

WINDHAM REGIONAL PLAN



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INTRODUCTION

VISION FOR THE WINDHAM REGION

The following statements of long-range desires constitute a shared vision for the future of the Windham Region. They form the basis of this Plan and will provide a background for understanding the Plan's policies. When readers of the Plan are uncertain about the reasons for a policy, returning to the vision statement should help. The vision is:

For The People....

- A high quality of life, defined as a composite of our economic, social, cultural and ecological well-being;

Support for modern infrastructure and telecommunications, while protecting the environment;

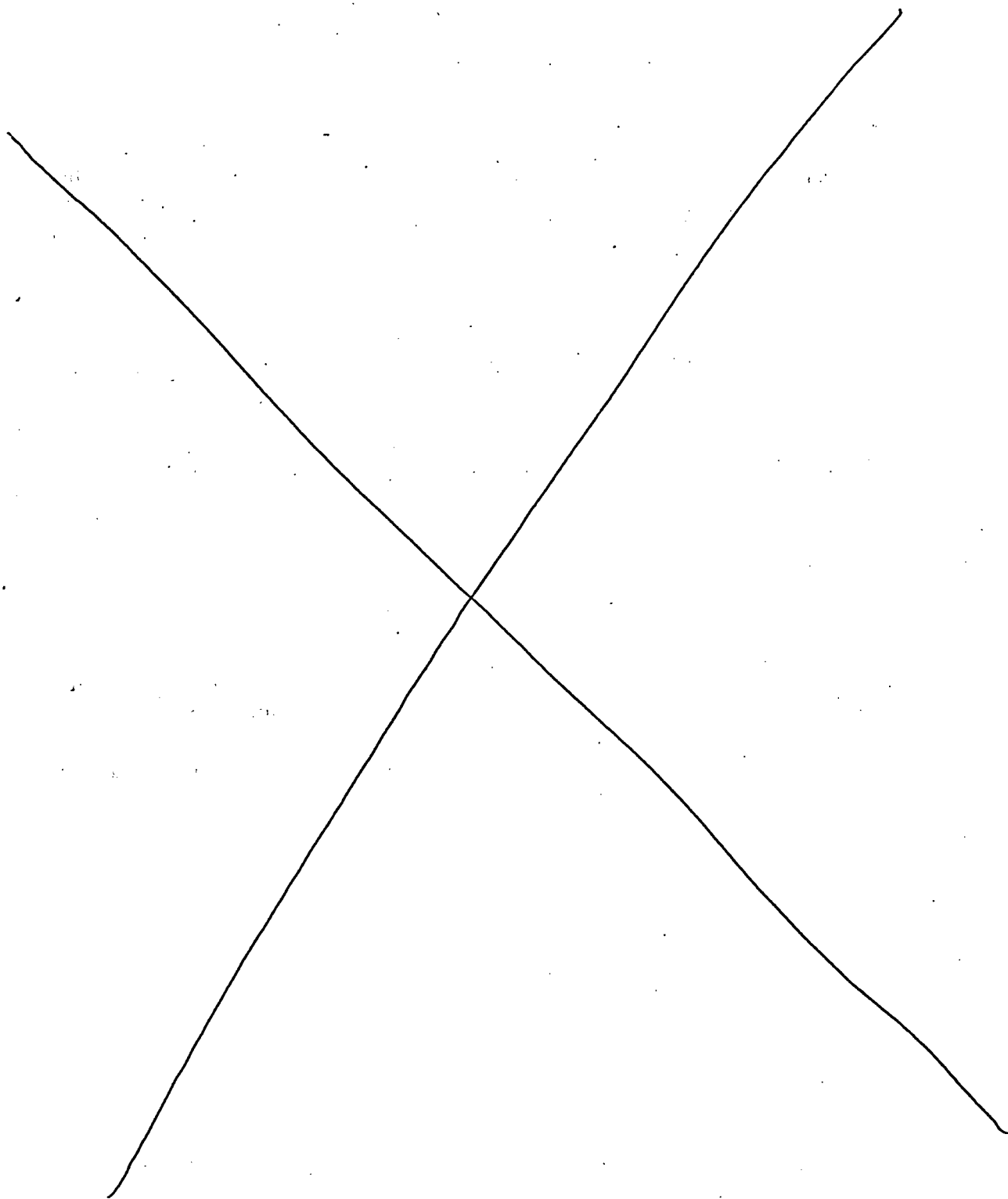
- A special place to live and work with a caring attitude for the environment, for each other, and for our communities and their institutions;
- A strong sense of history and culture;
- Stewardship of the region and its resources so that future generations will enjoy a sound economy, a healthy environment, quality education and effective health services;
- A sense of independence and self-reliance that also recognizes our interdependence and the need for mutual cooperation;

For the Place....

- A variety in land use that reflects the region's diverse mix of rural lands, small communities and large centers, with the natural environment and working landscape part of our daily lives;
- A region made better as a result of our efforts;

For the Communities....

- Individual places with their own identity and self destiny, commercial, and industrial centers, historic villages and downtowns, residential communities, and recreational centers, all of which both contrast and complement each other;
- A functional man-made environment, with interest, beauty and value that complements our natural environment;
- Decision-making that encourages public involvement at every stage, and affirms the legal right and obligation of elected and appointed officials to act. An educated and informed



citizenry ready to make effective choices;

- Dialogue within and among the region's towns about where and under what conditions change and growth should occur, and support for a type and pace of change that are appropriate for the region and its communities;

For the Future....

- A sustainable future with an identification of—and focus on—critical issues;
- Development, conservation and preservation interests working together to the benefit of our communities and the environment;
- A regional commission that recognizes and supports the goals, policies and issues of member communities as expressed in Town Plans, and that fosters cooperation among town, state, and federal governments and between public and private interests;
- Recognition of the rights and responsibilities associated with property ownership.

THE WINDHAM REGIONAL COMMISSION

The Windham Regional Commission (WRC) is an association of 27 towns, formed in 1965, subsequently constituted by the State Legislature, and now operating under the Vermont Municipal and Regional Planning and Development Act (24 V.S.A. Chapter 117). The WRC's mission is to assist member towns to provide effective local government and to work cooperatively with them to address regional issues. Each member town appoints two commissioners who represent that town's interests in regional affairs. Additionally, the WRC has up to ten citizen interest commissioners who represent other regional interests such as education, environment, housing, and business. The WRC is supported by an annual appropriation from member towns, a share of the state property transfer tax, and by private, state, and federal grants.

The WRC was created following Governor Philip Hoff's 1962 expansion of the state-planning program, with four basic goals:

- Promote economic development, increasing jobs and income;
- Preserve the natural beauty of Vermont;
- Obtain and maintain efficiency in government expenditure;
- Safeguard and extend local autonomy in planning and development decisions.

PURPOSE AND USE OF THE WINDHAM REGIONAL PLAN

The purpose of the Windham Regional Plan (the Plan) is to provide guidance for change in the Windham Region. The Plan reflects shared values and concerns of the people who live in the

27-town region and it discusses issues facing the region. Based on a set of over-arching regional goals and priorities, the Plan sets long-term policies for the region.

Who Uses The Plan?

The Plan is the basis for the WRC's day-to-day operations and guides regional planning efforts. The WRC commits its staff and resources to work for implementation of the Plan's stated priorities, goals and policies. The WRC's Executive Board, committees and professional staff implement the Plan.

Towns with active planning programs also use the Regional Plan as a guideline for local planning efforts, or they may adopt portions of this Plan as their own. When applicable, the District Environmental Commission and other state agencies use the Plan to review both public and private development proposals. As a source of regional information, the Plan serves citizens and government agencies.

Plan Organization

Each element of the Plan presents historical and background information as well as current information, data, and analysis. The Plan's policies, found in each chapter, form the core of the Plan and state the WRC's position and intent. The Implementation Chapter discusses how the Plan will be put into action (implemented).

Maps

This Plan contains maps that present important background information and others that, like the Plan's policies, present a vision for the region's future. The text and maps must be used in concert to be properly understood.

The maps present information in a generalized format. More detailed information often is available from other maps or data sources, and those are referenced on the maps or in an appendix. Users of this Plan and its maps are encouraged to consult those sources when more detailed information is needed regarding the presence, absence or precise location of a given map feature.

Legal Authority and Use of the Plan

The Plan is to be used by the WRC, town planning commissions, selectboards, state agencies, landowners, and citizens in a number of ways:

- To guide basic decisions for planning programs at the WRC;
- To provide guidance for planning and development initiatives at the local level;
- To serve as a basis for evaluation and review of projects proposed under Title 10, Chapter 151 (Act 250) and § 248 of Title 30; and
- To assist, where needed, in determining compatibility of state and federal agency plans affecting land use with regional and local planning and development priorities.

REGIONAL GOALS

A set of regional goals has withstood the test of time for relevance and importance to the Windham Region. These goals evolved from prior plans and they continue to be the subject of on-going dialogue between the WRC and its member towns. The regional goals listed below correspond generally to the Vermont Planning Goals.

- To provide a vital and diverse economy with rewarding job opportunities and high environmental standards for the region's citizens;
- To encourage and strengthen agricultural and forest enterprises;
- To plan development so as to maintain the region's historic settlement pattern of compact villages and urban centers separated by rural countryside;
- To provide for safe, convenient, economic, and energy efficient transportation systems including options such as public transit and paths for pedestrians and bicyclists, where appropriate;
- To maintain and improve the quality of air, water, wildlife, and land resources in the region;
- To identify, protect, and preserve regionally important natural and historic features of the Vermont landscape;
- To promote the development of housing suitable to the needs of the region and to ensure the availability of safe and affordable housing for all citizens of the region;
- To provide for wise and efficient use of the region's natural resources, including the prevention of surface water and groundwater pollution, the protection of fragile natural habitats and endangered or threatened species, the avoidance of agricultural and other land-use practices that lead to soil erosion, the management of woodlands on a sustainable basis, the sensitive treatment of scenic resources and mineral extraction that minimizes adverse effects on aesthetics, water quality, air quality, and special community resources (such as historic sites, recreation, or scenic areas), and insures that effective site rehabilitation plans are provided and implemented;
- To encourage energy conservation and efficiency, the development of renewable energy resources, and the availability of a reliable and sufficient energy supply;
- To plan for, finance, and provide an efficient system of public facilities and services (such as schools, water and wastewater facilities, highways and bridges) to meet future local, regional, and state needs;
- To broaden access to education and training for all citizens;

- To support affordable access to high quality health care services for all citizens; and
- To maintain and enhance recreational opportunities for both residents and visitors in keeping with the carrying capacity of natural resources and public facilities.

REGIONAL PRIORITIES

As part of the development of the Plan, WRC Commissioners were asked, via a survey, to identify priorities for the future development of the region and protection of its resources. The number one priority, at over 60%, is energy. The importance of planning for energy its supply and demand, its distribution and use, and its environmental impacts will be discussed in all of the plan elements and, most important, in the policies. This regional priority will also guide the WRC's work program over the five year life of this Plan.

WINDHAM REGION PROFILE

This chapter provides a snapshot of where the region has been and where it is now. In addition to providing a geographic and historical portrait, this chapter contains data depicting trends in the Windham Region regarding population, economy, housing, and transportation. Trends analysis plays an important role in the planning process as it points to patterns of change and areas that need particular attention in the future. As such, this chapter provides some of the framework for decisions that will guide the future. Other chapters in the Plan will contain data that is more specific to the topic discussed, but data in this Chapter is meant to be a regional overview.

GEOGRAPHY

Situated in Vermont's southeastern corner, the Windham Region consists of 23 towns in Windham County; the neighboring towns of Readsboro, Searsburg, and Winhall in Bennington County; and Weston in Windsor County. The region is bordered by Massachusetts to the south and New Hampshire to the east. At over 900 square miles (600,000 acres), the region accounts for roughly 9.8 percent of the State's total land area. The Windham Region has several distinctive identities, largely defined by the diverse natural environment.

The Connecticut River Valley, characterized by relatively flat and gently rolling land, was formed through glaciation. Glaciation contributed to the fertile agricultural soils and was responsible for deposits of clay, sand, and gravel. It also left boulders and scraped and scarred bedrock ledges. The Connecticut River has also been powerful in shaping the valley's settlement pattern of villages and towns separated by fields and forests.

The Green Mountains are the principle element of physical geography in the western part of the region with Stratton Mountain (at 3,936 feet) being the highest point in the region. The high elevation of this land area gives rise to headwaters that flow down into narrow valleys to join the larger tributaries. This part of the region, with its higher elevations, generally receives more precipitation and experiences lower temperatures. Due to this, the main concentration of development is along valley corridors with outlying areas mainly large woodland areas on high rising land. This geography also led to the development of ski areas and tourist resorts. In the northern and extreme western parts of the region, agriculture has not been a major activity because of the bedrock ledges, steep slopes, and thin and stony soils. However, large expanses of forested land have led to forest-based industries.

In addition to the Connecticut River, other major rivers of the region are the Deerfield, Green, North, Saxtons, West, and Williams, all of which are tributaries of the Connecticut. There are two major flood control reservoirs on the West River, the Ball Mountain and Townshend Dams. Somerset and Harriman are two major water storage reservoirs for hydropower generation on the Deerfield River.

There are several significant transportation routes that provide access to the Windham Region. Interstate 91 and Route 5 traverse north/south in the Connecticut River Valley. Route 100 runs north/south through the Green Mountains on the western edge of the region. Route 9 provides east/west access from Brattleboro to Bennington and between New Hampshire and New York.

Route 30 runs north and west from Brattleboro through the West River Valley towns of Newfane, Townshend, Jamaica, and Winhall.

HISTORY

The region's history has helped shape today's cultural landscape. Carvings, stonewalls, cellar holes, railroad beds, abandoned quarries, buildings and barns are all a part of the region's heritage.

Native Americans

Archaeological evidence has confirmed the early presence of Native Americans, from whom present day Abenaki claim descent, in the Windham Region. The Abenaki depended on seasonal hunting, fishing, gathering, and some agriculture.¹ Lowland settlement sites located in the floodplains of rivers, particularly at the confluence of rivers, were useful for growing crops and accessing the water for fishing and transportation. With the coming of European settlement, conflict and disease had devastating effects on the native population and their culture nearly disappeared.²

Early Europeans

Early European settlers came to a heavily timbered region with abundant wildlife. Early forestry focused on efforts to clear the land for homesteads and agricultural use. Harvested trees were used primarily for building and fuel; secondary uses were manufacture of potash, tannin, and other commodities. By the late 1700's, timber industries made important contributions to the region's economy from both domestic and international sales.

Settlement Patterns

Physical limitations have played a dominant role in the region's development pattern. European settlement first occurred in the Connecticut River Valley where water, good soil, and access to a natural transportation route were available. Towns and villages evolved at the intersections of streams, as exemplified by Brattleboro and Bellows Falls in the Connecticut River Valley, and Wilmington and Jamaica in the region's interior.

A linear pattern of development was the natural response to the river and stream valleys as was the establishment of a road system along those streams, linking village nodes in each major valley. These roads encouraged a land use pattern of mixed residential and commercial uses to radiate from each village. The resulting pattern of the region, readily apparent today, is one of small villages located in stream valleys with expansion along connecting roads.

Agriculture

Agriculture shifted from subsistence operations to market-oriented production. In the early 1800's, Vermont became a world leader in wool production with prized Merino sheep imported from Spain. The Town of Westminster was one center for wool production in Vermont and during the height of wool production, many carding, spinning, and weaving mills were

¹ Historical Society of Windham County

² *Proud to Live Here in the Connecticut River Valley of Vermont and New Hampshire*, Richard J. Ewald with Adair D. Mulligan, 2003

established in small towns. The Vermont sheep industry peaked in 1840 and declined dramatically after the Civil War, when demand for wool declined and global competition arrived in the form of wool from Australia and New Zealand. Eventually, dairy farming replaced sheep operations as the predominant form of agriculture.

Population On-The-Move

In the mid 1800's, Vermonters began to move around. Many hill farms were abandoned by their owners after years of clearing, grazing and cultivating took their toll on the thin, steep soils. Some people moved west, heading for more fertile land, encouraged by the opening of the Erie Canal in 1825, the California gold rush in 1849 and the Homestead Act of 1862. Other hill farmers moved to larger, nearby towns for jobs in growing industries. In the smaller villages, businesses that relied on hill farmers subsequently failed, and in some cases the villages themselves were abandoned. The Civil War also contributed to Vermont's population decline, as soldiers who had seen more fertile lands in the Ohio Valley and other areas emigrated after the war.

Manufacturing and Other Industries

The region's plentiful rivers and streams provided power for woolen mills, paper mills, and other industries as well as for transportation. Log drives occurred on the larger rivers until early in the twentieth century. Roads and railroads, themselves an important industry for the region, utilized river corridors and included routes along the Connecticut, West, and Deerfield Rivers. Railroads also played an important role in shaping the region and encouraging the development of Brattleboro and Bellows Falls as regional centers. The railroads carried freight and passengers, bringing more people to the region and facilitating commerce with Boston, New York and points south and west.

Brattleboro and Bellows Falls

Brattleboro and Bellows Falls benefited significantly from the nineteenth century railroad expansion. Brattleboro hosted a range of industries, including organ manufacturers, an iron foundry, a hospital, print shops, and a cigar factory. Bellows Falls also was an industrial center that included paper mills, a farm machinery company, lumber mills and marble works. The industries in both towns provided jobs and appealed to many who left farms to work in factories. In the latter part of the twentieth century, the development of Interstate 91, as part of an efficient and reliable national highway system, allowed Brattleboro and Bellows Falls to emerge as major warehousing and trucking centers.

Tourism

In the late 1800's, tourists were attracted to the region for its heritage, natural beauty and recreational activities. In the 1950's, the ski industry began to play a significant tourism role as alpine skiing and accommodations brought increasing numbers of skiers and visitors during the winter months. The completion of the Interstate Highway System in the 1960s began a new era characterized by easy and convenient access to the region from large metropolitan areas, resulting in explosive growth in vacation homes and related facilities. In the 1980s and 1990s, the region's ski resorts focused on expansion and development of other winter activities such as snowmobiling as well as golf, mountain biking facilities to attract visitors during all seasons.

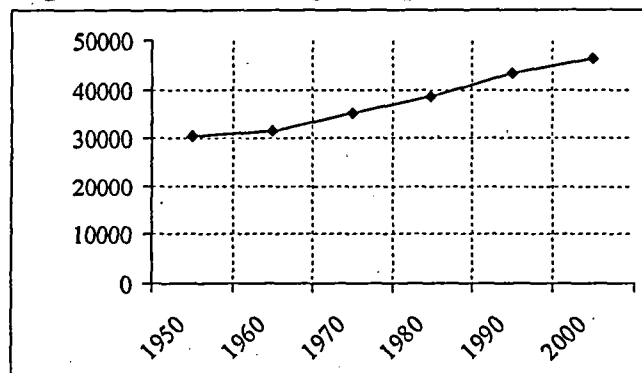
Agri-tourism activities that bring the farm experience to visitors (such as bed and breakfasts, educational farm tours, hay and sleigh rides) have become important components of tourism in the region.

POPULATION

Population Growth

The population of the 27 communities that make up the Windham Region, as reported by the 2000 U.S. Census, is 46,449. Since 1950, the region has experienced a continuous population increase (see Figure 1). The largest population growth occurred from 1980 to 1990 with a 12.5 percent growth. The statewide growth during that same time period was 10 percent. From 1990 to 2000, regional growth was 7 percent, compared to statewide growth of 8.2 percent.

Figure 1: Windham Region Population, 1950-2000



Source: U.S. Census, University of Vermont Center for Rural Studies

These demographic trends are the averages for the 27 towns in the Windham Region and it is important to note that there are variations in town population trends. Table 1 shows the town population changes that have occurred from 1970-2000. For example, Dover and Winhall experienced tremendous population growth between 1990-2000 with expansion of the respective ski resorts located nearby, whereas the historic regional centers, Brattleboro and Rockingham (which includes Bellows Falls), have experienced slight declines.

Table 2 shows the population projections³ for the Windham Region, which is projected to be moderate to slow over the next 15 years with a net increase of 3,327 persons, or about a 7.2 percent increase. The population is expected to remain below 50,000 persons. High rates of growth are expected to continue in the towns of Dover and Winhall. The smaller, more rural towns, such as Athens, Brookline, Halifax, Searsburg, Wardsboro, and Windham are expected to experience high growth rates as well.

³ Population trends are of interest in projecting future housing, facility, and service needs. One method of predicting future population is to assess demographic trends over the past two decades as well as making assumptions in regards to future fertility, mortality, migration trends, and group quarters population. Population projections are also subject to a degree of uncertainty because it is difficult to predict future trends, especially those related to migration and fertility.

Table 1: Population Change 1970-2000

Town	1970	1980	1990	2000	% Change 1970-1980	% Change 1980-1990	% Change 1990-2000
Athens	159	250	313	340	57.2	25.2	8.6
Brattleboro	12,239	11,886	12,241	12,005	-2.9	3	-1.9
Brookline	180	310	403	467	72.2	30	15.9
Dover	555	666	994	1,410	20.0	49.2	41.9
Dummerston	1,295	1,574	1,863	1,915	21.5	18.4	2.8
Grafton	465	604	602	649	29.9	-0.3	7.8
Guilford	1,108	1,532	1,941	2,046	38.3	26.7	5.4
Halifax	295	488	588	782	65.4	20.5	33
Jamaica	590	681	754	946	15.4	10.7	25.5
Londonderry	1,037	1,510	1,506	1,709	45.6	-0.3	13.5
Marlboro	592	695	924	978	17.4	32.9	5.8
Newfane	900	1,129	1,555	1,680	25.4	37.7	8
Putney	1,727	1,850	2,352	2,634	7.1	27.1	12
Readsboro	638	638	762	805	0	19.4	5.6
Rockingham	5,501	5,538	5,484	5,309	0.7	-1	-3.2
Searsburg	84	72	85	96	-14.3	18.1	12.9
Somerset	0	2	2	5	--	0	150
Stratton	104	122	121	136	17.3	-0.8	12.4
Townshend	668	849	1,019	1,149	27.1	20	12.8
Vernon	1,024	1,175	1,850	2,141	14.7	57.4	15.7
Wardsboro	391	505	654	854	29.2	29.5	30.6
Westminster	1,875	2,493	3,026	3,210	33	21.4	6.1
Weston	507	627	488	630	23.7	-22.2	29.1
Whitingham	1,011	1,043	1,177	1,298	3.2	12.8	10.3
Wilmington	1,586	1,808	1,968	2,225	14	8.8	13.1
Windham	174	223	251	328	28.2	12.6	30.7
Winhall	281	327	482	702	16.4	47.4	45.6
Region	34,986	38,597	43,405	46,449	10.3	12.5	7
Vermont	444,731	511,466	562,767	608,827	15	10	8.2

Source: U.S. Census, University of Vermont Center for Rural Studies

Table 2: Windham Region Population Projections

Census 2000	Projection 2005	Projection 2010	Projection 2015	Projection 2020	Change 2000- 2005	Change 2005- 2010	Change 2010- 2015	Change 2015- 2020
46,449	47,449	48,214	48,982	49,776	2.2%	1.6%	1.6%	1.6%

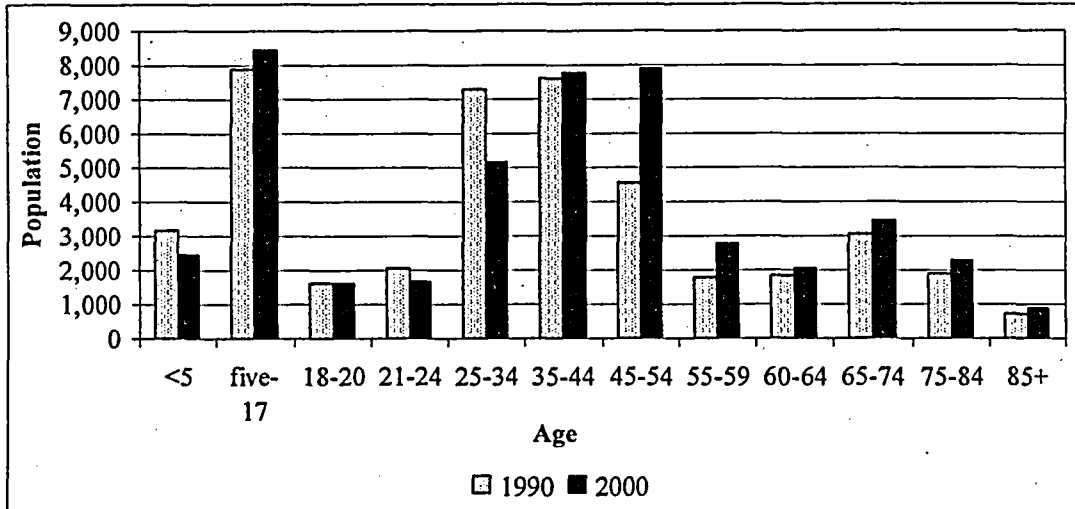
Source: VT Department of Aging and Independent Living, MISER Population Projections 2003

Age Characteristics

In 2000, about 23 percent of the population was under the age of 18. The working age population, those aged 18 to 64, accounted for 62 percent of the population. About 14 percent of the population were senior citizens age 65 years and older.

Figure 2 shows the age distribution in the Windham Region in both 1990 and 2000. The chart reveals a relatively small proportion of the population in their late teens and early twenties. This likely indicates that a substantial proportion of young adults leave the area, to attend college or for other reasons, after completing school. Only about 7 percent of the population in 2000 was age 18 to 24.

Figure 2: Population by Age Cohort



Source: U.S. Census

Table 3: Windham Region Population Growth Rate by Age

Age	Total 1990	Total 2000	Percent Change 1990-2000
Less than 5	3,179	2,435	-23.4
5-17	7,864	8,440	7.3
18-20	1,589	1,619	1.9
21-24	2,067	1,661	-19.6
25-34	7,260	5,149	-29.1
35-44	7,611	7,718	1.4
45-54	4,537	7,875	73.6
55-59	1,782	2,786	56.3
60-64	1,826	2,068	13.3
65-74	3,082	3,440	11.6
75-84	1,881	2,260	20.1
Over age 85	727	902	24.1

Source: U.S. Census

Although they constitute a small percentage of the population, seniors 75 years of age and older represented a fast growing segment of the population (see Table 3). Between 1990 and 2000, the number of residents aged 75 to 84 grew by 20 percent and the number of 85 years and older grew by 24 percent. The proportion of this combined age group to the total population remained relatively steady at 6 percent of the population in 1990 and 7 percent of the population in 2000.

The groups growing the fastest since 1990 are those aged 45 to 54 and those aged 55 to 64 (with growth rates of 74 and 54 percent respectively). Most of these large increases can be attributed to the aging of the population. However, in-migration is contributing to the increases in these age groups as well.

By contrast, the number of people aged 25 to 34 experienced a 29 percent decrease. The second largest decrease was in those children under the age of 5 years old, where there was a 23 percent decrease.

Overall, the following are notable observations that can be made from the data:

- There has been a significant increase in the population of those people who will likely enter retirement in the next 10 years (age 45-59).
- The population of people in the childbearing ages has generally decreased.⁴
- Assuming similar growth throughout this decade as experienced in the 1990's, there will be a decline in the number of school-aged children.

Households

In the year 2000, there were 19,329 households⁵ in the Windham Region. The average household size in Windham County⁶ was 2.35 persons per household. This compares to 17,035 households in the region in 1990 with an average household size of 2.49 persons per household in Windham County.

The most common categories of households in the Windham Region were one person and married couples without children at home, each accounting for 29 percents of all households, as well as married couples with children (see Table 4). The majority (55.5 percent) of one-person households were female. In 2000, 9 percent of the households were single parents with their own children. Within these households, single mothers were about three times more common than single fathers.

Table 4: Windham Region Household Composition, 2000

Household	Percent
One Person	29%
Married without own children ⁷	29%
Married with own children	21%
Single Parent with own children	9%
Non-family	8%
Other family	4%

Source: 2000 U.S. Census

⁴ The U.S. Census generally considers the childbearing years to be aged 15-44, with the 25.1 years as the average age of women when they give birth for the first time.

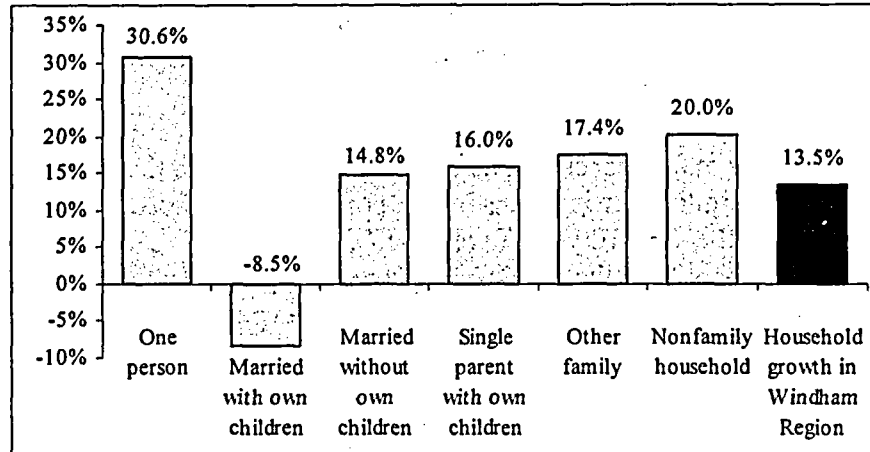
⁵ The U.S. Census defines a household as all the people who occupy a housing unit as their usual place of residence.

⁶ The U.S. Census calculates average household size on a county basis. Windham County does not include the towns of Readsboro, Searsburg, Weston and Winhall.

⁷ For U.S. Census purposes, own children consist of all sons/daughters of householders who are under 18 years of age.

Between 1990 and 2000, the number of one person households increased at a rate of 30.6 percent which was faster than the 13.5 percent growth in the overall number of households (see Figure 4). The number of married couples with their own children decreased.

Figure 4: Windham Region Change in Household Composition, 1990-2000



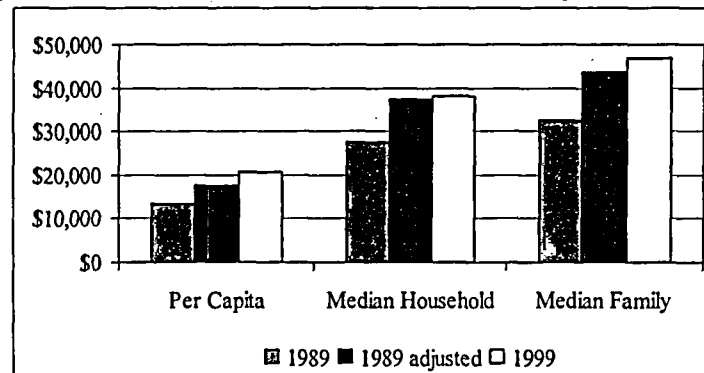
Source: U.S. Census

ECONOMIC CHARACTERISTICS

Income

Figure 5 summarizes changes in Windham County's median household, median family, and per capita incomes.⁸ Over time, inflation changes the value of income in real terms. Therefore, the 1989 incomes have been adjusted to the 1999 levels to provide for a more accurate comparison. All median incomes rose during the 1990's but none rose substantially above the rate of inflation.

Figure 5: Median Incomes for Windham County, 1989 and 1999



Source: U.S. Census

⁸ The U.S. Census calculates income on a county basis. Windham County does not include the towns of Readsboro, Searsburg, Weston and Winhall. A "family" is defined by the Census Bureau as a group of two or more people who reside together and who are related by birth, marriage, or adoption while a "household" is defined as all the people who occupy a housing unit as their usual place of residence. "Per capita" income is the mean income generated for every person in the county and is derived by dividing the total income generated in the county by the total population.

Town based income and poverty indicators, as show in Table 5, provide additional information regarding the wide variation in income and poverty at the local level. Eleven of twenty-seven towns' median household income exceeded the State's median. Some of those towns, Dover and Winhall, are located in the ski resort areas where there has been tremendous growth in population, mostly due to in-migration. Other towns, such as Vernon, Westminster, Newfane, Marlboro, Guilford, and Dummerston, are located close to the Brattleboro job center.

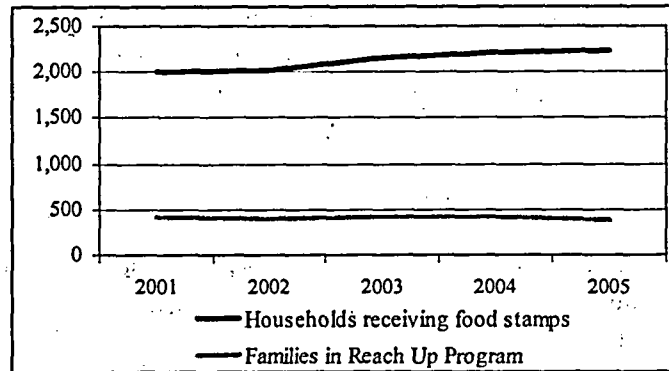
Table 5: Income and Poverty Level Comparisons, 1999

Town	Median Household Income	Per Capita Income	Median Family Income	Percent of Individuals Below Poverty Level per Town
Athens	\$31,172	\$17,745	\$33,571	12.2
Brattleboro	\$31,997	\$19,554	\$44,267	13.1
Brookline	\$39,125	\$18,082	\$44,375	8.5
Dover	\$49,688	\$23,485	\$49,688	10
Dummerston	\$46,121	\$23,742	\$53,375	2.4
Grafton	\$42,312	\$23,617	\$48,250	10.6
Guilford	\$45,982	\$21,028	\$52,431	6.8
Halifax	\$36,458	\$17,738	\$41,667	16.2
Jamaica	\$34,917	\$22,052	\$43,333	10.1
Londonderry	\$42,669	\$24,220	\$48,000	6.3
Marlboro	\$41,429	\$19,503	\$44,861	3.9
Newfane	\$45,735	\$22,215	\$51,328	5.1
Putney	\$40,346	\$18,577	\$50,170	8.4
Readsboro	\$35,000	\$17,911	\$48,214	7
Rockingham	\$33,423	\$19,051	\$45,503	10
Searsburg	\$17,500	\$10,472	\$31,667	17.5
Somerset	n/a	n/a	n/a	n/a
Stratton	\$39,688	\$32,488	\$43,750	5
Townshend	\$39,286	\$19,431	\$41,759	8.8
Vernon	\$49,688	\$19,720	\$55,325	2.8
Wardsboro	\$35,000	\$17,165	\$43,333	7.6
Westminster	\$44,263	\$20,019	\$49,615	10
Weston	\$44,792	\$36,546	\$57,500	8.1
Whitingham	\$37,434	\$21,904	\$45,500	7.9
Wilmington	\$37,396	\$25,171	\$46,786	9.3
Windham	\$39,659	\$20,704	\$41,786	6.3
Winhall	\$57,750	\$30,378	\$65,000	4
County	\$38,204	\$20,533	\$46,989	9.4
Vermont	\$40,856	\$20,625	\$48,625	9.4

Source: U.S. Census

Another measure of poverty is the numbers of households receiving assistance in the form of food stamps and the number of families in the Reach Up Program, Vermont's program to assist families with children by providing services that support work, cash assistance for basic necessities, health insurance, and food stamps. Since 2001, the number of families in Reach Up has declined while households with food stamps have increased (see Figure 6).

Figure 6: Food stamp and Reach Up Assistance, 2001 - 2005



Source: Vermont Agency of Human Services, Economic Services Division

Labor Force

The region's labor force did not experience large changes during the 1990's as indicated in Table 6. The labor force grew 9 percent from 1990 to 2000, adding an additional 2,030 people. In both 1990 and 2000, approximately 55 percent of the population participated in the labor force

Table 6: Windham Region Labor Force Composition, 1990 and 2000

	1990		2000		Change 1990-2000	
	Total	Percent	Total	Percent	Total	Percent
Population over age 16	33,478	100	36,951	100	3,473	10
Population over age 16 in the labor force	23,467	70	25,497	69	2,030	9

Source: U.S. Census

In 2004, the leading industries in Windham County were the service industries (35.4 percent) and wholesale and retail trade (19.1 percent) (see Table 7). Health care made up nearly one-third (31.2 percent) of services while food and beverage stores accounted for over one quarter (27.6 percent) of retail trade. Professional and business services experienced the largest growth between 1994 and 2004. Jobs in the professional and business services include architectural, engineering, advertising, consulting, management, administrative and support services. The manufacturing and information industries experienced the largest decrease in employment between 1994 and 2004, with 30 percent and 28.5 percent decreases respectively. While the manufacturing of durable goods declined, the decline of nondurable goods (which amongst other items includes food, beverage and tobacco products, textiles, and paper) was large with a loss of over 1,000 jobs.

Table 7: Windham County Employment by Industry, 1994 and 2004

Industry	Covered Employment ⁹ 1994		Covered Employment 2004		Change 1994-2004
	Number	Percent	Number	Percent	
<i>Private Ownership</i>	20,785	89.0%	19,985	87.0%	-3.8%
Agricultural, forestry, fishing, hunting	D ¹⁰	D	D	D	
Mining	D	D	D	D	
Construction	983	4.2%	1,103	4.8%	12.2%
Manufacturing:	3,554	15.2%	2,488	10.8%	-30.0%
Durable Goods	1,848	7.9%	1,717	7.5%	-7.1%
Nondurable Goods	1,706	7.3%	771	3.4%	-54.8%
Transportation & Utilities	1,182	5.1%	1,073	4.7%	-9.2%
Trade:	4,689	20.1%	4,395	19.1%	-6.3%
Wholesale	1,937	8.3%	1,586	6.9%	-18.1%
Retail	2,752	11.8%	2,809	12.2%	2.1%
Information	474	2.0%	339	1.5%	-28.5%
Finance, Insurance & Real Estate	1,138	4.9%	933	4.1%	-18.0%
Professional and Business Services	1,023	4.4%	1,241	5.4%	21.3%
Services:	7,388	31.6%	8,137	35.4%	10.1%
Education	1,182	5.1%	1,469	6.4%	24.3%
Health	2,366	10.1%	2,539	11.0%	7.3%
Arts, entertainment, recreation	183	0.8%	162	0.7%	-11.5%
Accommodation and food	3,040	13.0%	3,275	14.3%	7.7%
Other	617	2.6%	692	3.0%	12.2%
<i>Government Ownership</i>	2,579	11.0%	2,992	13.0%	16.0%
Total for Windham County	23,365	100.0%	22,978	100%	-1.7%

Source: Vermont Department of Employment and Training

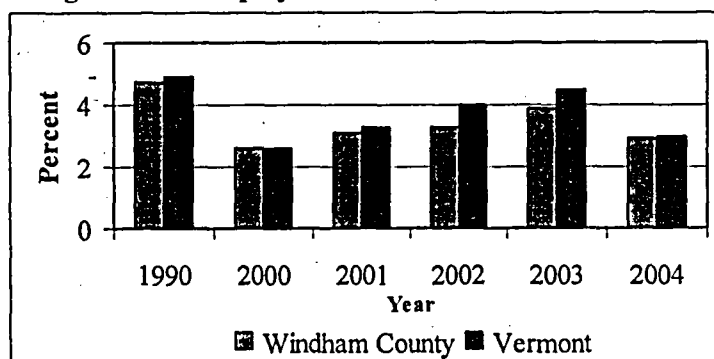
Since 2000, the unemployment rate for Windham County has remained lower than the 1990 county unemployment rate of 4.7 percent (see Figure 7). More recently, unemployment rates have fluctuated between a low of 2.6 percent in 2000 and a high of 3.9 percent in 2003, all the while staying at or below the State of Vermont unemployment rate.

Brattleboro remains a regional employment center. Over one-third of the region's residents who are employed reported working at businesses located in Brattleboro (see Table 8). Businesses in Rockingham and in the Deerfield Valley towns of Dover and Wilmington also continue to provide employment for significant proportions of the workforce. The remaining 23 towns in the region provide employment for almost a third of the workforce, collectively experiencing an 8 percent growth from 1990 to 2000. This increase is noteworthy in that it suggests a dispersal of workplaces to the same rural towns that have experienced the highest population growth rates.

⁹ Covered employment refers to employees and their wages in firms subject to the Vermont Unemployment Compensation Law, or for federal employees, the Federal Unemployment Compensation Law.

¹⁰ D denotes that the data was not disclosed by the Vermont Department of Employment and Training.

Figure 7: Unemployment Rates, 1990 and 2000-2004



Source: Vermont Department of Labor

Table 8: Place of Work for Windham Region Workers

Place of Work	1990	2000
Brattleboro	42%	35%
Windham Region (not including Brattleboro, Rockingham, Wilmington/Dover)	23%	31%
Rockingham	10%	7%
Dover/Wilmington	9%	9%
Vermont towns outside the Windham Region	5%	5%
New Hampshire	6%	6%
Massachusetts	4%	4%
Other State than Massachusetts or New Hampshire	1%	2%
Other Country	na	less than 1%

Source: U.S. Census

HOUSING

Housing Unit Growth

Between 1990 and 2000, the region's housing stock grew by about 5 percent with the addition of 1,532 housing units. This was a slower growth rate than what the region experienced between 1980 and 1990 when the housing units grew by nearly 32 percent.

Growth in total housing units within the region's municipalities has varied (see Table 9). The rates of growth in housing units are consistent with the towns that have experienced the largest percentage of population growth discussed previously. Brattleboro continues to contain the largest percentage of housing units in the region.

The majority of housing units in the Windham Region are single family homes (see Figure 8). The proportion of housing units that are single-family homes has increased from 66 percent in 1990 to 72 percent in 2000. Conversely, the proportion of multi-family units dropped from 27 percent of the total housing units in 1990 to 22 percent of the total housing units in 2000. Mobile homes represented 7 percent and 6 percent of the housing stock in 1990 and 2000 respectively.

Table 9: Housing Unit Growth by Town

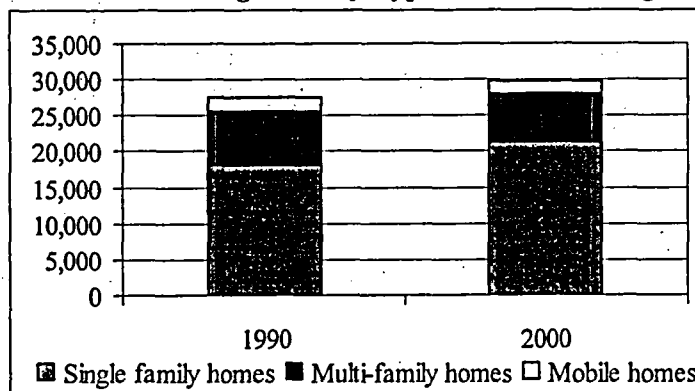
Town	1990		2000		Change 1990-2000	
	Housing units	Percent of region	Housing units	Percent of region	Total	Percent
Athens	195	0.7	210	0.7	15	7.7
Brattleboro	5,551	19.6	5,686	19.1	135	2.4
Brookline	268	0.9	274	0.9	6	2.2
Dover	2,450	8.7	2,749	9.2	299	12.2
Dummerston	857	3.0	893	3	36	4.2
Grafton	404	1.4	434	1.5	30	7.4
Guilford	873	3.1	931	3.1	58	6.6
Halifax	473	1.7	493	1.7	20	4.2
Jamaica	896	3.2	967	3.2	71	7.9
Londonderry	1,295	4.6	1,317	4.4	22	1.7
Marlboro	474	1.7	497	1.7	23	4.9
Newfane	974	3.4	977	3.3	3	0.3
Putney	1,016	3.6	1,049	3.5	33	3.2
Readsboro	478	1.7	466	1.6	-12	-2.5
Rockingham	2,476	8.7	2,425	8.1	-51	-2.1
Searsburg	92	0.3	87	0.3	-5	-5.4
Somerset	22	0.1	28	0.1	6	27.3
Stratton	864	3.1	1,091	3.7	227	26.3
Townshend	758	2.7	668	2.2	-90	-11.9
Vernon	677	2.4	784	2.6	107	15.8
Wardsboro	732	2.6	766	2.6	34	4.6
Westminster	1,294	4.6	1,412	4.7	118	9.1
Weston	463	1.6	537	1.8	74	16
Whitingham	737	2.6	802	2.7	65	8.8
Wilmington	2,176	7.7	2,232	7.5	56	2.6
Windham	334	1.2	354	1.2	20	6
Winhall	1,485	5.2	1,717	5.8	232	15.6
Region	28,314	100	29,846	100	1,532	5.4

Source: U.S. Census

Vacation and Second Home Development

Between 1980 and 1990, 92 percent of all new housing units in the region were built for vacation or seasonal use (6,347 new seasonal out of 6,866 total new units). The construction boom of the 1980's came at a time when many of the region's resorts expanded their facilities to prolong the ski season and accommodate four-season use. While growth in vacation homes has slowed considerably in recent years and most of the intensive growth of previous years occurred in a relatively small number of towns, vacation housing continues to be an influence throughout the region (see Table 10).

Figure 8: Number of Housing Units by Type in Windham Region, 1990-2000



Source: U.S. Census

Table 10: Percent of Seasonal Housing Units, by Town

Town	1980	1990	2000
Athens	36	33	19
Brattleboro	1	1	1
Brookline	37	37	28
Dover	65	84	74
Dummerston	15	12	8
Grafton	30	8	24
Guilford	8	10	7
Halifax	52	48	32
Jamaica	48	59	52
Londonderry	43	49	39
Marlboro	34	32	31
Newfane	34	39	26
Putney	10	8	5
Readsboro	10	32	23
Rockingham	4	4	3
Searsburg	55	47	45
Somerset	95	95	89
Stratton	89	92	94
Townshend	40	42	24
Vernon	3	1	2
Wardsboro	58	61	50
Westminster	5	11	8
Weston	41	50	44
Whitingham	29	37	32
Wilmington	50	60	52
Windham	60	62	51
Winhall	87	88	81
Region	26	35	31

Source: U.S. Census

TRANSPORTATION

Transportation is an important issue in the Windham Region. The U.S. Census data provides information on commuting trends and vehicle ownership. More detailed transportation statistics can be found in the Transportation Chapter. Table 11 summarizes commuting trends for Windham Region residents. The percentage of residents who commute to work alone in their cars has risen. Even though it only rose one percentage point, the actual result of this increase is over one thousand more trips per day. There is a higher percentage (7 percent) of people working from their homes in 2000 as compared with 1990 (5.5 percent). The mean travel time to work for residents of Windham County in 2000 was 20.5 minutes. This was an increase from 18.9 minutes in 1990.

Table 11: Commuting Patterns of Windham Region Residents

	1990	2000
Drove Alone	72.7%	73.7%
Carpooled	12.9%	11.5%
Public Transportation	0.2%	0.8%
Walked	7.6%	5.9%
Other Means	1.1%	1.1%
Worked at home	5.5%	7%

Source: U.S. Census

The majority of households in the Windham Region continue to own two vehicles (see Table 1). While the percentage of households that do not own a vehicle is small, it is higher for some groups such as seniors and renters. Over 21 percent of households that are headed by a senior aged 75 or older do not own a vehicle. Seventeen percent of renter households have no vehicle available, as compared to 3 percent of owner occupied households.

Table 11: Vehicle Ownership Patterns for Windham Region Residents

	1990	2000
Percent of households owning no vehicle	8.3	7.6
Percent of households owning one vehicle	35.5	35.6
Percent of households owning two vehicles	40.4	39.9
Percent of households owning three or more vehicles	15.8	16.9

Source: U.S. Census

LAND USE

EXISTING LAND USE/LAND COVER

The region's natural features, roadways and built environment are the foundation for future development and conservation efforts, and an examination of existing land use patterns provides the basis for future land use planning. The Existing Land Use/Land Cover Map illustrates the distribution of general land uses and land covers in the region. It is essentially a birds-eye view of what is occurring on the land.

The Windham Region is predominantly rural, the vast majority of the region's land being undeveloped. Almost 86 percent of the total land area is forested and only 6 percent is open. Less than 5 percent of the region falls into urban or built up areas. The urban/built up area includes residential, commercial, industrial, and public and semi-public uses. The remaining 3 percent is covered by water or wetlands.

Built Environment

Physical limitations have played a dominant role in the region's development pattern. A linear pattern of development was the natural response to the river and stream valleys and the establishment of a road system along those streams, linking village nodes in each major valley (refer to the Regional Development Pattern Map). These roads encouraged a pattern of mixed residential and commercial uses radiating from villages. The resulting pattern is one of small villages located in stream valleys with expansion along connecting roads.

The region's downtowns and villages have a dense development pattern and serve as the social, economic, historic and civic cores of their respective communities. Downtowns and villages contain public and private investment in infrastructure such as streets, sidewalks, parks, and, in some, water and sewer systems. A downtown is larger in size and has a greater concentration and diversity of commercial services than a village.

The region's downtowns, Brattleboro and Bellows Falls, are located in the region's two largest towns, Brattleboro and Rockingham respectively. The areas including and surrounding these downtowns serve as the regional centers. They are fully served by municipal water supply and wastewater treatment facilities and contain a full range of services supporting development, including transportation, solid waste, and communications. These centers, as well as others outside the region, provide services to the region's population. The centers also provide a diversity of other institutional, governmental, cultural, and recreational uses.

This Plan recognizes twenty-three villages: Algiers, Bondville, Grafton, Jacksonville, Jamaica, Londonderry, Newfane, Putney, Readsboro, Saxtons River, South Londonderry, South Newfane, Townshend, Vernon, Wardsboro, West Dover, West Halifax, West Brattleboro, Westminster, Weston, Whitingham, Williamsville, and Wilmington.⁷ Infrastructure varies from village to village and tends to be based on the community size. Some villages have invested in wastewater

⁷ Not all of the villages identified in this Plan are separately incorporated. Seven villages are incorporated: Bellows Falls, Jacksonville, Newfane, North Westminster, Saxtons River, Townshend and Westminster.

treatment facilities, water systems, sidewalks, lighting and recreational lands. While much of the region still follows the traditional settlement pattern of compact villages surrounded by rural countryside, the boundaries, in many cases, are being blurred. For various reasons, development is expanding outside of traditional village boundaries.

Though sometimes referred to as villages, hamlets are smaller than villages and generally lack the infrastructure found in villages. Hamlets are characterized by small clusters of structures and include primarily residential and some civic use buildings. Existing structures are close together with relatively small setbacks, creating a compact settlement pattern.

Large-scale resorts are located in the western part of the region in the Green Mountains. The resorts provide recreational facilities and services and contribute to the region's seasonal housing stock. Each resort has invested in private wastewater treatment facilities or has access to municipal facilities. Route 100, the state's interior recreational travel corridor, together with Routes 9, 11, 30 and 103, provides access to the resorts.

Most existing and new residential development is in scattered small subdivisions (less than 10 lots) or on individual single lots, taking advantage of existing frontage on public roads. Residential development has generally followed town secondary roads. Ski resort development, currently in an expansion phase, has had a large impact on regional land use. Wilmington, Dover, Stratton, Winhall and Londonderry all have dense residential development that is, in part, attributed to nearby resorts. Related growth has also occurred in Wardsboro and Jamaica where there is a large number of seasonal homes.

Forests

There are over 500,000 acres of forest land in the Windham Region. Most is in non-industrial private ownership, held by many individuals with an average holding of less than 100 acres. Forests are valuable as a timber resource; as wildlife habitat; for recreation, including hiking, hunting, trapping and fishing; as a retreat; and as a scenic resource. The Green Mountain National Forest comprises a large expanse along the western edge of the region, running from Weston in the north to Readsboro in the south.

Since its inception in 1980, the Current Use Program (more properly called "Use Value Appraisal") has increased awareness of the value of conservative timber management by providing state funded tax relief for landowners who agree not to develop their land and to practice forestry according to state-approved forest management plans. Approximately 137,000 acres of the region's forests (about 31 percent of the region's forested land) are enrolled in this program.

As illustrated on the Conserved Lands Map, roughly 22 percent of the land area in the region is conserved through the combined effects of private easements and local, state and federal government actions. Many of the remote lands in the western part of the region are under some form of conservation protection, most notably as public lands in the Green Mountain National Forest. These federal lands represent the largest, contiguous area of conserved lands in the

region. Nineteen of the region's 27 towns own land, with a large percentage of that land being municipal forests used for recreation and/or forestry purposes.

Open Lands

The region's open lands include fields, ski trails and other large clearings. Many of these lands are in agricultural use and are primarily located in the Connecticut River Valley with another concentration in the Deerfield River Valley. Agricultural lands remain an important and defining component of the region's landscape. While the Connecticut River Valley has the largest amount of prime farmland in the region, other farmed lands are found scattered throughout the region, generally in the river and stream valleys. The working agricultural landscape not only contributes to the regional economy but also provides scenic backdrop to the developed landscape.

ISSUES AND OPPORTUNITIES

Changes in the region's landscape and population make it apparent that several issues and opportunities must be addressed. These issues and opportunities will define the land use patterns of the Windham Region in the years to come.

- Land is being developed in the Windham Region at a much higher rate than the population is growing. According to the Vermont Forum on Sprawl,⁸ between 1982 and 1992, the Connecticut River Valley (which includes the region) experienced a 28 percent growth in developed land whereas the population grew by 8.1 percent. The research also indicated that 61 percent of the development occurred on unconnected parcels of fewer than ten acres. These individual developments are scattered along state highways and secondary town roads outside of the compact centers.
- Census data show a clear and continuing trend for population growth in outlying towns and no growth in regional centers. Most of the new housing that is accompanying this growth is single family housing being built in an uncoordinated fashion on scattered, large lots. Compounding the issue is the large number of seasonal homes, currently 31 percent of overall housing units in the region. Combined, this pattern of residential development is driving up land and housing prices, increasing municipal service costs, degrading the landscape and contributing to a reduced sense of community.
- Rural lands are easily transformed into suburbia. Sometimes newly arrived rural residents are unwilling to forego suburban amenities that they believe make life more comfortable, but the demand for these amenities in rural areas threatens the essence of the landscape these same residents cherish.
- Many of the region's villages have limited infrastructure to support future growth and available, buildable land is in small units. Septic disposal has proven to be the primary limiting factor for growth and development in unsewered areas. Failed septic systems can also affect the quality of life, threaten public health and the health of the environment. Many buildings in the villages are underutilized and business and community expansion is strictly limited by existing septic capacity. Septic system failures are not easily

⁸ *Economic, Social and Land Use Trends Related to Sprawl*, Vermont Forum on Sprawl, 1998-1999.

remedied due to the density of existing on-site septic and water systems. In addition, inadequate space and poor soils contribute to siting problems.

- Once cultural centers for their residents, many villages have become homes for people who travel to other places for work, errands and recreation. Those villages on major regional routes are faced with increased through-traffic generated by local residents, tourists, through-trucks, and delivery trucks, a trend that was noted in earlier Windham Regional Plans and that appears to continue unabated or even accelerated.
- Historically, industrial development has occurred in the established urban centers of Brattleboro and Bellows Falls and the region's larger villages. Over the years many industries closed due to factors such as technological change, reduced need to be near rail and/or water, market changes and mergers. In the wake of these closures, communities have been left with vacant, under-utilized and possibly contaminated parcels.
- In 2002, the state enacted revised on-site wastewater system and potable water supply rules to promote cleaner water, improved accountability and record keeping, prevent health hazards and unsanitary conditions. While there are many positives to the new rules there are concerns that the changes may have an impact on local land use and have the potential to encourage rural sprawl, particularly those towns without zoning. For example, these changes may make it possible for people to live in areas that previously could not be developed, such as areas with steep slopes and/or high water tables.
- Trends toward forest parcel subdivision by many individual owners and residential and recreational development in forests continue to threaten traditionally significant timber production, hunting, recreational uses and wildlife habitat. Many of the more regionally-significant undeveloped areas in the central part of the region remain in private ownership and without formal conservation protection.
- In Windham County, approximately 83,000 acres were farmed in 1970. The net loss of farmland acreage from 1970 to 2002 has been roughly 21,000 acres or about 25 percent of the agricultural land base. However, the low point may have come around 1992, when the loss was closer to 50 percent, but recent data indicate that this trend may be reversing. The Census of Agriculture shows that between 1992 and 2002 the number of acres of land in farms increased by about 40 percent, from 43,985 acres to 61,596 acres. The total number of farms also increased from 287 in 1992 to 397 in 2002. Generally, Windham County farms are smaller and have more diverse agriculture than the rest of the State of Vermont.
- The Vermont Land Trust (VLT) continues to be very active in holding conservation easements in the region, particularly on lands in active agricultural use. VLT holds a conservation easement on a large area of land along the Deerfield River in the western portion of the region.

A type of conservation effort relatively new in the Windham Region is land purchases by conservation organizations. These are often community-based and involve parcels of local interest, where public access is a primary conservation goal. With few exceptions, land purchases and conservation easements have been the predominant methods of land conservation in the Windham Region since 2000. Two conservation organizations, the Windmill Hill Pinnacle Association and the Putney Mountain Association, have conserved over 1,470 acres of land in Athens, Brookline, Putney, Rockingham and Westminster through land purchase.

- o The population of the Windham Region is aging. Continued growth in automobile-dependent areas of the region will have implications on the mobility, housing and independence of older people, especially if petroleum supplies diminish and/or prices rise significantly.
- o Decisions made about land use and development are intrinsically linked to energy efficiency. As noted previously, there is a clear trend in the region of growth occurring in the smaller towns, further away from commerce centers. This spread out pattern of development has led to an increase in the number of car trips as well as the average trip distance. This type of development not only consumes more energy for transportation but also requires expansion of the distribution lines and other infrastructure. It costs more for individuals and businesses to pursue their regular activities, and it has a negative effect on environmental quality generally and air quality specifically.

PROPOSED REGIONAL LAND USE

The proposed regional land use is intended to create a framework for decisions related to growth and development throughout the region. It recognizes existing settlement patterns; availability of existing and planned public infrastructure (water, sewer, and roads); and land use policies established in existing town plans.

The proposed land use categories represent a vision for the use and development of the lands in the region. The Proposed Land Use Map depicts the land use categories that are described below. The purpose of establishing land use categories is to complement, support and reflect town land use planning by presenting a regional structure for settlement patterns and planning for future growth. Much work has been done by town planning commissions to develop local land use plans, and those plans provide the basis for the land use planning, vision, and structure presented here.

Downtowns and Villages

The Regional Plan encourages development, redevelopment and infill in downtowns and villages. Concentrating development in order to maintain the region's characteristic settlement pattern is a major element in most town plans in the region. The promotion of this kind of settlement pattern will:

- o Reduce pressure to develop farmlands, commercial forests and important resource areas;

- Minimize new building along connecting regional roads;
- Reduce growth in automobile travel, thereby reducing traffic volume, congestion, air pollution, and fuel consumption;
- Minimize the initial costs and loss of electricity through extended electrical distribution lines;
- Ensure that downtowns and villages will be vital communities providing a mix of land uses and meeting a variety of human needs, including housing, jobs, and social services;
- Guarantee that continued reinvestment in downtowns and villages will serve the public interest; and
- Increase local control of future development.

The Plan recognizes the 23 villages and 2 downtowns, as described in the Existing Land Use/Land Cover section of this chapter, as growth areas for the future. These same villages and downtowns are places to promote redevelopment and encourage additional residential and commercial development. The downtown and village land use category includes the core civic/business district as well as the surrounding mixed use neighborhoods. Development in downtowns and villages should be carefully planned to minimize undesirable impact on the character of these places.

High Intensity Mixed Use

An intensive pattern of development exists along Putney Road (US 5) in Brattleboro, the outskirts of West Brattleboro Village (VT 9), VT 30 in Rawsonville and VT 100 in Dover. These areas primarily contain service industries such as gas stations and retail shops. Development has occurred as a result of landowners independently deciding to develop along these routes resulting in a spread out land use pattern that is automobile dependent.

The intent of the high intensity mixed use areas is to transform existing commercial areas into higher-density, compact, mixed use settlements through infill and redevelopment of these areas. They should be designed and scaled to be pedestrian oriented rather than dominated by the automobile. It is important that these areas maintain clear boundaries so that development is discouraged from sprawling outside of the mixed use intensity area. By utilizing proper growth management techniques, the negative impacts of strip development can be minimized and mitigated.

New Town Centers, previously discussed as local growth areas in the preceding Regional Plan, should also be considered high intensity mixed use areas. Currently, some towns in the region are exploring developing a new town center to provide for a place for compact growth and mixed use development. These new centers must be identified in an approved town plan for growth, have specific boundaries established by the town, protect historic, natural and agricultural

resources, should not be linear areas located along roads and should have little or no impact on the adjacent towns or the region.

Resort Centers

Resort development is generally concentrated around ski area base facilities, and these built-up areas are recognized as resort centers. This Plan recognizes four resort centers: Mount Snow, Haystack, Stratton Mountain, and Magic Mountain. Growth in the vicinity of these resort centers, which has been stimulated by resort development and expansion, is sometimes termed secondary development. Seasonal homes are perhaps the most discussed form of secondary development, but lodging and restaurants are also prevalent near the region's resort centers. Much of this secondary development has occurred in places having sewer systems, along major routes, and in and around historic village areas. The resort centers currently do not have specific boundaries that define their limits, and future efforts to better define these areas and plan for their development need to take into account the substantial changes that have occurred—and continue to occur—in the resort industry.

The resort centers are located in the region's uplands where soils are often shallow, and slopes are steep. Many streams and rivers originate from these lands, as well as some are productive forestlands and valuable wildlife habitat. These conditions have been a guiding factor in resort center planning, development, and expansion.

This Plan recognizes the need for orderly expansion of recreation facilities, commercial services, and housing in resort centers along with careful environmental management. Successful resort centers will provide year-round recreational activities for residents and visitors. The plan recognizes commercial recreation as a legitimate land use that should not depend on secondary housing development for its economic viability. Town and regional facilities must not be overburdened nor should natural resource protection be compromised by either primary or secondary development at resort centers.

Resort centers deserve continuing and comprehensive planning attention by towns, resort managers, and the WRC working cooperatively together. It is appropriate that the results of this coordinated planning be incorporated in town and regional plans and be reflected in programs and decision making at all governmental levels. This planning should reflect and address the relationship between resort based areas, related recreation and facility developments, natural resources, transportation corridors, and historic village and settlement patterns.

Rural Lands

“Rural lands” is a general term that includes the specific land categories listed below. These lands include forest lands, agricultural lands, wildlife habitats, open lands, lands used for recreation, hamlets, and low density residential development. These lands are important primarily for their resource use and potential, as well as for limited economic and residential use. These areas are generally characterized by a mixed pattern of agricultural, forestry, residential, outdoor recreational, and some small-scale commercial and industrial land uses. An essential quality of the rural landscape is that the land has the capacity to be worked or used, and preserving the “working landscape” helps to protect its components.

Despite difficult access, rough topography, or lack of wastewater treatment facilities and/or water systems, many rural areas have attracted increasing residential development. Residential development is an appropriate use at low densities in many areas. However, it has and will continue to encourage rural sprawl if it becomes the dominant settlement pattern as it consumes significantly more land per residential unit than higher density development. This rural sprawl has caused the fragmentation of large land parcels containing significant productive rural lands and resource protection areas. The following rural lands categories and their accompanying definitions are designed to reduce this fragmentation, protect important resources and provide for areas in which residential development can occur while maintaining the rural landscape.

Rural Residential Lands

These areas include lands already committed to rural residential development. They are located generally near existing villages and services, do not have access to municipal sewer and water infrastructure, and are easily accessible by the existing road system. These lands do not contain significant amounts of high value natural resource lands, and may accommodate moderate density mixed use development that is compatible with existing land uses and sensitive to the limitations of the land. Rural land uses such as agriculture, forestry, recreation, commercial, and light industry are appropriate, as long as they relate satisfactorily to existing land use.

Though sometimes referred to as villages, hamlets are a distinct land use that is primarily—and sometimes exclusively—residential. A hamlet is either an existing cluster of residential development within a rural area or an area proposed to allow for the development of a small concentrated settlement within a rural area. A hamlet allows for a mixture of land uses that are consistent with the traditional settlement pattern and that will not unnecessarily duplicate services offered in the village or commercial areas. Hamlets provide an area for rural residential growth that maintains the historic settlement patterns and densities. In order to achieve traditional hamlet densities, it may be necessary to have shared water supply or sewage disposal systems.

Productive Rural Lands

Productive rural lands are low density and very low residential areas containing land-based resources that when in productive use contribute to the working landscape and have significant economic value. These productive resources include active agricultural lands, sand/gravel/mineral deposits and operations, high value agricultural soils, and forestlands. Productive rural lands provide a significant contribution to rural areas by maintaining open space and providing lands for rural lifestyles and occupations. These lands are the traditional rural working landscape of the region and require a level of protection and stewardship for this reason. These areas generally are not located near municipal sewer and water. Low density mixed use development can be appropriate, but it must be compatible with the traditional land uses, in scale with its surroundings and sensitive to the limitations of the land.

Resource Lands

Resource lands are dominated by lands requiring special protection or consideration due to their uniqueness, irreplaceable or fragile nature, or important ecological function. Resource lands include fish and wildlife habitats; areas hosting significant natural plants, animals and

communities as designated by Vermont's Nongame and Natural Heritage Program, or federally identified endangered and threatened species; unique and fragile natural areas; riparian buffers; wetlands; shore lands; floodplains; aquifer recharge areas; steep slopes; lands over 2,500 foot elevation; ridgelines; essentially undeveloped forestlands having limited access to improved public roads; and regionally significant scenic corridors and areas. Resource lands of special value should be preserved and protected to the greatest extent possible. Any development or land use in these areas should be designed to have a minimal impact on the natural resource. It is important to limit and manage human interventions in resource areas. The most appropriate land uses for resource lands are conservation and management of natural resources and low impact, very low-density rural uses.

TECHNIQUES

To assist the region in implementing the vision for the proposed land use, both regulatory and non-regulatory techniques need to be employed. Regulatory approaches, which are implemented on the municipal level, include such actions as adopting zoning bylaws, subdivision regulations, flood management ordinances, impact fees, curb cut permits, noise ordinances and junkyard ordinances. Non-regulatory approaches, which can be developed at both the regional (across town boundaries) and municipal level, can include, but are not limited to, infrastructure projects, community development, historic preservation, planning and conservation.

Character and Density of Development

Clustering development promotes traditional New England settlement patterns: structures grouped closely together on small lots surrounded by open space, farmland and forest. Clustering buildings on the most appropriate portions of a parcel with the simultaneous protection of important resource lands is a viable alternative to traditional single-lot zoning. Even for some commercial establishments, clustering can reinforce the rural townscape and encourage the efficient use of roads and other utilities, thereby reducing costs. Architectural styles and building materials also affect the character of development, and the use of traditional New England styles and materials blends with existing settlement should be encouraged. Commercial sprawl, often characterized by boxy one-story buildings, detracts from the character of the region's traditional landscape.

Density ranges and averages, where applicable, allow for more flexibility than do standard minimum lot sizes in zoning bylaws. Density targets can allow small lots to be developed in order to maintain significant resources in larger tracts. Recommended dwelling unit density ranges and average densities should be based on existing and desired land use patterns in a particular area. The density of development in any particular area or site should be determined using the following as guiding factors: physical site limitations, character of the area, availability of water supply and wastewater treatment facilities, impact on the land's resources, effect on adjacent land uses, and the services that will be required to accommodate such densities.

Open Space Planning

Open spaces are public and private lands that are undeveloped and contribute to the natural and scenic landscape of the region. Open space planning is a part of shaping growth. Just as it is important to identify areas desirable and capable of handling development and then working to

direct that growth to those areas, it is also important to identify areas where development should be discouraged and then work to make that occur. Towns often do this as part of the local planning process. However, efforts should be undertaken at the regional level to create a comprehensive open space plan that looks beyond municipal boundaries and targets conservation efforts to areas that will provide the maximum amount of public benefit.

Resource Protection

Areas and resources requiring extra protection and preservation efforts include aquifers, drinking water source protection areas, wetlands, floodplains, important forest resources, pristine waters, important fish habitats, shorelands, prime agricultural soils, steep slopes, and areas prone to erosion, habitat areas for threatened or endangered plant and animal species, other critical and necessary wildlife habitats, historical and archaeological resources, and scenic vistas. The protection of these areas can be accomplished through an eight-part effort:

1. Better resource mapping and identification;
2. Incorporation of mapping into town plans and the Regional Plan;
3. Protection through local land use controls (including clustering and transfer of development rights) and state regulations;
4. Full and fair enforcement of local and state regulations;
5. Minimizing the impacts of adjacent development on these areas;
6. Encouraging landowners to place conservation easements on important lands;
7. Encouraging and educating landowners to manage their lands in ways that protect and enhance the valuable resources on their lands; and
8. Proposing techniques to compensate landowners for the public benefits provided by these lands.

Reinvestment in Downtowns and Villages

Reinvestment in downtowns and villages can promote compact settlement and add to the vibrancy of communities. Revitalization can be assisted through participation in Vermont's Designated Downtown or Village Center programs as well as investment in infrastructure, retaining local business and public services, and redeveloping brownfields.

Both Brattleboro and Bellows Falls are Designated Downtowns under the *Vermont Downtown Program*. Participation in this program requires documentation of a viable downtown center, a commitment to enhancing and maintaining the downtown district, and sound financial and administrative plans and provides resources to assist with the revitalization of a downtown. Some of the funding designated downtowns are eligible for include priority funding for state programs, downtown transportation and capital improvement funds and an income tax credit for rehabilitation of certified historic buildings.

Vermont's Village Center designation is a tool that can be used to support economic vitality in the village core. Currently, the region has 13 state designated Village Centers (Putney, Saxtons River, Townshend, West Brattleboro, North Westminster, Westminster Station, Westminster, Westminster West, Whitingham, Wilmington, Algiers, Jamaica and Weston). Communities that receive the designation become eligible for a number of benefits for their village centers that include tax credits for building rehabilitation and improvements as well as priority consideration for State programs.

An important component of vibrant downtowns and villages is the presence of public buildings. Many communities have seen economic and social benefits when the post office, the municipal building, the public library, and other important public buildings stay or expand downtown. Conversely, when they leave, the fabric of the downtown and village can begin to unravel.

An example of this issue, in particular for villages, is the local Post Office and its place in the community. In recent years, the United States Postal Service (USPS) has implemented new or renovated Post Office projects that had significant negative effects on villages, whether with architectural misfits or by relocating facilities outside their historic settings. Whenever similar projects are proposed, the USPS needs to cooperate actively and effectively with the affected community, the WRC, the Vermont Division for Historic Preservation, and other interested parties, particularly historic preservation trusts and similar not-for-profit organizations.

The lack of existing infrastructure to support additional growth in some of the region's villages is a concern. State regulations regarding water and wastewater systems can make it difficult to facilitate development without having centralized systems. The cost of building centralized systems is can be prohibitive, but infrastructure planning is an integral part of encouraging infill development and compact settlement patterns. This is an important issue for the region and deserves continued concentrated attention during the life of this plan.

Brownfield redevelopment is another important village and downtown revitalization tool due to the fact that the region hosted a range of industries over the years, including organ manufacturers, print shops, paper mills, lumber mills and marble works. Many of these former buildings/manufacturing sites have been left vacant or underutilized; often left on the real estate market for years. These abandoned or under-used sites are both eyesores and potential threats to public health. These sites, known as brownfields, are usually found in downtowns or village centers. Often the perception that the site may be contaminated may be enough to limit interest in redevelopment of the site. In 2000, the WRC established the Windham Region Brownfields Reuse Initiative (WRBRI) to help communities confront these land use challenges. The program, funded mostly with EPA grants, conducts site assessments and related activities at brownfield sites. The WRBRI also provides landowners with a better understanding of the funding sources, benefits, tax incentives, and the liabilities, insurance protection, and tools available to redevelop sites. The Brownfields program has been a success in the Windham Region and so long as there is a need and funding, this program will continue.

Growth Centers

In 2006, Vermont adopted Growth Center program to enable municipalities to designate growth centers. Designated growth centers can provide an alternative to sprawl and at the same time accommodate growth and development. This technique can support the economic vitality of the state's downtowns and village centers and maintain the rural character and working landscape of the surrounding countryside. Designated growth centers can be located in an area of land that is in or adjacent to a designated downtown and village center or new town center, with clearly defined boundaries that have been approved by one or more municipalities in their municipal plans to accommodate a significant share of growth anticipated by the municipality or

municipalities over a 20-year period.. A growth center incorporates mix uses, public spaces, provides for denser development and is supported by existing or planned investments in infrastructure. The Windham Regional Plan will incorporate growth centers that have gone through the Growth Center designation process in future updates of the Plan.

Consistency in Municipal Plan and Zoning Ordinances Terminology

Town plans in the region contain many different proposed land use designations. While often called by a different name, many proposed land use designations are similar in nature. It is hoped that the proposed land use categories in this Regional Plan will be considered in local level planning efforts. This will encourage consistency in the various municipal plans and lead to a more effective management of the region's lands so that the goals and policies of this Plan may be realized.

ENERGY AND LAND USE PLANNING

Effective land use planning can and should promote energy conservation. Targeting new development toward areas located close to the community's major roads and existing settlements will minimize the energy consumed by commuting and reduce the energy required to deliver essential services to residents and businesses. Decisions concerning capital expenditures on roads and other municipal infrastructure should be mindful of energy conservation.

Promoting revitalization and infill in downtowns and villages will lead to compact development. This higher density development could provide more opportunities for alternative transportation such as transit, walking and bicycling and lessen dependence on the automobile.

The siting, design, and construction of buildings strongly influences the amount of energy needed for heating as well as the amount of electricity needed for lighting. Proper subdivision design, building orientation, construction and landscaping provide opportunities to influence energy conservation.

LAND USE POLICIES

The following policies are organized by land use category, but apply universally where appropriate.

Downtowns and Villages

1. Direct new growth in the form of jobs, housing, commerce, utilities, industry, community facilities, recreational facilities, and cultural activities to downtowns and villages, with consideration of type and scale of development, in order to keep these centers culturally, socially, and economically viable.
2. Promote the economic and community vitality of the central business districts in Brattleboro and Bellows Falls by supporting revitalization efforts that strengthen and improve viability of the downtown areas.
3. Target federal, state, and private funding to support public transit, bridge and highway repair, other transportation needs, installation of sidewalks and lighting, water and sewer,

community development, housing, recreation, and other identified downtown or village needs.

4. Rehabilitate existing housing, commercial and industrial buildings and areas.
5. Promote the attractiveness of downtowns and villages through quality building and landscape design and by maintaining public open spaces for scenic and recreation pleasure.
6. Preserve downtown and village character through appropriate design and scale of commercial, industrial, residential, transportation infrastructure and community structures and uses.
7. Revitalize, strengthen and improve the viability of villages and downtowns through using and maintaining existing historic structures whenever possible.
8. Construct or expand utilities water and sewer when needed to protect health and ground water resources, and to allow appropriate in-fill and development of lands within villages.
9. Adopt clear land use plans and related implementation policies that will maintain village boundaries, preserve historic settlement patterns, and prevent rural sprawl.
10. Promote opportunities for alternative transportation development in village and downtown areas

High Intensity Mixed Use

1. Encourage communities to develop master plans for transformation of existing commercial areas and planning for New Town Centers.
2. Utilize access management techniques to ensure proper function, safety and performance of the roadway in the designing for high intensity mixed use areas.
3. Promote the attractiveness of high intensity mixed use areas through quality building and landscape design and by maintaining public open spaces for scenic and recreation pleasure.
4. Provide for safe mobility of pedestrians and cyclists in the high intensity mixed use areas.
5. Adopt clear land use plans and related implementation policies that will maintain high intensity mixed use boundaries and prevent rural sprawl.
6. Avoid new areas of strip development and seek means to offset the negative effects of existing strip development.

Resort Centers

1. Direct new growth and development in the form of resort jobs, housing, commerce, recreation, and cultural activities to the existing resort centers.

2. Concentrate growth at resort centers to minimize the trend towards dispersed housing and commercial growth.
3. Manage resource lands to preserve their value for water quality, trails, open space, wildlife habitat protection, and scenic enjoyment.
4. Incorporate public transportation in all plans for transportation improvements in the resort centers.

Rural Lands

1. Develop hamlets at the density of, and in the settlement pattern of, existing historic hamlets and villages.
2. Direct new residential development and services in rural areas to hamlets in order to prevent rural sprawl.
3. Support the development of, and protect the character of, hamlets through appropriate zoning, site planning, and building design.
4. Direct new hamlet developments away from areas that provide critical access to wildlife habitat and ensure that wildlife habitat does not become fragmented by the elimination of connections and corridors between wildlife areas.
5. Develop rural residential lands at densities that will serve to contain rural sprawl, and that are compatible with existing land uses and sensitive to the limitations of the land.
6. Encourage a mix of rural land uses including housing, home businesses, small-scale agricultural, commercial and industrial uses; and outdoor recreation, so long as these uses are compatible with one another and do not cause excessive noise, pollution, or disturbance.
7. Ensure that new development is sensitive to the limitations of the land and avoids important natural resource areas located within the rural residential lands.
8. Direct new rural residential development away from areas that provide critical access to wildlife habitat and ensure, through planning, that wildlife habitat does not become fragmented by the elimination of connections and corridors between wildlife areas.
9. Ensure that new development reflects existing settlement patterns, is low in intensity, and does not conflict with the use and management of forest, agricultural and mineral resource lands, but rather sustains these natural resource commodities.
10. Support a mix of rural land uses including agriculture, housing, home businesses, small-scale commercial and industrial uses, commercial forestry and outdoor recreation, so long as these uses are compatible with one another and do not cause excessive noise, pollution, or

disturbance.

11. Manage agricultural and forest lands to promote a long-term sustained yield of crops and timber products.
12. Encourage the use of innovative land-saving techniques - such as cluster development and fixed area density allocation - to protect agriculture, forest, and mineral resource lands from development and fragmentation.
13. Protect green space, particularly along streams and rivers, and other important lands that are valued for trails, open space, wildlife habitat and scenic enjoyment.
14. Encourage the conservation in perpetuity of agricultural lands, including related forest lands and sugar bushes.
15. Encourage full funding of the State Use Value Appraisal Program (Current Use) and enrollment in the program.
16. Ensure that new development reflects existing settlement patterns, is low impact and low intensity, and does not conflict with the resources, but rather sustains these natural resources.
17. Protect important natural resources such as fish and wildlife habitats, areas hosting state or federally identified endangered and threatened species, unique and fragile natural areas, wetlands, shore lands, floodplains, aquifer recharge areas, steep slopes, lands over 2500 foot elevation, ridgelines, essentially undeveloped forest lands which have limited access to an improved public road, and regionally significant scenic corridors and areas.
18. Protect green space, particularly along streams and rivers, and other important lands that are valued for trails, open space, wildlife habitat and scenic enjoyment.
19. Avoid extension of roads, energy transmission or distribution facilities, or other utility services into or through Resource Lands.
20. Construct corridors for new energy transmission or distribution facilities only when needed, and then only within or adjacent to existing operational energy transmission facility corridors to the maximum extent possible. Minimize their visual impact on ridgelines, slopes and open areas, and avoid important natural and historic resources.
21. Preserve and protect wildlife corridors that join tracts of resource land and important wildlife habitat in order to avoid fragmentation.

Growth Centers

In 2006, Vermont adopted Growth Center program to enable municipalities to designate growth centers. Designated growth centers can be located in an area of land that is in or adjacent to a

designated downtown and village center or new town center. The following policies apply to designated growth centers.

1. Increase capacity and, where needed, extension of infrastructure to serve designated growth center needs.
2. Establish clearly designated growth center boundaries and related local land use regulations.
3. Rehabilitate and use under-utilized land and buildings in growth centers.
4. Encourage cooperation between designated growth centers and neighboring towns on issues related to growth center development, related impacts, and financial issues.
5. Encourage consolidation of regional and town services where it will avoid unnecessary service duplication.

ENERGY

The Windham Region offers a high standard of living and an attractive environment, made possible in large part by access to abundant and relatively inexpensive supplies of energy. But energy supplies are easily perturbed by natural disasters and political crises, both of which have impacted us in recent years, and popular debates abound regarding the reliability of future energy supplies, especially petroleum. All of these events and issues remind us just how critical energy is to our society and way of life, and how fragile that balance might be. The major theme of this Regional Plan is energy: the diversity and reliability of supplies, the short and long-term financial costs to obtain it, the environmental impacts of how it is put to use, and the fact that those choices affect everything else. Energy issues are at least touched upon in every section of the plan.

Vermonters use a variety of fuel sources to meet energy needs, all of which present tradeoffs regarding societal and environmental concerns, and most of that energy is imported—all of the petroleum that we use for transportation and space heating, for example is imported. Most of Vermont's hydroelectric power is imported from Canada, and all of the uranium used at Vermont Yankee is imported. About the only fuels that aren't imported to Vermont are locally grown wood used for heating, and very small amounts of locally produced wind, hydroelectric and solar power.

Energy is a global commodity and its reliable supply requires global actions. But energy use is local, as are both the positive and negative impacts how it is used. State and local governments can best prepare for the future by taking action to diversify energy sources, to improve the efficiency of energy use, to stimulate the use of renewable energy resources, and to implement land use strategies that foster and support sustainable energy.

This section of the plan addresses energy use of all types, not only electricity. The generation, transmission, sale and use of electricity can be regulated at the state level to a greater degree than many other energy transactions and uses, but transportation accounts for the lion's share of our energy consumption, and for that reason the connections between the Energy, Transportation and Land Use Elements of this plan are important. But electric power nonetheless deserves special attention because of key issues regarding current and future supplies and the reliability of the transmission systems.

A key premise underlying this energy discussion is the need for significant progress on three fronts:

1. *Increased diversification* of energy sources, in order to reduce dependency on foreign sources and to increase stability in the event of supply interruptions or cost fluctuations;
2. *Reduced environmental impacts*, especially regarding air quality and subsequent impacts on water quality (some impacts originate elsewhere, such as acidification and mercury deposition in surface waters from electric power plants to the west of New England, and some locally, such as air impacts of carbon monoxide and soot from gasoline and diesel

engines); and

3. *Increased conservation* in all energy uses in order to reduce costs and in support of the above.

While most energy production is distant and outside the direct control of individuals and local governments, it remains true that energy use results from a mix of government policies and individual choices. Federal and state policies, such as tax incentives for purchasing and installing renewable energy systems, play a significant role and influence individual energy decisions. In past years, federal and state tax incentives were available to homeowners for the installation of passive and active solar energy systems, and many were installed across the United States. Today, federal tax incentives are available to commercial-scale wind energy conversion systems and that is largely credited for the wind farms being built across the country. Clearly, government policies and incentives can steer public and private investment toward cleaner, renewable energy sources if we so desire.

State and federal governments have more control of energy supplies, sources, and pricing than do municipalities, but regional efforts can play a role in energy development and energy conservation, particularly via influencing land use decisions that affect energy consumption. Reducing the region's dependence on outside energy sources and reducing the rate of growth of overall energy demand will contribute positively to the regional economy and quality of life.

Reducing the rate of growth in energy consumption for, transportation, our primary energy use, also would be expected to have positive economic and environmental effects. The relationships between the use of transportation resources and on one hand, and land use decisions and subsequent development patterns on the other, are undeniable, and trends over time have tended toward less efficiency. Sprawl, discussed in the Land Use section of this plan, is scattered development that increases traffic, increases pressure on local resources and consumes open space, turning farms and forests into rural subdivisions that serve cars better than people. The automobile-based American culture has made this possible. To the extent that we continue to allow and, in some cases, even encourage sprawl development, we are forcing ourselves and future generations to spend more money and consume more energy for automobile transportation than would otherwise be necessary. Conservation may present our greatest—and closest to home—new energy “source,” and it interacts with transportation policies in many ways, including:

- the extent to which we drive private motor vehicles instead of using public transportation or walking or cycling;
- the extent to which we design and develop our communities to favor automobiles over other modes of transportation; and
- the extent to which we choose energy-efficient vehicles when we do drive.

Energy conservation also interacts with other policies and decisions, such as:

- designing and building housing and commercial structures to capture passive heat and light and to use energy more efficiently and conserve it more effectively;
- fostering the development of indigenous and renewable energy sources;

- encouraging federal and state policies that would support more local and distributed electricity generation; and
- accepting local regulations that would more energy efficient building styles and patterns, or that would require more aggressive and longer-range energy planning.

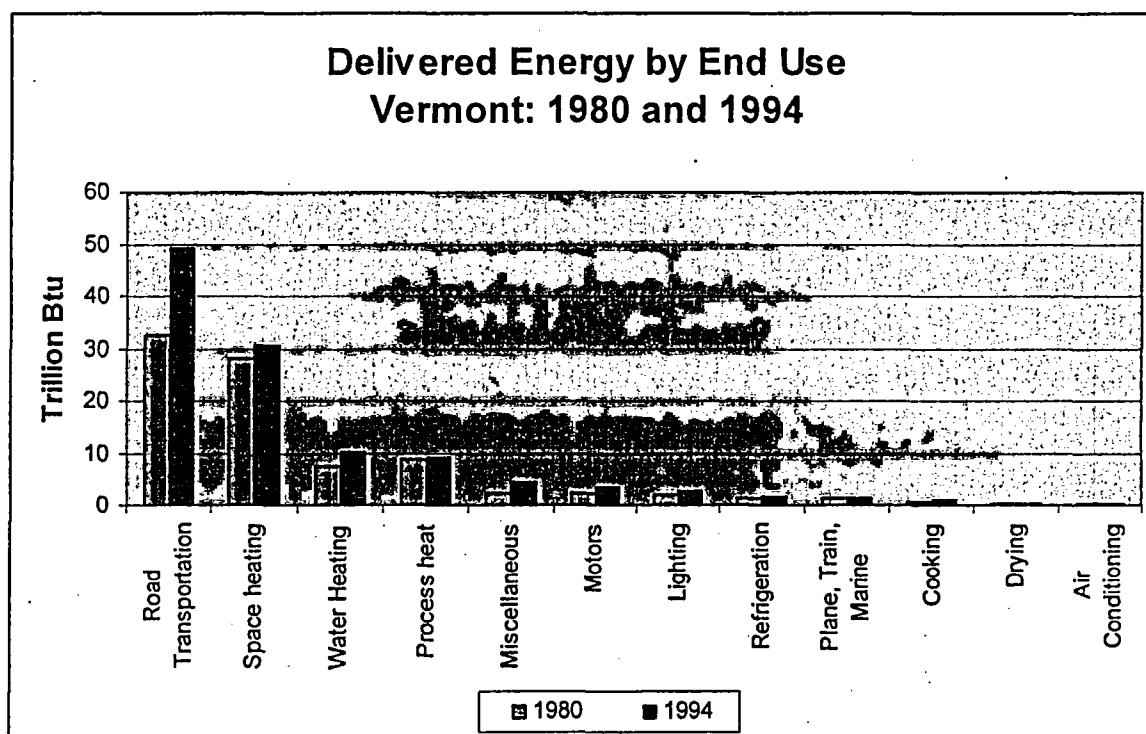
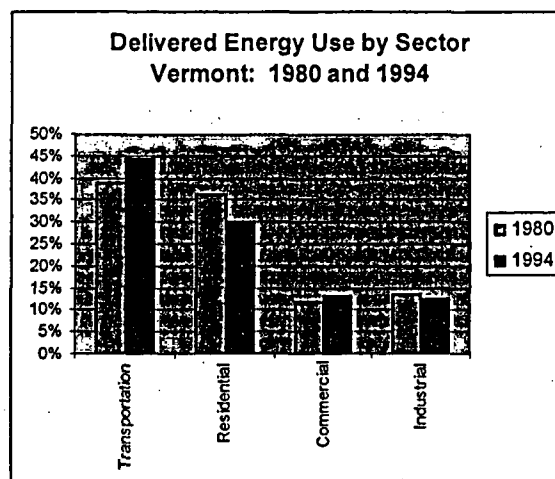
ENERGY USES

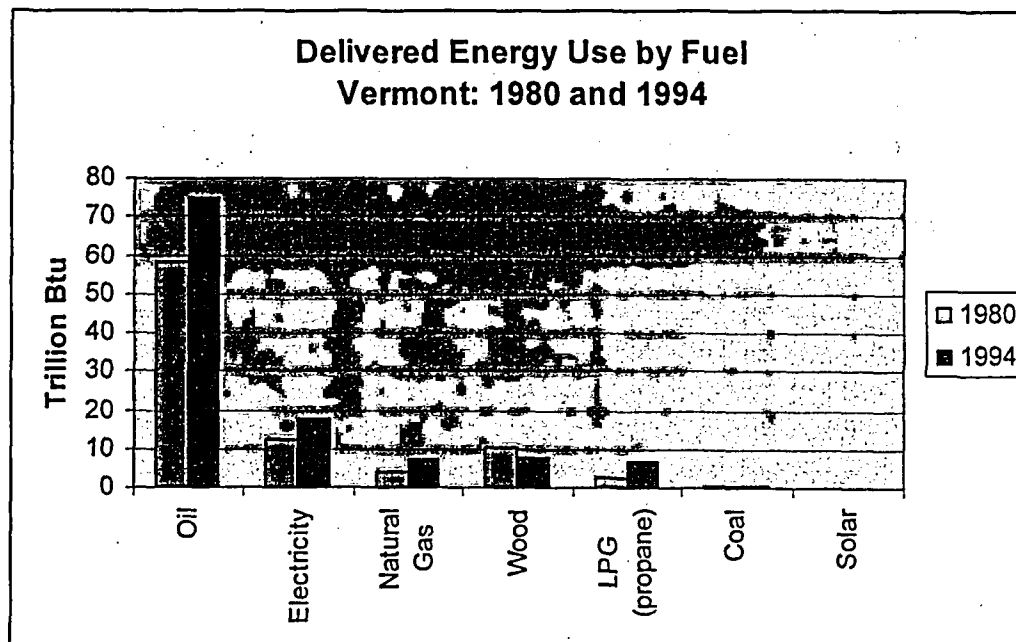
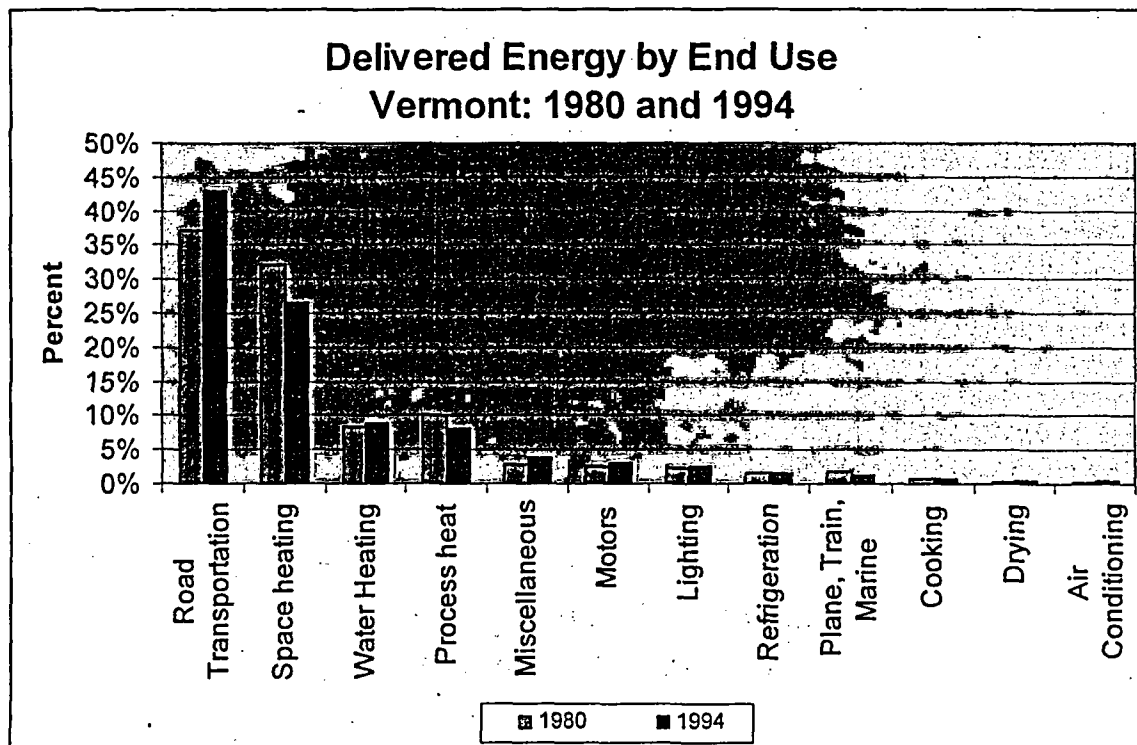
The following charts illustrate statewide energy consumption by sector, by end use and by fuel.⁹ Even though the data are only available statewide, regional energy use and trends can be inferred from this information. Total energy use is expected to show a 54 percent increase from 1990 to 2015, stemming largely from increased transportation energy use, due in turn to dispersed land use patterns and increased vehicle miles traveled. Neither federal nor state policies appear to be reducing the rate of growth of transportation energy consumption. As renewable electric generation projects come on line, and as home energy conservation continues to increase, the gap between transportation energy use on one hand, and residential, industrial and commercial energy consumption on the other, is expected to widen.

A technical note of some significance should be made here, and that is the distinction between energy measured at the point of consumption, called “delivered energy use,” and energy measured as generated, called “primary energy use.” Delivered energy use is measured at the point of use, as it enters—or is delivered to—the consumer’s home, building or vehicle. Primary energy use includes the delivered energy plus the energy that is lost in generation, transmission and distribution. This is especially important in the case of electric generation because thermal power plants, regardless of the fuel burned, must shed two units of heat energy for every one unit of electric energy that is produced. Delivered consumption is the measure most often used in reports of energy use because it provides a better baseline for comparison, and that is what is used here.¹⁰

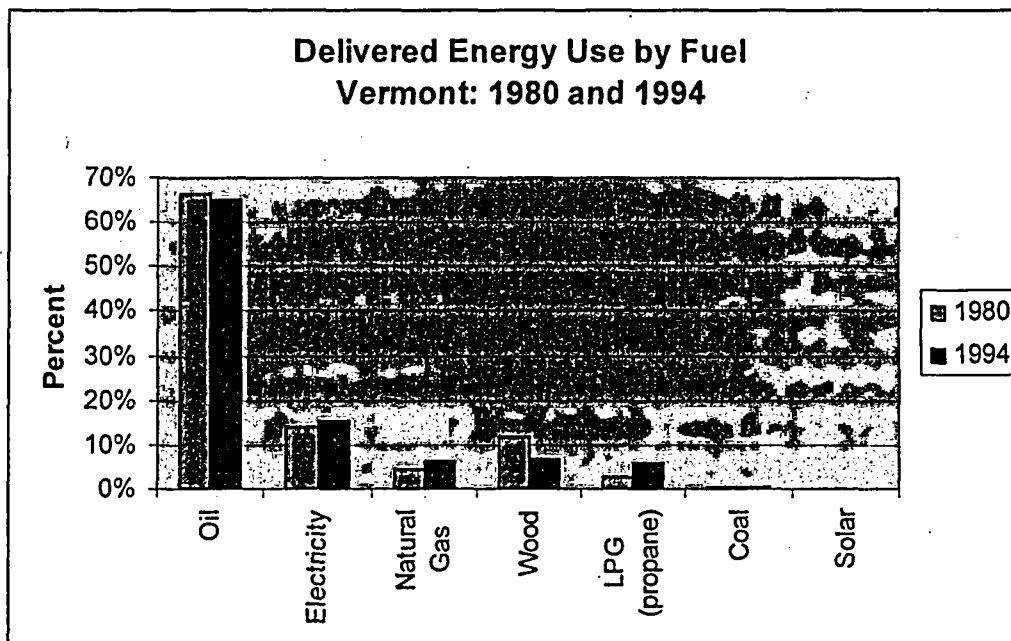
⁹ The Vermont Department of Public Service published the *2004 Vermont Comprehensive Energy and Electric Plan* in December, 2003, updating *Fueling Vermont's Future*, which was published in 1998. The more recent document does not present a comprehensive summary of statewide energy use by sector, unfortunately, but some references indicate that the general distribution of energy consumption by sector is relatively unchanged from what was presented in the 1998 edition. Data from the 1998 report are used for these graphs and elsewhere in this plan where appropriate and more recent data, mostly from the U.S. Department of Energy, are added where available.

¹⁰ *Fueling Vermont's Future; Comprehensive Energy Plan and Greenhouse gas Action plan*; Department of Public Service, 1998.





Note: The first modern commercial wind energy facility in Vermont commenced operation in Searsburg in 1997.



There are two main issues reflected in the preceding charts. First, transportation is the single largest use of energy in Vermont, and almost all of that is highway transportation. Related to that is the fact that oil is by far the primary fuel used in Vermont. Space heating is the second highest end use, and oil certainly represents a large share of that use, but transportation represents the greatest portion of our non-electric energy use and so it may offer the greatest conservation potential.

Second, electricity represents a significant share of all end uses other than transportation, it is present in almost every end use and involved in almost all the other fuel uses (an oil furnace won't operate without electricity, for example, nor will many gas appliances).

ENERGY SOURCES

Petroleum

Seventy percent of all energy used in Vermont is from petroleum products. Petroleum is used primarily for transportation, but heating is also a major use, accounting for 58% of all home heating energy used in Vermont. Inefficient land use patterns and increased vehicle miles traveled, with fairly stable heating needs, contribute to maintaining the dependency on this fuel source. A number of tradeoffs accompany our high reliance on oil:

- it has been readily available and affordable for over 100 years, and our subsequent dependence on it becomes a liability when supplies fall or prices rise significantly;
- it has fostered the automobile-based—and automobile-dependent—dispersed land use patterns that increasingly characterize the landscape; and
- major consequences of oil combustion, along with other fossil fuels, impact air and water quality.

Hydropower

The major supplier of hydropower for Vermont is Hydro Québec, which provides approximately one-third of the electric power used in Vermont. Looking ahead, the contracts underlying the Hydro Québec power purchases expire over a few years beginning in 2015.

The potential for expanding hydropower is severely limited because the majority of feasible sites have been developed, and because environmental policy and public sentiment would be unlikely to support construction of new dams. At the same time, relicensing requirements tend to call for higher minimum flows, which in turn can reduce storage and reduce the energy produced from existing facilities during peak demand. The greatest potential for additional hydropower may lie in improving the generating efficiency at existing hydroelectric plants or installing new turbines at non-producing or under-productive existing dams.

The other facilities include two intermediate load hydroelectric generation facilities along the Connecticut River, with dams in Bellows Falls and in Vernon. Annual generation at Bellows Falls is 290.88 million kilowatt hours, and Vernon is 157.17 million kilowatt hours. At the time this is drafted, TransCanada has applied to the Federal Energy Regulatory Commission to replace two of the five Vernon Dam turbines with larger, higher power rated units. Smaller, privately owned facilities also exist around the region.

TransCanada Corporation operates hydroelectric projects along the Deerfield River in Vermont. The Searsburg Dam and Station is rated at five-megawatts, and the Harriman Dam and Station, located in Wilmington and Whitingham, Vt., includes three generating units capable of producing 40 megawatts of electric power. Sherman reservoir lies mostly in Vermont but its electric generation occurs in Massachusetts.

Nuclear

The Vermont Yankee Nuclear Power Station (VY) in Vernon is owned by Entergy Nuclear Northeast, a subsidiary of Louisiana-based Entergy Corporation. VY came on line in 1972 and its operating license expires in March, 2012. About 55% of the originally licensed 500 megawatts generated is purchased by Vermont utilities, and provides about one-third of electricity consumed in Vermont.

In early 2006, Entergy Nuclear Vermont Yankee's applications to the U.S. Nuclear Regulatory Commission (NRC) and the Vermont Public Service Board (PSB) for a 20% power increase were approved. Termed an "extended power uprate," the largest of three uprate types that can be approved, the increase was implemented in 5% increments and completed in May, 2006.

As this plan is drafted, Entergy has applied to the NRC for a license extension to operate beyond 2012, which will require federal approval by the NRC and state approval by the PSB. Additionally, under state statute that was revised in 2006, legislative approval is required prior to action by the PSB.

The Vermont Yankee reactor undergoes refueling outages every 18 months. When fuel is changed, old fuel assemblies that have been in the reactor for approximately 4½ years are

removed to the spent fuel pool, where they are stored and cooled by an active water cooling system. The storage system was originally designed on the assumption that spent fuel would be stored for a minimum of five years and then sent out to be reprocessed (eliminated by Federal rule in the late 70's) or for long-term storage by the U.S. Department of Energy. The latter plan, currently focused on Yucca Mountain, Nevada, has encountered difficulties and may still be decades away. Privately operated interim storage facilities are being explored, including one being pursued at a Goshute reservation in Utah by an industry consortium that includes Entergy, but none is anticipated to be available in the near future. It is certain that the spent fuel pool at VY will reach capacity in 2007 or 2008.

With the spent fuel pool at capacity, and if there is no place to which spent fuel can be shipped for storage or disposal, the alternatives are to shut down the plant or store spent fuel in some other manner on site. "Dry cask storage" is currently used for this purpose at 35 nuclear stations in the U.S., and several commercial systems are approved by the Nuclear Regulatory Commission. Final state approval of an interim dry cask storage facility at the Vernon site was awarded as this plan was being drafted, and construction will begin by summer 2006. Complete decommissioning of the VY plant and dry storage of all spent fuel assemblies generated through 2012 will require approximately 55 casks; extended operation beyond 2012 and a later decommissioning would further increase that number.

Wood and Biomass

Wood as a primary source of home heating peaked in about 1979 at about 48% of Vermont households. Airtight stoves remain the most popular wood-burning device, and approximately 50 percent of the households in the region contained at least one wood-burning appliance when the state last published those data.¹¹ The current state energy plan does not offer current estimates or projections of home heating with wood, but it is assumed that rising oil and electric costs will spur new growth in the use of wood as a home heating fuel, both in the form of traditional cordwood and as processed wood fuel pellets.

The term "biomass" is often used in relation to commercial or institutional systems, often co-generating heat and electricity, and will be more commonly used as those systems come into more typical use. Biomass most often refers to wood and wood waste from harvesting and processing operations. Biomass also refers to any organic matter that is available on a renewed basis and includes forest residues, agricultural crops and wastes, livestock waste and aquatic plants. Energy can be derived from direct combustion of the biomass, or from combustion of flammable gases such as methane that is generated by the decomposition of organic material.

Wood burning produces air pollutants in the form of carbon dioxide, particulates, carbon monoxide and volatile organic compounds (VOC), generally in that order of magnitude. Carbon dioxide (CO₂) emissions can be a "net zero" impact, however, if sustainable forestry is employed. Sustainable forestry, in which new tree growth is allowed to replace harvested and burned trees, ensures that an amount of CO₂ equivalent to what is emitted by burning will again be captured from the atmosphere. Conversely, burning fossil fuels releases into the atmosphere CO₂ that had been sequestered for millions of years and is not offset by any biological

¹¹ *Vermont Residential Fuel Wood Assessment 1997-1998*, Vermont Department of Public Service, December 2000.

processes¹². Modern wood burning appliances that meet current EPA guidelines have lower emissions of particulates, VOC and carbon monoxide, but still higher than from oil, natural gas or Liquefied Petroleum Gas (LPG or propane).

Natural Gas

Currently, there are no natural gas pipelines that provide gas to the Windham Region. It is provided by Vermont Gas, the state's only supplier, but only in Chittenden and Franklin Counties. However, gas in the form of bottled gas—LPG, or propane—provided an estimated 13% of the home heating fuel for the region's residents in 2000, and it also is used for cooking and hot water. Overall, the use of LPG in Windham County increased by 3.6% from 1990 to 2000.

Coal

Statewide, coal provides for only 0.4% of the total energy use. Windham County use of coal for home heating has dropped from 1.6% in 1990 to 0.7% in 2000. Coal has a direct impact on Vermont and on the Windham Region, however, because it represents the cheapest, most abundant and most commonly used fuel to generate electricity in the U.S., and Vermont's air and water quality are harmed by deposition of mercury and acid rains from coal-fired power plants far to our west.

Solar

Solar energy provides only about 0.1% of the energy used in Vermont, almost entirely in the residential sector. While solar energy potential in northern New England is largely untapped, development of both hot water and photovoltaic systems is hampered by low solar potential during the winter months (due to latitude and to a high percentage of cloudy days during the winter) and by poor economic incentives if power from the grid is reasonably available. Technological advances may boost the use of solar power in the region, and increased uses of passive designs and siting can increase the use of solar energy and the conservation of other heating fuels in homes and businesses.

Waste

Waste as a source of fuel provides .5% of all energy used statewide. One of the nation's first commercial landfill gas-to-electricity projects was constructed in Brattleboro in 1982. Vermont Energy Recovery Systems uses the methane produced at the Windham Solid Waste Management District's Brattleboro landfill to generate and sell electricity to Central Vermont Public Service. The project generates approximately four million kilowatt hours annually. Other types of waste-to-energy fuels are discussed under "biomass", above.

Wind Power

In 1997, Green Mountain Power (GMP) developed Vermont's first modern commercial wind-generating station in Searsburg, consisting of 11 wind turbines with combined total power rating of six megawatts. The project was approved despite relatively high cost of power, due to its perceived value as a demonstration project. Currently wind power provides a negligible amount

¹² *Fueling Vermont's Future; Comprehensive Energy Plan and Greenhouse gas Action plan*; Department of Public Service, 1998.

of the energy used in Vermont, but it is generally viewed as having high potential for growth. Wind power is clean and renewable, but turbine placement can be difficult and controversial because of natural resource impacts, aesthetics, and the need for turbine placement altitudes between 2,500-3,300 feet which in Vermont often means in sensitive areas with thin soils and steep slopes.

Several commercial wind energy projects are pending in Vermont as this plan is drafted, including an approximately 49 megawatt installation proposed for Glebe Mountain in Londonderry and Windham, and a similar sized expansion of the existing Searsburg facility. Virtually all wind energy proposals in Vermont have faced strong opposition that frequently is based in aesthetic impacts, but their required placement at high altitudes, often in relatively undeveloped areas, all but ensures significant natural resource impacts.

Commercial wind power has become economically viable because of the combined effects of improved technology, federal tax subsidies, projected increased wholesale energy prices and projected increased demand. Projected demand, in turn, is in part a function of consumer preferences and state energy policies (Massachusetts and Connecticut require electricity retailers to maintain an escalating share of renewable sources among their supplies, called a Renewable Energy Portfolio or a Renewable Portfolio Standard, and Vermont law will require such if utilities fail to meet similar goals voluntarily. Those requirements create a state-mandated increase in demand for wholesale renewable power).

It should be noted that commercial wind energy was not economically viable anywhere in Vermont ten years ago. A lot has changed, and it is reasonable to assume that commercial wind energy will continue to evolve toward being more economical and viable in more locations and at lower altitudes in the future. If so, the potential locations for commercial wind energy generation could increase dramatically, carrying with it a mixed public reaction and potentially polarizing some affected communities.

Small, home based wind energy systems are favored by some policy makers, but relatively high costs and consequently long pay-back periods have thus far restricted their implementation. Part of the cost, both in terms of financial cost and labor required, relates to required storage batteries. Net metering is one way in which a homeowner can realize savings from operating a residential wind or photovoltaic system without using storage batteries. Under net metering, a homeowner is permitted to connect suitable generating equipment to the public power grid. During periods when more energy is generated than the property is using, the metered amount of electrical energy provided to the grid reduces the owner's residential electric bill. Legislation passed in 2006 that is intended to promote the use of "group net metering", which allows multiple accounts within an electric utility service area to pool resources and share both the costs and benefits of a net metered installation.

Energy Conservation

Local planning efforts that are sensitive to energy issues promote development and settlement patterns that minimize transportation requirements and encourage land use that conserves energy. Zoning bylaws, subdivision regulations, and the Act 250 process are vehicles by which

municipalities can promote energy efficient development at the local level. The siting, design, and construction of buildings strongly influences the amount of energy needed for heating as well as the amount of electricity needed for lighting. Energy can be distributed and consumed more efficiently by concentrating housing in towns and villages and minimizing dispersed settlement that is distant from existing power distribution systems.

Vermont's transportation sector consumes nearly half of the state's current energy demand, and energy expenses for transportation are projected to continue increasing at a rate faster than any other sector of the economy. Changes such as ride-sharing, combining trips, walking, and using alternative transportation individuals could reduce the region's total energy demand, but those programs have proven very difficult to implement at any meaningful scale, in large part because they conflict with a rural lifestyle and independent personal schedules. More and better public education programs regarding not only the environmental benefits of conservation but also the potential financial savings are needed.

Central Vermont Public Service and VELCO have estimated the potential for energy savings from conservation and efficiency measures of about 159 gigawatt hours¹³ per year between 2007 and 2016, or about 25% of projected annual use. Additionally, combined heat and power projects (CHP, also called co-generation) are a significant untapped source in cases where a high thermal demand is present, with an estimated potential of 12.8 megawatts of winter generation.

Over half of the electricity used by Vermont's residential customers supplies three specific end uses: electric space heating, electric water heating and refrigeration. Alternative technologies and fuels for space heating and water heating are widely available and can be used to replace the use of electricity for these end uses. The energy efficiency of most structures in the region could be improved by increasing insulation, minimizing air leaks and maximizing the efficiency of heating and cooling systems. Other programs of which residents can avail themselves include residential energy audits from VELCO, certification as an Energy Star Home by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy, and taking advantage of rebates on Energy Star lighting and appliances from Efficiency Vermont

ENERGY DEMAND

The forecasted increase in energy demand is influenced by demographic and economic trends, but does not necessarily follow growth in a linear fashion. The *2004 Vermont Comprehensive Energy and Electric Plan* projects an annual population growth rate of 0.4% from 2000-2020, down from 0.7% in the preceding decade, and an annual compound growth in electric demand of 1%, down from 1.2% in the 1990's. Based on Department of Public Service projections, and assuming no changes in energy use patterns, we should expect in the next 20 years to see a population increase of about 8%, a total electric demand increase of about 22%, and an increase in highway use of gasoline of about 22%. Demand for home heating oil, used by about 55% of Vermont households, is flexible due to a fairly common availability to choose the use of oil or wood in reaction to price. The state projections are for an essentially flat curve in heating oil

¹³ 1,000 watts = 1 kilowatt; 1,000 kilowatts = 1 megawatt; 1,000 megawatts = 1 gigawatt.

demand¹⁴ These data have major implications because they illustrate that demand for energy in the forms of electricity and highway transportation is expected to increase at a rate nearly three times the population growth, a pattern that may not be sustainable.

ELECTRICITY DEMAND

Vermont is part of the tightly connected New England power grid, and uses just over 4% of the total electricity consumed in New England. An Independent System Operator (ISO New England Inc.) replaced the New England Power Pool as the federally designated transmission organization for the six-state region. As such, it manages the daily operation of New England's bulk electric power system and oversees the development and administration of New England's wholesale electricity marketplace.

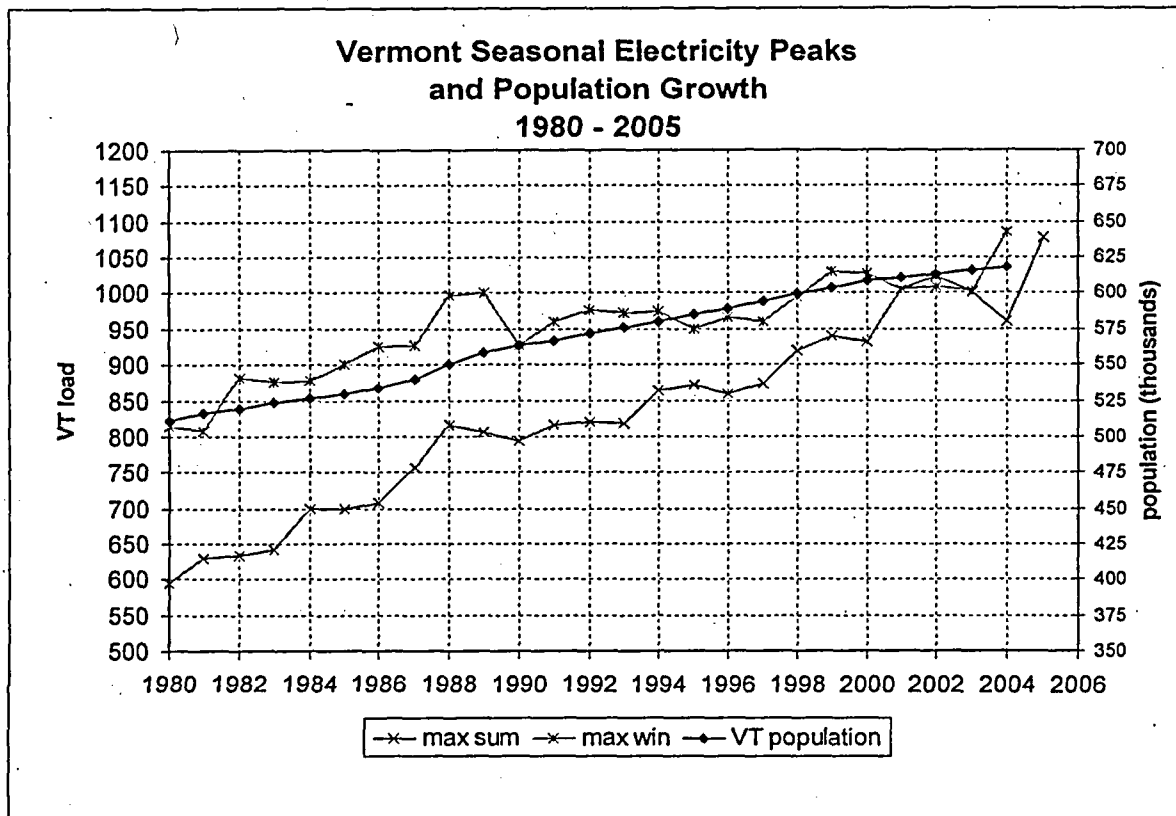
Statewide electric energy data show two important trends that are likely to have significant impact on our near-term energy future. First, as illustrated in the graph below, Vermont was a "summer peaking" state for the first time in 2001. This is the logical result of summer electric energy use having steadily increased at a faster rate than winter use and faster than population growth. Historically, Vermont experienced its peak electric demands during the winter, when other New England states were off peak, thus tending to avoid shortages. Simultaneous summer peaks across the New England grid may increase the potential for short-term power shortages.

Second, Vermont's peak demand now is about 1,100 megawatts and is growing at a rate of about 20 megawatts per year. The Vermont Electric Power Company (VELCO) projects that new transmission facilities will be needed when that peak demand reaches the 1,200 to 1,250 megawatt range, or sometime in the next five to eight years.¹⁵

An important regional consideration is the "southern loop" of Central Vermont Public Service's transmission facilities, which currently operates at or near capacity much of the time. The loop consists of 75 miles of transmission lines connecting Bennington and Brattleboro with the

¹⁴ 2004 *Vermont Comprehensive Energy and Electric Plan*, annual growth rates projected: population, 0.4%; electric demand, 1.0%; vehicle miles traveled, 1.0%; distillate fuel consumption, 0%.

¹⁵ Information presented by VELCO to the Southern Loop Community Working Group, April 27, 2006.



southern Vermont ski areas between (extending as far north as Bromley). Involved Windham Region towns include Winhall, Stratton, Londonderry, Jamaica, Townshend, Newfane, Dummerston, and Brattleboro. The two major tie-ins to the loop (the Woodford Road substation in Bennington and the Vernon Road substation in Brattleboro) are distant from the areas of growing electrical demand. When either substation fails or is out of service at or near peak conditions, the other may be unable to compensate. Central Vermont Public Service added transformer capacity at both substations in 1995, the first such improvement since the early 1970's. Current demand suggests a need to upgrade the southern loop facilities, and anticipated future growth requires it. In anticipation of this need, VELCO and CVPS have inaugurated a major planning project that is focused on identifying and implementing needed improvements to the "Southern Loop" that carries power between Brattleboro and Bennington.

CURRENT ISSUES

The reliable supply of electricity and its cost will be the focus of major policy debates in the years to come. Discussions of electric energy issues underscore the fact that demand is growing faster than the population it serves, and supply and capacity, are significantly eroded at the margins in a number of areas:

1. The electric supply is not diversified, and a narrow base is unstable. One third of the state's electric power comes from Vermont Yankee, and another one-third from Hydro Québec.

2. Both the Vermont Yankee and Hydro Québec contracts expire within the next decade, and other alternatives are likely to come at a higher price. If the Vermont Yankee operating license is extended, the Vermont utilities' contracts nonetheless expire in 2012.
3. Looking ahead to the loss of the majority of Vermont's electric power contracts in the near future, a simultaneous increase in the rate of growth of demand for electric power is evident, growth far in excess of the background growth of population.
4. The Southern Loop is an important part of the infrastructure that is in need of significant upgrades, and it may be somewhat indicative of the fact that New England's power system is older and less robust than in some other parts of the U.S.

The trends all point to problems in the cost and supply of electric power in the next ten to fifteen years.

Issues currently being considered at the state, regional and local levels include locating major generation facilities, transmission or system upgrades, encouraging conservation programs such as demand-side management and co-generation, and encouraging the consideration of biomass generation. Identifying local power needs and the use of unconventional methods of energy production and conservation – with a focus on renewable energy sources and localized generation – includes analyzing the electric grid to identify high use areas and potential power sources close to the point of use. Additionally, proposals or opportunities to bring natural gas supplies into the region may come up during the life of this plan; if so, the WRC will need to become actively involved in those efforts and reviews. The general public may have a better understanding of energy issues than in the past, and thus may be more receptive to state and local policies that would lead to a stronger and more strategic state long-range energy plan, increased diversity of our electric energy supplies, greater use of innovative and creative programs such as group net metering and distributed generation, and increased conservation at all levels.

ENERGY POLICIES

1. In all new commercial energy developments, adhere to a high environmental standard that includes minimizing environmental impacts and adequately mitigating those that remain.
2. With regard to commercial wind energy projects
 - a. Conduct thorough and proper studies and analyses to adequately address all areas of concern regarding development; and
 - b. Avoid negative environmental impacts to the maximum extent possible; minimize and appropriately mitigate those that cannot be avoided.
3. With regard to proposed developments and changes at the Vermont Yankee Nuclear Power Station
 - a. VY and other parties should respond directly, effectively and in a timely manner to public concerns and requests for information;
 - b. Effectively and adequately address all issues related to facility operation and reliability, which are inextricably intertwined with public health and safety

4. With regard to proposed new or improved energy transmission or distribution facilities:
 - a. Prefer and select existing transmission and distribution corridors over creation of new corridors
 - b. Avoid extension of energy transmission or distribution facilities into or through Resource Lands
 - c. Avoid extension or alteration of energy transmission or distribution facilities in any manner that would significantly impact Resource Lands or significantly diminish important natural resource values
5. Educate towns and the public about energy efficiency services available in the region, including education of homeowners and contractors regarding high standards of insulation for new buildings and the improving the energy efficiency of existing structures.
6. Support programs such as Efficiency Vermont in their goals to reduce electric energy costs with cost-effective energy efficiency measures, considering conservation as an energy source.
7. Balance improved conservation measures and the development of new generation and transmission to ensure adequate future energy supplies, including support for requirements that utilities improve the efficiency of procedures and assist customers to conserve energy and reduce costs.
8. Require the design of all new landfills, should any be proposed, to capture gasses generated during decomposition and to convert methane to useful energy.
9. Incorporate co-generation into proposed utility, industrial and commercial projects, including resort development and public facilities, wherever feasible.
10. Use alternative fuels, such as biodiesel, ethanol, methanol, and methane where reasonable, and support programs aimed at increasing their use.
11. Promote the reduction of vehicle miles traveled in Vermont.
12. Ensure public participation as part of the decision making process for siting, evaluating, and relicensing energy generation, transmission and distribution facilities and for electric utility deregulation.

ECONOMY

EXISTING ECONOMIC CONDITIONS

The region's economy is influenced by many external forces such as the global marketplace, demographic trends, transportation, local and state regulations, and energy. The Regional Profile chapter provides detailed data on the economic characteristics of the region.

In 2000, the median household income was \$40,856 for the State of Vermont and \$38,204 for Windham County. Eleven of the region's towns median household income exceeded the State's median. Nine percent of individuals were below the county and statewide poverty level in 2000. Generally, higher levels of poverty were found in some of the more rural areas of the region.

The composition of the region's labor force and unemployment numbers have not experienced dramatic change from 1990 to 2000. Demographic data indicates that there are a smaller percentage of young, working people in the region than those nearing retirement age.

Economic Sectors

In 2004, the highest percentage of employment for Windham County is found in the service (35 percent) and wholesale and retail trade (19 percent) industries. Between 1994 and 2004 the service industry experienced a 10 percent increase while wholesale trade decreased eighteen percent and retail trade increased two percent. The region's continued long-term economic shift away from agriculture, natural resources and manufacturing of durable goods to the service industries (most notably tourism, health, and education) reflects a statewide trend that began in the 1970's.

Services

The service sector includes health, education, arts, entertainment, and recreation industries. While the service sector is important in terms of providing stable employment, its wage levels are generally lower than other sectors. For example, in 2004 the average retail and leisure/hospitality sector wages in Windham County were 28 percent and 48 percent respectively less than the overall average wage for the County. Service sector jobs also typically have non-traditional shifts, which may include early morning, longer shifts, weekend and/or evening hours.

Some of the largest service employers in the region are health care providers, including The Brattleboro Retreat, Eden Park Nursing Home, Brattleboro Memorial Hospital, and Carlos G. Otis Health Care Center. Some of these service providers are among the fastest growing and high-wage areas of the economy, in part because of the growth in the health service industry.

As an industry, education accounted for five percent of the Windham County employment in 1994. In 2004, education accounted for six percent of employment in the county.¹⁶ School Supervisory Unions and the School for International Training provide educational services for local use and export. In addition, there are several independent primary and secondary schools as well as a branch of Vermont Community College and private colleges. The wide array of

¹⁶ Vermont Department of Employment of Training

educational services offered in the region draws students and families from all over the world, which contributes to the demand for lodging, dining, transportation, and retail industries. Some area schools occupy unique market niches: Landmark College and Greenwood School in Putney serve learning disabled students, while the Austine School provides for hearing disabled people and their families. World Learning Inc. focuses on international studies and training. The potential for growth in this sector is great, especially considering increased access through distance learning technologies. The technology-oriented Marlboro Graduate Center offers training opportunities for current residents of the region and serves as a magnet to new technology based business.

The Windham Region has attracted tourists for generations. With the construction of Interstate 91 and the development of the ski industry, the region has experienced a tremendous growth in tourism over the last 30 years. Its location in Southeastern Vermont brings it within convenient range of travelers from large urban areas. Brattleboro is at the junction of Interstate 91 and three major state highways, making it a gateway for travelers headed to other parts of the region and Vermont. The past decade has not seen an influx of new skiers and the industry is searching for new markets, such as the younger snowboarding generation. Sparse snow winters and industry changes have made the ski business capital intensive and contributed to a decrease in the total number of operating ski areas. The surviving ones have grown in size and in scope of services, to the point that in peak seasons the resort area populations rival the region's two traditional centers.

The three major components of the region's tourism and recreation industry are ski resorts, summer and fall tourism, and second homes. Each affects the economy in different ways and provides different types of employment. The first two are primarily seasonal industries and the last has year-round effects on the economy. Many of the current full time residents of the region first came to Vermont as seasonal tourists. Businesses that have benefited from the growth related to tourism and recreation include the arts, entertainment, lodging, restaurants, gasoline stations, retail shops, outdoor equipment sales, construction and building materials, and maintenance and repair services.

A 2003 tourism study sponsored by the Vermont Department of Travel and Tourism revealed that:

- Retail expenditure was the largest spending category (27 percent), followed by lodging (24 percent), food and restaurants (24 percent), and recreation (11 percent);
- Major segments of leisure travelers visited historic sites and attended cultural activities (41 percent), took part in outdoor activities (22 percent), and bought maple syrup (37 percent); and
- Two-thirds of overnight visitors came during the summer months of June through August.

Heritage and cultural tourism provides another opportunity to further promote and increase tourism opportunities. It has the advantage of using assets that are already here and encouraging

the preservation of the very details that distinguish Vermont. Heritage tourism, according to the National Trust for Historic Preservation, “means traveling to historic and cultural attractions to learn about the past in an enjoyable way.” With its wealth of historic villages and sites and cultural attractions, the Windham Region is well positioned to promote heritage tourism. One piece of the cultural heritage of Vermont is its long history of family-based farms, and agriculture. Agri-tourism not only attempt to draw tourists, but provide markets for Vermont’s agricultural products and thus help to keep farming viable. The Connecticut River Byway and Molly Stark Trail Scenic Byway are examples of coordinated heritage tourism projects in the Windham Region. Both byways are opportunities to enhance and support economic development, and particularly the historic agricultural economy.

The success of the region's travel and tourism industry is directly linked to the viability of its agriculture industry. Urban dwellers are drawn to the area's rural environment, viewing farms as scenic centerpieces of the surrounding countryside. Tourism provides a source of employment and a market for products from the farm community, and is a wealth generator for the overall economy. Each farm that goes out of production and into development diminishes the landscape and makes it less appealing to visitors. The health of the agricultural economy is important for the overall economy of the region.

Land-Based Industries

Land-based industries include not only agriculture, forestry, and fishing, but also specialty foods and food processing, wood products, and stone industries. Lumber companies, such as Cersosimo Lumber, make up a large portion of the sector.

Agriculture

Agriculture plays an important role in defining the region's lifestyle and landscape, and it has long contributed to the stability and diversity of the regional economy. From 1992 to 2002 the number of farms in Windham County increased from 270 to 397, an increase of 47 percent. From 1997 to 2002 alone, the number of farms increased by 92, an approximate 30 percent increase.¹⁷
¹⁸

The demand for Vermont agricultural and value added products remains strong. However, the market value of agricultural products sold in Windham County calculated in average total sales per farm has substantially decreased. In 1997 the average total sales per farm was \$66,775 compared to \$46,150 in 2002. After adjusting for inflation, this represents slightly more than a \$28,600 real decrease in average sales per farm. In 2002, approximately 59 percent of the farms had less than \$2,500 in sales, as compared to 26 percent of the farms in 1997.

While the number of large farms (over 500 acres) and small farms (49 acres or less) in Windham County has increased during this time, the average size of all farms has generally stayed the

¹⁷ U.S.D.A. 2002 Census of Agriculture

¹⁸ These data can be confusing. For example, the U.S.D.A. for the purpose of the census, defines a farm as *any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year*. The State of Vermont, for the Current Use Program, defines a farmer as *a person who earns at least one-half of his annual gross income from the business of farming*. Directly comparable federal/state data are not available.

same, at 154 acres in 1997 and 155 acres in 2002. One-third of the farms are between 50 and 179 acres. Overall, land in farming increased by close to 14,800 acres in the County over the same period of time.¹⁹

Production of fruits, vegetables and maple sugar have historically brought significant commercial returns. The 2002 Census of Agriculture reported a less than one percent decrease in the number of farms producing vegetables, orchard fruits, and greenhouse crops for sale since 1997, resulting in a 25.1 percent decrease in sales after adjusting for inflation from these "specialty crops." But some sectors, such as apple and other orchard fruit production are beginning to undergo significant change. In 1997, there were 1,067 acres of land in orchards. By 2002, the region experienced a 40 percent decrease with only 643 acres in orchards.

The number of Windham County farms in livestock, poultry, and related products increased overall. Sales and the number of farms in cattle and calves (beef and dairy) is down from 1997 and the number of farms in dairy has decreased by approximately 13 percent. The number of farms in the region with sheep and lambs has increased at a rate of 10 percent between 1997 and 2002. In both 1997 and 2002, the total sales from livestock, poultry, and their products outweigh total sales from crops.

Forestry

Forests are one of the region's most important economic resources. Approximately 86% of the region is forested and all but a small percentage of that land (0.7 percent of Windham County) is considered commercial in that it supports periodic harvest. These forests provide wood products, game for hunting (which brings in significant income to the region), maple products, and the basis of a livelihood for many people.

Timber industries have played an important role throughout the region's history. The commercially important forest species in the region are sugar maple, white pine, white ash, red oak and the birches. Hemlock is less important commercially, but is widespread in the region and is often harvested for paper pulp. In 2003, Windham County ranked third in the State in total for sawlog and veneer log harvest with 22.161 million board feet. The County is typically ranked in the top four counties for overall sawtimber harvest, leading the state in 2003 in the harvest of red oak (2.940 million board feet) and second in the state in white pine (6.565 million board feet), two important species for the State in terms of value and yield.²⁰

Windham County has the second highest number of sawmills in the state. Brattleboro is host to one of the largest kiln drying facilities for lumber in the United States. A number of secondary wood-related industries including construction materials, furniture manufacture, toy manufacture, cabinetry, boat building, musical instruments, and basket making are located in the region. The strength of the industry is directly related to the availability and good management of forestlands. A more detailed description of the importance of forestlands is in the Natural Resources Chapter.

¹⁹ U.S.D.A. 2002 Census of Agriculture

²⁰ Vermont Forest Resource Harvest Summary, 2003

Wholesale/Retail Trade

Between 1980 and 1990, the number of trade sector employees in the region increased by 55 percent. The growth rate in the wholesale sector during that period (121 percent) reflected the arrival and growth of two food-warehousing companies among the top employers in Brattleboro. Here again, the region's roadway network has been an advantage to its economic development. In 2004, retail trade made up 12 percent of Windham County's employers, making it the second largest sector of the economy. Average annual wages for retail are among the lowest of all sectors (\$23,559 in 2004), while wages for the wholesale trade sector, only 7 percent of employees, are among the highest (\$43,863 in 2004).

Most of the service and trade establishments have developed in Brattleboro and Bellows Falls, villages, and in the resort areas. In Brattleboro and Bellows Falls, public and private initiatives have been undertaken to improve the physical and financial conditions in the central business districts. Commercial development has occurred in conjunction with expansion of recreational facilities at the ski resorts for four-season use.

Manufacturing

The manufacture of intermediate and finished goods was the sector of largest employment in the region from 1930 until the 1980's, when it fell behind both service and trade sectors in terms of employment. In 2004 manufacturing accounted for 11 percent of the employment, a decrease of 4 percent from 1998 level. Although no longer providing the highest wage rates in the region, manufacturing continues to provide relatively high-paying jobs with an average annual wage in 2004 of \$40,939.

Manufacturing activity has taken place primarily in Brattleboro and Rockingham. Each town has improved land available for manufacturing. Brattleboro's Exit One Industrial Park offers 92 acres and the Southern Vermont Industrial Park on Putney Road has 70 acres. Both have municipal water and sewer and convenient access to Interstate 91. The Bellows Falls Industrial Park is 31 acres and also served by municipal water and sewer systems and convenient access to Interstate 91.

The Brattleboro Development Credit Corporation and the Bellows Falls Area Development Corporation encourage and support manufacturing industries in the region. These organizations have worked with the Vermont Industrial Development Authority to secure aid for industrial development. The WRC has been involved in various community development programs designed to create low-interest loans for business and industry.

ISSUES AND OPPORTUNITES

- o While large businesses tend to be very visible and their expansion or contraction grabs headlines, small businesses are a significant component of the region's economy. In 2004, 24 percent of Windham County businesses employed nine or fewer persons and 55 percent employed 49 or fewer employees.²¹ Traditionally, the small business sector tends to be where some of the most dynamic growth occurs. Having the majority of workers employed in

²¹ Vermont Department of Employment and Training, 2005

numerous and diverse businesses also makes the region less vulnerable to economic impacts from changes in any particular business sector or individual company.

- Employment projections for Vermont indicate that, by 2010, the fastest growing occupations will be computer support specialists, physician assistants, vocation education teachers (post secondary) and computer software engineers. The largest overall number of job openings, however by 2010, is expected to be for cashiers, retail salespersons, waiters and food preparation.²²
- New technologies, particularly in communications, contribute to conditions for locating businesses in rural areas like the Windham Region. Higher paying service industries such as health care, business, professional, legal, and information services are dependent on communications and information technology. The growth of this sector will reflect the region's access to and encouragement of telephone, computer, and cable enterprises. Bellows Falls is home to an important Internet Access Provider, and Marlboro College has a technology graduate center in Brattleboro. These types of enterprise help to keep the region competitive and attractive to technology dependent business. The region's strategic gateway location within a few hours drive of the northeastern U.S. metropolitan corridor provides an additional advantage.
- Median income growth has been flat in terms of purchasing power per household. This is consistent with national trends which show that middle to low middle incomes have not risen at the same rate as higher incomes. *The 2003 Vermont Job Gap Study* documents that a significant percentage of full time workers in Vermont still do not earn enough to pay for all the basic necessities of living. The Study found that about 55 percent of Vermont families with at least one full time worker and two children did not earn a livable wage. The study also points out the costs that must be borne by communities when families can not meet basic needs.
- The Windham Region, like much of the rest of Vermont, has struggled to make a long, slow recovery from the decline of manufacturing that began in the sixties. The recent expansion, led by technology and by focused economic promotion, has contributed to a significant revitalization of partially abandoned downtowns and underutilized commercial and industrial sites. At the same time, there has been pressure for sprawling business and residential growth outside the traditional villages and downtowns. This has led to a growing concern that the character of the region and the state as a whole may be changing in ways that undermine two of our major economic assets: the traditional rural Vermont landscape and the quality of life here.
- The region continues to attract and keep businesses because it offers an appealing environment for employees to raise families, has a wealth of high-quality outdoor recreation resources, and enjoys transportation access via the railroad and Interstate highway system.
- The most visible challenge to economic growth may be meeting the need to provide

²² Vermont Department of Employment and Training, 2003

affordable housing for workers. The region suffers from a shortfall in the creation of new housing units in an affordable range for a significant portion of the workforce. This condition also exists throughout much of the Northeast United States.

- Many of the region communities are interested in community economic development strategies. Community economic development encourages local economic activity to ensure that the investment and wealth generated from these activities can be retained in the community.
- Arts and culture are of growing importance to the regional economy. In June 2004, the Vermont Council on Rural Development issued a report titled *Advancing Vermont's Creative Economy*. Among the facts reported in the report are:
 - ⇒ 4.5 percent of Vermont's workforce hold jobs in the "creative cluster" of enterprises which include graphic, performing arts, among others;
 - ⇒ Between 1997 and 2001, the creative cluster in Vermont grew at a rate of about 5.4 percent, the fastest among all New England States;
 - ⇒ In New England, cultural heritage tourism brings in about \$6.6 billion in revenues. In Vermont, cultural heritage travelers stay longer (7.7 nights vs. 3.2 nights, and are more likely to buy Vermont-made products (87 percent vs. 51 percent) than the typical Vermont visitor.

FUTURE ECONOMY

The Windham Region offers a diversity of topography, communities and people. The quality of life in the region is built upon the many resources available, ranging from natural resources such as rivers, lakes, forests, and farmland, to cultural resources, including history, arts, and crafts. A diversity of business activities will continue to enhance the variety of resources that make the region special. Continued coordination among local, regional, and state organizations in supporting the growth of existing businesses and the development of new businesses is a critical component of ensuring and improving the region's economic vitality.

Efforts to encourage young people to stay and work in the region must be emphasized and could include encouraging businesses to provide livable wages, increasing the stock of affordable housing, and enhancing the region's creative economy

To contain sprawl and to enhance the vitality of the region's towns and villages, support and funding for economic development projects should focus on existing developed areas. Infill development, reusing existing structures, and making use of brownfield sites will help avoid unnecessary consumption of undeveloped land and enhance the region's downtowns and villages.

Infrastructure is an important component of the regional economy. Transportation, water and sewer facilities, and telecommunications all play a role in supporting existing businesses and

encouraging ones. The benefits of infrastructure development need to be balanced with potential secondary impacts on the built and natural environment.

Natural resources are significant foundations of the Windham Region's economy, and preserving them for the future is vital. Large tracts of undeveloped land are critical to the preservation of Vermont's rural economy and quality of life. They provide tourism, recreation and wildlife values, as well as more directly economic agricultural and forestry functions.

ENERGY AND ECONOMY

The day-to-day cost of energy frequently is a wide concern, though perhaps tending to be on a short-term basis in response to current events. But at the root of such issues is concern about energy reliability and cost over the long term.

There are three major reliability issues that influence the region's energy future.²³ First, New England has few indigenous energy sources, which means that our energy costs more because it has to travel farther to get here, and the need to import most of our energy makes us more vulnerable to supply and price fluctuations. Second is the concern that the newly deregulated structure of the electricity market may not provide the right incentives for companies to make needed long-term investments; older systems with less relative capacity are likely to be less reliable. Third, even with other incentives in place, communities are increasingly concerned about safety, security, and economic and environmental impacts related to energy developments of all kinds. That, coupled with a fragmented local decision making process makes it difficult to site new generation and transmission facilities in New England.²⁴

Personal and business transportation consumes about two-thirds of Vermont's energy budget. The service industry, particularly tourism, is very dependent on people driving to their destinations and gasoline costs and supplies are a major concern. Space heating and cooling also represent large shares of the energy budget and may, along with more energy efficient appliances of all types, offer potential for significant reductions in the region's rate of growth in energy demand.

Conservation of energy through weatherization and other energy efficiency products might lessen some of the demand for energy. However, working to obtain reliable and diverse energy sources on the national, state and local level is important to the vitality to the economy of the region.

ECONOMY POLICIES

1. Promote activities and development that contribute to a strong and diverse economy, providing satisfying and rewarding job opportunities for all citizens in all parts of the region

²³ Federal Reserve Bank of Boston. *The Challenge of Energy Policy in New England*. Research paper, April 2006.

²⁴ The report cited above also notes that "higher prices do not necessarily translate one-for-one into higher expenditures... New England...consumes less energy per capita than other regions—an average of 257 million Btus per capita each year versus 338 million for the United States as a whole. In the end...New Englanders pay an average of \$2,473 per capita for their energy needs, only slightly higher than the U.S. average of \$2,433.

and supporting a strong municipal tax base, while maintaining environmental standards and promoting environmental justice

2. Encourage activities that expand opportunities in areas with high unemployment or high numbers of workers earning less than a livable wage.
3. Encourage development of industry and commerce that utilizes renewable natural resources and agricultural products from within the region and Vermont.
4. Encourage restaurants and markets to obtain and supply agricultural products from within the region and Vermont.
5. Encourage community supported agriculture (CSA) as a means of making small farm operations more economically viable.
6. Generate a variety of stable, year-round jobs with wages and other compensation that provide a livable income, and that include skills training programs and other benefits that contribute to the personal development and quality of life for all workers.
7. Develop and assist the growth of small businesses, including home businesses, and entrepreneurial ventures that preserve and revitalize communities.
8. Utilize existing financial, physical, and technical resources to facilitate economic development, including the creative use and revitalization of suitable existing space for manufacturing and industrial activities, commerce, housing, and the arts.
9. Improve and expand markets, production, processing, and distribution of land-based industry products, in particular, value-added products.
10. Support a broad range of agricultural programs such as agri-tourism, agricultural demonstration, test projects, community supported agriculture, consumer or producer cooperatives, and farmers' markets.
11. Utilize waste and surplus products, such as low-grade timber, wood chips and cordwood, and other recycled or post-consumer products as available and feasible.
12. In addition to specific job re-training that teaches technical and trade skills, provide educational programs in basic skills, such as math and communication, in order to improve value and opportunity for the region's workforce, both entry-level and advanced.
13. Promote the economy through tourism activities that emphasize the character of the region itself: its beauty, culture, history, wildlife, and outdoor recreation.
14. Support the activities such as the arts, which enhance year-round tourism, stabilize the level of use of community resources; and improve cultural opportunities for all residents.

15. Focus appropriate economic development activities in designated downtowns, and in regional growth centers designated by this Plan, and local growth centers designated by town plans.
16. Consider current and future housing requirements in evaluating business development and expansion projects. Encourage measures that will establish and maintain an adequate and diverse housing stock for area workers, including expansion of infrastructure, in particular water and sewer, for housing and business development in growth areas and villages.
17. Expand and establish new commercial development that conforms to traditional historic development patterns, with compact mixed-use residential and commercial centers separated by rural countryside.

NATURAL RESOURCES

Protection of natural resources begins with an understanding of the complex balance of energy, ecosystems, and all living organisms. This interconnected web of life-support systems makes the sustainability of natural resources both a global and a local issue. Rapid consumption, misuse, or degradation can deplete and destroy both renewable and non-renewable natural resources.

The Windham Region is fortunate to have a wealth of valuable natural resources. Extensive forested lands, river valleys, upland streams, and wetlands create an ecosystem in the region that sustains numerous plant and animal communities in addition to supporting human habitation. This interconnected ecosystem of humans, animals, plants, earth, air, and water can be sustained through careful resource use and preservation.

SURFACE WATERS

Surface waters are predominant landscape features throughout the region, often determining both the location and form of regional settlement. Surface waters include rivers, permanent and intermittent streams, ponds and lakes (both natural and impounded), vernal pools, and wetlands. The region's abundant surface water is a valuable resource providing:

- Aquatic and wildlife habitat;
- Recreational opportunities;
- Scenic enjoyment;
- Riverine aquifer recharge;
- Water for drinking and irrigation;
- Hydroelectric generation; and
- Assimilation of properly treated waste.

Watersheds

The majority of the Windham Region is located within the Connecticut River basin with small portions located in the Hudson River and Lake Champlain basins. These basins contain many rivers and tributaries, each with their own unique values and uses. The table on the following page shows the Windham Region's major watersheds and their respective acreage within the region.

The principal surface water planning issues are:

- The protection of water quality from non-point sources of pollution;
- Remediation of waters identified as impaired by the state water quality assessments;
- Stream channel stability and floods;
- Public access;
- Education;
- Dams, their construction, management and removal;
- Use of waters for snowmaking;
- On-site septic management; and
- The management of waters to accommodate competing uses.

WINDHAM REGION WATERSHEDS			
Watershed	State Watershed Basin Number	Acreage In Region	Percent Of Region
Connecticut River Basin	--	582,598	99
West River ²⁵	11	306,150	52
Deerfield River	12	172,221	29
Lower Conn. River	13	104,237	18
Lake Champlain Basin	--	660	0.1
Otter Creek	3	660	0.1
Hudson River Basin	--	6,630	1
Batten Kill River	1	6,630	1
TOTAL		589,888	100

Lakes and Ponds

Within the watersheds of the region, there are 32 lakes and ponds of over 20 acres. These waterbodies provide their own special habitats and recreational opportunities, as well as issues. Some of the issues particularly pertinent to lakes and ponds are exotic invasive pest species such as Eurasian milfoil, competing recreational uses, and dam management and removal.

Vernal Pools

Of the order of 10,000 vernal pools are scattered throughout the roughly half-million woodland acres in the region. These ephemeral pools deserve protection because they provide the necessary breeding and nursing habitat for a number of amphibians (frogs and salamanders) and the total habitat for fairy shrimp.²⁶

Wetlands

The region's wetlands are vital for their abilities to recharge groundwater, regulate and filter surface water flow, store water, mitigate floods, and provide aquatic and wildlife habitat. Consequently, they require careful protection. The National Wetlands Inventory (NWI) Maps show Class I and Class II wetlands. Class I wetlands are so classified through a petition process. There are currently no Class I wetlands in the Windham Region. Class III wetlands are not mapped and are usually less than ½ to ¼ acre in area.

Water Quality

Under Section 305(b) of the Federal Clean Water Act, states are required to monitor surface water quality and to publish the results periodically. The most recent report for Vermont, dated

²⁵ Basin 11 also encompasses the Saxtons and Williams Rivers

²⁶ Further information is available in the Windham Regional report on *Woodland Vernal Pools and Associated Amphibians: their Relevance to Town Plans and Zoning Ordinances in the Windham Region of Vermont* (8 April 2003).

June 2004 shows the great majority of surface waters in the Windham Region to be in good condition. There are a number of exceptions, however, and their locations are shown on the accompanying map of “Impaired Surface Waters” together with the basic causes of their impairment. Additional details are contained in the appendices.

WINDHAM REGION LAKES AND PONDS OVER 20 ACRES				
Lake/Pond Name	Town	Acreage (Surface Area)	Outlet Type	Dam Height (In Feet)
Athens Pond	Athens	21	Natural with artificial control	3
Ball Mountain Reservoir	Jamaica	76	Artificial	260
Burbee Pond	Windham	50	Artificial	13
Cole Pond	Jamaica	41	Natural	
Deer Park Pond	Halifax	22	Artificial	14
Gale Meadow Pond	Winhall/Londonderry	195	Artificial	30
Gates Pond	Whitingham	30	Natural with artificial control	5
Grout Pond	Stratton	84	Natural	
Harriman Reservoir	Whitingham/Wilmington	2,046	Artificial	219
Haystack Pond	Wilmington	27	Natural	
Howe Pond	Readsboro	52	Natural	
Jacksonville Pond	Whitingham	20	Artificial	14
Kenny Pond	Newfane	26	Natural with artificial control	12
Lily Pond	Londonderry	21	Natural	
Lily Pond	Vernon	41	Natural	
Lowell Lake	Londonderry	109	Natural with artificial control	16
Minard's Pond	Rockingham	46	Natural with artificial control	25
North Pond	Whitingham	24	Artificial	20
Pleasant Valley Reservoir	Brattleboro	25	Artificial	42

Lake Raponda	Wilmington	121	Natural with artificial control	3
Sadawga Pond	Whitingham	194	Natural with artificial control	19 (West Dike – 10)
Searsburg Reservoir	Searsburg	25	Artificial	50
Sherman Reservoir	Readsboro/Whitingham	117	Artificial	
Shippee Pond	Whitingham	24	Natural with artificial control.	
Somerset Reservoir	Somerset/Stratton	1,568	Artificial	106
South Pond	Marlboro	68	Natural	
Stratton Pond	Stratton	46	Natural	
Sunset Lake	Marlboro	96	Natural with artificial control	10
Sweet Pond	Guilford	20	Artificial	20
Townshend Reservoir	Townshend	108	Artificial	133
Wantastiquet Pond	Weston	44	Artificial	22
Weatherhead Hollow Pond	Guilford	33	Artificial	17
TOTAL		5,420		

Sources: *Vermont Use of Public Water Rules, October 2002; Agency of Natural Resources Dam Report, January 2003*

Pollution

The primary causes of non-point source water pollution have been identified as construction activity near shore lands and the removal of riparian vegetation. Riparian buffers are important for removal of chemical pollutants and sedimentation from runoff, preventing them from entering surface waters. Other sources of non-point water pollution include acid precipitation (coming primarily from outside the region) excessive or inappropriate use of chemicals for agricultural purposes, road salts, and inappropriate disposal of industrial or household hazardous products.

Dams

There are numerous small and large dams constructed on streams and rivers in the Windham Region, as noted on the previous table, providing a variety of benefits including power generation, flood control, and recreational opportunities such as swimming and boating. However, these structures can have significant negative environmental impacts as they contribute to stream siltation, alter water level and flow fluctuations, increase water temperature, decrease dissolved oxygen and impede fish passage. This is of particular concern in the quest to restore the Atlantic salmon to the Connecticut River basin. Dam operations continue to be of regional

concern. New programs have been developed to evaluate dams and aid property owners with the removal of small private dams or their improvement for fish passage.

Dams that provide substantial or unique environmental restoration potential or that produce very little in terms of cost-effective renewable energy resources might be candidates for removal. The removal decision must be made with full consideration of the benefits derived (improved water quality, restored fisheries, increased water flow), as well as the costs of removal and for replacement power that would be passed on to power companies and consumers. Agreement on a replacement value, evaluation on a case-by-case basis, and use of appropriate guidelines is important.

Resort Industry

Ski area expansions may require additional water for snowmaking and construction of new snowmaking ponds. State regulations require ski areas to bring their water withdrawals for snowmaking into compliance with minimum flow regulations as part of any expansion of snowmaking. Ski areas in the region have also become heavily involved in the construction of resort housing, causing significant demands for potable water supplies and sewage disposal. Economic, safety and environmental factors should all be given special consideration in the construction of impoundments for snow-making and fire ponds.

Management of Water Resources

Improved watershed management and cooperation among towns, state and federal agencies, and area residents will be required to meet competing uses of the region's rivers, lakes and ponds. The Basin Planning process outlined in the 2000 Vermont Water Quality Standards (WQS) sets forth a process for developing management plans for the Waters of the State. The West River Watershed Alliance, in cooperation with the WRC and the USDA Windham County Natural Resources Conservation District, is developing such a plan for the West River watershed basin (State Basin #11), which should serve not only this watershed basin, but is further expected to provide a model for the other State-designated watershed basins in the region."

The WQS also establish classification of all surface waters into classes and management types. Once classified, the waters must be managed to obtain and maintain the designated classification. Classes are A and B, with management subsets in each. Class A waters are specifically identified in the WQS; all other waters are Class B and have not yet been assigned to a particular management type.

Class A(1) Ecological Waters are to be managed to achieve and maintain waters in a natural condition; Class A(2) Public Water Supplies are to be managed for public water supply purposes; Class B waters "shall eventually be designated as either Water Management Type 1, Type 2, or Type 3 by amending these rules." These management types refer to allowable departures from reference conditions for a variety of criteria, such as aquatic biota, aesthetics, public water supply, irrigation, and recreation. The lower classification types may vary further from the desired reference condition.

Consideration should be given to protecting all surface water in the region (lakes, ponds, streams, vernal pools, wetlands) by maintaining their riparian zone in and undisturbed (or minimally disturbed) vegetated state, preferably in woodland, the recommended width depending upon various factors.²⁷

GROUNDWATER

Groundwater provides the primary supply of potable water for most of the region. Despite its high resource value, it remains a poorly understood resource. Groundwater moves beneath the ground through aquifers, which are underground water bearing formations of sand, gravel and fractured rock. Due to Vermont's geology, groundwater is often unpredictable as it travels through a maze of cracks in bedrock formations. It can infiltrate rock fractures and travel quickly in unknown directions for long distances, or break out to the surface in a short distance.

Groundwater occurs in the unconsolidated sediment of streams and buried valleys and in bedrock fractures. While groundwater potential in areas of unconsolidated sediment is generally favorable, wells producing water from rock fractures usually have low yields (ranging from two to 15 gallons per minute). The region's mountains and uplands have either exposed bedrock or bedrock covered by a thin layer of glacial till with low permeability; in these areas bedrock fractures are the primary source of groundwater.

Pollution

Groundwater generally moves through soils very slowly. As a result of its characteristic slow movement, the cleansing processes that occur through dilution and movement in surface water do not take place underground. When an aquifer becomes polluted, simply removing the source of contamination does not clean up the groundwater. A contaminated aquifer may remain polluted for many years and practically forever in some cases. Groundwater occurring in rock fractures is highly susceptible to contamination. While unconsolidated sediment can usually filter out organic pollution contained in water, the same water can travel for miles through rock fractures without appreciable purification. Once contamination occurs, control and abatement are extremely difficult. Consequently, one of the most important challenges of environmental planning is to prevent pollutants from entering rock fractures. Potential groundwater pollutants include septage from improperly designed or functioning septic tanks and leaching fields for waste water, leakage from underground gas and oil tanks, and improperly disposed of chemicals, both stable and radioactive materials.

Groundwater Classifications

The Vermont Agency of Natural Resources (ANR) has begun to prepare detailed groundwater maps and to classify groundwater. There are four groundwater classes defined in Title 10 VSA, Chapter 48 Groundwater Protection, Subchapter 2, Section 1394, as follows:

Class I Suitable for public water supply. Character uniformly excellent. No exposure to activities that pose a risk to its current or potential use as a public water supply.

²⁷Further information is available in the Windham Regional report on Riparian Zones: their Relevance to Town Plans and Zoning Ordinances in the Windham Region of Vermont (8 April 2003).

- Class II Suitable for public water supply. Character uniformly excellent but exposed to activities that may pose a risk to its current or potential use as a public water supply.
- Class III Suitable as a source for individual domestic water supply, irrigation, agricultural use, and general industrial and commercial use.
- Class IV Not suitable as a source for potable water but suitable for some agricultural, industrial and commercial use.

By statute, all groundwater of the state is classified as Class III water unless reclassified by the Secretary of ANR under provisions of Title 10 VSA, Chapter 48 Groundwater Protection, Subchapter 2, Section 1394. The groundwater beneath the Windham Solid Waste Management District landfill in Brattleboro has been reclassified to Class IV. All other groundwater in the region remains Class III. A new groundwater protection rule and strategy was adopted by ANR in January 2000. This action is designed to “minimize risks of groundwater quality deterioration by limiting human activities that present reasonable risks to the use classifications...”

Mapping

Without good maps of the location of important groundwater, it will be difficult to plan for the long-term protection of this resource. This will be especially important in the siting of landfills and in planning for village centers that need a public water supply to accommodate village expansions. (Note: For further discussion on potable water supply, wellhead protection areas, and source protection areas see Community Resources.)

AIR QUALITY

Air in the region generally meets national ambient air quality standards, although for the pollutant ozone, the standard sometimes is met by a slim margin. Regarding clarity of the atmosphere, the Vermont Agency of Natural Resources has noted that visual range in Vermont—as measured by the number of days with visibility greater than 40 miles—is declining.

The region’s air quality is impacted by both local and distant sources of air pollution. Local sources include discharges from industries, residential activities, and significantly from non-point sources such as automobile operation. As in other parts of New England, the topography, prevailing wind and weather system patterns result in air pollution traveling from other areas of the country to southeastern Vermont.

Vermonters in their daily activities are responsible for producing air pollution in a manner more or less similar to their fellow citizens in other states. Due to its rural character and relatively small population and industrial base, the region’s air quality is influenced more by combustion of fuels for residential heating and by car and truck emissions than by other sources.

The continuing increase in automobile use and increasing proportions of pickup trucks and sport-utility vehicles (SUVs) are major reasons why Vermont’s air quality has not improved as much as expected while national reductions in air pollution emissions have been occurring. Although automobile and truck engines burn cleaner and run more efficiently than they did 10 or 20 years ago, the total amount of air pollution from the transportation sector in Vermont has remained constant. Vermont’s increased use of fuel has meant that levels of nitric acid in rainfall, nitrogen

dioxide, and ground level ozone have remained relatively constant in the State over the last 20 years.

Due to the long-range transport of air pollutants, it is difficult to control air quality on a local, regional, or even state level. We depend upon federal standards to regulate both imported and locally generated air pollution. The US Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards (NAAQS) to gauge air pollution and are legally enforceable standards, carrying the weight of federal law. Should it be found that an area does not meet any one of these standards, the area is deemed to be a “non-attainment area”. Six criteria pollutants are measured: particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, lead, and ozone. If a state does not meet one or more of the criteria pollutant standards it is considered in “non-attainment.” Vermont is fortunate to be in “attainment” for all criteria pollutants, whereas parts of our neighboring states are not. But while Vermont’s air quality currently meets the NAAQS, it is met by the slimmest of margins for some criteria and could easily fall into non-attainment²⁸. Federal law requires state government to develop and file with federal government a “State Implementation Plan”—better known as a SIP—for attaining the standard.

NOISE POLLUTION

Unpleasant or otherwise unwanted sound that travels through the air creates another type of pollution. Noise pollution may be caused by road traffic, airplanes, recreational vehicles, construction and industrial equipment, personal sound equipment, and yard equipment. Both humans and wildlife can be negatively affected by noise pollution. One often discussed noise problem is from the vehicular and truck traffic passing through the region’s villages.

FOREST RESOURCES

Regional Overview

Approximately 509,000 acres (86 percent) of the Windham Region is forested and produces enough timber annually to make the region one of the leading producers in Vermont, especially of high quality northern hardwoods. Windham County also has the most standing timber, 3.4 billion board feet, in the state. The predominant ownership is private, non-industrial (about 72 percent), with industry and government sharing the rest. The headwaters of the major streams and rivers are heavily buffered by forestland, preserving soils, and water purity at the source. Steady population growth and second-home growth have increased development pressure in forested areas.

The timber industry in Vermont is part of a worldwide market with a long-term trend of rising prices for high quality hardwoods. This resource, coupled with a vigorous Canadian market for softwood and hardwood sawlogs, has placed Windham Region forestland owners in a tempting position to harvest and send a substantial volume of logs out of the region and Vermont to wood processors elsewhere. With about 30 million board feet of sawlogs and veneer logs harvested annually, the regional economic effect is significant.

²⁸Currently, air quality in Vermont meets the NAAQS for carbon monoxide, lead, sulfur dioxide, nitrogen dioxide, and ozone. In the case of ozone smog and fine particulate matter, available data indicates that levels are very close to the federal standards. Vermont Committee to Ensure Clean Air, Draft Report, 2001.

A Multi-Valued Resource

Forests play a major role in the ecological, economic, and social health of the region. As a major component of our landscape, forests form the environmental setting for human activity, furnish habitat for wildlife, and contribute to water and air quality. They provide employment to foresters, loggers, artisans, and forest-product manufacturers, and also support a thriving recreation and tourism industry. In an increasingly populous and urban world, the region's forests offer reminders of Vermont's heritage and a traditional, rural lifestyle that appeal to residents and visitors alike.

Forestlands include:

- Productive forest soils;
- Timberlands;
- Plant and wildlife habitats;
- Riparian areas and wetlands;
- Unique and fragile sites;
- Recreational values;
- Scenic quality; and
- Historical/cultural/archeological sites (stone walls, foundations, stage roads, etc.).

The potential for use conflicts creates a need for thoughtful management that embodies sound silvicultural practices while permitting multiple, compatible uses and some modest fraction set aside as permanently protected natural areas. Economic pressures threaten many forested lands with conversion to non-forest uses, yet resource values are threatened or degraded if these lands cannot be maintained in large, interconnected blocks.

Regional Forest Ecology

Vermont's forests have recovered from a time when agriculture dominated a largely treeless landscape, followed by heavy logging of the young forests that first colonized the disused farmlands. These habitat changes have altered the relative abundance of various plant and animal species. With the maturing of today's forest, a mosaic of fields, pastures and woodlots in rural portions of the region increasingly has become unbroken forest. By contrast, in and around villages and other settled areas, an expansion of suburban development onto former farms is eliminating or fragmenting the forest.

Our forested lands should provide diversity that will allow a healthy mix of plant and animal communities to thrive. One factor working against such diversity is the impact of the deer herd browsing on the saplings that would ordinarily renew the diversity of the forest. Deer favor feeding upon certain species of young trees and, when or where the deer population is overly abundant, their intensive, selective browsing is limiting the regeneration of species such as red oak, white ash, and sugar maple. Deer browsing not only affects plant diversity, it also dramatically affects the long-term viability of the product resource. Reduced plant diversity and change in forest structure (elimination of the mid-story and expansion of ferns) also negatively affects wildlife diversity. Another factor working against such diversity is the increasing numbers of invasive alien plant and animal pest species that displace the native plants and animals.

We must reconcile forest uses directly serving economic ends with the need for large, undeveloped and relatively undisturbed, and interconnected blocks of forest that can meet the habitat needs of wide-ranging wildlife while minimizing human-wildlife conflicts. Forested sites of special natural value need identification and may require protection. Education aimed at improving understanding and appreciation by landowners and by the general public of the natural communities within the forest is essential to striking the right balance between natural, economic, and social uses of those resources.

Forest Economics

Forests make a significant contribution to the economy of the Windham Region. The region leads the State not only in growing stock and standing timber, but also in lumber manufacturing and hardwood kiln drying; and the forest products industries as a group lead the regional manufacturing sector in payroll, shipments, sales and employees. Recently, markets for good quality saw timber have been strong. That strength makes improvement harvests in many woodlots commercially viable, but also can persuade owners to liquidate the timber resource completely. Some forestland in the region has been heavily cut and sold for development. Research suggests, however, that the private owners of the great majority of the region's forests are not motivated by economic incentives alone, but value highly the non-economic resource attributes of the land. Nevertheless, the typical landowner is of mature age, and the threat of a permanent conversion to non-forest uses looms large when ownership passes to a younger generation or other new ownership.

Social Values of the Resource

The region's forests offer a rich selection of recreational options. Skiing and snowboarding, snowmobiling, mountain biking, hiking, hunting and fishing, wildlife observation and photography, and foliage appreciation all are popular in their seasons. Many view the resource as valuable as a precious natural environment and a source of solitude, as well as a host for recreation and forest-based employment. The resource accommodates and satisfies this wide range of values although some competing uses may at times be in conflict. State and federal public lands offer opportunities for a backcountry wilderness experience that individual private lands in smaller block sizes cannot match, and they also support the most concentrated commercial recreation in the form of ski resorts. Yet non-industrial private lands dominate our forested landscape, and their contribution to recreation and aesthetics is essential.

Questions as to whether the acquisition of additional public land is desirable, debate regarding the proper role of public and private land for environmental, economic, and recreational purposes, and consideration of policy and regulatory intervention to protect or advance social and environmental values all must be informed by regional specifics. The Windham Region's forest resource situation is unlike that of national forests in the western United States or the industrial forests in Maine, and one-size-fits-all prescriptions are distinctly unhelpful.

Changing Demographics

The changing demographics of the Windham Region, particularly in woodland ownership, are beginning to have an effect on forest management practices, as well as on public perceptions, attitudes and influence on regional forest policies. Some research indicates that new woodland

owners in the Windham Region and Vermont are younger and less traditionally land-connected than historic owners and that woodland transfers are more frequent. People from outside of Vermont have taken an increased interest in and have increased influence on management of the Green Mountain National Forest.

Fragmentation

Fragmentation of the forested landscape can be caused by any number of types of development. Subdivision of land and construction of new homes and businesses and their attendant infrastructure create smaller, divided, even isolated parcels that are too small or inaccessible to be managed or harvested effectively or efficiently. Sales by long-term industrial owners may add to this trend. Fragmentation is especially harmful to wildlife as habitats and habitat elements are eliminated or separated.

A parallel problem that is often associated with fragmentation is parcelization, which occurs when large forest tracts are sold as smaller lots. Even if these lots are not developed, there is often a change in attitude of the landowners and a decrease in the land base available for management. This can affect people employed in the forest products industry and decrease opportunities for recreational activities.

Legislative Intervention

Legislative intervention in forest-management practices and changes in forestland taxation under the Use Value Appraisal (Current Use) Program have affected both industrial and private ownership. In particular, private owners have created or inherited long-term management plans that are professionally monitored. In addition, a modest amount of increased public land acquisition, federal, state and local, is adding substantially to conservation of forestland in the Windham Region.

In 1997 the Legislature enacted the “Heavy Cutting” law with the intent of limiting clearcutting and severe highgrading (cutting only the best quality trees and leaving the worst quality trees.) An exemption is needed for a heavy cut that exceeds 40 acres or 80 acres within a two-mile radius. In the Windham Region the nature of timber harvesting tends to be on a smaller and lighter scale; since the law’s inception there have been only a very few applications submitted within the region. The forestry standards written into this legislation have helped to slow large-scale, indiscriminate liquidation and clearcutting, but tree quality in the residual stand can be quite low and yet still be in compliance.

Education

The education of woodland owners in the Windham Region has been enhanced by the requirements of the Current Use program and by the continued efforts, over 50 years, of the regional Woodlands Owners’ Association. In addition, woodland owners have become more aware of management options that combine timber improvement and utilization with enhancement of wildlife habitat by educational programs sponsored by statewide Vermont Coverts and other organizations and by cooperation between woodland neighbors. Public interest has been increased by the actions of Vermont policy makers to begin some regulatory efforts to improve forest management practices. Professional programs for loggers and other forest

workers (for example, the Logger Education to Advance Professionalism or LEAP program and the Game of Logging program) have increased safety levels and improved practices. Increased recreational use of forestland is enhanced by a variety of educational programs, such as those offered by the Bonnyvale Environmental Education Center (BEEC) of Brattleboro and the Nature Museum of Grafton.

SCENIC RESOURCES

The Region enjoys exceptional scenic quality. Mountain landscapes, farm landscapes, historic villages and towns, ridgelines, the night sky and nighttime landscapes, shorelines, and scenic views and corridors are all highly vulnerable to development. Scenic resource protection measures available to the region's towns include:

- purchase of scenic lands;
- scenic easements, or acquisition of development rights;
- review of the scenic impact of public investment activities;
- designation of scenic roads;
- public education; and
- regulation through zoning and subdivision regulations and the Act 250 development review process.

Maintaining scenic quality requires coordination of these techniques. Many structures such as utility poles, telecommunication towers, wind turbines, cleared powerline rights of way, gas stations, and streetlights are considered by many to be incongruous with our scenic landscape. Careful planning and design will provide development opportunities without adversely affecting the scenic value of the landscape.

Sky Glow

Light pollution or “sky glow” is a cumulative and increasing problem, especially near the urban clusters along the region’s eastern border and near major resort development centers. Light projecting upwards from these areas produces a glow near the horizon which diminishes the natural quality of the nighttime landscape and night sky. As these urbanized areas continue to expand, special consideration needs to be given to lighting design in order to minimize this cumulative adverse effect.

NATURAL AREAS, FRAGILE AREAS AND WILDLIFE RESOURCES

Natural and fragile areas are landscape features with ecological, educational, scenic, and contemplative value. They provide ecological preserves of relatively unaltered environments that are important to wildlife and the natural heritage of the region.

State Legislation

State legislation provides a means to designate Natural Areas (10 V.S.A. Chapter 83) and Fragile Areas (10 V.S.A. Chapter 158). By law, Natural Areas are owned by the Vermont Department of Forests, Parks and Recreation. Any party can own a Fragile Area, but it must have been determined to be of statewide significance. These designations provide protection and the assurance that the areas will be managed to maintain their natural integrity. Hamilton Falls, on

Cobb Brook in Jamaica State Park, is the region's only state-registered Natural Area. Consisting of a 40-50 foot high steep cascade with pools above and below and a mile-long chain of smaller cascades, falls, and pools, the site is exceptional for its geology, botany, setting and pristine water. The only state registered Fragile Area is the J. Maynard Miller Memorial Forest (the Black Gum Swamps) in Vernon. Black gum is a tree species of more southerly latitudes; this disjunct forest community is probably a relic from a warmer postglacial climatic period (between 3,000 and 5,000 years ago) when many southern plants extended their ranges into Vermont.

Lands Above 2,500 Feet

Although not formally designated as such, areas above 2,500 feet in elevation are often fragile areas in Vermont (see map). Lands above 2,500 feet are especially vulnerable natural environments because of their generally thin soils, steep slopes, sensitive vegetation, important wildlife habitats and often greater than average precipitation and wind. Some 24,800 acres (4 percent) of the Windham Region are above 2,500 feet in elevation.

Ecology

The Windham Region is rich in areas of high ecological value. The Vermont Nongame and Natural Heritage Program tracks native rare plants and animals and plant communities that are threatened or endangered. These species and communities are considered rare because they have particular habitat requirements, are at the edge of their ranges, or are vulnerable to disturbance or collection. The general locations of these species and habitats are mapped using GIS and species descriptions are available through the state program. The Windham Region is home to numerous Natural Heritage sites and species. These species and their habitats deserve an extra level of protection. The Conte Fish and Wildlife Refuge EIS has identified four areas in the region as nationally important fish and wildlife habitats: the West River including the Rock River, Winhall River and Wardsboro Brook tributaries, primarily due to the potential for Atlantic salmon restoration; Westminster Flats, for its waterfowl habitat; the Retreat Meadows, for its high value wetland ecology; and the Putney Mountain unit for its Northeastern Bulrush habitat.

Fish Habitat

Most of the region's rivers and streams provide important cold-water fish habitats. Shaded stream banks, clean gravel and rocky bottoms, and clean, cool water are necessary to maintain these cold-water fisheries. Lakes, ponds, and larger slower moving rivers provide warm-water fish habitat. Healthy fisheries are important for both their ecological and economic value. Sedimentation from runoff, bacteria from septic systems, clearing of streambank vegetation, damming of rivers and streams, and lowering in-stream water flows all impact negatively on these important fish habitats. Wetlands, vernal pools and other surface waters also provide specialized habitats for fish, reptiles, amphibians, mammals and migratory birds. Stream buffers and corridors provide important wildlife travel corridors. (Note: For further discussion of fish and wildlife resources, see also Surface Waters in this Chapter.)

Remote Forested Areas

The mountainous, forested landscape remote from community centers is the stronghold and haven for the region's large mammals, which include black bear, moose, deer, bobcat, fisher, coyote, otter, and beaver, although higher numbers of deer and coyotes are often found in the

less remote areas. Completing the forest ecosystem are the smaller mammals, reptiles, amphibians, game birds, raptors, and many valued songbirds and insects that depend on the region's diverse forest plant species. A critical state and regional issue is the maintenance of large tracts of connected forestland to support these species. Certain deer wintering areas and bear habitat are regionally significant necessary wildlife habitat (those habitats needed for a species to continue to thrive within that area). For wintering deer, low-lying softwood stands with southern exposures provide critical shelter from deep snow and cold temperatures. Stands of mature beech and oaks, accessible wetlands, and newly regenerated soft mast areas provide important feeding habitats for the black bear. Bear travel corridors supply a necessary link between feeding and breeding areas. These areas are particularly important since food sources and supplies vary from season to season and from year to year. New roads, guardrails, and construction of homes and other forms of development, as well as indiscriminate timber cutting and outbreaks of tree disease, endanger both the quantity and quality of these important wildlife habitats.

SOILS AND TOPOGRAPHY

Soil Characteristics

Soil characteristics impact land uses such as farming, forestry, mineral extraction, and commercial development. Prime agricultural soils that are rated high for crop production potential are very limited in the region, and are located primarily in the river valleys. Since most primary agricultural soils are flat and well drained, these soils are targets for development. Soils suitable for sand and gravel extraction are also limited within the region. Many of the region's soils can be shallow, unstable, highly erodible, wet or poorly drained. Wet soils may cause basement flooding and failure of footings, foundations, underground piping and septic systems. Road construction on wet sites can be damaging and prohibitively expensive. Drainage of excessively wet soils is often not an acceptable solution because of expense, rate of failure and potential for environmental damage. Any of these features alone, or in combination with steep slopes and/or high elevations, are potentially critical factors in determining appropriate land use in the region.

Earthquake Risk

Southeastern Vermont is considered to be at moderate risk of a moderate strength earthquake. This assessment is based on the historical occurrence of earthquakes nearby. Unstable soil factors can accentuate soil movement and increase subsequent earthquake damage.

Sewage Disposal

Development in the region has traditionally been encouraged on soils suitable for in-ground sewage disposal systems. Permeable soils are often closely associated with sites having high potential for aquifer recharge, and pollution of subsurface and surface waters may result from development on these soils. The travel time of liquid wastes, the rate of absorption and the location of groundwater and surface waters are all important factors to consider in planning development on permeable soils.

Mineral Resources

Mineral resources include deposits of sand, gravel, and other minerals, such as granite, slate, limestone, sulfide, uranium, iron ores, and ultramafics (sulfide, talc, soapstone, and serpentine). With the exception of sand and gravel operations, the proportion of the industry utilizing mineral resources has steadily declined in the region. This decline and abandonment of mining industries is primarily due to decreasing demand, changes in economic value, and local opposition to mining operations, rather than exhaustion of the region's reserves. Public and private interests often are in conflict over extraction of mineral resources, and the balancing the need to use these resources with public's right to minimize potential nuisances will be an increasingly visible issue.

Sand and Gravel

Sand and gravel deposits of varying quality are scattered throughout the region and are the principal mineral resources being extracted. Sand occurs in good quality deposits with large reserves along the Connecticut River Valley and near most of the larger tributaries. Deposits of good quality gravel, however, are usually small. The region's good quality, accessible gravel reserve is low.

Sand and gravel are economically important regional resources and significant portions of them occur in only a few towns: Brattleboro, Dummerston, Vernon, Halifax, Guilford, Newfane, and Jamaica. Few towns own and operate their gravel pits even though they experience a steady demand for highway construction and maintenance of unpaved roads. In resort towns during periods when vacation housing and commercial construction are taking place, demand for sand and gravel significantly increases. The increased excavation activity at the pits and the transport of material is known to bring about impacts that negatively affect community resources (roads and bridges), neighborhoods, water quality, and air quality, which in turn may generate or renew local opposition to the utilization of the resources. As the region grows, sand and gravel deposits will continue to be extracted for construction, fill, erosion control, and highway maintenance.

ENERGY AND NATURAL RESOURCES

Energy—its predicted supply, its cost, and the environmental impacts of how it is obtained and use—all have a direct relationship to our stewardship of the land and its resources.

Air quality is a major concern whenever fossil fuels are used, whether to generate electricity, for space heating, or for transportation; water quality and aquatic life are affected by hydro dams; the management of used nuclear fuel has ultra-long term implications; and all thermal electric power plants waste about 2 units of heat energy into the water or air for every one of electrical energy produced, regardless of the fuel. It is therefore essential that we use conservation and efficiency measures to lessen the growth in the amount of energy that we consume in the region.

regional fuel sources also deserve consideration in a number of ways. Wood harvested for fuel represents an important part of the working landscape and of the regional economy, but its combustion presents some immediate air quality concerns. Hydropower from existing dams presents clean and renewable electric power, but solar heating of pooled water and obstructed fish passageways present significant drawbacks. Wind is newly viewed as a natural resource as

wind-powered electric generation is poised to expand across much of New England, and it carries with it potential impacts on wildlife, soils and groundwater, and on scenic resources. As Barry Commoner noted thirty-five years ago in his fourth law of ecology, “there is no such thing as a free lunch.”²⁹

NATURAL RESOURCE POLICIES

Surface Waters

1. Maintain undisturbed buffers of vegetation along watercourses, lakes, ponds, wetlands, and vernal pools in order to protect shorelines, provide shading to prevent undue increase in stream temperatures, minimize effects of erosion, sedimentation and other sources of pollution, and maintain scenic, recreational, and habitat values.
2. Maintain or enhance existing chemical, physical, and biological quality of the region's surface waters.
3. Evaluate the licensing or re-licensing of hydroelectric power generating facilities on a case-by-case basis and endorse only those where all beneficial values and uses of the affected waters are maintained.
4. Maintain any designated Class I wetlands in their natural condition. Ensure that any permitted alterations to Class II and Class III wetlands do not significantly diminish their functional, ecological, or aesthetic values. Wetland mapping prepared by the National Wetlands Inventory, showing Class I and II wetlands, available in digital GIS format for each town, should be field-checked and verified.
5. Evaluate inter-basin transfers of water on a case-by-case basis and endorse only those proposals where it can be demonstrated that the water quality in both the sending and receiving basins will not be significantly lowered, the water table and stream flow in the sending basin will not be detrimentally lowered, and peak flows in the receiving basin will not be detrimentally increased. For purposes of this policy, a basin is the drainage area of a watercourse that is at least 1,000 acres in area.
6. Support identification, recognition, and appropriate management of waters with exceptional natural, ecological, recreational, cultural, or scenic values.

²⁹ Commoner, Barry. *The Closing Circle*. Knopf, 1971. Four laws of ecology: (1) Everything is Connected to Everything Else. There is one ecosphere for all living organisms and what affects one, affects all. (2) Everything Must Go Somewhere. There no "waste" in nature and there is no "away" to which things can be thrown. (3) Nature Knows Best. Humankind has fashioned technology to improve upon nature, but such change in a natural system is likely to be detrimental to that system. (4) There Is No Such Thing as a Free Lunch. In nature, both sides of the equation must balance, for every gain there is a cost, and all debts are eventually paid.

7. Support surface water classification and management strategies which are consistent with the municipal and regional land use planning objectives for the affected watershed, and which will effectively maintain existing water quality.
8. Maintain water flows in streams at levels that support a full range of in-stream uses and values.
9. Identify and address any adverse environmental impacts of development proposals that could impede the flow of flood waters, alter the stream channel or its floodplain, or otherwise endanger the health, safety, and welfare of the public.
10. Protect surface waters from run-off and sedimentation caused by agriculture, forestry, recreation, and development activities through the use of:
 - o Acceptable Agricultural Practices (AAP's);
 - o Acceptable Management Practices (AMPS) for forestry; and
 - o Best Management Practices (BMP's), for erosion control.

Groundwater

1. Maintain or enhance existing chemical, physical and biological quality of the region's groundwater.
2. Support the design and construction of on-site sewage disposal systems in consultation with a qualified professional in accordance with applicable state and local regulations.
3. Support uniform design and administration of on-site sewage disposal systems and encourage the development of alternative systems.
4. Avoid contamination of groundwater from the drilling of wells through the use of proper well-drilling technology and appropriate well placement.
5. Require small-quantity generators of hazardous waste to have storage and disposal plans demonstrating that water contamination risks have been minimized.
6. Water withdrawal from underground sources should be carefully monitored to ensure that aquifers and surface waters are not significantly depleted and that water is properly allocated. Promulgation of specific laws and regulations to control water withdrawal and to ensure minimum flows is encouraged.

Air Quality

1. Prohibit any development or activity that significantly degrades air quality.
2. Support efforts to reduce regionally generated air pollutants from vehicles, two-stroke engines, and wood and coal burning stoves.

3. Encourage all new development to follow the energy conservation guidelines developed by the Vermont Public Service Department for Act 250 permits.
4. Support economic activities that attract clean industries.
5. The use of wood stoves incorporating catalytic combusters should be encouraged.

Forest Resources:

Resource Protection

1. Support productive forestry in large parcels, contiguous blocks of parcels, and forested corridors linking blocks and maintain accessibility to those parcels. Doing so will contribute to the long-term ecological health and economic vitality of the region's forestlands.
2. Discourage the fragmentation of large parcels of forestland for development or other conversion to non-forest uses.
3. Support the work of land trusts in placing and encouraging sustainable management of forested parcels under conservation easements, of governmental organizations designating forested lands as resource and conservation lands, and of other organizations whose purpose it is to enhance and conserve forestlands and their resources.

Economic Contribution

4. Promote the development of markets for locally produced forest products and encourage local artisans and the growth of a value-added forest-products industry so that complete timber processing, from timber cutting to finished product, can remain in the region.
5. Support the development of industrial use of lower grade timber to allow forestland owners to undertake timber stand improvements profitably.

Appropriate Management

6. Encourage public, industrial, and private landowners to maintain and enhance forest resources on their lands and to follow sustainable forest management practices that provide habitat for diverse natural species, avoid high grading of timberlands, and follow Acceptable Management Practices.
7. Support the eradication of exotic invasive plants that impede natural forest regeneration in the region, especially glossy buckthorn, Japanese barberry, tartarian honeysuckle, Morrow (fly) honeysuckle and oriental bittersweet.
8. Encourage access to forest lands (with permission of the landowner) for responsible hunting in order to control the deer population, and for recreational hiking.
9. Encourage landowner participation in Vermont's Use Value Appraisal (Current Use) Program and support the Vermont legislature's continuation of this program on a fully funded basis.

Landowner and Public Education

10. Support landowner and forest-worker educational programs and organizations that teach or demonstrate sustainable forestry and Acceptable Management Practices or that provide educational opportunities to the general public to understand and appreciate the environmental, economic, and recreational benefits offered by the region's forest resource.
11. Encourage employment by private landowners of professional forest managers.

Scenic Resources

1. Improve sites that diminish a scenic view, particularly along state and federal highways and within scenic corridors.
2. Encourage scenic easements and implement appraisal practices that encourage donation of scenic easements to public and private natural resource/conservation agencies and organizations.
3. The scale, siting, design, and management of new development shall maintain or enhance the landscape and shall protect high quality scenic landscapes and scenic corridors.
4. Minimize visual impacts of communication towers and other high-elevation or ridgeline structures through co-location, design, siting, and color choice. Design and site communication and other high-elevation towers so that they do not require nighttime illumination.
5. Illuminate structures and exterior areas only at levels necessary to ensure safety and security of persons and property.
6. Arrange all exterior lighting so that the light source (lamp) is not directly visible from public roads, adjacent residences or distant vantage points. Shield exterior lighting so that the light does not project above the lamp.
7. Discourage exterior area illumination of regionally prominent physical features and landscapes. Ensure that any such illumination will not significantly reduce the natural appearance of the nighttime landscape, will not be obtrusive in the viewshed, and will not distract unduly from the night-time horizon or night sky.
8. Plan new or improved roads to maintain or enhance scenic resources.
9. Screen new development from I-91 and other scenic roads to the greatest extent practicable using vernacular perimeter plantings of hedges, hedgerows, and street trees.

Natural Areas, Fragile Areas and Wildlife Resources

1. Protect Natural Areas, Fragile Areas, and critical plant and animal habitats. If necessary, protect these areas from indiscriminate publicity by mapping them only in very general terms.

2. Protect important ecosystems and maintain or enhance the habitat needs and travel corridors required by the region's larger mammals.
3. Protect Natural and Fragile Areas from development. When development is proposed near a natural or fragile area, a buffer strip designed in consultation with the appropriate state agency, must be designated and maintained between the development and natural or fragile area.
4. Support state, federal, and conservation group acquisition of land and/or conservation easements to protect critical wildlife habitats and encourage designation of State Natural and Fragile Areas for significant features and resources.
5. Support community, regional, and state programs and incentives that encourage private and public landowners to recognize the economic importance of protecting, maintaining and enhancing fish and wildlife habitats and ecosystems.

Soils and Topography

1. Take special precautions on slopes to avoid environmental damage, including negative consequences associated with erosion and landslides.
 - o Minimize areas of earth disturbance, grading, and vegetation clearing on slopes over 15 percent;
 - o Avoid intensive development (other than recreational trails and ski lifts) in areas predominated by slopes exceeding 25 percent or above 2,500 feet in elevation; and
 - o Design developments on slopes over 15 percent so as to minimize the potential impacts of slides and earthquakes.
2. Use detailed site studies to determine suitability for development where steep slopes occur with shallow soils. Ensure that all development proposals on such soils provide and conform to an erosion control plan for construction phases of the development and a site drainage plan.
3. Avoid development on wet soils.
4. Avoid development on mucks, clays, silts, and other unstable soils that offer poor support for foundations or footings and are subject to slippage. Conduct extensive site investigation to determine suitability for any development on unstable soils.

Mineral Resources

1. Land with high potential for the extraction of mineral and earth resources shall be developed so as to not interfere with the subsequent extraction or processing of the resource.

2. Extraction of mineral resources shall not interfere with or have negative impacts on groundwater, air quality (dust and noise), and special community resources (historic sites, recreation areas, or scenic areas). Extraction sites must handle truck traffic without creating unsafe conditions for adjoining landowners.
3. Ensure that effective site rehabilitation plans are provided and implemented.

COMMUNITY RESOURCES

The purpose of this chapter is to examine the existing conditions, levels of service, and future needs of public facilities and services provided in the Windham Region. In addition, various privately owned and operated facilities and services are considered.

WATER SUPPLY

Surface and ground water provide drinking water to Windham Region residents. The quantity and quality of drinking water is an issue throughout the region. Ensuring safe and reliable water is critical to supporting existing development and encouraging growth.

Public Water Supply

A public water supply in Vermont is defined as a water supply system, owned or developed by the same person, having fifteen or more connections or regularly serving an average of at least 25 individuals daily at least 60 days out of the year (Vermont Water Supply Rule). Public water supplies may be owned and operated by a municipality or they may be privately owned, either individually or cooperatively. *Municipally owned public water supplies* may be managed by a town or a by a fire district.

Municipally owned public water supply systems are often provided in the more densely settled sections of towns and villages that may not otherwise be able to provide a safe and reliable domestic water supply. Many of the region's *privately owned public water supplies* serve vacation housing developments and some of the region's smaller villages. These central water supplies also allow residents to share in the cost of acquiring and maintaining their water supplies. Generally, public water supplies are easier to maintain and protect than individual water supplies in densely settled areas.

As noted in Table 1, Brattleboro, Readsboro, Bellows Falls, Putney, Wilmington, and the Winhall-Stratton Fire District own and operate municipal public water supply systems in the Windham Region. These systems serve populations ranging from approximately 400 to 12,000 people. The water main extension policies for towns with municipal water supplies vary.

The most common problem facing communities that have or seek to have municipal public water supply systems is obtaining funding to acquire or upgrade these facilities. All of these systems rely on groundwater for their source and they include some of the unincorporated villages in the region that are served by privately owned public water supplies. Yields from these wells range from 12 to 300 gallons per minute.

Small-scale public water systems are permitted through the Vermont Department of Environmental Conservation in the same manner as large systems. According to the Vermont Department of Health, there are over 200 *privately owned public water supply systems* in the region. Over half of these systems are classified as *transient non-community systems*.³⁰ While

³⁰ A public transient non-community water system serves 25 or more people more than 60 days per year. (examples include restaurants, motels and campgrounds).

almost every town in the region has at least one of these systems, the highest numbers of them are found in the towns with ski resorts (Dover, Londonderry, Wilmington). There are over 50 *public community water systems* in the region. Municipal water systems as well as water sources that serve condominium developments and mobile homes are included in this category. The majority of these systems are located in Dover.

Table 1: Municipally Owned Public Water Supplies in the Windham Region

Town/System Name	Source Name/Type	Population Served	Average Demand (MGD) ³¹	Capacity (MGD)	Percent of Capacity Used ³²
Bellows Falls/Bellows Falls Village Water Dept.	Minard's Pond	3,500	0.3	1.00	30%
Brattleboro/Brattleboro Water Dept.	- Pleasant Valley Reservoir - Sunset Lake - Retreat Meadow Wells ³³	12,000	1.70	3.00	57%
Putney/Putney Water System ³⁴	Sand Hill Well	600	0.04	0.10	40%
Readsboro/Readsboro Village	Howe Pond	400-500	0.035	0.10	40%
Wilmington/Cold Brook Fire District "Golf Tract"	Wells	330	0.01	0.04	25%
Wilmington/Cold Brook Fire District "Base Tract"	Wells	808	0.01	0.15	7%
Wilmington Village/Wilmington Water District	-Springs -Haystack Pond -Reservoir	1,500	0.06	Varies from 0.19-1.4	31%
Winhall-Stratton Fire District	wells	10,000 (200 non-seasonal)	0.25	0.85 max. daily	30%

Each public water system has an accompanying source protection area. The Vermont Water Supply Rule defines a Source Protection Area as the surface and subsurface area through which contaminants are likely to move toward and reach a collection point that supplies a public water system. Within the 200-foot radius of this primary collection area, contamination impacts are likely to be immediate and certain. Beyond that radius, source protection areas are tested and mapped to determine further sources of probable and possible contamination. Where there has been no mapping the state assumes a circular area with a 3,000-foot radius around the water source. Jurisdiction over the protection of public water supply sources rests with the Vermont Department of Environmental Conservation (DEC). Currently, there are no requirements for

³¹ MGD = million gallons per day

³² Approximate estimate of capacity used; from best available data

³³ Emergency/back up supply only

³⁴ All figures are estimates for Fall 2005 since only a couple of connections have been made as of February 2005.

towns to restrict land uses within such source protection areas, though some towns in the region have added additional regulations to these areas in their Zoning Bylaws.

Threats to groundwater and wells in the region include agricultural runoff, nearby salt storage areas, road salting, contaminated runoff from paved areas, and failing septic systems. Some private systems have been pumped at rates exceeding the aquifer's capacity, resulting in yields that do not adequately meet the needs of users. Some systems have inadequate storage capacity, creating problems during power failures when homes may be without water.

Privately Owned On-site Water Supplies

The majority of the Windham Region is served by individual private on-site water supplies, usually drilled or dug wells. Dug wells are susceptible to contamination from leachates that have reached the water table through soils. Drilled wells are susceptible to the same groundwater contamination as mentioned for public water supplies. Unlike source protection for public water supplies, private wells are not afforded specific levels of protection. The DEC does regulate potable water supplies under the Wastewater System and Potable Water Supply Rules. New wells do have required isolation distances from potential contamination, such as septic tanks and leach fields.

Individual on-site water supplies are located throughout the region, and this is why protection of groundwater quality is extremely important to maintaining high quality potable water supplies. Individual on-site wells can be affected by factors other than contamination. A new well drawing a high volume can deplete the groundwater supply in an area creating supply problems for existing wells. For more information on groundwater and groundwater policies, see the groundwater section of the Natural Resources Element.

WASTEWATER TREATMENT

Wastewater must be treated before being released to groundwater or surface water in order to ensure adequate removal of solids, destruction of pathogens, and removal of other pollutants, such as certain metals and organic compounds. Wastewater is generated from households and from commercial and industrial operations. There are three significant categories of wastewater to be treated:

- Municipal sewage, which may be treated in municipally-owned or in privately-owned treatment plants;
- Domestic septage, which typically is treated along with municipal sewage; and
- Industrial wastewater, which may be entirely or partially treated at the source, or may be incorporated into the flow of municipal sewage.

The only large industrial sources of wastewater sludge in the region are paper mills. Paper mill wastewater is treated, on site, by its generators. The solid and liquid portions from that process must nonetheless be treated and/or disposed of, sometimes with wastewater treatment plant

sludge and septage, so it is included in this section as well as in the Solid Waste Management section.

Waste Water Treatment Facilities

There are 10 publicly owned wastewater treatment plants in the region providing secondary or tertiary treatment as well as five privately owned treatment plants in the region (see Table 2).³⁵ Facility types include lagoons, extended aeration and oxidation ditches, and rotating biological contactors.

Most municipal systems in the region are operating under capacity. It should not be inferred, however, that the difference between design flow and current average flow represents available capacity. Other factors, such as capacity already allocated and/or being held in reserve, the ability to safely and economically dispose of the sludge that results from the treatment process, the organic load on the treatment plant that may be presented by different materials, and local decisions regarding how close to the theoretical limit the plant should operate, all affect the potential to use any remaining capacity. Federal regulations also play a prominent role in affecting the potential use of remaining capacity.

Sludge disposal from municipal wastewater treatment plants is accomplished by land application, composting, landfilling, or incineration. No sludge is incinerated in the Windham Region, but several small treatment plants in the region ship sludge to be incinerated in Connecticut and landfilled in Massachusetts. The State of Vermont regulates the levels of nitrates, phosphates, PCBs, and seven metals in each land application of sludge.

Effluent that remains after wastewater is treated and the solids removed is discharged to either surface waters or groundwater. Three plants in the region discharge their treated effluent by "spray irrigation," which involves spraying the effluent at controlled rates and at approved times of the year onto an area that is approved for that purpose and to which access by the general public is restricted. The remaining plants discharge effluent directly into one of the following streams: Connecticut River (five discharges), Deerfield River (three discharges), Saxtons River (one discharge), East Branch North River (one discharge), Flood Brook (one discharge), North Branch Ball Mountain Brook and Winhall River (one discharge), and Thompsonburg Brook (one discharge). Discharges of effluent into surface waters are regulated by state and federal agencies in accordance with regulatory requirements (tests of the pH, residual chlorine, dissolved oxygen, suspended solids, biochemical oxygen demand, bacterial counts, and the various metals and organic compounds that are regulated in sludge disposal).

³⁵ Secondary treatment involves the physical removal of solids as well as biological treatment of organic wastes by bacteria in a controlled system. Tertiary treatment provides a final stage, such as lagooning, micro-filtration, or disinfection, to raise the effluent quality to the standard required before it is discharged into the receiving environment.

Table 2: Windham Region Wastewater Treatment Facilities

Location	Facility Design Capacity (MGD) ³⁶	Average Monthly Flow (MGD)	Percent of Design Capacity Remaining	Sludge Treatment or Disposal Technique	Effluent Disposal Location
Municipal					
Bellows Falls	1.40	0.536	66%	Compost	Connecticut River
Brattleboro	3	1.6	45%	Land Application	Connecticut River
Jacksonville	0.05	0.025	50%	Landfill and Compost	East Branch North River
Putney	0.10	0.04	46%	Landfill and Incineration	Sacketts Brook
Readsboro	0.075	0.036	48%	Land Application	Deerfield River
Saxtons River	0.105	0.400	50%	Co-treatment	Saxtons River
West Dover	0.79	1.96	23.5%	Landfill	Spray-Deerfield River Basin
Whitingham	0.135	0.094	50%	Landfill and Compost	Deerfield River
Wilmington Village	0.135	0.094	69.6%	Compost	Deerfield River
Wilmington/Cold Brook FD, Golf	0.049	0.037	80%	Incineration	Spray-Deerfield River Basin
Wilmington/Cold Brook FD, Base	.030	NA	--	Incineration	Spray-Deerfield River Basin
Winhall-Stratton Fire District	.830	approx. .250	30%	Landfill	Spray – North Branch Ball Mountain Brook and Winhall River
Private Non-Industrial					
Flood Brook Union High School	0.009	NA	--	Incineration	Flood Brook
Magic Mountain	0.039	NA	93.3%	Incineration	Spray – Thompsonburg Brook
Private-Industrial					
Putney Paper	0.275	0.20	72.7%	Landfill and Compost	Connecticut River
Specialty Paper	2.0	1.5	75%	Compost	Connecticut River

³⁶ Millions gallon per day

Privately Owned On-site Waste Water Systems

Most of the region is served by on-site sewage disposal systems (septic systems). The majority of new housing in southern Vermont is being built with septic systems, and not on municipal sewer systems. Appropriate isolation distances from streams and wells and separation from high water table will also help to prevent pollution of ground and surface waters from leachates. In 2002, the State adopted the Wastewater System and Potable Water Supply rules which regulate on-site wastewater systems. Existing town ordinances that regulate on-site wastewater disposal may remain in effect until July 1, 2007, at which point the State will be the sole administer of permits. A town may request to take over permitting of the Wastewater System and Potable Water Supply rules.

Soil and topographic conditions play a major factor in on-site sewage disposal system design. The new state regulations incorporated several technical changes including allowing for less naturally occurring soil to the seasonal high water table. In addition, innovative technologies to handle the wastewater may be permitted.

Proper design, construction, and maintenance of on-site wastewater systems are important to keep them operating effectively thereby preventing ground and surface water contamination. Many domestic systems are pumped infrequently, some not at all, which reduces the total gallons to be treated but which also provides the basis for additional concerns about failed septic systems and potential ground water and surface water pollution. Commercial haulers pump septage from septic tanks, cesspools or holding tanks and are then responsible for finding an approved facility for disposal of the material.

SOLID WASTE MANAGEMENT

Eighteen WRC member towns belong to the Windham Solid Waste Management District (Brattleboro, Brookline, Dover, Dummerston, Guilford, Halifax, Jamaica, Marlboro, Newfane, Putney, Readsboro, Stratton, Townshend, Vernon, Wardsboro, Whitingham, Wilmington, and Winhall), three belong to the Southern Windsor/Windham Solid Waste Management District (Grafton, Rockingham, and Westminster), and three (Londonderry, Weston, and Windham) belong to the Londonderry Group. Searsburg operates their own municipal facility. Athens relies on private haulers for services and Somerset (an unincorporated town) has no waste management facility.

Under state law, solid waste involves a lot more than just discarded solid material that is of residential or commercial origin.³⁷ It also includes special wastes such as batteries, used motor oil, wastewater sludge, hazardous wastes, septage, and infectious wastes. The proper reduction, management and disposal of this wide variety of material require a concerted and creative regional effort. Recycling, hazard waste collection, and composting are important components of solid waste management. District or town-sponsored recycling programs are available to residents of all Windham Region towns except Athens and Somerset.

³⁷ 10 V.S.A. 6602(2)

The disposal of hazardous waste occurs in two different ways: District facilities accept universal waste such as antifreeze, waste oil and cadmium batteries and recycle it on site. Other household hazardous waste items (and waste from conditionally exempt small quantity generators) are disposed during special hazardous waste collection days that are held several times through the year. Federal and state regulations govern the management and disposal practices of all industries, businesses, and institutions that generate in excess of 100 kg (220 pounds) of hazardous waste or 1 kg (2.2 pounds) of acute hazardous waste per month.

Old, unlined landfills can be excavated, or "mined," and has been done in other parts of the U. S. Reasons to do so include removing sources of groundwater pollution. An old site then could be developed to comply with current standards and become the location of the next generation of waste disposal facilities. The old site might not pass modern siting standards were it virgin land, but reclaiming an unlined landfill could have environmental and economic benefits far in excess of that shortcoming.

RADIOACTIVE WASTE MANAGEMENT

Low Level Radioactive Waste

Most low-level radioactive waste (LLRW)³⁸ generated in Vermont originates at the Vermont Yankee Nuclear Power Station (VY), owned and operated by Entergy Nuclear Vermont Yankee. Smaller amounts come from other sources; such as hospitals and the University of Vermont. Most of the LLRW currently projected to be generated in Vermont will result directly from the scheduled shut-down and decommissioning of VY.³⁹ Low-level radioactive wastes, which may typically include gloves, tools, filter materials, etc., are classified by the Nuclear Regulatory Commission according to their type and amount of radioactivity.

Vermont Yankee low-level radioactive waste currently is accepted at facilities in South Carolina and Utah. Texas may accept this waste in the future under a compact with Vermont that was approved by Congress in the 1990's, is part of a nationwide plan to store low-level radioactive waste.⁴⁰ Texas has not yet finalized its development plans for a low-level waste storage facility, but an application to develop a facility was accepted in 2004 and hearing are underway in Texas at the time this is drafted. Also in 2004, Vermont paid its \$12.5 million fee to Texas, as agreed in the compact.⁴¹

³⁸ The U.S. Nuclear Regulatory Commission defines LLRW as material that includes items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation. LLRW typically consists of contaminated protective shoe covers and clothing, wiping rags, mops, filters, reactor water treatment residues, equipments and tools, luminous dials, medical tubes, swabs, injection needles, syringes, and laboratory animal carcasses and tissues. The most intensely radioactive wastes are typically found in the water treatment residues, discarded parts from nuclear reactors and small gauges containing radioactive material. Low level radioactive waste (LLRW) is also defined by 10 V.S.A Section 7001(7).

³⁹ Over the full life of the Vermont Yankee nuclear power station, approximately 75 percent of the total LLRW generated in Vermont is projected from dismantling the nuclear power plant.

⁴⁰ The compact originally included Maine, which has since withdrawn.

⁴¹ The cost of the entrance fee was fully borne by Entergy Nuclear Vermont Yankee.

High Level Radioactive Waste

Spent nuclear fuel (SNF), which is high-level radioactive waste, is used fuel that no longer contains enough useful material to economically sustain a nuclear chain reaction. It includes the fuel pellets themselves, the fuel rods that contain the pellets, and the assembly that connects and holds the rods in place. Together, these components form a "fuel bundle" or "fuel assembly."⁴² Following its use in the reactor, the fuel assembly is intensely radioactive and, while some of the radioactive elements decay relatively quickly, it will remain extremely dangerous for many thousands of years.

Upon removal from the Vermont Yankee nuclear reactor, all SNF is stored for a minimum of five years in the spent pool, designed specifically for this purpose. From the beginning of commercial nuclear plant operation in the U.S., it has been the federal government's and the industry's plan to provide for permanent storage at a single location, as opposed to keeping it on-site for an extended period. Currently, all SNF generated to date at Vermont Yankee is stored in the spent fuel pool. In order to bridge the gap between the capacity of the spent fuel pool and the amount of SNF to be generated during the plant's licensed life, on-site dry cask storage⁴³ would be needed. It is intended that the multi-purpose containers eventually would be removed from those storage casks and sent to a permanent storage facility, if and when that is completed and commissioned. Spent fuel at the decommissioned Rowe (MA) Yankee plant is stored on-site in dry casks.

The U.S. Department of Energy is legally responsible for a permanent storage program. A selected site has been under development at Yucca Mountain in Nevada, intended to isolate nuclear wastes for thousands of years in deep geologic containment. The reliability of that plan has been debated on the bases of overall storage capacity and long-term geologic stability of the site, and recent court decisions have challenged some of the underlying engineering assumptions, thus casting more doubt on the future of this facility. As a fallback to that permanent storage program, development of an "interim storage facility" is being pursued in Utah by a consortium of private companies, including Entergy.

EMERGENCY PLANNING SERVICES

Emergency Planning

Vermont Emergency Management contracts with most Vermont regional planning commissions to assist with emergency planning on a regional basis. Statewide, this has had the effect of changing emergency planning from a top-down system to a more locally and regionally coordinated process. The WRC is working with member towns, the Local Emergency Planning Committee, the State Emergency Response Commission, the Vermont Agency of Transportation,

⁴² Each fuel assembly in the VY reactor measures approximately six inches by six inches square, and twelve feet long.

⁴³ This process involves placing spent fuel assemblies into a "multi-purpose container" (MPC) and placing each MPC into a steel and concrete cask. Casks are placed in a secure location outside the reactor building where they are passively air-cooled. If and when a final storage facility is ready, each MPC would be transferred into a shipping container for transport to that facility. The dry-cask plan for Vermont Yankee would use a MPC containing 68 spent fuel assemblies per canister.

the Red Cross, mutual aid organizations and other regional planning commissions to promote better emergency planning and disaster resistant communities.

Building disaster-resistant communities through sound land use planning is the primary goal of emergency planning. Emergency planning includes risk assessment, mitigation planning and response preparedness. Risk assessment estimates the likely extent and severity of damage from predictable events. Mitigation planning employs sound land use practices and infrastructure management to protect public and private property from predictable damage. At the planning level, response preparedness involves a great deal of public education and coordination across many organizational boundaries. In short, accidents and natural events will always happen; the extent to which they become emergencies or disasters is partly a function of readiness.

With the enactment of the Federal Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, Congress imposed upon state and local governments additional planning and preparedness requirements for emergencies involving the release or spill of hazardous materials. Provisions of this law require that facilities with hazardous materials stored on-site report these products to local fire departments, Local Emergency Planning Committees (LEPC) and State Emergency Response Commissions (SERC).

As designated by Vermont Emergency Management, LEPC District #6 serves the Windham County towns with LEPC District #7 serving the Bennington County towns and LEPC District #3 serving Weston. Like all LEPC's nationwide, there were formed under EPCRA to coordinate planning efforts related to accidents involving hazardous materials. Subsequently, they have evolved to be an "all hazards" planning group that meets monthly to coordinate planning for all types of natural disasters, hazardous material accidents, large-scale transit accidents, radiological emergency response, and others.

Response assistance for all types of emergencies may be provided by local and State Police, local fire companies, public works departments, State agencies, the local Red Cross Chapter and private contractors. Other disaster relief services, such as flood evacuation and emergency shelters, are provided by these same local response organizations and may be coordinated with the Federal Emergency Management Agency (FEMA) or state agencies, as appropriate.

Each town within the emergency planning zones of Vermont Yankee and Rowe Yankee (a ten-mile radius around each site, designated by FEMA) has a local radiological emergency response plan that is coordinated with the other towns and with state plans. Local and state response to potential radiological emergencies is exercised and tested on an annual schedule that is overseen by FEMA and coordinated with Massachusetts and New Hampshire.

Fire

Most towns in the region have local fire fighting capacity within their boundaries. The Towns of Brattleboro and Wilmington and the Villages of Bellows Falls and Saxtons River have fire departments as divisions of local government. The remaining towns are served by volunteer fire companies that serve the fire-fighting needs of their town or towns, and some are partially staffed by paid firefighters. Many of these fire companies receive a significant amount of their funding

from the towns they serve, but they operate successfully because of the dedication of the fire company personnel who volunteer their services and a great deal of their time. Several towns have more than one fire company within their boundaries to better serve different areas. Only Searsburg, Somerset, and Brookline do not have local fire companies within their town boundaries; Searsburg and Somerset are served by the Wilmington Fire Department and Brookline is served by the New Brook Fire Company located in Newfane.

All of the region's fire companies are members of mutual aid systems. Mutual aid systems are associations of fire companies that allow local fire companies to receive fire-fighting assistance or back-up service from other member fire companies. There are five mutual aid systems that serve Windham Region towns: Southwest New Hampshire Mutual Aid, Tri-State Mutual Aid, Tri-Mountain Mutual Aid, Deerfield Valley Mutual Aid, and Connecticut River Valley Mutual Aid. Some towns belong to more than one mutual aid system.

Increasingly, the lack of volunteer fire-fighters and rescue personnel threatens to seriously compromise the effectiveness of the region's fire companies and emergency medical squads. Limited discretionary time at work, increased cost, and increased training demands combine to restrict volunteers' availability.

Emergency Medical Services

First response squads respond to calls for emergency medical service by getting to the injured person as soon as possible and stabilizing the person's condition until a licensed emergency medical transport vehicle arrives. Many members of these local rescue squads also volunteer to use their own vehicles and equipment to respond to calls for emergency medical services when contacted by a mutual aid system or some other dispatching service.

Six ambulance/rescue squads provide emergency ambulance services between towns and health care facilities. Other entities outside of the region provide back up service to these companies through mutual aid agreements. The professional and private ambulance services include Deerfield Valley Rescue (Wilmington), Ker-Westerlund Ambulance Service (Brattleboro), Rescue, Inc. (Brattleboro), LeFevre Ambulance Service (Bellows Falls), Bellows Falls Fire Department, and Brattleboro Fire Department. The following towns also have volunteer rescue squads: Brookline, East Dover, Grafton, Jamaica, Londonderry, Newfane, Rockingham, Saxtons River, Wardsboro, West Dummerston, Westminster, Whitingham, Windham, and Winhall. In addition, C&S Wholesale Grocers has a full-time rescue squad for its facility in Brattleboro which will respond to Mutual Aid calls as needed. Stratton Mountain Rescue functions during winter months only.

Police

Law enforcement is organized into town and village police departments, County Sheriff's Departments and the State Police. The Village of Bellows Falls and the Towns of Brattleboro, Dover, Winhall, Wilmington, and Vernon have police departments. Towns are allowed by statute to employ constables⁴⁴, although the level of activity and authority of constables varies. Typical

⁴⁴ 17 VSA § 2651a. Constables; appointment; removal: (a) A town may vote by Australian ballot at an annual meeting to authorize the selectmen to appoint a first constable, and if needed a second...

duties of a town constable may include patrolling at sporting and community events and serving court summonses.

The Windham County Sheriff's Department patrols and responds to calls on a contractual basis with the Towns of Dummerston, Jamaica, Newfane, Putney, Stratton, Westminster, Whitingham, and the Village of Saxtons River. The Town of Readsboro contracts for services from the Bennington County Sheriff's Department. The Windham County Sheriff's Department also has contracts for police protection with organizations other than towns, such as New England Power Company, the U.S. Army Corps of Engineers and Stratton Mountain Corporation. The County Sheriff's Departments will also respond to calls in those towns that do not have contracts and which do not have their own police department. This service, however, is provided only when staff is available and only when the Department is not responding to more urgent calls. The County Sheriff's Departments also provide back up support to town police departments and the State Police when requested.

Troop D of the Vermont State Police has a local office in Rockingham; a station in West Brattleboro is used by officers but not open for public access. State Police provide back up assistance to towns that have their own police departments and often provide primary police service to towns which do not have their own police squads and which do not contract with the Windham County Sheriff's Office for service. The State Police have primary responsibility for patrolling Interstate 91.

Law enforcement is a problem for many towns in the region, especially given the fact that only 5 municipalities have police departments. Traffic and speed enforcement have been identified as issues that towns are struggling to address. Other concerns include drug trafficking, especially along the I-91 corridor, and slow response times.

Enhanced 911

Though local emergency service providers are effective once on site, the rural pattern of development in Vermont presents frustrating and potentially life-threatening delays to callers, dispatchers and responders. The Vermont statewide E911 emergency calling system was developed to address these issues, and each town regularly updates its street address system and forwards that information to the E911 board. After those data have been verified and entered at the state level, the WRC receives the updates and in turn makes corresponding changes to its geographic information data base. In addition, the WRC assists towns with questions related to road naming and address systems.

EDUCATION

Early Education/Child Care

The availability of high-quality child care is a concern for many parents, employers and communities. Affordable, high-quality child care is essential in developing a full employment

economy, raising income levels, and lowering the need for public assistance. High-quality child care can also have many positive benefits for a child's social development.⁴⁵

In 2002, the Windham Regional Commission on behalf of the Children First Partnership conducted a county-wide child care needs assessment. The following findings were identified:

- Most child care facilities are located in the two regional centers of Brattleboro and Rockingham. However, most of the overall population growth is occurring outside of the regional centers. For parents who prefer to have their children at a child care facility near their home there are limited options. This issue will continue to be a problem in the future if the population growth continues along this same trend.
- There has generally been a decrease in the number of children under the age of 5 between the years 1990 to 2000. Even though there has generally been a decrease in the population under age 5, state and national trends suggest that there may have been an increase in the number of working parents and the increased need for child care facilities.
- In Windham County, 22% of all households are female-headed with children under 18. This is a larger percentage than found throughout the State of Vermont (19%). These numbers may translate into more working mothers in Windham County than other parts of the State and the need for increased availability of child care facilities.
- An overwhelming number of jobs in Windham County are in the service sector, which may indicate a higher need for child care for non-traditional shifts such as weekends and/or evening hours. These jobs are generally entry-level positions, with low wages and little or no benefits.
- The number of available slots and hours of operation may not be meeting the demands of the population, especially those that prefer to have their children in child care close to their area of employment. According to the State of Vermont's Child Care Study, with more parents working in an era of welfare reform, the demand for child care is expected to grow by 12% over the next 10 years.⁴⁶

There is an overall need to increase the availability of high-quality child care. In general, the population that appears to be most underserved is the 0-2 year olds (infants and toddlers). There is a clear need for expanded hours of operation, including more full-day, full-week programs. Several components need to be factored into locating additional or expanding existing child care facilities. Transportation concerns, the rural nature of the region's road network and existing commuting patterns, as well as the population growth patterns over the last ten years, all contribute to a unique environment for assessing specific child care facility location needs.

⁴⁵ Community Assessment Project, Windham County, Vermont, 2002. United Way of Windham County

⁴⁶ *Vermont Child Care: A Study of Wages, Credentials, Benefits and Market Rates*, 2001. Vermont Child Care Services Division

Elementary and Secondary Education

Each public school in the region is part of a regional supervisory union. There are five supervisory unions serving towns in this region: Windham Central, Windham Northeast, Windham Southeast, Windham Southwest and Windsor Southwest.

Local school or district boards govern all public elementary schools. Some towns that do not have their own elementary school pay the tuition for resident children to attend nearby public or independent elementary schools. There are four public secondary schools in the region. Three are operated by union high school districts: Brattleboro Union High School District #6, Bellows Falls Union High School District #27 and Leland and Gray Union High School District #34. Wilmington and Whitingham formed the Twin Valley School District for the purpose of jointly providing secondary education for their towns. Towns which do not have their own high school, or which do not belong to a union high school district, pay tuition for their resident high school age students to attend nearby public or independent high schools. Some are public schools outside the region, such as Green Mountain High School (Chester), and Drury High School and McCann Technical School (North Adams, Massachusetts). Independent high schools in or near the Windham Region include The Long Trail School (Dorset), Burr & Burton Seminary (Manchester), The Academy at Charlemont (Charlemont, MA), The Austine School for the Deaf (Brattleboro), Deerfield Academy (Deerfield, MA), Northfield Mount Hermon School (Northfield, MA), The Putney School (Putney), The Compass School (Westminster), Stoneleigh-Burnham School (Greenfield, MA), Stratton Mountain School (Stratton) and Vermont Academy (Saxtons River).

School enrollment figures are lower in most towns than what was experienced in the 1990's. The largest segment of the population has passed out of their childbearing years. Nonetheless, the consolidation of schools as well as aging facilities has led to school construction projects in the region. The location of a school does have an affect the environment. Building new schools on the edge of a community on large, undeveloped parcels of land not only abandons the village and downtown and existing facilities but also increases public expenditures, vehicle trips, pollution and loss of open space.⁴⁷

Post-Secondary Education

Four public post-secondary schools offer courses or programs within the region. The Community College of Vermont (Brattleboro) is an Associates Degree granting institution that offers a wide range of courses and workshops. The University of Vermont operates a regional continuing education center (Brattleboro). Johnson State College (Brattleboro) and Southern Vermont College (Brattleboro) offer programs leading to a bachelor's degree.

The region also hosts the campuses or regional offices for four independent colleges. Marlboro College (Marlboro) is a small independent liberal arts college that also provides the region with a diversity of cultural activities. Landmark College (Putney) offers programs designed to meet the needs of students with learning disabilities. World Learning, through its School for International Training, offers undergraduate and graduate programs at its Brattleboro campus. The Experiment

⁴⁷ *Schools for Successful Communities: An Element of Smart Growth*, Council of Educational Facility Planners International and U.S. Environmental Protection Agency, September 2004.

in International Living, part of World Learning, also offers exchange programs for college and high school students in foreign countries throughout the world. Union Institute and University offer bachelors and masters degree courses through its Brattleboro campus.

Students also have access to several out-of-state post-secondary institutions within commuting distance, including Keene State College and Antioch/New England Graduate School (Keene), Greenfield Community College (Greenfield, Massachusetts), and the University of Massachusetts and the affiliated 5-college system, which includes Amherst, Hampshire, Mount Holyoke, and Smith Colleges in Massachusetts.

Adult Education

There are several opportunities for adult education regionally. In addition to the various programs offered through community libraries and individual groups, the Community College of Vermont has a learning center in Brattleboro that offers associate degrees, career-related certificates, and credit and non-credit training programs. Vermont Adult Learning, which has an office in Brattleboro, can provide instruction in reading, writing, speaking, listening, math, reasoning and problem solving, occupational and workplace skills and information technology to adults 16 years and older who are not enrolled in secondary school and who older lack basic educational skills.

HEALTH CARE FACILITIES

Hospitals

Five hospitals serve most of the region's general and emergency medical care needs. There is a great diversity among the region's hospitals in the level of services provided. Brattleboro Memorial Hospital (Brattleboro), Southwestern Vermont Medical Center (Bennington), Springfield Hospital (Springfield), and The Cheshire Medical Center (Keene, NH) provide most of the region's acute medical care needs, with a total of 398 beds. These hospitals have facilities that provide surgery, X-ray, outpatient, laboratory, and physical therapy services. The focus of the Otis Health Care Center (Townshend) is primary and preventive care. The Center contains Grace Cottage Hospital, the smallest acute care hospital in Vermont (19 beds), a nursing home, an outpatient clinic and a community care home. It also provides outpatient specialties and outreach programs serving the elderly and disabled. The Dartmouth-Hitchcock Medical Center in New Hampshire and hospitals in Massachusetts and New York provide tertiary care⁴⁸ for the region.

The Mountain Valley Health Center (Londonderry), the Health Center at Bellows Falls, and the Deerfield Valley Health Center and Green Mountain Healthcare (Wilmington), along with the region's many medical offices, serve the day-to-day health care needs in the region. In order to provide immediate emergency health care, the Stratton and Mount Snow resorts provide health care facilities staffed by physicians during the ski season.

⁴⁸ Tertiary care is defined as highly specialized medical and surgical care for unusual and complex medical problems.

The financial condition of the region's hospitals is of primary concern. The level of service that the hospitals can provide is to a great extent determined by the resources available to the hospital to purchase new equipment, upgrade facilities, and attract and retain physicians. Rapidly changing technology in the health services industry requires hospital administrators to decide what new equipment is needed to best serve the region's medical care needs and what can be afforded.

The industry's shift toward providing greater levels of outpatient services is primarily a response to requirements by third party reimburses to provide many services on an outpatient basis. This has placed new demands on hospitals with facilities that were designed for providing in-patient services. Continued shifts toward outpatient services will require additional capital expenditures for new facilities.

Health care costs continue to rise faster than the rate of inflation. This has placed health care services out of the reach of many people at a time when a greater percentage of the population has no or inadequate medical insurance. Third party reimbursements, especially Medicare reimbursements, are declining for many types of medical procedures, increasing the amount of "free care" costs that hospitals and their paying patients must absorb. Commercial insurers and the self-insured will pay more to absorb rising "free care" costs.

Elder Care

Two home health care agencies coordinate many services in the region, including in-home health care. Southern Vermont Home Health Agency serves the southern half of the region, while the Visiting Nurse Alliance of Vermont and New Hampshire serves the northern half. Home health care service providers are Medicare certified by the State Department of Aging and Disabilities.

The region's nursing homes, community care homes and therapeutic community residences are undergoing substantial change and various agencies and organizations charged with meeting long term care needs within the region are concerned about the available capacity to meet those needs. Since 1996 it has been State policy to reduce the number of nursing home beds. Windham County has had two nursing homes closures and a third reduce its number of potential beds by 30. The goal is to shift much of the care to home and community-based systems, including assisted living facilities. The Windham Region is currently having difficulty finding beds for some Medicaid eligible patients with a serious need for nursing home care. Assisted Living facilities are not intended to provide care for this level of patient need. It is not clear whether an Assisted Living facility will have a choice once they take in Medicaid patient who requires a lower level of care that eventually increases to nursing home level care.

Mental Health

Mental health services are provided at Health Care and Rehabilitation Services of Southeastern Vermont and the Brattleboro Retreat. The Brattleboro Retreat is one of the country's oldest and largest independent mental health organizations and provides a full range of psychiatric in-patient care and a variety of out-patient services. Health Care and Rehabilitation Services of Southeastern Vermont has extensive outpatient programs in a number of towns in the region.

COMMUNICATIONS

Communications link the region's residents with each other and with the rest of the world. Increasingly, the region's commercial and cultural strengths require efficient access to modern communications systems. Maintenance and development of up-to-date communications systems facilitate cooperation and understanding of regional, national, and local issues.

Telephone and Cellular Communications

For telephone service, most of the region is served by Verizon New England, Inc. except Athens, Grafton, and portions of Rockingham, Westminster, and Windham, which are served by VTel. This is a rapidly changing sector of the world economy, and new service providers are entering the market frequently. Digital switches serve the entire region, allowing custom calling and call management features to be offered. Integrated Services Digital Network (ISDN) service, which allows all-digital switched transmission of voice, video, or data over the telephone network, is feasible in much of the Verizon service territory, but remains costly and suffers from slow installation.

Cellular phone service coverage varies widely in the region, and some areas remain difficult and less practical to serve. Coverage is incomplete for digital cellular and Personal Communications Services (PCS)⁴⁹ that use higher frequency spectrum than cellular.

The expansion of telecommunication facilities raises issues that include regulatory policies, health concerns, environmental quality, aesthetics, and historic resource protection. A concern for the WRC and member towns is the impact that cellular towers and related facilities may have on a rural landscape and villages. Federal law regulates the placement of telecommunication facilities in a given community; however, emphasis has been placed on balancing the need for telecommunications infrastructure with a community's desire to maintain community character. The Telecommunications Act of 1996 preserved state and local regulatory authority for the placement, construction or modification of wireless facilities. However, local zoning and regulations may not prohibit wireless services within the community or address the potential effects of non-ionizing electromagnetic radiation and unreasonably discriminate among providers of functionally equivalent services.⁵⁰ In response to this, a majority of the towns in the region adopted telecommunications regulations either as part of zoning bylaws or as stand alone ordinances.

The telecommunications industry is constantly changing and new technology is constantly being deployed. The emerging services will require facilities, although not all of these will be conventional tower-mounted facilities. As the number

⁴⁹ Personal Communications Services (PCS) and Personal Wireless Service Facilities (PWSF) are terms used in "official documents" and can cause considerable confusion. Their meanings are somewhat different: PCS refers primarily to digital cell phone technology, and PWSF refers to a wider range of wireless services, but for purposes of this Plan may be considered the same.

⁵⁰ Telecommunications Act of 1996, 47 U.S.C. §332(c)(7).

Internet

Access to the internet is available through different providers. High speed internet connections, also known as broadband, have been slow to expand in the rural areas of the region. Broadband is available in several parts of the region, including the densely settled areas in the Connecticut River Valley, the resort areas, as well as several other towns including Newfane, Windham, Grafton, Athens, and Townshend. In areas without broadband, most users must rely on dial-up connections over telephone wires in order to access the internet. Wireless internet is a growing technology that provides an alternative to DSL and cable connections for high speed connection. Several businesses have made this technology available to their patrons.

Increasingly, internet services are necessary for communications and marketing of any business, as well as communications within and beyond community borders. The lack of high speed internet access availability in many of the region's towns is a concern to many people. Many rural communities have been viewed by broadband providers as too sparsely populated to warrant investment, and, as a result, have no little or broadband service.⁵¹ The Vermont Rural Broadband Project assists rural communities in efforts to obtain or expand affordable broadband services by helping the community groups in documenting local broadband demand, building a business case, and locating potential service providers. The State has also recognized the importance of broadband service and has noted that it is their vision that all Vermonters will have ready access to affordable broadband services.⁵²

Television and Videoconferencing

Cable television is offered in a majority of towns in the region (see Table 3), but there are still significant unserved pockets. The use of satellite dishes to receive television signals has been widespread for a number of years, particularly in rural areas, and digital (small-dish) satellite services are common, competing with cable television for subscribers.

Table 3: Cable Companies Serving Windham Region⁵³

Company	Serving
Duncan Cable TV	Wilmington
East Dummerston Cable Television, Inc.	Dummerston
Gateway Cablevision Corp.	Dover, Whitingham
Opticable	Readsboro
Southern Vermont Cable Company	Newfane, Putney
Townshend TV Club, Inc.	Townshend
Adelphia Cable Communications	Brattleboro, Grafton, Guilford, Rockingham, Stratton, Vernon, Westminster, Weston, Winhall
Young's Cable TV Corp.	Londonderry, Rockingham

Source: Vermont Department of Public Service

Brattleboro Community Television (BCTV), a public, educational, and governmental (PEG) access station reaches subscribers in Brattleboro, Guilford, Putney, and Vernon with

⁵¹ Vermont Council on Rural Development, Vermont Rural Broadband Project

⁵² Vermont Telecommunications Plan, v. 4.0, Vermont Department of Public Service, 2004

⁵³ Not all franchises serve entire towns.

programming that includes coverage of town government meetings. Bellows Falls Community Television (BFCTV) operates a PEG station serving Bellows Falls from a location in Bellows Falls Union High School, and has programming that includes local meetings. Duncan Cable Television operates a locally oriented program service in Wilmington. Their programming includes taped coverage of Wilmington Selectboard meetings.

Video networks are creating links both within and outside the region. Vermont Interactive Television (VIT) is a two-way, interactive audio and video telecommunications system that currently operates from fourteen sites in Vermont (including Brattleboro, Bennington, and Springfield in southern Vermont) offering videoconferencing for education, government, businesses, and non-profits between sites both within the system and around the world. VIT currently operates its Brattleboro site at the BDCC Business Park on Browne Court. Several sites in Brattleboro also have the ability to input signals into the Adelphia Cable system through BCTV, as well as receive them. These sites are Brattleboro Union High School, Academy School, Oak Grove School, the Gibson Aiken Center, Green Street School, Canal Street School, Walnut Street School, Brooks Memorial Library, as well as the Vernon Town Offices and the Guilford Central School. It is possible to share signals between the BCTV and BFCTV systems. One-way video, two-audio satellite education and conferencing systems are also becoming increasingly common at the region's schools.

Other Media

The region is served by several commercial radio stations located within the region as well as surrounding areas. Vermont Public Radio is broadcast on 94.5 FM in Brattleboro, and public radio stations from Concord, NH; Amherst, MA; and Albany, NY can also be heard in the region.

Two daily papers, the Brattleboro Reformer and the Rutland Herald, are widely available and provide coverage of local and regional news. The Deerfield Valley News reports on events in the Deerfield Valley on a weekly basis. Towns in the southwestern corner of the region are served by the Bennington Banner and the North Adams (MA) Transcript. The Vermont News Guide (Manchester Center) and the Message (Londonderry) serve the northwestern section of the region. The Town Crier (Brattleboro and Rockingham), a commercial advertising weekly, provides a calendar of upcoming events and local business news. The Valley Advocate (Northampton, MA) and other free publications are widely available.

HUMAN SERVICES

Helping people meet their needs is essential to the social and economic well-being of the region. There are a variety of reasons that residents may need help. Poverty, language and cultural barriers, lack of education, physical and/or mental disability, and isolation are just a few of those reasons. Supporting approaches that prevent problems from developing and that meet the needs of residents in the region is critical.

Over 100 organizations and agencies provide a variety of programs and activities to meet the region's human service needs. Programs include social services and nutrition programs for elders, energy assistance for low-income households, employment referral services, emergency

food and shelter programs, and a range of programs for children. As in many rural areas, access to services can be a challenge. Access not only includes being able to physically reach the service but also includes outreach and technology that make people aware of the services. In 2005, the Vermont 2-1-1 caller hotline was launched so that Vermonters could have easy access to specialized health and human service referral information. Several other telephone hotlines also provide immediate information and support

Amongst the challenges to the human service agencies in the region are the aging population and poverty. The number of people aged 75 and older increased 21.2 percent from 1990 to 2000. According to Department of Aging and Independent Living projections, the population age 65 and up is expected to grow from 14.2 percent in 2000 to 26.6 in 2020. As noted in the Community Profile chapter, some towns in the region are experiencing wide economic disparity with high percentages of individuals below the poverty level and high median incomes. Of the 701 families in the region below the poverty level in 1999, over half of the families (386 families) were headed by a female with no husband present and 94.3 percent of those families headed by a female had children under the age of 18.

RECREATION

Within the towns of the Windham Region, there are varying levels of community facilities for recreation. Some communities, such as Brattleboro and Rockingham, have municipal recreation departments and provide a wide range of recreational activities for various ages. Other towns rely on volunteer groups to organize recreational leagues. Baseball, softball and Little League fields are limited throughout the region. According to data provided to the Vermont Department of Forest and Parks, the majority of athletic fields are public and are located at school properties throughout the region.

Ski resorts play an important role in the Windham Region by, among other things, providing recreation to residents and tourists alike. The ski resorts have become a destination for all four seasons, marketing sports such as mountain biking and golf, in addition to traditional water activities, to attract visitors.

An important recreational resource to the Windham Region is its trail network. A wide variety of trails exists for a variety of recreational use. The Appalachian Trail, Long Trail, and Catamount Trail all pass through the western part of the region, largely through the Green Mountain National Forest. New trails designed to meet the needs of various recreation users are being created, in large part by private and public non-profit groups. In the 2003, Pratt's Bridge Trail, 1.7 miles of hard pack surface trail that is handicapped accessible, was completed as part of the West River Trail. This was developed in partnership with the Paralyzed Veterans of America.

Bicycling and walking are also expected to continue strong growth in popularity and with it, support for multi-use paths, trails, and linear parks or greenways. Several efforts are underway to create trails and paths including a 5-mile Valley Trail along the North Branch of the Deerfield River connecting West Dover and Wilmington and the West River Trail which connects 4,500 acres of public land in Jamaica, Townshend, and Londonderry. There is beginning interest in developing a Connecticut River Trail from Brattleboro to Bellows Falls. Class IV roads and legal

town trails provide important recreational resources throughout the region's communities. Hiking, biking, horseback riding, cross-country skiing and snowmobiling are just some of the recreational activities that take place on these roads and trails.

The Windham Region is rich in water resources. Residents and visitors utilize the many rivers, streams, lakes, reservoirs, and ponds for water recreation such as swimming, boating, and fishing. There is a shortage of access to lakes and ponds in the region. Twenty-eight lakes and ponds in the region are over 20 acres; only nine miles of shorelines of these major lakes and ponds are on public or conserved lands. Water quality and shoreland protection must be maintained and enhanced as the demand for water recreation increases.

CULTURAL AND HISTORIC RESOURCES

Libraries

The region's libraries play an important role in serving the learning and information needs of its citizens, as well as providing community centers for meetings and cultural events. Story times, book discussions, lectures and films, internet access, and after-school programs are common programs at many of the region's libraries. There are 21 libraries in the region with seven towns not having libraries within their borders. Brooks Memorial Library in Brattleboro and Rockingham Library are the region's largest libraries.

Since the closing of the Regional Library, local libraries have felt the pressure to provide service to former Regional Library customers. Many of the smaller libraries now offer better access to more services than they did a few years ago thanks in part to short term funding initiatives from the Freeman Foundation and the Gates Foundation. Most libraries in the region are linked in an electronic network designed and supported by the Vermont Department of Libraries to bring the entire state's resources, state library holdings, college, university and public libraries, to citizens of the region.

Adequate funding for libraries is a struggle for libraries in the Windham Region. Federal and State funds do not pay for basic local public library services.⁵⁴ Local libraries must find funding to keep their doors open in order to take advantage of statewide services for their citizens.⁵⁵ Many towns in the region depend on volunteers to operate the town library.

Arts

For an area of its size, the region is unusually rich in cultural resources. Nationally recognized musicians, artists, writers and craftspeople have chosen to make the region their home, and their presence has helped to attract a diverse and appreciative audience to the area. The presence of the arts community enriches the lives of residents and visitors and enhances the region's appeal as a place to live and do business. Cultural resources have a direct link to the economy through spending by arts organizations and by audiences attending events.

⁵⁴ National Center for Education Statistics for FY2002 showed percentage distribution of income for Vermont: Federal 0%, State .1%, with the rest local (70.1%) or other.

⁵⁵ State and federally funded services include online databases, online union catalog, catalog records and consulting to improve staff skill, as well as operation support for Inter Library Loan.

The Windham Region plays hosts to numerous concerts, festivals, and performances. Summer concerts are held at the Yellow Barn in Putney, by the Guilford Friends of Music, and at the Marlboro Music Festival. The Brattleboro Music Center also hosts a series of choral, symphonic, and chamber works. Mount Snow and Stratton resorts also sponsor summer musical festivals. The Weston and Saxtons River Playhouses are well known for their summer theater productions. Several other theater companies, such as the New England Youth Theater and Sandglass Theater, offer workshops and perform in the region. The Brattleboro Museum and Art Center offers exhibits of work in a variety of media, often coupled with lectures or performances. Bellows Falls and Brattleboro have instituted popular Gallery Walks held on a monthly basis. Brooks Memorial Library (Brattleboro) and Rockingham Library (Bellows Falls) host film and lecture series, and provide gallery space. The Latchis Theater in Brattleboro, Opera House in Bellows Falls, and Memorial Hall in Wilmington are exceptional historic facilities that have undergone restoration and have been developed as performing art centers. There are several other small performance venues through the region including the Hooker Dunham Theater in Brattleboro and the Windham Hotel in Bellows Falls.

Craftspeople form a significant segment of the region's culture and economy, and play a major role in the heritage tourism that continues to grow in the region. A number of art and craft festivals are held annually, as are lecture series and other events sponsored by the Windham County Council for the Arts. The region also sustains professional storytellers, mimes, puppeteers, traditional and folk musicians, and folk, contra and Morris dancers.

Historic Resources

Historic structures and sites are an integral part of the Windham Region's character and quality of life. They serve as a link to the past and help strengthen the local economy by promoting investment as well as tourism. It is in the public interest to preserve and enhanced these historic resources.

There are a variety of preservation tools are available at the local, state and federal level. The following are just a sampling of tools available to towns in Vermont:

- *National Register of Historic Places:* The National Register of Historic Places is the official list of the Nation's resources worthy of preservation. Resources may be nominated individually, or in groups, as districts or as multiple resource areas and must generally be older than 50 years. Over 40 of the region's historic structures and districts are listed on the National Register of Historic Places. Inclusion on the National Register affords the property special recognition of its contribution to local resources, provides a review of effects which any federally funded project may have on the property (most notably highway projects), and may enable property owners to receive federal tax advantages for historically appropriate improvements.
- *Vermont State Register of Historic Places:* In the 1970's the Windham Regional Commission undertook a survey of historic structures in the Windham Region. Sites listed on the State Register are given due consideration during Act 250 reviews. During the permit process the Vermont Division of Historic Preservation will make recommendations to the district environmental commission on the impact to the historic resource. In addition to the sites

listed on the National Register, there are numerous other sites and structures are recognized in the State Register.

- *Vermont Designated Downtown and Village Program:* This program seeks to recognize and protect the cultural and economic investments in villages and downtowns by offering technical assistance and tax credits. Currently, there are two designated downtowns (Brattleboro and Bellows Falls) and 13 designated villages in the Windham Region.
- *Local Historic Districts:* Vermont State law (24 V.S.A. 4414) allows towns to create and administer a local historic district. The purpose of an historic district is to protect and preserve areas of outstanding architectural and historic value from inappropriate alterations and additions which might otherwise detract from the character. Towns may also designate historic landmarks and enact Design Review Districts.
- *Preservation Trust of Vermont:* The Preservation Trust of Vermont is a charitable, non-profit organization that initiates and assists local and statewide efforts to preserve Vermont's historic, architectural, and community resources. Through educational programs and technical and financial assistance, the Preservation Trust works to protect and restore significant historic properties, downtowns and community centers.
- *Certified Local Government (CLG) Program:* The CLG Program is a federally funded program administered by the State. A local government can participate in the program once the Vermont Division for Historic Preservation certifies the municipality. Matching grants are made each year to CLGs for survey and planning projects, including National Register nominations and education and advocacy projects. Rockingham is the only CLG in the Windham Region.

ENERGY AND COMMUNITY RESOURCES

Instituting energy-conservation measures on a community-wide scale can help local governments and citizens manage energy costs. Community energy programs can be designed to meet specific goals. In the Windham Region, Brattleboro is currently working with the Cities for Climate Protection to reduce energy consumption. Decisions made at both the municipal and individual level, such as having police officers patrol on foot or on bicycle, converting conventional light bulbs to compact fluorescent light bulbs, making energy-efficient upgrades to buildings, and reducing the solid waste stream through recycling and composting can have a positive impact on the environment and provide financial savings to communities.

COMMUNITY RESOURCES POLICIES

Public Water Supplies

1. Extend municipal water mains to only those areas where future development is being encouraged, as identified by growth center and growth area designations in approved town plans and this Plan or in areas where extension is required for public health purposes.

2. Maximize water conservation when planning for development in order to limit demands on public water supplies.
3. Discourage activities and land uses that may degrade the watersheds of public water supply sources.
4. Minimize erosion and runoff to protect public water supplies. Follow the state's Acceptable Management Practices as standards for silvicultural practices in public water supply watersheds.
5. Limit land uses within source protection areas to those uses that pose no threat of contamination to public water supplies.

Private On-Site Water Supplies

1. Locate and install wells using proper isolation distances and drilling techniques.
2. Ensure that new development does not impact existing private on-site water supplies.

Wastewater Treatment

1. Promote environmentally sound and affordable wastewater treatment, including research regarding the viability of alternative on-site management systems such as composting toilets and gray water recycling.
2. Ensure long-term reliability of the region's wastewater management systems and facilities, including the long-term ability to properly treat septage.
3. Plan development so as to manage wastewater effectively and maintain surface and groundwater quality.
4. Plan development so as to minimize water consumption, in order to lengthen the life and improve the efficiency of wastewater treatment facilities.
5. Support proposals to upgrade and improve existing wastewater treatment facilities. Extend sewer systems to only those areas where future development is being encouraged, as identified by growth area and center designations in approved town plans and this Plan or in areas where extension is required for public health purposes.
6. Assist towns to work cooperatively to ensure long-term access to reliable and affordable disposal systems.
7. Encourage installation of community treatment systems in villages, in clustered housing developments, and in remote areas where individual on-site septic systems are not adequate.
8. Assist towns and the Agency of Natural Resources, as feasible, to develop and disseminate educational material related to reducing hazardous elements and compounds in wastewater.

9. Reduce the use of hazardous materials. Improve collection and recovery systems of such materials in order to decrease their presence in the region's wastewater.

Privately Owned On-Site Wastewater Treatment

1. Encourage on-site sewage disposal system owners and operators to properly maintain their systems.
2. Ensure that new development has properly designed, constructed and inspected on-site sewage disposal systems.
3. Support programs to assist with the replacement of failed on-site sewage disposal systems.

Solid Waste Management

1. Ensure that planning for waste management and disposal addresses public health, environmental quality, and impacts on adjacent and nearby land uses.
2. Reduce the amount of solid waste generated in the region by developing recycling, composting, waste reduction and reuse, and general waste management programs that will be flexible and reliable amidst rapidly changing economic and regulatory environments.
3. Reduce the use of hazardous materials. Improve collection and recovery systems of such materials in order to decrease their presence in the region's solid waste.
4. Support the assessment of waste disposal fees that accurately and fairly charge disposal costs to the waste generators.
5. Support the inclusion of recycling programs in all solid waste management programs, and work with the District Environmental Commission to address waste management in Act 250 land use permit applications, as appropriate.
6. Encourage the financial support of recycling programs at the town and solid waste district level.
7. Assist in the planning, designing, and building of permanent collection facilities for household hazardous wastes and for small quantity generator hazardous wastes, in order to help protect the region's public health and environment.
8. Assist towns and solid waste districts to establish and enforce regulations governing the safe disposal of all wastes, including hazardous wastes. Encourage non-district towns to support and participate in regional or state-sponsored household hazardous waste collection programs.
9. Support federal, state, and local actions that will reduce the volume and toxicity of municipal solid waste in the Windham Region.

10. Assist towns and the Agency of Natural resources, as feasible, to develop and disseminate educational materials that promote public awareness regarding the use of hazardous materials and their environmental impacts.

Low Level Radioactive Waste

1. Ensure the safe and effective storage, transportation, and disposal of low level radioactive waste (LLRW).
2. Work to assure that standards at least as stringent as those proposed for a LLRW storage site in Vermont are applied to any alternative site.
3. Minimize the generation of LLRW.

High Level Radioactive Waste

1. Encourage a requirement that permanent spent nuclear fuel (SNF) storage be resolved prior to any consideration of extending or reviewing the operating license of Vermont Yankee.
2. Support increased local and regional public involvement regarding all SNF permitting and licensing decisions.

Emergency Planning

1. Build disaster resistant communities by promoting sound land use planning that accounts for known hazards.
2. Encourage all towns to improve existing roads and design culverts and bridges to carry a minimum of a 25-year flood event without damage.
3. Encourage all towns to require that all new public and private roads and driveways are properly constructed so that they do not contribute to the damage of town roads from runoff.
4. Support a regional effort to develop an all-hazards plan that stresses disaster mitigation.
5. Encourage towns to adopt a model flood hazard area regulation.
6. Encourage the development and improvement of emergency evacuation plans.
7. Encourage towns to include adequate provisions for pets and livestock in their disaster plans.
8. Explore efforts to develop a regional emergency response plan that includes surrounding areas in VT, NH, and MA.

Emergency Response

1. Provide timely and effective emergency services to all persons regardless of their ability to pay for these services.

2. Provide fire hydrants or other water sources in proposed developments so that fire-fighting personnel can adequately serve all structures.
3. Design and build new roads so that emergency vehicles can readily maneuver and access all proposed structures.
4. Ensure that the emergency service personnel, facilities, and equipment needed to effectively service new development are available to avoid placing undue demands on existing personnel, equipment, and facilities.
5. Support the installation of an additional or improved repeater to upgrade the quality of the Southwest New Hampshire Mutual Aid system's radio broadcasts.

Educational System

1. Support efforts to increase the availability and affordability of childcare.
2. Help to secure greater assistance from the state (financial and facilities assessment) to local and union school districts to provide quality education services and resources, as well as to meet state educational facility and program requirements.
3. Promote school construction and renovation projects in existing developed areas such as downtowns and village centers in order to take advantage of existing infrastructure, encourage walking and bicycling to school, and to enhance revitalization of communities.
4. Increase opportunities for public and private cooperation in offering vocational and basic competency training to employees of area business and industry.
5. Revise current state aid formula to place less emphasis on property wealth. Explore broad based, more equitable funding sources to make education less dependent on local property tax revenues.
6. Support efforts of local and regional libraries to provide materials and facilities for independent learning and development of life-long education.

Communications

1. Promote universal access to broadband telecommunications and information services that are competitive in availability and cost.
2. Encourage reduced rates on advanced telecommunications services, equipment, and user training for education, libraries, and health care. Support local access to diverse life-long distance learning opportunities and to low-cost public-use computers connected to electronic information.
3. Support greater penetration of public access, educational and government programming (PEG) through new PEG group formation and regional agreements. Encourage cable companies and other video programming service providers to support PEG operating and

capital budgets. Encourage cable television companies to provide coverage of regular town meetings and other important local events as part of their cable franchise agreements.

4. Encourage expansion of transmission and receiving equipment at existing transmission and receiving stations, including co-location of carriers.
5. Encourage siting, design, and access of towers and structures in all cases to provide quality transmission and minimize negative impacts on natural and scenic resources.
6. Ensure that new and existing telecommunication facilities comply with FCC emission standards in order to protect public health in the Windham Region.
7. Support increased access to public information, and information about local events in user-friendly electronic formats.
8. Encourage increased access for residents to state and local public meetings and hearings through Vermont Interactive Television and PEG channels:

Human Services

1. Promote economic development opportunities that will contribute toward meeting the region's social service needs.
2. Address the childcare, eldercare, and care for persons with disabilities needs of families by encouraging the location of appropriate facilities near places of employment or home.
3. Avoid duplication of human service efforts by assisting the coordination of community service organizations, as feasible and appropriate.

Recreation

1. Provide varied and accessible opportunities for outdoor recreation.
2. Facilitate the orderly development of needed public and private recreational facilities.
3. Encourage public opportunities for multiple use recreation and public access to recreation lands and waters, where they do not compete.
4. Maintain high environmental quality in the development of outdoor recreation facilities.
5. Recognize the recreational potential of watercourses and shorelines and provide facilities for water-oriented day use.
7. Develop multi-purpose trail corridors using abandoned railroad beds, Class 4 roads and other public rights-of-way. Protect existing trail corridors.

8. Encourage federal, state, and local acquisition of land and facilities well-suited for outdoor recreation, provided that adequate financial and management arrangements are made with the involved local governments.
9. Support United States Forest Service acquisition, other than by eminent domain, of private in-holdings within and selected lands adjacent to the Green Mountain National Forest, provided that adequate payments in lieu of taxes are made to the affected local governments.
10. Plan and provide recreational opportunities for the disabled and elderly.
11. Provide separate areas or facilities for conflicting uses of recreational resources. For example, swimmers and motorboats should not compete for the use of the same resource when such conflicts create safety hazards or significantly impair the use or enjoyment of the resource.

Cultural and Historic Resources

1. Support efforts to maintain and enhance the region's libraries.
2. Strengthen the role of cultural and artistic disciplines in public education.
3. Encourage community-based facilities and organizations which will support cultural needs, along with improvements in marketing and distribution of the arts.
4. Support organizational and communication networks serving the region to promote the enhancement of cultural opportunities.
5. Protect places of outstanding educational, aesthetic, archeological, or historical value from development that unreasonably impairs their character and quality.
6. Discourage development that would adversely affect cultural resources, including their destruction or alteration, alteration of surroundings, or the introduction of non-harmonious visual, audible, or atmospheric elements.
7. Encourage rehabilitation of significant historic sites and structures. Emphasize adaptive use of historic resources whenever it is economically viable.
8. Encourage development that preserves the historic and architectural character of town and village centers and the rural landscape.
9. Seek public uses and/or ownership to preserve significant historic sites or structures.
10. Support local, regional, and state non-profit historic preservation trusts.

HOUSING

EXISTING HOUSING CONDITIONS

Economic conditions, demographic trends, local and state property taxes, and municipal land use regulations all have an effect on housing conditions. The Regional Profile section provides housing data statistics that reflect the current housing situation in the Windham Region.

Housing Growth

From 1990 to 2000, an additional 1,532 housing units (representing a 5.4 percent growth) were added to the region's housing stock. Table 1 provides a summary of the region's housing stock and occupancy status in 1990 and 2000. Seasonal housing units and vacant housing units saw a decrease during that time while owner-occupied units had the largest increases. The conversion of second homes to year-round resident housing has also accompanied the recent increase in population.

Table 1: Windham Region Housing Stock and Occupancy Status

Unit Type	1990		2000		Change 1990-2000	
	Housing Units	Percent	Housing Units	Percent	Total	Percent
Owner occupied	11,004	38.8	13,213	44.2	2,209	20.1
Renter occupied	6,031	21.3	6,115	20.4	84	1.4
Seasonal	9,318	32.9	9,290	31.1	-28	-0.3
Vacant	1,961	6.9	1,227	4.1	-734	-37.4
Total	28,314	100	29,846	100	1,532	5.4

Source: U.S. Census

Growth in housing units among the region's towns has varied (see Regional Profile for figures). The highest numerical increases in housing units occurred in towns with large populations (Brattleboro and Westminster) or towns with resorts (Dover and Stratton). The towns that experienced the highest percentage of housing growth in the region were either resort towns or one the smaller, more rural towns, such as Athens and Grafton. Four towns (Readsboro, Rockingham, Searsburg, and Townshend) recorded a loss in the overall number of housing units. The reasons for these losses are difficult to ascertain but it is clear that in Townshend there was a decline in the number of mobile homes and in Searsburg there was a decrease in the number of single family detached units.

The towns that had experienced the highest growth in seasonal housing in the 1980's (Dover, Stratton, and Wilmington) appear to have seen a leveling off. This moderation of seasonal unit growth is due in part to conversion of already existing seasonal housing to year-round use. While the rate of seasonal housing development has declined from the high growth levels of the past, it still contributes to nearly one-third (31 percent) of the region's housing stock.

Types of Housing

Single family homes continue to be predominant form of development. Most new development has occurred along road frontage and has been built on a lot-by-lot basis as opposed to a large

subdivision. New single-family homes, in particular relatively high-priced homes, tend to be distributed outside the compact settlement areas of villages and downtowns. An increasing number of homes are being built in sensitive environments such as on ridgelines and in wildlife corridors. There has also been a trend toward forest parcel subdivision for residential development by many individual owners. There has been very little construction of new multi-unit housing located outside of the resort areas.

Multi-unit housing in the Windham Region can be found in a mix of different structure types (see Table 2). The majority of multi-family housing is located in smaller-sized structures that house 2 to 4 units. Owners overwhelmingly live in single family housing, while renters are distributed amongst a mix of the housing types. The majority of large multi-unit structures (housing five or more units) are found in Brattleboro (1,198 units), Stratton (541 units) and Rockingham (266 units). Resort development has heavily influence multi-unit development in Stratton where the majority of housing units are located in structures housing three or more units.

Table 2: Windham Region Units in Structure by Occupancy, 2000

Units in Structure	Region Total		Owner-Occupied		Renter-Occupied	
	Total	Percent	Total	Percent	Total	Percent
1-unit, detached	29,825	64.9	10,903	82.6	1,714	28
1-unit, attached	19,370	6.5	290	2.2	168	2.7
2 units	1,949	6.2	499	3.8	945	15.4
3 or 4 units	1,844	6.5	203	1.5	1,329	21.7
5 to 9 units	1,437	4.8	45	0.3	903	14.8
10 to 19 units	457	1.5	34	0.3	168	2.7
20 or more units	891	3	26	0.2	534	8.7
Mobile homes	1,858	6.2	1,197	9.1	348	5.7
Boat, RV, van, etc.	66	0.2	4	0	10	0.2
Total	29,825	100	13,201	100	6,119	100

Source: 2000 U.S. Census

Mobile homes⁵⁶ and mobile home parks continue to be one alternative to the high costs of housing. While mobile homes tend not to be the best financial solution in the long run due to reticence of mortgage lenders and types of financing available, they are one of very few choices for many low and moderate-income households. Mobile home parks can achieve unit densities that reduce costs but community sewer and water, whether public or private, are essential for a park's viability. The costs involved in building and maintaining such infrastructure do not make mobile home park ownership an attractive business investment. Increasingly, private parks in the Windham Region are becoming cooperatively owned. Often this is accomplished through the

⁵⁶According to 10 V.S.A. §6201, "Mobile home" means a structure or type of manufactured home that is built on a permanent chassis and is designed to be used as a dwelling with or without a permanent foundation, includes plumbing, heating, cooling, and electrical systems, and is: (A) transportable in one or more sections; and (B) at least eight feet wide or 40 feet long or when erected has at least 320 square feet or if the structure was constructed prior to June 15, 1976, at least eight feet wide or 32 feet long; or (C) any structure that meets all the requirements of this subdivision except for size and for which the manufacturer voluntarily files a certification required by the U.S. Department of Housing and Urban Development and complies with the standards established under Title 42 of the U.S. Code.

assistance of non-profit organizations as in the case of Brattleboro and Rockingham Area Community Land Trusts assisting the parks in Dummerston, Putney, and Westminster. Their involvement assures that these parks and homes will be maintained at Federal and State standards for safe healthy housing that remains affordable. In the region, there are a total of 8 mobile home parks with a total of 459 lots in non-profit or cooperative ownership.⁵⁷

Anecdotal evidence indicates that various types of modular or pre-fabricated housing have become more popular. Data quantifying trends in the numbers of modular housing in the region are unavailable, in part due to the fact that modular housing is indistinguishable from conventional housing because Vermont law requires it to meet the same construction standards as conventional housing. Modular housing delivered across state lines must meet Federal building codes that are at least as stringent as codes used by the State of Vermont.

As of December 2004, there were a total of 218 beds in nursing facilities, with a 98% occupancy rate.⁵⁸ State policy has resulted in a shift from institutional care to home-based care for the elderly and disabled populations and as a result, the region has experienced a decrease in the overall number of nursing home beds with the downsizing of Eden Park in Brattleboro and the closure of Stratton House in Townshend. There is a current and growing need for assisted units that meet the needs of those who can no longer remain at home. Efforts to open assisted living facilities in the region are underway with one project moving forward in Townshend that will include both independent living and assisted living. Feasibility studies for assisted living facilities are moving forward in Brattleboro and Rockingham/Westminster.

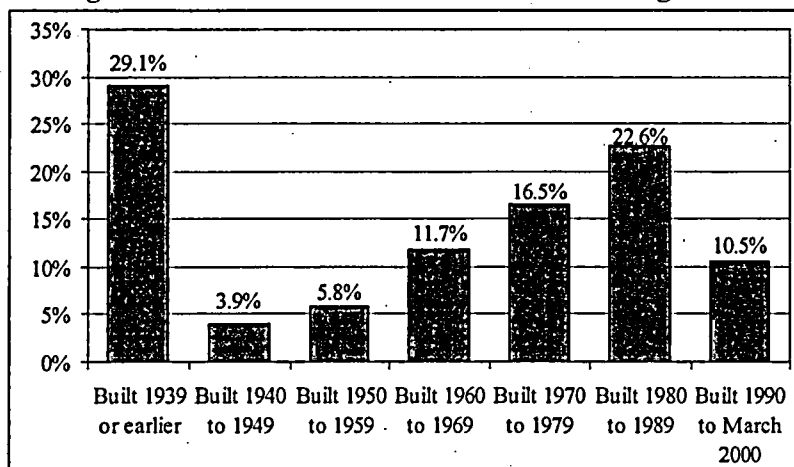
Age of Housing

Nearly one-third of the region's housing was constructed prior to 1940. These older housing units add to the historic character but also can present a challenge to property owners. Common problems in older housing include dated electrical wiring, poor energy efficiency, and the possibility of lead paint, a health issue particularly in homes with small children. It is noteworthy that within Windham County, according to the 2000 U.S. Census, the median year that renter occupied structures were built was 1940 as compared to 1967 for owner-occupied housing.

⁵⁷ *Vermont Directory of Affordable Rental Housing*, Vermont Housing Data

⁵⁸ *Shaping the Future of Long Term Care & Independent Living, 2004-2014*, Vermont Department of Aging and Disabilities, Agency of Human Services, May 2005

Figure 1: Year Structure Built in Windham Region



Source: 2000 U.S. Census

Housing Affordability

Traditionally, housing is considered affordable when a household spends no more than 30 percent of its gross income on housing. Housing costs for renters include rent and utilities (including heat, hot water, trash disposal, and electricity). Housing costs for homeowners include mortgage principal and interest, property taxes, property insurance, and utilities. Since affordability is determined by monthly costs, interest rates, the age of the home, and maintenance costs are also factored into the overall cost. Comparing the median income to the median price of housing in a community can provide a rough indicator of housing affordability.

The State of Vermont defines affordable housing as housing that is owned by its inhabitants whose gross annual household income does not exceed 80 percent of the county median income and whose household costs are no more than 30 percent of the household's gross annual income.⁵⁹ For those households below the county median income, the terms low and moderate household income levels are used. The Vermont Community Development Program, based on data from U.S. Department of Housing and Urban Development (HUD), defines Low and Moderate Income Levels (LMI) as below 50 percent and 80 percent of median income respectively. While it is difficult to calculate the percentage of households at or below HUD median incomes, Table 3 shows the estimated percentage of households in the Windham Region in each income category.⁶⁰

Table 3: Estimated Percentage of LMI Households in Windham County

Income Category based on four person household	Percentage of Households
At or below Moderate Income (\$32,100)	38.6%
At or below Low Income (\$20,050)	23.8%

Source: 2000 U.S. Census and 1999 U.S. Department of Housing and Urban Development Income Limits

⁵⁹ 24 V.S.A. §4303

⁶⁰ These HUD Median incomes are based on a four family household. HUD also projects income by household size but the U.S. Census data does not break down household income by household size. Therefore, these numbers are estimates based on the assumption of a four family household.

The “Livable Wage,” one tool for measuring housing affordability, is a calculation of the minimum earnings required to afford basic necessities for living. Housing is perhaps the most critical input to this calculation because everything else tends to get more difficult and expensive when a family lacks reliable housing. The 2006 Average Livable Wages for Vermont are shown in Table 4.

Table 4: 2006 Average Livable Wages

Type of Person	Hourly Wage	Annual Wage
Single person, no children	\$12.79	\$26,603
Single parent, one child	\$19.02	\$39,562
Single parent, two children	\$21.23	\$44,158
Two adults, no children	\$10.97 each	\$45,636 total
Two parents, one wage earner, two children	\$22.53	\$46,862
Two parents, two wage earners, two children	\$15.01 each	\$62,442 total

Source: Vermont Livable Wage Campaign, 2006

The costs of homeownership and rents continue to rise. Compounding this problem has been a shortage of newly created housing units, either for purchase or to rent, in a cost range affordable to average working families. According to the Vermont Department of Taxes, in 2005 the median purchase price of a primary single family homes sold in Windham County was \$188,000, an increase of almost 15 percent from 2004 and 63 percent from 2000. The median purchase price for vacation homes was even higher. Wage increases have not kept pace, putting home ownership out of reach for many, even with relatively low mortgage rates. “Starter homes” are often priced too high for households earning at or below median income.

In order to be able to afford an \$182,000 home, the average Vermont household would need a 2005 annual income of about \$65,000.⁶¹ Windham County’s median income was significantly lower at \$38,204.⁶² This indicates that there are a significant number of individuals and working families that find it difficult to afford suitable housing.

The median gross rent for a two-bedroom apartment in Windham County, as estimated by HUD, reached \$783 per month in 2006, an approximate 4.2 percent increase since 2005 and an 18.5 percent increase since 2001. For low-income households, the cost may mean paying more than 30 percent of household income for rent. Vacancy rates in Vermont are among the lowest in the nation, which drives up rental rates due to a consequently low supply/demand ratio.

Housing affordability in the region is addressed through a variety of local and regional programs. Organizations serving the region include the Brattleboro and Rockingham Area Community Land Trusts which create and manage affordable housing through a variety of programs that serve low and moderate income residents. Southeastern Vermont Community Action and Bennington-Rutland Opportunities Council offer weatherization and crisis fuel programs to assist low income homeowners and renters. The Southeast Vermont Housing Rehabilitation Loan Fund

⁶¹ *Between a Rock and a Hard Place: Housing and Wages in Vermont 2006 Update*. Vermont Housing Council and Vermont Housing Awareness Campaign.

⁶² 2000 U.S. Census

provides loan funding for low and moderate income homeowners to maintain safe and affordable housing. Several towns also offer home loan programs. Brattleboro Area Affordable Housing has funding available for homeowners wishing to add an accessory apartment.

According to the Vermont Directory of Affordable Rental Housing, there are 981 units of state or federally subsidized rental housing contained in 44 properties in the region. Housing subsidies come primarily from state and federal programs. The largest federal housing subsidy, in terms of dollars, is the mortgage interest deduction. However, the mortgage interest deduction does not benefit low-income households or renter households.⁶³ There are State and Federal programs specifically targeted at low and moderate income households. These include Section 8 vouchers⁶⁴ as well as the Community Development Program, Vermont Housing and Conservation Board, and USDA Rural Development programs. In recent years, there has been a decrease in federal funding for Section 8 vouchers.

Homelessness continues to be a problem in the Windham Region. The Morningside Emergency Shelter in Brattleboro reported 4,510 bed-nights in 2005⁶⁵. For 2006, the projection is for 6,100 bed-nights. There has been an increase in the number of women and children served at the shelter indicating that family homelessness is an increasing problem in the region. In order to meet this need, the shelter has increased capacity by adding some beds to the main shelter as well as opening a new building to provide shelter for pregnant women or women with children only. The shelter generally operates at 80-95 percent occupancy and the census does not fluctuate seasonally.

Windham Region residents with serious mental illnesses also have a critical need for affordable housing. Ninety percent of those individuals are not provided with a housing subsidy by the Department of Mental Health. Many live in substandard apartments, or pay 60 to 85% of their income on rent and utilities, or are homeless.

ISSUES AND OPPORTUNITIES

The following issues and opportunities relate to the housing conditions in the Windham Region:

- One way to bring down per unit costs is to increase housing density. This means enabling the kinds of development patterns that are a historic tradition in Vermont, compact villages and downtowns. Having people living in town centers helps support local businesses and is a component of downtown and village revitalization.
- A healthy economy and jobs that pay a livable wage are of critical importance in addressing the issue of an insufficient supply of affordable housing. Employers are concerned about the

⁶³ *Simple, Fair, and Pro-Growth: Proposals to Fix America's Tax System*, Report of the President's Advisory Panel on Federal Tax Reform, November 2005

⁶⁴ Section 8, also known as the Housing Choice Voucher Program, is a Federal housing program which provides assistance to low-income renters and homeowners in the form of rental subsidies that limit the monthly rent payment for the assistance recipient.

⁶⁵ A bed-night is one person spending one night in a sheltered environment.

negative impacts that housing costs have on the ability to hire and retain employees.⁶⁶ In particular, seasonal tourist based industries often do not provide a wage that is sufficient to cover market rate housing in close proximity to work. For the Windham Region to retain and attract businesses and workers, including seasonal workers who serve the resort and tourism industries, there must be an ample supply and a wide variety of housing types for people of all incomes.

- In late 2005, the Southeastern Vermont Housing Coalition Steering Committee, a broad coalition including the WRC, Alliance for Building Community, the Brattleboro Development Credit Corporation, United Way, Drop in Center, Town of Brattleboro and others was formed to seek a solution to the housing crisis in the region. The over-arching goal of this coalition is to create more units of housing in order to meet the full range of housing need for all the region's citizens. Town residents are also becoming increasingly engaged in creating affordable housing in the region. In addition to the work of the land trusts, grassroots groups such as the Rockingham Area Museum Project, Westminster Cares, and Friends of Algiers Village are working to solve needs in their local communities.
- Seasonal housing continues to have a variety of influences throughout the region. Planning issues related to seasonal housing cross town boundaries and include the demand for improved highway access to resort areas, traffic volume, and speed issues in villages along vacationer routes, as well as inflated housing and land costs in areas around major recreation areas. In addition, many towns have experienced a loss of social capital⁶⁷ due to the amount of second home owners in their community. Often seasonal properties are purchased or constructed at prices out of scale to the local economy and can put upward price pressure on local housing. At the same time, the region's economy, especially service, tourism and building trades, often benefit from the business brought in by resort and seasonal housing development.
- Technological advances have made it easier to overcome physical constraints and develop housing in environmentally sensitive areas that are often located at a distance from existing settlement areas. Development in these sensitive locations can threaten traditionally significant timber production, disrupt wildlife habitat and corridors, negatively impact hunting and other recreational uses, have intrusive visual impacts, threaten water quality in areas of headwaters, and lead to an increase municipal costs (e.g. town road maintenance, providing emergency response, etc.).
- Demographic trends indicate that elder services in general, and long term care needs in particular, will have growing and ultimately profound impacts on the region. The State of Vermont expects an increasing demand for long term care services by 2020 with peak

⁶⁶ *Housing and Vermont Economy*, Vermont Housing Finance Agency, 2006.

⁶⁷ Social capital is based on Robert D. Putnam's concept of civic engagement, creating social networks, and establishing trust and tolerance as discussed in *Bowling Alone: The Collapse and Revival of American Community*, 2000.

demand not occurring until after 2030.⁶⁸ Providing senior housing that is located in close proximity to services and transportation is of particular importance as accessibility issues will increase as the population continues to age.

FUTURE HOUSING NEEDS

Adequate and affordable housing for all economic groups is a current need in the region and there is no evidence that this need will be adequately met without specific community effort. An adequate supply of year-round housing that offers varieties of housing size, cost, and location is essential to the economic and social health of every town in the region. Communities benefit when employees are able to live close to their workplace, young adults can afford to buy or rent in their hometowns, and elderly residents are able to remain in the community where they have family, friends, and history.

Housing, when developed, should take into consideration the landscape and existing historic settlement patterns. Housing should be located near community centers. Infill development is desirable because it can provide a better alternative to sprawling development patterns, thereby concentrating development in already densely settled areas.

It is also important to ensure that there is a range of choices available to households in terms of housing type and location. While single-family homes may continue to be the preferred type of housing, providing a mix of housing options can help meet the needs of various household and income levels.

CRITICAL ACTIONS

Housing is a regional issue requiring the participation and cooperation of all towns. Clearly the nature of that participation will vary from town to town, based on a town's resources, and settlement and business patterns. Special planning efforts at all levels, including local, regional, state and federal, are required to stimulate the development of affordable housing. The following are deemed to be critical components that should be utilized in order to reach the desired future housing in the region:

Perpetual Affordability

Housing developed using public funding assistance needs to remain perpetually affordable. Assuring that publicly funded projects do not revert to market driven housing is a key factor in their long term cost effectiveness.⁶⁹ In the Windham Region, the history of affordable housing over the past thirty years is testimony to the importance of assuring perpetual affordability of publicly funded housing. Many units of publicly funded affordable housing built here in the seventies needed to be repurchased in the nineties with public money in order to keep the units affordable. This mistake should not be made again.

⁶⁸ *Shaping the Future of Long Term Care & Independent Living, 2003-2013*, Vermont Department of Aging and Disabilities, Agency of Human Services, January 2004

⁶⁹ *Final Report on the Management Review of Vermont's Nonprofit Housing Development Organizations*, Vermont Department of Housing and Community Affairs, 2005

Public Private Partnerships

Vermont's current system of using a public private partnership for developing low and moderate income housing is working well and should be maintained. Typically the operational management and the bulk of the pre-development work, including the costly and time consuming permitting process, is performed by non-profits while actual construction is undertaken by private developers.

Housing Assistance

In order for affordable housing to be available to every economic group, a portion of the housing will require some form of subsidy. On the regional and local level, the capacity for subsidizing housing is limited. Municipalities can waive various fees and institute tax abatement policies similar to those used to encourage business development. Municipal policies and strategies that aid the creation of housing at lower private market rates will also facilitate the development of subsidized housing by reducing per unit subsidy costs.

Housing rental assistance subsidies like the Section 8 housing voucher program are extremely effective in supporting affordable housing by both non profit and for profit organizations. While offering state funding for replacement or expansion of this type of housing subsidy would be extremely valuable, and could help reduce homelessness, it is equally important that funding for existing successful housing programs be maintained or expanded.

Town Planning

Towns should identify areas for compact development and facilitate the kinds of densities needed to reduce per unit costs. Locating these areas near services will improve affordability for residents and reduce municipal costs for services. Proper provision for adequate and safe water supply and sewage disposal will be integral to this development. Due to limited financial resources at the town level, it is hoped that there will be appropriate state and/or federal funding to support community infrastructure to meet these needs. At the same time, implementing regulatory strategies that reduce development costs can help restrain per unit costs as well. For example, allowing cluster subdivisions or providing density bonuses for development that accomplishes desired outcomes can help reduce development costs.

Life Safety Improvements

There are many old structures in the Windham Region, which means that rehabilitation and renovation play an important role in improving the housing supply. Many existing structures were built without a building code in place. Therefore, ensuring safe housing in the Windham Region includes making life safety improvements where necessary. These improvements include ensuring appropriate egress, fire and smoke separation, fire and smoke detection, and fire suppression systems. The National Fire Protection Association has established a residential standard to complement the commercial code for fire protection sprinkler systems. Encouraging these systems is a way to save lives and structures, especially historic landmarks.

Brownfields

There are few underutilized structures available for housing conversion in the Windham Region. Often the available locations are complicated by the presence or potential presence of

contamination, also known as a brownfield site. The Windham Region Brownfields Reuse Initiative has funding available to assess potential contamination on specific sites and develop remediation plans as needed. Programs at both the federal and state level can provide funding for actual cleanup. Where brownfield sites are appropriate locations for mixed housing and commercial services, it may be well worth the investment.

ENERGY AND HOUSING

Energy efficiency is a critical issue in terms of housing quality and affordable housing. The costs of heating and cooling a home are among the highest costs associated with homeownership. It is possible to reduce energy costs by measures such as siting the building to maximize solar gains, using energy-efficient appliances, and undertaking weatherization improvements such as adding insulation and improving windows to reduce the loss of heat. This is especially relevant given that energy resource availability and costs are generally not within the control of Windham region residents.

The State of Vermont has acknowledged the importance of energy efficiency in housing. The Vermont Residential Building Energy Code, updated in 2004, establishes technical requirements for new home construction to ensure a minimum standard of energy-efficiency. Upon completion of home building, State Law requires every builder to self-certify that the home complies with the Code as built. The *Vermont Residential Building Energy Standards Certificate* must then be filed with the Vermont Department of Public Service and the local Town Clerk. Efficiency Vermont, the State's energy efficiency utility, helps consumers identify cost-effective ways to reduce energy costs through technical assistance and financial incentives.

HOUSING POLICIES

1. Promote the development of a diversity of safe and affordable housing to meet the range of needs of all Vermont residents, including those of low and moderate incomes.
2. Develop housing in a manner that maintains the historic settlement pattern of compact village and urban centers separated by rural countryside, and that has minimal impact on natural resources, open space, and important agricultural and forestlands.
3. Employ innovative planning, design, and construction techniques that minimize the long-term cost and energy consumption of housing, including locating housing convenient to community centers and employing energy efficient construction.
4. Concentrate new development in areas with essential services, and include multi-unit housing that is compatible with existing architecture and development density for that area.
5. Promote and facilitate the design and retrofit of life safety improvements in housing units.
6. Meet the housing needs of the growing population of elders and people with disabilities by developing a mix of housing types (including low and moderate income units, independent living units, service enriched units, and subsidized and unsubsidized units) that has easy access to services and public transportation and that offers.

7. Assist the coordination between public and private agencies involved in planning and financing of affordable housing, including alternative mechanisms such as land trusts, cooperative housing, limited equity cooperatives, and others.
8. Promote the planning and implementation of strategies that would ensure that publicly funded projects do not revert to market driven housing.
9. Rehabilitate and maintain existing affordable housing stock.
10. Recognize that adequate and affordable housing is a need in all communities and a regional issue requiring the participation and cooperation of all towns.
11. Support affordable housing projects initiated by towns, by nonprofit organizations such as community land trusts and housing authorities, as well as by for-profit organizations; and encourage waiving of fees, tax credits and land tax abatement, and assistance with public grants and other sources of funding, as feasible.
12. Improve infrastructure, including enhancement of sewer and water systems, which promote and enable greater housing densities in areas related to community centers and in a manner consistent with traditional growth patterns of compact villages and downtowns.
13. Facilitate opportunities for housing affordable to the region's workforce.

TRANSPORTATION

In the eighteenth and early nineteenth centuries the horse and buggy shaped our villages. In the late nineteenth and early twentieth centuries the railroads and rivers influenced the development of our regional centers and at the end of this century the automobile has both enabled and dictated our land use. Today the region's transportation network continues to be essential to its economic and social well-being. Residents and visitors use it for travel to work and school, to shop and to obtain services, and for most recreational and cultural activities. We depend on it for emergency access to our homes and businesses and we rely on roads being safe and useable under extremely adverse weather conditions.

The region continues to search for an acceptable balance between providing adequate levels of transportation services for a growing resident population, accommodating commercial and industrial growth and serving the needs of seasonal population influxes, while simultaneously preserving the character of the region. At the same time, government policies are working toward expanding and enhancing the transportation system to make it more multi-modal and less exclusively reliant on cars and trucks.

The two landmark bills that brought surface transportation into the 21st century—the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21)—shaped the highway program to meet the Nation's changing transportation needs. In August 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). With guaranteed funding for highways, highway safety, and public transportation totaling \$244.1 billion, SAFETEA-LU represents the largest surface transportation investment in our Nation's history. SAFETEA-LU builds on this firm foundation, supplying the funds and refining the programmatic framework for investments needed to maintain and grow our vital transportation infrastructure.

In 2006, the Windham Regional Transportation Plan (WRTP) was developed and included herein by reference. This section builds on the WRTP as well as additional transportation studies completed for the Windham Region.

HIGHWAY SYSTEM

Geographic barriers to transportation in the region include extensive ridges and several major rivers with limited crossings. These features have channeled growth into the region's major river valleys. Consequently, the region's roads are characterized by many sharp curves and steep hills, which are rough, narrow, and prone to heaving. While state roads and village streets are paved, many town roads are gravel, some by local policy. Most roads are old and many are below typical federally accepted highway standards for sight distances and width.

Most of the major transportation routes in the region are found in the river valleys: Interstate 91 and U.S. Route 5 follow the Connecticut River; Route 30 and the northern portion of Route 100 follow the West River; the southern end of Route 100 and Route 112 follow the Deerfield River and the East Branch of the North River; Routes 121 and 103 follow the Saxtons River and the Williams River respectively. The only principle transportation route that does not follow a

significant river is Route 9, which crosses east to west over Hogback Mountain in Marlboro. These transportation corridors link the region's population centers and are naturally tied to major centers in other regions, such as Keene, NH; Greenfield and North Adams, MA; and Bennington, Manchester and Springfield, VT.

The Windham Region includes 892 bridges and approximately 1700 miles of town and state highways. As is true throughout the U. S., many of those bridges and much of that highway system are in disrepair. The State of Vermont's highest transportation priorities include accelerated programs to repair bridges and repave roadways, and the same is true of virtually all Windham Region towns.

Road Classification

Regional roads are classified in two primary ways: at the local level, by "Town Highway Classification" and at the state and federal levels, by "functional classification." For calculating maintenance and related costs, "two lane equivalent" miles are frequently used. The United States Forest Service (USFS) also classifies roads within and access to the Green Mountain National Forest.

Town Highway Classification

Town highways are under the general supervision and control of the selectboard of the town where the roads are located. Town highways are classified from Class 1 to Class 4, depending on use and condition, and this classification assists in determining the distribution of the state's annual town highway allocation.

Functional Classification

The state and federal governments use a functional classification system, where at one end of the continuum speed and convenience are maximized, but access between the highway and surrounding land is minimized. At the other end, access to individual parcels is provided, but speed and convenience are appropriately reduced. When a road segment is forced to serve opposing functions (for example, serving as both an inter-town or interregional travel corridor and as a local or village oriented road) a "functional conflict" exists and both safety and convenience suffer. The Vermont Agency of Transportation (VTrans) reviews the statewide functional classification annually with assistance from the towns and the regional planning commissions changes to the system

Route 9 and 103 are also designated as part of the National Highway System (NHS). The purpose of the system of NHS routes is to "provide and interconnected system of principal arterial routes which will serve major population centers, international border crossing, airports, public transportation facilities and other major travel destinations, meet national defense requirements; and serve interstate and interregional travel."

Road Mileage in the Windham Region by Town Highway Classification

Road Type	Description	Miles
Class 1 Town Highways	Are an extension of state highways and carry state highway route numbers, but are town maintained.	8
Class 2 Town Highways	Are selected based on the through connections between towns and typically have more traffic than Class 3 roads in the town.	288
Class 3 Town Highways	Comprise the rest of the traveled town highways, and must be passable under normal conditions all seasons of the year by a standard manufactured passenger car.	952
Class 4 Town Highways	Comprise the rest of town highways, and need not be kept open year 'round by the town, but bridges and culverts are to be maintained.	113
Legal Town Trails	Public rights-of way, which are not highways and are not a required responsibility of the town for any construction, maintenance, repair or safety.	77
State or U.S. Highways		244
Interstate (without ramps)		39
TOTAL		1721

Source: Vermont Agency of Transportation 2005

Road Mileage in the Windham Region by Functional Classification

Function	Description	Miles
Rural Principal Arterials (Interstate)	Primarily serve statewide and interstate travel.	39
Rural Principal Arterials (Other)	Same as above, but non-interstate roads.	33
Rural Minor Arterials	Link cities and large towns (or major resorts) and forms an integrated network providing interstate and intercounty service.	102
Rural Major Collectors	Primarily serve traffic of intra-county importance (such as to larger towns, parks, regional schools, etc.).	167
Rural Minor Collectors	Provide service to smaller communities; network is spaced to collect traffic from local roads to major collector.	121
Rural Local Roads	Provide service to adjacent land and over relatively short distances.	1236
Urban Principal Arterials	Primarily serve major centers of activity and highest traffic volume. It should carry the majority of trips	3

Function	Description	Miles
	entering and leaving the urban area and trips by-passing the urban area.	
Urban Minor Arterials	Interconnect the urban principal arterial system and serves moderate length trips.	12
Urban Collectors	Provide service for traffic within residential neighborhoods, commercial and industrial.	8
Total		1721

Source: Vermont Agency of Transportation, 2004

United States Forest Service Roads Classification

United States Forest Service (USFS) classifies roads within or access to the Green Mountain National Forest as either "Forest Highways" or "Forest Roads." Forest Highways are public roads, which are highly important for travel to and access through the National Forest (for example the Stratton-Arlington Road and VT 9). Forest Roads provide access within the National Forest and may be under the jurisdiction of either a town or the USFS. Town-owned Forest Roads may be maintained by the town or the town and the USFS may share maintenance responsibilities. USFS-owned Forest Roads, under the jurisdiction of the Forest Service, are maintained by the USFS.

Bridge Classification

Bridges in Vermont are classified according to length and by whether the ownership and maintenance responsibility lies with the town or the state. "Long structures" are those over 20 feet in length, and "short structures" are six to 20 feet long. Structures shorter than six feet are classified as culverts, regardless of design. Two-thirds of the region's 892 bridges are owned by towns. Bridges are also classified by type of bridge. Throughout the region examples can still be found of historic covered, metal truss, masonry arch and concrete arch bridges. Historic bridges are a particularly valuable cultural asset of many towns and decisions about how to preserve and use them (and sometimes whether to do so) can be extremely difficult. Not surprisingly, concerns about rehabilitating or replacing obsolete bridges and the desire to preserve rural or scenic quality often conflict.

Condition of Highway System

Roads and bridges eventually must be repaired or replaced. VTrans has estimated that statewide 20 percent and region-wide 10 percent of the (non-Interstate) state highway's pavement is in poor condition. The state also estimates that without significant fiscal investments pavement condition will continue to deteriorate. Hundreds of bridges have exceeded their design lives (many built after the 1927 flood and designed to last 50 years) In the State Long-Range Transportation Plan, VTrans has prioritized the need for repair and maintenance of bridges and pavement, and the WRC works with VTrans to review and prioritize specific projects.

VTrans road sufficiency ratings, used to identify and prioritize improvements to the road network, evaluate structural condition, safety, and service, weighted by traffic volume and scored

from 1 to 100. Similarly, VTrans bridge sufficiency ratings indicate whether bridges are adequate, functionally deficient, or structurally deficient. The condition of major travel routes and "long structures" (bridges over 20 feet in length) is summarized in the following figure and shown on the accompanying map.

Roads (Major Travel Routes)			
Bad (0 to 40)	Poor (40 to 60)	Fair (60 to 80)	Good (80 to 100)
23%	34 %	30 %	23%

Source: VTrans data; state highways rated in 2001; local major collectors in 2003

Bridges (Long Structures Only)		
Structural Deficiency	Functional Deficiency	No Deficiency
16%	18%	66%

Source: VTrans data, 2005

It should be noted that sufficiency ratings are weighted to help plan and budget for needed system repairs. Traffic volume over a given highway is an important factor in those decisions, and so a road with a high volume would be given a lower rating than one in similar condition but carrying low traffic volumes. The lower sufficiency rating therefore identifies that high-volume road as a higher maintenance priority.

Similarly, bridge ratings take into account the availability of and distance to alternative stream crossings. Therefore, a bridge that is structurally deficient because of a needed repair may be rated lower than one with a worse condition because there is no available alternative crossing and thus its repair is logically a higher priority than one with another bridge nearby.

The condition and safety of road network has been and continues to be an area of major concern on the town level. The WRC has been working with various region towns to implement two programs that help to address some of this concern. The Road Surface Management System (RSMS) and Culvert/Bridge Inventory is a program to optimize dollar investments in road maintenance. This program has demonstrated that timely and appropriate maintenance applications can prolong the life of a towns' transportation infrastructure and save long term maintenance costs. As of this writing, the WRC has worked with 13 region towns to implement this program.

The Road Safety Audit Review (RSAR) program, brings a full range of professional highway transportation experts to specific local "problem sites," in an effort to find the best solutions. To date, the WRC, in conjunction with VTrans, has worked with two municipalities to assess four intersections.

Traffic Volume, Speed and Congestion

Traffic volumes have increased significantly on most of the region's roads in recent years and those increases are projected to continue. These general increases are not unique to the Windham Region. Rather, they are more the local manifestation of national and statewide trends in which virtually all measures of automobile and truck use indicate a continuing increase. These projections

should not be taken as a given of what the future will look like, but rather a projection of traffic volume if current travel patterns do not change and increasing mobility is not otherwise accommodated.

In many of the villages along arterial and collector roads, significant concern has been raised about the type, speed, and volume of traffic. All of these contribute to reduced quality of life, heightened safety concerns, and increase noise in the affected communities. To address this issue, many communities have investigated implementing “traffic calming solutions,” such as textured pavement, roundabouts, and gateway treatments.

In September 1999, WRC completed the Vermont Route 30 Corridor Management Study. The Corridor Management Study identified many issues in the corridor, but traffic volumes and speed were mentioned as consistent problems in the villages along the corridor. The Study called for a systematic and thematic approach to traffic calming along this road and in 2001, the VT Route 30 Traffic Calming Report was completed. In 2004, three consistent traffic calming themes were selected to be implemented: speed limits, installation of town welcome signs, and installation of dynamic stripes. To date, speed limits and installing dynamic stripping were completed. Preliminary data in some of the villages show a decrease in speeds in the vicinity of the stripes; although further analysis of the data will continue.

Traffic congestion, especially at peak tourism seasons, at certain times of the day or week, and/or in certain critical locations, places a severe burden on some towns in the region. Historically, the typical response to traffic congestion problems has been to make improvements to the infrastructure: build wider, straighter roads; replace or repair inadequate bridges; and build new roads to “by-pass” congested areas. Most of these improvements have been geared toward either improving safety or increasing convenience. Efforts in recent years to build bypasses in the region have been poorly received because of the significant negative environmental impacts.

Many local and state officials have begun to reconsider transportation projects in light of the broader issues of energy efficiency, impact on land use and development, and effects on air quality and other environmental concerns. Often, design requirements that accompany federal highway funding result in a roadway being built or rebuilt to accommodate traffic speed and/or volume exceeding local needs. If this design level also exceeds local growth and development plans, then the roadway improvement may thwart local efforts to guide land use and development by changing general traffic patterns and by encouraging settlement patterns that are not consistent with local plans and desires.

Access Management

Access Management promotes the preservation of safe, efficient traffic operations and the character of roads through application of land use control measures and design standards. Towns realize that a number of businesses are dependent on traffic along state and town highways and that as the number of curb cuts or driveways increases, so does the rate of accidents. In 2001, VTTrans adopted the State Highway Access Management Guidelines for the purpose of controlling the location and spacing of driveways and commercial entrances along the state highway system. The guidelines describe the six access categories and the allowable traffic

operations in each category. VTrans, in coordination with the Regional Planning Commissions, analyzed traffic volume, speed limits, density of existing access points, and functional class along the entire length of each state and Class 1 town highway. Based on the criteria for each category set forth in the guidelines, all highways were broken into various segments and designated as an Access Category 1-6. All selectboards in towns with state highway were notified of the proposed access category designations, provided with category descriptions and a map of their town's highways and comments or concerns were requested.

Scenic Roads and Vermont Byways

Scenic Roads are an important recreation and tourism resource and, as such, should be protected. Currently, only a few scenic roads have been officially designated in Vermont under the Scenic Highway Law, (Public Act No. 58 of 1977) and none by towns in this region. However, many town plans identify roadways that exhibit particular qualities and that occupy a special place in a community's landscape, history or culture. Attributes of a "scenic road" may typically include forest patterns or significant stands of trees, scenic terrain, and distant views, road surface or road layout characteristics, nearby surface waters, picturesque farms or villages, stone walls and cemeteries, or unique man-made and natural objects.

The Vermont Byways Program acknowledges that many varied attributes of a given road may deserve recognition and protection. A "Vermont Byway" is a highway or other public road that has special scenic, historic, recreational, cultural, archeological, and/or natural qualities and that is formally designated by the Vermont Scenery Preservation Council and Vermont Transportation Board in order to enable management practices and programs that focus on any or all of those qualities. The Connecticut River Byway (VT142 and US 5) and the Molly Stark Trail (VT 9), both designated Vermont Byways, traverse the region. The Connecticut River Byway, designated a National Scenic Byway in 2005, is located on both sides of the Connecticut River in New Hampshire and Vermont and stretches from their border with Massachusetts Canadian border. The Molly Stark Trail Scenic Byway encompasses all of Vermont 9 from the Vermont border with New York and New Hampshire.

Aesthetics, Preservation and Design of the Highway System

In response to the concern that the roadway and bridge designs need to be "sensitive to the social and environmental context of Vermont"⁷⁰ the State of Vermont adopted Vermont State Design Standards for roadway design. The State of Vermont also established a Historic Bridge program to protect historic transportation structures. To further address the issues of aesthetics and livability in the communities adjacent to the roadways, VTrans currently has a Traffic Calming Protocol that agencies need to follow when considering traffic calming projects on state highways and when using Federal and state dollars for such projects. The Windham Region Commission has been active and supportive of these innovative programs and will continue to review transportation projects to assure compatibility with the Regional Plan.

⁷⁰ Vermont State Design Standards, October 1997.

FREIGHT TRANSPORTATION

According to the U.S. Department of Transportation, trucking remains the dominant mode to transport freight. From 2005 to 2020, within New England, freight traffic is anticipated to grow 79 percent. While freight encompasses truck, rail, water, and air, Vermont's statewide mode share for all movements consists of 90.4% by truck, 8.3% by rail, and 1.3% by other⁷¹.

Trucks

This increase in trucking can produce a marked qualitative change in some areas, as residents and motorists are forced to cope not only with more traffic but also with larger, heavier, and noisier vehicles. Resulting from a combination of development in formerly remote areas, an increase in overall commercial activity and related traffic, and a general trend toward "just-in-time" inventory and delivery systems (with reduced retail inventories and thus more frequent deliveries), increased truck traffic places roads and bridges under greater stress.

In the region and statewide, truck traffic has increased significantly in recent years, both in absolute numbers and as a percent of total traffic volume. The state legislature passed legislation in 2000, establishing a state Truck Network. This legislation provided for changes in the rules governing truck lengths and permits in the state. Currently, 53-foot tractor-trailer trucks may travel unpermitted on VT 9 and VT 103. While these tractor trailers might efficiently move goods, this will continue to have significant local impacts, perhaps most notably, in the village centers of Wilmington and West Brattleboro.

Brattleboro, located at the junction of a major east-west and north-south commercial routes, has seen significant growth related to interstate commercial transportation. Brattleboro and Bellows Falls could continue to grow as major trucking centers, which could have many positive economic effects, but the negative impacts of such growth should be anticipated and mitigated to the extent possible. Most of the negative impacts would be expected to stem from air and noise pollution and safety, especially in relation to travel through residential areas. When local roads become heavily used as arterial highways with high volumes of through-traffic and significant numbers of heavy vehicles, the two different functions of local traffic (town/village/rural) and inter-regional commerce must mix. In particular, the downtown centers of Brattleboro and Bellows Falls are impacted by heavy truck traffic that would use I-91 if the weight limits for certain vehicles were not lower on the interstate highway than on other state routes.

Rail

Freight shipments by railroad have shifted significantly to America's highways. Today most local areas in the U.S. are served by "short lines" which provide not only intra-regional service but also connecting service to the national railroads and to other short lines. While railroads obviously are limited in the extent to which they can serve freight transportation needs within the region, they are an under utilized interstate transportation resource.

The two, active rail, short lines in the region are New England Central Railway (NECR), Inc. and Green Mountain Railroad Corporation (GMRC). The GMRC operates over tracks and rights of

⁷¹ Vermont Freight Study, 2005.

way owned by the State of Vermont, while NECR, which is a subsidiary of RailAmerica, owns and operates on its own right of way. The Guilford Rail System operates over the NECR lines in the region. There are no regional or Class 1 railroads in Windham Region and the only transload facility is at Riverside, in Rockingham. Goods and materials being transported through the region on these short lines include Omya limestone slurry, forest products, petroleum products, farm products, coal, metallic ores non-metallic minerals, food or kindred products, electrical machinery, transportation equipment, miscellaneous waste and scrap; mixed shipments; and hazardous material. VTrans policies include acquiring abandoned railroad rights-of-way for potential future rail restoration, which is now an acceptable use of federal transportation funds.

The Bellows Falls Tunnel, along the NECR line, has been identified as an impediment to double stack rail cars and auto trains.. This historic rail tunnel was built in the 1851 and is under "The Square" in Bellows Falls. Currently the floor of the tunnel has been lowered to allow for double stack rail cars to move through it, but there still is not enough clearance. Minor modifications would need to occur to the tunnel for safe, efficient service. Rail tunnel clearance, at this site, could be one reason why the Association of America Railroads (AAR) showed a decrease of 21% in total terminated and originated freight rail traffic in the years 1992-2002. The Town of Rockingham, Village of Bellows Falls, WRC, and VTrans all support minor modifications to the structure of the tunnel with the commitment the historic structure as a whole will be preserved.

BICYCLING AND WALKING

The Windham Region Bike/Pedestrian Plan (WRBPP), July 2000, has three primary goals:

- To improve regional linkages through new and improved routes;
- To support and enhance the region's villages with pedestrian improvements; and
- To provide a set of tools to help improve overall bicycling and pedestrian conditions.

Currently, no off-road and one on-road bicycling facilities exist in the region. VT 9 through the village of West Brattleboro is designated by the State of Vermont, through signage and markings on the shoulder, as an on-road facility. For the remainder of the region, cyclists use the existing road shoulders, which have varying width and conditions. On roads with no shoulders, cyclists share the road with vehicular traffic. Regionally, pedestrian travel corridors exist primarily in local disjointed segments. Pedestrians travel along the numerous paved and unpaved roads throughout the Windham Region. In addition to roads, pedestrians utilize sidewalks found in Windham Region villages, resort centers, regional centers, and growth centers. Brattleboro and Bellows Falls have extensive pedestrian facilities. The condition of these sidewalks varies.

Nationally there is growing interest in having "walkable" communities. Many of the region's downtowns and villages date back to an age when the majority of people mostly walked to their daily destinations and the development pattern was pedestrian oriented. Much of this is more or less intact, and gives the region a good start on making the communities more walkable

The sufficiency of the region's road network for bicycle and pedestrian use has remained relatively unmeasured. As a starting point, the 2005 Bicycle Suitability maps for the eastern half of the region provide bicycle sufficiency ratings. The next step is to build these into a system for identifying, rating and prioritizing bike or pedestrian improvements on the region's road network.

Efforts to build multi-purpose trails in the Windham Region are underway and these projects include the West River, Valley and Connecticut River Trails. A number of communities, some with assistance from the WRC, have started to install newer more bicycle friendly parking facilities in villages and downtowns. In addition, the regional bus providers have been putting bicycle racks on as many busses as possible.

PARKING

Public parking facilities exist both officially and informally in the regional centers and villages. Outside of the region's villages and towns, public parking often is available to recreational users on road shoulders. The Windham Region is rural and thus heavily dependent on the private automobile for transportation, more so than an area having a larger and more densely settled population. Public transit, therefore, is more difficult to support financially, while the relative need for automobile parking may be greater. Providing needed parking capacity in a way that supports and augments public transit, as well as supporting pedestrian and bicycle transportation where feasible, is a difficult challenge, but an important goal. The Brattleboro Transportation Center, located in the downtown area, provides both intermodal connections and long term parking.

The Vermont system of "park & ride" lots that exists along the Interstate highways and other major routes—some lots established by the VTrans and others informally established by motorists at convenient locations—serve an important function. That role could be enhanced by more visible promotion of their use and by site improvements in some locations, such as security lighting. The WRC identified a large number of potential park & ride lot locations in the 1995 WRC Park & Ride Study. In 2003 the WRC Transportation Committee reviewed the study and reprioritized the park and ride lots. VTrans only has one formal lot in this region at the Dummerston Covered Bridge off VT 30 and one proposed near I-91 (exit 4) near Putney.

PUBLIC TRANSPORTATION

Throughout the Windham Region and the state, public transportation provides basic mobility service to all ages of Vermonters and integrates community and economic development. By providing local residents that do not have access to an automobile or can not drive to a doctor's appointment, to school, to a social appointment; public transportation becomes ever increasingly intertwined in the daily lives of the community. Public transportation also provides a way to get local residents to jobs and to shopping plazas, thereby contributing to the economic vitality of the community. There are challenges to keep public transportation alive and efficient in the region, including insufficient funding resources and providing service to the populations living out in the rural areas. Rural communities typically lack not only the large population base to support public transit directly, but also, poor road conditions, which often present barriers to the economical operation of a reliable public transportation system in these communities. Certain parts of the region have experienced a general increase in the transit dependent population. This particular

population can include families in economic distress, individuals that are 65 years of age and older, individuals that are 18 years of age and younger, and households without a car.

Over the last five years, public transportation in the region has grown dramatically, but many communities are still not served. The existing settlement pattern in the region of densely developed villages and regional centers may provide for a good location to link to public and other forms of transportation. Current use of the transportation infrastructure in resort centers exceeds capacity during peak times suggesting the need for alternate means of getting people to local attractions. The ability to develop cost effective and convenient links between transportation modes should be the primary goal for transportation improvements in the resort centers.

Public Transit

The Brattleboro Bee Line, Connecticut River Transit, Inc. (CRT), and the Deerfield Valley Transit Association (DVTA) provide public transit in the Windham Region. The Brattleboro Bee Line is an in-town service managed by the Town of Brattleboro. CRT provides fixed-route, paratransit and elderly/disabled service to Windham and Southern Windsor counties including Brattleboro, Bellows Falls, Ludlow, Springfield, and Windsor. The DVTA serves six towns in the Deerfield Valley and the Connecticut River Valley for fixed-route, paratransit and elderly/disabled service, and also provides contract transit to one ski resort.

The future for public transit in the state will be to focus on maximizing the efficiency of their resources, of their ridership. The regional transit providers, with assistance from VTrans and WRC, have begun implementing the coordinated service model. Coordinated transit service involves the public, the elderly, and people with disabilities all riding in the same bus, at the same time; whereas in the past, certain transit service had been exclusive. This type of transit service divides the funding equally, based on the ridership numbers on the bus. For example, if there were two elderly riders, one student and one adult, then the transit funding for the elderly and people with disabilities would be charged 50% of the total ride cost and the public would cover the other 50%.

Intercity Bus

The region is served by Vermont Transit, which has scheduled stops in Bellows Falls and Brattleboro. From the Windham Region direct routes on Vermont Transit go north to Burlington, Vermont; south to Springfield, Massachusetts; and east to Keene and Manchester, New Hampshire and Boston, Massachusetts. Private van services provide direct service to Bradley and Logan airports.

Rail Transportation

Amtrak's *Vermont* stops in Brattleboro and Bellows Falls. Nearby stops are in Claremont, NH, and Amherst, MA. As regional ridership on the *Vermont* continues to fluctuate, VTrans maintains financial committed to passenger rail service statewide. Additional rail access is available in Rutland (*Ethan Allen Express*) and Springfield, Massachusetts (*Northeast Direct*).

Airports

Access to the Windham Region by commercial and private air transportation is available through the following airports: Bradley International Airport, Hartford (Windsor Locks), Connecticut; Logan International Airport, Boston, Massachusetts; Albany International Airport, Albany, New York; Manchester Airport, Manchester, New Hampshire; Dillant-Hopkins Airport, Swanzey, New Hampshire; Hartness State Airport, Springfield, Vermont; and Worcester Airport, Worcester, Massachusetts. Use of airports varies and is dependent on fares and availability of flights, but Bradley International Airport is the most frequently used airport for people traveling into and out of the Windham Region. Albany and Manchester have recently experienced increased use.

Mount Snow Airport, located in West Dover, is the only private-public use airport located in the Windham Region. Additional airport landing strips are private.

Regional residents and visitors currently have no public transit options when traveling to and from airports easily and quickly accessed from the Windham Region. Currently, there are private transportation options in a range of rates. One solution may be a partnership with public and local private providers to schedule regular service from the Brattleboro Transportation Center and the Bellows Falls transportation centers once opened.

MULTIMODAL AND INTERMODAL TRANSPORTATION

To enhance travel in the Windham Region, improvements need to be made for travel within and through the region for all transportation modes (cars, trucks, public transit, pedestrians, cyclists, and rail). To improve access for all travelers, better connections need to be made between all transportation modes (intermodal). To better serve truck and rail freight, at least one strategically located and modern intermodal facility is needed to serve the region. For passenger travel, intermodal passenger transportation facilities need to be located in the regional centers. An intermodal transportation center has recently been completed in Brattleboro and the proposed center for Bellows Falls is currently in the design phase. To serve the tourists visiting the region, connections from the intermodal passenger transportation facilities to resorts centers need to be improved.

FUTURE TRANSPORTATION SYSTEM

The region's future transportation system shall encompass a coordinated system between all region towns, the WRC and the state of Vermont. Through this coordinated system the process itself shall be more efficient; thereby allowing future town and regional projects to be identified sooner and completed in a timely fashion. Certain town and regional projects that will enhance the connectivity and vitality in our communities involve an integrated multi-modal system, state and town roadway improvements, state and town highway bridge improvements, providing safe mobility to bicycle and pedestrians, and established park-and-ride facilities. . The map series in this element includes maps that illustrate the existing system, projects that are currently proposed or underway to enhance the existing system, and a future system (that includes more multi-modal facilities, more public transit, etc.). Projects that are currently proposed or underway to enhance the existing system are in Table and were ranked, regarding regional project priority, by the Windham Regional Transportation Committee in June 2005.

In addition to those highway projects, the WRC would like to see improvements to the other important components of the existing transportation system. Functional conflicts in villages in the region need to be reduced or eliminated through traffic calming or other safety improvements. Alternative transportation needs to be enhanced by improving existing sidewalks and roadways to accommodate bicycles and pedestrians. Lastly, the bus and other transit system need to be maintained and enhanced.

Projects to Enhance the Existing System

RANK	TOWN	DESCRIPTION
1	Marlboro	VT9 Reconst 1.008km
2	Brattleboro	Repl. BR30 Creamery Br.
3	Rdsboro-Whitinghm	VT100 Reconstruction
4	Wardsboro	BR68 on VT100
5	Newfane	BR14 TH2 Marlboro Bk.
6	Rockingham	BR4 on VT103
7	Brattleboro	VT 5 Putney Road Scoping
8	Brattleboro	VT 119 Bridge Approach
9	Wilmington	VT100 Replace BR47
10	Winhall	VT 30 Replace BR 52
11	Vernon-Putney	BR1, B10, BR13 Rehabs
12	Wilmington	VT9 Bypass (Improvements)
13	Dover	VT100 Dunn's Curve
14	Brattleboro	US5 Main St.
15	Wilmington	VT9/VT100 Intersect Signal
16	Guilford	BR56 on TH13
17	Readsboro	Repl. BR32- TH2 West Br.
18	Readsboro	Rehab BR31- TH3 West Br.
19	Jamaica	BR33 on TH43
20	Readsboro	Repl. BR21- TH4 West Br.
21	Dummerston	BR 37- TH62 (Iron Truss)
22	Wilmington	Repl. BR49- TH46
23	Newfane	W'ville Covered BR17
24	Guilford	I-91 Truck Inspection
25	Brattleboro	BR6 N&S Rehab
26	Brattleboro	BR8 N&S Rehab
27	Guilford	BR3 N&S Rehab
28	Rockhm-Weathsfld	Multiple Bridge Rehabs
29	Townshend	VT30 Glare Barrier

The region's future transportation system will be a more thoroughly integrated multi-modal system that provides residents, businesses, and visitors with varied transportation options and will include the following projects.

- Development of intermodal freight capacity in the Town of Rockingham;
- Completion of intermodal passenger facilities for Bellows Falls and Brattleboro;
- Improve connections between U.S 5, VT 30 and I-91 in Brattleboro;
- Completion of the Valley Trail, Dover;
- Development of a comprehensive Park & Ride Lot system for the Region;
- Development of a Connecticut River "Rail with Trail", between Brattleboro and Bellows Falls; and
- Completion of the West River Trail

The future system will serve the overall regional needs, while minimizing negative impacts on communities and add to the vitality of the region.

ENERGY AND TRANSPORTATION

Transportation accounts for the lion's share of our energy consumption, and for that reason the inter-connections between the Energy, Transportation and Land Use Elements of this plan are important. The region's total energy demand could be reduced right now through individual choices such as ride-sharing, combining trips, walking, and using alternative transportation. To accomplish this there will need to be increased and more effective public education programs regarding not only the environmental benefits of conservation but also the potential financial savings are needed. Future planning and implementation that provides more public transportation, manages regional transportation demand, locates industrial parks where future links to the rail network would be feasible and encourage land use patterns that reduce the need for individual private transportation would reduce energy demand even further. Other strategies, perhaps more effectively implemented on a State or national level, include improving vehicle efficiency, reducing the total number of vehicle miles traveled, and providing incentives to the development of alternative technologies. To accomplish a reduction on energy dependence in the region all strategies; local, regional, state and national, must be pursued simultaneously.

TRANSPORTATION POLICIES

1. Integrate the use of energy efficient and alternative modes of transportation such as public transit, ride-sharing, van pools, bicycling, and walking into community plans and private development, whenever possible.
2. Enhance public transit services to meet the challenges of consumers with special needs and to better serve the general public.
3. Develop an integrated inter-modal regional transportation system, including a safe and convenient regional system of park & ride lots, to encourage ride-sharing.
4. Include transit-orientated facilities in proposed development, where appropriate, including resort centers.
5. Improve sites that diminish scenic views, particularly along state and federal highways and within scenic corridors.
6. Screen new development from I-91 and other scenic roads to the greatest extent practicable using native or vernacular perimeter plantings of hedges and street trees.
7. Use existing transportation corridors to accommodate new transportation services, facilities, and utilities.
8. Prioritize maintenance and improvement of the region's transportation system over building new infrastructure.

9. Develop and use innovative transportation design programs, including access management and the road safety audit review program, to provide safer access and mobility for users.
10. Work with local and regional entities to designate Vermont Byways or to otherwise protect travel corridors that exhibit special scenic, historic, recreational, cultural, archeological or natural qualities.
11. Work with the United States Forest Service (USFS) and affected towns on decisions regarding decisions about maintenance and operations of USFS forest highways or roads.
12. Maximize the use of existing transportation corridors to provide a safe and efficient level of service for bicyclists and pedestrians.
13. Encourage development that increases walkability and village-pattern land use, and that avoids the negative effects of strip development and sprawl.
14. Incorporate non-motorized means of transportation, such as bicycle lanes or paths and sidewalks, in road construction and particularly near and within employment centers. Add sidewalks and bike paths to existing infrastructure whenever feasible.
15. Maintain, improve, and expand passenger and freight rail services and intercity and interstate bus service, including continued state support of Amtrak service to the region.
16. Consider the secondary growth that results from transportation infrastructure improvements and its effect on land use, in all transportation system decisions.
17. Minimize functional conflicts and require that developers be responsible for relieving new traffic problems generated by their developments.
18. Encourage preservation and creation of Rights of Way for future linkages between communities, neighborhoods, services and other destinations, including preservation of historic roads, trails, and other rights of way that may not be officially recognized, and designing subdivisions so that present or future direct linkages to adjacent properties will not require returning to the main road.
19. Encourage and support the use of energy efficient transportation such as public transit, ride-sharing, van pools, bicycling, and walking, whenever possible.

IMPLEMENTATION

PUTTING THE REGIONAL PLAN INTO ACTION

This Plan outlines a direction for the region's future and guides public and private actions affecting the region's towns. To this end, goals and policies are presented on a multitude of subjects related to the region's growth and development now and in years to come. This chapter describes the various methods available and recommended to implement those goals, policies, and programs.

To a limited extent, the Plan's very existence and distribution may result in actions to implement its recommendations. Primarily, however, the Plan is implemented as a result of further projects and studies of the WRC as it works with member towns, state agencies and other interests. The value of the Plan is its ideas, the soundness of the technical work of the WRC staff, and the forum the WRC provides for member towns to work cooperatively on common issues. These qualities may be of more value in the long run than the more traditional implementation techniques of regulation, public infrastructure construction, and taxation. Without a dedicated effort to implement the Plan by the WRC and its member towns, however, it will have limited effect.

The Plan is designed to give clear direction on actions to be undertaken to implement the Plan's goals and policies, which is done in part by recommending programs and actions for each topic. In most cases these program statements are directed to the WRC itself, but some are directed to state agencies, towns or the private sector. Where program statements are directed to the state, it is generally suggested that state agency programs are required for successful implementation and provide a basis for a given plan's compatibility finding pursuant to 3 V.S.A. Section 4020.

Implementation of the Plan requires consideration and coordinated action by public bodies--local, regional, state and federal--and private interests, including citizens who are concerned about the region's future. Users of the Plan have something to gain from the Plan and something to contribute toward its implementation. The citizens of the region have the greatest stake in the region's future and, therefore, the greatest stake in plan implementation. Local governments also bear some of the responsibility of implementing the Plan, and the WRC shall join its member towns in working toward implementation.

The WRC has two basic avenues available for plan implementation, first by its own active efforts in the study and support of ideas and policies, and second by the decision and actions of others, either voluntarily or as a result of requirements of several provisions of state and federal laws. This Plan relies on the use of both avenues: active involvement of the WRC and its member towns and with support from the state.

General implementation strategies are discussed in this chapter. The Plan also functions as the basic foundation for the Commission's Annual Work Programs. Programs identified in this Plan and the implementation strategies will be reviewed each year in preparing the Commission's Annual Work Program. Consideration should be given to identifying the highest priority needs in formulation of the Annual Work Program.

WRC TECHNICAL ASSISTANCE TO TOWNS

The planning programs of the WRC member towns are one of the most important vehicles available for furthering Regional Plan policies. Member towns may find information, policies and programs in this Plan that are appropriate for their town plans. The WRC technical assistance work with its member towns will also help implement this Plan. The WRC, within its limited resources, will continue to assist member towns with town plan preparation. This will include offering sample elements and information of other towns, and providing housing need guidelines. A town may use portions of this Plan as its town plan pursuant to 24 V.S.A. Section 4349a.

Implementation of town plans by member towns using bylaws and other tools will also further the implementation of this Plan. The WRC will maintain staff resources to assist towns to implement town plans by developing innovative zoning techniques, subdivision regulations, and impact fee ordinances when supported by work agreements. The WRC will advise towns on capital budgeting and infrastructure improvements when in keeping with this and the town's plans.

The WRC is charged with the preparation and maintenance of Implementation Guidelines to assist towns in achieving consistency with the Vermont Planning Goals. Since these goals are shared by the WRC, the work will also help to implement this Plan.

The WRC will maintain a Services Policy describing technical assistance available to member towns as part of the Commission's core activities and the opportunities for expanded service when funded as a special project. The Services Policy will include a priority for work that will result in compatible town plans and implementation of approved town plans.

The WRC maintains a Town Plan Review and Approval peer process that is designed to support member towns as they prepare their town plans and seek WRC action to have an Approved Plan. This process has as one of its standards the compatibility of the town plan with this Plan. Compatibility, by state definition, is intended to ensure that the plan of a given town, region or state agency does not reduce the implementation or desired effect of another.

The WRC will develop strategies designed to assist member towns in defining and managing growth and development that have cumulative impacts as required by 24 V.S.A. Section 4345a.

The WRC assists member towns with inter-town coordination in a variety of ways. These efforts help towns cooperatively address regional issues including those covered in this Plan. The WRC will use this Plan in undertaking coordination projects.

The WRC will consider the policies and programs included in this Plan when assisting towns with special projects, and when appropriate, will set priorities for special project assistance based on compatibility with this Plan.

Besides assisting selectboard members and planning commissioners to develop and implement town plans, the WRC will also work with town managers, listers, auditors, road commissioners,

and others on issues and projects related to providing effective local government. The WRC will continue to increase involvement of selectboard members in guiding the Commission's Work Program and support to member towns.

REGIONAL ISSUES AND PROJECTS

The WRC works cooperatively with its member towns to address regional issues. This work can include studies of special problems and it can lead to detailed plans and designs that further the goals and policies of this Plan. It can result in the Commission sponsoring programs that meet regional needs. Most importantly, it includes regular review and maintenance of this Plan so that it provides timely guidance.

During the term of this Plan the WRC will undertake, complete or continue the work discussed in this section. Other regional work that implements the Plan, not presently anticipated, will also be undertaken during this period. This work will require the assistance of, and coordination with member towns, state agencies, community organizations, and the private sector.

Growth center planning deserves coordinated attention in accordance with new state law that was enacted in 2006. The WRC, in cooperation with member towns, should continue to examine the issues related to growth centers, such as growth and development, employment, transportation, affordable housing, education, utilities, and financing local and regional services and it should assist interested towns to explore growth center designation and policy issues.

Water quality issues and watershed-based planning are increasing in importance in this region and across Vermont. To an appropriate extent, the WRC should adjust its work programs in future years to continue its focus on watershed planning and to cooperate with towns, local watershed groups, state and federal agencies, and others to maximize the benefits for member towns from this approach.

The WRC has a long-standing commitment to planning for housing and community development. During the next several years this continued effort can lead to projects through the combined efforts of the state, private development and financial interests, and community non-profit groups. Projects may include natural resource based business development, existing business assistance, tourism planning, as well as new housing and housing rehabilitation projects. State support through the Community Development Program and the several state agencies with housing related responsibilities is needed to help the WRC and its member towns continue this effort.

Regional land conservation efforts should continue in cooperation with the Vermont Land Trust, other non-profit conservation organizations and interested member towns. The purpose of the program is to assist towns and landowners in the protection of important lands that give the region and its communities their distinctive rural character. Recreational areas, scenic resources, farmlands and productive forests should be the focus of such programs. Multi-town projects might include farmland protection, implementation of the Connecticut River Scenic Byway and the Molly Stark Byway, and protection of contiguous wildlife corridors and mountain resource lands. Town projects would likely be focused on lands identified as being worthy of conservation

in town plans. Work would be accomplished through land trust efforts including such techniques as purchase of land and easements for conservation, recreation, and scenic preservation.

INFORMATION AND TRAINING

One of the most successful ways the WRC can work for implementation of this Plan is through continuation and expansion of its information and training programs. Newsletters, public forums, workshops and the WRC Resource Center help to inform town officials and citizens of the issues and opportunities presented in this Plan. Basic in approach but perhaps difficult to measure in effectiveness, the value of this implementation tool can be easily underestimated.

The WRC has established and maintains a Geographic Information System (GIS) Service Center. The center is designed to offer data and mapping analysis support services to member towns, the WRC's own programs and other compatible projects. To be successful, the center needs accurate and up-to-date data to be available in a coordinated state system. Development and maintenance of these databases should be a priority for the WRC and the state. The state's twelve regional commissions should continue to work cooperatively together and with state agencies to support data development efforts that are mutually beneficial

PLANNING COORDINATION

The following guidelines are established to assist the WRC in its major role in planning coordination.

1. The WRC will participate in reviews of state agency plans if and as requested, giving particular attention to their compatibility with this Plan and the approved town plans of member towns.
2. The WRC will participate in state review processes such as Public Service Board hearings under Title 30 Section 248 and others, giving particular attention to the policies of this Plan and the approved town plans of member towns.
3. The WRC will review federal projects and participate in environmental impact reviews under the National Environmental Policy Act as resources allow. The WRC will consider and point out the short and long-range impacts of federally supported public investment projects and programs on the region's economy, settlement pattern, human and natural resources, and public facilities and utilities, giving particular attention to their compatibility with this Plan and the approved town plans of member towns.
4. The WRC will work for an effective state public investment planning and review process that provides meaningful participation in the review of state projects and the review of development activities supported by state funds.
5. The WRC will continue its Public Policy and Legislative Committee to address legislation and other important public policy issues. Selectboards are invited to take an active role in the committee and regionally important public policy issues will be

- identified at the start of each year so that the committee may be proactive in its work.
6. The WRC supports the coordination value of periodic meetings of select board members from throughout the region. The WRC will assist such meetings and offer to sponsor similar regional meetings of planning commissioners, treasurers, town clerks, listers, etc.
 7. The WRC supports state improvements to the Act 250 development review process by the following:
 - a. Coordinate State agency reviews of Act 250 applications with the WRC and member towns when there are common issues.
 - b. Work with the District Environmental Commission to ensure that applications completely address all criteria including town and Regional Plan conformity. When all criteria have been addressed, development review should occur in a timely and efficient fashion without protracted reviews.
 - c. Work with towns and other regional planning commissions to propose and review new legislation that would improve permit processes to increase permitting reliability and encourage appropriate development in designated growth centers.
 8. The WRC will maintain its peer review process to assist member towns seeking regional approval of town plans.

DEVELOPMENT REVIEW

Town and regional plans include provisions that address major projects, new development and land development issues. Usually, as one of the criteria for the issuance of a permit decision, proposed developments must conform to town and regional plans. In the process of development review, the WRC will assist decision-makers regarding regional issues addressed in this Plan.

The State of Vermont and various federal agencies have a number of proceedings where town plans and the Regional Plan are used in making land use and resource decisions. State law provides that regional plans are relevant to permit applications as provided below (24 V.S.A. Section 4348):

1. "The provisions of the Regional Plan shall be given effect to the extent that they are not in conflict with the provisions of a duly adopted town plan; and
2. To the extent that such a conflict exists, the Regional Plan shall be given effect if it is demonstrated that the project under consideration in the proceedings would have a substantial regional impact."

The WRC's development review process will be conducted in accordance with the following guidelines:

1. The WRC will review projects of regional importance and will consider the provisions of town plans and the Regional Plan in this review.
2. The WRC will upon request assist towns in their determinations on local permits for projects which have regional issues.
3. A WRC Project Review Committee will be made up of a core group of Regional Commissioners and will seek the assistance of the Regional Commissioners from the town where the development is being proposed and any other involved town. The Committee will review projects that may have regional importance, that might contribute to cumulative impacts, that are precedent setting, and others referred to the Committee for review by staff or a member town. The Committee will review testimony on major projects and development review issues and may refer recommendations to the full Commission for approval.
4. A primary focus of the review will be to consider the provisions of town plans and the Regional Plan. The Committee will identify information needs, issues and areas of non-conformance with the Regional Plan and town plans as necessary.
5. The Committee will also consider the cumulative impacts that may occur. The WRC may initiate cumulative impact review by requesting, coordinating and reviewing cumulative impact studies. The scope of each cumulative impact study should address impacts to both the natural and human environment and offer measures to avoid and/or mitigate adverse impacts. The costs of such studies should be borne by the applicant.
6. If, in its review, the Committee determines that a conflict exists between the provisions of town plans and the Regional Plan, the WRC will work with town officials to alleviate or minimize the conflict. If a conflict between a town plan and the Regional Plan cannot be resolved, the town plan will prevail except as provided in 7) below.
7. If the Committee believes that a conflict exists between the provisions of the Regional Plan and any applicable town plan with respect to the development proposal under consideration, then the Committee, with the assistance of WRC staff, shall prepare a report that assesses Substantial Regional Impact and gives consideration to the following:
 - a. Is the alleged conflict clear and distinct? Is the conflict significant? What are the issues raised by the development proposal under consideration that are alleged to conflict with the provisions of one or more applicable plan(s)? Do the provisions of both the Regional Plan and the town plan(s) clearly and specifically address the issue(s) in question?
 - b. Will the development proposal, if constructed, cause the implementation of one plan to significantly reduce the desired effect of the implementation of the other plan?
 - c. Will the issues upon which the plans are alleged to conflict have a significant positive or negative impact on more than one town? Will these issues have a significant positive or

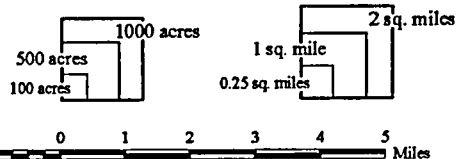
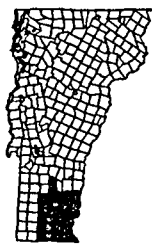
negative effect on regionally important resources, facilities, infrastructure, services or other factors?

- d. Have reasonable efforts been exhausted to resolve the conflicting issues, such as, but not limited to, amendment of the development proposal?
- e. Will implementation of the town plan, as proposed by the development under consideration, have such substantial negative effect on the implementation of the Regional Plan that the provisions of the Regional Plan ought to be given precedence?
- f. Are there any other factors or information which the Committee deems relevant to the determination of whether or not "substantial regional impact" exists?

The Committee report shall be considered by the WRC, with interim action by the Executive Board if necessary as provided for in of the WRC Bylaws⁷². The Committee report may be amended. Following such consideration and amendment, the Board or Commission shall vote on the question of whether or not the provisions of the Regional Plan should be given effect over the provisions of the town plan. The results of this vote, together with a copy of the Committee report and any amendments made to it shall be transmitted to the regulatory body that is conducting the review. This action and the accompanying report shall be the basis for determining whether "substantial regional impact" exists as required by 24 V.S.A., Section 4345a(17), and shall be given "due consideration, where relevant, in state regulatory proceedings" as provided therein.

⁷² Article VI.H.3

2006 Windham Regional Plan



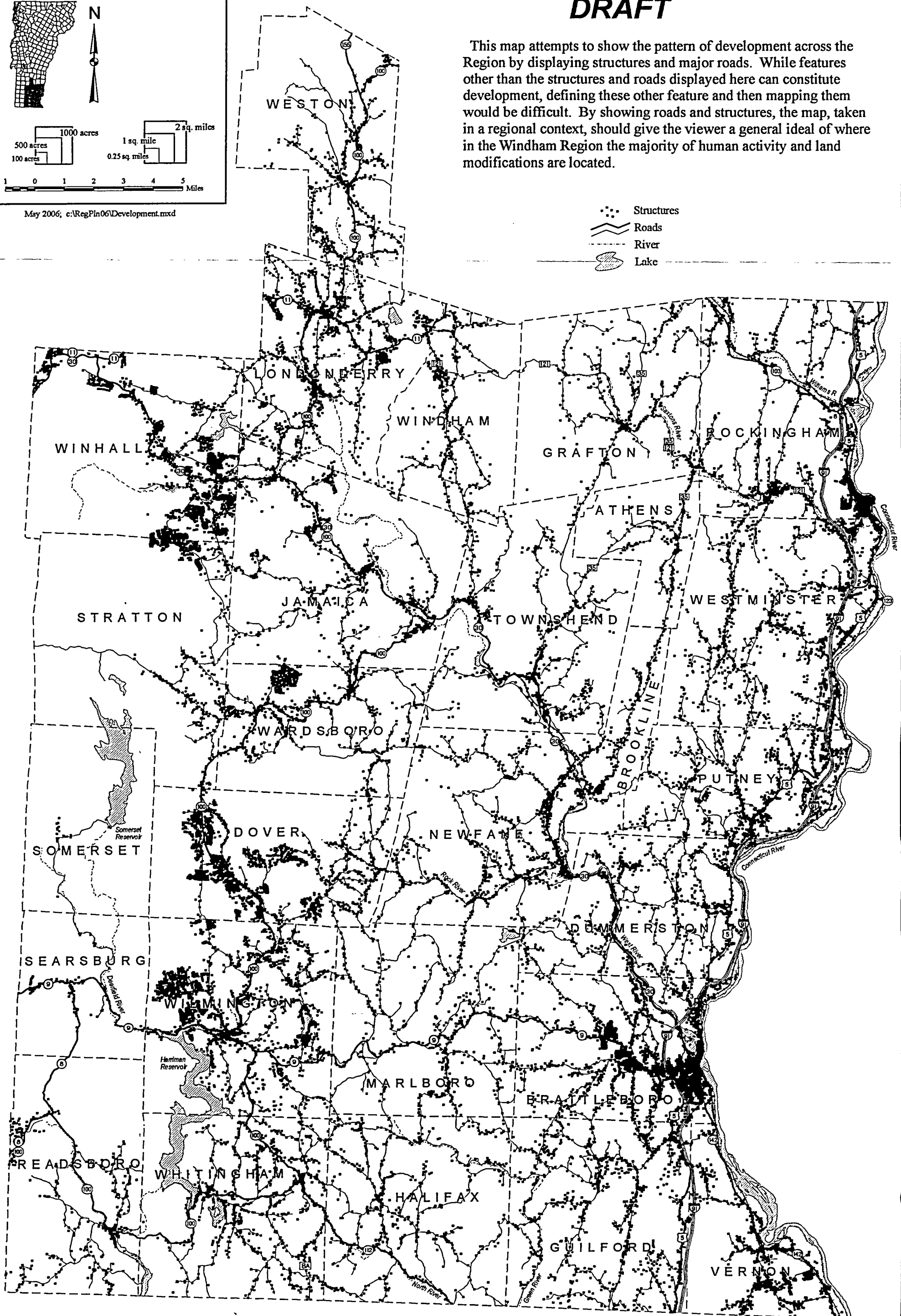
May 2006; c:\RegPln06\Development.mxd

Regional Development Pattern

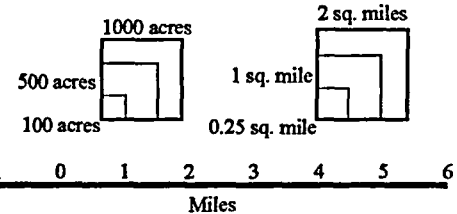
DRAFT

This map attempts to show the pattern of development across the Region by displaying structures and major roads. While features other than the structures and roads displayed here can constitute development, defining these other feature and then mapping them would be difficult. By showing roads and structures, the map, taken in a regional context, should give the viewer a general ideal of where in the Windham Region the majority of human activity and land modifications are located.

- Structures
- Roads
- River
- Lake



2001 Windham Regional Plan



September 2001; C:\REGPLN01\LANDCOV.APR: 11x17 map

Note: This map should be used for general reference and planning purposes only.

Sources (refer to appendix): 24, also 1, 2, 3

DRAFT

Existing Land Use/Land Cover

The final version of this map will be in COLOR.

- regional center
- village
- resort center

Town boundary

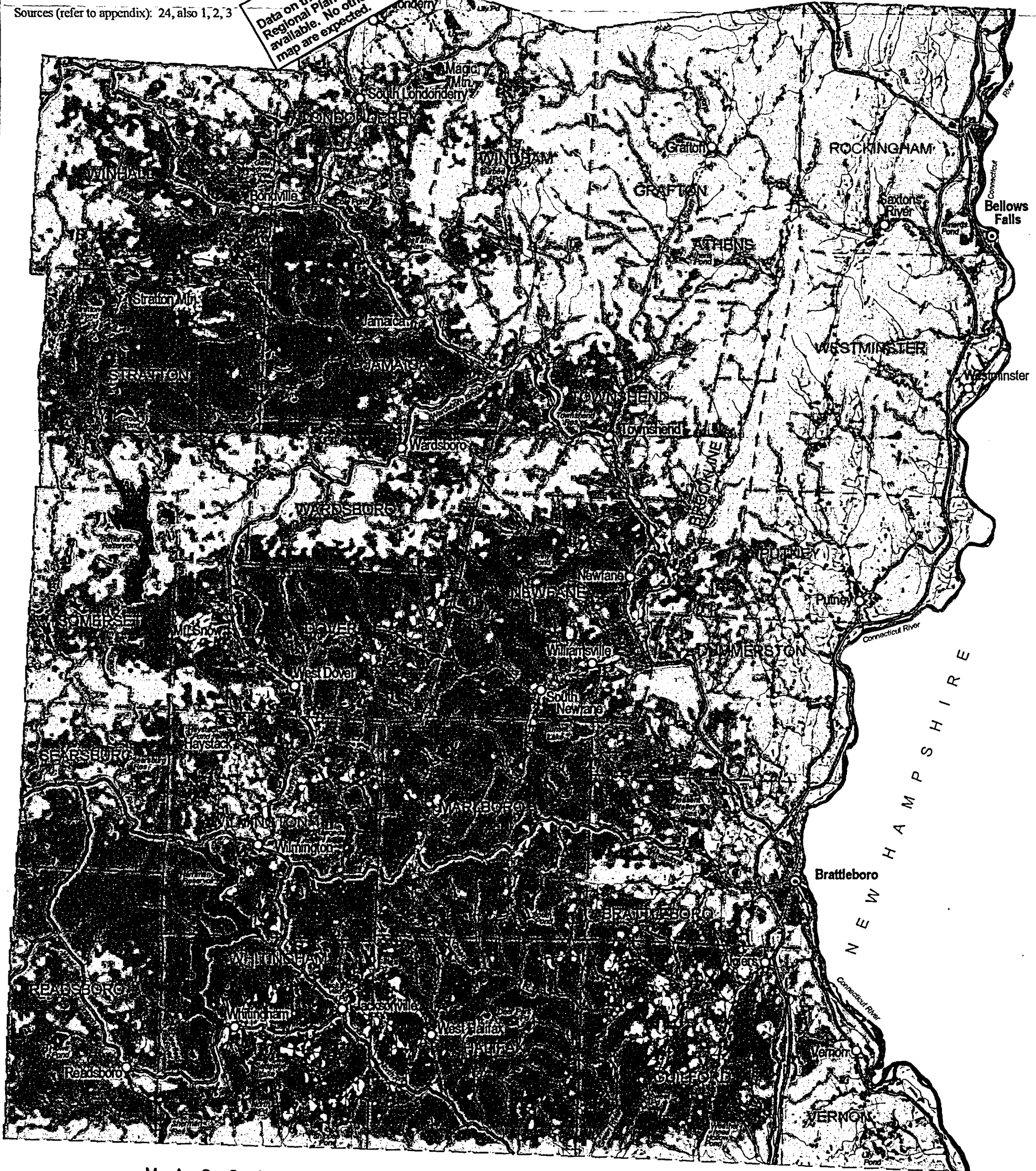
- Generalized land use/land cover:
- Urban/built-up
 - Open/agriculture
 - Forest
 - Water
 - Wetland

This map attempts to show generalized land use and land cover patterns across the Region. The land use/land cover areas identified on this map are not exact delineations of where these uses or coverages occur, but are instead generalized delineations of where each of these uses or coverages is predominate.

For example, where an individual house is located in a forested area, the predominate use and cover is forest. Likewise, in a residential area where a one acre woodland is located, the predominate use and cover is urban/built-up.

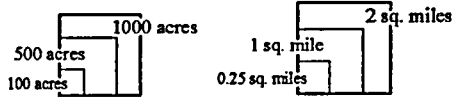
The map, taken in a regional context, should give the viewer a general idea of where in the Windham Region major built-up, forested, open, wetland, and water areas are located.

NOTE: Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



MASSACHUSETTS

2006 Windham Regional Plan



May 2006; c:\RegPln06\Consland.mxd

DRAFT

Public and Conserved Lands

The final version of this map will be in **COLOR**.

Publicly-owned land:

- Federal
- State
- Town

Federal lands include those administered by the Forest Service, Army Corps of Engineers, and Fish and Wildlife Service. State lands include State Forests, State Parks, and Wildlife Management Areas, among others. Town lands are generally town forests or watershed lands. A town may own land in another municipality.

Land owned by a Conservation Organization:

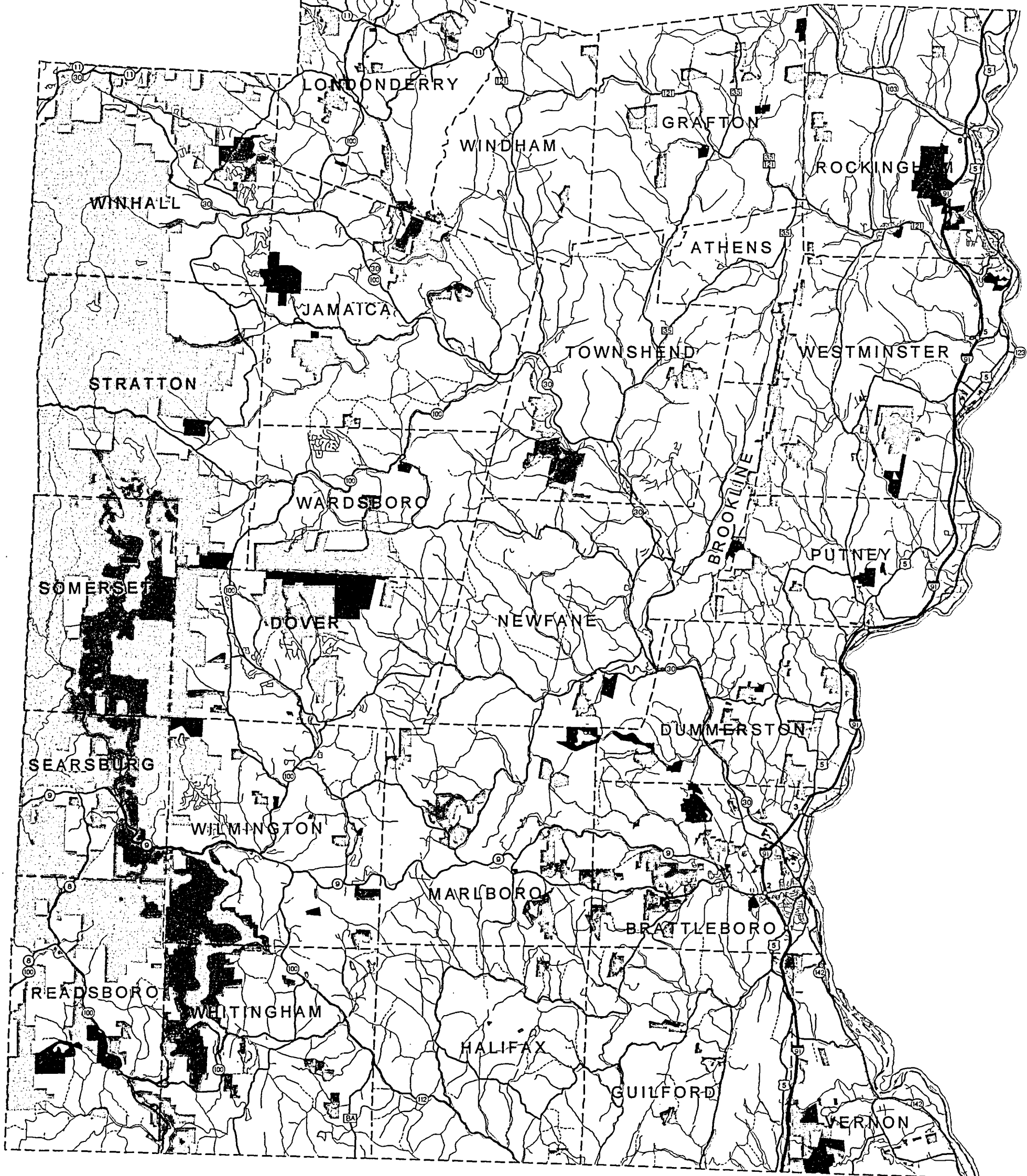


This category includes lands owned primarily by The Nature Conservancy, Windmill Hill Pinnacle Association, Putney Mountain Association, and New England Forestry Foundation, among others.

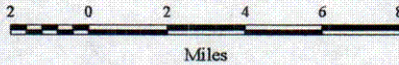
Privately-owned land with a Conservation Easement:



Most conservation easements are held by the Vermont Land Trust or the Vermont Housing Conservation Board.



2006 Windham Regional Plan



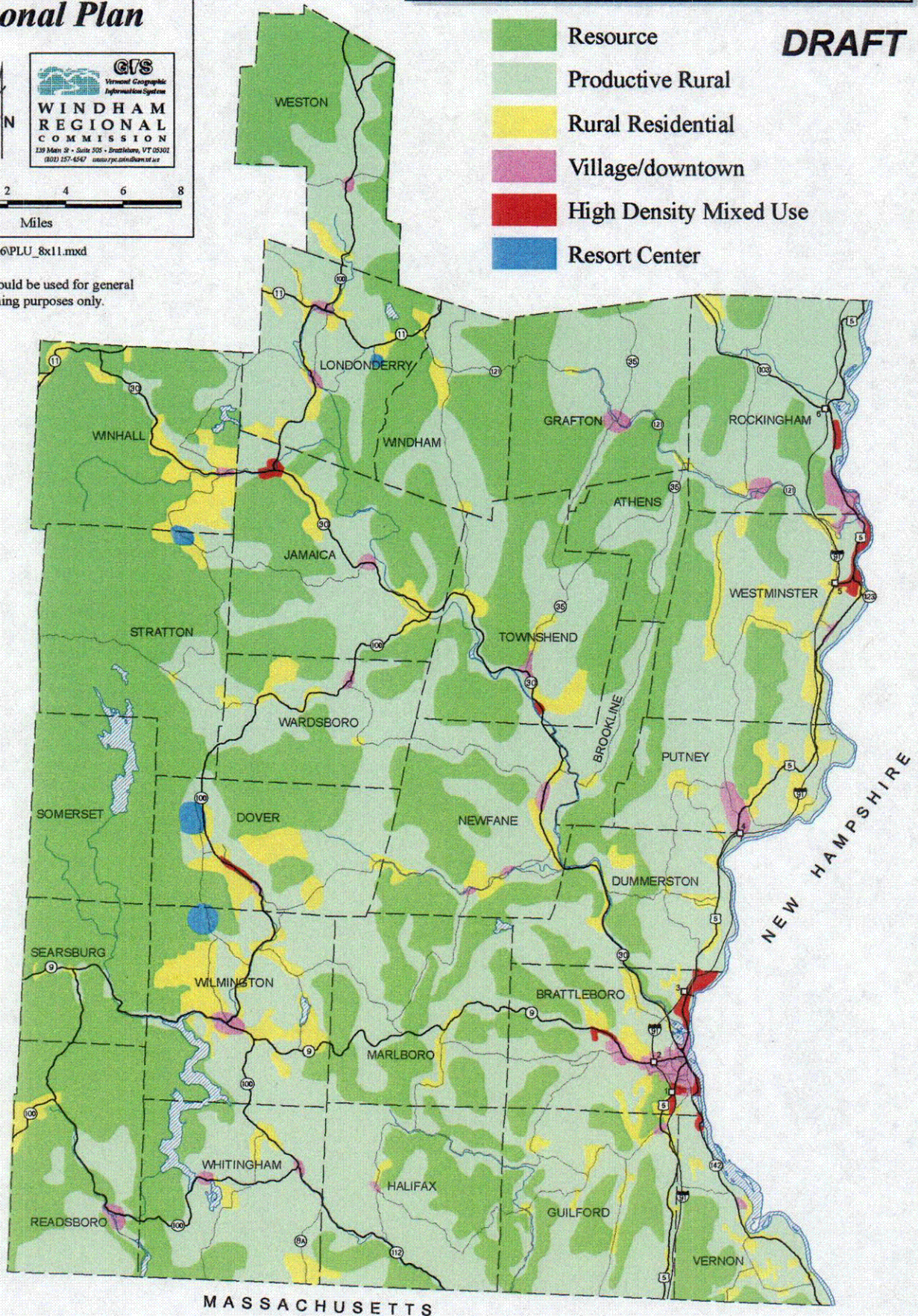
May 2006; c:\RegPlan06\PLU_8x11.mxd

Note: This map should be used for general reference and planning purposes only.

Proposed Land Use

DRAFT

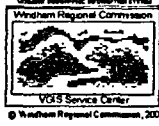
- Resource
- Productive Rural
- Rural Residential
- Village/downtown
- High Density Mixed Use
- Resort Center



2001 Windham Regional Plan



GIS



2 0 2 4 6 8
Miles

September 2001; C:\REGPLN01\WATERSHD.APR: 8.5x11 map

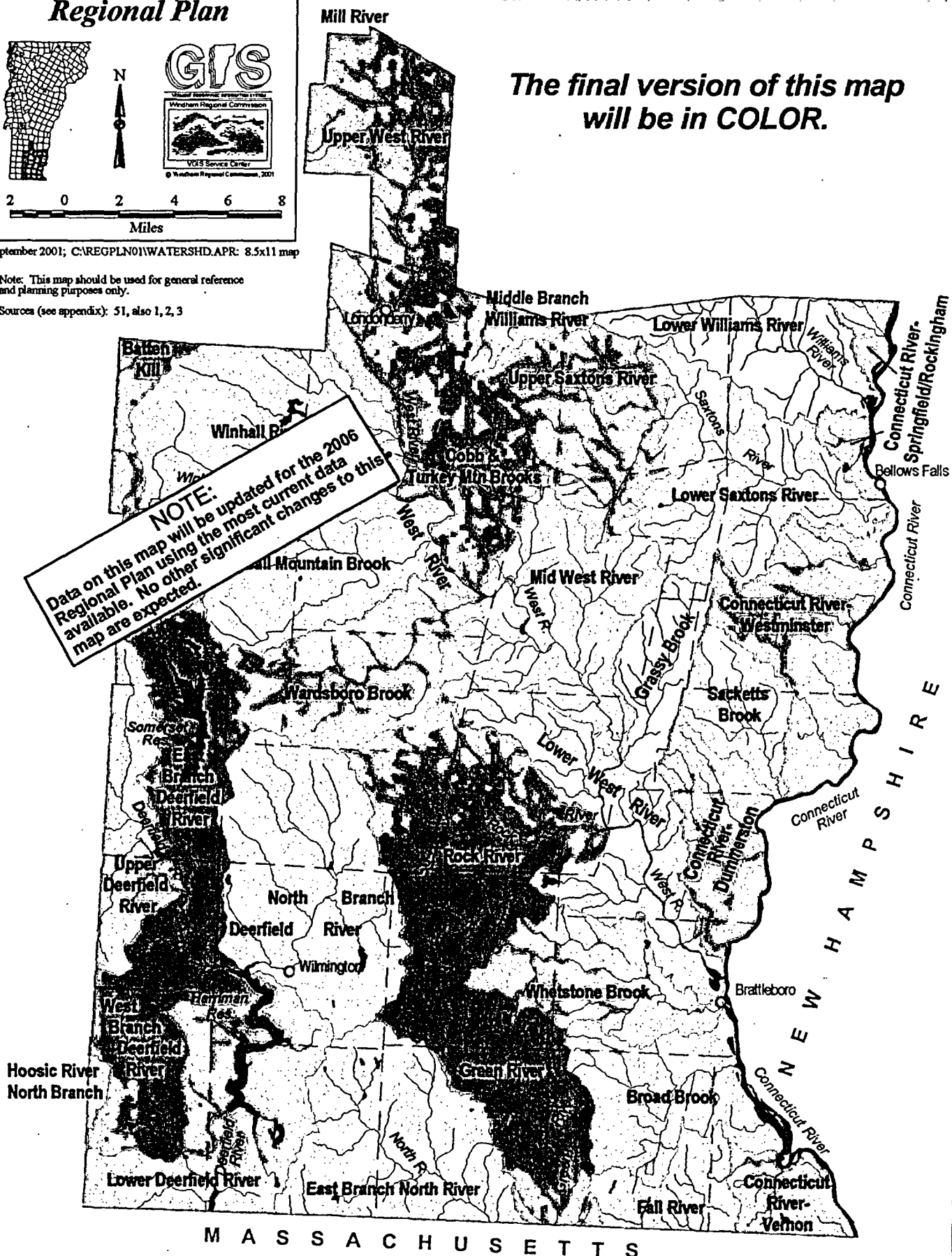
Note: This map should be used for general reference and planning purposes only.

Sources (see appendix): 51, also 1, 2, 3

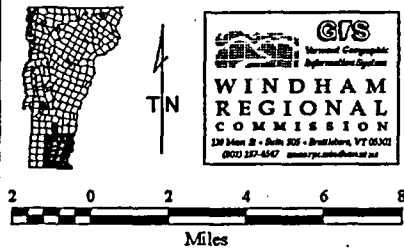
Watersheds

*The final version of this map
will be in COLOR.*

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2006 Windham Regional Plan



May 2006; C:\regplan06\Basins.mxd

Note: This map should be used for general reference and planning purposes only.

Mill River Watershed
Basin 3

Basins

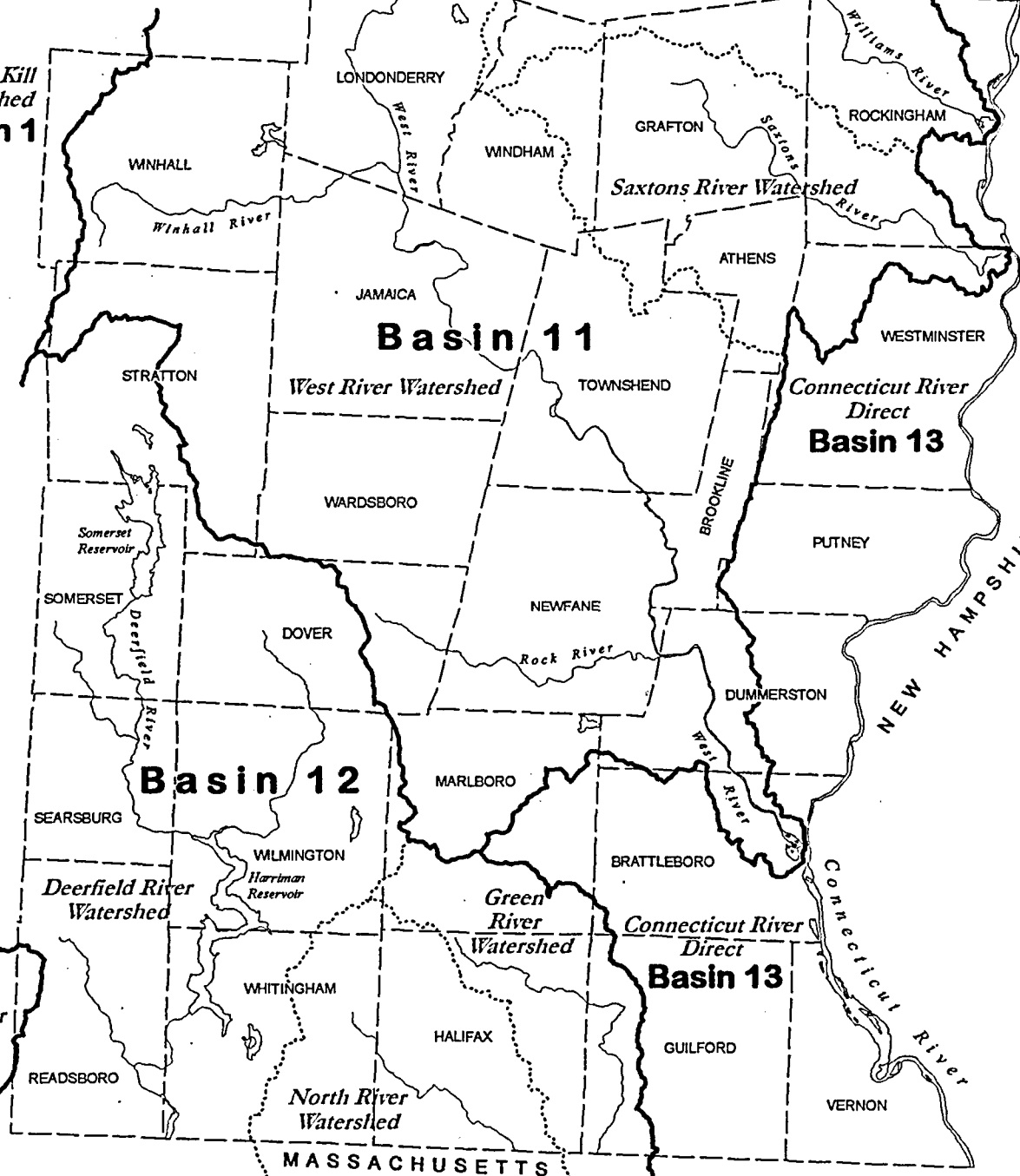
DRAFT

SOUTHERN WINDSOR REGION

Connecticut River Direct
Basin 13

Batten Kill Watershed
Basin 1

BENNINGTON COUNTY REGION



Basin 11

Connecticut River Direct
Basin 13

Basin 12

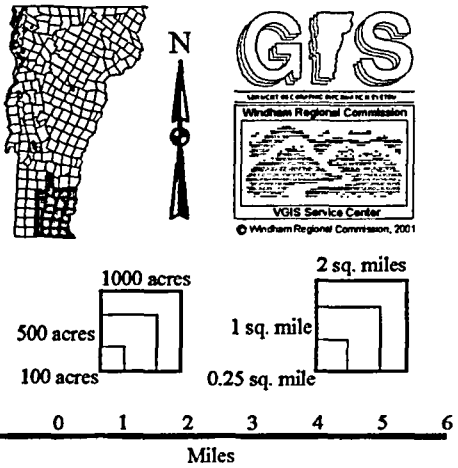
Basin 1
Hoosac River Watershed

Connecticut River Direct
Basin 13

MASSACHUSETTS

NEW HAMPSHIRE

2001 Windham Regional Plan



September 2001; C:\REGPL\N01\WATERRES.APR: 11x17 map

Note: This map should be used for general reference and planning purposes only.

Sources (refer to appendix): 32, 33, 34, 35, 36, also 1, 2, 3

Water Resources

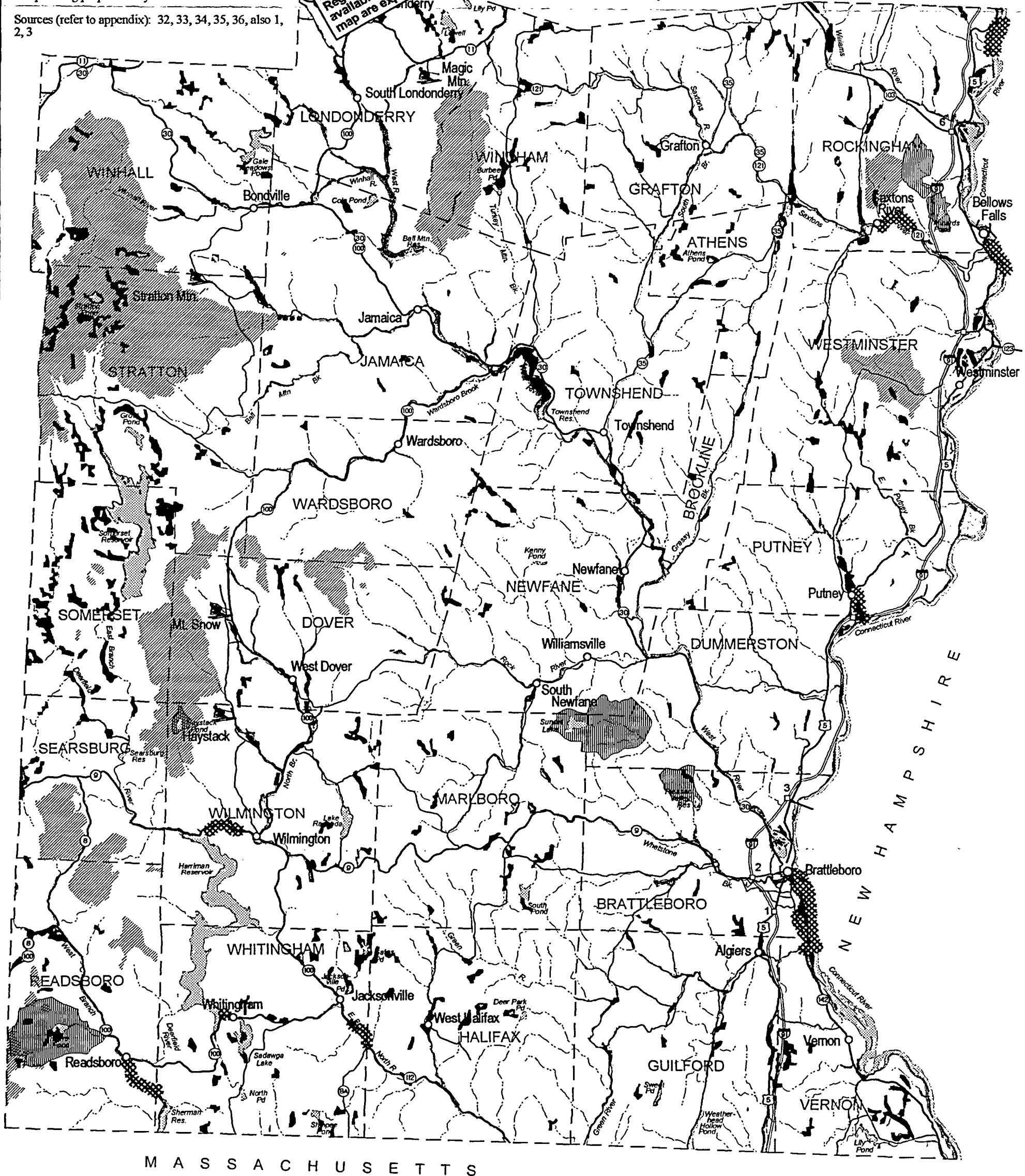
- Outstanding resource water
- ▨ Watershed of Class A(1) waters
- ▩ Watershed of Class A(2) waters
- Areas dominated by wetlands
- ▤ Areas dominated by floodplains
- ▧ Waste management zone
- Water

Notes:

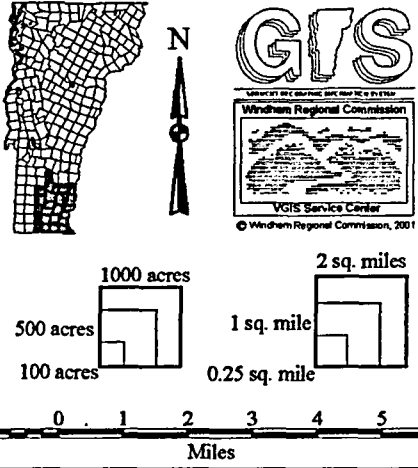
- Class A(1) waters, or "ecological waters," include those watersheds designated as such by VT Water Resources Board, and by default, all waters above 2500 feet.
- Class A(2) waters, or "public waters supply waters" are waters that contribute to a community's water system.
- Waste management zones have been enlarged slightly to improve visibility.

DRAFT

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2001 Windham Regional Plan



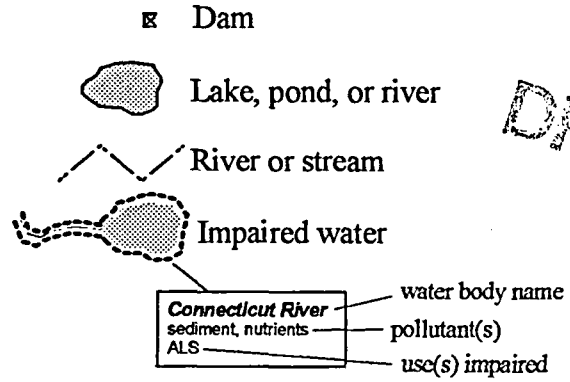
September 2001; C:\REGPLN\O\MPAIR\APR: 11x17 map

Note: This map should be used for general reference and planning purposes only.

Sources (refer to appendix): 25, 26, also 1,

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.

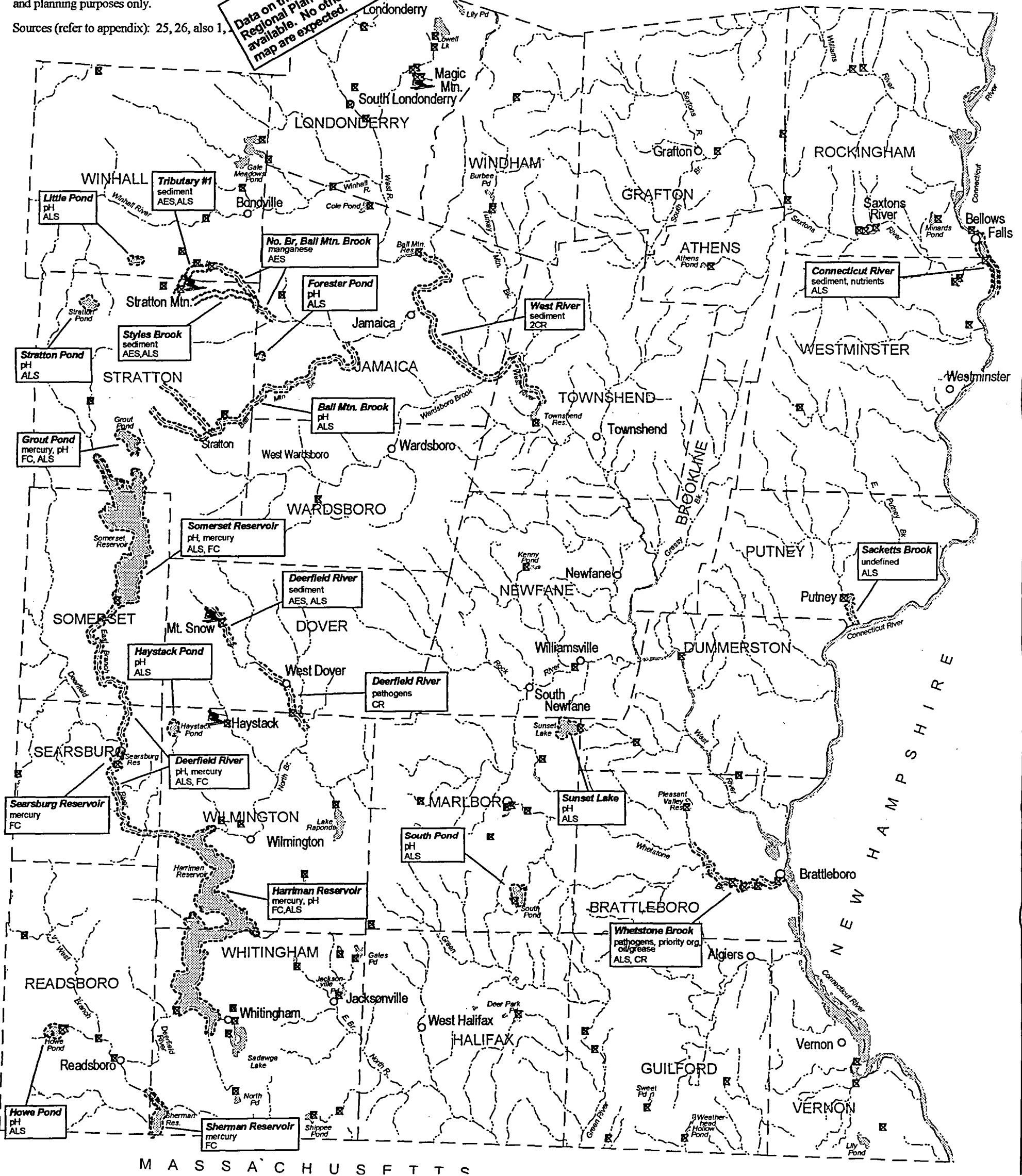
Dams and Impaired Waters



DRAFT

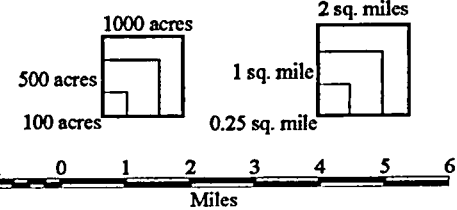
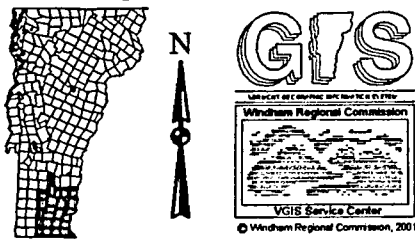
Uses impaired:
AES - aesthetics
ALS - aquatic life support
FC - fish consumption
CR - contact recreation (i.e. swimming)
2CR - secondary contact recreation (fishing, boating)

Impaired waters are those that are listed in the State of Vermont Year 2000 List of Waters. In that document, the term impaired "means a documented violation of one or more criteria of the Vermont Water Quality Standards."



MASSACHUSETTS

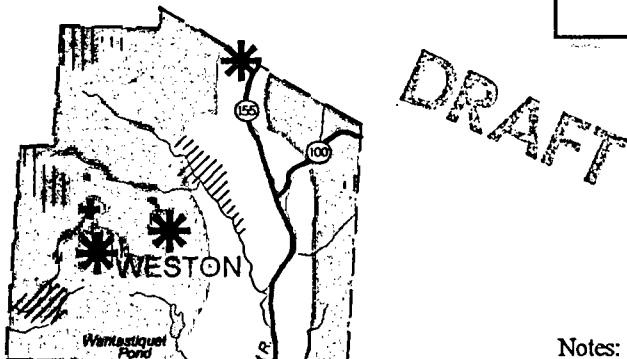
2001 Windham Regional Plan



September 2001; C:\REGPL\N\NATAREAS.APR: 11x17 map

Note: This map should be used for general reference and planning purposes only.

Sources (refer to appendix): 37, 38, 39, 40, 41, 1, 2, 3



NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.

Ecological Resources

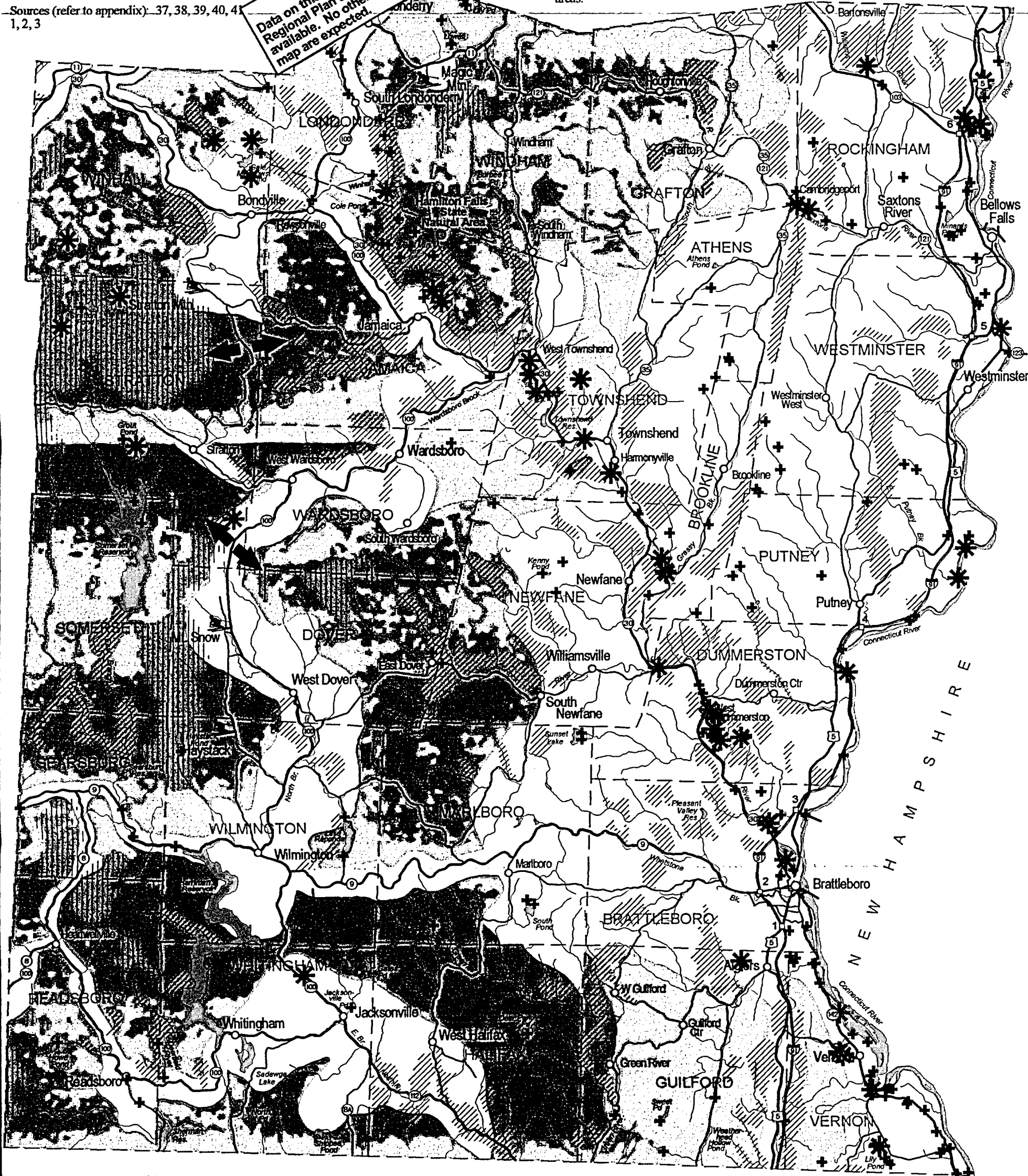
- + Rare, threatened, or endangered species occurrence
- * Significant natural community
- /// Deer wintering area
- |||| Land over 2500 feet
- Bear production habitat
- Seasonal bear habitat
- ↔ Regionally significant bear travel corridor

The final version of this map will be in COLOR.

Notes:

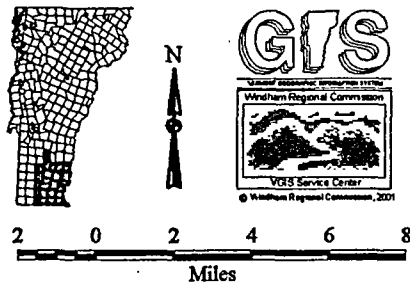
- The locations of rare, threatened, or endangered species occurrences or significant natural communities are approximate, but generally within 200 meters. The actual area represented by the species or community may be a few square feet or many hundreds of acres.

- Black bear travel corridors, according to Forrest Hammond, biologist with the Vermont Department of Fish and Wildlife, are forested habitats that are regionally important and are used by large numbers of bears to access critical seasonal foods or to link bear ranges and sub-populations. Travel corridors are comprised of bear travel routes and may include one or more road crossing areas.



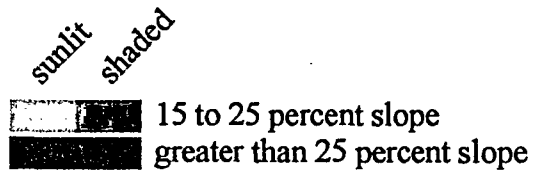
M A S S A C H U S E T T S

2001 Windham Regional Plan



Steep Slopes

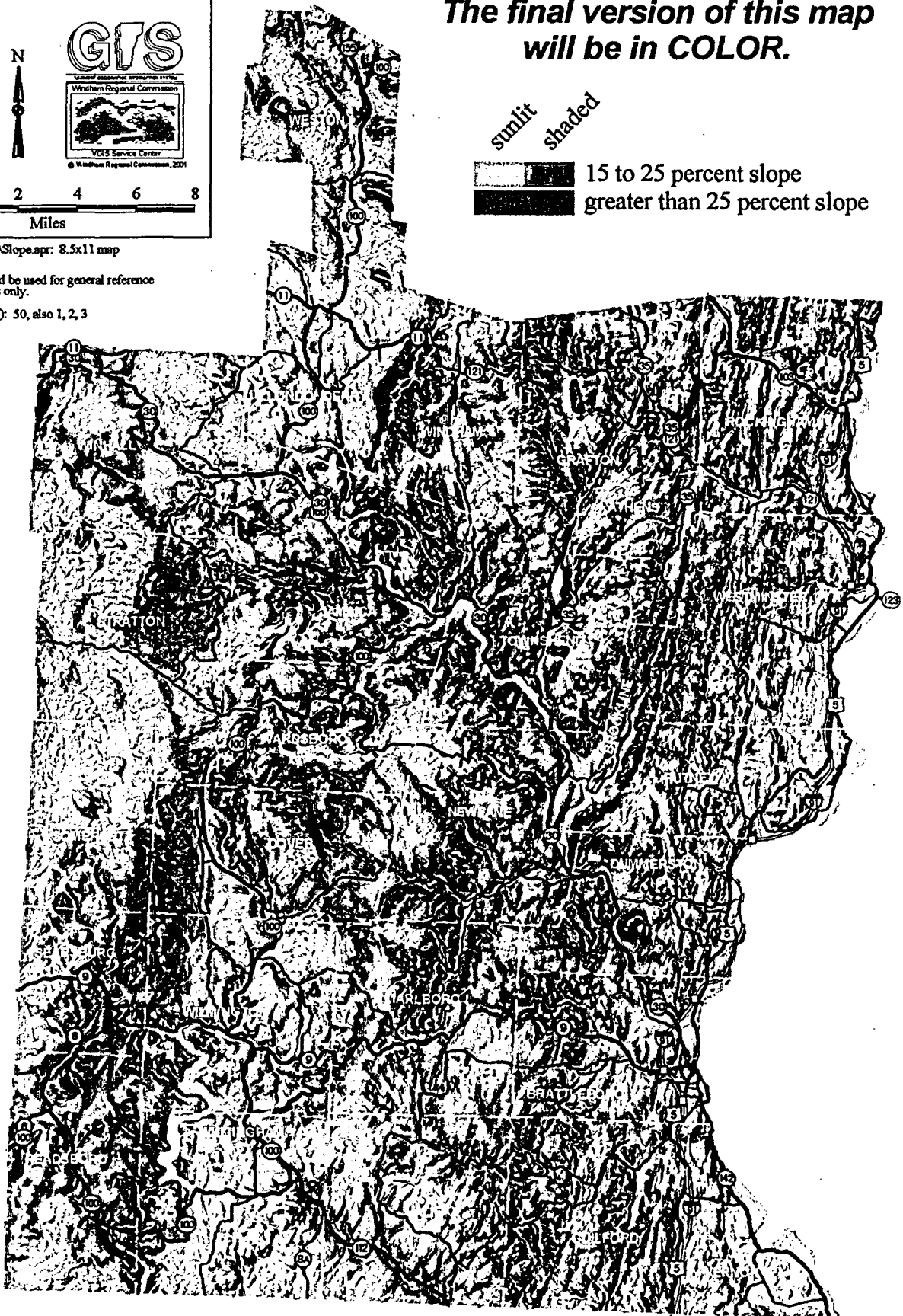
The final version of this map
will be in **COLOR**.



May 2006; c:\RegPIn06\Slope.apr: 8.5x11 map

Note: This map should be used for general reference
and planning purposes only.

Sources (see appendix): 50, also 1, 2, 3



2001 Windham Regional Plan



N

GIS



2 0 2 4 6 8
Miles

September 2001; C:\REG\PLN01\AGOIL\APR: 8.5x11 map

Note: This map should be used for general reference and planning purposes only. On-site investigation is required to verify the existence of these soil classes.

Sources (see appendix): 4, also 1, 2, 3

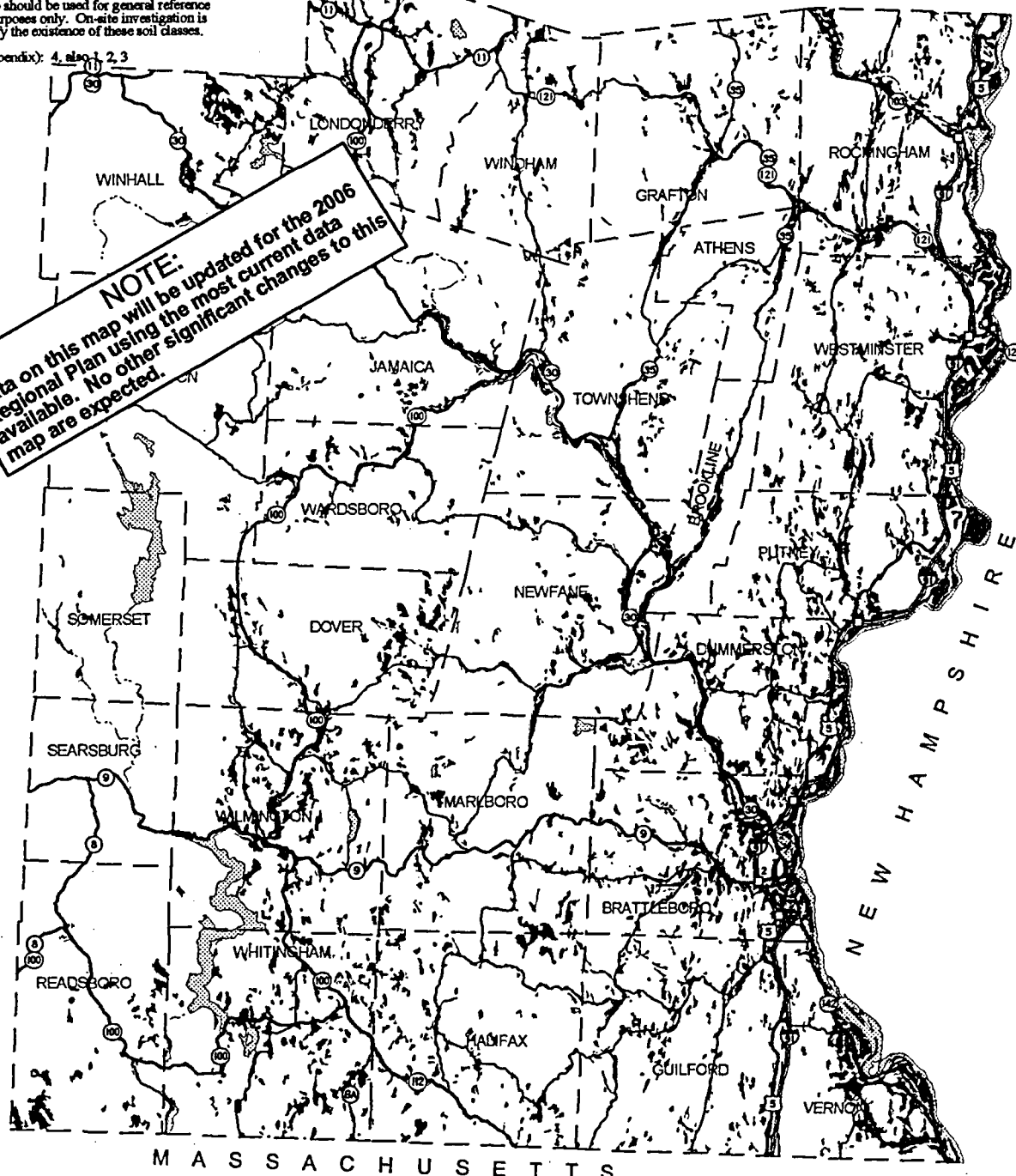
Important Farmland Soils

DRAFT

Important farmland soil
Water

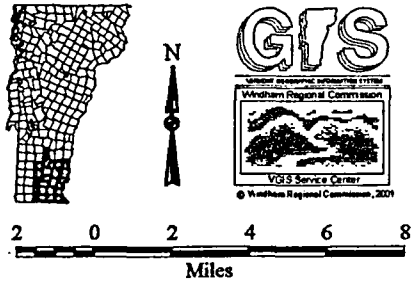
The soils shown on this map have been given an important farmland rating of "prime" or "statewide" by the USDA Soil Conservation Service (now the Natural Resource Conservation Service). Such soils may qualify as "Primary Agricultural Soils" as defined by Vermont's Land Use and Development Law, Act 250.

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



M A S S A C H U S E T T S

2001 Windham Regional Plan



September 2001; C:\REGPLN01\AGGRES.APR: 8.5x11 map

Note: This map should be used for general reference and planning purposes only. On-site investigation is required to verify the existence of these soil classes.

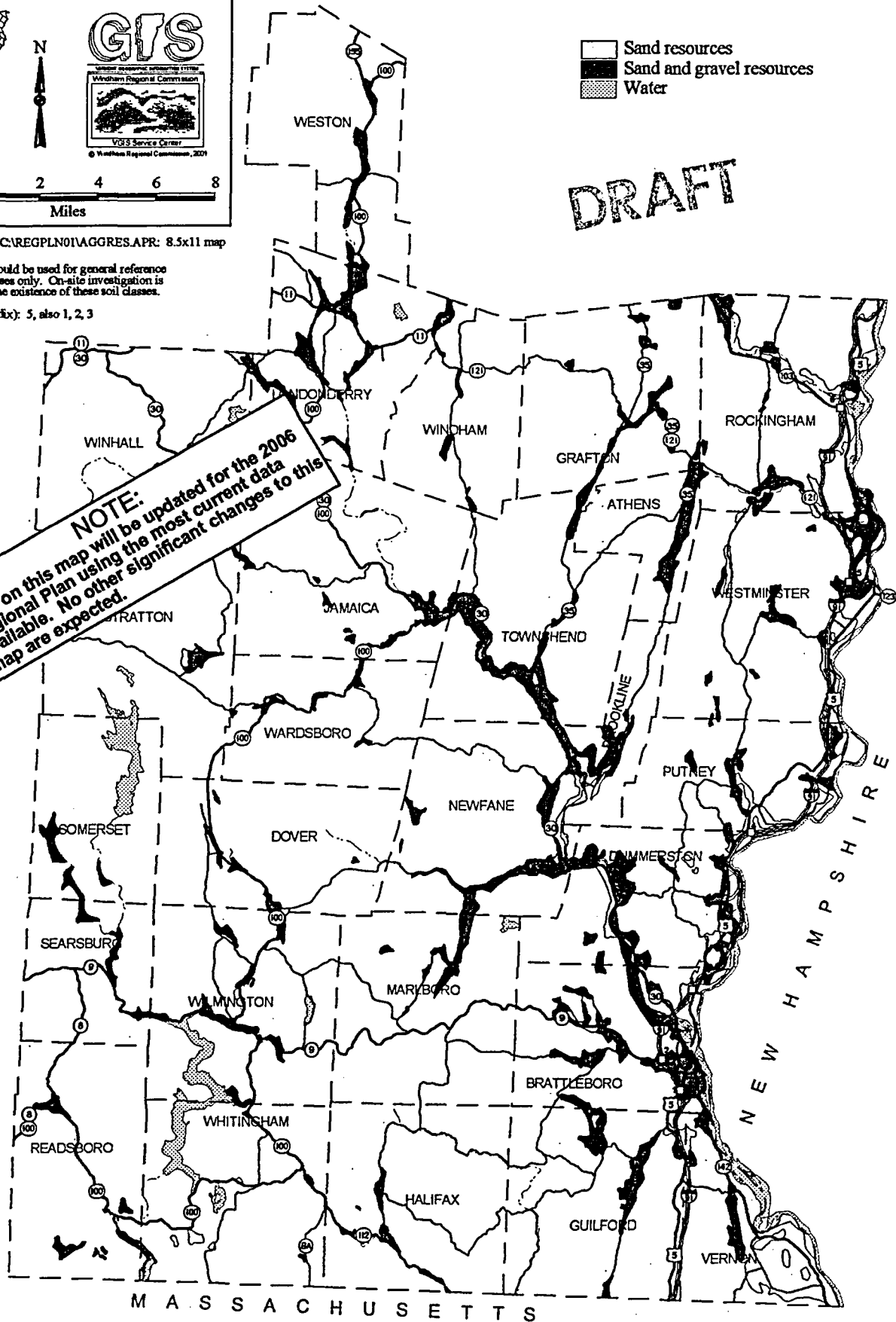
Sources (see appendix): 5, also 1, 2, 3

Sand and Gravel Resources

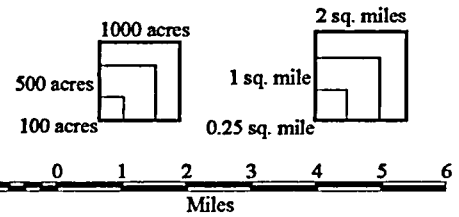
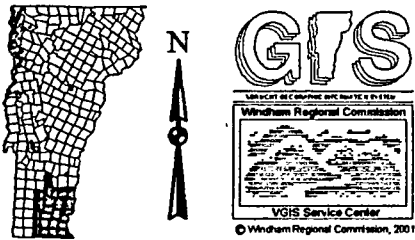
Sand resources
 Sand and gravel resources
 Water

DRAFT

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2001 Windham Regional Plan



September 2001; C:\REG\PLN\UTILITY.APR: 11x17 map

Note: This map should be used for general reference and planning purposes only.

Sources (refer to appendix): 6, 7, 8, 9, 10, 11, 12, 13, 14, also 1, 2, 3

DRAFT

Utilities

Electric utility franchise areas:

- Central Vermont Public Service Corporation
- Green Mountain Power Corporation
- Vermont Electric Co-op
- Village of Readsboro Electric Department
- Village of Jacksonville Electric Department

- Well head protection area
- Surface water source protection area

- Municipal sewer service *
- Municipal sewer and water service *

* - symbol denotes service in that general area; actual service area is not located

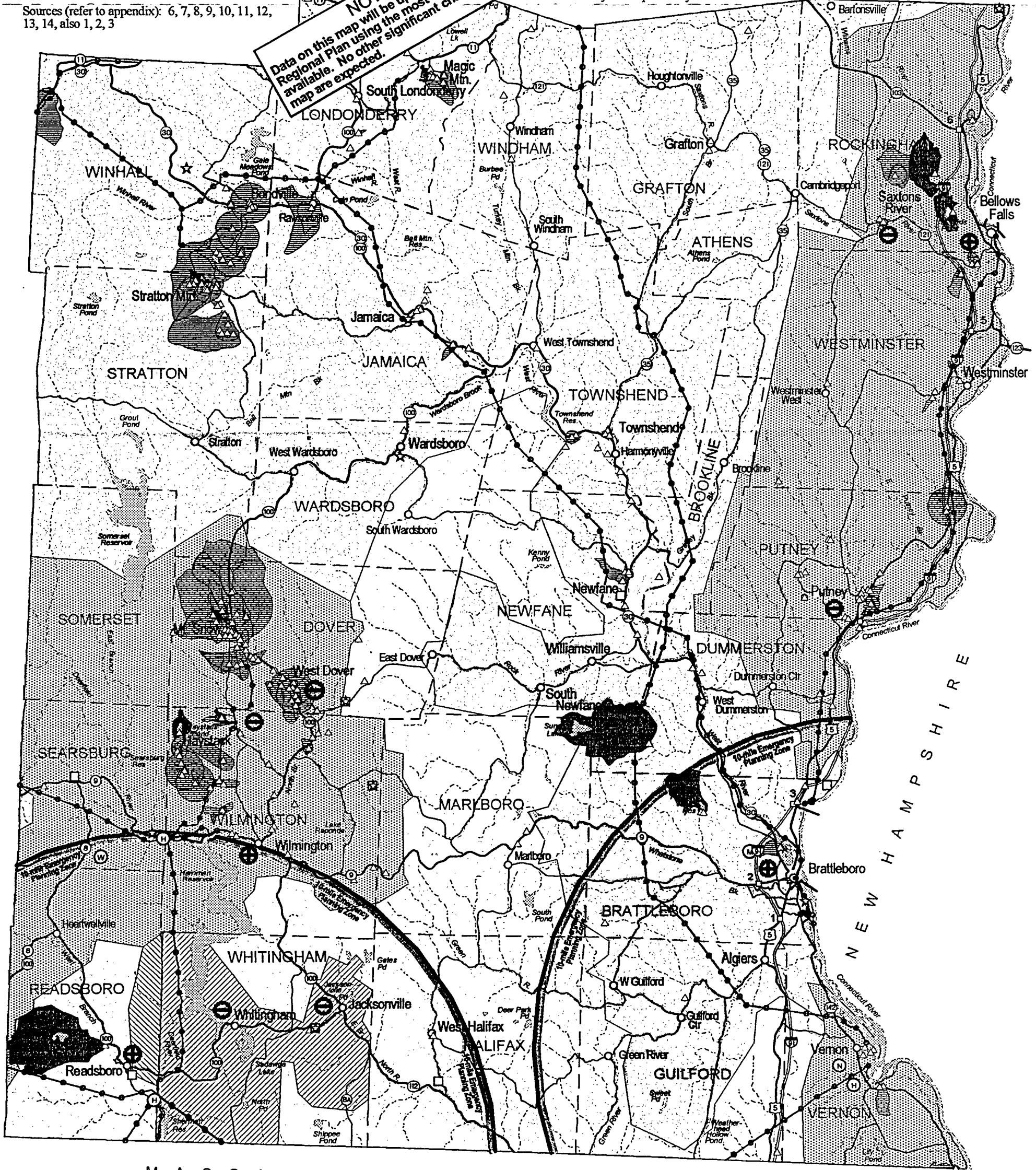
Electric Generation Facility:

- hydro
- methane
- nuclear
- wind

- Transfer station
- Closed landfill
- Public water supply source
- Electric transmission line
- Boundary of 10-mile Emergency Planning Zone

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.

A public water supply is a water supply system with ten or more connections or regularly serving an average of at least 25 individuals daily at least 60 days a year. These systems may be operated by a municipality or may be operated privately or cooperatively.

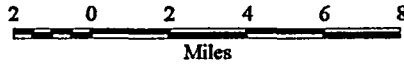


MASSACHUSETTS

2001 Windham Regional Plan



GIS



September 2001; C:\REGPLN01\EDUCATN.APR: 8.5x11 map

Note: This map should be used for general reference and planning purposes only. On-site investigation is required to verify the existence of these soil classes.

Sources (see appendix): 27, 28, also 1, 2, 3

Educational Facilities

DRAFT

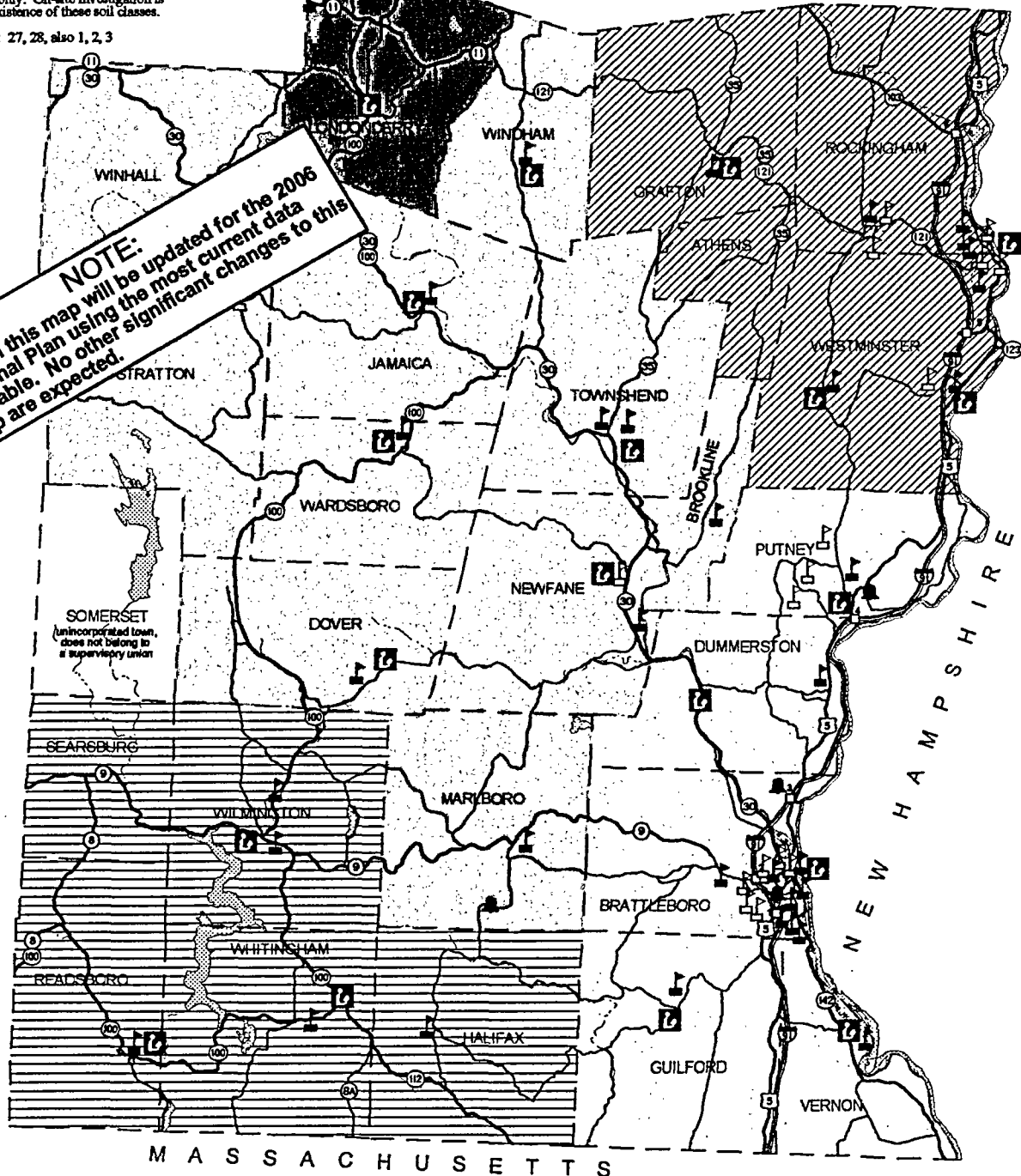
- Public school
- Independent school
- College
- Library

Supervisory Unions:

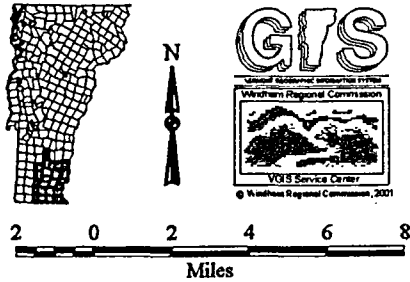
- Windham Central
- Windham Northeast
- Windham Southeast
- Windham Southwest
- Windsor Southwest

The educational facilities on this map may not be positioned at their actual location. For clarity, symbols have been moved slightly. All known facilities, however, are represented on this map and shown within one mile of their actual location.

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2001 Windham Regional Plan



September 2001; C:\REGPLN\HEALTHCR.APR: 8.5x11 map

Note: This map should be used for general reference and planning purposes only.

Sources (see appendix): 55, 56, 57, 58, also 1, 2, 3

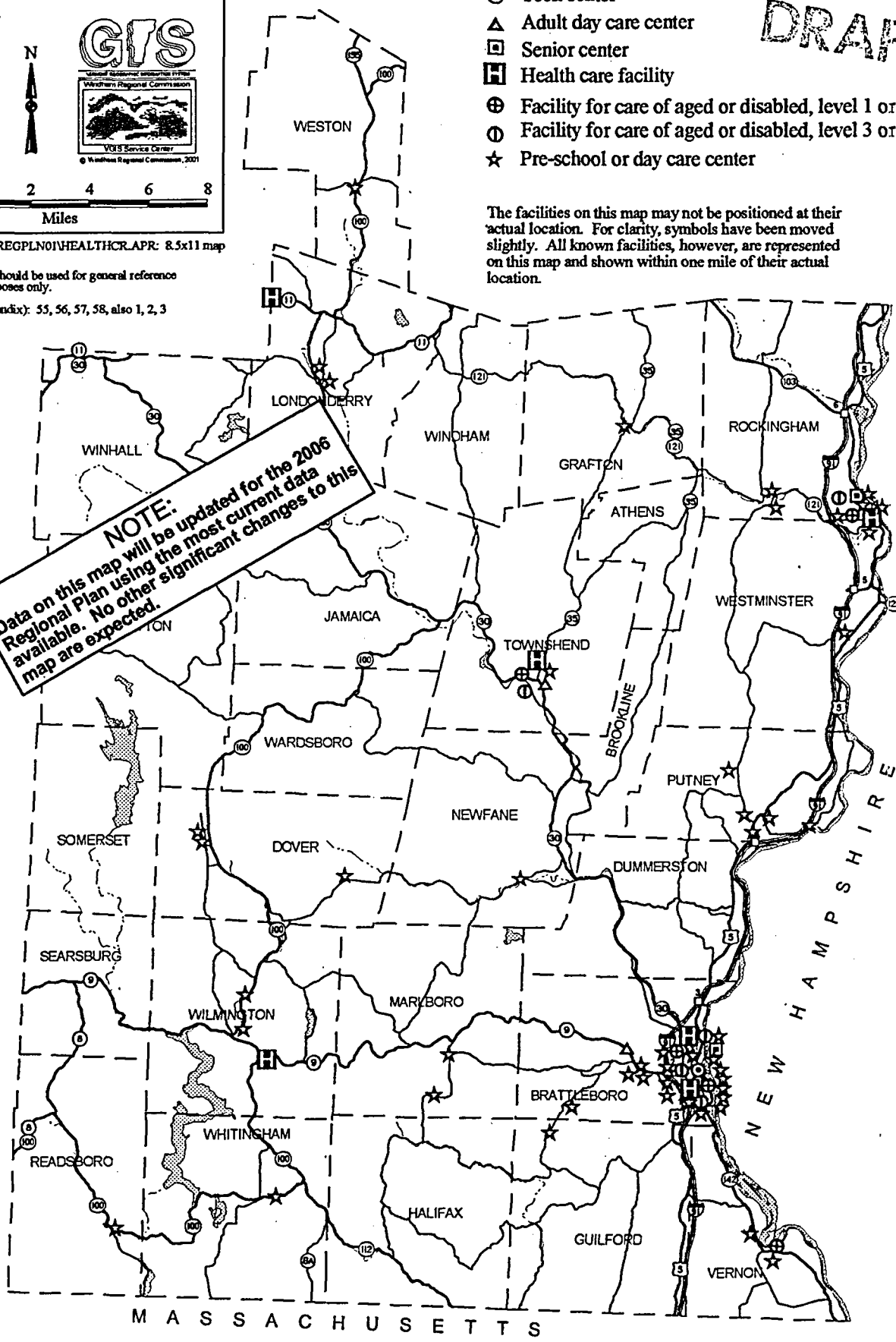
Health and Social Service Facilities

DRAFT

- ⊙ Teen center
- △ Adult day care center
- Senior center
- ⌘ Health care facility
- ⊕ Facility for care of aged or disabled, level 1 or 2
- ⊖ Facility for care of aged or disabled, level 3 or 4
- ★ Pre-school or day care center

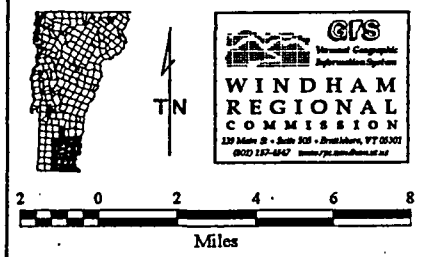
The facilities on this map may not be positioned at their actual location. For clarity, symbols have been moved slightly. All known facilities, however, are represented on this map and shown within one mile of their actual location.

NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2006 Windham Regional Plan

Historic Districts

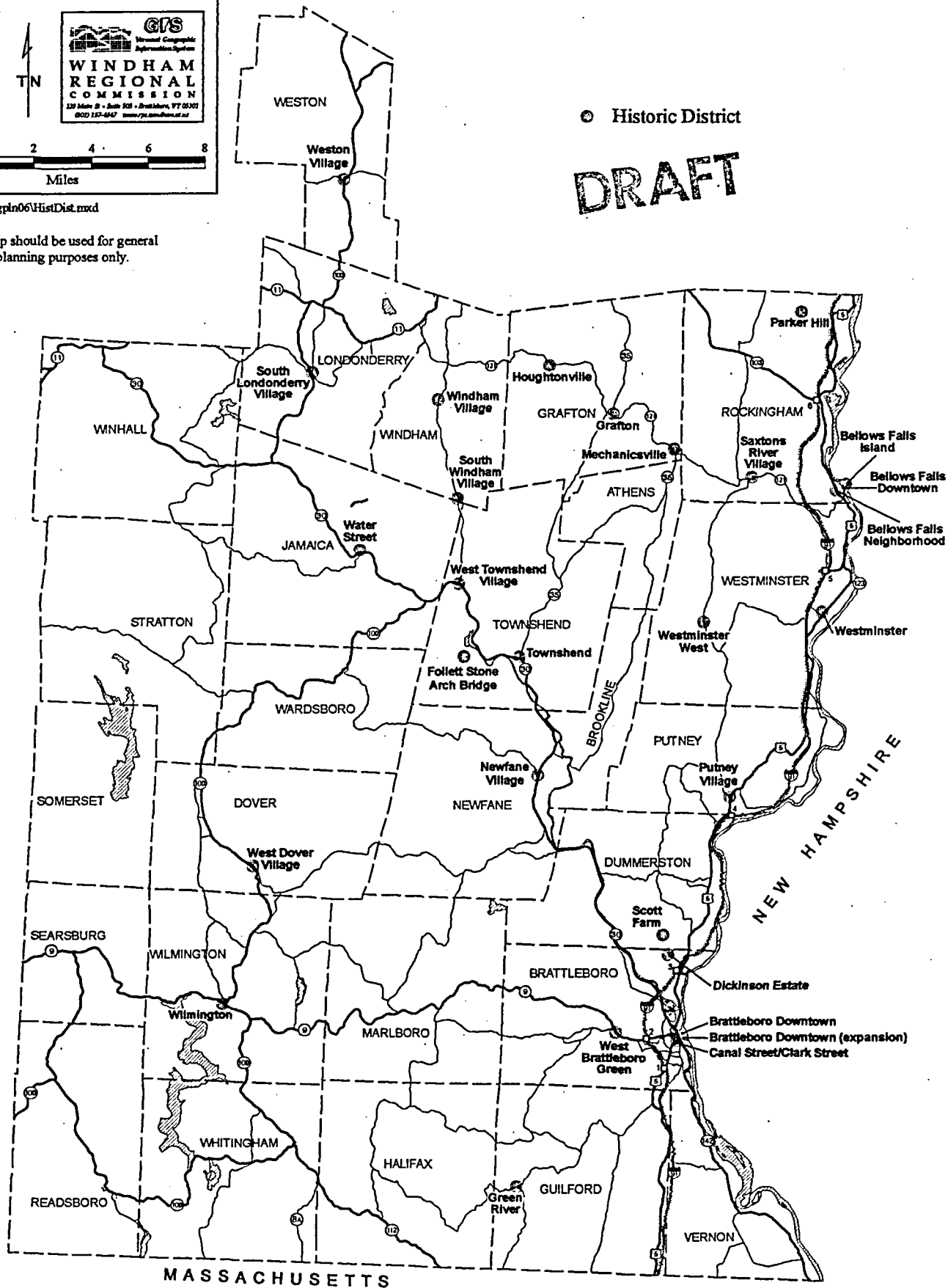


May 2006; C:\regpin06\HistDist.mxd

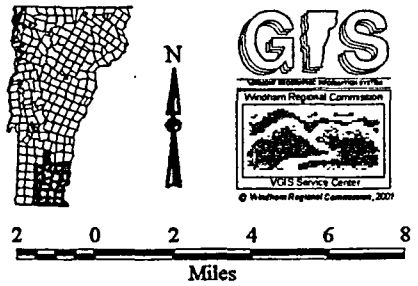
Note: This map should be used for general reference and planning purposes only.

● Historic District

DRAFT



2001 Windham Regional Plan



September 2001; C:\REGPLN\COMMBLDG.APR: 8.5x11 map

Note: This map should be used for general reference and planning purposes only.

Sources (see appendix): 54, also 1, 2, 3

Governmental Services

- ★ Police
- ✚ Fire
- Town government
- Highway maintenance
- △ State government

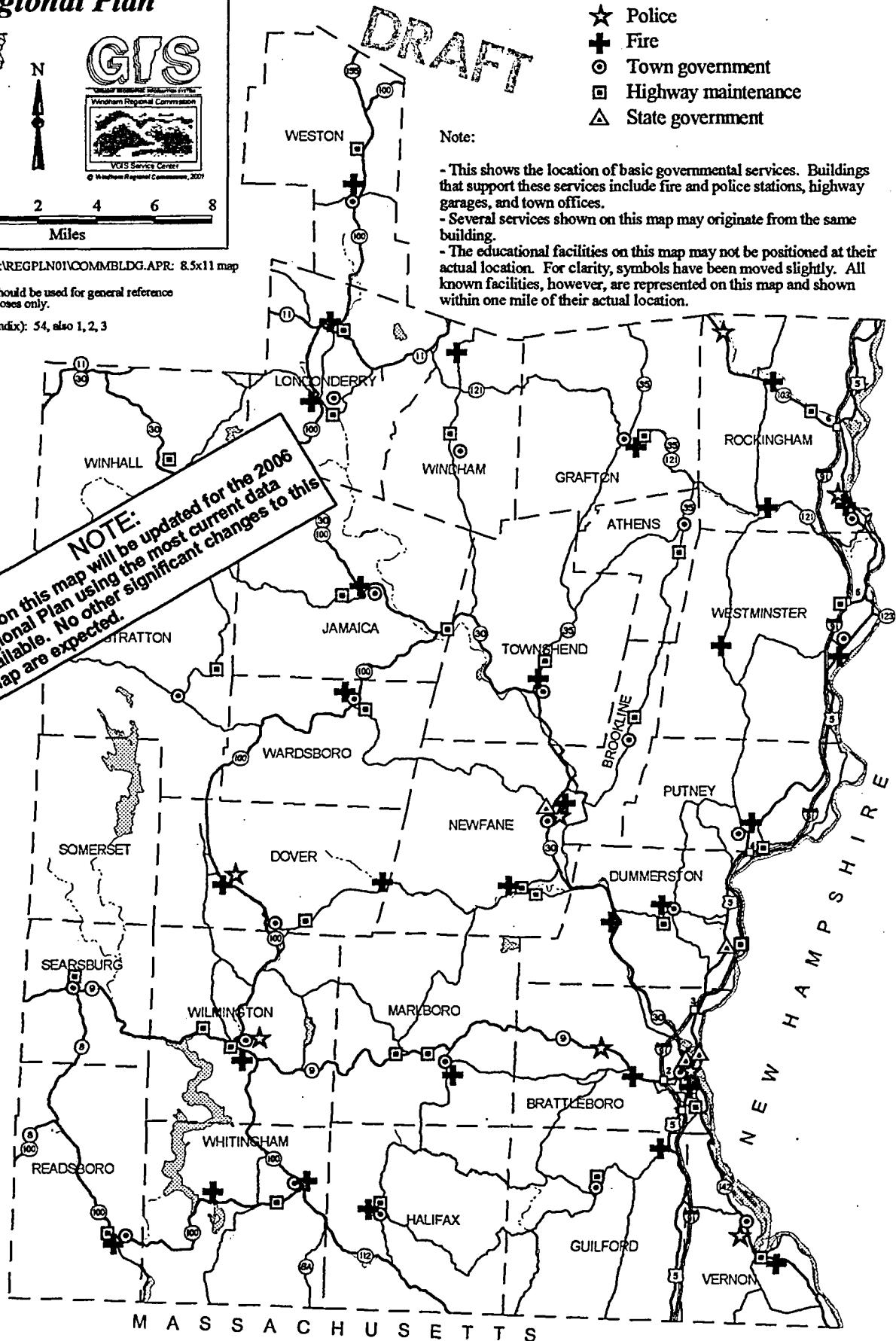
Note:

- This shows the location of basic governmental services. Buildings that support these services include fire and police stations, highway garages, and town offices.

- Several services shown on this map may originate from the same building.

- The educational facilities on this map may not be positioned at their actual location. For clarity, symbols have been moved slightly. All known facilities, however, are represented on this map and shown within one mile of their actual location.

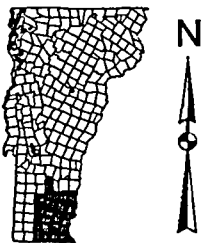
NOTE:
Data on this map will be updated for the 2006 Regional Plan using the most current data available. No other significant changes to this map are expected.



2006 Windham Regional Plan

DRAFT

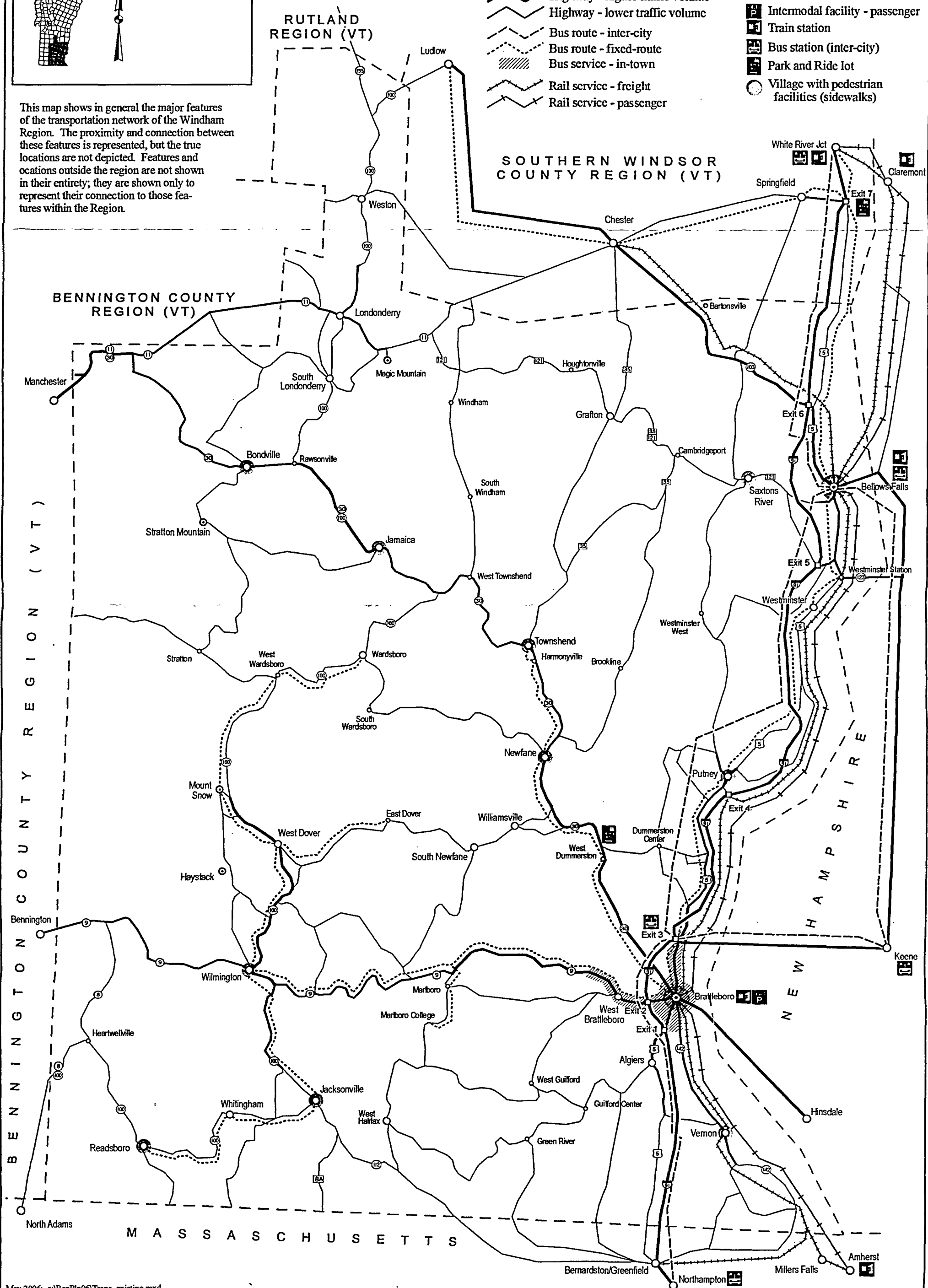
Existing Transportation Network



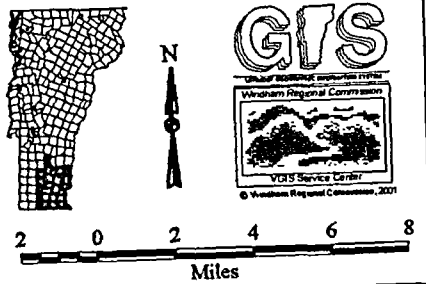
This map shows in general the major features of the transportation network of the Windham Region. The proximity and connection between these features is represented, but the true locations are not depicted. Features and locations outside the region are not shown in their entirety; they are shown only to represent their connection to those features within the Region.

- Highway - higher traffic volume
- Highway - lower traffic volume
- Bus route - inter-city
- Bus route - fixed-route
- Bus service - in-town
- Rail service - freight
- Rail service - passenger

- Intermodal facility - passenger
- Train station
- Bus station (inter-city)
- Park and Ride lot
- Village with pedestrian facilities (sidewalks)



2006 Windham Regional Plan



May 2006; c:\RegPlan06\trans_projects.apr: 8.5x11 map

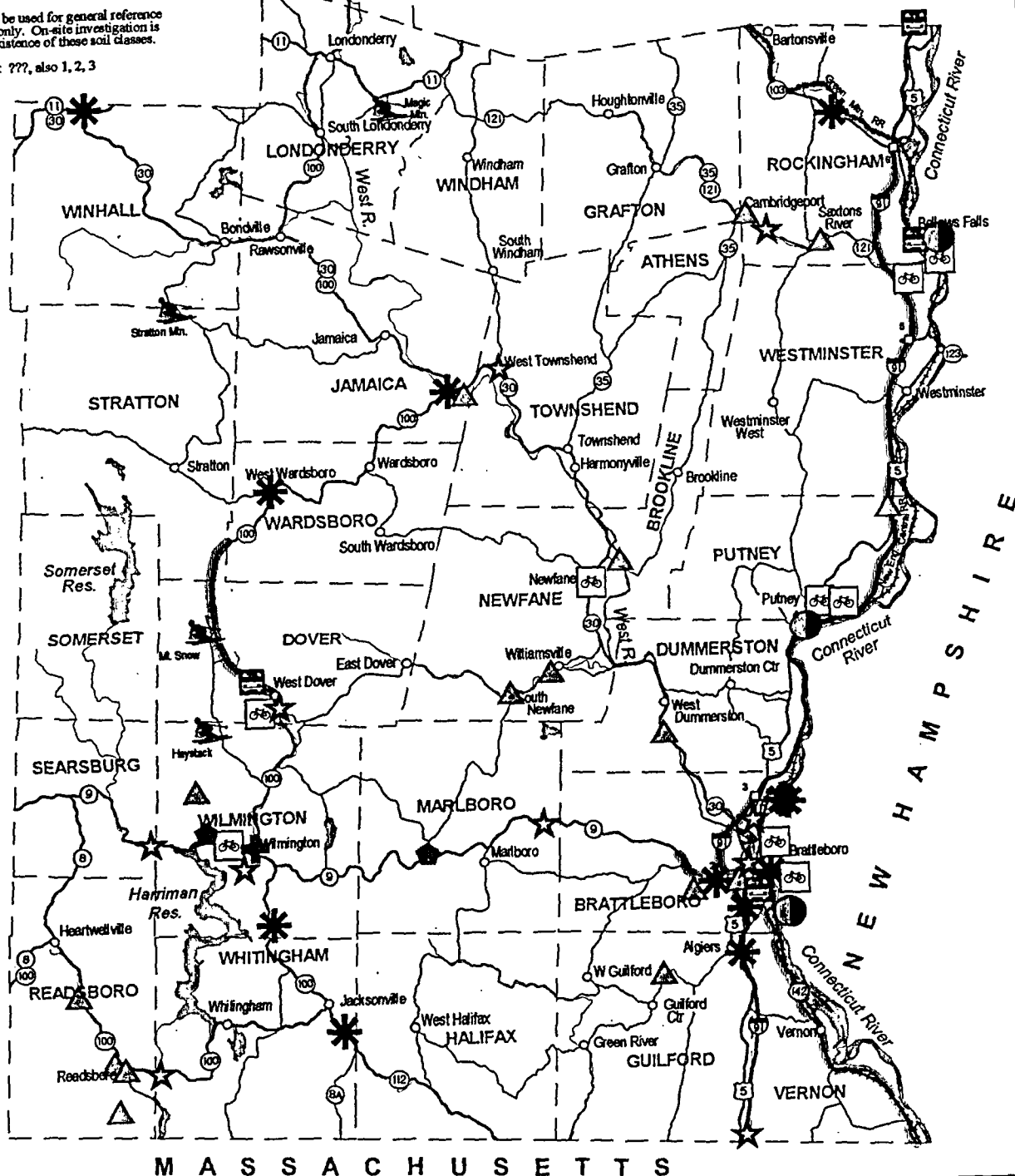
Note: This map should be used for general reference and planning purposes only. On-site investigation is required to verify the existence of these soil classes.

Sources (see appendix): ???, also 1, 2, 3

Projects to Enhance the Transportation System

DRAFT

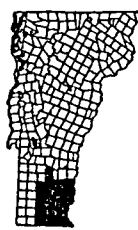
- Bike/ped or Enhancement Project
- Town Bridge Project
- Transit and Rail Project
- Rail Project
- Paving Project
- Traffic Operations Project
- Roadway Project
- Multi-modal Project
- Buildings Project
- State Bridge Project



2006 Windham Regional Plan

DRAFT

Future Transportation Network



This map shows in general the major features of the transportation network of the Windham Region. The proximity and connection between these features is represented, but the true locations are not depicted. Features and ocaions outside the region are not shown in their entirety; they are shown only to represent their connection to those features within the Region.

- Highway - higher traffic volume
- Highway - lower traffic volume
- Bus route - inter-city
- Bus route - fixed-route
- Bus service - in-town
- Rail service - freight
- Rail service - passenger

- Intermodal facility - freight
- Intermodal facility - passenger
- Train station
- Bus station (inter-city)
- Park and Ride lot
- Village with pedestrian facilities (sidewalks)
- Area to resolve functional conflict

