within prescribed periods of time.

Actions. Ongoing activities consistent with courses of action set forth in policy statements and designed to achieve specific objectives.

About Our Neighbors and Region

Introduction

The Town Plan expresses a vision for the future of the Town of Norwich as determined by the Planning Commission, Selectboard and the residents of Norwich. Although many issues are within the control of the town through its town meeting, elected and appointed officials, and private groups, others are dependent on outside regional events and forces and may need regional solutions. The town has participated in regional decision-making whenever possible. Some areas of regional cooperation have included transportation, solid waste disposal, mutual aid fire protection, recreation, protection of natural resources, and transportation.

Region

Norwich is a member of the Two Rivers-Ottauquechee Regional Commission (TRORC). The Regional Planning Commission creates a Regional Plan and coordinates transportation planning in addition to offering planning support services to the 30 Vermont member-towns.

The Two Rivers-Ottauquechee Regional Plan was most recently adopted in May 2007. The land use section of the Regional Plan and this plan are compatible. The Regional Plan recognizes Norwich Village as a town center in the region. Both plans call for guiding growth towards traditional settlement areas, encouraging quality development , protecting natural resources and preserving open space, working lands and environmental quality in outlying rural areas.

Although Norwich is a Vermont town, due to its location on the border, there is significant interaction with New Hampshire Upper Valley towns. Norwich is one of the four core Upper Valley towns along with Hartford, Lebanon, and Hanover. Norwich, being smaller - population of 3,400 versus 10,000 to 13,000 in the other towns - and primarily residential, relies on these larger towns for employment opportunities, services, and cultural events. As reflected in the following list, there is cooperation between Vermont and New Hampshire towns in emergency response, transportation, recreation, education and cultural events.

Other regional planning and mutual aid groups to which Norwich contributes include:

Upper Valley Regional Emergency Services Association. A fire and rescue mutual aid system for surrounding towns.

Local Emergency Planning Committee District 12 (LEPC 12). A multi-town group to support emergency planning in each community.

Vermont Ambulance District 9. Provides EMS training.

Orange and Windsor Counties Public Works Emergency/Non-Emergency Mutual Aid. A compact to provide a framework through which nine municipalities assist each other in times of extraordinary need or emergency circumstances.

Greater Upper Valley Solid Waste District (GUVSWD). A 10-town municipal district that provides solid waste management authority, services, and planning to its member towns in Vermont.

Upper Valley Recreation Association (UVRA). A 16-town bi-state association that schedules games, organizes coaching clinics, sets rules, and coordinates any other issues related to youth sports.

Upper Valley Trails Alliance. Advocates for the use, maintenance and development of trails in the region to connect communities.

Linking Lands Alliance. A 14-town project sponsored by the Vermont Agency of Natural Resources that is mapping wildlife habitat blocks, corridors, and crossings.

Connecticut River Joint Commission. A bi-state commission created to preserve and protect the resources of the Connecticut River (Norwich is represented at the Upper Valley Subcommittee).

Dresden School District. A bi-state school district consisting of Hanover and Norwich, and providing facilities for middle and high school students and administrative support for all grades, including elementary.

Vital Communities. A regional nonprofit organization based in White River Junction, VT, that works to engage citizens, organizations, and communities in creating solutions to our region's challenges.

Upper Valley Transportation Management Association (UVTMA). A bi-state partnership of five upper valley municipalities, major employers and regional planning commissions that works to mitigate traffic congestion and reduce reliance on single occupant vehicle commuting.

Upper Valley Lake Sunapee Regional Planning Commission. A regional planning commission serving 27 municipalities in western New Hampshire including Hanover and Lebanon (although Norwich is no longer a member town, we participate with UVLSRC in many transportation and planning programs).

Neighboring Towns

No significant conflicts exist or are intended between this plan and municipal plans either adopted or proposed in neighboring towns.

Hartford. Hartford has a Municipal Plan, most recently adopted in June of 2007. Hartford classifies the land near the boundary with Norwich primarily as rural, except for the land near U.S. Route 5, which has been designated by Hartford as planned for commercial/industrial use. Further, some land along the Hartford town line with Norwich is protected from development through conservation easements or public ownership. The protected and rural lands in Hartford are very compatible with this plan's vision for Norwich's outlying lands. The significant changes to Hartford's zoning made in the mid-2000s have increased compatibility with the changes that Norwich made several years earlier, as both towns have reduced residential development densities in their rural areas and increased protection of natural resources in their development review processes.

The land near Route 5 in Hartford is already substantially developed, and its 2010 designation as a growth center in Hartford suggests that much of the town's growth over the next five to ten years will be focused on the areas in and around the villages of Wilder, Hartford and White River Junction, south of the town line with Norwich. The Planning Commission has studied the Route 5 corridor in Norwich to determine whether it would be a suitable location for compact housing development, under existing planned unit development zoning regulations for that area while recognizing that a lack of wastewater disposal capacity continues to be a limiting factor to development in this area. This plan recognizes that Hartford, Hanover and Lebanon will continue to be the employment and service centers of the Upper Valley. Hartford has subsequently seen an increase in revitalization of the White River Junction downtown area,

including mixed-use development, rental housing and senior housing.

Sharon. Sharon most recently adopted its town plan in February of 2010. Sharon does not have zoning regulations, but it does have subdivision regulations. In its plan, Sharon classifies land near the Norwich boundary as rural residential or forest reserve. Sharon's land use plan is compatible with this plan, although absent zoning regulations Sharon will be constrained in implementing its plan. Currently, the rate of development in Sharon is low, and what growth occurs causes little impact on Norwich. Any dramatic increase in development in Sharon could affect Norwich, particularly in the form of increased traffic on Norwich roads.

Thetford. Thetford most recently adopted its town plan in March 2007, with zoning and subdivision regulations in place since 1974. With the exception of a small village residential area in Union Village, the land in Thetford abutting Norwich is zoned for traditional rural and low-density residential uses. Future development and population growth will be focused in Thetford's growth centers, which include five residential villages and two hamlets. Thetford's plan is compatible with this plan.

Strafford. Strafford is a rural town that experienced rapid growth in the 1980s, with much slower growth recently. The town has had subdivision regulations since 1970 and zoning regulations since 1978. Strafford most recently adopted its town plan in March of 2008. The plan calls for growth management and preservation of open space. Strafford's plan designates the area near the Norwich town line for rural residential uses, which is compatible with this plan.

Hanover. Hanover, as a developed town with limited land available for new construction compared to most communities in the Upper Valley, has experienced slow growth in recent years. Zoning is restrictive and the two major employers, Dartmouth College and Dartmouth-Hitchcock Medical Center (DHMC), have each been stable or growing at a slow rate in recent years. Hanover is a source of employment, educational facilities, cultural activities, retail stores, and professional services for Norwich residents, while Norwich conversely provides a source of housing for home for many of those employed by Hanover businesses and institutions.

Lebanon. The City of Lebanon, largest of the municipalities in the Upper Valley with a population of approximately 13,500, is a major employment and growth center with a daytime population of approximately 30,000. Lebanon is the home to many of the Upper Valley's largest employers including Dartmouth-Hitchcock Medical Center, Hypertherm and other high-tech companies, large retail stores, and service companies that provide employment and important services to Norwich residents.

About Our Future

Sustainability

For the foreseeable future, the Town of Norwich will continue to experience local forces of change such as population fluctuations and changing demographics as the greying of the Vermont population continues, and global forces of change such as increasing natural resource scarcity and climate change. The current trend in Norwich and the state of Vermont is for outward migration and the overall aging of the population. There has been not only a significant decline in the overall population but a significant decline in the number of school children statewide. Therefore, we recognize the need to plan for a sustainable future for Norwich. Sustainability is defined as meeting our needs in the present without compromising the ability of future generation to meet their needs[1].

Sustainability is a philosophy that involves long-term thinking and balanced decision-making. Now, and in 50 years, we want Norwich to be a community with the following characteristics:

Strong municipal leadership, citizen involvement in government, and transparency in government decision-

[1] **Page 8, *World Commission on Environment and Development. Our Common Future***. (Oxford University Press, 1987) (Hereafter, the "Brundtland Report").

making;
Meaningful and productive partnerships with adjoining towns, regional organizations and other stakeholders;
The ability to attract and retain residents who contribute to the life of the community;
Viable local employment options;
Opportunities for involvement in cultural and recreation activities;
Clean air, land and water including dramatically reduced greenhouse gas emissions;
A high degree of walkability and alternative modes of transportation besides single-passenger cars and trucks;
A protected and preserved natural environment and a compact settlement pattern;
Strong social ties with a community ethos;
Well-maintained infrastructure providing a high level of social amenities; and
Affordable places to live.

It is not Norwich's intent to strive for self-sufficiency, but to join with its neighbors in the region to work toward a sustainable future together. A number of formal and informal regional efforts are already underway that are improving sustainability in the region – Advance Transit, Upper Valley Transportation Management Association (TMA), Local First Alliance, Upper Valley Localvores, Valley Food and Farm, Upper Valley Land Trust, the regional planning commissions and other organizations, governments, employers and individuals are taking part. This plan focuses on specific actions for Norwich as a town, but it must be recognized that achieving our vision for a sustainable future will involve both individual and coordinated regional action.

A sustainable community depends upon consistent, thoughtful sustainable decisions, supported across the town. Therefore, the following considerations underpin the implementation of this plan:

Ensuring that we leave a positive legacy for future generations.
Making decisions that balance environmental, social, cultural and economic trade-offs over at least a 50-year time frame (while recognizing the difficulty in predicting Norwich's needs and the changes both internal and external that will occur over 50 years).
Reducing our ecological footprint by using our land, resources and energy efficiently.
Encouraging all residents to be actively involved in their community.

Smart Development

"Development" can, but need not, imply "growth". Growth poses a challenge to sustainability in that it is inherently unsustainable over time in a finite world, with finite resources. This plan does not encourage growth, but also recognizes that growth may occur and when it does, it should happen consistent with this plan. Central to achieving a sustainable future is the need to change our land use development practices and patterns. Smart development describes a pattern of land development that uses land efficiently, reinforces community vitality and protects natural resources. Smart development is about ensuring that development is simultaneously good for the economy, community and the environment.

The concept of smart development establishes principles for a more sustainable community that include:

Revitalization of, and directing of new development towards, existing settlement areas.
Mixed land uses.
Compact building design.
A range of housing opportunities and choices.
Walkable neighborhoods.
A variety of transportation choices.
Distinctive, attractive communities with a strong sense of place.
Preserved open space, farmland, natural beauty and critical environmental areas.

Predictable, fair and cost-effective development review and decision-making process.
Community and stakeholder collaboration in development decisions.

The land use plan for Norwich, presented in Chapter 12, incorporates these smart development principles. The land use plan establishes the framework for Norwich's land use regulations and this plan includes recommendations of changes to better support the smart development and sustainability principles outlined above.

Themes

Each chapter of this plan ends with a series of goals and objectives. To achieve a sustainable future for Norwich, these policies are intended to be considered as a whole, rather than taken individually, with an understanding of the connections and potential conflicts that exist between them. The following over-arching themes provide a framework for understanding the relationships between the goals and objectives of this plan and our vision for a sustainable future:

	Protecting and preserving our land and natural environment.
	Improving how we get around.
	Minimizing our use of non-renewable resources.
	Supporting a productive, engaged, multi-generational population.
	Increasing the resilience of our economy.
	Enhancing our recreation and cultural opportunities.
	Reinforcing our sense of community.

Each of the goals and objectives of this plan supports one or more of these sustainability themes. These relationships are highlighted through the keyed symbols associated with each theme that appear in the policy section at the end of each chapter of this plan. The sustainability themes are also woven into the Implementation Program, which follows this section and which is organized around four focus areas: sustainability, housing, natural and historic resources, and energy efficiency.

Implementation Program

The Norwich Town Plan is a guide that does not create mandates, but rather reflects a vision of the town going forward. This long-term vision of the town is reflected in the goals, objectives, and policies of this plan, and will be realized by implementing the recommended actions listed at the end of each chapter. As conditions change, the implementation process must remain flexible.

Existing zoning and subdivision regulations in Norwich may need to be reviewed and possibly revised to reflect the plan's objectives and policies. Other regulations governing roads, traffic, sewage disposal, health, etc., may also need to be reviewed and possibly revised. Non-regulatory implementation programs may include capital budgeting, public facilities planning, and natural resource inventories. Programs combining public and private activity may include housing, land conservation, historic preservation, and economic development. Decisions will be made on the priorities of recommended actions; some programs may demand immediate attention, others may not. Some changes to regulations should and can be made immediately; others may need more research and discussion within the community.

While the Planning Commission, Conservation Commission, ad hoc committees, and other public and private groups including the Fire District Prudential Committee, may take an active role in the implementation of the Town Plan by drafting changes in regulations or creating specific programs, decisions involving town funds or changing regulations will be made by the voters of Norwich, either directly at a Town Meeting vote or by their elected representatives on the Selectboard or School Board.

Historic Perspective

It is necessary to know where we have been and where we are now in order to determine where we should be headed. This basic principle applies to charting our future course not only as individuals, but also as a town. The following is a brief sketch of Norwich's history, which provides insight into how the town arrived at its current situation.

18th Century

Formation and Founders

Norwich is one of four adjoining towns in the Upper Connecticut River Valley to receive charters granted on July 4, 1761, by Governor Benning Wentworth. The other towns are Hanover and Lebanon, New Hampshire, and Hartford, Vermont. Norwich's first settlers came, as did those of the other towns, principally from north-central Connecticut. They traveled northward almost 200 miles up the Connecticut River and, in many cases, named their new towns for their previous ones.

Generally, the men whose names appear on the charters – the grantees or proprietors – were not the ones who settled the new land, but were the older and more established inhabitants of their Connecticut towns. The younger men, those with the strength and skills to be pioneers, to build sawmills and gristmills, to clear the forests, were the ones to undertake the hardships of the move. In 1763, a few settlers came to Norwich and located close to the river and in the Pompanoosuc area. The first clearing in the township was made by John Fenton and Ebenezer Smith, both proprietors, and Fenton's nephew, John Slafter, son of proprietor Samuel Slafter.

The exploration and "sizing up" of the chartered township, which was "to contain six miles square, and no more" began in 1764. Jacob Burton of Preston, encouraged by the proprietors in Connecticut, made the journey north. He had the knowledge and the ability to build and operate a mill, take the measure of the region and survey the town. He determined suitable spots on Blood Brook for a sawmill and a gristmill. The location of roads and lots needed to be planned, and there were other conditions laid out in the Norwich town charter with which the settlers would have to comply. Burton's own permanent dwelling was constructed in 1767.

Among other early comers to Norwich were Samuel and John Hutchinson, who arrived in 1765. They cleared an island in the Connecticut River, planted corn on it, then returned to Connecticut; the next year they came to stay. Nathan Messenger also arrived in 1765. His cabin is thought to have been located near the Norwich end of the Ledyard Bridge.

Historic Settlement Areas

The confluence of the Ompompanoosuc and the Connecticut Rivers came to be known as Pompanoosuc. Union Village in the northeastern part of the town is also on the Ompompanoosuc. By 1795, a gristmill had been established there. Beaver Meadow (West Norwich), now a small community, had its beginning in 1780 when its first settler, Conant B. Sawyer, came from Hebron, Connecticut.

Lewiston, of which little remains, was located near the west end of the Ledyard Bridge. Dr. Joseph Lewis settled here near the bank of the Connecticut River in 1767 and owned much of the surrounding land. It was here that an early ferry provided transportation to the Hanover side of the river. John Sargeant, the original operator (at least as early as 1771 and probably in 1770) had a continuing conflict with Dartmouth College founder Eleazar Wheelock over the ferry, and because Sargeant's tavern apparently provided liquor for Wheelock's students. Lewiston's demise came with the construction of the Wilder Dam in 1950 and Interstate 91 in 1968.

Norwich Center must be remembered for several reasons. It was here, on Meeting House Hill, that Peter Olcott built his first house and barn in 1773. Olcott was a leading citizen of the town, serving in various town and state offices, including that of lieutenant governor; he was also a trustee of Dartmouth College. The first church in Norwich was built at the Center on land given by Olcott. Begun in 1778, it was finally finished in 1785. For about two weeks that same year, the Center Church served as the meeting place of the Vermont legislature. All that remains now of Norwich Center is the burial ground on Meeting House Hill and whatever archeological evidence remains of some 10 homes, shops, and offices.

Union Village, Pompanoosuc, Beaver Meadow and Lewiston are all rather clearly defined places, but in addition there are settlements that did not develop business or commercial places. Rather, they are distinctive and more nearly neighborhoods: Podunk, New Boston and Tiger Town.

19th Century

Population and Migration

Norwich now has a population of about 3,400 people. Historically, the growth of the town reflects trends elsewhere in the state and in the New England region, and has been influenced by events throughout the country. Norwich grew quickly from the early settlers to a peak population of 2,316 in 1830. After that date population slowly declined to a low of 1,092 in 1920. The 1830 figure was not reached or surpassed again in a decennial census until 1980 when a count of 2,398 people was registered. (See Chapter 4)

While Norwich was becoming increasingly settled, land in the northern part of the state was being opened up to development. The movement that brought settlers from Connecticut to the region we now know as "the Upper Valley" was repeated, as residents of Norwich set out to settle new lands further north. The movement actually began quite early; for example, in 1803, after having lived in Norwich for some 20 years, Captain Benjamin Burton with his family moved on to Irasburg in Orleans County.

Though they might not have always moved, Norwich residents were also active in organizing other towns. Thus, we find that the proprietors of Randolph, Vermont, were in large part from Hanover and Norwich. A History of Norwich, Vermont (1905) by M. E. Goddard and H.V. Partridge notes that (p. 135) "the evidences of depopulation and disappearance of houses in Norwich seem to be especially marked at Beaver Meadow, and along the 'turnpike,'…"

In the earlier portion of the 19th century, agricultural and forestry practices shared in creating the conditions that made people living in Norwich seek new and unused lands. The importance of good resource management had not yet been realized to any extent either locally or nationwide. In 1840, for example, more than 13,000 sheep grazed in Norwich. Sheep are close croppers and can quickly reduce the value of a hillside.

Just as local people left the town for places further north in the state, so residents were enticed by the opening of the West with its vast natural resources. Jasper Murdock set out as early as 1801 with his family, including his father-in-law, the Reverend Lyman Potter, who had been the town's first settled Congregational minister, to journey to Ohio (then the Northwest Territory). The move of settlers westward whether into New York State, Pennsylvania or beyond continued into the early-20th century and to such an extent that emigrant aid societies were frequently formed and guidebooks were published for those undertaking the trek.

Education

Looking at Norwich's 200 years of history, a concern for education can be identified from the beginning. The Vermont Constitution of 1777 had specified that each county should have a grammar school. Windsor County built the first in 1785, located in Norwich. Between 1785 and 1841, 20 school districts were formed and these can still be identified on maps such as the one in the Beers' Atlas of Windsor County (1869). Some of the old schoolhouses survive as present-day dwellings.

In 1819, Captain Alden Partridge, a graduate of the U.S. Military Academy at West Point and its superintendent from 1815 to 1817, returned to his native town of Norwich and established the American Literary, Scientific and Military Academy. From 1825 to 1829, Partridge moved the school to Middletown, Connecticut, where he hoped to find a greater potential and larger financial base; the school, however, returned to Norwich.

In 1834, it was incorporated as Norwich University. During the next 30 years, the university had its ups and downs for apparently Partridge was not as good a businessman as educator; he also quarreled with Truman B. Ransom, who succeeded him as president. Then, in 1866, the South Barracks building was destroyed by fire. When the Town of Northfield, Vermont offered both a location and buildings, the university accepted the invitation to move there.

The Norwich Classical and English Boarding School, a relatively short-lived enterprise, occupied the North Barracks after the university's departure. It operated from 1867 to 1877. The North Barracks burned in 1898, thus ending a dominating presence on the Norwich Green.

Economy

Industry was supported by natural resources in Norwich. Business partnerships developed along the river; the trade of timber and its by-product, potash, in exchange for rum, molasses and sundries was especially lucrative between Norwich landowners and merchants in Springfield, Massachusetts and Hartford, Connecticut.

As merchantable lumber dwindled, however, emphasis shifted to agriculture based on wheat and other grains. In 1810, merino sheep were brought to Vermont and, by 1830, Norwich, like many other New England towns, was raising them by the thousands. The wool and the breeding stock itself were eagerly sought and easily transported elsewhere; wool commanded high prices, particularly during the Civil War when the supply of cotton was cut off and armies had to be clothed. During this time, wool was valued at $1.00 per pound versus today's value of about 25¢ per pound. That boom was over in the late 1860s, complicated by tariff manipulations and unbeatable competition, first from western states, then from Australia.

When dairy herds were introduced at the end of the century, the pastures yielded new productivity. Though not clean sweepers like sheep, cattle demanded more silage (thus more hay fields) and larger barns. The growth of the milk industry was gradual in the late 1800s, but, once secure, it caused a visual revolution in the landscape and helped slow down the rate of population decline. A typical mid-19th century Norwich farm consisted of about 150 acres, of which 125 were cleared and 25 forested.

Railroad

The Connecticut and Passumpsic Railroad, finished in 1848, connected the Upper Connecticut River Valley to tracks across the country. When White River Junction became the region's principal railhead, Norwich farmers and merchants had a faster means of transporting their produce and wares, by boxcar rather than wagon load. The railroad replaced the Connecticut River as a trade route, eliminating the disadvantages of seasonal transportation.

The sharply increasing demand of growing cities for fresh milk, cream, and butter brought prosperity for those who had successfully shifted from shearing sheep to milking cows. Already established communities like Lewiston and Pompanoosuc grew around railroad depots. The former boasted its own store, post office, and coal and lumber yards.

20th Century

Education

In 1963, Norwich and Hanover joined together in the first interstate school district in the country, forming the Dresden School District. Its first annual report noted that the two towns had "been impelled by common difficulties toward a cooperative solution of school problems." The district was established as an interstate compact by Public Law 88-177.

Infrastructure

In the 20th century, two technological advances affected the history of Norwich: construction of the Wilder Dam and Interstates 91 and 89.

Wilder Dam, built south of town in 1950, is part of a network of hydropower dams that altered farming patterns along the Connecticut River and its tributaries. Many of Norwich's fertile flood plains were submerged, including those in Pompanoosuc.

Perhaps the building of Interstates 91 and 89 most dramatically influenced the course of Norwich history. Completed in the late-1960s, the four-lane highways connected Norwich overnight to the entire East Coast and to the rest of the country. Travel time between Norwich and Boston or New York City was cut in half. Dilapidated or abandoned houses quickly became summer and retirement homes (a trend already evident in Beaver Meadow in the 1940s), replacing working farms but rescuing some rural architecture.

Land Use

The second half of the 20th century saw Norwich transition from an agricultural to a bedroom community. In 1940, it is estimated that one-half of the town's land was cleared. The trend away from agriculture is reflected by the fact that currently less than 30 percent of the land is cleared.

Only a few people in town can remember seeing cattle being driven down Main Street to their barns from pastures further out. While Norwich did exist for many years as a quiet farming community, longtime residents have seen it change into a bedroom community for nearby employment centers.

Those who work elsewhere choose to live in Norwich because of the town's good school and its proximity to Hanover, Dartmouth College, and the Dartmouth-Hitchcock Medical Center. They come here for the kind of life that has disappeared elsewhere and which they perceive can be found here. The Dartmouth presence is strong and the college and its library have long drawn both summer renters and permanent residents. Academics from other institutions have been coming here since the 1940s, and many of them settled in the Upper Valley after fleeing Europe during World War II. Others see Norwich as a place for retirement; frequently these are alumni of Dartmouth College. All of these trends are agents of change for Norwich.

Town Profile

With an understanding of recent development trends, current community makeup, and likely future change, a planning effort can better respond to residents' needs and better account for the impacts and opportunities of development. To develop a realistic set of development projections, a community profile:

1) documents the development trends that have brought the town to its current situation;
2) assesses the current makeup of the town from demographic, economic and social perspectives; and
3) assesses the range of development factors affecting the town.

In addition, the pace and form of land development significantly affects the fiscal health of communities. Virtually any form of land development creates two direct side-effects:

1) the generation of incremental revenue in the form of increased property taxes; and
2) the generation of incremental cost for additional community services to serve the new development,.

Accordingly, this chapter presents a variety of data that profile Norwich's residents and provide a basis for planning efforts. It also provides background on the town's recent and current fiscal situation, and provides a basis for town fiscal projections based on development trends.

Community Demographics

Historic Population Change

After a strong period of growth between 1791 and 1830, when the town reached a population of more than 2,300 residents, a long period of population decline occurred. In 1920, Norwich reached a low population point of fewer than 1,100 residents. After some slow growth in the 1930s and '40s, population levels increased at a rapid pace. A review of historic population data for Norwich indicates that the period between 1970 and 2000 was one of strong growth for the town, as a factor of both in-migration and natural increase. Since 2000, however, Norwich population has declined from 3,544 in 2000 to an estimated 3,393 in 2015. Figures 4-1 and 4-2 trace Norwich's population from the first federal census in 1791 through the 2010 Census. Clearly, the past 50 years have been a time of tremendous change in the town.

Recent Population Trends

For the 30 years from 1970 to 2000, Norwich's growth rate outpaced state and regional averages as shown in Figure 4-3. It was during the 1980s that Norwich experienced its greatest absolute population growth but growth remained strong through much of the 1990s. Since 2000, however, Norwich's population has declined by an estimated 4.3 percent, while the population of the Lebanon NH-VT micropolitan NECTA region has grown by an estimated 3.7 percent, indicating that Norwich's population is not keeping up with regional growth. Norwich's school population has also declined significantly. Despite the drop in both the general population and school population of Norwich, both the municipal budget and the school budget have continued to grow, creating an unsustainable fiscal trend that must be addressed.

The 2012 Upper Valley Lake Sunapee Regional Housing Needs Assessment estimates that by 2030 more than one-third of the region's population will be age 65 or older and nearly half of all households will be headed by someone age 65 or older. Many seniors will want to "age in place" but they will face challenges because the homes they are occupying today may not meet their long-term accessibility, mobility and/or affordability needs. There is an inadequate supply of housing located, designed and priced to meet future demand.

Components of Population Growth. Population growth in any geographic area has two major components: natural increase and net migration. Natural increase derives from subtracting the number of resident deaths during any period from the number of births to town residents. Net migration means the difference between the number who move into a town with the number who move out of a town during any period. These two components of Norwich's recent population growth are shown in Figure 4-6. During periods of rapid growth, in-migration typically dominates, while during periods of slower growth natural increase usually accounts for the larger share. Overall, Norwich's recent population growth occurred primarily in response to net migration (new people moving into town).

Age Distribution. Distribution of the population by age group helps us to understand more about the demographics of a town. Figures 4-7 and 4-8 contain a graphic comparison of the distribution of Norwich's population by age group, as well as data showing absolute changes in each of these age groups.

Looking at how the town's age profile has changed in recent decades suggests one major factor in Norwich's growth trends. The echo baby boom (the bearing of children by Baby Boomers), which spurred population growth beginning in the 1970s, peaked in the 1980s and ended in the 1990s. This is evidenced by the large cohorts of children counted in the 1980 and 1990 census, and the town's vital statistics. The large baby boom generation has passed out of its childbearing years and boomers are reaching retirement age, as shown in the 2010 Census. The generation that followed the boomers is smaller, had fewer children and waited longer to start families. While the current generation of Millenials is larger even than the Baby Boomers, they are only now beginning to have children themselves in significant numbers and thereby affect these demographic trends.

The current age distribution in Norwich is a clear reflection of the aging of the baby boomers, as well as the type of household that has migrated to Norwich over the years. In many instances, new Norwich households are well-

established families, with two parents and older children. This is a reflection of Norwich's attraction to families with school-aged children, as well as the expense of housing in town, which is prohibitive for most younger people. This fact limits natural growth, as most families moving to town are established with children before arriving to town.

Households

For planning purposes, growth trends in households are more relevant than population change. It is households, rather than individual residents, that drive the need for housing, infrastructure and services. Norwich, like many communities around Vermont, has experienced a declining household size in recent decades, coupled with a decrease in population. At the same time, the population in the Lebanon NH-VT micropolitan NECTA region has increased, augmenting the continued demand for housing in the region.

Household Size. In 1970, the average household size in Norwich was approximately three people. That average had declined to 2.46 people per household by 2010. Despite being very low by national standards, average household sizes in Norwich have consistently been larger than those in the region or state. However, given the aging of the town's population, average household sizes should be expected to decline further in future years unless there are changes in the housing and economic factors that are currently preventing younger couples from moving into Norwich. The share of the Norwich population that is 62 or older has increased from 13 percent in 2000 to an estimated 22.5 percent in 2011-15.

Household Income. An investigation of income levels in Norwich suggests that the town is home to relatively high-income households. Figure 4-12 shows that between 1980 and 2015, the median household income in Norwich more than doubled to nearly $100,000 after adjusting for inflation, while the Windsor County and statewide median household income rose by around $10,000. Figure 4-11 illustrates the income profile of Norwich households as documented by the U.S. Census Bureau.

During the 1990s, both the actual numbers and percentage of households in the lower income brackets living in Norwich declined. The percentage of households in the middle-income brackets remained stable, while the town added households in the upper income brackets. Between 2000 and 2011-15, this trend continued, with a further decline in the population of households in the lower income brackets and a large increase in the population of households with incomes above $150,000. This reflects a reinforcing trend where the cost of land and housing in Norwich is prohibitively expensive for lower-income and many moderate-income households, while the attractiveness of the town to wealthier households persistently drives land and housing prices still higher. It also reflects the tax burden in Norwich, which has grown significantly as school and municipal expenditures have increased, despite reductions in general and school-aged populations.

Growth Projections

Norwich's profile is incomplete without an estimate of potential future growth or contraction in the town. In a small community like Norwich, population and growth predictions can be difficult. The migration of new residents to Norwich has clearly ebbed and flowed in concert with the regional economy. As distinct from predictions, projections simply extrapolate current trends into the future and do not try to anticipate potential changes in those trends.

Recent projections suggest that Norwich's population will continue to decline slightly over the next several decades. As detailed above, the demographic composition of residents is trending older, so substantial population growth due to natural increase is not anticipated in the near term. Changes in the regional economy, however, could quickly and dramatically change the anticipated rate of growth in town through in- or out-migration. In particular, the demographic trends of the Millenniel generation will have far reaching effects locally and nationally.

The projection in Figure 4-13 breaks population growth out by age group, based on the assumption that fertility and migration rates will remain at the rates in effect when the projections were developed, using data from 2010-2014. The projection shows the demographic profile of town residents shifting, as a larger proportion of the population will be age 65 or older in each period. These trends will not change unless the factors driving them change, most notably the high cost of housing and declining family sizes.

Fiscal Impacts of Growth

As state tax and education policies in Vermont have changed over time, the fiscal impacts of residential and business development on municipalities, school districts and taxpayers have also shifted. This fact complicates any assessment of whether specific types of development are fiscal "winners" or "losers" – that is, whether they bring more tax revenue into the municipality than they cost in services, especially over the long term.
Vermont's ongoing efforts to equitably fund education across the state have, over the past decade, significantly changed the property tax system from one in which commercial development was commonly perceived to reduce residential tax bills to one in which some municipalities are encouraging family-friendly residential development as a way to lower school taxes. Acts 60 and 68 changed Vermont's school funding formula and implemented a statewide system to redistribute education tax revenue based on spending per pupil. Under the current education funding system, commercial development no longer necessarily results in tax benefits for residential property owners.

Town and School Budgets

Town and school budgets continue to increase, as shown in Figure 4-14, despite persistent reductions in general and school-aged populations.. Increases in budgets have been accompanied by real (i.e., inflation-adjusted) increases in the tax burden carried by Norwich property owners, as shown in Figure 4-15, though the increase between 2010 and 2016 was smaller than that of previous period.
While budgets have increased, the distribution of municipal expenditures has also changed.. Approximately one-half of the town budget pays for road building and maintenance. Public safety costs, as a percentage of the total budget, have slowly risen over the past 20 years and currently represent about one-quarter of the municipal expenses. Much of the increase in the municipal budget is directly linked to increases in personnel-related costs such as health insurance, which are difficult to contain at the local level. Employee costs have impacted school budgets similarly. Consideration should be given as to whether current benefit plans and spending are sustainable. For further discussion of Norwich's education system, see Chapter 7.

Cost of Community Services

Despite the future uncertainty of the state education funding formula, the fiscal implications of development can be assessed based on current budgets, land uses and tax policies. A Cost of Community Services (CoCS) study analyzes the financial demands of public services and shows how much it costs to provide these services to residential, commercial and industrial users, working lands and open space, and public land uses.
Such a study, using the methodology developed by the American Farmland Trust (AFT), was completed for Norwich based on the town's 2007 Grand List and actual FY2007 budget. CoCS studies in rural communities around the country have consistently shown that residential development costs municipalities more in services than it pays in taxes while working lands and open space pay more than they require in services. As shown in Figure 4-16, residential land uses in Norwich break even on the municipal side of the budget, but when school costs are considered they require $1.14 in services for every $1 in taxes paid. This figure is close to AFT's national average of $1.09 in services for every $1.00 reported in their 2006 Cost of Community Services Studies Fact Sheet. Norwich's open lands are a fiscal "winner" for the town for both municipal and school budgets.
This CoCS study could be further refined by a detailed analysis of town revenues and expenditures in order to more accurately allocate them between land use categories. Where revenues or expenditures could not be directly attributed to a single land use (e.g., recreation to residential land uses), they are allocated based on the percentage of the town's total real property value in each land use category. The results of a CoCS analysis are

only a single-year snapshot. The study can be repeated on a regular basis to track changes in the fiscal impacts of land use changes within the town over time. Further analysis that examines the location of residential uses would also be informative, as homes located close to the village center and accessible by main roads generally cost less for the town to service than homes in more remote parts of town.

Fiscal Impact Assessment

Cost-averaging is a common approach to assessing the fiscal impact of development, whereby each new increment of growth is assumed to have the same proportionate costs as existing development of the same type in the town. While useful as a general planning tool, this method does not reflect the reality of how budgets are impacted by development. Most municipal or school costs if graphed against population growth would look more like a set of stairs than a straight line. Facilities and services are generally able to accommodate some additional demand at their current size, staffing or funding level. Then a significant increase in expenditure, such as to put an addition on a school or hire more police officers, is needed to accommodate further growth. It is worth noting that the smaller a community (or cost pool), the more this effect will prevail, whereas the curve will smooth as the community size increases.

It is often assumed that any development that does not increase the number of school-age children living in town will be a fiscal winner. However, as the CoCS study shows, that is an over-simplification of the fiscal impact of new development, as schools are simply one of many drivers of municipal expenses. Non-residential development may cost more than the municipal fiscal benefit it provides from additional tax revenue due to secondary impacts that vary depending on the characteristics of the use. Non-residential uses may create significantly more traffic than residential development does, which would increase highway expenses, or may require relatively greater increased public safety expenditures. Uses that create jobs may draw more residents, which could be a benefit and a cost. Under current state education tax policies, an increase in school-age children can often have a positive effect in lowering the education tax rate by lowering the average per pupil expenses used in calculating Norwich's tax rate, but where such additional students necessitate special services, or are so numerous as to require physical expansion of school facilities, the additional costs could outweigh those benefits. Finally, as noted above, the location of residential development affects the costs to the town of serving it. The 2007 CoCS study suggests that increased residential development often causes an increase in taxes due to more residents generally creating an increasing demand for services. Moreover, the notion that growth *per se* is necessarily good for either residential or commercial development is increasingly under challenge as being inconsistent with principles of sustainability.

The CoCS study suggests that undeveloped land is a fiscal winner, which is also the conclusion reached in a recent study by the Vermont Land Trust[2]. While in relative terms undeveloped land does not contribute much in revenues, it generates very little demand for services, while contributing important, though less tangible, benefits for the environment and our collective quality of life. Thus, it is important to consider the fiscal implications of the future use of undeveloped land. It may be more fiscally prudent to retain undeveloped land, particularly when land is remote, or would require expensive extensions of service systems were development to occur.

[2] http://www.farmlandinfo.org/sites/default/files/Land_Conservation_and_Property_Taxes_in_Vermont_1.pdf

Goals, Objectives and Actions

Goal A **Protect the town's fiscal health by guiding the location, form, magnitude and pace of development to make best use of existing facilities and services.**

Identify and address the potential effects on property taxes from *residential and commercial development of different types and amounts, in various locations.*		

Action A.1.a Integrate the town's capital and operational budgetary planning with the policies that stem from the Town Plan so as to favor conservative budgeting.

Action A.1.b Identify tipping points in demand from additional development in town that could trigger the need for additional town staff, capital equipment or facilities in service of that development.

Action A.1.c Identify the added costs that would occur with the added staff, equipment or facilities that would be weighed against the value of the types of added developed property to analyze whether such development is tax neutral or represents a greater or lesser burden to existing properties.

Action A.1.d Incorporate fiscal impact assessment into the review and permitting of development projects to determine the appropriateness of a project within the context of overall planning for the town.

Encourage development patterns that will minimize or eliminate expected future tax increases for Norwich's taxpayers.		

Action A.2.a Use the town's land use regulations to guide future growth toward responsible and sustainable development in suitable locations where it can make use of existing facilities and services.

Action A.2.b Determine what forms, in what locations, and at what scale non-residential development is appropriate for Norwich without negatively Impacting existing village businesses

Action A.2.c Enact regulations to encourage reasonable amounts of non-residential development appropriate in scale for Norwich to occur in designated areas

Action A.2.d Take measures to guide the location, form and pace of residential growth in order to encourage housing to be located in areas that are easily accessible to good roads, town services, schools and public transportation.

Action A.2.e Consider designating growth centers, such as our hamlets, as locations where moderate growth and concentrated patterns of development could be encouraged.

Action A.2.f Support development that can feasibly utilize existing service systems, including small extensions, in preference to development that would require new or greatly expanded infrastructure.

Action A.2.g Support increasing the supply of affordable and workforce housing suitable for families with school-age children in a manner that minimizes or eliminates any related increases in the aggregate rate of Norwich education and municipal taxes.

Encourage the preservation of land in agricultural, wooded, or undeveloped state, particularly in areas of town not well connected to service systems.		

Action A.3.a Use legislative tools such as the payment in lieu of taxes (PILOT) authorization in 24 V.S.A. 2741, to stabilize and reduce taxes on agricultural land.

Action A.3.b Insure that tax assessments for conserved land reflect the fact that they will not be developed in the future.

Housing Plan

This section presents a perspective on current and future housing in Norwich. Housing markets and related issues change over time, along with the economy and other external factors; however, people will always need adequate shelter. It will be important to consider the housing needs of residents of all ages, financial situations, and life-styles. Concerns about climate change, energy use and availability, and sustainability are also considerations in planning for the future housing stock in Norwich. Regional economic forces will continue to dominate the housing market in Norwich. No matter how active the town may be in housing issues, it is unlikely to make any significant change in the prevailing market. However, by choosing a deliberate path rather than simply reacting to these forces, Norwich can play an appropriate role, considering its size relative to neighboring towns, in providing adequate housing stock for a variety of population groups.

Housing Profile

Housing Construction Trends

Norwich's housing trends directly reflect population trends. Because Norwich is a primarily residential town that primarily serves as a bedroom community for nearby job centers, the town's housing stock is focused on single-family homes, used on a year-round basis (84%). The town also has a small, but active, rental housing market that includes both single-family and multi-family homes. Finally, there are some seasonal and second homes in the town.

Since the first Census count of dwellings in 1940, the number of residences in Norwich has more than doubled. The post-war housing boom and interstate highway construction fueled demand in the 1950s and '60s. Over the next several decades, the region's growing economy drew new residents to Norwich, many of them young couples starting families. The 1970s and 1980s saw more than 650 homes built. The pace of development fell by more than 50% in the 1990s, when fewer than 125 homes were added to the town's housing stock. Between 2000 and 2010, the town issued permits for 114 additional dwelling units. Since then, housing starts have slowed to an average of about 6 per year. In other words, new residences are now being added at roughly 20% the pace that they were at the height of the modern growth boom.

Housing Types and Tenure

Norwich's housing stock is strongly oriented toward single-family homes, as shown in Figures 5-3 and 5-4. According to the 2011-15 American Community Survey, nearly 84 percent of homes in Norwich are single-family, detached units as compared to 68 percent of homes in Windsor County. Conversely, when compared with the county and state, Norwich has fewer housing units in multi-unit buildings and mobile homes.

Figure 5-4 is based on a sample of Norwich homes surveyed by the U.S. Census Bureau. The Norwich grand list reports somewhat different numbers, indicating that there were 1,295 detached single-family homes and 15 mobile homes in Norwich in 2016.

Approximately 70 percent of Norwich's homes were owner-occupied, according to the 2010 Census. The town's owner-occupancy rate has been higher than state and regional averages for many years. As shown in Figure 5-5, Norwich added rental units during the 1980s, but there was actually a small decrease in the number of rentals during the 1990s, followed by a small increase between 2000 and 2015. Norwich's location near Dartmouth College in Hanover and the Dartmouth-Hitchcock Medical Center in Lebanon, both of which generate a substantial number of transient residents, suggests that there may be unmet demand in the rental market.

Housing Values

Housing value is an important factor in understanding relative tax burdens, the desirability of a town or neighborhood, the age and quality of local housing, and other aspects relevant to community planning and development. As shown in Figure 5-7, a much larger percentage of Norwich's homes are high-value as compared to the larger region. More than half of its owner-occupied units have values exceeding $250,000. Norwich's housing stock is clearly in a high price range when compared with regional and statewide averages. Further, less than 10 percent of owner-occupied units in town were valued at less than $100,000, according to the 2000 Census. Norwich is unquestionably an expensive place to live.

Home Sales. The dynamics of the local housing market can also be summarized by a review of the numbers of sales and average sale values. Figure 5-7 shows the number of sales of primary residences each year and the median value of those transactions. Primary residences include single-family homes, condominiums and mobile homes with land where the seller had 100 percent interest in the property, excluding transactions that were not deemed to be arm's length (such as transfers between family members).

Trends in Norwich's housing market over the past two decades have been similar to those throughout the Northeast. The strong market in the mid- to late 1980s gave way to a weak housing market in the early '90s.

Housing prices began to rise sharply again in the mid- to late-1990s. During 2006, the housing boom collapsed due to the fundamentals of both the housing market and the broader economy. Since 1988, the median sale price of a primary residence in Norwich has increased about $50,000 after adjusting for inflation. The decrease in housing prices seen in 2009 was a reflection of the economic and real estate crisis and sale prices have generally returned to pre-recession levels.

Housing Market Conditions

In assessing housing issues, it is important to incorporate a regional perspective. In this region, the housing stock and pricing can vary significantly from town to town. However, no community is a closed system, where future housing needs can be projected based on an analysis of the current population alone. Housing markets are always regional in nature; regional demographic trends and in-migration/out-migration will affect demand levels and pricing in Norwich. The town is part of a regional market, as many Norwich residents depend on neighboring communities for employment. Norwich is part of the Hartford-Hanover-Lebanon labor market area (LMA), which includes 25 municipalities in Vermont and New Hampshire.

The housing statistics presented above document that the town's housing stock is heavily weighted toward higher-priced, single-family homes. Figure 5-8 contains a comparison of the reported assessed values of owner-occupied homes in Norwich and the Lebanon NH-VT NECTA region.

Not surprisingly, Norwich's owner-occupied housing stock is more expensive than the region's. This reflects the predominance of expensive homes. Norwich's housing stock contains a small percentage of mobile homes, which offer an affordable housing option. Condominiums, which offer an affordable housing option in other parts of the state, are also not well represented in Norwich's housing stock.

Housing Needs

The demographics of a regional housing market are a useful predictor of general housing needs. While a range of factors including individual preferences affect housing needs, housing market analyses clearly correlate age and income data to the kind of housing people want. Knowing the current and projected mix of households by age of household head and income, it is possible to make reasonably accurate predictions about housing needs. For instance, a household headed by a 25 to 34 year-old, having an annual income of $40,000 to $60,000, will probably be seeking, or have recently purchased, its first home. Markets with a substantial number of households in this category will need affordable starter homes. Similarly, most households with incomes below $40,000 are likely to be renters, while households with incomes of $60,000 or more are likely to be established single-family homeowners.

As shown in Figure 5-9, the percentage of Norwich households earning $100,000 or more is substantially greater across all age groups than in the region as a whole. This is, in part, a factor of housing availability. These are the only households that can afford the kind of housing typically available in Norwich.

Given the high costs of housing in Norwich, many employees who work in Norwich cannot afford to live here. This is an intensification of regional conditions generally, with some area businesses complaining that the high cost of housing makes it difficult to attract workers to the region.

Since only a fraction of all households are seeking housing at any given time, it is helpful to assess the mobility of those in various age/income categories, to estimate the size of housing markets. Households in various age and income groups have markedly varied propensities to move within the course of a year. Most significantly, mobility declines with increasing age and income. Younger, lower-income households are the most likely to move, while older, higher-income households are the least likely.

Affordability of Housing

The State of Vermont defines housing as being affordable if households with incomes at or below 80 percent of the county median family income spend no more than 30 percent of their incomes on housing costs. Housing costs for homeowners include mortgage costs, property taxes, and property insurance. Housing costs for renters include rent and utilities (heat, hot water, trash removal and electric).

The county median family income is reported annually by the federal Department of Housing and Urban Development (HUD) along with income limits for households of various sizes (see Figure 5-10). HUD further classifies income levels for its housing programs as follows:

Extremely low income = 30% or less of the median

Very low income = >30% to 50% of the median

Low income = >50% to 80% of the median

Moderate income = >80% to 100% of the median.

The 2015 plan for East Central Vermont, "What We Want Plan"[3], states that "We must address the lack of affordable housing near jobs and service centers. By 'affordable' we're talking about more than subsidized housing for low-income residents; we're talking about housing for skilled workers and professionals whose talents we need for a thriving community." More than 1 out of 3 households in the region have a high housing cost burden (more than 30% if their income) and nearly 1 out of 6 households have a severe housing cost burden (more than 50% of their income).

Home Ownership. Figure 5-10 presents "affordable" monthly housing costs and the amount of affordable homes available in Norwich based on the assessed value of residential properties and the state's methodology for determining affordability. In 2016, around 10 percent of Norwich's residences would be affordable to a four-person household that earned the median annual income for Windsor County of $72,310. Even for households earning twice the median income, a large percentage of the town's homes would be unaffordable. Housing affordability affects not only those trying to purchase a home, but households who already own a home, especially when rising markets result in higher tax assessments. According to the 2011-15 American Community Survey, 27 percent of Norwich's home-owning households had housing costs that consumed 30 percent or more of their income. While this is down considerably from 2000, this shift reflects the higher incomes of incoming Norwich homeowners and the possible out-migration of lower income households.. Among Norwich homeowners with incomes below [80% of the county median income] $50,000, nearly 64 percent had housing costs that consumed 30 percent or more of their income in 2011-15.

Rentals. While housing costs for renters in Norwich are considerably lower than for owners, Norwich rents nevertheless substantially exceed those in the broader region. According to the 2011-15 American Community Survey, the median gross rent in Norwich was $1,214. By contrast, the median gross rent for Windsor County was $868. About 25 percent of Norwich's renting households had housing costs that consumed 30 percent or more of their income. Among Norwich renters with incomes below $35,000, however, 72 percent spent 30 percent or more of their income on housing.

Regional studies have found that rental housing affordable for those earning entry-level wages ($9-$20 per hour) in the area is virtually non-existent in the private, unsubsidized market. They suggest that a larger share of future housing construction will need to be rental and multi-family for the region to attract the necessary younger workers and to serve an increasing demand from seniors for down-sized, more affordable or more accessible housing units. The 2015 What We Want Plan calls upon towns to identify land in core areas and on transit routes that is suitable for development of new, energy-efficient housing.

[3] ***East Central Vermont: What We Want*** is the product of a three-year planning process funded by a Sustainable Communities Regional Planning Grant from the Department of U.S. Housing and Urban Development (HUD) through the Partnership for Sustainable Communities, an interagency partnership consisting of HUD, the Department of Transportation (DOT), and the Environmental Protection Agency (EPA).

Future Housing

Diversity of Housing

A diversity of housing types, styles, and sizes meeting the needs of residents of all ages, financial situations, and lifestyles necessarily requires variability in land use regulations. Housing types may include single-family homes, duplexes, multi-unit buildings, accessory apartments, accessory or guest houses, that utilize concentrated patterns of development. Smaller homes, such as bungalows and cottages, built at higher densities can provide low and moderate-priced housing, without requiring subsidies. Such building can be efficiently situated throughout the town, subject to availability of septic-suitable soils and existing infrastructure. Open space and resource protection incorporated into the site plan designs for multi-unit developments can preserve the rural character of Norwich while providing denser housing.

Energy-Efficient Housing

Energy-efficient homes may cost more to build, but they invariably lower the cost of ownership by consuming fewer resources over time. Using energy-efficient building materials and techniques, and incorporating renewable energy sources for heat and power should be encouraged and, in some cases mandated, for new homes. These concepts are discussed more fully in the Chapter [10], Energy.

Accessibility of Future Housing to Services

As discussed in the Chapter [12], Land Use, locating new housing closer to town facilities and services, including good roads and public transportation, saves the town money. Norwich's land use regulations currently allow for more concentrated development in areas more accessible to these services and facilities. This pattern of development also lowers energy consumption for transportation.

Future Affordability of Housing

Housing in Norwich is too expensive to purchase and maintain for many working individuals and families who have traditionally lived and worked in town. "Moderate-priced housing," also known as "workforce housing" (120% or less of median income in Windsor County), and "affordable housing" (80% or less of median income in Windsor County) are both in short supply. "Very low income" (50% or less of median income) housing does not meaningfully exist in Norwich. If Norwich wishes to encourage economic diversity in its community and would like those who work in Norwich to be able to live in Norwich, then investments must be encouraged in workforce, affordable and low-income housing.

Increasing the supply of affordable housing in Norwich will not be accomplished by town regulations alone. Although regulations allowing some flexibility in housing types, site design, mixed uses, and density in the appropriate areas are critical, additional non-regulatory action supporting affordable housing funding through grant programs, public-private partnerships, and other innovative programs are necessary due to the high cost of land and construction in the town.

Affordable Housing Planning Process

In order to increase the affordability of housing in Norwich, the Planning Commission plans to launch an affordable housing planning process in 2018. This process will solicit resident input and develop a plan to address the following questions:

> What goals should Norwich establish for the development of affordable housing? Norwich is well-located within the region, near jobs in Hanover, Hartford and Lebanon and with an excellent local school.
>
> What approaches should Norwich consider for increasing the amount of affordable housing? There are many options to consider, and through the planning process, the town can identify a range of options and develop a comprehensive approach to achieving its affordable housing goals.
>
> How can Norwich ensure that growth happens at an appropriate pace and scale? While Norwich residents generally favor the development of affordable housing, some are concerned that development will take place at

too rapid a pace and too large a scale. Through the planning process, the town will consider options for regulating growth to ensure it remains at the level desired.

Housing for Seniors

Many older residents, wishing to continue to live in Norwich, look for housing that is affordable and meets their changing needs. Considerations for senior housing, in addition to cost, are locations that are easily accessible to basic services, stores, and public transportation. Ownership options may include rentals, condominiums, "shared-housing," accessory houses and apartments, and smaller single-family homes such as bungalows and cottage style housing. All of these may be designed to be more cost-efficient and meet the needs of older residents. The existing HUD-funded 24-unit Norwich Senior Housing near the Norwich Public Library on Dorrance Drive is an example of successful lower-cost housing in Norwich that is accessible to public transportation and village services and stores. There is a long waiting list for Norwich Senior Housing, confirming the need for more affordable options in Norwich for this growing demographic.

Goals, Objectives and Actions

Goal B Provide for sustainable housing for residents of all income levels and ages.

Encourage a diversity of housing types to accommodate all ages, financial situations, and life-styles.		

Action B.1.a Adopt land use regulations that recognize and allow for a diversity of housing types to meet the needs of all ages, financial situations, and life-styles.

Action B.1.b Implement a planning process to develop affordable housing goals, identify solutions, and ensure appropriate protections are in place to ensure town growth remains at appropriate levels.

Encourage safe, energy-efficient housing.		

Action B.2.a Consider adopting local building codes to maintain energy efficiency, personal safety, and sustainability.

Allow growth in the housing stock to occur at a rate that is consistent with the town's ability to provide services in a fiscally sound manner.		

Action B.3.a Determine future housing density in different areas of the town based on proximity and access to town facilities and services, including roads, public transportation, schools, water and septic capacity, and emergency services.

Quantify the need for additional affordable housing in Norwich by categories: "subsidized," "affordable," and "workforce."		

Action B.4.a Maintain updated statistics on demographic trends and housing for the town and the region to better evaluate the actual housing needs of the community on an ongoing basis.

Facilitate the creation of different types of affordable housing as needed.		

Action B.5.a Explore and evaluate multiple strategies for encouraging the creation of affordable housing including, but not limited to:

1. Density incentives for smaller houses, bungalows, or cottages, and accessory apartments or houses in or adjacent to existing houses.
2. Innovative construction techniques to reduce costs.
3. Inclusionary zoning. [Explain]
4. Removing unnecessary provisions in the land use regulations that may limit affordable housing.
5. Public and private programs to provide financial support for affordable housing.
6. Sourcing funds for affordable housing through grants, government funding, and private partnerships.
7. Create an affordable housing trust fund funded through graduated impact fees, real estate transfer taxes or other means. (Some such approaches may require new authorizing legislation from the state.)

Participate in regional solutions for affordable housing.		

Action B.6.a Establish Town goals for five, ten and twenty year milestones for the desired proportion of Affordable Housing in Norwich.

Action B.6.b Coordinate affordable housing programs with neighboring towns and share support services such as maintaining covenants for
perpetual affordability of properties.

Action B.6.c *Continue to work with the Three Rivers-Ottauquechee Regional Commission* on regional planning goals.

Quantify the need for additional senior housing in Norwich.		

Action B.7.a Maintain updated statistics on demographic trends and housing for the town and the region to better evaluate the actual housing needs of seniors in the community on an ongoing basis.

Make provisions for and facilitate the creation of different types of senior housing as needed.		

Action B.8.a Accommodate more housing for seniors near the Village Center or in other areas accessible to services, public transit, and stores.

Action B.8.b Grant waivers in land use regulations for parking and density that reflect the needs of seniors.

Action B.8.c Allow for varying forms of ownership for senior housing: apartments, condominiums, “shared housing” (single-family home shared by unrelated residents), or single-family homes.

Action B.8.d Source funds for senior housing through grants, government funding, and private partnerships.

Economic Development

A local economy can be viewed in two ways:

1) What economic activities occur within the town; and
2) In what local or regional economic activities are the town's residents involved?

While Norwich is often regarded as a bedroom community, the data make it apparent that there is substantial local economic activity. However, it does not appear that the business community has experienced much growth during recent years.

Labor Force

In 2017, the Vermont Department of Labor reported an unemployment rate for Norwich of 2.1 percent (well below the state average of 3.2 percent). According to the Census Bureau, 80 percent of the local labor force was composed of private wage and salary workers, 9 percent worked for government and 11 percent were self-employed or business owners.

The percentage of Norwich residents who are self-employed was slightly higher than in the county or state as a whole. Over the years, home businesses have been started in Norwich only to outgrow their locations and then move to one of the nearby communities where suitable locations and the infrastructure needed to support larger business are more readily available. This is a loss for our local business community.

Norwich residents are a part of the regional economy, and find jobs in a variety of industries and occupations. Figure 6-2 compares the distribution of Norwich residents' employment by industry and occupation with similar breakdowns for Windsor County and Vermont.

Clearly, Norwich residents' jobs show a different distribution by industry than county and state averages. These differences reflect the importance of Dartmouth College and the Dartmouth-Hitchcock Medical Center as sources of employment for Norwich residents. Additionally, a high percentage of town residents work in a professional specialty.

Employment

The analysis of employment trends that follows is based on employment data provided by the Vermont Department of Labor; however, the department only reports information on jobs covered by unemployment insurance, which excludes the self-employed, most business owners and some farm employees. As a result, the "covered employment" numbers underestimate the total number of jobs in town.

Employment trends in Norwich have largely mirrored regional economic cycles. Figure 6-1 shows comparative "covered employment" increases in Norwich, Windsor County, and Vermont between 1980 and 2016. Note that the figures refer to the number of people employed in each of these geographic areas, rather than employed residents.

Between 1980 and 2000, the total number of establishments (employers) in Norwich increased substantially. Since then, the number of employers has remained at levels similar to 2000, with some annual fluctuation, but the number of people employed in Norwich has risen. In 2016, there were 122 private businesses and five public sector employers and a total of 950 people employed in Norwich, only 159 of whom were residents. While accounting for a small percentage of employers, the public sector provides more than 10 percent of the jobs in town. The private businesses in Norwich are generally very small, with an average of seven workers. Most of these private businesses are in the service sector, reflecting the importance of the retail stores, professional and business services in the village area. Norwich does not have any single large employer. However, through physical expansion and enhanced onsite customer amenities, King Arthur Flour has added jobs, serves as a community gathering place, become a national tourist destination, and increased tax revenues for Norwich.

While Norwich does maintain a healthy employment base, the town is not a significant regional job center. Three local communities (Hartford, Hanover and Lebanon) provide a substantial amount of employment. A substantial number of Norwich residents commute to these other communities for their jobs. As shown in Figure 6-5, only about 10% (159 out of 1,617) of Norwich residents who work do so in Norwich.

Wages

Wages paid by Norwich employers (see Figure 6-1) have increased at a greater rate than state and county averages over the past 35 years and have become higher than those averages in recent years.

Livable Wage. Few Norwich families depend on a single wage-earner earning average wages (see Figure 6-4). However, there is growing concern in the state regarding the ability of full-time workers to earn an income sufficient to meet a family's basic needs, commonly referred to as a "livable wage."

The Vermont Joint Fiscal Office reported that an annual livable wage for a family of four with two working parents in 2015 was around $85,000, while for a single person with no children it was around $33,000. In all cases, the livable wage is higher than the state's minimum wage. Given that these numbers are based on state averages, the cost of housing in Norwich requires a higher livable wage locally.
Focusing economic development activities on creating well-paying jobs is especially critical in Norwich to ensure that residents can meet their basic needs, especially in light of local housing costs discussed in Chapter 5 and other costs like health care, food and energy that are anticipated to increase in future years.

Business Receipts

In addition to employment and wages, another useful measure of economic activity may be found in the receipts generated by local businesses. Figure 6-3 shows total tax receipts reported by Norwich businesses for each fiscal year between 2000 and 2016. Gross receipts are for all reported retail sales, including those that are not subject to the Vermont sales tax (e.g., groceries, medicine, etc.). Gross business receipts have increased incrementally after adjusting for inflation reflecting slow but sustained growth in the local economy.

Sustainable Development

Building a sustainable local economy that focuses on local markets and local resources, and that serves to strengthen the local community simultaneously supports our values and protects our long-term economic interests. Sustainable economic development requires activities and industries that:

Maximize use of local resources in a manner that does not deplete those resources;

Are energy efficient, and emphasize the use of local renewable energy sources;

Maintain high standards of environmental health and don't degrade the quality of our water, air and soils or the viability of native wildlife;

locally produce high quality goods and services that are needed locally, providing alternatives to imported goods and services;

Reinforce traditional settlement patterns;

Employ local residents and pay a livable wage;

Are locally owned and controlled, and reinvest in the community; and

Contribute to the vitality of our community, including the social fabric and well-being of residents.

Economic development that emphasizes sustainability should take precedence over other economic activities that do not exhibit the characteristics listed above. In contrast, public resources should never be used in pursuit of unsustainable outcomes, absent unequivocal short-term necessity.

Guide commercial development in accordance with the land use policies of this plan, in particular Objective K.3 and its associated actions.		

Offer broadband service to all homes and businesses in town to support residents' ability to work from home and allow entrepreneurs who live in Norwich to locate their businesses in town.		

Allow for home businesses throughout Norwich to the extent that they do not affect the quality of life in their neighborhood or unduly burden community infrastructure such as roads.		

Ensure that the scale or rate of commercial or industrial development in Norwich does not exceed the town's ability to provide facilities and services, or increase costs for current taxpayers.		

Education

Education is a core aspect of Norwich's identity and sense of community. For many years, the town's excellent school system made it a popular choice for families, both those new to the Upper Valley and those wishing to relocate here from within the region as their children reach school age. As is true statewide, declining enrollment in recent years poses a fiscal challenge.

Primary and Secondary Education

Background

The Norwich school system is made up of two school districts. The Norwich School District is responsible for educating children from kindergarten through grade six at the Marion Cross School in Norwich. The Dresden School District, which includes the towns of Norwich and Hanover, New Hampshire, serves Norwich children from grades seven through twelve in the Richmond Middle School and the Hanover High School, both in Hanover.

The Dresden School District was formed in 1965, and was the first interstate school district in the country. Before that time, Norwich educated students through eighth grade and high school students were tuitioned to other towns, primarily Hanover.

Enrollment Trends

The Marion Cross School has seen major facility expansions, in the 1950s and most recently in 1989. The more recent addition was in response to dramatic increases in the school age population in the latter half of the 1980s as a result of the "echo baby boom."

Enrollment peaked in 1995 when 487 students were enrolled at the elementary school, as shown in Figure 7-1, and then declined sharply through the early 2000s. Between 2003 and 2007, enrollment stayed fairly stable at between 300 to 310 students. K-6 enrollment fell below 300 students in 2008 and has remained around 300 during the past decade. A pre-kindergarten program began during the 2015-16 school year that has increased the number of children at the school by around 35.

An enrollment projection prepared by the school district in 2017 suggests that enrollment at Marion Cross could fall to around 230 students over the next 10 years. Low or declining enrollment numbers create a financial strain on taxpayers because state education funds returned to the town are based on spending per pupil, whereas fixed expenses of operating the school cannot be reduced when the enrollment drops.

Educational Facilities

The 1989 Marion Cross School expansion increased classroom capacity to a theoretical maximum of 420 students. While this suggests that there is substantial excess capacity at current enrollment levels, it should be noted that the school is using space much differently today than it did 20 years ago. Interdisciplinary curricula, cooperative group learning, inclusion of students with disabilities, inclusion of technology in day-to-day classroom learning (rather than solely in a computer lab), differentiation, full-day kindergarten, etc., all require more space for a smaller number of students. That said, it is clear that Marion Cross has accommodated, and could accommodate, substantially more students than it does today.

While the Marion Cross School does not participate in the federal school lunch and breakfast programs, it does provide a lunch or breakfast to any student in need. In Vermont, the state legislature passed Act 22 in 2003, which requires that public schools participate in the National School Lunch Program and the School Breakfast Program unless the school board votes to exempt the district from the requirement. The purpose of the program is to ensure that all students receive healthy meals so they are better able to learn. The program has many federal record-keeping requirements and would be an additional expense for the school. The need for Norwich to participate in this program is evaluated annually by administrators, teachers, and the School Board. In addition, the draft long-range plan for the Marion Cross School includes as a sub-goal "ensure that all students' nutritional needs are met" and the subcommittee tasked with implementing this section of the long-range plan will be considering different ways to meet this challenge.

While the last major renovation to the Marion Cross School was completed in 1989, investments continue in maintenance and gradual improvements. During the summer of 2009, the building's exterior was painted green. According to Vermont's School Energy Management Program, Marion Cross uses 35 percent less energy per square foot than the average school in the state (see Figure 7-2). Investments in lighting, insulation and solar

panels have saved money on both electricity and heating oil. Other significant infrastructure improvements have been identified, such as leach field repair.

Major capital programs at both the Richmond Middle School and Hanover High School were completed in the 2000s. The Richmond Middle School, which was formerly located on the same campus as the high school, moved to a new building on Lyme Road in 2005. The facility, which cost $18 million, is just one reason why the Richmond school is widely recognized as one of the best middle schools in New England. Last year, Richmond Middle School was selected as a spotlight school for the New England League of Middle Schools. This designation is based on test scores, academics, the overall atmosphere of the school and a number of other criteria and is awarded based on a review by peer educators.
A $24 million renovation of Hanover High School was completed in 2007. This renovation effectively resulted in a new school, with a new auditorium, gymnasium, cafeteria, library and classroom spaces. Hanover High School is widely regarded as one of the best public high schools in the country.

School Missions and Philosophy

Marion Cross School. "The Marion Cross School Community values a tradition of educational excellence and is committed to nurturing the whole child in a climate of respect. We promote excellence and encourage a love of learning; we demonstrate and encourage mutual respect among students, parents, faculty and community members; we provide opportunities for every child to develop his/her full potential; and we cherish our traditions and our school's place in the community."
Richmond Middle School. "Our mission is to provide a challenging, comprehensive and developmentally appropriate education for all of our students. Our broad goal during these three years is to ensure that our students are provided with the skills to become successful and thoughtful adults in a highly competitive and complex world. It is the task of our middle school to bridge the growth gap between childhood and adulthood, from dependence to independence, and from understanding the world in a simple and concrete manner to comprehending it in its multifaceted, multi-layered configuration. The educational community represented by the Dresden Board, parents and community members, and the Richmond staff has identified important concrete goals which guide our school in its pursuit of the effective and compassionate education of children in their middle years."
Hanover High School. "Hanover High School is an active learning community that provides broad academic and co-curricular programs. We engage students' minds, hearts, and voices so that they become educated, caring, and responsible adults. All students are given the opportunity and encouragement to use their:

> Minds to pursue excellence, academic challenge, and personal success.
>
> Hearts to respect and care for the emotional and physical well being of themselves and others, and for the environment.
>
> Voices to contribute to the democratic process and the common good."

Cost of Education

Costs related to the education of Norwich children are borne directly by the taxpayers of Norwich, in full for the Marion Cross School and in proportion to the number of Norwich children for the middle and high schools.
In recent years, the proportion of Norwich students at the Richmond Middle School and Hanover High School has dropped, from more than 40 percent to currently about one-third. Accordingly, Norwich's assessment for the cost of the middle and high schools has been reduced in recent years. This proportion is not expected to change materially in the next five years.
Costs for Marion Cross grew more substantially between 1999 and 2003, but have moderated in recent years. In 1999, the per-pupil cost as defined by Vermont's "allowable tuition" (current per-pupil expenditures excluding tuition, transportation, debt and special education) was $6,382 and Norwich ranked 56th in the state by this measure (with the school ranked first having the highest per pupil expenditures). By 2003 the per-pupil cost was $9,579 and Norwich ranked 21st in the state (out of more than 200 elementary schools). Five years later, in 2008, the per-pupil cost had increased to $10,042 and Marion Cross ranked 98th in the state. Over this five-year period, the rate of increase was less than one percent per year.

Figure 7-3 shows the tax paid or projected to be paid on a house with a value of $410,000 in 2005. In the initial year, the tax paid was $5,894. For 2010, the tax had increased to $6,289. By 2014, the end of the five-year planning period, the tax was projected to be $6,611. However, it should be noted that approximately 30 percent of Norwich taxpayers receive some reduction in their tax bill based on their income level.

Private Schools and Home Study

Private schools in the area include The Waldorf School, Crossroads Academy, Willow School, Cardigan Mountain School, Mid-Vermont Christian, Sharon Academy, and Kimball Union Academy. A handful of Norwich students are home-schooled.

Issues

The following issues are likely to be faced by the educational system in the near future:

- State and federal requirements concerning facilities and special needs are likely to continue to increase. This will require modifications to the building to accommodate special-needs students as well as more space for fewer students.
- State and federal requirements concerning employment of Special Educators.
- Need to remain current in technology.
- Rising cost of employee benefits.
- Continuing local and regional decline in enrollment.

Long-Range Planning

The Norwich School Board has engaged in a long-range planning process to look at educational goals and ensure that students have an excellent education that meets the future needs of society. This plan deals with such concerns as maintaining high academic standards, an excellent faculty, appropriate building space for an outstanding curriculum, a commitment to the growth and development of the individual student, a positive attitude toward change, and a sound financial management program.

Post-Secondary & Adult Education

Vermont Technical College, The Community College of Vermont, Granite State College and Lebanon College--the latter two in New Hampshire--have programs in technical and post-secondary education. Dartmouth College in Hanover provides opportunities for adult education through its MALS (Master of Arts in Liberal Studies) and ILEAD (Institute for Lifelong Education At Dartmouth) programs.

Childcare

The majority of Norwich parents are employed and depend on childcare services for preschool-age and older children after school, during holidays and summer vacations. According to the 2011-15 American Community Survey, only 8 percent (55 of 687) of school-age children and 49 percent (50 of 102) of preschool-age children live in a household that includes a parent who is out of the labor force.

The Marion Cross School began offering a full-day kindergarten program for all school-age children beginning in the 2009-10 school year. Marion Cross School also provides special education services to children starting at age three.

There are several childcare providers located in Norwich and many more in neighboring communities. The Childcare Center in Norwich serves children aged six weeks to six years. The Norwich Nursery School has programs for toddlers and preschoolers during the school year. The Marion Cross school also houses an after-school program for students operated by the Child Care Center in Norwich. The Child Care Project, housed at Dartmouth College, is available to assist all Norwich parents in finding childcare.

Goals, Objectives and Actions

Goal D Provide cost-effective educational facilities suitable for supporting quality education for Norwich students.

Monitor population changes closely and thoroughly investigate available options on an ongoing basis to allow the community time to react to future needs for both the Norwich and Dresden School District schools.		

Action D.1.a Schedule and publish an annual review of all pertinent statistics and updated projections relative to changes in future school populations of both Norwich and Dresden that might have significant tax implications for Norwich.

Action D.1.b Evaluate annually any long-range needs for the Norwich School District that pertain to projected enrollments, future land needs and future capital expenditures.

Action D.1.c Explore whether the present arrangement is still the fairest manner to apportion Dresden School District costs between Hanover and Norwich.

Continue to pursue sustainability and reduced energy usage in the operation of school facilities and programs.		

Community Facilities & Services

This chapter addresses the operation of town government and the delivery of services. Many of the policies and guidelines for the work that is done are covered in the transportation, natural resources, land use, and financial policy chapters. This chapter contains an overview of town facilities and services from two perspectives:

(1) The current state of the facility or service and whether there are issues to resolve; and
(2) Changes expected over the next 5 to 10 years relating to facilities and services.

It is the goal of this chapter to encourage the town to plan for changes in future years, and to establish priorities for facility and service improvements in conjunction with a Capital Improvement Plan (CIP) for funding for these improvements.

Introduction

Municipal government provides and maintains facilities, services and infrastructure. These include solid waste disposal and recycling, roads and sidewalks, emergency services (including police, fire protection, and emergency medical response), recreation, and administration of these functions. In order to pay for these services and the schools, the town assesses property and collects taxes.

During the past 30 years, both population growth and the increasing expectations of Norwich residents have resulted in significant facility and service expansions and improvements. Town budgets have reflected these changes. As shown in Figure 4-3, the rate of growth has slowed since the late 1980s, even during periods of a strong economy.

Although most aspects of town services have become more efficient through technology and better planning, there have been expansions of town administration budgets due to decisions to turn to professional management to take charge of town operations formerly run by volunteers. These decisions include the addition of a part-time professional assessor in 2001, the switch to a town manager/selectboard form of government in 2002, and the addition of a part-time paid fire chief in 2008. Another source of increased municipal expenses has been unfunded mandates by the state, requiring the town to perform additional services at its own expense.

Facilities

Public Works Buildings

The existing Department of Public Works Garage, built in 1976, is an 80-foot by 50-foot (4,000 square foot) steel frame building with five bays and limited additional space for storage, and administration. There are no offices or break rooms separate from the garage work area. A 2012 report listed many functional deficiencies, code compliance issues, and additional operational space needs. Proposals to double the size of the building and address the deficiencies, along with bond votes including a Public Safety building for fire and police, were presented to the town twice in 2015 and were defeated. In January of 2016, the town submitted an application to FEMA to use $ 432,968 of Alternative Funds from the loss of the Norwich Pool Dam in Irene to add a 4,000 square-foot addition on to the building to house office space and other necessary enclosed spaces. The project also addresses energy efficiency and indoor heated storage for additional vehicles and equipment. Funding was approved in February 2017, and construction began in the fall of 2017.

Fire Police Public Safety Building

The existing Fire Department Building was originally built in 1925 as a wood frame building and was replaced in 1980 with a steel frame 4,096 square foot garage with a brick veneer façade, and a wood framed training / meeting room. The building is marginally heated and there was an exhaust extraction system for the fire apparatus installed in 2009. The building is of adequate size to house the fire apparatus and equipment but does not have enough room for related support activities.

The current Police Department office, adjacent to the Fire Department Building, was built as a private residence in 1957. The town acquired the building in 1994 as a short-term solution for housing the Police Department. The plywood sheathed ranch style house on a slab was never designed to accommodate the complex requirements of a modern police department and with minimal maintenance over the past 25 years, the building has structural, insect, and rodent problems and many code deficiencies.

Proposals to build a new Public Safety building for fire and police adjacent to the existing Fire Department building, along with bond funding, were presented to voters twice in 2015 and were defeated. The voters approved a third plan and bond for $1,400,000 in November, 2016. Construction for the new building began in the late spring of 2017 and was officially opened in April 2018.

Tracy Memorial Hall (Town Hall)

Tracy Hall, completed in 1939, contains seven town offices, records vaults, a gym/auditorium, and two meeting rooms. The building underwent major interior and structural renovations in 1994–5, including an installation of an elevator, new electric service, wiring for IT services, new HVAC, and a reconfiguration of spaces. The cost was approximately $850,000 funded with a 20-year bond, which was retired in 2016. The various spaces are used by town offices, recreation, and, when available, by outside groups.

Capital Planning and Budgeting

Since 1994, major renovations and new buildings have been funded with bonding. Repairs, maintenance and minor improvements are funded from reserve accounts established for each building. The reserve accounts are funded annually based on the age of the building and anticipated major repairs. The amount for the Tracy Hall reserve account has been increased in recent years in anticipation of replacing HVAC equipment, flooring and other major repairs. Funding of reserve accounts for buildings being replaced with new ones will be reduced.

Public Works Department

In 2007, the Highway Department, Solid Waste and Recycling Department, and Buildings and Grounds Department were combined into the Public Works Department under the Public Works Director. This created a more efficient arrangement promoting the sharing of resources.
The Public Works Director, who reports to the Town Manager, oversees department operations and staff and also prepares budgets, bids for major purchases, multi-year paving and bridge repair plans, and grant applications. As with most town departments, federal and state policies and regulations have greatly increased the administrative work-load at the town level.

Highway and Bridge Maintenance

The Highway Crew, comprised of five full-time employees and a seasonal employee, maintains the roads, bridges, and equipment. Major equipment includes:

- 5 plow/dump trucks
- 1 mid-sized truck for in-town use
- 1 pickup truck
- 1 loader
- 1 backhoe loader
- 2 graders

Replacement of equipment is funded from a designated equipment fund supported with annual budgeted payments determined by long-range equipment replacement needs. Major equipment purchases have also been paid by low-interest, short-term bonds. Public Works Equipment is included in the Norwich Capital Budget Plan and Report (known as Norcap).

Smaller road maintenance projects and maintenance of the unpaved roads are performed by the highway crew in the summer season. Major projects, including re-treatment of paved roads and bridge replacement, are contracted out. Re-treatment of paved roads represents a significant portion of the Public Works Budget (20% in 2017), and according to a study done in 2005 known as the Marcon Report, should be closer to 30% in order to prevent the roads from deteriorating over time. The long-term costs of fixing deteriorated roads far exceed those of maintaining the road surface on a regular basis. In addition to maintaining roads, the Town of Norwich has 69 major bridges and stream crossings, 822 road crossing culverts, and 326 driveway culverts to maintain. The town receives some state funds for maintaining roads based on mileage and also receives special grants for major paving projects. In past years, the town received state funds for bridge replacement and repair. In the future, these funds are to be allocated regionally based on importance to the region and condition of the bridge. This will reduce funds available for smaller bridge projects.

The impact of growth on the highway and bridge maintenance budgets primarily depends on the location of development, rather than the size of the developments. Development in areas accessed from state highways may have a minimal effect on the town highway budget, as opposed to development in areas far from the village on narrow town roads at higher elevations. Land use policies will affect future highway and bridge budgets.

Buildings and Grounds

The Buildings and Grounds Department, established in 2008, includes one full-time employee responsible for maintaining the grounds of all town property, maintaining sidewalks during the winter, repair and maintenance of town buildings, and maintaining recreation fields and facilities. The department's equipment includes a Holder articulated tractor (used for removing snow from sidewalks and for mowing), additional mowers, and other tools.

The need for the Buildings and Grounds Department was precipitated by agreements with the state requiring the town to maintain some areas adjacent to state highways in exchange for the state constructing enhancements. The department also lowers the cost of maintaining town property by eliminating the use of multiple outside contractors. The department maintains recreation fields, town-owned open space along highways, and the grounds associated with town buildings and facilities, and performs other maintenance projects that were formerly contracted out in a piecemeal manner.

Solid Waste and Recycling

Norwich residents use the transfer station off New Boston Road for most of their solid waste disposal and recycling needs. The station is managed by the Public Works Department and is staffed by three part-time attendants. Residents have the option of using a private hauler or taking their trash and recyclables to the transfer station. Over the years, there has been a steady increase in the types of materials accepted for recycling. Resale of recycled materials helps to offset facility expenses, but is subject to unpredictable fluctuations in the marketplace.

The town's membership in the Greater Upper Valley Solid Waste Management District provides residents with additional options for disposing of hazardous waste at special collections in the District, and access to the Hartford Solid Waste/Recycling Transfer Center, where construction and demolition waste may be disposed of along with recycled materials and trash.

The District, consisting of 10 towns, owns a permitted site for a new landfill in Hartland, which may be constructed and opened in the near future. This new facility is projected to receive the district waste for more than 50 years. Additional solid waste from other regions of Vermont and New Hampshire will provide substantial funding for the facility.

Reduction of the volume of solid waste through recycling and the purchase by residents of goods with less packaging has been a goal of the town and the District. Education of residents and businesses has been an effective tool for reducing the amount of solid waste.

Utilities

Water Supply

The Town of Norwich currently has no direct role in public water supply. All properties, except for those within the Norwich Fire District, obtain potable water from on-site wells or small, state-regulated water systems. The District, managed by its Prudential Committee, operates a public water system serving the historic village center and some outlying areas. This water system was substantially improved in the late 1980s. A 1988 well rehabilitation program resulted in substantial water capacity beyond current needs. The Prudential Committee foresees no major changes to the system during the next few years, but is considering possible connection to the Hanover system as a backup service measure.

The water service area has undergone only minor geographic expansions over the past 20 years. The last major expansion in the water service area was the addition of the McKenna Road properties. More recent expansions have been incremental in nature, and have included only one or two buildings at a time. No significant expansions to the system are anticipated at present. The District's policy for expansion requires a developer to provide complete funding for any system improvements. However, in most instances, the absence of municipal water is not a limiting factor on development capability in Norwich.

The Norwich Fire District (not to be confused with the Norwich Fire Department) was created in 1922 and operates as a municipal entity within the town with its own right to tax and create ordinances. A three-member Prudential Committee elected by the voters of the District governs the District, which includes the Village Business and Residential Districts and some additional properties along Route 5 North.
Over the years, the Fire District has performed various governmental services for its constituents and the residents of Norwich, including zoning ordinances (before town-wide zoning was adopted), operating the volunteer fire department prior to the town taking over, installing sidewalks, and enacting specific ordinances regarding hunting and canine control. Since the 1971 purchase of the privately-owned Norwich Water Supply Company, the district has operated the municipal water department.

Of the 974 acres of the Fire District's land, 917 acres are in the watershed of the Charles Brown Brook, the former source of water for the municipal system. In 1995, 350 acres of the watershed land were placed under an agreement between the town and the District, and in 2001 the remaining 567 acres were added to the agreement. The District retains title to the property with a conservation easement given to the town in exchange for an exemption from town property taxes.
Forestry, educational, and recreational uses of the property are under the control of a Land Management Council, composed of three voting members appointed by the Prudential Committee and the Selectboard and four non-voting members representing the Conservation Commission, Prudential Committee, Recreation Council, and Selectboard. Timber sales from the property support the management activities.
As the town grows and faces additional development and service issues, it is possible that the goals of the Town of Norwich and Norwich Fire District will be better served by merging. This issue should be considered and evaluated periodically.

Sewage Treatment

There is no municipal sewage disposal system in Norwich. The costs and benefits of a municipal sewage treatment system have been considered several times in the past, most recently in 2005, when the Selectboard charged a committee with evaluating the need for a municipal sewer system and the feasibility of building one, either with a new treatment facility or through hooking up to the existing systems in Hanover or Hartford. The report found that:

- There is no area-wide failure of existing systems that would indicate a need for a municipal system.
- A conventional municipal wastewater treatment system would be prohibitively expensive.

Tying into another municipal system, most likely Hartford, may be feasible.

The report acknowledged that a municipal system would allow for more growth, but did not take a position on whether this was good or bad. The full report is available from the Town Manager's Office or on the town web site.

Concern has been expressed about a municipal sewage treatment system allowing too much development in areas it would serve, however, concentrated development in designated areas closer to existing roads and facilities may be more beneficial in the long term. We must determine what the Town is prepared to support in terms of growth, while recognizing that the choice is only ours in the negative. We may be able to prohibit too much growth, but we cannot conjure it. This Plan recognizes that sufficient support does not currently exist to allow a connection from Norwich to a neighboring town's sewage and/or water system. Such a move would require specific authorization and support in the Town Plan via a future amendment. This issue is discussed more thoroughly in the Land Use and Housing chapters, and appropriate guidance for the placement and density of future development is included in current land use regulations based on the goals and policies supported in this plan.

Electricity Distribution

Electricity is supplied in Norwich by Green Mountain Power (GMP). There are two electrical transmission lines originating at the Wilder Dam, one running north along Interstate 91 into Thetford (GMP) and another running northwest along Turnpike Road into Sharon (VELCO). There are three-phase power lines along most of the Route 5 corridor and in Norwich Village, which are needed to facilitate power generation at distributed, community-scale sites (as compared to traditional utility-scale power plants or dams) closer to where the electricity will be used. Still smaller single-phase power lines prevail outside the Village, connecting neighborhoods and single homes to the larger distribution network.

Adoption of a "smart grid" into the systems of both electric utilities would improve the energy efficiency of Norwich consumers. A "smart grid" delivers electricity from suppliers to consumers using two-way digital technology to control appliances at consumers' homes to save energy, reduce cost and increase reliability and transparency. It also incorporates overall digital management of the distribution system to monitor disruptions in service and generally improves the efficiency of the system. This, however, is a system-wide change, not something that can be initiated by the town.

Telecommunications and Broadband

Cell phone service and high-speed internet access have become a necessity in our lives, just as electricity and the telephone were in the early part of the last century. These modern technologies utilize towers, antennas, and additional wire strung along poles or underground. Federal statutes mandate that these services be made available to everyone, thereby limiting the rights of towns to review and condition these projects and, in some cases, eliminating local review entirely.

Norwich has one 87-foot-high cell tower above Upper Loveland Road with antennas for two providers. Due to hilly terrain and the limited number of towers, cell service in Norwich is spotty and, in some areas of town, nonexistent.

The availability of cell service (which often also delivers Internet access) and broadband internet access are services providing important benefits to residents including safety and security, education, economic, health monitoring, entertainment, etc. The town should continue to support these services while minimizing the adverse visual impact of towers, antennas and wires to the extent possible.

Although parts of town have access to broadband internet service over cable, DSL (digital subscriber line) or wireless providers, many areas away from the village center and main roads cannot obtain high-speed internet connections. These areas of town are limited to slow dial-up or almost as slow, expensive satellite service. ECFiber provides service in portions of the town at speeds substantially faster than either cable or DSL. Provision of broadband service to all areas of town is essential for a variety of reasons such as:

Economic development;

Education;
Reducing travel;
Accessing medical services from home; and
General well-being of residents.

Provision of state-of-the-art cell phone and broadband services to all areas of town is also an important ingredient in attracting individuals and families to Norwich.

Emergency Services

Police

Before 1973, when the Norwich Police Department was originally established by the appointment of a Chief of Police, police services were provided by part-time elected constables. Since then the force has increased to a chief, three full-time officers, two part-time officers and a full-time clerk-dispatcher. While the department is available on a 24-hour basis, regular patrol services are now provided for an average of 16 hours each day. The majority of the departmental budget is allocated to regular patrol operations. The department's major equipment includes two cruisers, a four-wheel-drive patrol vehicle, extensive communication and video systems, firearms, and other specialized equipment.

The responsibilities and size of the police department are not dependent on population growth alone. Other factors may include:

- Public expectations for police services
- Demographics of town residents
- Types and impacts of commercial businesses
- State and federal mandates for services and reporting
- Use of technology to increase efficiency of the existing force
- Daytime population versus resident population

Fire Protection

The Norwich Fire Department is a volunteer department consisting of a part-time (30 hours per week) salaried fire chief and 37 members. The fire division has 27 members, some of whom are Emergency Medical Technicians (EMTs) who work in the Emergency Medical Services (EMS) Division. These "on-call" firefighters and EMTs are paid for time spent in responding to fire calls and for some training time. The department has one station that houses two engines, one tanker, one aerial ladder, one forestry truck and one mini-pumper. The department provides fire, emergency medical service, hazardous materials response (operations level) and rescue services. The department has had a salaried career fire chief since August 2008.

The Norwich Fire Department faces challenges with recruitment and retention of members, as do most volunteer fire departments. This is a national problem that has been the target of numerous studies. Among the challenges identified are time demands, training requirements, increasing call volume, state and federal requirements, high cost of housing, an aging community, and the effects of the decline in volunteers. Daytime responses are a particular challenge to the department, since there are a limited number of members available during workdays. Norwich and its adjoining communities rely on mutual aid, and multiple departments are dispatched to credible reports of building fires.

Norwich's recent classification from the Insurance Services Office (ISO) of 4 on a scale of 1 to 10 is one of the best ratings in Vermont and the Upper Valley, resulting in lower insurance premiums for all home owners. These ratings are based on equipment, training, communications, dispatch time, and water supplies. Homeowners may receive greater discounts if they are in the Norwich Fire District and are situated nearby a fire hydrant.

In addition to fighting fires, the Norwich Fire Department has been proactive in fire prevention and preparedness, with the goal of significantly reducing loss from fire without expanding the town budget. Zoning and subdivision regulations have been amended, requiring new development to provide all-season access for fire trucks and an adequate water supply to fight fires. In some cases, residential sprinkler systems will be required where there is limited access to a water supply.

The town has excellent water supply for fighting fires in and near the village due to the good pressure and capacity provided by the Norwich Water District hydrants. In outlying areas, water is brought from the village by tankers or pumped from rivers, streams, or ponds. The Fire Department has installed nine dry hydrants

accessible to fire equipment along ponds, streams, and rivers in the rural areas. The goal is to have water supplies for fire pumpers in every area of the town. Landowners are encouraged to install dry hydrants when building or renovating ponds.

Although these water supplies are effective for property protection, residential sprinkler systems, in conjunction with smoke alarms, improve protection of lives and property from fires in homes. A residential sprinkler system is designed to control a fire long enough for the occupants to escape. Some communities around the country are now requiring a residential sprinkler system in new homes. The Norwich Fire Department highly recommends them, especially for homes at a distance from the firehouse.

First-Response & Emergency Medical Services

Emergency medical services are provided by the First Aid Stabilization Team (FAST) Squad. The FAST Squad has 18 members trained at or above the EMT-Basic level who provide patient care prior to the arrival of an ambulance from the Hanover Fire Department. The FAST Squad and Police Department have several automated external defibrillators.

First-response ambulance and emergency medical services are provided by the Town of Hanover through a contractual agreement based on both a per-capita payment from Norwich (in 2010, $82,000 annually) and user fees. Fees not paid by the user must be paid by the town.

Given the investment involved in equipment and personnel, this agreement is advantageous to Norwich. It is expected that this arrangement will be continued for the foreseeable future.

Emergency Dispatch and 911

Emergency calls are answered by VT 911. Police services are dispatched by the Hartford dispatch center. Fire and emergency medical calls are dispatched by the Hanover dispatch center.

Assigning numbered street addresses for all occupied structures and locations where citizens gather is an important component of quick emergency response. Norwich has created official names for all public roads and for private roads serving three or more residences. Street numbers based on distance from the beginning of the road have been assigned to all residences and businesses. Landowners are required to display house numbers visible from the road, but this has not been fully enforced.

Emergency Management

The Town Manager serves as the Emergency Management Director. The Manager is assisted by a Deputy Emergency Management Director (currently the Fire Chief) and an Emergency Management Coordinator. The Town Emergency Management Committee, comprising elected and appointed town officials, is a consensus group that assesses risks and prepares the local hazard mitigation plan, local emergency operations plan, continuity of government plan, and other documents in coordination with regional, state, and federal emergency management agencies.

In addition to maintaining and updating operations planning for a coordinated emergency response to major events, the committee also prepares pre-disaster mitigation plans for physical and regulatory changes to minimize the damage and loss of life in a major disaster. The types of disasters prepared for include natural disasters such as floods and ice storms, major fires, terrorism, hazardous material spills, and health-related events such as a pandemic outbreak of disease.

Disaster planning has evolved from focusing primarily on response and recovery to mitigation and resilience. Resilience is a concept focused on identifying and managing risks, proactively reducing vulnerabilities and improving response and recovery. A resilient community has the ability to withstand, respond and adapt to challenges. The goal is to ensure that communities are continually building capacity to adapt to a changing climate and respond to natural disasters. A resilient community thinks long term and is able to reorganize and renew itself, ideally in ways that put it in a stronger position than before the disaster.

The Town of Norwich has a FEMA-approved Local Hazard Mitigation Plan, which was adopted in 2015. The purpose of that plan is to identify hazards facing the community, assess the likelihood and risks associated with those hazards, and develop strategies to reduce the risks from known priority hazards. It is also a requirement for the town to qualify for FEMA Hazard Mitigation Grants. That plan, as most recently adopted is incorporated into this Town Plan by reference. The Town of Norwich also updates and adopts a Local Emergency Operations Plan on an annual basis.

In the event of a federally-declared disaster, 75% of the eligible public costs (road repairs, for example) are reimbursed by the federal government. The Vermont Emergency Relief and Assistance Fund provide state funding to match that federal public assistance. Norwich is eligible for a 12.5% match, rather than the base 7.5% match, because the town has adopted:

- Flood Hazard Regulations;
- Town Road and Bridge Standards;
- A Local Emergency Operations Plan; and
- A Local Hazard Mitigation Plan.

If Norwich were to expand its flood hazard regulations to also limit new development within state-mapped river corridors and to participate in FEMA's Community Rating System, the state match percentage would increase to 17.5%.

Town Government & Administration

Selectboard and Town Manager

The Town of Norwich has been governed by an elected Board of Selectmen (changed to Selectboard in 1996) since the first town meeting in 1761. In 2002, the town adopted the Selectboard/Town Manager form of government.

The Town Manager reports to the Selectboard, and is subject to the direction and supervision of the Selectboard. The Town Manager's responsibilities, as prescribed by state statute, include the general supervision of the affairs of the town and more specifically, to be the administrative head of all departments of town government and responsible for the efficient administration and finances of those departments. The Selectboard is responsible for setting town policies, adopting budgets prepared by the Town Manager, adopting ordinances, making appointments to town boards and committees and laying out roads. The specific responsibilities of a Town Manager and the Selectboard are found in 24 V.S.A Chapters 33 and 37.

Town Clerk

The Town Clerk is an elected official with specific statutory duties, including maintaining permanent town records of land transactions, roads, town meetings, and vital records (births, marriages and deaths). The town clerk also supervises elections, registers voters, issues licenses for marriages and dogs, and is the clerk for the Board of Civil Authority and the Board of Abatement. The town clerk is assisted by at least one part-time assistant town clerk.

Prior to the arrival of the Town Manager, the town clerk provided many additional services related to the day-to-day operation of the town that were not part of her statutory duties, including Tracy Hall operations and communicating resident concerns to department heads. These services are now the responsibility of the Town Manager's office.

The level of activity in the Town Clerk's office is based more on the number of real estate transactions and elections rather than the population growth, although there is some correlation. The future transition to digital records and indexing may result in efficiencies that will limit the need for additional personnel in the future. The 1994 renovation of Tracy Hall created sufficient office and vault storage space for now and the foreseeable future.

Finance

The Finance Director is responsible for the accounting functions and tax collecting of the town. These functions include payables, receivables, payroll, fixed assets, reporting, and preparing for the annual audit. Prior to 2002, an elected treasurer performed these duties. With the transition to the Selectboard/Town Manager form of government, the position of Finance Officer reporting to the Town Manager was created. The Finance Officer has a part-time assistant. The role of the treasurer is now limited to paying orders authorized by the Selectboard and investing funds with the approval of the Selectboard.

Listers/Assessors

A contract assessor was hired in 2012 to assist the Board of Listers by assuming the technical responsibilities of inspecting and assessing properties, preparing the Grand List, and interacting with the state. The elected Board of Listers hears and adjudicates grievances, lodges the Grand List, and participates in Board of Civil Authority hearings. The contract assessor is engaged to complete a town-wide reappraisal on a three-year cycle, visiting one-third of the properties in town each year.

Planning and Zoning

The Planning and Zoning Office is responsible for the regulation and permitting of land development in Norwich. The Planning Coordinator and Zoning Administrator are two separate positions held by the same person. The Zoning Administrator reviews all applications for development, issuing or denying permits, or forwarding the application to the Development Review Board for a warned public hearing. The Zoning

Administrator is clerk for the Development Review Board, preparing and warning hearings, assisting at hearings, and issuing decisions written by the board. The Zoning Administrator is also responsible for enforcement of the zoning and subdivision regulations.
The Planning Coordinator provides support to the Planning Commission in preparing the Town Plan and land use regulations, and assists the Town Manager in transportation planning and other matters. In addition to the Planning Coordinator/Zoning Administrator, a part-time assistant was added to the office in 2007 to process the paperwork associated with permit applications and hearings, and manage the databases. Changes in workload are related to the economic climate for development and changes in the town's land use regulations requiring more permits and hearings.

Cemeteries

Of the 10 cemeteries in Norwich, lots are only available at Hillside, where roads and lots were added in 2008, providing additional space. There may be a need for additional space in the future, and potential sites should be identified and reserved for cemetery space.
The income from the Perpetual Care Trust Fund covers from 20 to 50 percent of the amount the town spends on maintenance in the cemeteries. This percentage fluctuates based on interest rates and the amount spent on restoration of headstones. The town has been appropriating $15,000 in recent years to supplement the interest from the Perpetual Care Trust Fund.

Recreation

Recreation Department

The Norwich Recreation Department manages a year-round recreation program for all Norwich residents and non-residents as space permits. Prior to 1995, the Norwich Recreation Council was an independent organization supported by fees, donations, and an annual appropriation from the town. In 1995, the town assumed responsibility for the council's financial operations, and it became the Norwich Recreation Department. The director became full-time in 2002. Some instructors are paid either by the hour or a percentage of fees, while the team sports programs depend primarily on volunteers from the community.

The number of students in Norwich has dropped substantially in the last 10 years, causing participation in specific programs to be reduced, but the number of programs has increased. Despite the drop in resident children, the Recreation Department still offsets of its annual budget with user fees, much higher than similar departments in the region.

The town's recreation facilities include:

- Huntley Meadow, with four tennis courts and six fields: two baseball diamonds, two full-size fields and two ¾-size fields. Three of these fields were added over the last six years. A mountain bike track was added by the Trails Committee in summer 2017.
- The Norwich Green, with small fields for lacrosse, soccer and baseball.
- Two gyms: Marion Cross School and Tracy Hall.
- Barrett Meadow, with a small field for limited activities.
- Indoor space at Marion Cross School for summer circus camp and other classroom programs.

The two gyms are sufficient for current and foreseeable needs.
Currently, the Recreation Department offers some non-athletic programs such as television production and sponsors some special events such as dances and road races. Adult programs include mountain biking, dance, capoeira, Chi Kung, and snowshoeing.
The Norwich Recreation Department continues to try new programs for residents of all ages. New facilities under consideration include an access to the Connecticut River for kayaks and canoes, and more running trails.

Other Recreation

Norwich's trails and Class 4 roads are used for hiking, mountain biking, horseback riding, and cross-country skiing. Town residents also have access to the Appalachian Trail, the Bill Ballard Trail along the Charles Brown Brook on Fire District land, a network of hiking and skiing trails on Parcel 5 on the Fire District land on the north side of Beaver Meadow Road, the Norwich Nature Trail in the Milton Frye Nature Area southeast of the school, the Hazen Trail south of the Montshire Museum, the Bradley Hill Trail, and the trail to Gile Mountain. Many of these trails could be connected to create a network of recreational trails throughout the town with the cooperation of private landowners. The Town and the Norwich Fire District have negotiated an agreement for the Fire District land south of Beaver Meadow Road to be managed for recreational use by a committee of town residents.

Bicycle and pedestrian paths, as discussed in the Transportation chapter of this plan, are designed primarily for people going from one place to another without having to use a car, but are also used by bicyclists, joggers, and cross-country skiers for recreation.

The Connecticut and Ompompanoosuc rivers also offer recreation for Norwich residents. There are two access locations to the rivers for launching boats, one along River Road owned by the town and one in Pompanoosuc owned by the state. There is no shoreline location along the river easily available to Norwich residents for swimming.

Goals, Objectives and Actions

Goal E Provide a full range of community services and facilities in a cost-effective, environmentally sound manner without creating an undue burden on local taxpayers.

Update the capital improvement program and budget based on projections of the needs of specific facilities and services consistent with historical growth trends in Norwich appropriate for a town of 3,400 residents at the core of a designated Micropolitan Area.		

Action E.1.a Update and adopt a Capital Improvement Program that includes all capital construction and purchases over five- and ten-year periods. The plan should be updated each year. The purpose is to spread costs evenly over time and to anticipate major construction projects.

Maintain roads and bridges in the most cost-effective manner (this may require increased maintenance at an earlier stage of deterioration).		

Action E.2.a Update the pavement and bridge inventory on an annual basis.

Expand access to state-of-the-art high-speed internet service to all households and businesses in Norwich.		

Maintain the high quality of the Norwich Police Department in serving the community.		

Action E.4.a Perform regular reviews of the operations and effectiveness of the Norwich Police Department using the criteria in the 2007 Norwich Police Services Report.

Action E.4.b Review the optimum size of the force and hours of coverage based on the needs of the community.

Maintain the high quality of the Norwich Fire Department and the resulting low ISO score with continued training programs, developing new rural water supplies, and effective pre-planning.		

Action E.5.a Recommend residential sprinkler systems to all homeowners in the outlying parts of Norwich. Consider requiring them for new houses not readily accessible to emergency vehicles.

Action E.5.b Enforce the existing ordinance requiring all home and business owners to display E911 locatable address numbers either on the building, if visible from the road, or at the entrance to their properties.

Maintain the professional staff in a cost-effective manner and keep technology up to date in each town department for the most effective and efficient delivery of services to the residents.		

Action E.6.a Provide technical support to all departments through network servers and equipment replacement programs.

Provide recreation facilities and programs for all residents.		

Action E.7.a Maintain and continue to expand the recreational trail network.

Action E.7.b Create additional locations, with adequate parking, for access to the Connecticut and Ompompanoosuc rivers for swimming and small car top-type watercraft.

Action E.7.c Encourage use of the trail network as an alternate means of commuting from the village to Route 5 South and the Dresden Fields.

Strengthen Norwich's resilience to disaster, including floods, and ability to sustainably adapt over time to a changing climate.	

Action E.8.a Ensure that Norwich's Local Emergency Operations Plan and Local Hazard Mitigation Plan is kept up-to-date and re-adopted as necessary.

Action E.8.b Continue to implement the programs, projects and activities identified in the Local Hazard Mitigation Plan as most recently adopted.

Goal F **Provide facilities and services in a cost-effective manner that reinforces the town's land use development, energy, and natural resource protection goals and policies.**

Continue to work towards long-term solutions for disposal of solid and hazardous waste through regional cooperation, and reduction of the volume of solid waste through recycling and consumer education.		

Action F.1.a Continue to actively participate in and evaluate the Greater Upper Valley Solid Waste Management District's plan to build a new landfill in Hartland.

Maintain sources of high-quality potable water for current and future residents of Norwich.		

Action F.2.a Continue to develop contingency plans for disasters that may threaten the village water supply.

Focus water supply and wastewater improvements on existing development areas		

Action F.3.a Research emerging technologies for waste water treatment, grey water uses,to enable concentrated development in areas previously identified as unsuitable for such uses.

Transportation

Transportation facilities in Norwich include: state, town, and private roads; railroad lines; public transit routes; bikeways; and pedestrian paths. These facilities provide connections between homes, businesses, recreational facilities and workplaces in the community, the region and beyond.

We are in an era of significant change in the use of energy and the management of energy resources. There is a direct relationship between land use, energy consumption and transportation. Better roads may promote more intense land use if zoning provisions permit, and poor roads will discourage most types of land use. Public transportation and compact development will result in reduced energy use. Land use planning that creates clusters of housing will facilitate public transit, bicycling and walking. Transportation planning should look at all modes of travel and be coordinated with land use planning and energy conservation.

This chapter will not only focus on the most common form of transportation – the automobile – but will also consider alternative modes of transportation, including bicycling, walking, and regional public transit. Other aspects of transportation planning for Norwich include support for regional coordination and cooperation, sustainability, energy conservation, and planning for more compact development in appropriate places and at a scale appropriate for Norwich in accordance with smart development principles.

Roads In Norwich

Interstate and State Highways

There are 18.3 miles of state-maintained highways in Norwich. These are generally the most heavily traveled roads in town. As shown in Figure 9-1, traffic levels on these roads continue to increase.

Interstate 91. Interstate 91, the primary north-south thoroughfare in western New England, was completed through Norwich in the early 1970s and runs north-south along the town's eastern boundary. I-91's southern terminus is the junction with I-95 in New Haven, Connecticut, while its northern end is at Derby Line, Vermont, at the Canadian border. Its intersection with I-89 five miles south at White River Junction provides Norwich with direct interstate highway access to Boston, Montreal, New York City and points between and beyond.
In Norwich, the highway travels 7.6 miles from the Hartford to Thetford town lines with Exit 13 located in Norwich less than one mile north of the Hartford line and south of Norwich Village. In 2008 Norwich's segment of interstate had a sufficiency rating of 92.3 out of 100. The average daily traffic between Exits 12 and 13 in 2015 was 17,900 vehicles; between Exits 13 and 14, it was 12,100 vehicles.

U.S. Route 5. U.S. Route 5 is a two-lane rural road that parallels the Connecticut River along much of the 8.5 miles it travels through Norwich. U.S. Route 5 is part of the bi-state Connecticut River Scenic Byway and a popular bicycle route. South of I-91 Exit 13, Route 5 runs to the west of the interstate. From the exit in Norwich, Route 5 travels into Norwich village and then eastward crossing under the interstate to continue north on the east (or river) side of I-91. This segment of the highway is lightly traveled and highly scenic. South of Exit 13, Route 5 averages around 5,000 vehicles per day, while between the exit and Norwich village the number of trips per day is about 6,000. North of the village traffic on Route 5 is less than 1,500 vehicles per day.

Vermont Route 10A. Vermont Route 10A is a 0.9-mile connector between I-91 Exit 13 southbound and the Ledyard Bridge over the Connecticut River that links Norwich to downtown Hanover, New Hampshire. Route 10A is heavily traveled, with more than 14,000 vehicles crossing the bridge each day. This state highway had a sufficiency rating of 68.2 out of 100 in 2001, due more to safety and traffic issues than to the physical condition of the road. During the peak morning and afternoon commuting hours, traffic on Route 5 between the village and Exit 13, and Route 10A from the exit to the bridge, can become congested as vehicles become backed up between Norwich and Hanover. Any increase in development that involves travel to NH via Route 10A must address the current congestion on this route.
The bridge connecting Norwich and Hanover has an interesting history of its own. Built in 1859, the Ledyard Free Bridge was the first, and for many years the only, non-toll bridge over the Connecticut River. The Ledyard Bridge has been rebuilt four times due to disasters and deterioration. Construction on the current bridge was completed in 1999.

River Road. River Road is a 0.8-mile state highway connector between Vermont Route 10A at the Ledyard Bridge and U.S. Route 5 North along the Connecticut River. It does not have a state route number, but is a designated state highway. Due to the proximity of the River Road to the Connecticut River to the East and the railroad, substantive changes to the road are not possible.

Town Highways

Background. In the late 1700s, when Norwich was first settled, in addition to the King's Highway and early Post Roads, many of the roads were laid out and built by original investors/settlers to encourage development and increase the value of the land. Early landowners allowing roads to cross their property were compensated with additional land. Agricultural and forest products were processed in the town for local trade and export. The commerce of the town depended on roads to move goods around town and to the river, and later to the railroad

depots in Lewiston and Pompanoosuc. By the mid 1800s, there were more than 100 miles of roads as compared to the 85 miles currently maintained by the town and state.

As the population moved west, many of the homesteads were abandoned and roads to less productive land were no longer used or maintained. By 1931, road mileage had decreased to 72 miles. Some of these old roads can no longer be seen on the ground but may still be legal rights-of-way that exist in the town records (See Ancient Roads).

Even with the population now exceeding the historic peak of the 1830s, very few new town roads have been built. Most development has occurred along existing roads. The exceptions are roads in residential developments, such as Hawk Pine, McKenna Road, Carpenter Street, Hazen Street, Cliff Street, and Huntley Street. There has been some interest in upgrading sections of Class 4 roads to Class 3 to accommodate more development and provide more interconnections between existing roads, but this has not happened.

The town maintains 76 miles of its 96 miles of public roads in Norwich with some financial aid from the state, based on the class and mileage of the town roads.

Road Class and Function. Norwich's 96 miles of town road are classified as follows:

Class 1: Heavily traveled roads that are extensions of the state highway system and are assigned a state route number. Currently, there are no Class 1 town roads in Norwich.

Class 2: Major roads that do not meet the criteria for a Class 1 road but still may have a state route number and serve as through-roads from one town to another. Route 132, Union Village Road and Beaver Meadow Road are Class 2 roads. Class 2 roads are usually paved. Norwich has 14.5 miles of Class 2 roads.

Class 3: Roads that are maintained to be passable at all times of the year by a regular passenger car and are not Class 1 or Class 2. They are usually gravel roads, although in Norwich there are 11 miles of paved Class 3 roads. Norwich has a total of 61.2 miles of Class 3 roads.

Class 4: Non-maintained or partially maintained town roads. The town receives no funds from the state to maintain these 19.1 miles of roads. Some Class 4 roads are privately maintained by landowners and some are essentially trails which may or may not be passable by a vehicle.

Legal Trails: Town-owned rights-of-way that are not maintained and may not be open to vehicles. There are approximately 3.5 miles of legal trails in Norwich.

VTrans has also classified the town's roads based on their function. Routes 5, 10A and 132 are major collectors; they serve primarily traffic traveling between destinations within a region. Union Village Road, River Road and portions of Main Street are designated as minor collectors, which connect smaller communities and collect traffic from local roads to major collectors.

Road Maintenance and Construction. The Selectboard has responsibility for building and maintaining town roads. The Selectboard appoints the Town Manager as Road Commissioner. The Town Manager hires a Director of Public Works. The Town Manager is charged with overseeing the roads and legal rights-of-way, and overall maintenance strategies, and is the Selectboard's liaison with the Director of Public Works. The Director of Public Works supervises the Highway Department, the workers, and equipment. For an additional discussion of the Highway Department, see Chapter 7, Community Facilities and Services.

The town has several ordinances and policies relating to town roads. These include:

Road Specifications - 1976

Class 4 Road Policy - 2/28/89

Scenic Road Ordinance - 10/30/89

Criteria for Accepting Roads - 12/8/92

Ordinance Relating to Use of Trails - 12/8/01

Private Highway Specification Ordinance - 2/11/03

Several Speed and Parking Ordinances

Road Maintenance. Road maintenance is budgeted in three categories: winter maintenance (snow removal and sanding), summer maintenance (grading, paving, ditching, and replacing culverts), and capital improvements (bridge replacement, road relocation, and widening and straightening).

Road maintenance is always a difficult balance. With a limited budget, is it better to completely rebuild or reclaim a short section of highway versus patching or skim-coating longer sections only to repave a few years later? On unpaved roads, is it better to add gravel each year or to rebuild the roadbed and ditches to avoid erosion? These are the kinds of decisions being made by the Town Manager and the Director of Public Works with budgets approved by the Selectboard and voters. The inconveniences of badly deteriorated roads or closed bridges are not well received by the taxpayers, nor are ever-increasing highway budgets.

In 2007, a study, the Marcon Report, of the conditions of paved roads and the re-paving program indicated that the town was falling behind and that roads were deteriorating at a substantially faster rate than repairs were being made. The cost of rehabilitating a road increases substantially as the condition worsens. The town is now using a computerized Road Surface Management System (RSMS) to plan for long-range maintenance and capital improvements.

Upgrading Existing Roads. The town needs to make informed decisions on whether existing roads will need to accommodate additional traffic and, if so, whether they can or should be upgraded. Widening, straightening, or paving may increase safety, but may also increase the speed of traffic, encourage more development, and destroy the scenic beauty and rural character of Norwich's back roads. The town should find a way to provide safe roads without improving them to typical Class 2 or 3 standards if it will adversely affect the rural character of the town.

Class 4 Roads. Class 4 roads are town highways that are not maintained for year-round travel. The town must replace larger culverts and repair bridges on Class 4 roads, but they are not otherwise maintained. A landowner whose property is accessible by a Class 4 road may maintain the road privately with permission from the Town Manager.

Class 4 roads form a part of a long-standing network of trails/tracks used for recreational purposes. In the future, some Class 4 roads could be upgraded to Class 3 to increase the efficiency and safety of the town's road system or to allow development in suitable areas. Many areas along the western and northern boundaries of Norwich are inaccessible from each other without first traveling back to the center of the town. Upgrading of some existing Class 4 roads to Class 3 would create alternative routes for emergency vehicles and allow detours if roads are closed in major storms. In some cases, Class 4 roads provide the only access to individual properties. Careful consideration should be given to the value of Class 4 roads and how they may contribute to the quality of life of Norwich's residents.

Legal Trails. A legal trail is a public right-of-way that may previously have been a town road and is open to the public for recreational use, but from which the town may exclude motor vehicles. It may be the same width as the town highway, or a lesser width if so designated. The Selectboard may also create a new trail with a designated width. The Selectboard adopted an ordinance in 2001 to regulate the use of its legal trails. Most of the 3.5 miles of legal trails in Norwich are designated for recreational use and were converted from Class 4 town highways within the last 10 years. The town's ordinance prohibits the use of motor vehicles, other than vehicles being used for farming and snowmobiles, on trails unless a special permit is approved by the Selectboard. A legal trail may be upgraded to a Class 4 or Class 3 town road in the future.

Ancient Roads. Ancient roads refer to old public rights-of-way created in the early days of Norwich that are no longer used as roads or trails. Some of these roads, although long forgotten, may have never been legally discontinued and may still be town rights-of-way, creating an unanticipated cloud on the title of property. These forgotten roads could be considered an asset of the town providing recreational trails and access. In 2006, the state legislature passed Act 178 in order to resolve this issue by requiring towns to find "unidentified corridors"

by July 2010 and to reclassify them to trails or roads, or to discontinue them by 2015. The Norwich Ancient Roads Committee has been working to identify potential "unidentified corridors" to present to the Selectboard for re-classification or discontinuance.

New Roads. In recent years, new roads in Norwich have been privately built to accommodate specific new developments or to relocate an existing road. New private roads constructed by developers are under the jurisdiction of the Development Review Board and must meet private highway standards, if serving two to 10 residential lots, and Class 3 road specifications for 11 or more lots. There is a more detailed discussion of private roads below.

Occasionally there are requests by developers or landowners for the town to take ownership, and thereby responsibility for maintenance, of a private road. In December 1992, the Selectboard adopted a policy for accepting ownership of private roads based on the density of housing on the road and other uses of the road, such as connecting with other town roads or accessing public lands. Farrell Farm Road, which provides access to more than 20 homes, is the only private road to be accepted as a town highway recently. The landowners paid to have the road improved to town highway standards prior to the town's acceptance in 2008.

Norwich Village. Norwich village, like many Vermont town centers, has been experiencing increased traffic as the number of homes in outlying rural areas and neighboring towns has continued to increase. Norwich's topography and road network has amplified this effect, as often the only way to travel from one place to another within town is to pass through the village. Additionally, the majority of the town's employed population commutes through Norwich village to reach I-91 or cross the bridge to Hanover. At the same time, parents and buses are converging on the village to transport children to and from school.

Given that such a large percentage of Norwich commuters are headed to one of several major employers, public transit should be able to reduce the number of people commuting in their own cars. In fact, bus service between Norwich village and Hanover has existed for decades. The lack of parking within the village, however, prevents many commuters from choosing to ride the bus. Development of park-and-ride lots has been considered for a number of years. An appropriate location has yet to be acquired that would eliminate the need for most commuters to drive through Norwich village, although the recent development of a park-and-ride lot at Huntley Meadows has attracted increasing use. Concerns have also been raised that out-of-town residents would drive into Norwich, park their cars and take the bus, thus increasing traffic entering town from the south or east. In addition to periods of heavy traffic, limited parking and pedestrian access discourage walking and limit the growth potential of downtown businesses.

Scenic Roads

Norwich has many beautiful rural road corridors that provide pleasant travel and vistas for residents and visitors alike. In 1977, legislation was passed by the state that provides towns with the authority to designate roads as scenic. In 1989, the town enacted its own Scenic Road Ordinance in order to keep the designation local and not listed in state tourism publications. A total of 5.2 miles of roadway, including Bragg Hill Road, Jericho Street and Goodrich Four Corners Road, have been designated as scenic. The Scenic Road Ordinance does not actually protect the "scenic vistas," but it does regulate the maintenance and removal of features within the road right-of-way (usually 50 feet wide) such as trees and stone walls in order to preserve scenic character. Changes during the 2000s in the zoning and subdivision regulations have offered some protection to scenic vistas along many of these and other roads.

Private Roads and Driveways

Private roads in Norwich range in length from short driveways serving individual homes to long shared drives accessing many houses. These private roads are maintained either by an individual landowner, a group of

landowners, or a landowner or condominium association. The town has four primary concerns with private roads:

- That the intersections of private roads with town roads are designed to be safe and not cause damage to the town roads;
- That roads are designed, built, and maintained so that emergency vehicles are able to reach residences;
- That new roads and drives are designed, built and maintained using appropriate stormwater management techniques and infrastructure to minimize run-off, sedimentation and flooding of downslope infrastructure, property and waterways;
- That new roads are built with minimum impact on significant natural resources and scenic views; and
- That private roads are built and maintained to standards appropriate for their intended use in order to avoid the town ultimately having to take responsibility for hazardous, inadequate or deteriorated infrastructure.

The town has the authority and responsibility to regulate private roads with regard to these issues, and does so with three ordinances:

- The Norwich Driveway Access Ordinance, administered by the Director of Public Works, regulates the design and location of any new private road or driveway where it intersects with a town highway.
- The Norwich Private Highway Specifications Ordinance regulates the construction of any new private road serving from two to 10 residences or lots.
- The Norwich Zoning Regulations regulate the design of new driveways serving a single lot or residence.

The Norwich Private Highway Specifications and the Norwich Zoning Regulations are administered by the Zoning Administrator and the Development Review Board. Pre-existing roads are exempt unless their use changes. The Natural and Historic Resources section describes the type of natural and scenic areas that driveways and private roads should not adversely impact, such as wetlands and ridgelines.

Culverts

Recent studies have shown that roadway and roadside drainage systems that fail to convey the amount of water they are receiving from adjoining property are a significant source of flood-related damage to roads and associated infrastructure. This includes undersized or blocked culverts. Since 2013, the Town of Norwich has maintained a bridge and culvert inventory that assesses the condition of these structures and aids in the prioritization of replacement and repair work each year, including upgrading of undersized culverts.

Access Management

Access management describes a set of strategies that can be applied by municipalities to prevent congestion and improve safety as development occurs along road corridors. Each new access (driveway or road) that intersects with existing roads, particularly main traffic corridors, introduces a new potential interruption to the flow of traffic and increases the possibility of traffic accidents. The Vermont Agency of Transportation has developed Access Management Program Guidelines, which include recommended policies, regulations and road design standards aimed at minimizing the number of new access points and improving the safety of access points. Currently, shared driveways are the most commonly used access management technique in Norwich. Not only do shared driveways reduce the number of new access points intersecting town roads, they also have numerous environmental benefits, due to reduced construction and maintenance requirements and a reduction in the amount of impervious surface needed to serve new development.

Public Transportation

Norwich residents' access to public transportation includes taxis, a regional bus system (Advance Transit), a van for seniors based at the senior center in White River Junction and a district school bus system. There is also inter-city bus service to major cities and airports (Vermont Transit and Dartmouth Coach), train service (Amtrak), and a regional airport in West Lebanon connecting the region to New York, Boston and beyond.

There are a number of difficulties in serving a rural community such as Norwich with local public transportation, the primary one being that typically, there are relatively few people going to the same place at

the same time on a regular basis. In addition, with relatively uncongested highways and the general availability of parking, there is little motivation for drivers to give up the convenience of a personal vehicle. The cost of providing service convenient enough to entice a large percentage of drivers out of their cars and onto public transit may far exceed the benefits of less pollution and greater energy conservation. However, as fuel prices and traffic have increased, and parking in Hanover has become scarcer, more commuters are using public transit, bicycles and car pools.

The current Advance Transit bus system connects Norwich village with hospitals, employment centers, and retail shopping areas throughout the Upper Valley. Advance Transit's Brown Route makes several stops in Norwich village, in downtown Hanover and around the Dartmouth campus, with service approximately twice an hour between 6:30 a.m. and 5:30 p.m. on weekdays. During peak commuting hours, the Brown Route includes a stop at Norwich's new park-and-ride lot, north of the village at Huntley Meadow. From Hanover, connections to other Advance Transit routes can take passengers to destinations around the region, including connections on Stagecoach to points north and northwest including Bradford and Randolph and connections on Connecticut River Transit to points south as far as Brattleboro. Norwich's riders are mostly commuters going to Dartmouth College or the Dartmouth-Hitchcock Medical Center, where they do not need personal vehicles during the day and parking is limited.

Bus ridership has been growing in Norwich for many years. The decision to make Advance Transit service free for riders spurred transit use. In 2016 11,354 passengers boarded Advance Transit buses in Norwich. This compared to 2,168 in 1992.
The most efficient form of public transit in the community should be the school bus system, with groups of passengers (students) going to the same destination at the same time. Still, many parents choose to drive their children to and from school, contributing to traffic congestion in the village and on Route 10A to Hanover at the beginning and end of the school day.

A van operated by the White River Council on Aging provides transportation for seniors to the Bugbee Senior Center in White River Junction, medical appointments and shopping trips. Although donations are accepted, this service is largely supported by local and federal funding.
Directing future development in Norwich into the village center or other areas to be designated for future growth
would facilitate the future expansion of public transportation by creating population centers within walking or bicycling distance to pick-up points.

Park-and-Ride Lots. Siting park-and-ride lots to intercept commuter traffic at key points would support the use of public transportation and car-pooling. These lots may be serviced by regular bus service or shuttles from specific employers. Public lots available to anyone on land owned or leased by the town or state may be eligible for state or federal funding. The use of private lots sponsored by major employers or institutions and located on private land may be limited to those affiliated with the owner. Either type will promote use of public transportation and carpooling, thereby alleviating traffic into Hanover and reducing the use of carbon fuels. Norwich built its first park-and-ride in 2009 at Huntley Meadow off Turnpike Road with 20 parking spaces served by Advance Transit.

Air Travel

There is no air travel facility located in Norwich. Lebanon Regional Airport is the closest airport that offers limited passenger and freight services. National and international flights are available from airports in Burlington; Hartford, Connecticut; Boston, Massachusetts; and Manchester, New Hampshire. Bus service is available to the Burlington, Manchester and Boston airports.

Regional Transportation Planning Issues

Regional transportation planning in Vermont is now increasingly the responsibility of the Regional Planning Commissions rather than state highway engineers in Montpelier. The Two Rivers-Ottauquechee Regional Commission (TRORC) has a Transportation Advisory Committee (TAC) with representatives from its member towns. The TAC creates a Regional Transportation Plan that is coordinated with land use planning and is responsive to local needs and concerns. The Vermont Agency of Transportation will use the Regional Transportation Plan for determining which projects they will fund and the priority of these projects.

In addition to TRORC, Vital Communities, a regional nonprofit organization based in White River Junction, hosts the Upper Valley Transportation Management Association (UVTMA), which is sponsored by the Upper Valley towns, major Upper Valley employers and both regional planning commissions. The mission of the UVTMA is to provide leadership and education to promote planning, development, and implementation of transportation initiatives to mitigate traffic congestion and reduce reliance on single-occupant vehicle commuting. The UVTMA provides information about alternative transportation, researches transportation issues, and works with towns and businesses on transportation issues and solutions.

Of regional concern to Norwich is traffic generated in other towns that flows onto Norwich roads and particularly through Norwich village. Over time, growth in Sharon, Strafford or Thetford could seriously affect traffic in Norwich village and on Route 132.

Pedestrian and Bicycle Paths

Safe and convenient pedestrian and bicycle paths connecting Norwich village, Hanover, playing fields and recreation areas, and outlying population centers would provide for alternative modes of transportation. Although portions of the village have sidewalks and there are some existing trails and Class 4 roadways, generally pedestrians and bicyclists share the roads with cars. U.S. Route 5 North has become a major regional bicycle route. Ideally, bicycle lanes should be available along roads for experienced and faster riders, and on separate paths for inexperienced or casual riders and pedestrians.

The Trails and Transportation Committee has been identifying potential bicycle paths and trails, and sources of funding. It has also been working with groups from other towns within the region to coordinate a network of regional trails and bicycle paths. A path connecting Huntley Meadow with the Village Green has been a high priority. An Upper Valley Loop Trail connecting Norwich, Hanover, Lebanon and Hartford is a long-term project supported by the towns and the Upper Valley Trails Alliance. A connection from Dothan Brook School in Hartford to Route 10A in Norwich is a significant gap that needs to be planned and completed.

Norwich Corridor Project

The Norwich Corridor Project was conceived and planned in 1999-2000 as a major enhancement of the roadway connecting the newly rebuilt Ledyard Bridge through the village to Turnpike Road. The master plan reflects the desire of the community to redesign this corridor from its current form, a typical 1960s interstate highway access road, to a form more appropriate to its role as a connection between two New England villages by slowing traffic, providing pedestrian and bicycle lanes, and planting street trees and other landscaping. The implementation of this plan has moved slowly over the years, with limited portions incorporated in a 2009 state paving project. Despite the setbacks, the town should retain the vision of this plan for future improvements in the corridor.

Development Review

All new development in Norwich should recognize and accommodate the transportation issues identified in this plan. Access to all modes of transportation should be considered in the adoption of new regulations and the review of specific proposals. Using the UVTMA Mobility Checklist will identify many of the features of walkable, smart growth communities that are pedestrian, bicycle, healthy-lifestyle and energy-conservation friendly.

Goals, Objectives and Actions

Goal G **Plan, maintain and provide for safe, efficient, sustainable, and multi-modal transportation facilities that serve existing and planned land uses throughout the town and region and are consistent with the character of Norwich and the region.**

Provide and maintain an efficient and safe network of roads, sidewalks, bikeways and trails that incorporate rural aesthetics and encourage alternative modes of travel.		

Action G.1.a Maintain an up-to-date bridge and culvert inventory and use that inventory to prioritize and schedule replacements and repairs to those structures.

Encourage new development to locate where there is existing transportation capacity and to meet all the objectives of this section.		

Create a long-range plan for creation and maintenance of sidewalks, bikeways, trails and park-and-ride lots to be updated on a regular schedule.		

Action G.3.a Proposed major changes in land use, either new development or changes in zoning districts, should be evaluated based on the available or planned capacity of transportation facilities serving the area.

Action G.3.b For long-range planning for maintenance and capital improvements of roads and bridges, use available and appropriate tools. Plans should be reviewed by the Planning Commission, Conservation Commission and Transportation Committee to ensure coordination with land use planning and resource protection.

Plan for and develop long-term solutions to traffic congestion, particularly alternatives to widening roads or installing traffic signals.		

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Action G.4.b Facilitate alternative modes of transportation, such as sidewalks, bikeways, park-and-ride lots, carpooling and public transit.

Action G.4.c Consider how best to promote multi-modal transportation uses when making changes in land use.

Consider the aesthetic enjoyment of traveling on the road and effects on wildlife habitat, in addition to safety and cost, in decisions regarding changes within the road right-of-way.		

Action G.5.a Adopt policies and guidelines to be followed when upgrading town roads, taking into consideration cost, safety, aesthetic enjoyment of traveling on the road, provisions for bike and pedestrian traffic, and other concerns of residents served by the roads.

Action G.5.b Research potential new design concepts that maintain the characteristics of a small NE village while enhancing the safety of users. .

Action G.5.c Consider effects on wildlife habitat and travel corridors when making changes within road rights-of-way.

Promote creation of an interconnected system of trails, paths, bikeways, and sidewalks to meet the recreation, health, and transportation needs of Norwich residents.		

Action G.6.a Create and maintain a master plan for future trails, paths, sidewalks, and bikeways. Use the master plan as a basis for pursuing grants and other funding for design, right-of-way acquisition, and construction of planned improvements.

Action G.6.b Build pedestrian and bicycle paths connecting village centers, recreation areas, town facilities, and paths to other towns to promote health, safety, and alternative modes of transportation in Norwich.

Action G.6.c Incorporate the needs of cyclists and pedestrians into all transportation facility planning and review of future development

Action G.6.d Accommodate bicycle and pedestrian safety when rebuilding and upgrading roads and bridges.

Continue to provide additional protection for the exceptional scenic, historical, and cultural qualities of Norwich's designated scenic roads under the Norwich Scenic Road Ordinance.		

Action G.7.a Review and update the current Norwich Scenic Road Ordinance based on its past effectiveness and current concerns.

Consider the potential value of Class 4 roads, legal trails or ancient roads for recreational trails or for future roads before any reclassification or change in these roads or discontinuance of public rights-of-way.		

Action G.8.a Consider the following prior to re-classifying or discontinuing any Class 4 road:

1. Recreational use, connections to other trails, access to public land
2. Suitability to upgrade to future Class 3 road based on topography, geology, and environmental impact
3. Potential for providing access to areas suitable for future development based on land use objectives of town plan
4. Potential for providing future link between existing Class 3 roads and, if so, benefit to vehicular transportation network and emergency response
5. Liability to town in current condition
6. Effect of change of classification on abutting landowners' use of their property
7. Historical significance of thoroughfare

Action G.8.b Consider the following prior to discontinuing any legal trail or ancient road:

1. Recreational use, connections to other trails, access to public land
2. Suitability to improve the right-of-way for vehicular travel or recreational use based on topography, geology, and environmental impact
3. Potential for providing access to areas suitable for future development based on land use objectives of town plan
4. Potential for providing future link between existing town roads and, if so, benefit to vehicular transportation network and emergency response
5. Liability to town in current condition
6. Effect of change of classification on abutting landowners' use of their property
7. Historical significance of thoroughfare

Ensure that all private roads meet basic standards appropriate for Norwich's climate, terrain and rural character in order to protect public safety, infrastructure, and the environment, and promote multiple modes of travel.		

Action G.9.a Regulate intersections with private roads and town roads by providing standards for sight distance, intersection angle, percent of grade at intersection, and any other criteria to promote safety and prevent damage to town roads.

Action G.9.b Encourage the use of shared driveways to reduce the number of private roads intersecting the town roads.

Action G.9.c Continue to regulate the design and construction of private roads serving two or more houses, and private driveways for single-family residences, to facilitate access by emergency and service vehicles, protect public safety and limit environmental impacts.

Action G.9.d Where possible, design private roads to follow existing tree lines, stone walls, ridgelines, or other topographical features and to protect rural character to the greatest extent possible.

Action G.9.e Create guidelines for the design and construction of private roads and driveways to have minimum impact on significant natural resources and scenic views.

Action G.9.f Continue to regulate the design and construction of private roads and driveways to ensure that appropriate storm water management techniques and infrastructure are used to minimize run-off, sedimentation and flooding of downslope infrastructure, property and waterways.

Balance the decision to retain the town‘s ancient road rights-of-way for the benefit of town residents..		

Increase awareness and use of existing public transportation to reduce future traffic congestion in the town and region, environmental impact, and wear-and-tear on roads.		

Action G.11.a Promote use of public transportation by providing park-and-ride lots, bike racks at bus stops, bike racks on buses, small bus stop shelters, and similar improvements to make public transit more convenient.

Action G.11.b Revise land use regulations to allow both public and private park-and-ride facilities in key locations to allow commuter traffic to transfer from single-occupant vehicles to public or private busses or carpools.

Action G.11.c Facilitate carpooling through use of ride-share physical or electronic bulletin boards.

Encourage more students to use the school bus system to alleviate traffic congestion in the village.		

Action G.12.a Create programs to educate parents and students of the advantages of using the school bus system.

Action G.12.b Design or plan any improvements to the school’s traffic circulation pattern, access drive or parking area primarily to accommodate safe bus transportation, walking and cycling, and to discourage parents from driving to the school to drop off and pick up students.

Coordinate transportation and land use planning with surrounding towns.		

Action G.13.a Meet with officials from surrounding towns to discuss planning objectives and specific proposals that impact both towns.

Incorporate the following UVTMA Checklist Goals into land use planning and development review where feasible.		

- Proximity to Services, Employment, and Transit.
    - The most effective way to reduce single-occupant vehicle (SOV) transportation is to locate housing near services and employment and on transit routes.
    - Pedestrian and Cyclist Orientation. These features encourage people to walk and cycle instead of getting into their automobiles. Routes for pedestrians and cyclists within the proposed development should be convenient, attractive and safe. The design also should provide for the easy use of strollers, scooters, roller blades, walkers and wheelchairs.
    - Density/Location. Concentrated development in appropriate places supports pedestrians, cyclists, and public transportation opportunities.
    - Mix of Uses. In appropriate places, transit stops should have a mix of residential, civic, and commercial land uses, as well as other land uses nearby. The mix should offer people opportunities to live and work close to transit, to obtain at least basic goods and services, and to use transit to travel to other places.
    - Parking. Parking should be minimized while encouraging active transportation alternatives to the SOV.

Participate actively in the regional transportation planning process to ensure that regional plans support the goals, objectives and policies of the Norwich Town Plan and that Norwich takes advantage of regional solutions to transportation issues affecting town residents.		

Action G.15.a Ensure regular representation to all regional transportation entities, such as UVTMA, Advance Transit, Upper Valley Trails Alliance, etc.

Action G.15.b Investigate the possibility of passenger train service.

Energy

We are in an era of significant change in the use of energy and the management of energy resources. Change based on new research and technology is so rapid that many of the concepts and programs addressed in this chapter may be obsolete within a few years, but the goal of moving to sustainable lifestyles by conserving resources and reducing greenhouse gases will remain.

This goal will be attained by reducing energy demand within our homes and businesses and in our transportation system and lifestyle choices and by converting to renewable non-fossil-fuel energy sources. The benefits of an effective energy policy are economic, environmental, and social.

Profile

History and Trends

Originally energy needs were met locally: forests for fuels, rivers and streams for mills, physical labor from man and beast for work and transportation, and perhaps some wind power. The widespread adoption of coal, and later oil and still later natural gas brought a switch to inexpensive fossil fuels for transportation, heat, and electric power, as well as a move away from local energy sources. Now, with 85 percent of the money spent by Vermonters on energy going out of state or country, most of the money spent on energy is exported from our local economy and does not return to create jobs or buy goods locally. In addition, foreign fuel sources are unstable, subject to huge price swings and supply shortages beyond our control and are a persistent driver of global conflict.

Two dramatic periods of energy price inflation, in the late 1970s and the early 2000s (in each period the price of oil increased more than 1000% in a short period) each drove major changes in building construction, transportation, and general energy efficiency. Recognition of the threat of climate change has further accelerated the move away from fossil fuels in the last 10 years and heightened interest in solar, wind and other renewable non-carbon energy resources. It is in our clear interest that this trend will continue.

Energy Use

The State of Vermont has set a goal of meeting 90% of its energy needs through efficiency and renewables by 2050. As of 2014, Norwich was meeting less than 20% of its annual energy needs through renewables as follows:

29% of the 174,000 MMBTUs used for heat. A well-insulated, 1,500 square foot home in Vermont uses about 75 MMBTUs per year for heat. There are approximately 1,640 homes in Norwich, most of which are larger than 1,500 square feet.

26% of the 57,000 MMBTUs used for electricity. The average household in Vermont uses about 7,200 kWh (24.6 MMBTUs) of electricity per year. There are approximately 1,350 households living in Norwich.

7% of the 211,000 MMBTUs used for transportation. The average personal vehicle in Vermont is driven 15,000 miles per year and gets 25 miles to the gallon, consuming 72 MMBTUs per year. Norwich residents have approximately 2,600 personal vehicles. *

* Source of Data- Vermont Community Energy Dashboard

Norwich is typical of Vermont communities relative to energy consumption. More than 75% of energy consumed in Vermont today is from fossil fuels, and it is used primarily for heating and transportation. Meeting the 90% goal by 2050 will require significant improvements in the energy efficiency of buildings and in the transportation sector. For example, there has been a significant increase in the amount of energy being generated from photovoltaic solar systems in Norwich. As of 2017, approximately 1,420,900 kWh/year is being generated by a total of 1093 kW in photovoltaic solar installations: 219 homes (both on-site and off-site installations), 1 business, and 1 church in Norwich. This represents 16.4% of the homes in Norwich.

Energy Resources

Wind Resources. Wind speeds in Norwich, even in the higher elevation areas on the western side of town, are relatively low, suggesting that wind energy at any meaningful scale is not feasible in Norwich.

Solar Resources. A combination of forest cover and topography significantly reduces the areas of town that are suitable for solar power generation. The suitable sites are primarily located in the eastern portion of town where the topography is less severe, there is more open land and there is access to existing infrastructure.

Siting Standards and Guidelines

The following sites have been reviewed by the Norwich Planning Commission as locations that should be given priority as renewable energy generation sites,

These parcels qualify as a Category II site for a solar array not larger than 150 kW AC:

Parcel 11-045-200, located at 673 Union Village Road

Parcel [12-001.300.b], located at [intersection of Farrell Farm Rd and Starlake Ln]

These parcels qualify as Category III sites for a solar array not larger than 500 kW AC:

Parcel 11-104-000, located at 635 US Route 5 North

Parcel 11-105-000, located on US Route 5 North

Future Energy

The town's energy future is inextricably linked with energy policies and economic forces at the state, federal, and international levels. We should not be content to cede energy policy to the state and federal government. The town is the unit of government closest to the citizens, and is therefore most accessible to the participation of every individual. Local energy is smart energy.

Implementation of this Town Plan can be the initial step in the development of a sustainable energy future. Our long-term vision is to become a model of sustainable energy practices by: reducing our energy use through utilization of energy-efficient end-systems; achieving the maximum development of local renewable resources that is economically feasible; and thoroughly evaluating and modifying, wherever feasible, our patterns of energy use, settlements, transportation, and industry to minimize environmental impacts and carbon emissions that contribute to the crisis of climate change. By implementing these goals, we expect to reap long-term economic, environmental, and quality-of-life benefits.

Since our air and water quality as well as the quality of life in Norwich are affected by our energy use, we must take responsibility for the environmental effects of our energy use, in consideration of generations yet to come. Therefore, the Town of Norwich resolves to take action that will create a sustainable energy future; one that minimizes environmental impact, supports our local economy, and emphasizes energy conservation, efficiency, and the increased use of local and regional clean renewable energy sources.

Energy Conservation

Energy-efficient buildings are a critical component of energy conservation. The town should continue to support state programs such as the Vermont Residential Building Energy Standards Certificate to encourage the energy-efficient construction of new buildings and create incentives to retrofit existing buildings to be more energy efficient. The town should continue to set an example by implementing energy conservation programs for all new and existing municipal buildings. Energy efficiency and the reduction of greenhouse gases shall be considered in the purchase of new vehicles and machinery.

In addition to energy-efficient buildings, the conservation of energy in Norwich should also include land use and transportation policies. Land use issues addressed in Chapter 12 and transportation issues addressed in Chapter 9 include the importance of sustainable development patterns that reduce the need for excessive use of private vehicles. Building more densely in areas near existing roads and public transportation can minimize the increased use of inefficient single-occupancy vehicles.

Goal H **Reduce overall energy consumption within the town through conservation and efficiency, thereby decreasing the adverse environmental and economic impacts associated with energy consumption, reducing dependence on imported energy, and lowering holistic energy costs.**

Model responsible energy use through municipal actions, decisions, purchases and projects.		

Action H.1.a Reduce energy consumption in all town buildings and operations.

Action H.1.b Investigate and consider energy conservation and efficiency measures for use in all town buildings and operations.

Action H.1.c Encourage the development and use of local low-pollution, low-carbon-emission renewable energy resources for all town buildings and operations.

Action H.1.d Encourage conversion of older wood stoves to new cleaner-burning EPA-certified wood stoves. Do not permit use of outdoor wood boilers unless they meet strict emission control standards.

Action H.1.e Investigate prospects for a district heating system in the town center, ideally a cogeneration system that would create electricity as well as space heat.

Action H.1.f Conduct complete energy audits of all town buildings to identify areas of energy waste and areas of potential savings, determine whether end-uses of energy are properly matched with the types of energy sources used, recommend cost-effective energy conservation and efficiency measures and modifications that will make use of renewable energy, prioritize these modifications and incorporate them into the Town's Capital Budget, and implement programs as prioritized by the previous steps.

Action H.1.g Construct all new municipal buildings according to standards of energy efficiency at least equivalent to Energy Rated Homes of Vermont 4-star level or other state energy code. Mandate that all new buildings that will involve heating and cooling consider the lowest carbon emission heating/cooling plant design - for example, cold-climate heat-pump technology.

Action H.1.h Develop and implement a program of upgrading to, and maintaining, energy-efficient and nonpolluting exterior lighting for both public and private facilities including streetlights. Exterior lighting should be controlled by timers and light sensors to reduce usage when not needed and only low-level security lighting should be on all night.

Action H.1.i Use life-cycle cost planning in evaluating all decisions concerning the purchase by the town of any equipment, vehicle, or other item requiring energy consumption. Use comprehensive pollution analysis in this decision-making process. Host a public discussion of the trade-offs between pollution, CO_2 emissions, and energy costs as identified by life-cycle cost analysis. The town should consider together its twin goals of pollution reduction and cost reduction.

Action H.1.j Engage in long-range planning for the use and acquisition of sustainable low-pollution energy. Include environmental and pollution risks and benefits in this planning process.

Action H.1.k Increase the energy efficiency of all town vehicles by the use of alternative fuels and hybrid-drive systems in town vehicles and other technological advances as they are developed. The ecological and social impacts of specific types of alternative fuels should be considered before their adoption for town vehicles. Analyze the routes and travel of all town vehicles in order to recommend changes that will reduce transportation costs.

Action H.1.l Manage town forest land, where possible, to provide high-value locally produced durable wood products, recreational uses, and wildlife habitat for the benefit of the town and its residents in a sustainable manner. Where sound forest management practices dictate, some wood may be harvested for use as fuel as a "transition" fuel source.

Action H.1.m Study the feasibility of converting municipal buildings and schools to the lowest possible carbon emission heating and cooling systems, including cold-climate-heat pumps.

Action H.1.n Consider conversion of legacy oil burners to bio-diesel "boost" heat sources for cold-climate heat pump systems.

Action H.1.o Consider systems that burn wood chips, wood pellets, grass pellets, and other fuel stocks whose combustion releases carbon only if non-combustion systems are deemed not feasible.

Require that cost-effective conservation, efficiency, renewable energy technologies and techniques be incorporated into all new publicly funded structures erected in the town.		

Encourage the use of energy-efficient materials, technologies and techniques in all new privately owned structures erected in the town.		

Action H.3.a Facilitate compliance with state mandated energy efficiency codes including the Vermont Residential Building Energy Standards Certificate through directing building permittees to free consultation with Efficiency Vermont.

Action H.3.b Create Incentives for meeting or exceeding state and federal or industry energy efficiency standards in the construction of all buildings.

Encourage and support land use policies that promote energy conservation, the development of local renewable energy sources, and reduced travel requirements to work, services, shopping, and recreation.		

Action H.4.a Adopt land use and zoning ordinances that encourage energy conservation and efficiency and the environmentally sound development of local renewable sources of energy.

Action H.4.b Encourage agricultural activities and seasonal farm stands so that local produce can be marketed locally.

Action H.4.c Allow appropriate home occupations in order to reduce commuter transportation.

Promote development of local clean, low-pollution (e.g. solar, hydro, wind) renewable resources as a replacement for imported nonrenewable resources and for combustion-based energy sources.		

Action H.5.a Identify and protect potential clean, low-pollution renewable energy resources such as hydro, solar, wind and cold-climate heat pumps.

Action H.5.b Encourage and support the development and use of clean, low-pollution, local renewable energy resources for the town's residential, commercial and industrial sectors.

Action H.5.c Encourage townspeople and developers to use clean, low-pollution local and/or renewable resources and technology on a sustainable basis.

Action H.5.d Promote environmentally sound development of the town's clean, low-pollution renewable energy resources.

Action H.5.e Encourage use of clean, low-pollution renewable energy sources instead of imported non-renewable energy supplies and combustion processes.

Action H.5.f Recommend construction design standards and siting requirements that encourage solar heating and lighting and cold-climate heat pumps or other low-carbon-emission technologies in all new buildings.

Ensure that energy supplies will be reliable, affordable, and environmentally sound.		

Action H.6.a Require that all wood-burning installations meet all applicable National Fire Protection Association (code # 211) safety requirements and Federal EPA emissions standards. Encourage a switch away from wood-burning to cold-climate heat pumps in areas zoned to allow denser development and areas subject to inversion conditions.

Action H.6.b Promote state and/or local tax abatement programs for improving the sustainable management of forests.

Action H.6.c Protect designated productive forest lands from development by working with land trusts and owners to acquire conservation easements to protect forest lands and/or by offering tax stabilization agreements to landowners who agree to manage their forests for wood products, recreational uses, and wildlife habitat in a sustainable manner.

Increase public awareness of energy issues and build public support for energy efficiency, pollution reduction, and sustainable energy policies.		

Action H.7.a Encourage and support public energy education and awareness programs that responsibly consider the environmental impacts of energy decisions.

Action H.7.b Provide resources for information on conservation and efficiency technologies including efficient transportation; local clean, low-CO_2 renewable resources; related town, state, and federal energy programs; and available funding and financing for these programs. These resources may be made available at the Norwich Public Library, town offices, and town web site.

Action H.7.c Provide information on local and regional funding for residential energy audits and cost-effective weatherization services for all existing homes, with special emphasis on low-income housing.

Action H.7.d Provide information to encourage the use of local wood products and resources.

Action H.7.e Promote a campaign to educate the community on solar technologies, such as passive solar heating and natural lighting, as well as other low-carbon-emission technologies such as cold-climate heat pumps.

Action H.7.f Promote community weatherization programs to increase the energy efficiency of existing homes using additional insulation and other cost effective sustainable techniques. Programs should provide information regarding any health risks of specific types of insulation and about the importance of maintaining adequate ventilation to allow adequate air exchange.

Action H.7.g Consider adopting local building codes to maintain energy efficiency, personal safety, and sustainability.

Action H.7.h Provide information to residents about existing and potential solar, wind and hydro-powered generating sites, procedures for developing solar, wind power and hydroelectric power, and available solar, wind and hydro-powered generating systems. Provide information on net-metering opportunities.

Action H.7.i Encourage state legislators and regulators to support distributed power generation opportunities such as net metering below zero, allowing residential hydro, solar, and wind systems to be net sellers of power to the grid.

Coordinate land-use and transportation planning that promotes energy-efficient transportation.		

Action H.8.a Promote cost-effective energy efficiency in future transportation planning.

Action H.8.b Promote and implement strategies to encourage ride-sharing, public transit, bicycling, and walking.

Action H.8.c Encourage the use of existing public transportation and school bus routes, state car-pooling and van-pooling programs, and other transportation alternatives.

Action H.8.d Promote the development and use of a system of trails, greenways, sidewalks, bicycle paths, and commuter parking lots as safe and viable transportation components.

Action H.8.e Encourage the installation of bicycle parking racks at major activity areas such as schools, recreation facilities, shopping centers, major places of employment, and mass transportation facilities.

Action H.8.f Encourage the installation of electric-vehicle charging stations.

Action H.8.g Provide shelters, where needed, for pedestrians and bicyclists at bus stops and ride-share pickup locations.

Action H.8.h Include bicycle paths as a component of the town's Capital Improvement Program and pursue federal and state funding for their construction.

Action H.8.i Include bicycle paths, pedestrian walkways, and mass transportation access in review of all proposals for development.

Action H.8.j Consider whether to adopt zoning regulations that support compact development and reduce transportation needs.

Action H.8.k Consider transportation efficiency issues and bicycle use when making road expansion decisions.

Encourage and support the retrofitting of older buildings as a more energy-efficient and sustainable practice than demolition and rebuilding.		

Action H.9.a Consider the total cost of energy use and sustainability when determining whether to retrofit an older building or demolish it and re-build. Energy costs may include demolition, disposing of used materials, manufacturing and transporting new materials, and construction. The embodied energy costs - energy used to create the materials and construct the original building - may also be considered and include the energy used to create the materials and construct the original building.

Action H.9.b Provide information to owners of older and historic buildings about the many tax credits, grants, and low interest loans created to support both historic preservation and energy efficiency.

Natural and Historic Resources

Norwich's citizens value the town's natural resources and are concerned with their protection. This has been shown by the responses to several town-wide surveys and questionnaires conducted by the Planning and Conservation Commissions over the past decade. The Capital Land Fund, in existence for more than two decades, is evidence of community support through annual dedications of public funds for conservation and resource protection.

Norwich's natural resources are valued for contributing to its citizens' well-being and the town's rural character. This chapter will explore the past and present state of Norwich's natural, scenic and historic resources and suggest how those resources should be treated in the future.

A Changing Landscape

The colonists who first moved into the forested lands of the Norwich Town Grant did so with the intention of making use of the area's natural resources. They settled along the river plain and above the fall-lines of the brooks, where there was good soil. At first, they avoided the ancient bed of glacial Lake Hitchcock, where they found soggy clays and wetlands, and where the streams were clogged with flood debris.

As more immigrants arrived, they cleared and settled the land between the banks and deltas by the lake created over several thousand years while the continental ice sheet was retreating. Early settlers quickly deforested much of the arable land using a slash-and-burn technique to create farm fields and pastures. This rapid change in the landscape had many impacts on the town's natural systems – loss of species as habitat disappeared, alteration of soils, extensive erosion from deforested uplands that deposited silt and modified streams, damming and diversion of streams for waterpower and irrigation. As the town developed, residents began extracting the glacial deposits of sand and gravel for construction and road building, a practice that continues today.
Once the broader expanses of level land were settled, homesteaders worked their way along the main brook valleys, which provided natural corridors where roads could be more easily built. The landscape of the early 19th century was one characterized by significantly more open land than exists two centuries later. Hillside farms, always marginal, were abandoned after several generations struggled to subsist on their poor lands; the fields and pastures reverted to their natural forested state. Evidence of these farmsteads can still be found – segments of stone walls, depressions created by old cellar holes, remnants of stone foundations or chimneys – in what looks like undisturbed forest today.

The town's higher ridges and peaks remained largely undeveloped, although all but the least accessible lands have been logged at some point during the last 250 years. Today most of the steep hills and ridges are covered in forest, creating scenic vistas from both the valleys and the peaks. Norwich's topography affords many opportunities for scenic views from the roads that travel along valleys and up into the hills. These vistas are major contributors to the rural character enjoyed by Norwich's residents.

Over the last 50 years, Norwich's landscape has again undergone change. Residential development expanded out from the river valley up into the hills. Modern technology and infrastructure have allowed us to live in places previously too inaccessible or difficult to build on. While many of the homes located in the town's uplands are barely visible as one travels the wooded back roads, each new house affects the natural systems around it to some degree. The impact of those many small changes can have significant cumulative effects – fragmenting wildlife habitat, altering surface drainage patterns, generating pollution. While we generally recognize the importance of the town's natural systems and their functions today, we continue to change the landscape around us and utilize its resources as suits our purposes.

Air and Climate

Air Quality

Like most of Vermont, Norwich enjoys excellent air quality. Given the absence of large-scale industry or major urban centers in the region, local air quality concerns are limited mainly to vehicle emissions, especially from idling vehicles, heating systems, and dust generated by construction and excavation sites. The cumulative effect of these local sources of air pollution would increase with additional growth, absent deliberative mitigating policies, and may have a greater impact on air quality in the future.
Of more immediate concern are impacts on air quality resulting from pollution generated far from Vermont. Most notably, the coal-burning power plants of the Midwest have been cited as the main cause of acid rain and other airborne pollutants, which are detrimental to the health of forests and pond ecosystems throughout the Northeast. Clean air is a basic resource that can no longer be taken for granted even in rural communities like Norwich.

Climate

Climate represents the average weather conditions characteristic of an area over time. Weather patterns are an important consideration for planning and design because of their effect on such things as soil erosion, plant growth, storm water runoff and flooding, groundwater supplies, road maintenance, energy demand and alternative energy supplies. Weather patterns, especially wind, also influence air quality.

Norwich experiences average high temperatures in the low 80s during the summer and average lows in the single digits above zero during the winter. However, short periods of highs above 90°F and lows below 0°F occur most years. Two to three inches of precipitation can be expected most months, as shown in Figure 11-1.

The effects of climate change are already evident in Norwich, including more intense storms linked to rising average temperatures. Over the next 50 years, climate change models have projected that the average temperatures in the region will increase by five to nine degrees Fahrenheit. Such an increase would reduce the number of months with average low temperatures below freezing from the current six, to four, and increase the number of months with average highs above 80°F from two to three or four.

While some human residents may not miss the extra months of winter weather, the plants and animals around us will. Climate change will alter the town's natural environment by changing the plant species that can thrive in Norwich, the migrating patterns of waterfowl and songbirds, the temperature of rivers and ponds, and countless other changes throughout parts of the interconnected web of life. The climate and natural environment will become more like that of the mid-Atlantic region. The impact on recreation and tourism will also be significant, with fewer good days for alpine and cross-country skiing, outdoor ice skating and snow-shoeing resulting and a potentially longer mud season.

Terrain, Geology and Soils

Topography

Elevation. The elevation in Norwich ranges from 400 feet above mean sea level along the banks of the Connecticut River to 1,850 feet atop Gile Mountain. The dramatic rise from the valley floor to the upland ridges and hilltops creates the varied terrain that is an important component of the town's character. Norwich's landform is often described as a hand, with the palm being the relatively level lands of the river valley and the fingers being the narrow stream valleys that extend up into the hills. There are a number of named mountains and hills as shown on Map 5.

Slope. Steep slopes characterize significant portions of Norwich, as shown on Map 6. Slope is one of the primary characteristics of land that influences the uses it can support. While the map shows general areas of moderately and severely steep slopes, site assessments may be needed to accurately delineate steep slopes and determine the management requirements for specific properties.

Percent of slope is one way to describe the steepness of land and measure change in elevation over a given distance. A one percent slope equals a one-foot change in elevation over a 100-foot distance. The Natural Resources Conservation Service (NRCS) recommends careful management to limit site disturbance on slopes in excess of 15 percent and suggests avoiding all construction activities on slopes in excess of 25 percent to prevent soil erosion, increased runoff, downstream flooding and other hazards.

On steep slopes, soils are typically shallower, the volume and velocity of surface water runoff is increased and the erosion potential is greater than on level ground. Maintaining or restoring forest cover is the optimal solution for controlling erosion and slowing runoff from steep slopes. The tree canopy helps to dissipate the energy forces of a strong rainfall, while tree roots hold soil in place. Dropped leaves and forest litter help to prevent soil compaction, fertilize the soil, retain moisture, allow water to infiltrate the soil and recharge groundwater supplies.

Ridgelines. As described above, the town's topography includes a number of prominent hills and ridgelines, which are characterized by their elevation and steep slopes. In addition to physical limitations and impacts on natural resources, development on steep slopes and prominent ridgelines can adversely affect scenic character. Development on hillsides, summits and ridgelines, especially at higher elevations, is often highly visible from numerous vantage points. Such development also contrasts dramatically with the natural backdrop of unbroken forest.

Bedrock Geology

The Connecticut Valley marks an important geologic boundary as well as the political boundary between Vermont and New Hampshire. The Ammonoosuc fault line lies just east of Interstate 91 along the river. Road cuts along the interstate reveal the geologic history of the valley, which included periods of sedimentary rock formation when all of New England was under the Atlantic Ocean and volcanic activity that metamorphosed older rocks.

The valley also contains a wealth of depositional and erosional features related to the more recent glaciation during the last ice age. Most of what we now call the Connecticut Valley existed before that last period of glaciation. Ice pushed into the valley from the north, gouging it deeper and wider. When the glacier began to melt, the valley was flooded, forming an immense body of water referred to as Lake Hitchcock. At one time Lake Hitchcock and Lake Vermont (the glacial-era Lake Champlain) were only separated by a few miles. Large amounts of sediment were released from the melting ice and were deposited on the lake bed. As the floodwaters receded, the river cut a channel through the former lake bed and its deposited sediments.

Soils

The physical and chemical components of soil vary greatly in Norwich and influence the suitability of land for various land uses, such as agriculture and development. The town's soils developed as geologic forces shaped the landscape and underlying bedrock and topography, climate and ecological factors influences their characteristics. The Natural Resource Conservation Service has inventoried, assessed and mapped Norwich's soils, most recently updating its survey data in 1992. In 1994, the maps were converted into digital format and are a layer of the Norwich Geographic Information System (GIS). While the maps provide an excellent basis for town-level planning, site assessments may be needed to accurately determine the types, characteristics and extents of soils on any given property.

Shallow Soils. Soils on ridgelines and hillsides in Norwich are thin (less than two feet to bedrock). Shallow soils increase the difficulty and expense of constructing adequate septic systems. In addition, soils overlaying steep slopes are highly erodible and, like shallow soils, pose similar constraints to septic system installation and proper operation.

Hydric Soils. There is only a small amount of land in Norwich characterized by hydric soils. These soils generally occur in conjunction with streams and indicate that wetlands may be present, including unmapped Class III wetlands.

Sand and Gravel Resources. Norwich has small deposits of sand and significant deposits of gravel. There are several active extraction operations in town and a number of sites that have been previously mined for sand or gravel. The ability to acquire sand and gravel locally significantly reduces the cost of road maintenance within the town. With proper erosion control and reclamation techniques, their extraction can have minimal impact on the environment and the land can be returned to other productive uses. Sand and gravel deposits are a valuable, non-renewable resource for construction, which becomes unavailable for future use if built upon. Further, the sand and gravel deposits near the Connecticut River, and elsewhere, are highly porous and readily transmit septic effluent to the groundwater, making them still less suitable for building.

Agricultural Soils. On a nationwide basis, certain soils are designated as prime for agriculture because of their chemical properties and drainage characteristics. As shown on Map 9, Norwich has prime soils within the floodplain of the Connecticut River and Ompompanoosuc River, and on the terraces of the ancient Lake Hitchcock.

Many of the same characteristics that make these soils excellent for farming also make them a prime location for development, as evidenced by the fact the Norwich Village is largely located on agricultural soils. A large percentage of Norwich's agricultural soils are located on parcels of land less than 25 acres in size, which limits their productive use. Some of these soils remain undeveloped and, though not sufficient for large-scale agricultural practices, have potential to be used for vegetable and specialty crops for local and northeastern markets. The ability to grow food locally is one of the components of Norwich's rural character valued by residents.

Forestry Soils. The Natural Resource Conservation Service also has identified the best soils to support commercial forestry, including many upland soils that are too shallow, rocky or steep to support other types of development. As a result, primary forestry soils are generally less threatened by development, but are more sensitive to site disturbance and erosion. To help prevent soil erosion, the state has adopted acceptable management practices to prevent soil erosion and maintain water quality on logging jobs.

Septic Suitability. With no municipal wastewater infrastructure, all of Norwich's homes and businesses rely on soil-based septic systems to treat their sewage. While the town can no longer regulate wastewater systems, as that authority was assumed in its entirety by the state in 2007, the capability of the town's soils to adequately treat waste remains an important planning issue.

Norwich has large areas characterized by soils that are not well-suited for conventional septic systems. The shallow depth of many of the town's soils noted above is a limiting factor, which often requires the installation of more expensive alternatives such as mound systems, and is one of the factors driving the high cost of new home construction in Norwich. It should not be assumed, however, that the current assessment of the ability of Norwich's soils to adequately treat septic waste will on its own serve to limit development in particular parts of town or control the town's growth rate over time. Wastewater technology continues to evolve and soil conditions are likely to become a less critical factor in septic system design in the decades ahead. New state standards adopted in 2002 reduced the required isolation distances to bedrock and groundwater and allowed for alternatives to conventional systems.

Water Resources

Groundwater

Groundwater is the least understood and documented of all our natural resources, yet it is essential to the preservation of life and to economic stability. The entire population of Norwich relies on groundwater for domestic uses. It is tapped from underground springs or fractures in rock, or mined from underground storage areas called aquifers.

Aquifers are subsurface deposits of coarse sand and gravel that, because of the depth of the material and large pore sizes between sand grains and cobbles, hold vast quantities of groundwater. The coarse texture in an aquifer also allows rapid and untreatable diffusion of pollutants. The two types of aquifers are gravel and bedrock. Both can be unconfined or confined (not susceptible to surface water) and both can be vast or limited in quantity and time of recharge. Septic tank effluent, leaking underground fuel storage tanks, landfill leachate, agricultural runoff, or improperly stored hazardous wastes are potential sources of groundwater pollution. The recharge water's passage through vegetation and soil must filter out such toxins; otherwise, the pollution is virtually impossible to remove from the aquifer and its use as a potable water supply would likely need to be discontinued or a water treatment plant would be required. Preventing pollution spills or leaks, creating or

maintaining vegetated buffers, following accepted manure management practices, and establishing setbacks within recharge areas are effective methods of protecting drinking water supplies stored in aquifers.

Norwich Village Water Supply. Since the 1980s, Norwich Fire District village's water supply has been an aquifer three miles north along the Connecticut River. It lies in an esker, a thick ribbon of sand and gravel left by a river that ran under the great ice sheet while it was retreating northward. The modern river cut through it, probably when ancient Lake Hitchcock was emptying, so that only its northern part is in Vermont; its southern part extends down through Hanover from the level of the Cold Regions Research and Engineering Laboratory (CRREL). The Fire District owns 27 acres of land at the south end of the Vermont part of the esker to ensure access to it.

The town has incorporated an approximately 69-acre Primary Aquifer Protection Area into its zoning regulations that includes the Fire District's holdings and some of the gravel mine to the north. A Secondary Aquifer Protection Area includes the entire watershed (approximately 2,315 acres) of the stream that flows near the Primary Aquifer Protection Area. The current boundaries of the Primary Aquifer Protection District are based on hydrological studies conducted in 1990. The water quality of the well is affected by the water quality of the Connecticut River and therefore the actual area that needs to be monitored could be extensive. The Connecticut River, the railroad, Route 5 and Interstate 91 all pass near the esker. A major toxic spill on any of these might contaminate the village's drinking water supply.

Given that a portion of the aquifer re-charge comes from the Connecticut River, which is controlled by the State of New Hampshire, continuing cooperation between the two states is important for safeguarding this resource. An interstate aquifer protection district has been proposed, but not yet implemented.

In summary, there is an ongoing critical need to protect the aquifer that supplies Norwich village and other sources of drinking water, and to identify major sources for future needs. Only with planning, education, and action can Norwich assure its citizens that their water and health will be safeguarded from harmful micro-organisms and toxic chemicals. Protecting groundwater deserves the highest priority in formulating plans for the future of Norwich.

Surface Water

Connecticut River. Norwich is located along the Connecticut River, which forms the town's 7.8-mile eastern border. The Connecticut River is probably Norwich's most valued natural, recreational and scenic resource, and has been recognized as a national treasure through its designation as an American Heritage River in 1998. The Connecticut River travels 410 miles from its source in a small lake near the Canadian border to flow into the Atlantic Ocean at Long Island Sound.

The river gathers the flow of 24 major tributaries and thousands of small streams that originate in the mountainous uplands of Vermont and New Hampshire. Its watershed encompasses 41 percent of Vermont's land mass and one-third of New Hampshire's. Between the two states, 52 communities, in addition to Norwich, have a boundary defined by the river. The river can be seen as a living thread that has tied, and continues to tie, the people along its entire length together in one long valley community.

Recent decades have seen the river's resurgence as an important natural and recreational resource. First for Native Americans, then for early European settlers, the Connecticut River was an important corridor for travel and commerce. By the 20th century, the historic practice of dumping waste directly into the nearest stream or river so unwanted pollution would wash away with the flowing waters resulted in major rivers like the Connecticut becoming virtual cesspools whose downstream waters could barely support life.

In recent decades, the river's water quality has markedly improved as upstream communities have installed wastewater treatment plants, and direct discharges of untreated effluent into surface waters have been outlawed. Work remains to be done to clean the river, and prevent pollution from entering its waters. Attention is now being paid to non-point sources of pollution, especially storm water runoff from developed property and nutrient-loading from agricultural lands.

Currently, the Connecticut River as it flows past Norwich is considered Class B according to state and federal water quality standards. Class B waters are managed for aesthetic values, recreation on and in the water, public water supply with disinfection and filtration, high quality habitat for aquatic plants and animals, irrigation and other agricultural uses.

The entire Town of Norwich is located in the Connecticut River watershed, which means that all runoff and surface waters drain to the river. The town is divided into several sub-basins as shown on Map 7. Most of town drains directly to the Connecticut River via Blood Brook and its tributaries or several other small streams that flow directly to the Connecticut. An area in the northeastern portion of town drains to the Ompompanoosuc River, while areas to the west drain to the White River; both rivers are tributaries of the Connecticut.

The Connecticut River Joint Commission includes New Hampshire's Connecticut River Valley Resource Commission, created by the legislature in 1987, and Vermont's Connecticut River Watershed Advisory Commission, similarly created in 1988. These commissions are charged with cooperating in order to preserve and protect the resources of the Connecticut River Valley, and to guide its growth and development. The commissions are advisory and have no regulatory powers, preferring instead to advocate and ensure public involvement in decisions that affect the river and its valley. The Upper Valley River Subcommittee addresses local issues and concerns.

Ompompanoosuc River. The Ompompanoosuc River flows into the Connecticut River in the northeastern corner of town. Only the final three miles of the river's total 25-mile length are in Norwich. The river is impounded by the Union Village Dam, which was completed in 1950 as part of a U.S. Army Corps of Engineers project for flood control. Segments of the Ompompanoosuc River upstream of Norwich are on the state's list of impaired waters. The Elizabeth Mine, an abandoned copper mine in South Strafford approximately seven miles upstream from the Union Village Dam, is leaching highly acidic runoff into the West Branch of the Ompompanoosuc River from a 40-acre tailings pile. The site has been listed as a federal Superfund site and awaits funding for cleanup. The region has a history of copper mining, and several other sites are also likely leaching metallic compounds into the river.

Public Access. Today Norwich's rivers and streams are used extensively by residents and visitors for boating, swimming and fishing. No longer corridors for commerce and industry, waterways are being rediscovered as recreational, scenic and natural resources. The railroad line from White River Junction to Wells River, built in the mid-1880s, limits access to the Connecticut River, yet has also protected the shoreline.

There are only two public water access points in Norwich: a small site north of the Ledyard Bridge on River Road owned by the town, and another belonging to the Vermont Department of Fish and Wildlife on the Ompompanoosuc. A state-owned primitive canoe campsite, accessible from the river, provides for low-impact recreation. A spot for public swimming on the Ompompanoosuc River or Connecticut River does not exist in Norwich, though potential sites exist. Currently, there are no incentives to landowners to create greenways along the rivers.

The Montshire Museum of Science owns more than 2,000 feet of Connecticut River shoreline property, including land on both sides of the railroad right-of-way. The Montshire's property includes an inlet, the lagoon, where Blood Brook enters the Connecticut – a favorite spot for shoreline birds and other animals, as well as recreational boaters. The Montshire's web of trails includes one along part of the shoreline. Its private canoe access in the lagoon and its shoreline trail are open to visitors of the museum.

Small Streams. In addition to the two main rivers, there are a number of smaller streams and brooks in Norwich, as shown on Map 7. The largest of these is Blood Brook, which arises on the slopes of Gile Mountain in the northernmost corner of the town and empties into the Connecticut River near the southernmost corner, running almost the entire diagonal length of the town. Its two largest tributaries are the Charles Brown Brook from the northwest and the New Boston Brook from the north-northeast. A smaller branch, Bragg Brook, joins

near the south end of town. Dothan, Podunk, Tigertown and Mitchell brooks flow southward toward the White River. Avery Brook flows into the Ompompanoosuc River from northeast Norwich through Thetford.
All of these brooks have beautiful, clear tumbling water and are recreational resources, to walk alongside or fish. They support wildlife and provide natural corridors that facilitate travel for many species. They also contribute to the recharge of groundwater supplies, but they are not regularly tested. The quality of water in the town's brooks and streams needs to remain high to support these uses.

Lakes and Ponds. Norwich has one large kettle-hole pond, Star Lake, within its boundary. A portion of the constructed Norford Lake crosses Norwich's boundary from Thetford. There are a number of small ponds supported and controlled by beavers, two of which are ponds at the headwaters of Avery Brook and Mitchell Brook. Other small ponds are associated with larger wetland complexes and many are a result of beaver activity along the town's many brooks.
While beavers sometimes cause flooding that can damage the built environment and working timber stands, overall they are generally beneficial to the natural environment. The consequences of beaver dams are very important for stream ecosystems and the terrestrial environments that surround them. New plant clusters develop on the flooded shorelines and the process of restoring natural rich vegetation that can support a diverse mix of species develops within the transition zones (or ecotones) that form along the edges of the newly-created beaver ponds. Shallow, warmer water creates the conditions needed for the creation of wetland vegetation and a swampy transition zone forms between the water and the land.

Beaver ponds can help improve water quality and reduce downstream sedimentation. The fine sediments and organic substances that fall on the bottom create a perfect substratum for the development of aquatic vegetation. Thanks to the development of vegetation, the streambed is stabilized and the newly-created complex not only catches the sediments, but also acts like a filter and a container of sediments flowing in from the surrounding ecosystems. Due to the accumulation of organic substances, water micro-organisms flourish and aid in the decomposition of pollutants. Beaver ponds also increase the storage capacity within a drainage basin, reducing flooding during spring snow melt and storm events. Water flow is slowed, reducing the potential for erosion and downstream sedimentation.

Riparian Buffers. The maintenance and enhancement of shoreline vegetation is the simplest and most effective means of protecting the many benefits and values associated with surface waters. Maintaining or planting naturally growing woody vegetation alongside surface waters is essential to the health of streams and lakes. Appropriate buffer width is related to stream bank slope and the purpose of the buffer. A 25- to 50-foot buffer may increase stream bank stability and remove sediment on level land and moderate slopes. Greater width would be needed on steeper slopes or where sediment loads are particularly high. In addition to filtering pollutants, a 100-foot buffer will provide food, cover and breeding habitat for many kinds of wildlife. Buffers of several hundred feet are necessary to provide habitat and corridors for some species.
Appropriately, vegetated shorelines contribute to maintenance of water quality and shoreline protection in the following ways:

- Provide bank support and stabilization;
- Help prevent bank undercutting and bank collapse;
- Provide food and shelter for fish and wildlife, and corridors for wildlife movement;
- Intercept, absorb, and filter out pollutants such as silt, fertilizers, toxic chemicals, and livestock wastes;
- Keep water temperatures cool during hot summer months when fish are susceptible to heat stress;
- Slow surface water runoff;
- Increase wildlife diversity;
- Reduce flood and ice damage to stream channels, and adjacent lands and structures; and
- Preserve natural character of waters.

Wetlands

Marshes along rivers and streams, swamps, and bogs in woods, areas that are more or less regularly soggy or inundated, are wetlands. Historically, wetlands have been considered a nuisance to be eliminated, but they are now understood to be essential not only for the survival of many species of plants and animals, but also for maintaining the health, safety, and welfare of the general public. These fragile resources protect drinking water supplies by filtering out pollutants and by helping to recharge aquifers. Wetlands minimize flood damage by temporarily absorbing and storing floodwaters. They also present significant development constraints associated with poor drainage and high-water tables.

The importance of wetlands has been recognized on a National level since the 1970's. Vermont adopted legislation and rules in 1990. Wetlands of a size and/or quality to fulfill the functions mentioned above are protected. These wetlands, Class I of national significance and Class II of statewide significance, comprise less than five percent of the state's land area.

Wetlands in Norwich included in the National Wetlands Inventory were initially regulated by the 1990 Vermont Wetland Rules as Class II wetlands and required a 50-foot buffer between development and the delineated wetland. Some of the town's major wetland complexes are located in the brook valleys and along the shore of the Connecticut River. The largest wetland in town is an approximately 65-acre area along New Boston Brook.

The 2010 Vermont Wetland Rules changed the definition of Class II wetlands from those included in the National Wetlands Inventory to those meeting specific functional criteria identified in the new rules. Most Class II wetlands are already included in the new Vermont Wetlands Inventory. As additional class II wetlands are delineated they are added to the inventory.

Several "advisory wetland inventories" may assist in identifying where potential Class II wetlands may be located. These include a Norwich Conservation Commission inventory based on 1992 infrared aerial photos and limited field checking and a state inventory of "Potential Wetlands" based on NCRS hydric soils maps.

Vernal Pools

Vernal pools are small wetlands characterized by a lack of woody vegetation resulting from the persistence of standing water for a portion of the year. They typically occur in small depressions in upland forests or less frequently in forested swamps. Vernal pools generally lack inlets and outlets, and collect water mainly from precipitation and snow melt. The pools are shaded by the surrounding forest canopy and so can retain moisture well beyond "mud season." Depending on the amount of precipitation in a given year, a vernal pool may be dry or still have standing water by mid-summer.

Vernal pools provide important breeding habitat for amphibians such as salamanders and frogs. In order to support those species the pools need to retain their water during the late-spring/early-summer breeding season. The pools are highly productive ecosystems that provide a rich source of food for a wide variety of species. Their small size and temporary nature make vernal pools difficult to inventory and protect. Construction of roads, timber harvesting and other development in upland forests around vernal pools can negatively affect the pools and the species that depend on them.

A partial inventory of vernal pools, mapped by the Norwich Conservation Commission in 2006 using infrared aerial maps, is in the Norwich GIS and is shown on Map 8.

Floodplains

As shown on Map 7, floodplains have been identified along the town's rivers and streams. Mapped floodplains include those areas that have a one percent chance of flooding in a year. These areas temporarily carry and retain bank overflow from spring runoff and heavy storms, and are vital to the health of the river and the safety of the community. Increased development and shifting weather patterns have resulted in a number of serious flood events around Vermont in recent years.

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) show the floodplain that FEMA has determined would be covered by water during the "100-year flood," which is a storm event that has a 1% likelihood of occurring in any given year and which is referred to as the base flood. This

area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show expected base flood elevations (BFEs) and floodways (smaller areas that carry more current).

There are approximately 50 homes and a small number of non-residential structures currently located within the mapped special flood hazard area in Norwich. None of the town's critical facilities (ex., fire station) are located in floodplains and there are no repetitive loss properties in Norwich as identified by FEMA.

Norwich has adopted flood hazard area regulations to limit development within flood hazard areas, as required for municipal participation in the federal flood insurance program. These regulations are intended to protect life and property, and to allow property owners to obtain flood insurance and mortgages at relatively affordable rates. The town needs to continue strictly restricting development within its floodplains to protect public health and safety.

FIRMS are only prepared for larger streams and rivers. Recent studies have shown that a significant portion of flood damage in Vermont occurs outside of the FEMA mapped areas along smaller upland streams, as well as along road drainage systems. Since FEMA maps are only concerned with inundation, and these other areas are at risk from flash flooding and erosion, these areas are often not recognized as being flood-prone. Property owners in such areas outside of SFHAs are not required to have flood insurance. Flash flooding along smaller streams can be extremely erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains, and creating landslide risk.

River Corridors

In addition to the risks associated with inundation, there is the related hazard posed by storm-swollen streams and rivers, which may unexpectedly jump their banks and cut new channels. Due largely to human influences, many stream and river channels are no longer stable, especially in upland areas. Their instability creates an erosion hazard during major storms, which as noted elsewhere in the plan, are becoming more common as a result of climate change. Fluvial erosion hazards are often in locations that are unlikely to be inundated with flood waters and are therefore not protected through existing regulations that limit development in floodplains. Eroding stream banks are also a significant source of sediment and polluting nutrients entering major rivers and lakes, which decreases water quality.

The Vermont Agency of Natural Resources has developed river corridor maps that show the areas subject to erosion. In these areas, the lateral movement of the river and the associated erosion is a greater threat than inundation by floodwaters. As with the FEMA FIRMs, the smaller streams have not been mapped and a default 50-foot corridor of concern is defined from the top of bank of these streams. There are approximately 15 homes currently located with the state-mapped river corridor areas, outside the special flood hazard area, in Norwich.

Fluvial geomorphology seeks to explain the physics of flowing water, soils and land use in relation to various land forms. It analyzes physical, chemical, biological and land use data to explain the historic causes of the problems currently being experienced in stream corridors in an attempt to resolve or avoid conflicts between fluvial systems and the built environment. A geomorphic assessment is currently underway on Blood Brook in Norwich and the town is considering limiting development within identified fluvial erosion hazard areas in a manner similar to current regulations within flood hazard areas.

The Blood Brook Watershed Corridor Plan of March 2008 is the result of a three-phase study by the Norwich Conservation Commission, the Two-Rivers Ottauquechee Regional Commission, and the Vermont Agency of Natural Resources, Department of Environmental Conservation, River Management Program. The purpose of that plan is to assess the underlying causes of channel instability and encourage the stream's return to equilibrium conditions. The plan outlines management efforts directed toward long-term solutions that help curb escalating costs and minimize the danger posed or damage caused by storm-swollen streams. Such efforts can help reduce flood and erosion hazards along the river corridor, improve water quality and aquatic habitat, and enhance aesthetic and recreational values of the stream.

Forestland

Forest is the most common land cover type in Norwich accounting for nearly 22,000 acres or approximately 76 percent of Norwich's land. Forest resources provide a number of benefits, including an economic return for local landowners, water quality, wildlife habitat, recreation opportunities for town residents and visitors, and an important visual backdrop to the town's scenic views and vistas. Most of Norwich's forestlands are in private ownership, but remain in tracts 50 acres or larger. The largest single forest parcel is the 450 acres along the Appalachian Trail owned by the National Park Service. The Norwich Fire District owns a 330-acre parcel off Beaver Meadow Road.

Forests are a permanently renewable resource if managed properly. Sound forest management results in a stable economic return for landowners, local resources to support local industry, and perhaps most importantly, an incentive for keeping large tracts of land free of development and available to the public for recreation, wildlife and scenic enjoyment. However, poor forest management can result in the degradation of biological diversity and can damage scenic landscapes. Forest management can be accomplished in a manner that does not create erosion or adversely impact scenic areas and wildlife. Generally, a sound forest management plan should be based on a number of objectives, including sustainable timber production, the protection of water quality, maintaining a diversity of wildlife habitat, and aesthetic enhancement. Whatever the objectives of a forest property owner, developing and implementing a forest management plan is the best means of managing a forest parcel for long-term, sustainable forest production.

The majority of the town's forest land is privately owned. While much of the private forest is made up of large parcels associated with single-family residences, many undeveloped parcels under forest management also exist. Of the privately owned forestland in town, more than 11,000 acres are currently enrolled in the state's current use program, and are therefore managed in accordance with a forest management plan approved by the county forester (see Figure 11-4).

Wildlife

In addition to its 3,400 human residents, Norwich is home to a variety of animal species. To survive, these animals require substantial acreage, preferably in large, solid blocks interconnected by undisturbed corridors for seasonal movement. The preservation of a diverse array of species requires more than protection of identified deer wintering areas or bird nesting sites. Certain species such as black bear that require large contiguous habitat areas, which also support a variety of other species, serve as indicators of the health and diversity of local wildlife populations.

In Norwich, forested upland areas are home to bear, deer, bobcat, moose and coyote. The Connecticut River and its tributaries support natural and stocked populations of brook, brown and rainbow trout. The Connecticut River is also a major route for bird migration. The marshes and other wetlands along the Connecticut River provide migrating songbirds and raptors with food, water and shelter. Numerous species of waterfowl, including ducks, egrets and blue herons, occur along the river. Non-game small mammals such as beavers and otters that need continuous access to water abound along the river. Wetlands also provide critical habitat for a variety of species such as mink, otter, beaver, black bear, grey fox, moose, ducks, herons, other wading birds and shore birds and other species.

Special natural areas contribute to the quality of life in Norwich, promoting species diversity, aesthetic enjoyment, recreation and education. Natural areas in Norwich include orchid swamps, peat bogs, vernal pools, , fall-line gorges, estuaries and deer yards. Natural areas can be identified and graded in order of their uniqueness or significance. Such an assessment would provide direction for conservation efforts. Important natural areas can be protected through purchase, through encouraging landowners to seek permanent conservation protection, and through careful review of proposed development.

The main threat to wildlife habitat is fragmentation. Figure 11-3 illustrates the impacts of land subdivision and fragmentation of large tracts of forestland on wildlife populations in northern New England. The left-hand

column identifies expected species in large tracts of undeveloped forest, while each subsequent column depicts the species likely to be lost as the land is subdivided into smaller parcels for scattered development.

In order to maintain habitat for animals that have large home ranges, such as bear, bobcat, fisher, and moose, and other animals that are sensitive to human disturbance, such as wood thrushes, larger blocks of forest or meadowland, or wetland habitat need to be conserved. Blocks up to 20 acres are home to species typical of urban and suburban landscapes (e.g., raccoons, skunks, and squirrels). Moose, bald eagles, goshawks and similar species usually require 500 to 2,500 acres, while blocks of more than 2,500 acres may hold the full complement of species expected to occur in this region of Vermont.

Within Norwich, a number of large, unfragmented blocks of forest remain, including:

- 2,600 acres between Beaver Meadow and Turnpike Roads, which continues into the Town of Sharon
- 2,000 acres south of Bragg Hill Road
- 1,500 acres between Upper Turnpike Road and New Boston Road
- 1,400 acres between Turnpike Road and Upper Turnpike Road, which continues into the adjoining towns of Sharon, Strafford and Thetford
- 1,000 acres between New Boston Road & Bradley Hill Road

Maintaining contiguous forested lands within Norwich, as well as between Norwich and neighboring towns, protects wildlife habitats found in core forests and provides corridors that connect larger blocks of forest.

While many residents enjoy hunting, fishing, wildlife viewing and have extensive knowledge of local wildlife and fisheries, the information has not been documented. Most of the town's important wildlife habitats have not been inventoried or mapped. The extent of documented knowledge about wildlife habitat in Norwich is surprisingly limited, in part because of the amount of fieldwork and mapping needed to document local populations. For this reason, site-specific evaluations may be required to determine the potential impacts to wildlife and important habitat associated with a particular subdivision or development proposal.

Scenic Resources & Rural Character

Norwich is appreciated by most of its residents as a quiet community for rural living. Commercial development is limited to retail and service establishments on Main Street and Route 5. The many small businesses and offices that residents operate from their homes remain inconspicuous. The green in the center of Norwich village and the historic homes along or near Main Street are a visual reminder of the community's heritage. Abandoned cellar-holes and granite posts mark former homesteads of the town's founding families and their descendants.

Norwich is no longer primarily an agricultural town, but retains a few moderately-sized farms and much rural character. Open country and meandering roads that follow lively brooks between forested slopes lead to small hamlets with names like Beaver Meadow, Union Village, Pompanoosuc and Podunk. The Connecticut River with its tributary, the Ompompanoosuc, open fields and remaining patches of pasture add to the variety and beauty.

Yet, as the town's landscape continues to change, residents recognize that Norwich's rural character is threatened. The views from the roads, fanning like fingers of a hand from Norwich village, are changing as more homes are built, so that passersby are required to look between houses to glimpse the view beyond. This section of the plan describes the main elements of Norwich's rural character – its agricultural and forest lands, brooks and wetlands, wildlife and vulnerable habitats, scenic roads and vistas, historic buildings and sites, views of the night sky and a quiet environment. Other elements, such as the traditional village settlement pattern and clustered housing in relation to open space, are discussed in other sections of the plan, but are equally important in a discussion of natural resources. In order to preserve rural character, it is necessary to identify the elements of Norwich's natural and built environment that creates that character.

Scenic Resources

Long vistas across open farmland to the town's upland forests to the west and across the Connecticut River toward the White Mountains to the east create a landscape of great scenic beauty in Norwich. A scenic area can be one with views of farmsteads surrounded by pasture, of compact villages nestled among hills, and of arching trees over dirt roads. It can also be views of mountain ridgelines seen across a level or gently rolling field. These areas combine elements of contrast, reflect order and harmony, and contain intact patterns and focal points. Scenic beauty is linked to the visual relationships between the built environment, open farmland, mountains and rivers.

Norwich's scenic beauty and rural character is heavily influenced by the patchwork pattern of meadow and forest resulting from more than two centuries of farming. The beauty of the agricultural landscape comes from the productive use of the land and its seasonally changing colors, textures and patterns. Open lands are responsible for the wide and distant views found along many of the town's roads. Striking views that include forested mountains in the distance with a foreground and middle-ground of rolling countryside can be seen from many vantage points in town, and have nearly universal appeal as scenic resources.

Scenic Vistas and Roads. The Natural Resources Questionnaire circulated to Norwich residents in 1988 brought out nominations for scenic areas from nearly all respondents and included roads through most of the fall-line gorges that followed tumbling brooks through unbroken forest; for instance, the Crooked Half-Mile, lower Bragg Hill Road and Tigertown Road. Views considered the best were those from the top of Gile Mountain, upper Bragg Hill, Bradley Hill, and along the Connecticut River. Special areas included the Village Green in fall foliage season, the New Boston beaver ponds, the Norwich Grand Canyon, and the Van Arman and Smith farms.

The 360-degree panorama from the fire tower atop Gile Mountain is one of the area's most extensive and accessible vistas. On a clear day, a half-hour walk offers views of both the Green Mountains and White Mountains, along with much of the Connecticut River valley stretching between the two.

In 2003, the Norwich Conservation Commission undertook to produce the Norwich Open Space Priorities Informal Plan which enumerated Norwich's significant open spaces in the belief that a rational open space system is fundamental to maintaining and enhancing the character of the town as it grows. (See Chapter 9 for a further discussion of scenic roads.)

Ridgelines. The scenic qualities of a forested ridgeline or hillside silhouetted against the sky, can be compromised by poorly planned development, such as inappropriate building placement, site design, material selection and excessive clearing. While they are some of the most visually sensitive areas of town, Norwich's hillsides and ridgelines are highly desired locations because of the views they offer. It is possible to locate development in the town's uplands in a manner that preserves the scenic qualities of the landscape. Landowners wanting a more open view in a forest setting can limb trees and selectively cut branches to create view corridors rather than clear-cut a swath of trees. As described before, the town's hills and ridgelines have been identified as a critical component of its scenic character. The town's Ridgeline Protection Overlay district was designed to protect these fragile and beautiful features of the town's landscape.

Rural Character

Open Space. Compact village clusters surrounded by open space - all land that is not built on - help define the character of Norwich as a New England town with roots deep in the past. Open meadows, fields and woods contribute to the enjoyment of residents and visitors alike as they walk or ride along the town's roads and trails; they are an essential part of Norwich's scenic beauty. Farmlands preserve open stretches viewed from Interstate 91 and Route 5, as well as closer to town and along Union Village Road. Other open lands are vital parts of favorite areas, such as Bradley Hill Road and Bragg Hill Road. Farm fields and pastures, which comprise less than 15 percent of the town's land area, are critical to retaining views, especially for travelers on the town's roads. Norwich is fortunate that it retains much of its open space. Currently, less than 10 percent of the town's land area has been developed, yet parcels are being continuously subdivided and developed. Remaining areas should be identified and prioritized for possible protection. Landowners can be encouraged to do this through

conservation easements, development plans that group or cluster houses together leaving the remaining land as preserved open space, and estate planning that considers the future use of the land.

Agricultural Structures and Patterns. Historic farmhouses, barns and other agricultural outbuildings are also essential components of the town's rural character. They are an architectural connection to the town's history and heritage as a farming community. Other visual reminders of the agricultural use of Norwich's land are the stone walls and hedgerows that define the edges of fields and meadows. They create a recognizable pattern on the landscape that reinforces the town's rural character. While farmsteads, fields and pastures may pass from productive to residential use, the architectural elements and visual patterns can provide a framework for appropriately locating and designing development so that it fits into a rural environment. New uses can be found for obsolete farm structures, giving them new life while maintaining their architectural integrity.

Lighting. The skies above and the views from and toward Norwich are appreciated at night as well as day. The ability to enjoy a view of the night sky without the intrusion of artificial lighting is another component of the town's rural character. The ability to enjoy the night sky can be reduced by excessive and unshielded lighting. Public safety and welfare require adequate illumination in proper places, but excessive lighting may produce unsafe or unpleasant conditions in which unshielded light glares into the eyes of drivers and into houses. Excessive lighting also unnecessarily consumes energy.

Noise. Intrusive noise is out of character in a rural setting, where people expect a quiet atmosphere interspersed with natural sounds like bird songs or flowing water. Traffic and other sources of noise can diminish rural character.

Trails and Greenways

Appalachian Trail. The Appalachian Trail, a 2,178-mile, continuous hiking trail from Mt. Katahdin, Maine to Springer Mountain, Georgia travels more than five miles through Norwich. The National Park Service owns 697 acres around the trail in Norwich. After traversing about two miles by roadway from Ledyard Bridge via Main Street to the trail entrance near the top of Elm Street, the trail generally follows the ridgelines that define the southern part of the Blood Brook watershed. The Dartmouth Outing Club maintains this segment of the trail. The Appalachian Trail Conference and Upper Valley Land Trust worked to acquire and hold conservation easements on abutting lands to create a buffer for the trail. In Norwich, 556 acres adjacent to the trail corridor have been conserved in addition to the lands owned by the National Park Service. Altogether, this protected greenway corridor represents four percent of Norwich's land area.

This major open space corridor serves as a backbone of protected recreational land and has been a driving force to develop an interconnected trail system throughout the town. Connections currently exist from the Appalachian Trail to the following town trails and roads: Cossingham Trail, Tucker Trail, Happy Hill Road, Burton Woods Road, Brown School House Road, Ballard Trail, Gile Mountain Ridge Trail, Heyl Trail, Elm Street, Bragg Hill Road, Hopson Road and the informal trail under the power transmission line.

Ecologically, the Appalachian Trail corridor provides habitat for a diverse array of plant and animal species. It travels through a forested landscape with an understory of ferns and wildflowers to emerge briefly for expansive views on its path from Elm Street over Bragg Hill to the Jericho area and on into Hartford. The protected corridor is an excellent example of the Northern Hardwood Forest natural community and the related Hemlock Northern Hardwood Forest community. The area includes some important wetlands and an area of mesic forest, which is home to a number of rare plant species.

Town Trails. Norwich's trails and greenways provide a valued resource for citizens and visitors. A favorite bicycle and jogging route travels along the Connecticut River on the River Road and then extends north into Thetford. Another walking and jogging route for residents and visitors alike makes a loop on Route 5 south and Hopson Road, taking advantage of the open spaces of the Booth property and the Warner Meadow, both protected with conservation easements donated to the Upper Valley Land Trust.

The Milton Frye Nature Area adjacent to the Marion Cross School is readily accessible to school children and the general public close to the center of town. With interpretative stops, it helps to educate classes of school children and others, as well as to provide a peaceful respite. Trails owned by the town, leading to Gile Mountain (the highest peak in town) and to the Schmidt Preserve with its showy lady slippers (a rare plant species), provide access to other favorite spots in the fall and spring, respectively. Another resource, the Bill Ballard Trail, follows the Charles Brown Brook down the length of the Fire District watershed land.

A trail created by the mutual efforts of the Montshire Museum and the conservation commissions of Norwich and Hartford leads from the museum to Wilder Village. It and other Montshire trails – one for finding wildflowers and one along the Connecticut River – are valued assets.

Class 4 roads and numerous trails are used by hikers, bikers, horseback riders, cross-country skiers and snowmobilers. Many are not identified on maps. Some roads and trails could be interconnected to provide a continuous network, both in Norwich and adjoining towns. Ways may be found to provide safe hiking and biking passage to the Huntley Meadow from the center of town.

Trails in Norwich with permanent easements or on public land are mapped and included in the Norwich GIS and are shown on Map 4. Opportunities to interconnect existing trails need to be explored. Other corridors of open space need to be identified and landowners encouraged to protect them, perhaps using the Appalachian Trail Corridor as a model and creating links to it.

Historic and Cultural Resources

Norwich's wealth of historic and cultural resources is essential to its sense of place and character. They are key elements of the town's traditional settlement pattern, energy sustainability, scenic resources and rural character, and economic sustainability.

Norwich's iconic town center results from centuries of town settlement, construction, and preservation of distinctive houses, public buildings, places of worship, and commercial buildings. This town center is the focal point for the broader town made special by its rural character and scenic resources.

Long-time residents have protected these qualities while more recent residents choose to live in Norwich in part because of its sense of place and character. These qualities thus contribute to Norwich's strong property values and the viability of its town center.

Norwich's historic resources range from undisturbed Native American sites to Civil War letters; from historic buildings to portraits of those who owned them, and from 18th-century account books to 20th-century photographs. The diversity of historical documents within the town and in nearby repositories is staggering, but myth often replaces fact. Our historical resources furnish the elements of truth often obscured in fanciful folklore. For instance, Blood Brook is often described as the site of an Indian massacre. The closest Native American conflict to Norwich was the raid on Royalton on October 16, 1780. Blood Brook more likely received its name because of the tanneries located on its banks.

Norwich's historical resources are recognized at the local, state and national levels. The Norwich Village Historic District is listed in the National Register of Historic Places and numerous historic structures are identified in the state's historic register. Resources buried in the earth, built on the landscape and preserved in town archives are used on a daily basis. They are integral to, and help to define, the town's unique sense of community through the years.

Archaeological Resources

Native American Resources. Although few of the town's archaeological sites have been identified and fewer still studied, it is possible to predict, based on environmental characteristics, where certain kinds of prehistoric Native American sites would be more likely found. Results from archaeological investigations around Vermont in recent decades suggest that prehistoric sites are typically located within 300 to 500 feet of an existing or relict water source, on gently sloping land, or adequately drained soils with a southeast-south-southwest exposure. These lands provided essential resources that attracted human populations. People exploited these resources and left behind archaeological remains of their activities at these locations.

In Norwich, the confluences of the town's rivers and brooks on the rich alluvial plains adjacent to the Connecticut River are known to harbor vestiges of civilizations that pre-date colonial settlement by thousands of years. The Ompompanoosuc River (the Native American name meaning 'place of very white stones') is associated with Native American heritage. From Gile Mountain and Griggs Mountain to Brown Brook and Blood Brook, and the Connecticut River, all have the potential for revealing evidence of Native American activity. In 1994, a Marion Cross Elementary School student located a projectile point during a casual walk on the Fire District land.

It is important to recognize and respect the importance of these ancient dwelling, hunting and burial sites and not to disturb or pilfer them for curiosity's sake. Casual 'digs' destroy the ability of professional archaeologists to accurately date and study buried artifacts. The Vermont Division for Historic Preservation should be contacted if a site is inadvertently unearthed. Not every site is worthy of preservation, but an expert should be called to assess the find.

Colonial Resources. Archaeology also tells us a lot about the colonists who came to settle in what would become Norwich. As far as is known, none of the original houses built by the earliest colonists – Jacob Fenton, the Hutchinsons or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are rare, as many buildings were destroyed during the war. Archaeological research, coupled with information from primary manuscripts, would likely locate the archaeological remains of the first town's homesteads, mills and other structures.

18th and 19th Century Resources. Excavations around the Marion Cross School during construction of the 1993 addition unearthed cadet buttons, eating utensils, clay pipes and ceramic plates used at Norwich University. A gnarled piece of iron found at the site illustrates the heat of the fire that destroyed the south barracks in 1866, leading to the university's move to Northfield. Granite posts along the road and ripples in the land tell of the rich manufacturing history of potash works, blacksmith shops, tanneries and orchards. Near many of Norwich's 18th- and 19th-century homes are 'trash pits' where domestic refuse was dumped. With time, these textured soils become a buried record of lifestyle. Ceramic bits found in these historic dumpsters document dishes imported from England, France and China. In fact, potsherds (broken archaeological samples) recently found near the Norwich Inn suggest that 19th-century dinners were served on fancy Chinese porcelain plates.

Although largely gone from the landscape, Norwich's industrial history can be understood through archaeology. For instance, the Pattersonville Chair Factory was located on the Ompompanoosuc. While the factory was originally composed of more than nine buildings including sawmills, warehouses and a company store, only two structures remain. Together with photographic documentation and business records, the archaeological potential of the site is rich. Lewiston village, once a thriving community with stores, homes, sawmill, icehouse and railroad depot, was razed when the interstate ramps were built in the 1960s. Three existing buildings, photographs, maps and concentrations of archaeological resources document the history of this site.

Historic Resources

Material Culture. Material culture is an academic phrase for what can be described as above-ground archaeology. The study of material culture focuses on structures and objects like buildings, bridges, roads, domestic furnishings, tools and machines to better understand history through the daily life of the time. It complements the traditional study of history by linking the written word to the three-dimensional world. Norwich's history, in large part, can be understood by driving along Main Street, where impressive neoclassical houses speak of an affluent, highly style-conscious community. Large, hipped roof houses with connected barns and out-buildings along outlying roads tell of well-off farmers and a complicated network of trade and commerce.

Historically, houses and outbuildings were built with convenience and practicality in mind. Until recently, the latter (barns, wood sheds, stables, sugar and milk houses, chicken coops, hog houses, etc.) were integral parts of domestic space in Norwich. Some of these structures have been renovated and adapted to current needs. Others have fallen into disrepair, eventually to become part of the archaeological record rather than visual landscape. In addition to recording a way of life and use of resources, farmhouses, barns, outbuildings are an essential component of the town's rural character, as described elsewhere in this plan.

Primary Resources. The artifacts of Norwich's history are diverse and plentiful. The Norwich Historical Society seeks to "preserve and interpret items from Norwich's past" including textiles, ceramics, paintings and prints, maps, letters and photographs. Thus, there is a repository for the safe-keeping of items found in homes, businesses, antique shops and flea markets that directly relate to town history.

Records at the Town Clerk's Office and at the county seats in Woodstock and Middlesex are also invaluable resources for telling the complex story of Norwich's settlement and development. The Vermont Historical Society, Shelburne Museum, Bennington Museum, Special Collections at Dartmouth College, and Norwich University archives are additional repositories for historical resources. Family archives are another important resource. Many Norwich homes house heirlooms in attics, cellars, closets and trunks. While the 18th and 19th centuries intrigue us, Norwich's 20th-century history is just as significant. It is perhaps the century that has witnessed the most change in the town's daily routines.

Architectural Resources. Norwich's architectural heritage is one historic resource that is unmatched in the Upper Valley. Norwich village (Main Street and adjacent side streets) was placed on the National Register of Historic Places in 1991 because it retains its early scale and architectural integrity. The Beaver Meadow Union Chapel was listed on the National Register of Historic Places in 1995. The classification is honorific and does not place restrictions or covenants on the buildings. Numerous buildings throughout town are also listed on the state historic register.

Older Buildings and Energy Sustainability. Although retrofitting older buildings to increase energy efficiency may be expensive, the actual cost in energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy-efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy - energy used to create the materials and construct the original building - will also be lost. Many of the newer techniques for evaluating energy efficiency and sustainability in construction take these factors into account. The retrofitting of older buildings may also qualify for many tax credits, grants, and low interest loans created to support both historic preservation and energy efficiency.

Goals, Objectives and Actions

Goal I **Maintain and improve the quality of our air, water, wildlife and land resources.**

Maintain the high quality of the town's air resources by discouraging uses and practices that generate air pollution.		

Action I.1.a Monitor local sources of air pollution.

Action I.1.b Promote use of efficient, less polluting technologies to heat buildings, especially non-polluting wood-burning practices.

Action I.1.c Consider the impacts of new development on traffic congestion that would result in increased air pollution.

Action I.1.d Support efforts to raise weight limits to allow heavy trucks access to Interstate 91 rather than being required to travel on Route 5 through the village.

Action I.1.e Collaborate with neighboring communities and Advance Transit to provide mass transit services for Norwich residents as a means of reducing air pollutants from private vehicle emissions.

Action I.1.f Promote compact development patterns as a way to reduce air pollution by decreasing automobile dependence and increasing the feasibility of mass transit.

Action I.1.g Use the town's zoning regulations to control dust from activities such as construction sites, and resource extraction and processing operations.

Ensure the responsible use of gravel and sand resources to provide long-term benefit to the town.		

Action I.2.a Identify sand and gravel deposits, and conserve these limited resources for future uses.

Action I.2.b Use the town's zoning regulations to require the use of appropriate techniques to minimize environmental impact of sand and gravel extraction and provide for reclamation of the land.

Action I.2.c Require all applicants for resource extraction operations to prepare, submit and implement erosion control, storm water management and site restoration plans.

Action I.2.d Require all applicants for resource extraction operations to operate in a manner that avoids or minimizes impacts to natural, scenic and historic resources, public infrastructure and quality of life for nearby residents to the greatest extent feasible.

Action I.2.e Require adequate storm water management and erosion control measures for stockpiled sand, gravel, soil, salt or other similar materials.

Action I.2.f Prohibit the stockpiling of sand, gravel, soil, salt or similar materials in areas adjacent to public water supplies, identified aquifers and surface waters.

Encourage the preservation of prime agricultural soils and viable tracts of productive farmland.		

Action I.3.a Promote landowner participation in the state's current use program.

Action I.3.b Explore other methods to reduce the property tax burden of maintaining viable tracts of productive farmland.

Action I.3.c Continue identification and evaluation of active and potential agricultural lands by methods such as the Land Evaluation and Site Assessment for Farmland (LESA) program.

Action I.3.d Use Norwich's zoning and subdivision regulations to promote the conservation of farmland by permitting homes to be clustered while maintaining viable tracts of productive farmland.

Action I.3.e Encourage development to be located along the edges of fields or on the least productive land in order to preserve primary agricultural soils, allow for continued agricultural use and maintain the scenic character of Norwich's rural landscape.

Action I.3.f Designate development envelopes on lots being created or newly built upon to ensure that buildings are sited to minimize impacts on agricultural soils and productive farmland.

Action I.3.g Encourageadjacent lots to share roads, drives and utility corridors whenever feasible to limit fragmentation of agricultural soils and productive farmland.

Action I.3.h Support the ability of current and future residents to grow food locally by promoting the conservation of agricultural soils, including pockets not large enough to support traditional farming operations.

Maintain the town's steep slopes in a manner that prevents erosion, changes to natural drainage patterns and loss of scenic character.		

Action I.4.a Use the town's zoning and subdivision regulations to control development in areas characterized by shallow soils and/or steep slopes to reduce erosion and pollution potential.

Action I.4.b Review development on moderately steep slopes and prohibit development on severely steep slopes.

Action I.4.c Require the preparation and implementation of storm water management and erosion control plans for development on steep slopes.

Action I.4.d Limit removal of woody vegetation on steep slopes.

Protect the aquifers and groundwater that are the sources of Norwich's present and future drinking water supply.		

Action I.5.a Identify and protect potential drinking water resources.

Action I.5.b Identify and map all public water supplies and known aquifers in Norwich.

Action I.5.c Re-evaluate the boundaries of the existing Aquifer Protection District.

Action I.5.d Regulate development to prevent contamination of public water supplies and known aquifers due to the on-site production, storage or disposal of potential pollutants or hazardous materials.

Action I.5.e Test groundwater in Norwich village to identify any pollution from septic systems.

Action I.5.f Develop contingency plans for supplying Norwich village with potable water in case of a disaster that contaminates the current drinking water supply.

Action I.5.g Develop plans to add a filtration plant to the existing water system owned and controlled by the Norwich Fire District that serves Norwich village should treatment become necessary due to pollution of the groundwater stored in the aquifer.

Maintain and improve the water quality in the town's brooks and rivers.		

Action I.6.a Collaborate with neighboring Upper Valley communities in a regional effort to manage riverfront lands and improve the water quality of the Connecticut River.

Action I.6.b Participate in state, regional, federal and other efforts to protect the Connecticut River.

Action I.6.c Regulate development to prevent contamination of surface waters due to the on-site production, storage or disposal of potential pollutants or hazardous materials.

Action I.6.d Prohibit all discharges into rivers and brooks from failed septic systems, construction site erosion, storm water run-off, agricultural run-off and other sources of pollution that would adversely affect water quality.

Action I.6.e Review development plans to assure adequate setbacks of buildings and septic systems to prevent erosion and pollution and minimize alteration of stream courses.

Action I.6.f Encourage the maintenance or establishment of vegetated riparian buffers along the town's surface waters in order to filter storm water runoff, prevent soil erosion, protect wildlife and fish habitat and maintain water quality.

Action I.6.g Promote the maintenance and planting of native woody plant species within riparian buffers by educating landowners about both appropriate native and inappropriate invasive trees and shrubs.

Action I.6.h Limit the maintenance or creation of expanses of lawn within riparian buffers in order to prevent erosion and maintain the natural condition and function of waterfront lands.

Action I.6.i Educate the owners of waterfront properties about the potential impact of household chemicals, de-icers, animal waste, and lawn and garden products and practices on water quality.

Protect public safety and private property from flood hazards by maintaining the natural functions of the town's floodplains and stream corridors.		

Action I.7.a Continue to participate in and meet the requirements of the National Flood Insurance Program so that owners within floodplains are eligible for flood insurance.

Action I.7.b Regulate development in order to prevent loss of life or property by prohibiting further significant development within identified floodways and floodplains.

Action I.7.c Review any proposed development, alteration of the natural grade or loss of pervious ground cover within identified floodways and floodplains in order to prevent restrictions to the flow of floodwaters or reductions in the natural ability of the land to absorb floodwaters.

Action I.7.d Complete geomorphic assessments on the town's streams and implement measures to minimize loss of life or property due to fluvial erosion.

Action I.7.e Explore adoption of river corridor regulations to limit development in areas prone to fluvial erosion hazards.

Action I.7.f Do not locate any municipal or critical facilities, other than water-dependent structures, within mapped flood hazard or river corridor areas.

Preserve the functions and prevent the loss of the town's wetlands.		

Action I.8.a Identify and assess the town's wetlands.

Action I.8.b Complete the identification and mapping of Norwich's wetlands.

Action I.8.c Petition the state to reclassify wetlands that the town considers of national importance to Class I status to ensure a higher level of protection.

Action I.8.d Maintain provisions in Norwich's zoning and subdivision regulations to minimize the loss of wetlands to development.

Action I.8.e Educate landowners about the function and value of wetlands, including their role in storing water during storm events and reducing the severity of downstream flooding.

Action I.8.f Require construction of compensatory flood storage if wetlands that provide flood storage will be lost or adversely affected by proposed development so as to achieve no net loss of the affected wetland's flood storage function.

Conserve significant wildlife habitats, especially the habitats of rare and endangered species, protect core blocks of forest and maintain forest connectivity between blocks.		

Action I.9.a Define, identify, map and document Norwich's significant wildlife and plant habitats, including forest blocks and habitat connectors.

Action I.9.b Map larger blocks of contiguous forest land and potential travel corridors between those blocks in Norwich and neighboring towns.

Action I.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection.

Action I.9.d Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible.

Action I.9.e Require buffers between new development and significant wildlife habitats.

Action I.9.f Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species.

Action I.9.g Promote the protection of rare and endangered species, and their habitats, by the town's landowners.

Encourage the conservation of working forestlands and the use of management practices that enhance forest health and long-term productivity.		

Action I.10.a Promote landowner participation in the state's current use program for forestlands.

Action I.10.b Manage town forests and other forested public land in accordance with best practices in order to conserve and maintain them as a long-term resource.

Action I.10.c Require forestry practices that minimize erosion and damage to watercourses.

Goal J Identify, protect and preserve the important natural and historic features that create Norwich's scenic landscapes and community character.

Protect the scenic beauty and rural character of Norwich's forests, open lands, shorelines and roads.		

Action J.1.a Identify and prioritize scenic areas and roads in town.

Action J.1.b Develop and implement plans to protect and encourage protection of identified scenic areas and roads of highest priority.

Action J.1.c Require new development to be located and designed in a manner that minimizes its impacts on the town's identified scenic resources.

Action J.1.d Designate development envelopes on lots being created or newly built upon where deemed necessary to ensure that buildings are sited to minimize impacts on identified scenic resources.

Action J.1.e Encourage the use of construction materials and colors for new construction in identified scenic areas that will result in structures blending into their surroundings.

Action J.1.f Limit the scale and height of new structures to be built in identified scenic areas so that new development will better fit into its surroundings.

Action J.1.g Require landscaping as needed to screen new development from view or blend it into the surrounding landscape.

Preserve Norwich's ridgelines in their natural state without visible intrusions by development as an integral component of the town's scenic character as viewed from public lands and roads.		

Action J.2.a Identify ridgelines and review proposed development on or adjacent to them in order to minimize impacts on the town's scenic character.

Action J.2.b Limit clearing of existing vegetation on development sites.

Action J.2.c Limit the height and placement of new structures so that they remain below nearby ridgelines and the forest canopy.

Action J.2.d Require landscaping as needed to screen new development or blend it into the surrounding landscape.

Action J.2.e Require the use of construction materials and colors that will enable structures to blend into their surroundings.

Preserve existing open space as a vital component of Norwich's rural character.		

Action J.3.a Encourage landowners to keep their fields open and educate them about mowing practices that will not harm nesting birds.

Action J.3.b Identify and evaluate significant open space areas in Norwich that may warrant special protection.

Action J.3.c Develop and implement a plan to protect and encourage protection of open space of high priority utilizing landowner cooperation and by purchase, using the town's Conservation Trust Fund and other private and public resources.

Action J.3.d Use Norwich's zoning and subdivision regulations to promote cluster/open space development, so as to maintain a significant amount of open space.

Action J.3.e Require that subdivision and site plans respond to the existing landscape features and patterns that are components of rural character such as hedgerows, stone walls, open fields and the terrain.

Protect Norwich's residents from the intrusion of noise, light, traffic and similar impacts at levels not characteristic of a rural environment.		

Action J.4.a Regulate sources of loud or persistent noise such as aircraft overflights, vehicles that have removed exhaust noise suppression devices for greater power, vehicles and equipment with back-up alarms, and similar sources.

Action J.4.b Establish and enforce daytime and nighttime noise levels that preserve the quality of life enjoyed and expected by town residents.

Action J.4.c Regulate lighting, so that it may be reasonable for public safety, but ensure access to the day and night sky by minimizing intrusive light.

Action J.4.d Revise zoning and subdivision regulations to protect the environment from unnecessary, offensive and wasteful lighting, while providing such lighting as is reasonably necessary for public safety, and to ensure reasonable access to natural light and darkness.

Action J.4.e Revise zoning and subdivision regulations to require new development projects to show that lighting and construction will not impede access to natural light and darkness for neighboring units.

Enhance public access to Norwich's rivers, streams and natural areas via an interconnected greenway system.		

Action J.5.a Identify and map existing trails and greenways.

Action J.5.b Identify existing trails and Class 4 roads, and interconnect as possible and maintain them for public use.

Action J.5.c Identify and map "unidentified corridors" as defined in the state's Ancient Roads statute, and re-classify those that can be delineated to town highways or trails as appropriate based on the long-term interests of town residents.

Action J.5.d Identify potential trail corridors to link existing trails and greenways with each other and with trail systems in neighboring towns.

Action J.5.e Create public trails to access natural and scenic resource areas where feasible and appropriate.

Action J.5.f Schedule regular maintenance of town trails by Conservation Commission/Trails Committee.

Protect Norwich's archaeological, historic and cultural resources in order to preserve the community's history, heritage, culture and character for future generations.		

Action J.6.a Establish criteria for identifying sites with potential archaeological value in Norwich.

Action J.6.b Require professional assessments of the potential of new development to impact archaeological resources when development is proposed on sites identified as archaeologically sensitive.

Action J.6.c Designate development envelopes on lots being created or newly built upon, where deemed necessary, to ensure that buildings are sited to minimize their impacts on archaeological resources.

Action J.6.d Support work conducted by the Norwich Historical Society.

Action J.6.e Establish criteria for identifying significant historical structures or sites in Norwich.

Action J.6.f Identify, designate, map and document Norwich's significant historic sites or structures to encourage greater public recognition, enjoyment and protection of these resources.

Action J.6.g Identify any historic structures outside the town's designated historic district or not included in the state's inventory of historic resources.

Action J.6.h Seek designation on the National Register of Historic Places for other Norwich villages like Beaver Meadow and Union Village.

Action J.6.i Allow for the adaptive reuse, restoration or reconstruction of historic structures that may otherwise not conform to zoning standards such as setbacks and height limits.

Action J.6.j Review development plans prior to construction or demolition to prevent or minimize any adverse effects on significant historical sites or structures.

Action J.6.k Document details of structures slated for remodeling or demolition with photographs and reports.

Action J.6.l Require that subdivision and site plans respond to and incorporate existing historic structures and landscape features that speak to the town's heritage, culture and character, such as cellar holes, stone walls and historic buildings including barns and agricultural outbuildings.

Action J.6.m Require that new development be designed to maintain the historic context of the site and its environs, and to minimize its impact on historic value, architectural integrity and views of identified historic structures nearby.

Encourage and support the retrofitting of older buildings as a more energy efficient and sustainable practice than demolition and rebuilding.		

Action J.7.a Consider the total cost of energy use and sustainability when determining whether to retrofit an older building or demolish it and re-build. Energy costs may include demolition, disposing of the used materials, manufacturing and transporting new materials, and construction. The embodied energy costs- energy used to create the materials and construct the original building - may also be considered and include the energy used to create the materials and construct the original building.

Action J.7.b Provide information to owners of older and historic buildings about the many tax credits, grants, and low interest loans created to support both historic preservation and energy efficiency.

Land Use

More than two centuries have brought about many changes in Norwich's landscape as it has been transformed from a wilderness by settlers in the 1770s, to a rural town of farms and villages, to a bedroom community for nearby employment centers. The topography may be the same, but forests were cleared and allowed to grow again, pastures were created and then disappeared, streams were dammed and undammed, farmsteads were built and abandoned, and villages emerged.

This land use plan attempts to identify those features of the natural and working landscape that should be preserved and to direct future land development in a manner that respects the desire of the community to preserve its rural character and quality of life, while creating homes and employment opportunities for current residents and future generations. The plan responds to our mutual needs and interdependencies as a community while respecting the rights and concerns of individual citizens.

It must be recognized that Norwich's landscape has never been and cannot be static and that change can be both necessary and positive. This land use plan describes current land use patterns in Norwich, assesses recent land use trends and establishes policies to direct future land use changes.

Norwich's Land Use History

Chapter 2 of this plan follows the transition of Norwich from a largely uninhabited wilderness in the mid-1700s to the residential community it has become today. Most of the land in Norwich has been through many changes since the original settlers arrived - first cleared of trees, then grazed clean by sheep, then either allowed to revert to forest or converted to pasture or hay field for dairy farms. Norwich is now 76 percent forested, and farm fields and pastures account for only 14 percent of its land area.

For the most part, major land use changes in Norwich have been in response to economic changes of a regional, national or global nature. Transportation has played a significant role in these changes with the 1848 opening of the railroad that connected Norwich to markets throughout the country and the building of Interstates 91 and 89 in the early 1970s that put the entire Northeast within a day's drive of Norwich. The effect of changes in transportation, markets, and regulations on a regional, national and global level, and resulting changes in our agricultural activity have had a dramatic impact on the working landscape.

Current Land Use in Norwich

Residential Land Uses

Over the past 50 years, Norwich's pattern of residential development has changed from the early compact settlements separated by open farmland to a linear spread of houses along many of town's major roads. Several large subdivisions with relatively small lots were created in or near Norwich village before the enactment of state subdivision regulations in 1968. Through the 1970s, development continued to occur closer to Norwich village. In the 1980s, construction began spreading further out along Turnpike Road, Beaver Meadow Road and New Boston Road.

Much of this later development has been in lots slightly larger than 10 acres due to the exemption from state septic regulations for such parcels. The 10-acre exemption, created in 1968, had less impact after 1997 when the town on-site wastewater disposal regulations were changed to match those of the state and was removed entirely by the state in 2002. This 10-acre pattern created lots "too small to plow, but too big to mow"; that is not large enough for economically viable agriculture or forestry, but larger than needed for a private residence.

Active farms have been disappearing from Norwich since the mid-1900s and former pastures or hay fields are now house lots or are reverting to woodland. A strong economy in the Upper Valley, the excellent reputation of the school system, and the availability of land drove residential development in the 1980s. The rate of growth slowed in the 1990s and 2000s, but the amount of open space being converted to residential lots continues to be substantial as shown in Figure 12-2 and the average new house lot is approximately five acres. (See Chapters 4 and 5 for a more detailed analysis of population and housing growth in Norwich.)

Potentially, there is enough land for many times the number of houses now in Norwich under current zoning even with substantial reduction of potential new lots in the rural residential district due to density limitations adopted in the 2002 subdivision regulations. However, there are constraints on residential development other than zoning, such as limited septic disposal capacity, steep slopes, limited access, state and federal wetlands rules, conservation easements, and private deed restrictions. There are a number of factors that could increase the pace of residential development in Norwich, including:

- A strong regional economy.
- State-wide planning, regulation, and growth designations.
- Continued state adoption of new technology for on-site wastewater treatment or introduction of a municipal wastewater system.
- High taxes on undeveloped land forcing or encouraging owners to subdivide and sell.
- Continued excellence of local schools relative to others in the region.
- Less restrictive land use regulations.

As Norwich considers options regarding future development, it should be mindful of the core philosophy underlying our existing zoning system: if Norwich is to allow for more houses without destroying the rural character and scenic beauty of the town, development should be directed into areas suitable for that growth. To this end, under the existing zoning regulations, specific areas of the town that are easily accessible to good roads, town services, schools and public transportation – such as the historical village center – have been designated for more compact development, while outlying areas of town without that accessibility have been designated for lower densities of development. In outlying areas, Norwich encourages new non-agricultural buildings to be grouped or "clustered" to preserve larger contiguous parcels for agriculture, forestry or the protection of rural character and scenic beauty.

Demand for residential housing, high property taxes, and the poor economic return from farming and forestry apply constant pressure to develop open land in Norwich. The housing demand is mostly created by regional economic factors (see Chapter 5, Housing Plan) but, as long as the town maintains its attractive rural character, good schools and town services, this demand will most likely continue.

Commercial Land Uses

Commercial development in Norwich has remained primarily in the Village Business zoning district and along the east side of Route 5 South in the Commercial/Industrial zoning district. The limited commercial activity along River Road mostly consists of "grandfathered" businesses that pre-date zoning. Although, at times, there has been demand for more commercial space, availability has been limited by the lack of a municipal wastewater system and the town's Zoning Regulations. The Village Business District is almost filled to capacity. The Commercial/Industrial District on Route 5 South has direct access to the state highway and Interstate 91, but the area has been only partially developed due to poor conditions for on-site wastewater disposal and the presence of Class II wetlands. Future development has been limited by the conversion of a portion of the 70-acre commercially-zoned parcel owned by the Dresden School District to athletic playing fields.

Home businesses exist throughout the town, but the visibility of many is low because zoning regulations allow only one sign up to four square feet and no outside display of goods or equipment. Many of these businesses have no signs at all.

Although at one time, additional commercial development in Norwich was considered by some to have a positive effect on the property tax burden by increasing the value of the Grand List without adding students to the school, Acts 60 and 68 changed Vermont's school funding formula and implemented a statewide system to redistribute education tax revenue based on per pupil funding. Under the current education funding system, the argument can no longer be made that commercial development will necessarily result in tax benefits for residential property owners. The debate around school funding over the past two decades points out that towns should not substitute tax policies for land use policies, as the tax structure may change and yesterday's "fiscal winner" may not remain as such.

Public and Privately Conserved Land

Approximately 11 percent of land in Norwich is either permanently protected from development or controlled by the town/fire district, state or federal government. Additional land may be protected by private deed restrictions; however, since these restrictions may be removed in some cases by future owners or may not legally hold up over time, they do not have the same force as conservation easements held by qualified organizations.

Working Lands and Open Space

For more than 50 years, working farms had been disappearing from the Norwich landscape as the town transitioned from a primarily agricultural community to a primarily residential community. However, it now appears that farms will not vanish entirely from Norwich; over the past decade, there has been an increase in the number of farms operating in town. The 2007 Agricultural Census counted 30 farms in the Norwich zip code as compared to 21 in 1997.

Only one dairy farm remains in operation, but agriculture in Norwich is becoming increasingly diversified. There are at least seven farms currently operating in Norwich, according to a survey done by Norwich Historic Preservation Commission and Norwich Historical Society as part of the exhibit, "Norwich Farms: Cycles of Change". New farmers are turning to value-added, specialty and local food products to make agriculture economically viable. The town's farms raise sheep, beef cattle, hogs and poultry, and grow fruits and vegetables, which are sold at roadside stands and farmer's markets to Upper Valley residents and businesses who want to eat and serve more locally grown food. Rural landowners continue to undertake other traditional activities like maple sugaring, harvesting timber from managed woodlots, and extracting sand or gravel for sale to supplement their income. Increasing numbers of Norwich residents keep horses on large and small lots. Several hundred acres of farmland have been conserved in Norwich, which ensures that these lands will not be developed and will remain available for agricultural use. The best way to protect Norwich's working and open lands remains for agriculture and forestry to be economically viable. While there is little local control over the economics of farming and forestry, the town should support the alternatives to the traditional dairy farm that are emerging - diversified agriculture, farm-based businesses, and local food and energy production – as a way to protect working and open lands. Undeveloped land with productive soils for agriculture or forestry has been inventoried and future development should be planned so as not to destroy access to this irreplaceable resource. In 2007, 129 parcels totaling 12,165 acres were enrolled in the state's current-use program, which is intended to reduce the property taxes paid by owners of working farms and managed forest land. The landowner pays tax based on the value of the land for farming or agriculture and the state reimburses the town the difference between what the landowner pays and the full tax based on fair market value.

Despite the amount of residential development in Norwich over the past 50 years, there are still many large parcels. The 2007 Grand List shows that 54 percent of the town's total acreage is in parcels of more than 50 acres (143 parcels) and that 32 percent is in parcels of more than 100 acres (55 parcels). Further, there remains a significant amount of cleared land in Norwich that is under-utilized, as many former farms have been divided into large lots. Some owners of these residential lots grow hay for sale, primarily to keep the land open, or brush-hog the pastures to keep growing hedgerows, juniper and pasture pines at bay. Limiting further fragmentation of these larger landholdings would have a number of benefits for the town including retaining a base of farm and forest land for future generations and protecting the rural character valued by current residents. Agricultural, forest, and open space land provide lower property tax receipts for the town than developed land; however, they also require very little in town services as compared with developed land. Agricultural, forest, and open space land does not provide children for the school or put any cars on town roads. This financial benefit to the town is in addition to the aesthetic benefits of living in a "rural" town and the environmental benefits of land conservation. In most cases, when open space land is developed for residential use, the additional new taxes do not cover the additional costs to the town over time. (See Chapter 4 for a more detailed analysis of the costs versus benefits of development.) Large developments in areas of town with limited access and facilities could be very costly for all taxpayers in the future.

Future Land Use

If Norwich is to protect its natural resources, preserve agricultural land, and maintain its rural character and scenic beauty, development will need to become less haphazard and more planned than it has been in recent decades. New economic forces have replaced those that shaped the town before the 1960s. The value of land is no longer in agriculture and logging, but in residential development. If left unregulated, residential development could occur in every "nook and cranny" that modern technology can find access and sewage disposal capability for, just as in the 19th-century, when the town was clear cut without restrictions with timber and sheep as the economic engine.

Land Use Planning Areas

For the purpose of describing the desired future land use patterns in Norwich, the town has been divided into land use planning areas as shown on Map 11. Their purpose is to describe the future land use pattern and character envisioned (or under consideration, as noted) in various parts of the town. The density, scale and mix of land uses appropriate for each land use planning area are identified and important land use issues are discussed below.

These areas are not intended to be regulatory, like zoning districts, and their boundaries are generalized. A land use planning area may encompass several zoning districts or, conversely, a single zoning district may include more than one land use planning area. The descriptions that follow are a sketch plan of the town's vision for its future. As with a conceptual architectural drawing, a set of blueprints will need to be drafted to construct the building. The town's land use regulations and related implementation tools are the detailed instructions that will ensure that the vision described in this land use plan is achieved over time.

Village and Adjacent Lands. These lands include the most densely developed parts of town and are accessible from state and interstate highways.

At the nucleus of this area is Norwich village - the historic center of the town. The village is densely developed, compact, human-scaled, pedestrian-oriented and mixed-use. It has a network of interconnected streets with sidewalks, street trees and buildings set close to the frontages. The village business district accommodates mixed-use development, commercial uses and civic spaces. Extending out from the downtown core are historic and more recently constructed residential neighborhoods.

It is the intent of this plan that Norwich village:

> Remain the heart of the community where civic buildings and uses are located.
>
> Retain its architectural integrity through the preservation of historic buildings and the compatible design of new structures.
>
> Be pedestrian, rather than automobile, oriented by providing sidewalks and trail connections, managing and calming traffic, and offering parking in a manner that maintains the aesthetic character of this historic center.

To support a compact settlement pattern, Norwich zoning regulations currently provide that Norwich village and adjacent lands can be developed at higher densities than lands more distant from this center. Residential neighborhoods near the village should provide sidewalks and trails that allow residents to walk to school, shopping, services, transit stops and employment. Open spaces and parks should be preserved to protect important resources and provide opportunities for outdoor recreation and a connection to nature.

Due to limited building space, parking constraints and traffic congestion, the existing village business district is most appropriate for businesses serving the needs of the community rather than those primarily drawing customers from outside Norwich. Because of transportation constraints and the desire to preserve the rural character of the town, the most appropriate location for commercial development serving regional markets is east of Route 5 South, which is currently zoned commercial and includes such businesses as King Arthur Flour.

Designated Village Center. The Norwich Village Center (Village Center) includes the Village Business Zoning District and additional area along Main Street north to the Norwich Public Library on Hazen Street and south to

the Norwich Historical Society and Marion Cross School. (See Map 12). The Village Center is part of the Norwich Village Historic District listed on the National Register of Historic Places. Approximately 23 of the principal structures in the Village Center are listed as “contributing buildings” to the Historic District. Uses include some residential properties, many Norwich businesses, the town hall, police and fire station, public library, elementary school, Historical Society, the Norwich Congregational Church and the Village Green.
The Village Center was previously a Designated Village Center under the Vermont Downtown Program but the designation could not be renewed due to a lack of specific support in the 2011 Norwich Town Plan. The Norwich Village center meets both the statutory definition of a Village Center and other state guidelines. The Village Center designation will make various tax credits available to property owners for improvements related to historic restoration, code compliance, and accessibility, and provides the town with priority consideration for various state grant programs. The town intends to reapply for the designation following adoption of this Town Plan. There are currently no plans to expand the Village Center to include Neighborhood Development Areas.

Route 5 South/River Road. The areas on the west side of Route 5 South and along River Road are served by state highways and easily accessible to Interstate 91, schools, municipal services, and public transportation.

However, a significant restraint on development in these areas is the lack of wastewater disposal infrastructure via a municipal wastewater facility or other alternative to individual on-site septic systems as well as public support. Due to poor soil conditions outside of the existing village, the capacity of on-site systems is limited. A municipal wastewater facility has been discussed and researched, but never built; this is possibly due to the cost, lack of an existing health hazard, fear of too much development, or a combination of these concerns. The 2005 Norwich Sewer Committee Report found that there was no immediate public health emergency and that the future need for municipal or community wastewater systems should be part of a long-term public town planning process.

Alternatives to a new municipal system include connections to wastewater treatment systems in Hanover or Hartford, or smaller, decentralized community systems utilizing new technologies.
In 2014-2015, the town commissioned a report to review options for these areas and in 2016, the Planning Commission began investigating the possibility of developing a new zoning district to make compact development more feasible in these areas and to increase the incentives in these areas for the development of affordable housing. A number of important considerations were raised in a public forum in 2017 about this concept, and the commission is presently considering how best to respond to and incorporate public input. The commission wishes to give further consideration to public input as well as the nuances of this important topic. Because such a zoning district is not presently authorized under this town plan, its creation would require a future change to the town plan.

Hamlets. The re-creation of "outlying villages" or hamlets, either in the historic locations of the original settlements or in new locations, would create a focus for denser residential development in specific locations. A hamlet is a small, compact cluster of homes, frequently organized around a crossroads, civic building or public space. It may contain less than a handful of residences or be large enough to support one or more small, neighborhood-serving businesses.
The land use planning area map shows several potential hamlet locations in existing or historic centers. Most commonly identified as potential hamlets are Beaver Meadow, Union Village, Pompanoosuc, and New Boston, but all of these locations have some severe natural resource limitations and may not be suitable. Other locations not currently developed may be more suitable. Establishing a hamlet should be considered whenever plans are being made to develop a large tract of outlying, rural land. Not all outlying lands are suited to support this development pattern, but compared to low-density, scattered development, it is a preferred alternative that can allow for growth while preserving rural character.

The creation of common cultural and recreational areas within these hamlets could create a sense of a local community. The Town of Norwich has become large enough that some of the advantages of a small community are at risk. Existing and new outlying hamlets could be enhanced to generate smaller communities. Small parcels of common land could facilitate this. Higher density in these areas could bring down the cost of housing, save open land and provide common recreational facilities, create more active communities, and save on town services.

Valley. Roads and streams radiate out from Norwich village to the west, north, and parallel to the Connecticut River to the east. These valleys contain level land suitable for development, but also scarce farmland, wetlands, and scenic vistas of the working landscape with hills in the background. Over the past several decades, the farm economy and development pressure has made it difficult for landowners to keep agricultural lands in productive use given the demand for and value of their property for residential development. Norwich, however, desires to maintain the rural character of its valley lands created through more than two centuries of productive use and retain a base of working farm and forest land for future generations.

The town has recognized that it needs to be creative and consider innovative techniques to achieve these goals. In order to preserve rural character while accommodating reasonable amounts of development, Norwich should consider use of cluster development on these valley lands. Clustering is a development technique that groups allowed development together on smaller lots with a significant amount of the original parcel set aside as open space or productive land.

Even well-planned development on rural lands often requires trade-offs. Is it better to protect scenic views by placing new development within a wooded area or are homes on open fields preferable to protect forested wildlife habitat? Are designs that place homes located near existing roads to minimize the need for costly infrastructure superior to those that place homes at the end of long access drives out of view of travelers on the public roads? The complexity of rural planning is that there is no right or wrong answer that can be applied town-wide. Each piece of land needs to be considered and assessed individually. The town's land use regulations should provide the flexibility to develop a rural parcel in the manner best suited to that particular piece of land and location.

Commercial development in the rural areas should be limited to businesses that will have a very low impact on town services or infrastructure and will not adversely affect the rural character and current residential or agricultural uses. The level and type of commercial activity should be compatible with existing residential uses and sensitive to natural resources in the area such as the Connecticut River.

Upland. Forested uplands dominate the western side of Norwich. Beyond the narrow stream valleys that extend up into the hills from the lowlands along the Connecticut River Valley, the terrain is steep and soils are shallow. Few roads bisect these areas with the result being large, unbroken tracts of forestland as shown on Map 10. Their physical character, value as wildlife habitat, fragile ecology and inaccessibility make these lands generally ill-suited for development other than low-impact recreation and sustainable forest uses. The ecological benefits of maintaining large blocks of unfragmented forest and wildlife habitat are discussed in the Natural and Historic Resources chapter of this Plan on pages 11-13 through 11-15

Low-impact development that has been carefully sited and designed may be appropriate within the town's upland areas, but the overall density of development should remain very low. Impacts to be minimized include tree clearing, disturbance of steep slopes, fragmentation of important wildlife habitat, and increased stormwater runoff and/or decreased water quality in upland streams. Recreational and forestry uses should be supported to the extent that they are undertaken in a sustainable manner that protects environmental quality. Scenic

resources, such as views of prominent ridgelines and hillsides from public roads, may be protected by directing development to less visible sites or maintaining an appropriate level of vegetative screening.

Goals, Objectives and Actions

Goal K Maintain and enhance Norwich's historic settlement pattern of compact village and rural countryside while accommodating growth at a sustainable rate.

Preserve and protect the town's natural resources, scenic beauty and rural character while managing growth in outlying areas.		

Action K.1.a To the extent development is proposed on larger parcels outside of the current village center, encourage clustered and compact development balanced by conservation of open space.

Action K.1.b Promote, through incentives in land use regulations, the clustering of residential housing with the goal of preserving larger contiguous parcels for farming, forestry and the preservation of open space.

Action K.1.c Consider creating incentives for clustering of residential housing and commercial developments in order to preserve natural resources and open lands.

Action K.1.d Support the use of conservation easements to preserve open space.

Action K.1.e Limit the allowed density for properties in outlying areas where there is limited access to services.

Direct new development to those locations best suited to accommodate it, particularly areas that are easily accessible to good roads, town services, schools and public transportation.		

Action K.2.a Develop guidelines and criteria to identify land that is physically capable of supporting development.

Action K.2.b Make inventories and maps of all protected natural resource areas readily available to all residents, landowners or their agents.

Action K.2.c Review the current zoning setbacks and protection zones for natural resource areas including wetlands, shorelines, and aquifers, and, if needed, establish new zones and setbacks.

Action K.2.d Maintain other protection areas such as steep slopes and ridgeline areas which may need additional evaluation on a site-specific basis prior to development. These areas should be clearly delineated on maps, and specific criteria and conditions for development should be established.

Limit commercial development through performance standards to a type, scale and design that is compatible with the character of the town and the neighborhood.		

Action K.3.a Use performance standards to allow the type of commercial development appropriate for each of three categories: (a) Outlying neighborhood services; (b) Village businesses; (c) Regional commercial development.

Action K.3.b Re-evaluate performance standards on an ongoing basis to determine their effectiveness and make changes as needed.

Action K.3.c Support the ability of Norwich residents to work from home or operate businesses on their residential property to the extent that the activity is compatible with surrounding land uses and does not adversely impact neighbors' quality of life.

Action K.3.d Allow for appropriate business/services needed in the community.

Action K.3.e Create criteria and performance standards for commercial uses in the rural residential areas to allow low-impact uses that will not adversely affect residential and agricultural uses.

Action K.3..f Ensure that commercial development provides public spaces such as seating for public use, picnic tables, flower beds or a small park.

Preserve and protect the character of Norwich village.		

Action K.4.a Encourage village businesses that are primarily intended to serve the needs of and enhance the vitality of the local community.

Action K.4.b Apply for state designation as a village center to recognize the town's efforts to maintain the vitality and livability of its historic village and to provide priority consideration for state grants and other resources.

Encourage and strengthen agricultural and forest industries.		

Action K.5.a Promote use of sound forest and agricultural management practices.

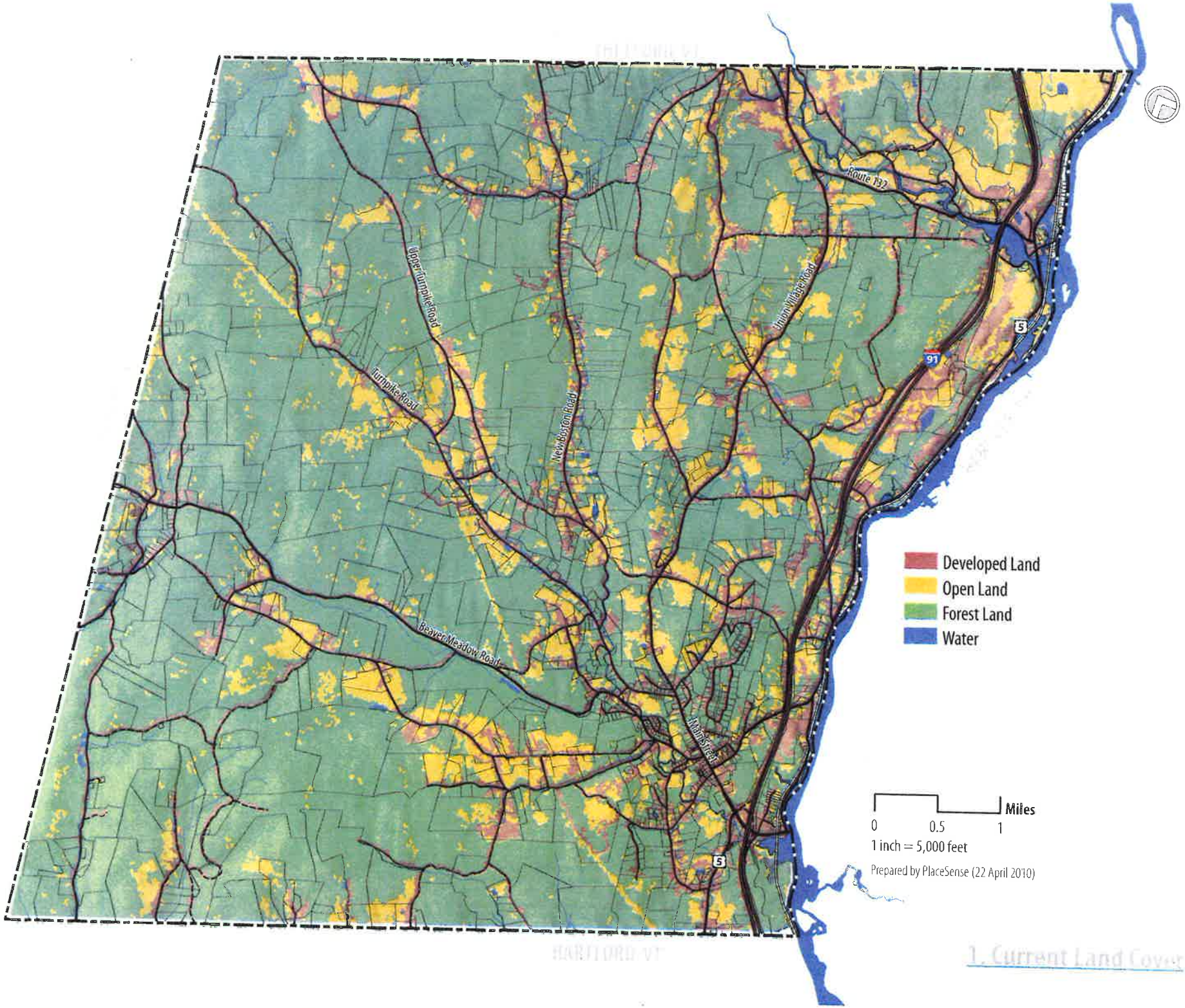
Action K.5.b Evaluate, define, map and protect prime agricultural soils.

Action K.5.c Implement strategies to enhance the long-term viability of agricultural and forestlands.

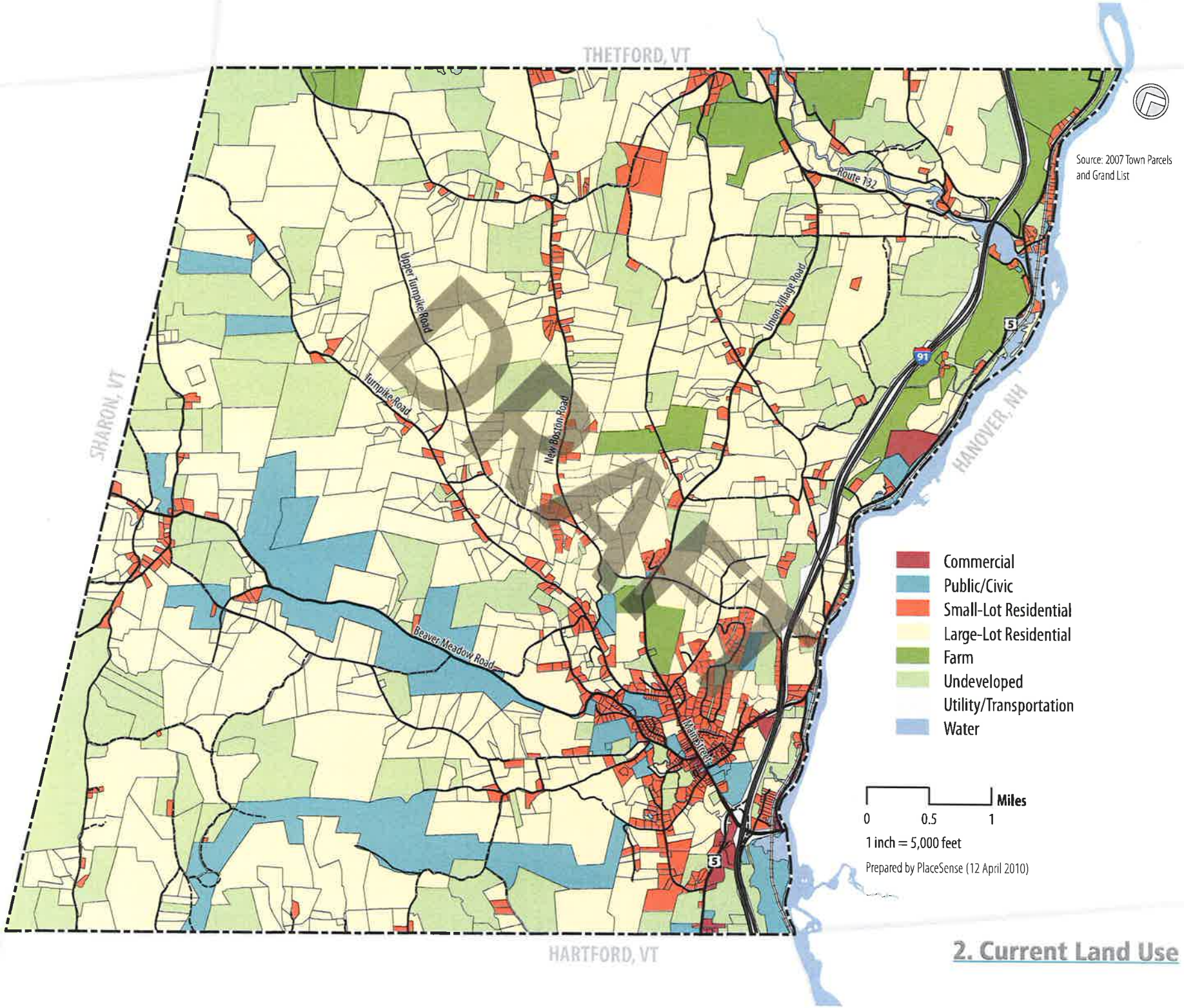
Action K.5.d Support the viability of working farms through: (a) non-restrictive zoning for agriculture; (b) allowing commercial uses that help support the agricultural uses and/or preservation of land for agriculture; and (c) property tax relief at the town level.

Action K.5.e Allow for the manufacture and marketing of value-added agricultural and forest products.

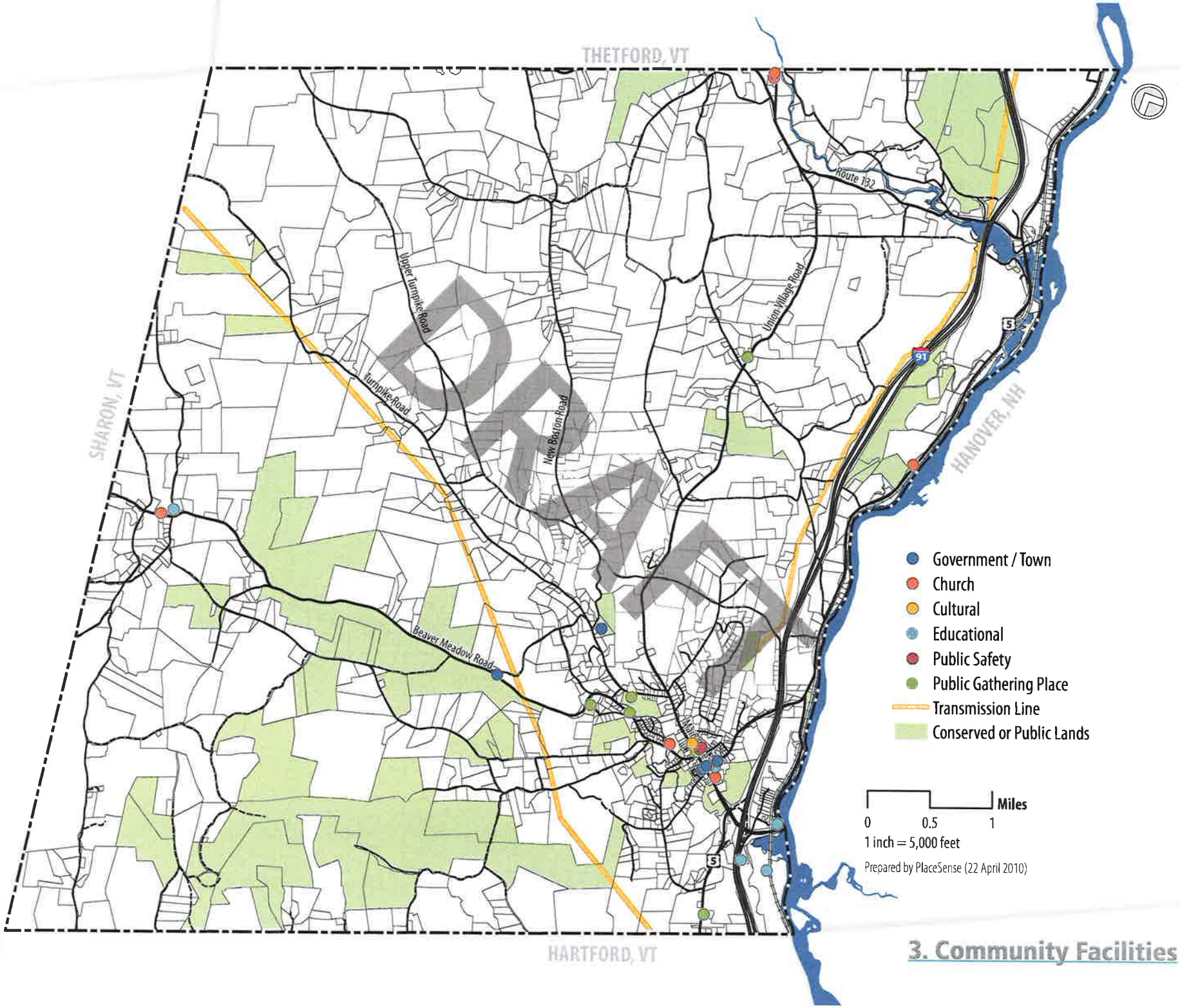
Action K.5.f Promote the sale and consumption of locally grown food products.



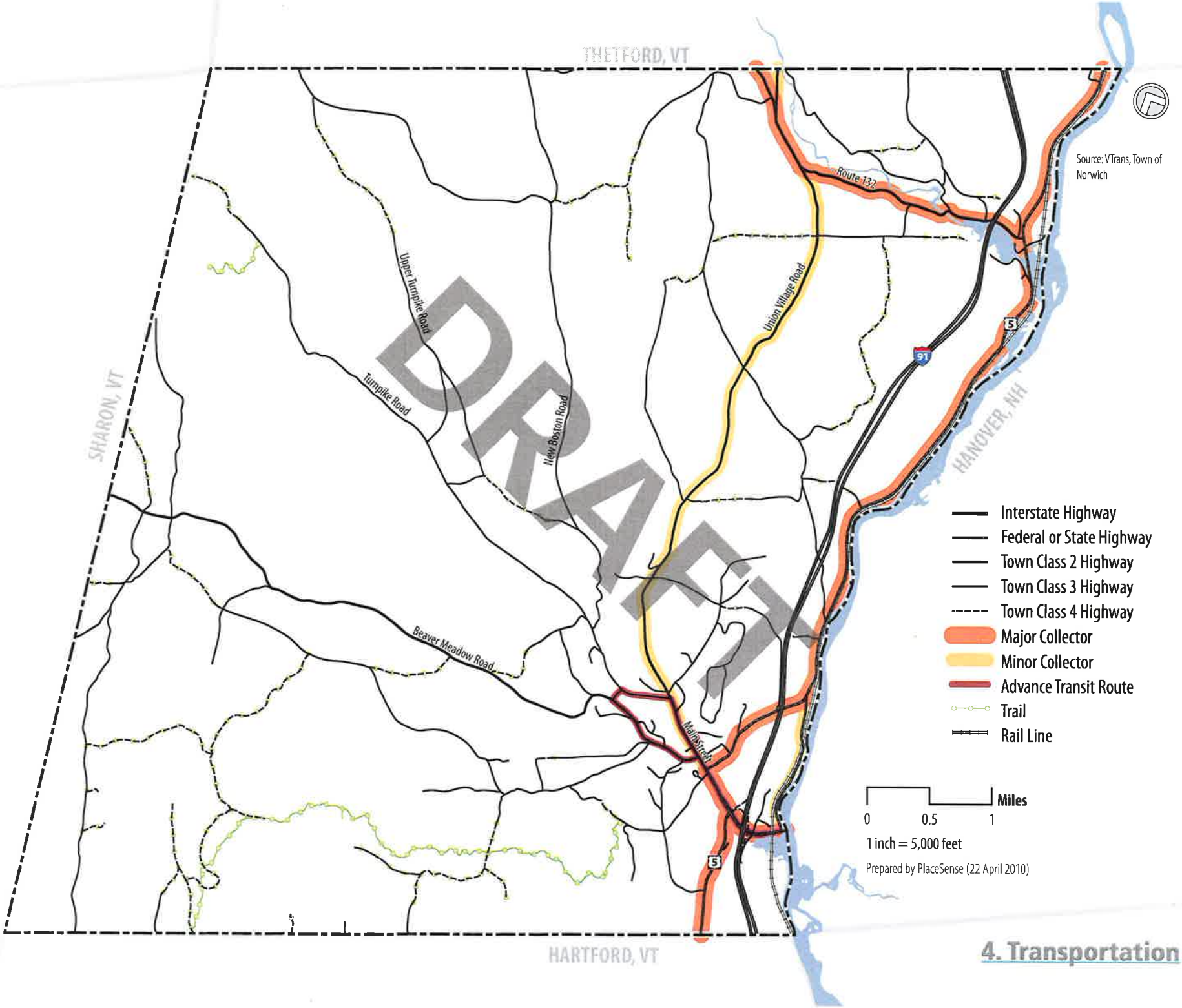
1. Current Land Cover

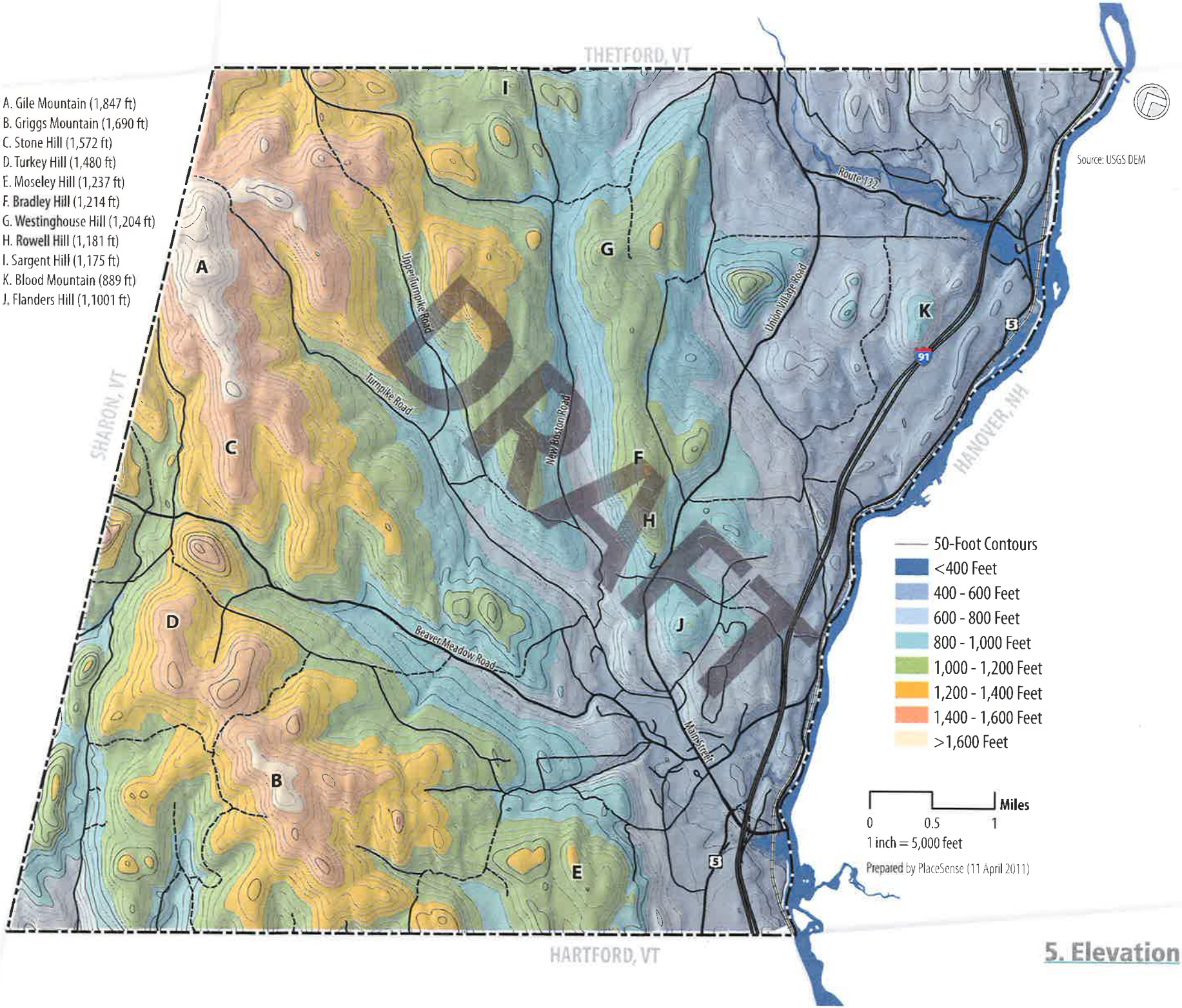


2. Current Land Use

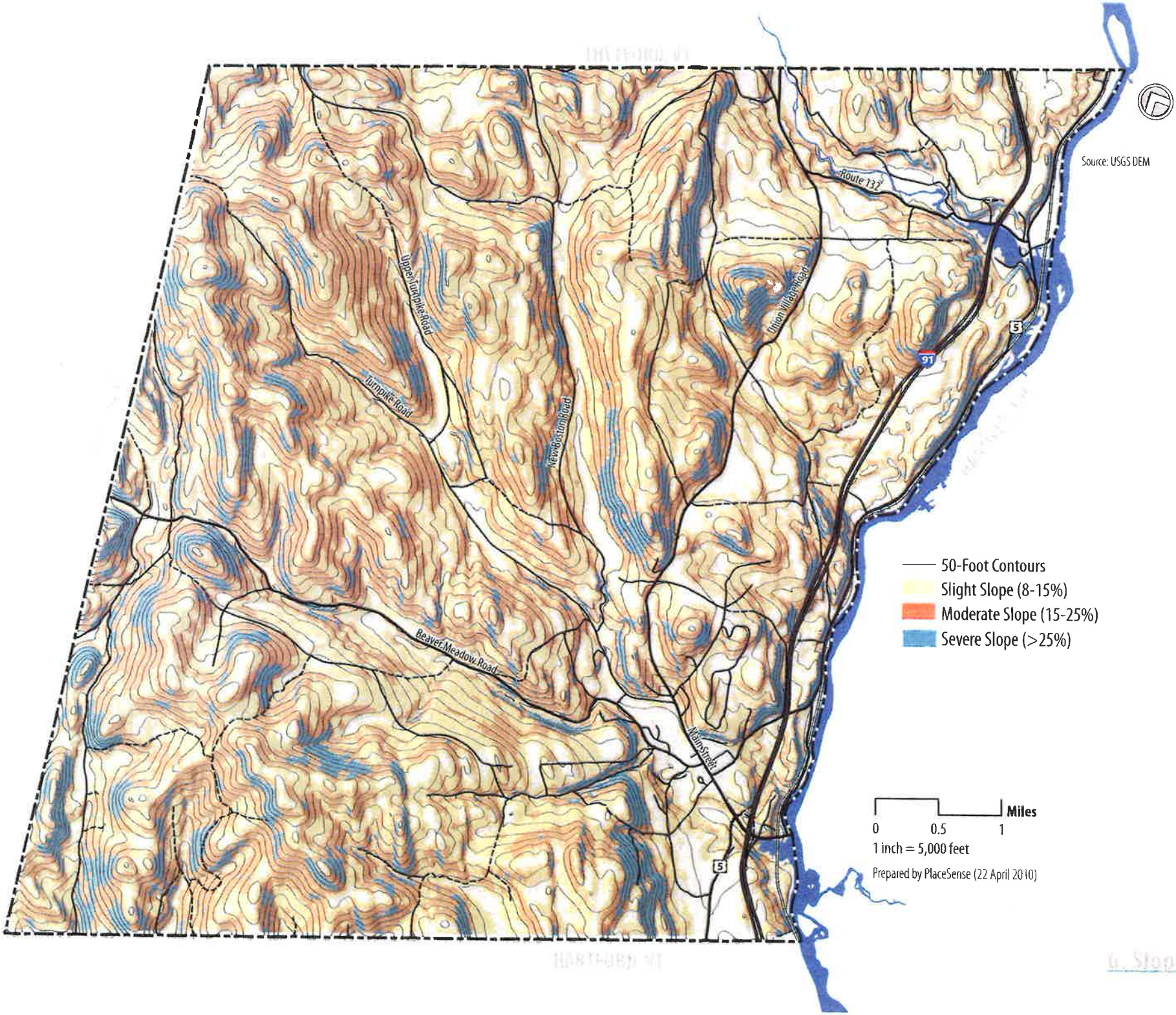


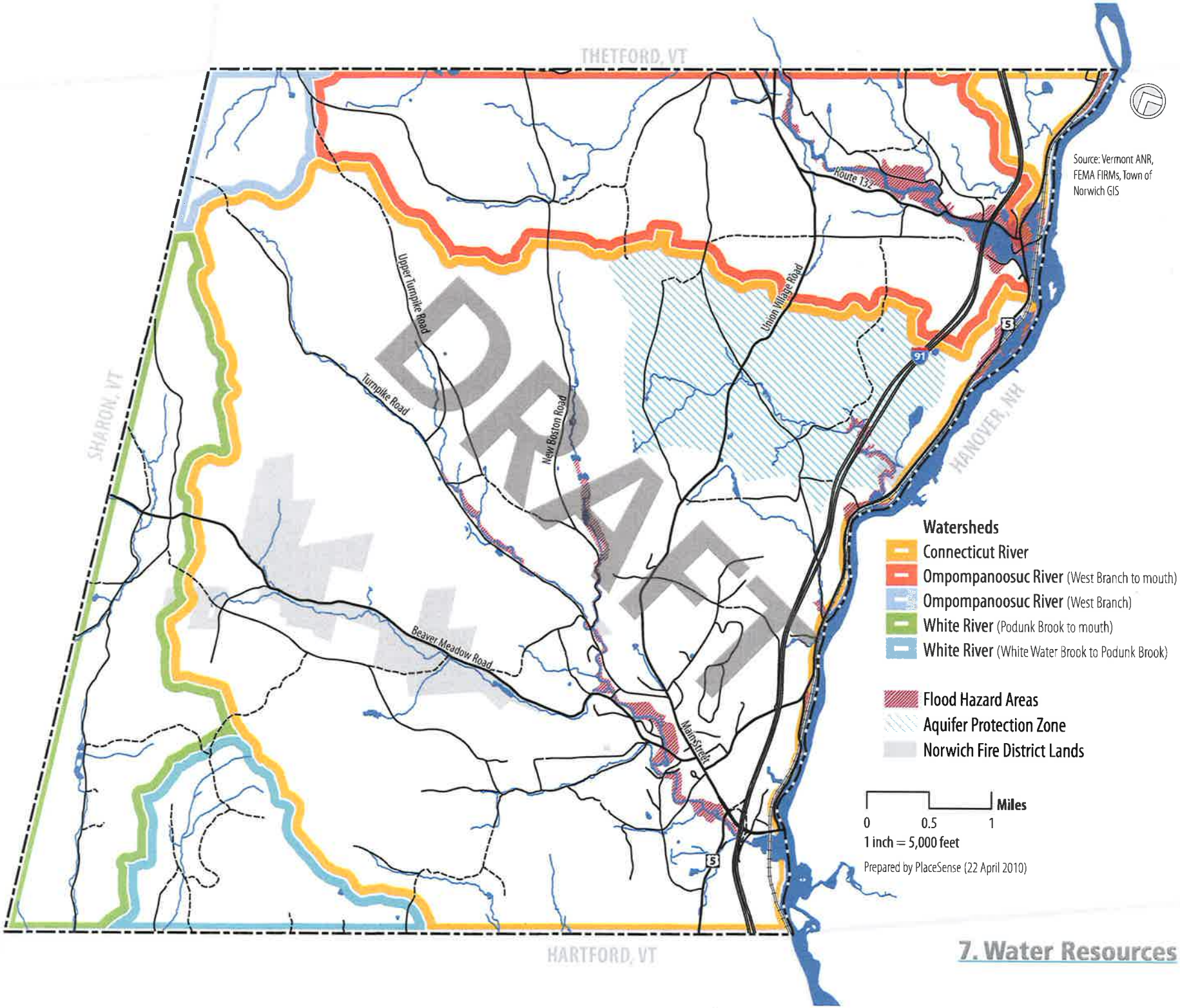
3. Community Facilities


THETFORD, VT
SHARON, VT
HANOVER, NH
HARTFORD, VT
DRAFT
Route 132
Upper Turnpike Road
Turnpike Road
New Boston Road
Union Village Road
Beaver Meadow Road
Main Street
5
91
Source: VTrans, Town of Norwich
Interstate Highway
Federal or State Highway
Town Class 2 Highway
Town Class 3 Highway
Town Class 4 Highway
Major Collector
Minor Collector
Advance Transit Route
Trail
Rail Line
Miles
0
0.5
1
1 inch = 5,000 feet
Prepared by PlaceSense (22 April 2010)

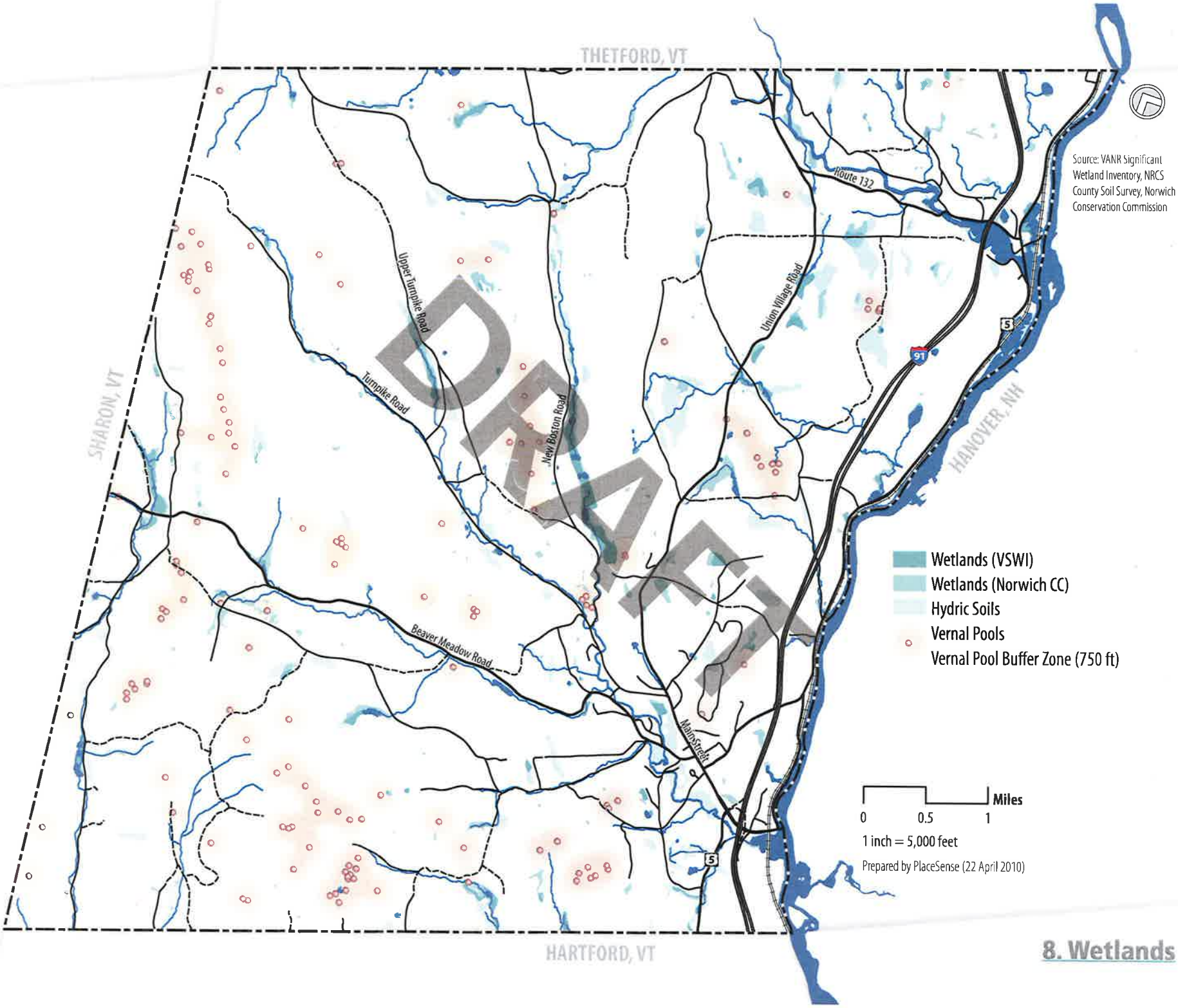

A. Gile Mountain (1,847 ft)
B. Griggs Mountain (1,690 ft)
C. Stone Hill (1,572 ft)
D. Turkey Hill (1,480 ft)
E. Moseley Hill (1,237 ft)
F. Bradley Hill (1,214 ft)
G. Westinghouse Hill (1,204 ft)
H. Rowell Hill (1,181 ft)
I. Sargent Hill (1,175 ft)
K. Blood Mountain (889 ft)
J. Flanders Hill (1,1001 ft)
THETFORD, VT
SHARON, VT
HANOVER, NH
HARTFORD, VT
Source: USGS DEM
Route 132
Upper Turnpike Road
Turnpike Road
New Boston Road
Union Village Road
Beaver Meadow Road
Mainstreet
91
5
DRAFT
50-Foot Contours
<400 Feet
400 - 600 Feet
600 - 800 Feet
800 - 1,000 Feet
1,000 - 1,200 Feet
1,200 - 1,400 Feet
1,400 - 1,600 Feet
>1,600 Feet
Miles
0
0.5
1
1 inch = 5,000 feet
Prepared by PlaceSense (11 April 2011)

5. Elevation

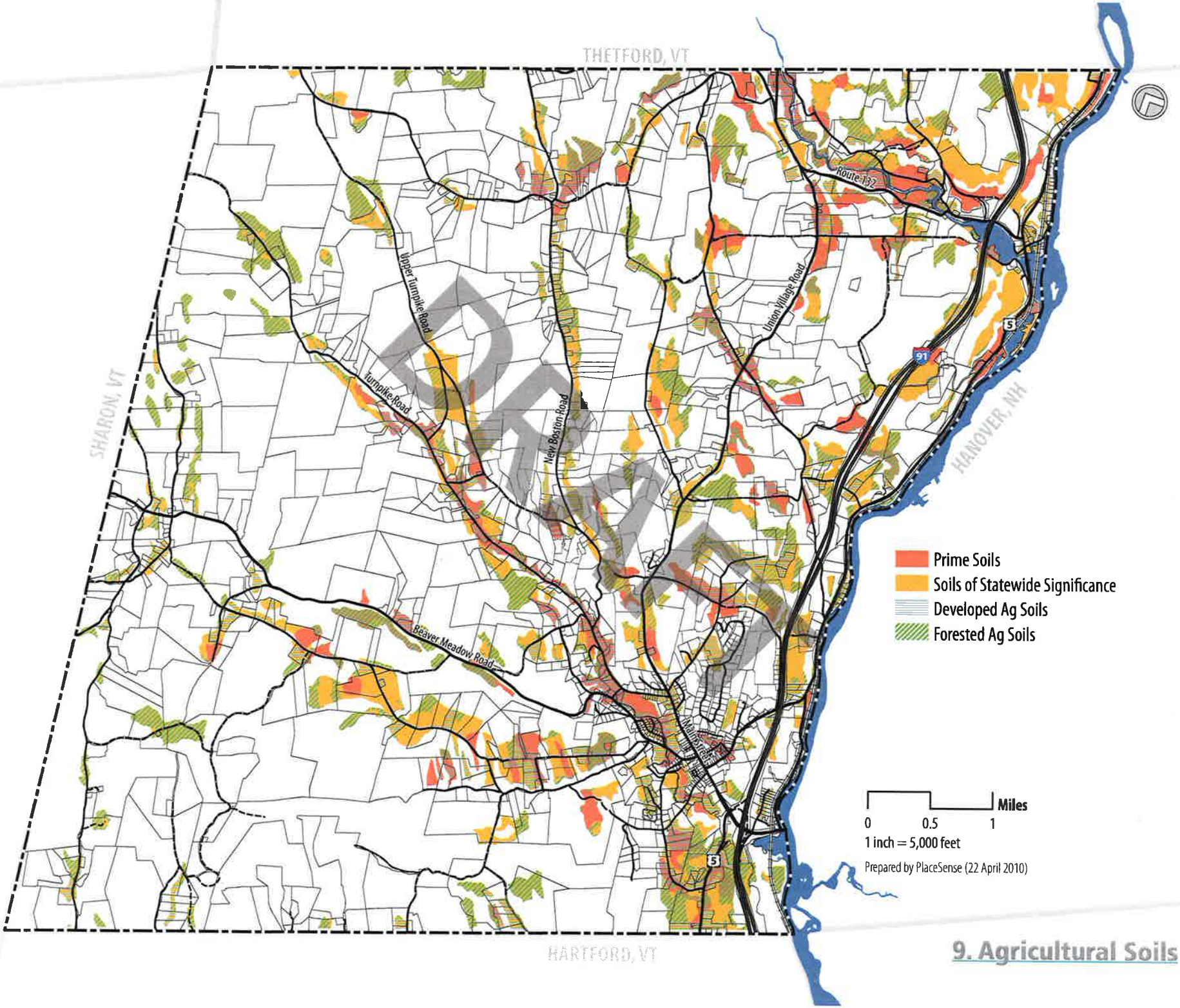

Source: USGS DEM
Route 132
Upper Turnpike Road
Turnpike Road
New Boston Road
Union Village Road
Beaver Meadow Road
Main Street
91
5
50-Foot Contours
Slight Slope (8-15%)
Moderate Slope (15-25%)
Severe Slope (>25%)
Miles
0
0.5
1
1 inch = 5,000 feet
Prepared by PlaceSense (22 April 2010)



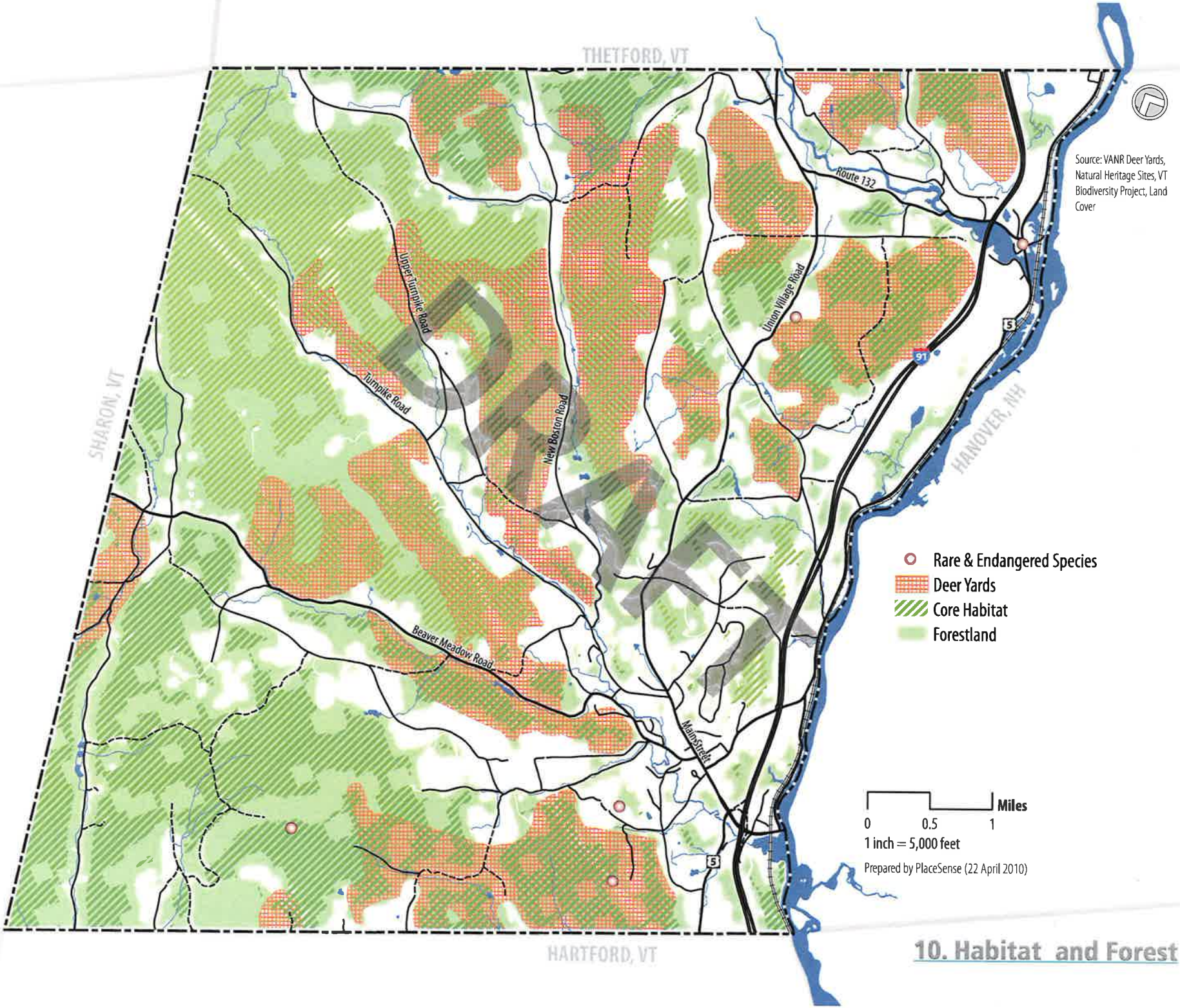
7. Water Resources


THETFORD, VT
SHARON, VT
HANOVER, NH
HARTFORD, VT
Route 132
Upper Turnpike Road
Turnpike Road
New Boston Road
Union Village Road
Beaver Meadow Road
Main Street
5
91
DRAFT
Source: VANR Significant Wetland Inventory, NRCS County Soil Survey, Norwich Conservation Commission
Wetlands (VSWI)
Wetlands (Norwich CC)
Hydric Soils
Vernal Pools
Vernal Pool Buffer Zone (750 ft)
Miles
0
0.5
1
1 inch = 5,000 feet
Prepared by PlaceSense (22 April 2010)

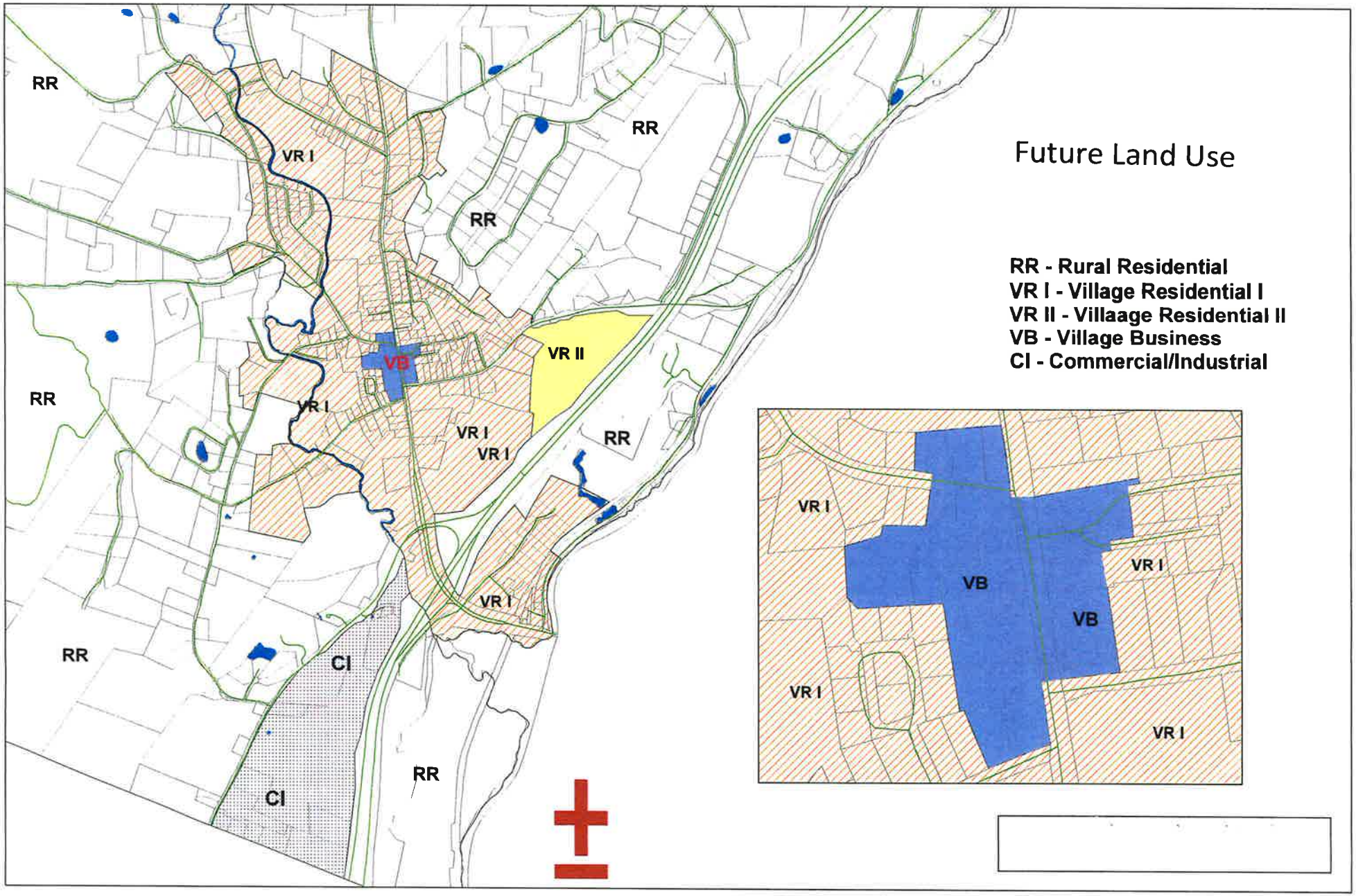
8. Wetlands

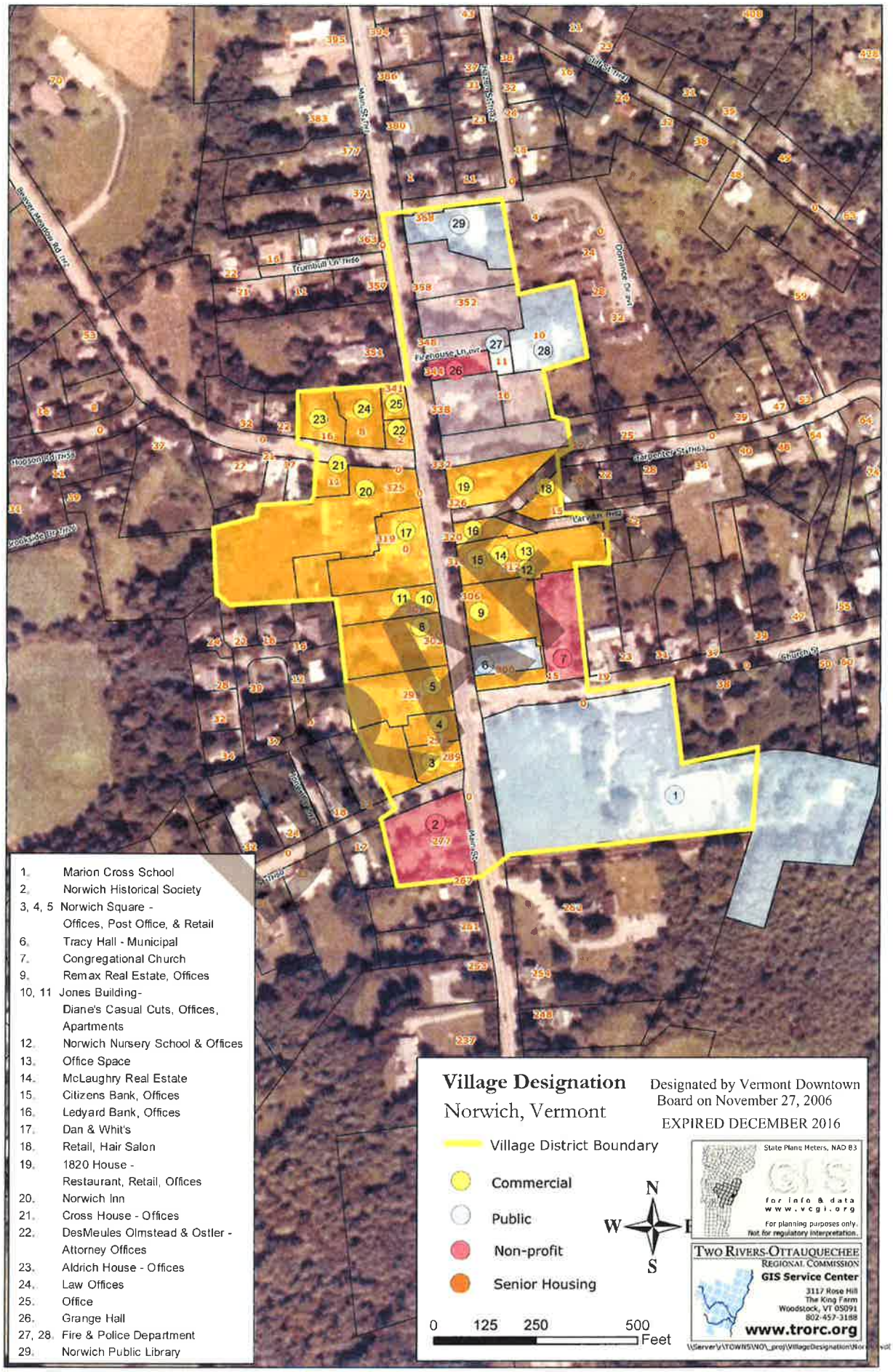


9. Agricultural Soils



10. Habitat and Forest


Future Land Use
RR - Rural Residential
VR I - Village Residential I
VR II - Villaage Residential II
VB - Village Business
CI - Commercial/Industrial
RR
VR I
VR II
VB
CI


Village Designation
Norwich, Vermont
Designated by Vermont Downtown Board on November 27, 2006
EXPIRED DECEMBER 2016
Village District Boundary
Commercial
Public
Non-profit
Senior Housing
N
W
E
S
0 125 250 500 Feet
State Plane Meters, NAD 83
for info & data www.vcgi.org
For planning purposes only. Not for regulatory interpretation.
TWO RIVERS-OTTAUQUECHEE REGIONAL COMMISSION
GIS Service Center
3117 Rose Hill
The King Farm
Woodstock, VT 05091
802-457-3188
www.trorc.org
1. Marion Cross School
2. Norwich Historical Society
3, 4, 5 Norwich Square - Offices, Post Office, & Retail
6. Tracy Hall - Municipal
7. Congregational Church
9. Remax Real Estate, Offices
10, 11 Jones Building- Diane's Casual Cuts, Offices, Apartments
12. Norwich Nursery School & Offices
13. Office Space
14. McLaughry Real Estate
15. Citizens Bank, Offices
16. Ledyard Bank, Offices
17. Dan & Whit's
18. Retail, Hair Salon
19. 1820 House - Restaurant, Retail, Offices
20. Norwich Inn
21. Cross House - Offices
22. DesMeules Olmstead & Ostler - Attorney Offices
23. Aldrich House - Offices
24. Law Offices
25. Office
26. Grange Hall
27, 28. Fire & Police Department
29. Norwich Public Library

Appendix

Table of Contents of Figures

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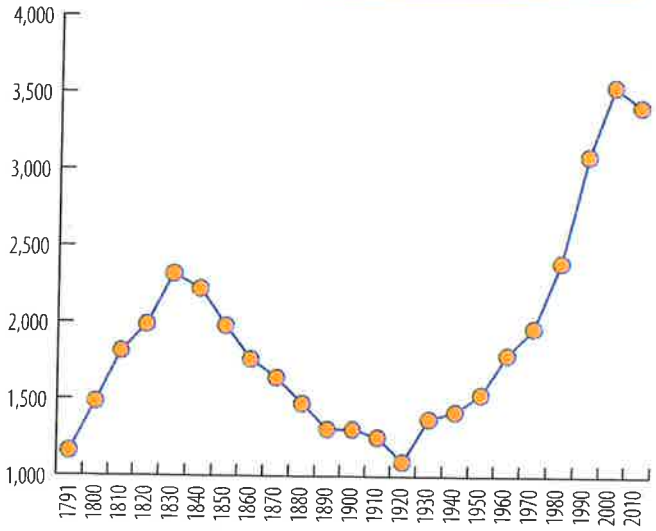
FIGURE 4-1: Norwich Historic Population Table

YEAR	POPULATION	YEAR	POPULATION	YEAR	POPULATION
1791	1,158	1890	1,304	1990	3,093
1800	1,482	1900	1,303	2000	3,544
1810	1,812	1910	1,252	2010	3,414
1820	1,985	1920	1,092		
1830	2,316	1930	1,371		
1840	2,218	1940	1,418		
1850	1,978	1950	1,532		
1860	1,759	1960	1,790		
1870	1,639	1970	1,966		
1880	1,471	1980	2,396		

SOURCE: US Census

FIGURE 4-2: Norwich Population Table



SOURCE: US Census

FIGURE 4-3: Comparison of Recent Population Trends

	TOTAL POPULATION							POPULATION CHANGE BY DECADE (ABSOLUTE AND AVERAGE ANNUAL RATE)											
	1950	1960	1970	1980	1990	2000	2010	1950s		1960s		1970s		1980s		1990s		2000s	
Norwich	1,532	1,790	1,966	2,396	3,093	3,544	3,414	258	1.6%	176	0.9%	430	2.0%	697	2.6%	451	1.4%	-130	-0.4%
Windsor Cty.	40,855	42,483	44,082	51,030	54,055	57,418	56,670	1,628	0.4%	1,599	0.4%	6,948	1.5%	3,025	0.6%	3,363	0.6%	-748	-0.1%
Lebanon LMA	41,408	44,460	48,389	58,361	66,636	74,084	78,152	3,052	0.7%	3,230	0.9%	9,972	1.9%	8,275	1.3%	7,448	1.1%	4,068	0.5%
Vermont	377,738	389,881	444,731	511,456	562,758	608,827	625,741	12,143	0.3%	54,850	1.3%	66,725	1.4%	51,302	1.0%	46,069	0.8%	16,914	0.3%

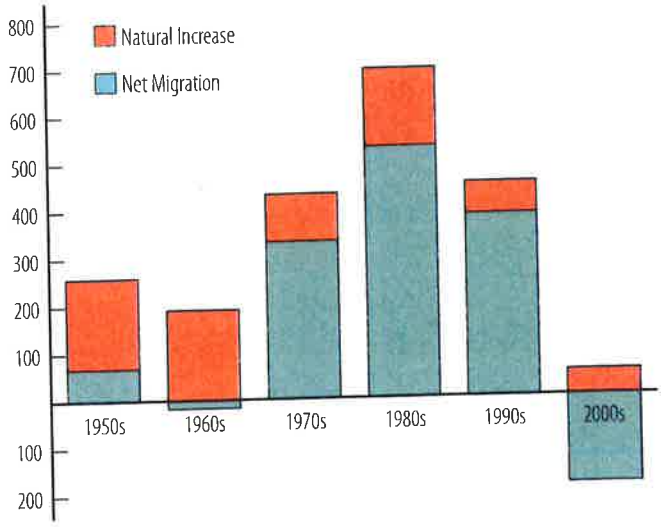
SOURCE: US Census

FIGURE 4-4: Norwich Recent Population Table

YEAR	POPULATION	YEAR	POPULATION	YEAR	POPULATION	YEAR	POPULATION
1980	2,398	1990	3,093	2000	3,544	2010	3,414
1981	2,468	1991	3,138	2001	3,575	2011	3,433
1982	2,527	1992	3,182	2002	3,591	2012	3,423
1983	2,590	1993	3,246	2003	3,582	2013	3,396
1984	2,653	1994	3,300	2004	3,562	2014	3,400
1985	2,717	1995	3,355	2005	3,525	2015	3,393
1986	2,785	1996	3,404	2006	3,513		
1987	2,858	1997	3,426	2007	3,505		
1988	2,941	1998	3,460	2008	3,523		
1989	3,028	1999	3,502	2009	3,516		

SOURCE: Vermont Department of Health and US Census Decennial Counts.

FIGURE 4-6: Norwich's Population Change



SOURCE: Vermont Department of Health

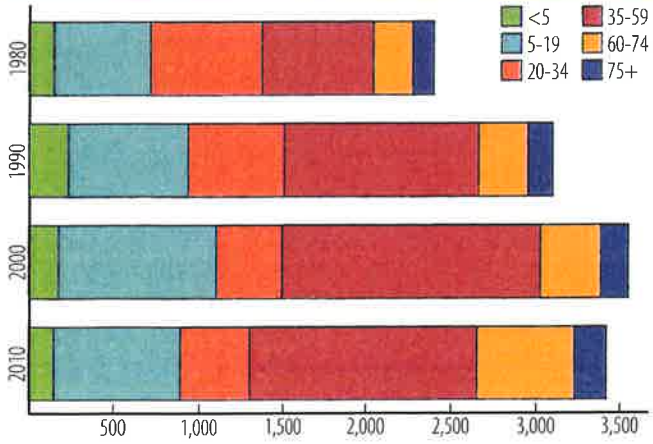
FIGURE 4-5: Vital Statistics and Natural Increase

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Births	21	29	38	31	30	36	30	43	38	53	36	37	20	20	18	24	23	21	23	28
Deaths	13	18	27	16	21	21	18	16	14	19	25	18	13	23	19	17	16	21	19	12
Natural Increase	8	11	11	15	9	15	12	27	24	34	11	19	7	-3	-1	7	7	0	4	16

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Births	24	22	21	20	26	23	28	23	13	21	23	17	18	16	25
Deaths	15	17	22	13	20	19	16	12	14	19	17	14	16	14	23
Natural Increase	9	5	-1	7	6	4	12	11	-1	2	6	3	2	2	2

SOURCE: Vermont Department of Health

FIGURE 4-7: Age Distribution in Norwich 1980 to 2010



SOURCE: US Census

FIGURE 4-8: Age Distribution Table

	<5		5-9		10-17		18-24		25-34		35-44		45-54		55-64		65-74		75-84		85+	
Norwich (1990)	225	7%	254	8%	391	12%	180	6%	489	16%	591	19%	439	14%	246	8%	187	6%	102	3%	31	1%
Norwich (2000)	166	5%	246	7%	625	18%	174	5%	277	8%	558	16%	735	21%	347	11%	224	6%	120	3%	45	1%
Norwich (2010)	142	4%	221	6%	463	14%	176	5%	294	9%	387	11%	650	19%	588	17%	302	9%	148	4%	43	1%
Windsor Cty. (2010)		5%		5%		10%		6%		11%		12%		17%		16%		10%		5%		3%
Lebanon LMA (2010)		5%		5%		10%		10%		12%		12%		16%		15%		8%		5%		2%
Vermont (2010)		5%		6%		10%		10%		11%		13%		16%		14%		8%		5%		2%

SOURCE: US Census

FIGURE 4-9: Household Growth Trends

	TOTAL HOUSEHOLDS						ABSOLUTE AND PERCENT CHANGE										
	1960	1970	1980	1990	2000	2010	1960S		1970S		1980S		1990S		2000S	
Norwich	546	646	907	1,195	1,367	1,386	100	18%	261	40%	288	32%	172	14%	19	1.4%
Windsor County	12,653	14,089	19,082	21,523	24,162	24,753		11%		35%		13%		12%		2.4%
Vermont	110,754	132,041	178,394	210,650	240,634	256,442		19%		35%		18%		14%		6.6%

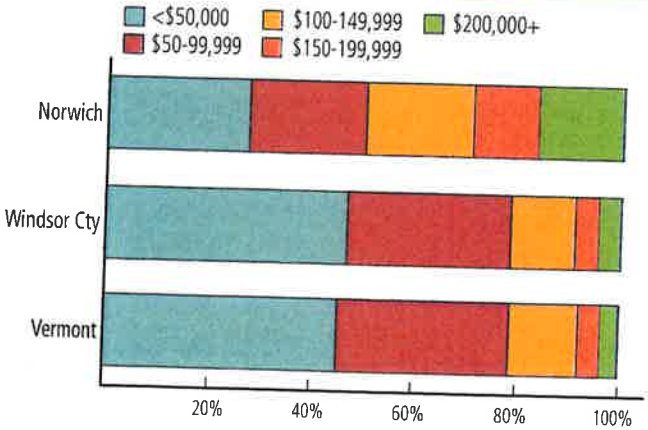
SOURCE: US Census

FIGURE 4-10: Household Composition Table

	NON-FAMILY				FAMILY									
	SINGLE-PERSON		MULTI-PERSON		MARRIED COUPLE W/ CHILDREN		MARRIED COUPLE W/O CHILDREN		FEMALE SINGLE-PARENT		MALE SINGLE-PARENT		OTHER	
Norwich (1990)	306	26%	94	8%	367	31%	320	27%	75	6%	18	1%	15	1%
Norwich (2000)	331	24%	91	7%	445	33%	349	25%	89	6%	28	2%	34	2%
Norwich (2010)	353	25%	88	6%	360	26%	463	33%	61	4%	20	1%	41	3%
Windsor Cty. (2010)		30%		8%		17%		32%		6%		2%		5%
Vermont (2010)		28%		9%		18%		30%		7%		3%		5%

SOURCE: US Census

FIGURE 4-11: Households by Income Group, 2015



SOURCE: US Census Bureau 2011-2015 American Community Survey

FIGURE 4-12: Income Comparison

NORWICH	PER CAPITA INCOME	MEDIAN HOUSEHOLD INCOME	MEDIAN FAMILY INCOME
1980	$27,900	$38,500	$72,800
1990	$37,100	$77,400	$106,000
2000	$48,600	$90,800	$107,600
2015	$54,300	$99,700	$125,800

WINDSOR COUNTY	PER CAPITA INCOME	MEDIAN HOUSEHOLD INCOME	MEDIAN FAMILY INCOME
1980	$20,200	$44,100	$51,200
1990	$25,900	$53,000	$62,900
2000	$30,800	$56,000	$67,400
2015	$32,500	$53,000	$70,700

VERMONT	PER CAPITA INCOME	MEDIAN HOUSEHOLD INCOME	MEDIAN FAMILY INCOME
1980	$17,700	$42,500	$49,500
1990	$24,600	$54,000	$63,200
2000	$28,400	$56,200	$67,000
2015	$29,900	$55,000	$70,000

SOURCE: US Census Bureau (1980, 1990, 2000 Decennial Census & 2011-15 American Community Survey). Adjusted to 2015$ using the Consumer Price Index.

5-A

FIGURE 4-13: Local Population Projections

	CENSUS			PROJECTION				
AGE	1990	2000	2010	2020	2025	2030	2035	2040
0 - 4	225	166	142	139	144	158	150	145
5 - 9	267	246	221	149	164	170	187	177
10 - 14	251	388	310	189	168	184	191	211
15 - 19	183	298	208	246	187	166	182	189
20 - 24	137	113	121	273	218	166	147	162
25 - 29	195	125	174	145	212	170	130	115
30 - 34	239	152	120	88	137	197	159	123
35 - 39	319	234	180	179	95	150	211	172
40 - 44	320	324	207	150	210	111	175	243
45 - 49	241	390	313	215	161	227	120	189
50 - 54	150	345	337	214	213	162	229	120
55 - 59	133	236	317	286	197	199	151	215
60 - 64	113	138	271	280	263	181	184	142
65 - 69	102	108	185	272	267	254	175	181
70 - 74	74	116	117	221	244	241	235	162
75 - 79	64	74	78	145	200	221	219	215
80 - 84	54	46	70	81	117	161	183	184
85+	26	45	43	50	62	87	122	145
Total	3,093	3,544	3,414	3,322	3,259	3,205	3,150	3,090

SOURCE: Local projections based on average Windsor County fertility and migration rates from 2010 to 2014.

FIGURE 4-14: Comparison of Town and School Budgets

	1980	1985	1990	FY1995	FY2000	FY2005	FY2010	FY2015
Town	$736,000	$838,000	$1,493,000	$1,692,900	$2,184,200	$3,044,100	$4,049,208	$4,542,986
2015$	$2,114,900	$1,845,800	$2,709,600	$2,632,800	$3,004,400	$3,694,300	$4,401,300	$4,543,000
per capita (2015$)	$880	$680	$880	$780	$850	$1,050	$1,290	$1,340
Norwich School	$927,000	$1,054,000	$2,350,000	$2,640,700	$3,359,500	$3,554,200	$4,651,858	$5,040,828
2015$	$2,663,800	$2,321,600	$4,265,000	$4,106,800	$4,621,000	$4,313,300	$5,056,400	$5,040,800
per pupil (2015$)	$11,290	$8,380	$10,960	$8,430	$13,510	$14,100	$16,580	$16,260
Dresden School	$1,419,000	$3,534,000	$6,161,000			$4,941,900	$6,134,161	$6,742,850
2015$	$4,077,600	$7,784,100	$11,181,500			$5,997,500	$6,667,600	$6,742,900
per pupil (2015$)						$16,520	$20,080	$23,830

SOURCE: Norwich Town Reports and SAU#70 Annual Reports

FIGURE 4-15: Comparison of Average Taxes on a Residence

	1980	1992	1998	2003	2010	2016
Norwich	$1,250	$3,290	$4,630	$6,820	$8,850	$10,020
2016$	$3,640	$5,620	$6,820	$8,900	$9,730	$10,020
Vermont	$580	$1,010	$2,050	$2,360	$3,960	$4,790
2016$	$1,680	$1,730	$3,020	$3,070	$4,350	$4,790

SOURCE: Vermont Department of Taxes. Represents taxes on the average R-1 property. Adjusted to 2016$ using the Consumer Price Index.

FIGURE 4-16: 2007 Cost of Community Services

MUNICIPAL	EXPENDITURES	REVENUES	TAXES PAID	RATIO
Residential	$3,170,148	$501,155	$2,699,702	$0.99
Com. / Ind.	$254,792	$30,602	$178,311	$1.26
Undeveloped	$221,502	$24,723	$281,883	$0.70
Public	$84,619	$12,506	$3,187	$22.63

SCHOOL	EXPENDITURES	REVENUES	TAXES PAID	RATIO
Residential	$11,937,475		$10,092,089	$1.18
Com. / Ind.	$0		$710,111	$0
Undeveloped	$0		$1,122,582	$0
Public	$0		$12,693	$0

TOTAL	EXPENDITURES	REVENUES	TAXES PAID	RATIO
Residential	$14,606,468	$501,155	$12,761,082	$1.14
Com. / Ind.	$224,191	$30,602	$934,302	$0.24
Undeveloped	$196,779	$24,723	$1,319,361	$0.15
Public	$72,113	$12,506	$84,807	$0.85

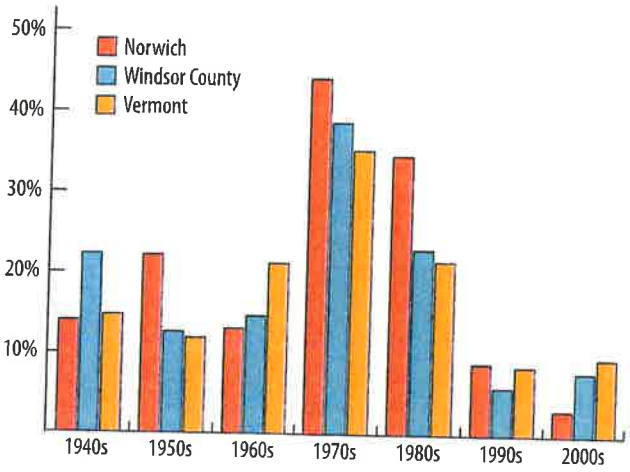
SOURCE: Norwich 2007 Grand List and FY2007 Actual Budget. Ratio is expressed as expense per $1 of revenue. School expenditures is amount to be raised through taxes.

FIGURE 5-1: Housing Unit Count

	1940	1950	1960	1970	1980	1990	2000	2010
Norwich	454	517	631	713	1,027	1,382	1,505	1,553
Windsor Cty	11,112	13,579	15,283	17,508	24,275	29,849	31,621	34,118
Lebanon LMA				17,428	24,796	31,319	33,625	38,401
Vermont	106,362	121,911	136,307	165,063	223,198	271,214	294,382	322,539

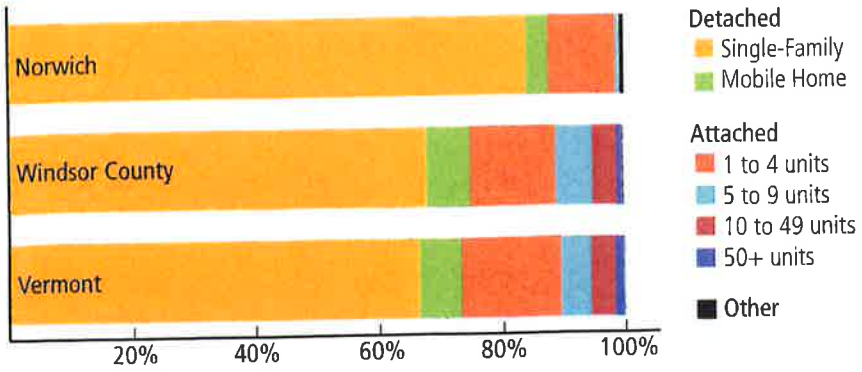
SOURCE: US Census

FIGURE 5-2: Percent Change in Housing Units



SOURCE: US Census

FIGURE 5-3: Comparison of Housing Types, 2015



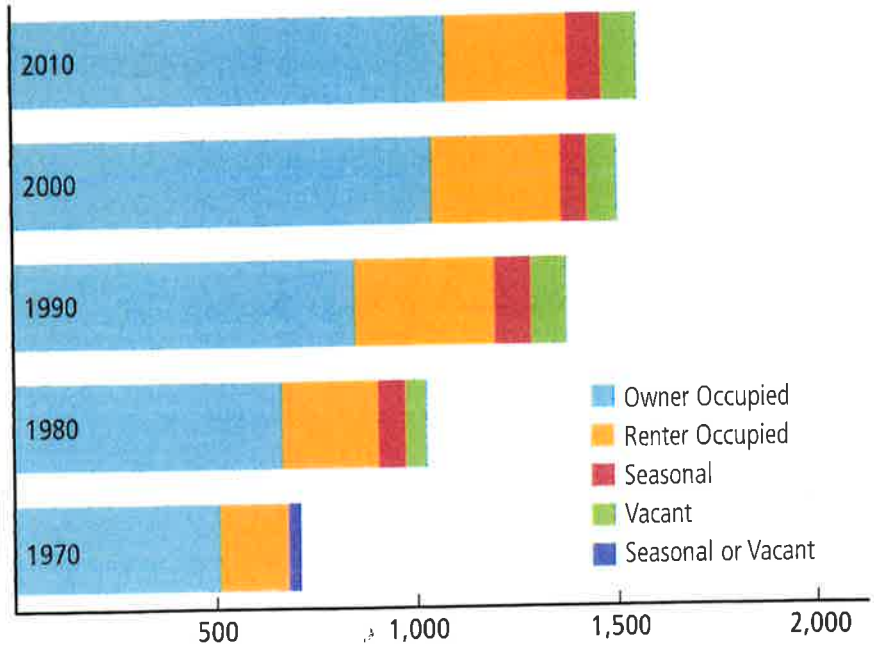
SOURCE: US Census Bureau, American Community Survey 2011-2015

FIGURE 5-4: Norwich's Housing Units by Structure Type

	DETACHED				ATTACHED							
	SINGLE-FAMILY		MOBILE HOME		1 TO 4 UNITS		5 TO 9 UNITS		10+ UNITS		OTHER	
1990	1,045	75.6%	48	3.5%	163	11.8%	64	4.6%	0	-	62	4.5%
2000	1,290	85.7%	36	2.4%	131	8.7%	18	1.2%	24	1.6%	6	0.4%
2015	1,373	83.9%	60	3.7%	183	11.2%	9	0.6%	0	-	11	0.7%

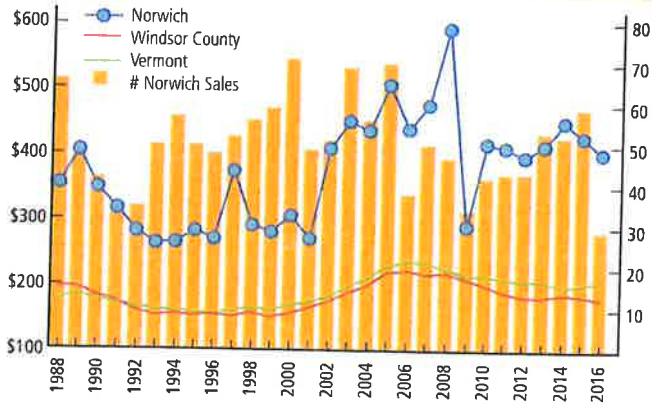
SOURCE: US Census Bureau (1990 and 2000 data from Decennial Census and 2015 data from the 2011-2015 American Community Survey)

FIGURE 5-5: Housing Occupancy in Norwich



SOURCE: US Census

FIGURE 5-6: Comparison of Residential Sales



SOURCE: Vermont Housing Data and Vermont Department of Taxes. Median sales of primary residences expressed in 1,000$ and adjusted to 2016$ using the CPI.

FIGURE 5-7: Sales of Primary Residences in Norwich

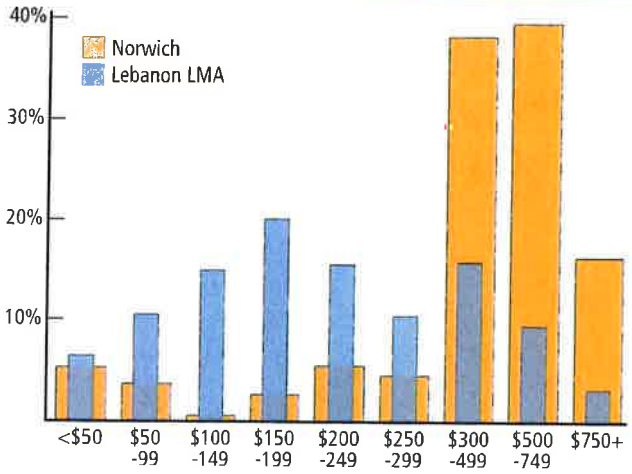
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Median Value	$350,700	$401,530	$345,280	$313,040	$278,720	$260,660	$262,240	$279,940	$267,370	$370,750
# of Sales	66	48	42	33	35	50	57	50	48	52

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Median Value	$287,790	$277,380	$302,610	$267,740	$405,800	$447,810	$433,460	$503,460	$435,660	$472,700
# of Sales	56	59	71	49	51	69	56	70	38	50

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Median Value	$589,210	$287,850	$414,130	$408,320	$394,220	$412,000	$447,950	$425,000	$400,000
# of Sales	47	34	42	43	43	53	52	59	29

SOURCE: Vermont Housing Data and Vermont Department of Taxes (adjusted to 2016$ using the CPI)

FIGURE 5-8: Comparison of Housing Values



SOURCE: 2011-15 Census ACS (values expressed in thousands of dollars)

FIGURE 5-9: Comparison of Households by Age & Income

NORWICH

	<25		25 TO 44		45 TO 64		65+	
<$50,000	7	0.5%	61	4.5%	174	12.9%	128	9.5%
$50-99,999	0		136	10.1%	86	6.4%	86	6.4%
$100-149,999	12	0.9%	88	6.5%	109	8.1%	69	5.1%
$150-199,999	0		38	2.8%	108	8.0%	22	1.6%
$200,000+	0		13	1.0%	153	11.3%	59	4.4%

LEBANON MICROPOLITAN STATISTICAL AREA

	<25		25 TO 44		45 TO 64		65+	
<$50,000	2,242	2.5%	9,135	10.3%	14,539	16.3%	14,519	16.3%
$50-99,999	613	0.7%	9,339	10.5%	13,207	14.8%	6,158	6.9%
$100-149,999	76	0.1%	3,147	3.5%	6,209	7.0%	1,894	2.1%
$150-199,999	23	0.0%	976	1.1%	2,493	2.8%	514	0.6%
$200,000+	0		747	0.8%	2,270	2.5%	1,009	1.1%

SOURCE: US Census Bureau 2011-15 American Community Survey

FIGURE 5-10: Housing Affordability in Norwich

HUD ANNUAL INCOME LIMITS (2016)

	1-PERSON	2-PERSON	3-PERSON	4-PERSON
200% of Median	$101,340	$115,860	$130,260	$144,620
150% of Median	$76,010	$86,900	$97,700	$108,470
120% of Median	$60,800	$69,520	$78,160	$86,770
100% of Median	$50,670	$57,930	$65,130	$72,310
80% of Median	$40,500	$46,300	$52,100	$57,850
50% of Median	$25,350	$28,950	$32,550	$36,150
30% of Median	$15,200	$17,400	$19,550	$21,700

AFFORDABLE MONTHLY HOUSING COSTS (30% INCOME)

	1-PERSON	2-PERSON	3-PERSON	4-PERSON
200% of Median	$2,500	$2,900	$3,300	$3,600
150% of Median	$1,900	$2,200	$2,400	$2,700
120% of Median	$1,500	$1,700	$2,000	$2,200
100% of Median	$1,300	$1,400	$1,600	$1,800
80% of Median	$1,000	$1,200	$1,300	$1,400
50% of Median	$600	$700	$800	$900
30% of Median	$400	$400	$500	$500

AFFORDABLE HOME PURCHASE PRICE

	1-PERSON	2-PERSON	3-PERSON	4-PERSON
200% of Median	$345,500	$395,000	$444,000	$493,000
150% of Median	$259,000	$296,500	$333,000	$370,000
120% of Median	$206,500	$237,000	$266,500	$296,000
100% of Median	$171,500	$197,000	$221,500	$246,500
80% of Median	$137,000	$156,500	$176,500	$196,500
50% of Median	$84,500	$97,000	$109,000	$122,000
30% of Median	$50,000	$57,000	$65,000	$72,000

PERCENT OF AFFORDABLE HOMES IN NORWICH

	1-PERSON	2-PERSON	3-PERSON	4-PERSON
200% of Median	30%	40%	50%	59%
150% of Median	13%	19%	27%	35%
120% of Median	6%	10%	14%	19%
100% of Median	4%	6%	8%	11%
80% of Median	2%	3%	4%	6%
50% of Median	0%	1%	1%	2%
30% of Median	0%	0%	0%	0%

SOURCE: HUD, Vermont Housing Data & 2016 Grand List

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FIGURE 6-1: Establishments, Employees and Wages

	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Norwich																	
Establishments	72	87	100	110	136	128	124	127	128	133	133	133	134	133	132	128	127
Employees	556	703	670	703	814	746	771	783	853	839	861	927	908	935	969	1,005	950
Ave. Wages	30,800	34,700	32,400	41,300	37,100	38,500	37,700	38,700	39,100	41,400	42,300	39,700	41,500	42,900	47,200	46,400	48,200
Windsor County																	
Ave. Wages	36,300	34,300	35,300	35,000	38,200	39,600	40,200	40,700	40,600	41,200	40,900	40,500	40,700	41,100	41,700	42,800	43,800
Vermont																	
Ave. Wages	34,500	35,700	37,700	37,100	40,300	42,000	42,400	42,800	42,700	43,400	43,400	43,000	42,800	43,300	43,600	44,800	45,100

SOURCE: Vermont Labor Market Information (adjusted to 2016$ using the CPI). Wages expressed in thousands.

FIGURE 6-2: Comparison of Resident's Industry and Occupation

	NORWICH				WINDSOR COUNTY	VERMONT
	2000		2011-15		2011-15	2011-15
Industry						
Agriculture, forestry, fishing, hunting, mining	24	1%	36	2%	3%	3%
Construction	83	5%	96	6%	7%	7%
Manufacturing	117	7%	103	6%	11%	11%
Wholesale trade	21	1%	8	0%	2%	2%
Retail trade	89	5%	57	3%	10%	11%
Transportation, warehousing, utilities	47	3%	8	0%	2%	3%
Utilities	0	-	0	0%	1%	1%
Information	32	2%	31	2%	2%	2%
Finance, insurance, real estate, rental, leasing	53	3%	61	3%	5%	5%
Professional, scientific, management, administrative	212	12%	214	12%	9%	8%
Educational services	505	28%	466	27%	14%	14%
Health care, social assistance	401	23%	424	24%	16%	15%
Arts, entertainment, recreation	39	2%	83	5%	3%	3%
Accommodation, food services	96	5%	99	6%	8%	7%
Other services	26	1%	37	2%	4%	5%
Public administration	33	2%	22	1%	4%	5%
Occupation						
Management, business, financial	319	18%	236	14%	14%	15%
Computer and mathematical	90	5%	83	5%	2%	2%
Architecture and engineering	55	3%	27	2%	2%	2%
Life, physical, social science	53	3%	99	6%	2%	1%
Community and social services	18	1%	60	3%	2%	2%
Legal	30	2%	24	1%	1%	1%
Education, training, library	335	19%	320	18%	8%	8%
Arts, design, entertainment, sports, media	77	4%	69	4%	2%	3%
Health care practitioners and technical	225	13%	264	15%	7%	6%
Health care support	19	1%	74	4%	2%	2%
Protective service	7	0%	0	0%	1%	1%
Food preparation and serving	46	3%	62	4%	5%	5%
Building and grounds cleaning and maintenance	6	0%	1	0%	6%	4%
Personal care and service	72	4%	39	2%	4%	4%
Sales and related	104	6%	51	3%	9%	9%
Office & administrative support	161	9%	152	9%	11%	12%
Farming, fishing, forestry	0	0%	29	2%	2%	1%
Construction, extraction, maintenance	74	4%	76	4%	9%	9%
Production, transportation, material moving	87	5%	79	5%	12%	11%

SOURCE: 2000 Decennial Census & 2011-15 American Community Survey

FIGURE 6-3: Business Receipts

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gross	$123.0	$67.0	$71.0	$80.1	$86.3	$88.0	$96.3	$103.9	$119.1	$118.7	$131.4	$141.8	$142.8	$161.9	$146.2	$147.2	$160.9
Retail	$8.9	$9.3	$8.5	$12.1	$14.4	$13.8	$13.3	$12.3	$11.5	$11.8	$11.2	$10.9	$11.2	$10.7	$11.0	$11.7	$11.6
Use	$1.1	$0.8	$0.9	$0.7	$0.8	$1.0	$0.9	$0.8	$0.7	$0.7	$0.7	$1.2	$1.2	$0.9	$1.0	$0.9	$0.9

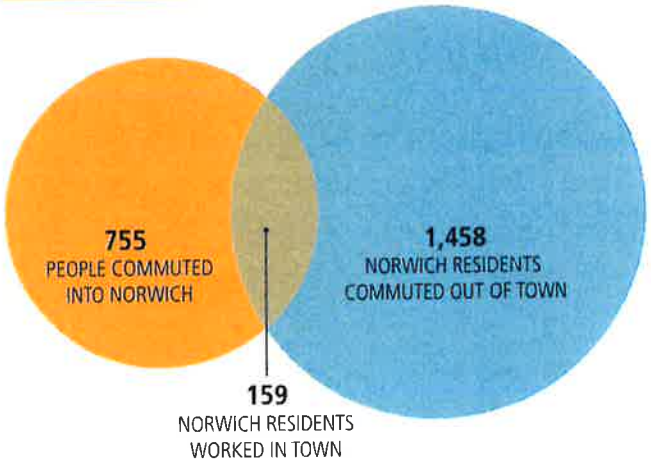
SOURCE: VT Department of Taxes (expressed in million $ and adjusted to 2016$ using the CPI)

FIGURE 6-4: Family Income Estimate

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Norwich												
Returns	878	920	904	914	928	1,774	939	939	916	930	916	937
Exemptions	2701	2,825	2,789	2,791	2,807	3,465	2,827	2,786	2,695	2,722	2,665	2,703
Median AGI	$123,500	$129,700	$136,100	$142,500	$128,500	$121,900	$126,100	$130,700	$128,100	$134,200	$138,500	$140,800
Windsor County												
Median AGI	$64,700	$64,500	$65,900	$67,200	$64,500	$62,200	$62,700	$62,000	$61,900	$63,100	$65,000	$65,600
State												
Median AGI	$64,300	$64,700	$65,600	$66,500	$64,700	$63,100	$63,400	$63,300	$63,700	$64,800	$66,500	$67,800

SOURCE: VT Department of Taxes (adjusted to 2015$ using the CPI)

FIGURE 6-5: Commuting Patterns, 2015



SOURCE: US Census Bureau, On the Map

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FIGURE 7-1: Enrollment Trends

	PK	K	1	2	3	4	5	6	K-6	7-12
Actual										
1991-92		44	59	78	54	60	59	56	410	273
1992-93		51	55	60	80	56	62	58	422	287
1993-94		52	60	54	68	86	58	65	443	310
1994-95		56	61	67	61	73	87	65	470	314
1995-96		67	60	67	69	63	72	89	487	322
1996-97		59	70	62	69	70	60	68	458	364
1997-98		32	61	68	59	66	73	62	421	393
1998-99		35	39	62	67	61	66	69	399	398
1999-00		34	36	38	63	71	61	67	370	405
2000-01		30	43	37	39	60	71	62	342	438
2001-02		28	41	44	38	38	62	75	326	436
2002-03		41	39	44	50	36	42	63	315	412
2003-04		38	48	45	41	54	38	44	308	416
2004-05		30	41	48	46	45	53	41	304	383
2005-06		32	37	41	50	48	43	55	306	363
2006-07		28	37	41	45	58	58	47	314	357
2007-08		26	30	35	43	45	60	60	299	336
2008-09		33	34	29	36	57	46	59	294	317
2009-10		39	30	36	32	39	61	45	282	320
2010-11		41	47	36	39	40	39	63	305	332
2011-12		48	49	45	41	40	40	39	302	325
2012-13		43	47	49	45	42	44	40	310	336
2013-14		38	51	45	52	47	46	46	325	324
2014-15		25	40	52	46	53	46	43	305	301
2015-16	34	33	29	44	53	53	49	49	310	283
2016-17	35	34	35	28	44	52	56	49	298	

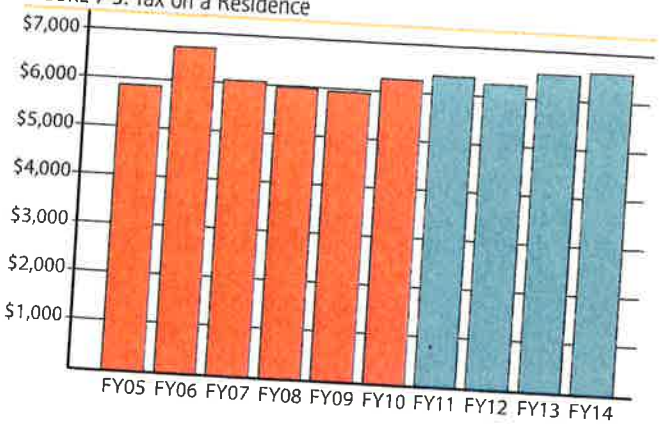
SOURCE: Norwich Annual Town Report and Vermont Annual School Report

FIGURE 7-2: Marion Cross Energy Usage

	MARION CROSS	VERMONT AVERAGE
Building Size (sq ft)	50,000	
Total Electricity Use (kWh)	211,800	
Total Fuel Use (million BTUs)	1,865.7	
Electricity Use (kWh per sq ft)	4.2	5.9
Fuel Use (BTUs per sq ft)	37,314	59,313
Total Energy Use (BTUs per sq ft)	51,771	79,524

SOURCE: School Energy Program

FIGURE 7-3: Tax on a Residence



SOURCE: Norwich School Board. Based on a residence assessed at $410,000 in FY05.

FIGURE 7-4: Children by Family Type and Employment

	2000		2015	
Total children (under age 18)	1,033		789	
Younger than age 6	210		102	
Living with 2 parents	205		86	
Both parents in labor force	133	65%	36	42%
One parent in labor force	72	35%	50	58%
Neither parent in labor force	0		0	
Living with 1 parent	5		16	
Parent in labor force	5	100%	16	100%
Parent not in labor force	0		0	
Age 6 to 17	823		687	
Living with 2 parents	693		468	
Both parents in labor force	444	64%	413	88%
One parent in labor force	243	35%	55	12%
Neither parent in labor force	6	1%	0	
Living with 1 parent	130		219	
Parent in labor force	130	100%	219	100%
Parent not in labor force	0		0	

SOURCE: Date from the 2000 Decennial Census and the 2011-2015 American Community Survey.

FIGURE 8-1: Norwich Fire and Rescue Calls

	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
Structure	8	6	11	7	11	10	9	8	6	3	1	7	7	13						7
Auto	14	12	17	16	18	20	33	32	43	36	40	40	33	31						27
Wildfire	5	5	5	2	5	5	1	5	3	6	5	4	4	2						4
CO Detector	3	5	0	1	2	1	2	3	4	7	14	8	9	10						
False Call	13	10	15	9	14	10	19	16	40	26	22	15	20	20						38
Mutual Aid	5	3	4	6	3	8	4	13	5	14	18	10	29	18						30
Other	10	4	4	12	15	11	17	22	4	12	31	55	20	24						
Total Fire	58	45	56	53	68	65	85	99	105	104	131	139	122	118	115	144	157	144	165	161
Medical						15	79	93	117	102	120	111	78	93	85	87	87	93	87	75

SOURCE: Norwich Annual Report (Note: classification of calls has changed over the years)

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FIGURE 9-1: Average Annual Daily Traffic

		1986	1990	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2015
I-91	Exit 12 to Exit 13							18,000	20,200	17,100	17,100	16,700	17,100	17,900
I-91	Exit 13 to Exit 14			10,100	10,600	11,200	11,700	12,500	12,800	12,500	11,600	11,900	11,700	12,100
Route 5	Hartford Line to Hopson Rd	3,210	3,385	4,490	4,800	5,100	5,200	5,300	5,500	5,500	5,300	5,000	4,900	5,400
Route 5	Hopson Rd to Exit 13	4,540	4,790	5,395	5,400	5,600	5,700	5,800	5,900	6,500	6,300	4,200	4,100	4,500
Route 5	Exit 13 to Main St	7,510	5,450	4,070	4,100	4,200	8,000	8,200	8,300	9,300	7,100	5,700	5,500	5,900
Route 5	Main St to Norwich SH	1,120	1,125	1,410	1,500	860	920	1,600	1,500	1,400	1,300	1,300	1,200	1,200
Route 5	Norwich SH to Route 132	1,680	1,635	1,560	1,600	1,600	1,700	1,800	1,700	1,700	1,600	1,700	1,600	1,600
Route 5	Route 132 to Thetford Line	1,340	1,305	1,190	1,200	1,300	1,300	1,500	1,300	1,300	1,300	1,300	1,300	1,300
Route 10A	Exit 13	10,600	10,540	10,260	10,300	10,800	11,900	10,600	9,800	9,900	11,900	12,400	12,300	12,400
Route 10A	Exit 13 to Norwich SH	12,270	12,710	12,370	12,400	12,800	12,800	14,300	14,200	14,100	13,900	13,700	13,600	14,000
Route 10A	Norwich SH to State Line	13,290	14,770	14,375	14,400	14,700	13,700	15,400	15,100	15,300	14,800	14,500	14,200	14,200

SOURCE: VTrans

FIGURE 11-1: Norwich's Climate

STATISTIC	LOCATION	UNITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ave. High Temp.	Hanover	deg F	28.40	32.70	42.60	55.90	69.40	77.90	82.60	80.10	71.10	58.60	45.00	31.80
Ave. Low Temp.	Hanover	deg F	7.20	9.70	21.40	31.80	42.60	52.20	57.40	55.90	48.20	37.00	28.40	14.50
Ave. Precipitation	Hanover	Inches	2.50	2.40	2.60	2.90	3.60	3.30	3.30	3.60	3.30	3.30	3.50	3.10
Ave. Precipitation	Union Village Dam	Inches	2.61	2.07	2.48	2.69	3.27	3.06	3.35	3.58	3.32	3.32	3.20	2.48

SOURCE: National Oceanic and Atmospheric Administration (NOAA) Global Climate Normals 1961-1990

FIGURE 11-2: Slope Constraints

SLOPE	DEVELOPMENT CONSIDERATIONS
<3%	Suitable for development. May require drainage improvements.
3-8%	Most desirable for development, having the least restrictions.
8-15%	Suitable for low density development with consideration given to erosion control, stormwater management and septic design.
15-25%	Unsuitable for most development and septic systems. Construction costly with erosion and run-off problems likely.
>25%	All construction should be avoided and careful land management required.

SOURCE: Natural Resource Conservation Service

FIGURE 11-3: Impact of Forest Fragmentation on Wildlife Species

UNDEVELOPED FOREST	BLOCKS 500+ ACRES	BLOCKS 100-499 ACRES	BLOCKS 20 - 99 ACRES	BLOCKS <20 ACRES
Small Rodent, Squirrel, Cottontail, Raccoon, Skunk, Muskrat, Red Fox	Small Rodent, Squirrel, Cottontail, Raccoon, Skunk, Muskrat, Red Fox	Small Rodent, Squirrel, Cottontail, Raccoon, Skunk, Muskrat, Red Fox	Small Rodent, Squirrel, Cottontail, Raccoon, Skunk, Muskrat, Red Fox	Small Rodent, Squirrel, Cottontail, Raccoon, Skunk, Muskrat, Red Fox
Woodchuck, Beaver, Hare, Porcupine, Weasel	Woodchuck, Beaver, Hare, Porcupine, Weasel	Woodchuck, Beaver, Hare, Porcupine, Weasel	Woodchuck, Beaver, Hare, Porcupine, Weasel	
Mink, Deer	Mink, Deer	Mink, Deer		
Moose	Moose			
Fisher, Bobcat, Coyote, Black Bear				
Song Birds	Song Birds	Song Birds	Song Birds	Song Birds
Sharp-Shinned Hawk, Broad Winged Hawk, Cooper's Hawk, Osprey, Turkey Vulture, Horned Owl, Barred Owl	Sharp-Shinned Hawk, Broad Winged Hawk, Cooper's Hawk, Osprey, Turkey Vulture, Horned Owl, Barred Owl	Sharp-Shinned Hawk, Broad Winged Hawk, Cooper's Hawk, Osprey, Turkey Vulture, Horned Owl, Barred Owl		
Red-Tail Hawk, Goshawk, Raven, Bald Eagle	Red-Tail Hawk, Goshawk, Raven, Bald Eagle			
Reptiles, Amphibians	Reptiles, Amphibians	Reptiles, Amphibians	Most Reptiles, Most Amphibians	Most Reptiles, Most Amphibians
Garter Snake, Ring-Neck Snake	Garter Snake, Ring-Neck Snake	Garter Snake, Ring-Neck Snake	Garter Snake, Ring-Neck Snake	
Wood Frog	Wood Frog	Wood Frog		

SOURCE: A Response to Sprawl: Designing Communities to Protect Wildlife Habitat and Accommodate Development and Conserving Wildlife in Maine's Developing Landscape; July 1997.

FIGURE 11-4: Current Use

YEAR	PARCELS	TOTAL ACRES	TAXES SAVED
1993	83	8,138	
2003	125	11,587	$679,322
2005	127	11,934	$306,852
2006	130	12,193	$300,763
2007	129	12,165	$378,045
2008	128	12,198	$394,843
2009	131	12,322	$415,761
2010	136	12,846	$469,835
2009	131	12,322	$415,761
2010	136	12,846	$469,835
2011	136	12,808	$476,636
2012	139	12,812	$488,490
2013	141	12,999	$695,516
2014	146	13,401	$765,408
2015	145	13,530	$775,742
2016	148	13,701	$759,681

SOURCE: VT Department of Taxes

FIGURE 12-3: Norwich Village

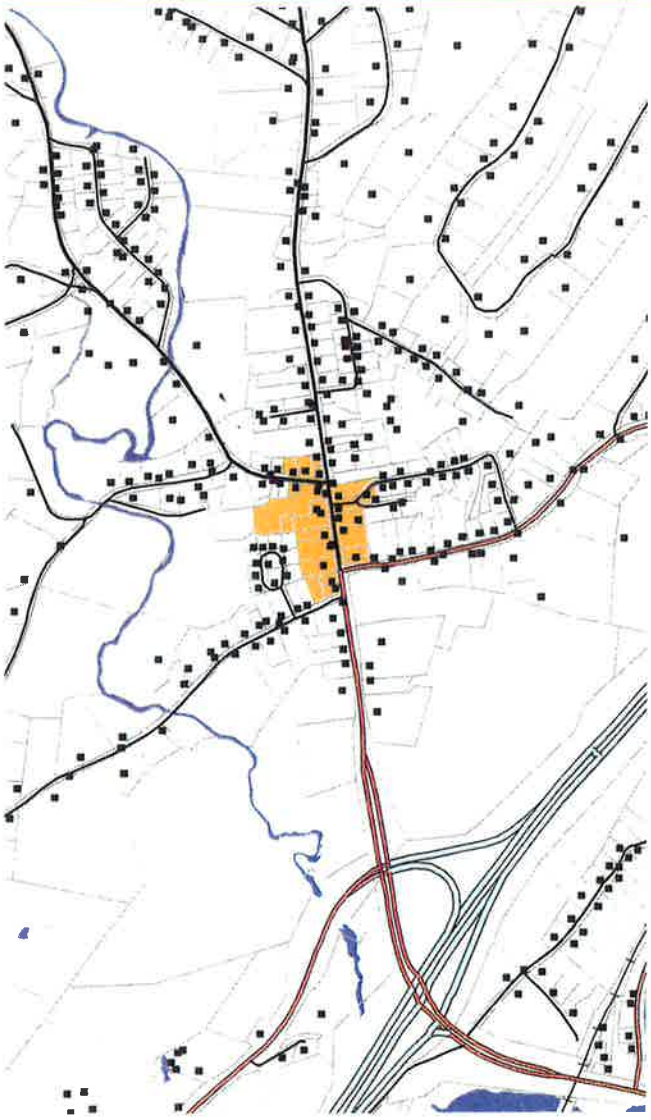

FIGURE 12-1: Parcels by Size

PARCEL SIZE	1993		2016		CHANGE	
	COUNT	ACRES	COUNT	ACRES	COUNT	ACRES
<1 acre	347	189	375	155	28	-34
1-9 acres	644	2,161	701	2,243	57	82
10-19 acres	213	2,738	272	3,338	59	600
20-49 acres	126	4,091	139	4,307	13	216
50-99 acres	83	5,713	71	5,030	-12	-683
100-199 acres	52	7,224	47	6,383	-5	-841
200-299 acres	13	3,154	8	1,913	-5	-1,241
300+ acres	5	2,495	6	3,824	1	1,329

SOURCE: Norwich Grand List

FIGURE 12-2: Parcels by Class

PARCEL CLASS	2004			2007			2011			2016		
	COUNT	ACRES	VALUE	COUNT	ACRES	VALUE	COUNT	ACRES	VALUE	COUNT	ACRES	VALUE
Residential-1	745	1,410	$266,706	787	1,486	$312,474	778	1,514	$315,350	810	1,488	$345,027
Residential-2	454	15,376	$251,138	485	15,682	$308,410	486	15,644	$318,321	503	16,320	$339,521
Mobile Home	23	314	$3,299	15	282	$2,454	15	279	$2,247	15	198	$2,230
Condominium	91	1,159	$28,790	39	37	$8,208	40	37	$10,374	27	0	$7,517
Commercial	66	423	$44,120	73	341	$57,881	79	368	$62,308	77	557	$69,644
Industrial	2	62	$694	1	53	$528	1	53	$527,900	0	0	$0
Utility	5	129	$6,654	6	241	$8,529	6	241	$6,165	3	0	$7,910
Farm	5	317	$4,432	11	1,327	$9,841	12	1,333	$11,872	10	1,125	$9,247
Undeveloped	181	8,142	$25,304	180	7,792	$37,344	187	8,793	$41,816	173	7,503	$33,495

SOURCE: Norwich Grand List (value expressed in $1,000)