

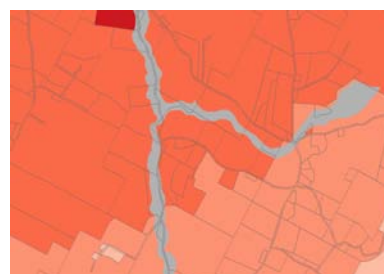


Central Vermont Regional Plan

2008

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Amended September 8, 2015



Central Vermont Regional Planning Commission
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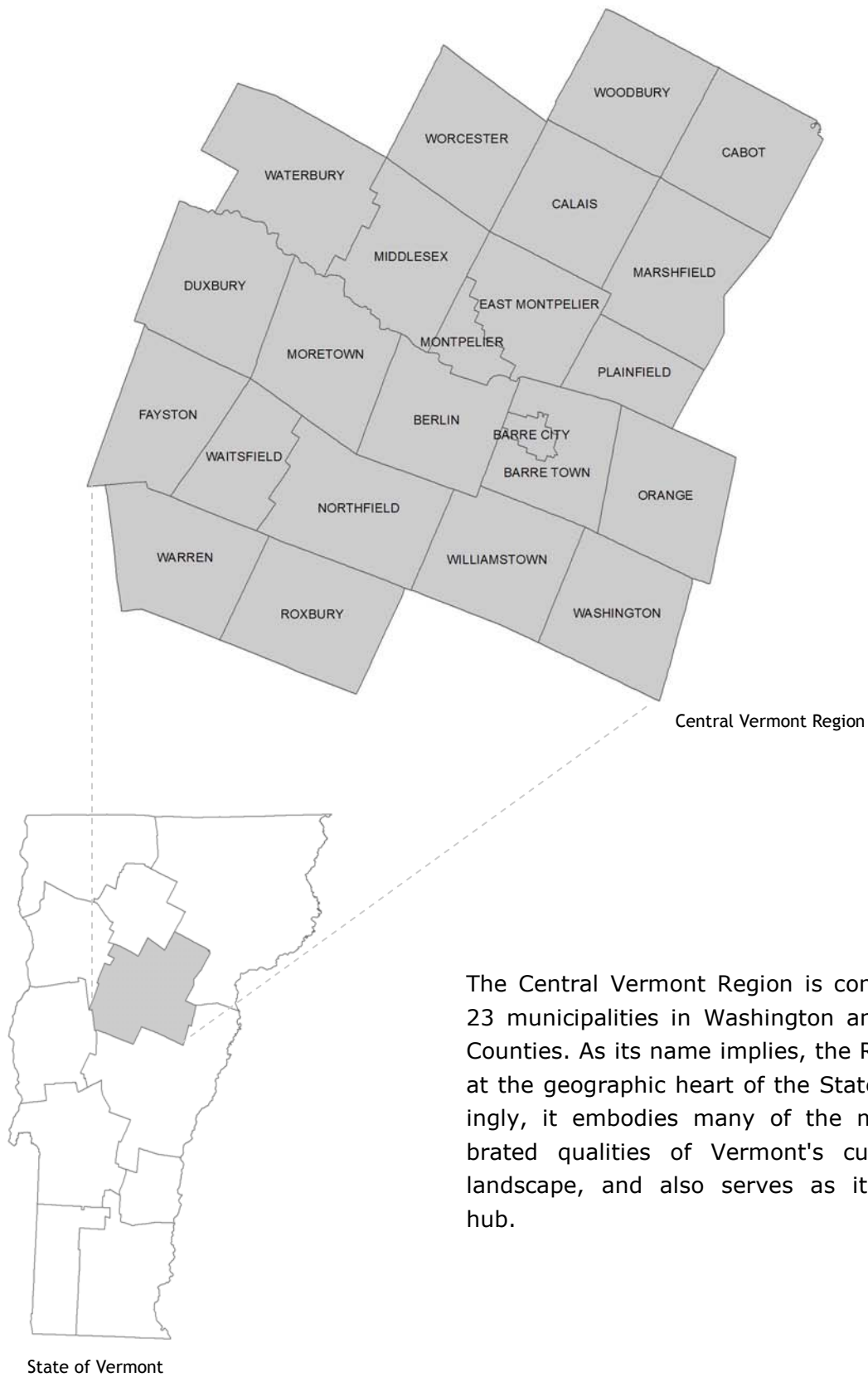
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The Central Vermont Region is comprised of 23 municipalities in Washington and Orange Counties. As its name implies, the Region lies at the geographic heart of the State. Accordingly, it embodies many of the most celebrated qualities of Vermont's culture and landscape, and also serves as its political hub.

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Introduction

PREAMBLE

The Central Vermont Regional Planning Commission (CVRPC) was created in 1967 under Vermont Statute Title 24, Chapter 117, to provide planning assistance to municipalities within the Region and create a forum for addressing those issues which transcend municipal boundaries. This same piece of legislation requires Regional planning agencies to prepare plans which are consistent with statewide goals and compatible with the plans of their member municipalities and adjoining Regions. This document seeks to satisfy that mandate.

CVRPC is not a part of state government, but is a creature of State Statute and bound by that Statute. Representatives appointed by the legislative bodies of its member communities govern the Commission's activities and policies.

OVERVIEW OF THE REGION

The Central Vermont Region is comprised of 23 municipalities in Washington and Orange Counties. As its name implies, the Region lies at the geographic heart of the State. Accordingly, it embodies many of the most celebrated qualities of Vermont's



Located along the northern spine of the Green Mountain range in the Central Vermont Region, Camels Hump, elevation 4,083 feet, is the highest undeveloped mountain in the state.

culture and landscape, and serves as its political hub, as well. Unfortunately, our problems are also typical of those in evidence throughout the State: a sluggish economy, inefficient use of resource lands, stressed infrastructure, and increased energy costs and consumption, among them.

Physically, the Region is transected by several north-south running mountain chains (e.g. Green Mountains, Northfield Range, Worcester Range, Irish Hills, Woodbury Mountains, and Groton Range) separated by fertile river valleys. The valley of the Winooski River is the exception to this pattern cutting across the mountains as it flows west to Lake Champlain. (See map: Topography)

It was in the valleys where early settle-

ment began where population, commerce, and infrastructure have historically been concentrated in compact hamlets, villages, and cities. Often the surrounding countryside and wilderness supplied the raw materials (e.g. lumber, granite, wool, grains, milk, etc.) for the manufacturing concerns of these centers.



Robinson sawmill, Calais, constructed 1803, is the oldest standing sawmill in Vermont.

In recent decades however, people, and to a lesser extent, commerce has shifted into the countryside. As a result of this trend, many of Central Vermont's rural municipalities have doubled their population while our largest cities have not grown at all, and even declined.

The reasons for shifting land use and habitation patterns are several: the emergence of commuter lifestyles, a population seeking rural environs, and the growth of resort areas and second home development, among them. All of these have been enabled by the advent and subsequent dominance of the automobile.

The fact that much of the Region's new growth has occurred along transportation corridors is no accident, and is often encouraged by land use regulations. Not until very recently have we noticed the more disturbing aspects of "strip development" and suburban sprawl.

Still, while Central Vermont is no longer immune to the perils and pitfalls of life in modern America, it remains a place of unique beauty, character, and promise. We are not yet "just like everywhere else." In fact, Central Vermont is diverse beyond its size. We are home to a golden dome, and an interstate highway, remote logging roads, covered bridges, fast food restaurants, a culinary institute, a military college, road houses, opera houses, ski condos, hunting camps, conservatives, liberals, farmers, artisans, lawyers, activists, teachers, bureaucrats, politicians, merchants, the unemployed, the elderly, and perhaps most importantly, children.

PURPOSE OF THE PLAN

Title 24 VSA Chapter 117 Section 4347 "Purposes of Regional Plan" states:

"A Regional plan shall be made with the general purpose of guiding and accomplishing a coordinated, efficient and economic development of the Region which will, in accordance with present and future needs and resources, best promote the health, safety, order, convenience,

prosperity and welfare of the inhabitants as well as efficiency and economy in the process of development. This general purpose includes, but is not limited to recommending a distribution of population and of the uses of the land for urbanization, trade, industry, habitation, recreation, agriculture, forestry and other uses as will tend to:

- (1) create conditions favorable to transportation, health safety, civic activities and educational and cultural opportunities;
- (2) reduce the waste of financial, energy and human resources which result from either excessive congestion or excessive scattering of population;
- (3) promote an efficient and economic utilization of drainage, energy, sanitary and other facilities and resources;
- (4) promote the conservation of the supply of food, water, energy and minerals;
- (5) promote the production of food and fiber resources and the reasonable use of mineral, water, and renewable energy resources; and
- (6) promote the development of housing suitable to the needs of the Region and its communities."

While the above language outlines the purposes of the Plan from a statutory standpoint, CVRPC views the Plan primarily as a means to enhance the lives of the Region's residents. Accordingly, the preservation and enhancement of the "quality of life" for all Central Vermont residents is the guiding principle of this Plan and the work of the Central Vermont Regional Planning Commission (CVRPC).

The term "quality of life" encompasses an array of factors that influence the level of satisfaction and enjoyment we are able to achieve in our day-to-day lives. As such, any analysis of quality of life must address both our basic needs and our desires and aspirations. Among these are:

- 1) A Safe Environment - Central Vermonters desire clean air, water and land, a safe multi-modal transportation system, and access to quality health care and emergency services;
- 2) Job Opportunities - We desire meaningful, secure jobs paying livable wages.

3) Natural Beauty - We place a high value on the scenery and resources the landscape provides.

4) Educational Quality - Central Vermonters of all ages should have access to affordable, quality educational opportunities to enrich their lives and improve their skills.

5) Low Crime Rate - Central Vermont residents should live safe from crime.

CVRPC hopes this Plan reflects our desire to live in a Region that will be a model of health, wealth, knowledge, beauty, culture, and community for many generations to come. It is a goal of CVRPC to define, quantify, and track these elusive concepts over the next five year planning period.

IMPLEMENTATION

This Plan presents the most recent demographic and statistical data available during the period over which it was written. Much of this information comes from the 2000 U.S. Census; however, a variety of other sources are used, as well, including state and local reports. In addition, demographic projections ("Economic and Demographic Forecast, Central Vermont Regional Planning Region 2000 to 2020") were developed for CVRPC by Economic & Policy Resources, Inc. These projections are incorporated by reference as an appendix to the Plan. Data sources have been identified for all charts and tables cited in the text.

In the course of preparing this Plan, CVRPC agreed to compile data that is not included in the body of the 2003 Plan, but which may be significant or useful in identifying and understanding important Regional trends in the 2008 Plan. CVRPC intends to track these indicators over the life of the Plan (and beyond) in order to monitor changes in the Region's quality of life and help identify meaningful policies and programs for the future.

Throughout this document are specific policies, recommendations, strategies, offers and proposals designed to reflect the values of Central Vermont residents and help realize the goals of this Plan. It is primarily through the statutory functions and obligations of CVRPC, and the initiative of the Region's municipalities, that these and other aspects of the Plan will be implemented. Title 3 Section 4021 of the Vermont Statutes also stipulates that State agency plans must be compatible with Regional plans, as well as approved municipal plans. In this regard, CVRPC believes that the definition of growth centers used by State agencies should be compatible with that

of the Regions. A six point implementation program is highlighted in the following passages:

- CVRPC will review this Plan in preparing its annual work program, and in all of its internal decision making, so as to ensure that our actions are consistent, defensible, and purposeful. In addition to the work plan required by the Department of Housing and Community Affairs, there will be a Regional Plan implementation schedule which will establish priorities of key Plan goals for implementation followed by an annual review to evaluate progress, analyze current data, re-assess priorities, and consider possible amendments to the Regional Plan.
- CVRPC will continue to provide technical assistance to member municipalities in the areas of community planning, bylaw development and administration, capital budgeting, community development, and GIS in accordance with our membership services policies. We will do so upon request and in support of those policies of this Plan which encourage action at the municipal level. In addition, CVRPC will continue to provide local officials and interested citizens with information and training on the complete range of topics and issues presented in this Plan. We will do so through periodic workshops, newsletters, public forums, and the provision of materials and information upon request.
- CVRPC will review State agency plans and programs to assure that they are consistent with the goals and policies of this Plan and those of member towns.
- When requested, CVRPC will review municipal plans for consistency with this Plan.
- CVRPC will maintain and strengthen its commitment to Regional and inter-municipal issues and programs in accordance with, and in support of, this Plan. Specifically, we will continue our technical support services for the Mad River Valley Planning District, the Wrightsville Beach Recreation District and the Mad River Solid Waste Alliance. In addition, we will continue to provide Region-wide transportation planning services. Finally, we will respond to inter-town conflicts or opportunities with mediation or technical assistance services, where appropriate.
- CVRPC will continue to participate in Act 250 proceedings in accordance with our adopted guidelines for the purpose of advancing the goals of this Plan.

The goals and policies of this Plan should be reasonable and uniformly applied. No specific goal or policy of the Plan should be construed or applied in isolation from

the other goals or policies of the Plan. The implementation of these goals and policies will not be contrary to the public interest or the doctrine of private property rights.

COMPATIBILITY STATEMENT

It is the Commission's belief that this Plan is compatible with the plans of our neighboring Regions and with those of municipalities within the Central Vermont Region. In other words, and in accordance with Chapter 117 mandates, this Plan "as implemented, will not significantly reduce the desired effect of the implementation of the other plan(s)."

It can be seen that almost everywhere the Central Vermont Region abuts other Regional commissions' jurisdictions, land uses are either very low intensity or near wilderness in nature as significant mountain ranges bound us to the west and east. In addition, most human activity is focused toward the center of the Region. Because of this geography, opportunities for land use (or other conflicts) with neighboring Regions are limited.

There was a conscious effort in the writing of this Plan not to usurp the authority or planning functions of Central Vermont's municipalities. This is made clear in the Plan's purpose statement, and elsewhere, in policies which support local initiatives and offer Commission assistance in the realization of the same.

Furthermore, the Regional Planning Commission does not believe there are any significant conflicts between this Plan and any municipal plan that has received the approval of this Commission. Should a conflict arise between this Plan and a municipal plan approved by this Commission, such conflict should generally be resolved at the most locally appropriate level. As such, the municipal plan should take precedence on impacts that are local in scope, while the Regional Plan should prevail where "substantial Regional impact"¹ may result. Individual projects may have aspects that fall under either jurisdiction. For instance, a large, new commercial de-

¹ Development projects of substantial Regional impact are those that will have substantial and ongoing impact on two or more municipalities, including the host municipality. Among the development projects of substantial Regional impact are those that will likely impact on a resource within the Region which is widely used or appreciated by people outside of the locality in which it is located. Development projects of substantial Regional impact are those which may affect settlement patterns to the extent that the character or identity of the Region (or its sub-Regions) is significantly affected. Development projects of substantial Regional impact are those that are likely to alter the cost of living, availability of choices, access to traditional way of life or resources widely used or appreciated by Regional residents. In addition, because CVRPC has defined housing as a critical need for the Region, CVRPC will participate in the Act 250 review for any project which proposes to: increase the total number of year round housing units (according to the most recent U.S. Census) in its host municipality by more than 2%; or create more than 30 housing units of any type; or create more than 5 "affordable" housing units, as defined by VSA Chapter 117 Section 4303.

velopment could have transportation impacts that extend beyond the host community, but have aesthetic concerns that are purely local. It should also be noted that, in accordance with CVRPC's Act 250 Review Policies, the Commission's position on any Act 250 project shall be based solely upon those aspects of a project that may have Regional impact.

CVRPC also recognizes that it is possible that even where the Regional Plan and the local plan appear to be compatible, differences in the interpretation and application of plans can and do occur. CVRPC will attempt to identify such discrepancies as early as possible in any relevant review process and notify the affected municipality accordingly. CVRPC will offer to meet with representatives of any municipality with which it may have a disagreement in an attempt to resolve any differences prior to issuing a final position or decision. However, CVRPC will retain its statutory right to reach independent judgment in any and all such instances.

Copies of the proposed Plan have been sent to neighboring Regional planning commissions and all Central Vermont municipalities in order to solicit feedback, comments and suggestions

STATEMENT OF BASIC POLICIES

The Central Vermont Regional Planning Commission is charged with promoting mutual cooperation among its member towns in the planning and development of sites and infrastructure necessary to meet the future needs of the Region's residents. This Plan is intended to guide future growth and development, infrastructure investment and environmental protection in Central Vermont by providing a framework within which the basic human needs of clean air and water, access to employment, food and shelter, and emergency services sufficient to provide personal safety can be satisfied. In doing so, it strives to promote a healthy natural environment, quality educational systems, and broad access to recreational and cultural opportunities. Although this Regional Plan has a statutory life of only five years, it is written using the year 2008 as a bench mark while keeping an eye toward the even more distant future.

Attainment of goals set by this Plan will require a commitment to a vision of the Region as a community. In planning for the long term public interest of the Region, CVRPC can play a vital role in assessing the strengths and opportunities by finding and building solutions to those issues that transcend town boundaries. Towns no longer function as self-sufficient islands in providing services, employment and education. The interrelationships and interdependence between towns within the Region are clear.

The goals and objectives of each element of this Plan implement the following broad policies of the Central Vermont Regional Planning Commission:

- CVRPC in cooperation with its member municipalities and neighboring Regions seeks to guide the future of development to gain the maximum benefit for the least cost.
- CVRPC is dedicated to the promotion of the economic, social and educational well being of the Region and its residents by supporting the creation of opportunities for self-improvement while protecting individual rights and liberties.
- CVRPC encourages planning that identifies, respects and preserves our important historic, natural, cultural, and recreational resources.
- CVRPC promotes housing availability to meet the needs of people of all socio-economic levels.
- CVRPC seeks to maintain a healthy environment and to respect the Region's historic settlement patterns.
- CVRPC promotes diversified economic development and the creation and/or maintenance of sufficient jobs for all residents.
- CVRPC encourages development patterns which result in more energy efficient transportation patterns.
- CVRPC encourages investment in public facilities and services in areas of population and economic growth.
- CVRPC supports the identification and utilization of economic growth centers as a method of achieving development patterns that are mutually advantageous to the environment and the socio-economic needs of the Region's towns.

(The use of the word "encourage" in this Plan is intended to mean "to foster or give support to" and is not intended to indicate any mandates.)

ACKNOWLEDGEMENT OF CHANGING CONDITIONS

By law, Regional plans in Vermont have a statutory life of five years. The information and policies presented in this document represent CVRPC's best effort to present an accurate and useful picture of conditions in Central Vermont at the beginning of a planning period starting in the summer of 2008. We recognize, however, that we live in dynamic times and that some of the facts, issues, and concerns presented here may change over the life of this Plan. If conditions warrant amendments to the Plan prior to its expiration date, the Commission will respond accordingly.

Land Use Element

The land, or more broadly, the natural earth, is the source of all that sustains human life. This fact is sometimes easy to forget in modern America. Water pours from our taps. Food is purchased, often already prepared, under the fluorescent lights of the supermarket. Clothing hangs from a rack at the corner boutique. Shelter is erected for us out of "construction materials" on "building lots."

Yet, we remain inextricably dependent upon natural systems. Traced to their origins, all of life's necessities are products of the earth and its processes. So are we.

Over the past several decades, Vermont has witnessed dramatic cultural change. Technological advances in the areas of transportation and telecommunications have been the primary agents of this transformation, opening up what was a fairly insular, self-sufficient rural society to the "outside world." With this exposure came new people, new development, and new social, economic, and land use patterns. Some of the changes the State has experienced have been beneficial; some have not.

While people may always argue about the pros and cons of technology and land development, they are part of our current reality. The challenge before us now is to guide these forces of change so as to bring about a marriage between our culture and our place that is sustainable, harmonious, and mutually beneficial. In the years to come, nothing will say more about the success of our efforts than the way in which people use the land and its resources.

DISCUSSION: TRENDS

In recent decades, the amount of land in agricultural production and wetlands has diminished, as forested and developed lands have expanded. While it is always difficult to predict the future, especially for the long term, certain expectations regarding land use seem reasonable, at least over the life of this Plan. Among them are:

- Land in agricultural production will continue to decrease. While the rate of change could depend on a number of factors, including Federal policies and pricing, development pressures, market influences, and taxation policy, the rate of loss is expected to slow given stronger protective measures now in existence, the emergence of land trusts, and the fact that most of the marginal farms are no longer in business leaving only the finest soils still in production. Some of the farmland lost over the next five years will revert to the forest/brush category and some will be converted for development.

Central Vermont Land Uses, 2002*

Land Use	Acreage	Percent of Region
Forest Land	404,127	77.53%
Ag/Open Land	66,257	12.71%
Scrub/Shrub	18,113	3.47%
Residential	15,600	2.99%
Surface Waters	6,075	1.16%
Wetlands	3,233	0.62%
Commercial/ Services	2,837	0.54%
Industrial	1,560	0.46%
Institutional/Government	1,317	0.25%
Roads and Parking Lots	1,132	0.22%

*The information for this table was derived from the interpretation of aerial photographs supplemented by field checks. Figures for "developable" land include only those portions of a parcel committed to a given use and not necessarily the entire acreage of the parcel within which the use occurs.

- Wetland acreage will stabilize due to the existence of strict, protective regulations at the Federal, State, and sometimes local level.
- Acreage in forestland may increase slightly, but will not change dramatically. Conversion to development will probably be offset by vegetative succession of abandoned farmland.
- Developed land will increase. The amount of land converted to development will be a function of several variables, including: the Regional economy, population trends, regulatory controls, and the patterns of growth.

PRODUCTIVE RESOURCES

Central Vermont possesses "working landscapes" where people manage, nurture, and harvest the resources of nature. Farmlands, forest lands, and lands containing mineral resources are vitally important to the economy and character of our Region.

This Plan encourages the protection of resource production lands and the livelihoods of the people who use them by recognizing their benefits, promoting their products, and rethinking the attitudes, policies, and land use patterns that threaten their existence.

Agricultural Land

In spite of the general decline of agriculture, farming and farmlands continue to contribute many millions of dollars annually to the economy of the Region, and directly provide over one thousand jobs to its residents, and many more indirectly. According to the 2005 Vermont Occupational Employment Projections, farming and forestry is still projected to account for about 1,000 jobs in Central Vermont in 2012.¹ The lure of our pastoral landscape yields substantial indirect benefits from tourists, as well.

In addition, the case can be made that preserving farms and farmlands may help preserve urban economies. Sprawling suburbs, office parks and shopping malls in now agricultural areas would likely contribute to the demise of downtown businesses and neighborhoods.

Farming helps to define the Region's cultural identity and provides Central Vermont residents with open space, recreational opportunities, aesthetic pleasure, and a sense of place. More importantly, farms and farm soils, if protected now, can assure us of some degree of Regional self-sufficiency in the event that outside food supplies dwindle, are cut off, or become prohibitively expensive. While such scenarios may seem far-fetched for the short term, a number of circumstances already in motion could make them a reality within our lifetimes. Among such circumstances are: global climate change, dwindling and

Vermont Agricultural Soils

See map: *Central Vermont Primary Agricultural Soils*

Agricultural Value:

1, 2, and 3 have few limitations restricting their use; these soils are level to gently rolling and are the most productive.

Soils in classes 4, 5, 6, and 7 have more limited agricultural value due to slope, excessive wetness or shallow depth to bedrock.

Classes 4 and 7 are Federally classified as "statewide," but within Vermont agricultural values 1 through 7 are all categorized as "primary agricultural soils."

Vermont soils are identified by USDA/NRCS in its publication *Farmland Classification Systems for Vermont Soils* (June 2006 edition).

USDA/NRCS acknowledges those soils with agricultural values of 1 through 7 as demonstrating the characteristics needed for various agricultural uses. This compilation is updated when necessary, is available in print, on the internet, and on CD-ROM.

Complete details are available at: www.nrb.state.vt.us/llup/publications/importantfarmlands.pdf

The Vermont Center for Geographic Information: www.vcgi.org

Your nearest office of the USDA/NRS, or online at:

www.vt.nrcs.usda.gov/soils/

<http://websoilsurvey.nrcs.usda.gov>

¹Vermont. Department of Labor: 2004- 2014 Occupational Employment Projections.

expensive energy reserves, disease susceptible mono-culture farming in major production areas, soil salinization and water shortages in these same locations, trade fluctuations, and worldwide population increases.

Farmlands provide a variety of environmental functions from which we all benefit. They provide wildlife habitat. They capture carbon dioxide, thereby maintaining air quality. They help protect the integrity and function of our flood plains and wetlands. They can help maintain water supplies through groundwater recharge. Farms, as they exist in Central Vermont, are part of, and contribute to, the natural systems that sustain life.

In light of all this, a strong, healthy agricultural economy is vital to the Region's well-being. The limited supply of primary agricultural soils, their general suitability for septic systems, combined with agriculture's increasing dependence on higher quality land make it crucial that land use decisions display foresight and recognize the importance of these soils to future generations. As such, it is a primary goal of this Regional Plan to preserve and promote a viable agricultural economy, culture, and land base.

Forest Land

Forestlands provide many benefits to Central Vermont residents. The timber industry contributes greatly to our economy, providing many jobs and important wood and paper products. Forests contain habitat essential to a variety of wildlife species and help protect and replenish surface and groundwater supplies. They also perform an important atmospheric cleansing function protecting the quality of the air we breathe. Many recreational pursuits are dependent on, or enhanced by, forestland, as is the aesthetic quality of the Region.

Approximately 77% of the total land area in Central Vermont is forested. However, large tracts of managed, productive timberlands are being lost to subdivision and development due to inflated land prices and the comparative economic hardships of forestry use. Often such development does not significantly decrease the overall forest acreage, but fragments ownership so that unified or even individual management becomes difficult. Still, many large, healthy tracts remain.

Since private landowners own a majority of the Region's productive forestland, it is important that these lands are conserved through sound, long-term forest management programs, and compatible patterns of growth and development. Productive forestlands are defined as all large tracts which in themselves, or when combined, form a major economic unit for long-term timber production.

Mineral Resources

The mineral deposits of Central Vermont are recognized as an important resource. The presently known mineral resources of the Region include granite, talc, asbestos, chromite, verde antique, sand and gravel.

The granite quarries of Barre Town and granite industries of Barre City, Berlin, Calais and Montpelier are major contributors to our economy and living monuments to a colorful part of our Regional heritage. While sand and gravel deposits are less renowned, they play an important part in local and personal economies and are relied upon by municipalities for road building and maintenance materials.

The products of earth resource operations are so important that we must accommodate them even as we guard against their more harmful aspects. This is an example where the planning process can be used to encourage locations and operating procedures that could minimize the conflicts and uncertainties of the regulatory process.

RESOURCE PROTECTION

Within our Region's boundaries are many ecologically sensitive areas and resources that serve as symbols of our natural heritage and barometers of the Region's environmental health.

These environmentally sensitive lands are not mere amenities. They have great value for education and research and for the understanding and appreciation of natural systems and processes. They perform critical ecological functions, enhancing the stability and diversity of ecosystems. They also provide aesthetic relief and recreational opportunities, and hence, economic benefit.

The preservation of ecologically sensitive places is a goal of this Plan. Human use of such areas should be accomplished in a manner which protects their integrity and function.

Resource protection lands include: natural and fragile areas, critical wildlife habitat, groundwater recharge areas, surface waters, wetlands, floodplains and scenic areas. (See maps: *Natural Resources 1* & *Natural Resources 2*)

Natural and Fragile Areas

Natural and fragile areas are, according to Vermont Statute, "areas of land or water which have unusual or significant flora, fauna, geological or similar features of sci-

entific, ecological or educational interest." For the purposes of this Plan such places include: sites listed on the Vermont Fragile Areas Registry, natural areas identified by the Vermont Natural Heritage Program, and elevations over 2,500 feet as shown on USGS topographic maps.²

Critical Wildlife Habitat

Our native wildlife species are valued by Central Vermont residents in a variety of ways for a variety of reasons. Some merely enjoy their presence as a reflection of nature's spirit. Some rely on wildlife for sport, food, or income (direct and indirect). Others have scientific or academic interests in wild creatures. For many of us, a combination of the above factors plays a role in our appreciation of wildlife.

Our most critical wildlife species are generally thought of as those which yield significant economic return, provide for sport and subsistence hunting, are symbolic of wilderness values, or face the threat of extirpation or extinction. We know that viable habitat is the single most important survival need for most of these species; yet for many, habitat loss and fragmentation is a real and present threat. As defined by the Vermont Department of Environmental Conservation, critical habitats are: white-tailed deer wintering areas, black bear reproduction zones, and any areas necessary to support the food, shelter or breeding needs of rare, threatened, or endangered species.³

Groundwater Recharge Areas

Well over half of Central Vermont's residents, and many of its businesses and industries receive their water from subterranean sources. In our rural areas, this figure rises to almost 100%. In general, groundwater sources in Central Vermont are plentiful and of good quality. In addition, groundwater is usually less susceptible to seasonal fluctuations and contamination than surface water making it an ideal source for public, urban supplies.

Incidents of groundwater contamination are on the rise, however, primarily due to improper activities within those areas which serve to replenish supplies.⁴ Sources of groundwater contamination in Central Vermont include domestic sewage, landfills, improperly disposed of hazardous wastes, leaky underground storage tanks, pesticides and fertilizers. Supply quantity is threatened in some locations, as well, because of an increase in impermeable surfaces in aquifer recharge areas.

² Vermont. Agency of Environmental Conservation. Vermont Fragile Areas Registry 1982

³ Vermont. Department of Environmental Conservation. Critical Habitats.

⁴ Greenberg, A.S. Groundwater Quality Protection and Planning: A Guide for Local Government, UVM, 1991.

Once contaminated, groundwater supplies are difficult and expensive to rehabilitate. New sources may be hard to find, costly to develop, and susceptible to the same fate as the tainted source, if treated similarly. It is critical, therefore, that our existing and future groundwater supplies are protected. The future of our municipalities and their prospects for new growth and development depend upon the quality and quantity of this important resource.

The State of Vermont has adopted an aggressive groundwater management strategy designed to promote a proactive approach to the protection of subterranean water supplies. This strategy includes the delineation of critical recharge zones (known as Wellhead Protection Areas or WHPA's) for public water supply systems and the establishment of land use guidelines to reduce contamination potential on these sites. Although WHPA's have no individual regulations attached to them, existing State regulatory programs will regard them as "red flags" indicating the need for special consideration of proposed development activities. In addition, the Department of Environmental Conservation requires that a "source protection plan" that minimizes the contamination risk within WHPA's be developed.

Surface Waters

The Region's lakes, ponds, rivers and streams represent an invaluable resource. They provide water for drinking, and domestic and industrial uses. They generate hydroelectric power. They dilute and assimilate various effluent. They provide recreational and aesthetic values for public use and enjoyment. They also contribute to the propagation of fish and wildlife and to economic development.



Canoeing on Wrightsville Reservoir, Middlesex, Vermont.

Streams, rivers and lakes with adequate vegetative buffers on their shorelines enhance the benefits of the resource. Vegetative buffers protect shorelines from flood flow and ice damage, prevent bank erosion, are aesthetically pleasing, and maintain a cool water temperature, an adequate oxygen level for fish habitat, and effluent assimilation capacity.

Unfortunately, the demands that we place upon surface waters are often incompatible and detrimental to their overall quality and function. Our challenge is to balance our needs with respect to surface waters and to adjust current development practices so as to minimize their harmful impacts.

Floodplains and Fluvial Erosion

Floodplains are areas of land adjacent to a water body that are frequently inundated by water. While these places serve important ecological functions, including flood-water storage, sediment trapping, nutrient filtering and aquifer recharge, they also can be hazardous to human life and property. Arising from a variety of causes, including heavy rain, melting snow, ice jams, poor drainage and dam breaks, flooding is the most frequent, damaging and costly type of natural disaster experienced in the State and Region. In fact, over the last 50 years flood recovery costs have averaged \$14 million per year (not adjusted for inflation) statewide.



Fluvial erosion along the Mad River, Waitsfield, Vermont. Image courtesy of VTDEC River Management Program.

Floods cause damage in two distinct, but related, ways. Inundation can fill structures with water and cause property damage and drowning. It is a great concern for those living in or near flood hazard zones. Surprisingly, however, fluvial erosion, including bank failure and changes in river channel courses during floods, actually causes more damage.

Unfortunately, our society's historical response to floods has been to treat the symptoms rather than the causes of floods – repairing damages rather than preventing them. Furthermore, some of

the traditional “cures” actually exacerbate the problem they attempt to fix. The disaster response paradigm is changing, however, and CVRPC has been taking an active role in both inundation mitigation and fluvial erosion hazard mitigation.

In response to recent program and mapping changes made by the Federal Emergency Management Agency (FEMA) to the National Flood Insurance Program (NFIP), we have been working with our member municipalities to help them identify and correct any deficiencies in their flood hazard regulations and/or maps. This program identifies those areas within a flood hazard zone (the area inundated by water during a flood with a statistical probability of occurring once every 100 years – i.e., the “One Hundred Year Flood”) and prescribes development review guidelines and pro-

cedures for lands within regulated areas. Compliance with these Federal standards is required for continued NFIP eligibility. Residents of municipalities that lose eligibility would face prohibitive costs for insurance protection outside of the program. Most of the Central Vermont Region is facing a 2009 deadline for program compliance.

On the fluvial erosion front, we have been working with the State of Vermont and member towns to conduct fluvial erosion hazard assessments for many river and stream segments in the Region. Using field surveys and GIS technology, we have completed (or will soon complete) erosion hazard maps for sections of the main stem of the Winooski River and many of its tributaries, including the North Branch, Jail Branch, Stevens Branch, Kingsbury Branch, as well as and the Dog and Mad Rivers. It is hoped that municipalities will use this information to help avoid future life and property damage.

According to the Vermont River Management Program, "the largest single source of flood losses, both in terms of cost and the number of people affected, is damage to transportation infrastructure." Undersized, or blocked bridges and culverts are a main culprit in exacerbating flooding and erosion hazards. Accordingly the Commission has, through our Bridge and Culvert Program, completed detailed inventories of these structures to provide our municipalities with information on the exact locations and specifications.

Finally, we continue to work with our communities on pre-disaster mitigation planning (see Utilities, Facilities and Services Element) in order that they meet the Federal eligibility requirements for disaster recovery and mitigation funding.

Wetlands

Wetlands are areas of land that are "inundated or saturated with water for varying periods of time during the growing season."⁵ Wetlands help make the environment more livable. They are among our most productive and diverse biological communities. They purify surface and underground water supplies. They are natural flood storage areas during wet periods and replenish reservoirs during dry spells.

Although wetlands can sometimes present significant and costly obstacles to development, over the past century or so more than one half of the original wetland acreage in New England has been destroyed. Now that we are beginning to understand the important ecological functions that wetlands perform, these special areas are receiving greater protection.

⁵ Vermont Agency of Natural Resources, Department of Environmental Conservation, [Vermont Wetlands Conservation Strategy](#).

Scenic Areas

Central Vermont is a place of celebrated natural beauty. Its scenic landscapes not only enrich lives and spirits and attract new businesses and residents, they also provide the basic ingredient for one of the Region's most important industries - tourism. Each year thousands of visitors travel here to see the mountain vistas, pastoral scenes, fertile valleys, historic villages, Interstate 89 (which has received awards for its scenery), remote back roads, and woodlands ablaze with autumn color. Thus, it is in our best interest, both psychologically and economically, to preserve the best of Central Vermont's visual splendor.

LAND DEVELOPMENT ISSUES

As our population increases and ages, more people require shelter, jobs, and places to purchase and manufacture goods. Consequently, growing areas, or areas preparing for growth, must find the ways and means to accommodate new construction. In Central Vermont, the pace of new construction has greatly exceeded the rate of population growth over the past few decades. In fact, since 1970 the number of new housing units and businesses here has increased at more than twice the rate of the population. This fact is, in part, indicative of society's appetite for new products, personal services, and independent living, and in part due to comparatively large growth in the Region's 18 - 64 year old age cohort group.

Given the uncertainties of the economy and vagaries of society, it is difficult to say whether this trend will continue unabated over the next few decades. However, it is safe to forecast that growth and development will continue at some level, and that the Region must be prepared to accommodate this growth for the good of its residents and its economy. At the same time, it is important to acknowledge that there are physical, ecological, and economic limits to current patterns of growth and development. Accordingly, the development policies presented in this element are intended to guide new land development so as to maximize its economic and societal benefits while avoiding, to the extent practicable, its environmental and societal pitfalls.

Residential

Over the past few decades, the rate of housing growth has grown faster than that of population growth (see chart: Housing Units vs. Population in the Central Vermont Region 1970-2000). A decrease in average household size, a larger adult population, and an increase in the number of vacation units are primarily responsi-

Housing Units vs. Population in the Central Vermont Region 1970-2000

	1970	1980	1990	2000
Total Housing units	17,208	23,655	27,577	29,912
Percent change		37.5%	16.6%	8.5%
Total Population	50,688	56,290	59,619	63,276
Percent change		11.1%	5.9%	6.1%
New units		6447	3922	2335
Population increase		5602	3329	3657

SOURCE: United States Census Bureau. Selected Housing Characteristics. 2000

ble for this phenomenon. (For more discussion see: Housing Element.)

Commercial/Industrial

Like residential growth, commercial and industrial expansion has out paced population increases in Central Vermont. In fact, the 80's witnessed a 46% growth in the number of business establishments in our Region compared to a modest 11% growth in the number of residents. With an increase in the Region's working age population, more business growth is likely and necessary.

Employment statistics seem to indicate that the location of many of Central Vermont's new business establishments reflects the increasing consumer base of the Region's rural towns and semi-rural bedroom communities. In fact, between 1982 and 1990, 3559 of the 4328 new jobs (82%) and 361 out of 471 new employers (77%) were established outside of the Region's urban core (i.e. Barre City and Montpelier).⁶

Often, new businesses have located along the state highways and collector roads which bring commuters back and forth to work and tourists to and from their destinations. While only a few locations have experienced full blown "strip development," most of the Region's major corridors are witnessing the early stages of this impact. The above generalizations are not intended to apply to traditional home occupations or modestly scaled self-employment enterprises. Such activities generally do not alter the character of the areas in which they are situated, offer goods and services which may be inappropriate or unnecessary in densely settled locations, and are usually so small in scale and impact so as to have, individually, no Regional signifi-

⁶ Vermont Department of Labor Statistics

cance. For more discussion see: Economic Element.

Growth Patterns/ Growth Centers

Historically, in Central Vermont most new growth occurred in a compact form within or adjacent to established centers (or so as to create new ones). This pattern allowed businesses and residents to take advantage of existing services and facilities and helped to reinforce the economic and social importance of our cities and villages.

Over the past several decades, however, this pattern has begun to be disrupted. Much of the residential construction over the past thirty years has taken place on large lots located on the back roads of predominantly rural communities. With greater frequency, new businesses have located along the state highways, interstate exits, and collector roads which bring commuters back and forth to work and tourists to and from their destinations, or in areas where other infrastructural improvements have been provided. While only a few locations have experienced full blown "strip development," or suburban sprawl, most of the Region's communities are witnessing the emergence of these patterns to some degree.

Generally speaking, Vermonters have come to the realization that such patterns of growth are often unnecessarily consumptive of land and energy, taxing on public services, destructive of downtowns, inflationary for land and housing costs, and in conflict with the aesthetic character of the Region. Accordingly, we as a State have embraced the notion that our interests would be best served by concentrating new development in existing settlements and/or mixed use zones called "growth centers." CVRPC, too, has supported this so called "smart growth" concept with the expectation that a future influenced by this model would deliver economic, social, and environmental benefits to the Central Vermont Region, specifically:

- maximizing the utility and efficiency of public service, energy and infrastructure expenditures;
- reinforcing and revitalizing the role of the Region's villages and cities as centers of commerce, industry and community life;
- reducing development pressures on important natural resource lands;
- preserving the character and aesthetic integrity of the Region and thereby, the tourism economy it fosters; and
- delivering less ambiguous messages to the development community, and providing for less risk in the permit process.

In the 90's and early 2000's, CVRPC attempted to implement this vision through our Growth Center initiative. The purpose of this program (developed in the absence of

a statewide response) was to recognize and facilitate an approach to encouraging compact growth that was locally initiated, yet consistent with sound planning principles and the greater good of the Region. Under this program, designation entitled the recipient community to the Commission's support in directing growth to such zones – through the Act 250 process, technical assistance, or other means.

In 2006, CVRPC's program was superseded and rendered obsolete by Act 183, Vermont's ambitious new "Growth Center Law." Though the goals of the State program are similar to the Commission's now defunct program, the Act incorporates a far more rigorous application and qualification process in return for more tangible benefits. The State program requires that the proposed growth center:

- be integrated in or adjacent to a designated downtown, designated village, or designated new town center
- adhere to "smart growth" principles (e.g. mixed uses, higher densities, pedestrian scale, etc)
- be reflected in a local plan which has received Regional approval, as well as in the local bylaws and capital budget
- be "of an appropriate size sufficient to accommodate a majority of the projected population and development over a 20 year planning period."

A great deal of documentation (including population projections, "build out analyses"/GIS mapping, calculations of infill potential and land area needs, and other studies) is required in the application process to demonstrate adherence to these mandates. In return, and upon approval by the Downtown Development Board, State designated growth centers receive the following major benefits:

- Eligibility for Tax Increment Financing (TIF) (This allows municipalities to borrow against future tax revenues of properties benefiting from public improvements, thereby facilitating infrastructure development.)
- Relaxation of Act 250 standards including: higher jurisdictional thresholds for affordable housing projects, greater ease of master plan permitting, and a lower ratio for the mitigation of primary agricultural soils impacted by development (1:1 within as opposed to 2:1 outside of growth centers).
- Priority eligibility for a variety of State funds and programs.

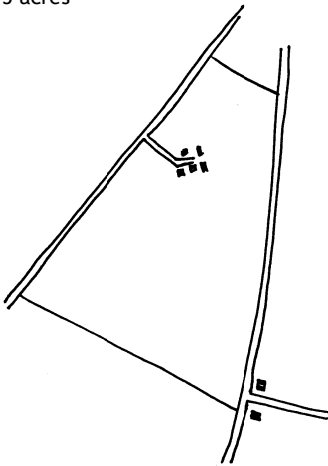
Open Space Subdivision

CVRPC recognizes that not all new growth will or should occur within growth centers. In fact, some industrial or warehousing operations may be incompatible with the mix of uses found in traditional growth centers, and hence better suited to sin-

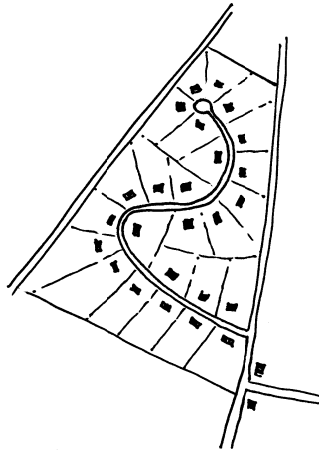
gle use industrial parks. However, even for development outside of growth centers there are often preferable alternatives to standard residential, commercial and industrial subdivisions. Most of these alternatives involve allowing increased density on a portion of a subdivided parcel in return for a commitment to keep some portion of the tract undeveloped. Such techniques (sometimes called "planned unit," "cluster" or "open space development") can help a community meet its open space and natural resource protection goals, and concentrate its service areas, while allowing the landowner to realize his or her property equity. In addition, this form of development may reduce the cost of housing while providing home buyers with reasonably sized lots and access to protected open spaces. Research has shown that homes in "clustered" subdivisions generally appreciate faster than those in conventional subdivisions, may reduce the developer's infrastructure investment by 30 to 50 percent, and can reduce municipal service costs significantly.

Open Space Subdivision

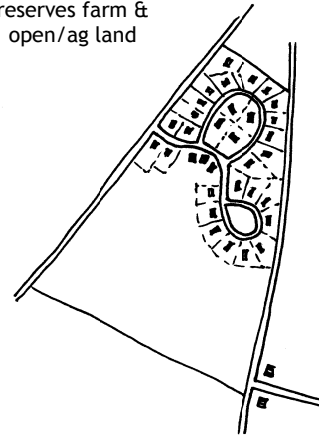
Existing Farm
• 75 acres



Conventional Subdivision
• 25 three acre lots



Open Space Subdivision
• 30 one acre lots
• Preserves farm & open/ag land



Unfortunately, some towns' current regulatory practices make it difficult to achieve clustering on single lot subdivisions which comprise much of the new residential growth. In addition, site conditions may impose constraints in some multi-lot developments. Still, clustering is a concept which may help to bring our housing needs and open space/resource goals into partnership where they have traditionally been at odds.

Interstate Interchanges

There are six interchanges on Interstate 89 within the Central Vermont Region (Williamstown/Northfield, South Barre, Berlin, Montpelier, Middlesex, and

Waterbury). While they vary in the intensity and type of development they currently support, each of these interchange zones has the potential for growth, and local by-laws allow for some commercial development in each instance. The form and function of the Region's interstate interchange areas are important for transportation, as well as aesthetic and economic considerations. Uncontrolled, unplanned growth in these areas could clog roads, sap the vitality of existing centers, and negatively affect the character and image of the Region. Thoughtful development could provide needed services, jobs, and reinforce existing development patterns. It should be recognized that not all interchange zones are appropriate for the same kind or degree of new growth.

The State of Vermont, by Executive Order and through the auspices of the Agency of Commerce and Community Development, has recognized the importance of interstate interchange areas through the production of a manual titled "Vermont Interstate Interchange Planning and Development Guidelines." This document explores policy issues, characterizes interchange areas by type, and offers text and pictorial guidelines to illustrate both the consequences of poor design/policy and the advantages of alternative design options.

Several municipalities in Central Vermont are taking a more active role in shaping their own destinies with respect to this issue. Both Berlin and Middlesex have developed plans that emphasize village type development for the future growth of their respective interchange zones.

CVRPC is currently working with Berlin to develop zoning bylaw amendments for a town center district in the vicinity of Interstate Exit 7.

"Build-out" Modeling

Advances in computer programming have provided CVRPC with some new tools to help municipalities evaluate their growth potential and growth management strategies. Since 2004, Commission staff has been working with local planners on a variety of "buildout modeling" projects. These exercises employ GIS programs to produce maps and data which can be used to determine a community's potential future growth under current (and/or alternative) local bylaws and land capabilities. CVRPC then uses this information to evaluate the efficacy of existing regulations in achieving the vision articulated in local plans, and to help formulate new growth management strategies where current bylaws are demonstrated to be engendering an undesirable outcome.

While these build-out studies have often revealed much about the individual towns and cities in Central Vermont, they have also uncovered some interesting findings

affecting the wider Region. Among the noteworthy findings are:

- Parts of our Region have been and continue to be influenced by the growing Chittenden County “metropolis.” Compared to the rest of Central Vermont, municipalities in the study area displayed higher growth rates, incomes and housing costs and more dynamic commuting patterns. This effect dissipates as you move farther from Chittenden County.
- Land use policies and regulations don’t appear to be as influential as market forces in determining the amount and location of growth. Growth pressures are highest closest to Chittenden County even where stringent regulations are in place.
- Significant development capacity exists in Central Vermont. Our studies suggest that approximately a quarter of the land in the Region is highly suitable for development and that thousands of residential units could be built in each town under current regulations and land capabilities.
- Most municipalities support “smart growth” principles, but have not been able to put them into practice. In fact, most new development is occurring in low density zones.
- Lack of sewer and water infrastructure and marketable incentives for creative development are obstacles to smart growth in rural towns.
- Where infrastructure does exist, capacity is ample, but underutilized. Furthermore, village/downtown “density sampling” revealed that allowable zoning densities in such areas are often considerably less than that displayed by existing neighborhoods.

To date, CVRPC has conducted “buildout studies” for the municipalities of Waterbury, Duxbury, Middlesex, Moretown, Montpelier, Berlin, East Montpelier, Plainfield, Calais, and Marshfield.

Stormwater Management

In a pristine environment, stormwater is managed by the landscape's natural features. Surface flow is inhibited by vegetation and most water is able to infiltrate the ground through pervious, un-compacted soils. That which does not, settles into depressions and wetlands or finds its way into streams and rivers where excess water collects on undeveloped flood plains, retreating harmlessly, in time.

In a developed landscape, the situation is different. Falling precipitation is intercepted by roofs, parking lots, roads, sidewalks and other impervious surfaces which increase the quantity, velocity, and concentration of surface runoff. Water flowing over such surfaces picks up a variety of pollutants (e.g., gas, oil, animal waste, road salt, antifreeze, etc.), as well as debris, thermal gain, and speed - all of which can have severe consequences on water quality and aquatic biota. Fast moving, channelized surface flows can erode roads and other structures, overwhelm combined stormwater systems, contribute to the occurrence and severity of downstream flooding, and cause sedimentation in rivers, lakes and streams. As urbanization continues, soils are disturbed by new construction, vegetated buffers are lost, and the pressure to develop in less suitable locations (e.g., steep slopes, higher elevations) increases.

While growth and development have the potential to decrease water quality and increase flooding, that is not necessarily the case. Good land use planning and site design can do much to reduce the impacts of stormwater runoff (and even help correct existing problems) by minimizing impervious surfaces, maintaining and/or providing vegetation, and employing Best Management Practices (BMP's) and structural controls during and after construction.

Brownfields

Brownfields are defined by the United States Environmental Protection Agency (U.S. EPA) as "real property, the expansion, redevelopment or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant." Typical prior uses that may fall into this category in Central Vermont include old town dumps, photo developing sites, mill complexes, factories, dry cleaners, auto repair shops, gas stations and even some agricultural sites.

According to the U.S. EPA, it is estimated that there may be over 450,000 brown-field sites in the United States. Yet a report undertaken by the Northeast-Midwest Institute, a non-partisan research organization, suggests that there may be nearly 1 million sites nationwide. Estimates vary for different reasons. Existing inventories of brownfield properties may consider commercial and industrial properties listed on the real estate market but, not account for those not for sale and/or abandoned. Estimates may include only those properties which are currently enrolled in a brownfield assessment or clean-up program. The Vermont Department of Environmental Conservation's (VT DEC) Brownfields Response Program Sites List currently lists 52 brownfield sites currently undergoing investigation and remediation. Regardless, most properties with an industrial or manufacturing history may be a brownfield.

Brownfield sites often remain vacant and underutilized due to concerns over liability and unknown environmental assessment and clean-up costs; yet many sites can be rehabilitated. Redevelopment or re-use of potentially contaminated sites has many benefits:

- Eliminates eye sore properties,
- Promotes/supports historic use patterns,
- Protects human and environmental health, and
- Strengthens the local economy.

Since brownfield sites are often in already developed areas, their reuse can help to promote compact land use and in-fill development. According to the U.S. Environmental Protection Agency's web site "for every acre of brownfields redeveloped, it is estimated that an average of 4.5 acres of greenfields are saved."

CVRPC has been very active in the area of brownfield rehabilitation since the last Regional Plan adoption. Beginning in 2004, we have received over a half million dollars in EPA grants to assist our communities in assessing and reclaiming these important properties. To date, CVRPC's Brownfield Program has funded an extensive environmental site assessment for the Salt Shed on Stone Cutters Way in Montpelier and plans are now underway to transform the former industrial site to a mixed use development. Additional sites that have benefited from the program include the Railroad Turn Table, also located along Stone Cutters Way, next to the Salt Shed (for future use as a "pocket park"), the MWT site in Northfield Falls (for the purpose of selling the property to the current tenants of the building and to retain business in a historic mill building), and two municipally owned sites in the Town of Warren (to assess their potential for the creation of affordable housing and public recreation space).

Noise

Any undesired sound can be considered "noise." Noise pollution is defined as "continuous and unrelenting sounds at all levels or episodic and excessively loud sounds." While it must be recognized that noise necessarily accompanies certain business and transportation operations, new development should make all reasonable efforts to minimize noise impacts and shall not exceed acceptable standards in residential areas. Among the techniques available are: restricting hours of operation or construction, using vegetated buffer zones to filter sound, taking advantage of topography in designing projects to provide sound barriers, the use of structural barriers (i.e. earth berms and sound walls), and architectural design and materials. Higher noise levels may be appropriate and unavoidable within designated industrial, commercial, and mixed use zones.

LAND USE GOALS AND POLICIES

Goal 1:

To promote sound management, conservation and use of the Region's natural resources.

Policies:

1. When land development does occur on important resource lands, it should be designed to minimize or compensate for its impact on productive use. Off-site mitigation ¹⁰ may be appropriate in some instances. Clustering with permanent protection of open space (and primary agricultural soils in particular) is strongly recommended to preserve the land base and avoid resource fragmentation while allowing for equity retrieval for individual landowners. The density of clustered uses should reflect the limitations and capabilities of the subdivided parcel. In addition, the development should not materially alter the overall land use patterns of the area, nor should it interfere with accepted farming, forestry practices, or resource production on adjacent lands. Vegetative buffers between uses may be appropriate in some instances.
2. CVRPC also encourages the use of non-regulatory techniques (including tax stabilization programs, voluntary conservation easements, and purchase of development rights or fee simple purchase through community land funds or trusts), creative development, municipal "overlay protection zones," and off-site mitigation to protect important resource lands. The Commission will assist landowners or municipalities in the analysis, development or implementation of such measures upon request.
3. CVRPC encourages the use of creative development techniques and standards (e.g. clustering and open space development), municipal "overlay protection zones," and non-regulatory techniques to minimize the impact of new development on land uses and ecological functions described in the "Resource Protection" section of this Plan. The Commission will assist landowners, developers or municipalities in the analysis, development, or implementation of such measures, upon request.
4. Municipalities are encouraged to establish conservation commissions (under V.S.A. 24, Chapter 118) to assist in the identification, study, maintenance and protection of important natural resources.

¹⁰ Off-site mitigation usually means permanent protection of land or other form of obligation not necessarily adjacent to the development site that compensates for the impact of development.

5. Storage and utilization of fertilizers, pesticides, petro-chemicals, herbicides, sludge, or other potentially harmful industrial, agricultural, commercial or residential materials, must be accomplished in a manner compatible with existing regulations.
6. CVRPC opposes the downgrading of surface water classifications unless such action is required to accommodate treated effluent from new or expanded municipal sewage treatment facilities. The Commission also opposes the upgrading of surface water classifications where such upgrading might be misleading or dangerous to users.
7. Where a proposed project involves a discharge into, or withdrawal from, any of the Region's surface waters, consideration should be given to the short and long term impact on such waters and to applicable health and water regulations. The potential degradation of water quality, the impact on wildlife, the assimilative capacity of waters, and the effect on the Region's ability to support future growth should be evaluated. Protection of the public health, safety, and welfare shall be the primary objectives.
8. Trees and other vegetation along streams, rivers, and lakeshores serve to: protect property from flood flow and ice jams, prevent bank erosion, enhance aesthetic appeal, and maintain the oxygen level of the water for fish habitat and effluent assimilation capacity. For these reasons, undisturbed areas of vegetation should be retained and encouraged along the banks of surface waters. Municipalities are encouraged to adopt strategies, including shore land bylaws, to protect surface waters. (CVRPC will assist such efforts, upon request.)
9. High density development in proximity to surface waters should consider community septic systems to permit adequate setback of the leaching area, or connections to public systems, if possible.
10. CVRPC will continue to work with municipalities in avoiding and mitigating flood damage through:
 - assistance with flood hazard bylaw and maps,
 - the mapping and analysis of fluvial erosion hazards,
 - the Commission's Bridge and Culvert Inventory Program, and
 - the preparation of local and Regional pre-disaster mitigation plans.
11. CVRPC will explore the merits of having Commission staff become FEMA Certified Floodplain Managers.

Goal 2:

To enhance and support the viability of the Region's resource based industries.

Policies:

1. CVRPC supports and encourages the protection and continued productivity of viable primary agricultural soils, productive forest land, and mineral resources. Sound land use planning including flexible development options, fair government pricing taxation and subsidy programs, agricultural diversity, and promotion of value-added products and industries are viewed as means to this end.
2. Public improvements are considered a significant reason for farmland's metamorphosis into prime development land. The installation of sewer or water lines, and roads across or into the immediate vicinity of agricultural parcels or primary agricultural soils can encourage the development of farmland. For this reason they require careful review. Such improvements will be discouraged unless:
 - such a position would conflict with the local plan; or
 - the improvements are required to implement the settlement pattern goals set forth in this Plan or in that of a Central Vermont municipality;
 - there is an overriding public need being served; or
 - adequate permanent protection is inherent in the development proposal; or
 - parcels or soils affected are determined to be "not viable" for reasons of size, topography, surrounding land use, or potential productivity.
3. CVRPC encourages municipalities to identify locally significant agricultural and forest parcels and/or districts through locally and consensually developed land evaluation and site assessment programs (e.g. LESA and FLESA). Such identification can assist in establishing protection priorities and programs.
4. CVRPC recommends continuation of, and participation in, the Use Value Appraisal Program as a means to promote continuing sound management of resource lands by taxing them fairly and according to their current use.
5. CVRPC will, in conjunction with other stakeholders and relevant organizations, consider methods to determine the amount of agricultural land required to meet the Region's long term requirements under a "worst case scenario" regarding food importation.
6. The extraction of sand and gravel should not be unduly detrimental to surrounding land uses or the environmental quality of the area. A reclamation plan should be included as part of any extraction proposal. Possible alternative uses should be identified in local plans. Municipalities are encouraged to map the important,

accessible sources.

7. New developments that encroach upon resource lands, and the occupants thereof, are encouraged to respect the rights of resource land owners to continue existing operations, and undertake appropriate expansions, according to accepted practices.

Goal 3:

To encourage the historic settlement pattern of compact village and urban centers separated by rural countryside while promoting development in economically viable locations.

Policies:

1. New development should be planned so as to respect the historic settlement pattern of compact villages, neighborhoods, and urban centers separated by rural countryside. Accordingly, CVRPC:
 - Endorses the concept of creating new villages to accommodate new growth.
 - Endorses "smart growth" planning principles as embodied in this Plan and supports the designation of "Growth Centers" – be they identified in local plans or through the State process codified in Act 183. We would also support efforts to simplify the State Growth Center designation process so as to make its benefits more accessible to a broader cross-section of communities.
 - Will assist municipalities in conducting the studies required to prepare applications to the Downtown Board for State Growth Center Designation.
 - Supports the appropriate expansion of existing settlements, particularly where excess infrastructural capacity exists. (The existing settlements within Central Vermont are those areas currently served by public water and/or sewer systems or characterized by higher densities of development. Existing settlements include, but are not limited to, the downtowns and cities, the villages and the myriad concentrated residential neighborhoods.)
 - Encourages PUD, "cluster" or "open space" design for new residential and commercial developments, particularly those outside of existing settlements or planned growth areas and discourages the development of commercial and residential sprawl.
 - Encourages "in fill" development and adaptive reuse of buildings in existing settlements.

- Supports and encourages revitalization efforts directed towards strengthening and improving villages and cities.
 - Recognizes that some environmental and development "trade-offs" will be necessary to achieve desired growth patterns. To this end, CVRPC believes that mandatory mitigation of any agricultural soils or habitat losses, even at a reduced ratio, within State designated Growth Centers is counterproductive to enticing development and recreating traditional land use patterns.
 - Believes that land use restrictions should not unduly hinder self-employment for residents. Such opportunities may help reinforce traditional land use patterns through economic incentives.
 - Believes that land use plans should not unnecessarily infringe upon the landowner's ability to enjoy and profit from the investment and use of private property.
 - Encourages municipalities and individual landowners to identify sites which may qualify for assessment and/or cleanup under the EPA's Brownfields Grant Program.
 - Encourages municipalities to undertake build-out modeling in order to better evaluate development capability and future growth potential under current zoning, as well as to examine the potential impact of employing alternative density strategies.
2. To seek ways to overcome the economic disincentives to development within existing built-up areas, including the high costs associated with the construction of, or hookup to, necessary infrastructure. CVRPC:
- Recognizes Tax Increment Financing (TIF) as a valuable tool for supporting infrastructure development in planned growth areas and supports amending current State law to make it more practical for communities to implement.
 - Over the next five years, will continue to work with municipalities to prepare a Regional land use map that incorporates the developing land use plans of its municipalities and displays locally and/or State designated growth centers. In conjunction with this effort, CVRPC will provide technical assistance in growth center planning, upon request, and in conjunction with State guidelines.
 - Will recognize growth center designations and employ them to attempt to achieve desired growth patterns through its influence over public expenditures and development review decisions, where applicable.
 - Will provide assistance to municipalities seeking such funding for brown-field assessment and remediation, upon request.

Goal 4:

To protect environmentally sensitive or unique areas.

Policies:

1. Natural and fragile areas identified in this Plan should receive protection from harmful uses.
2. Where natural and fragile areas occur on developable private lands and where their adequate protection would preclude any other reasonable use of those properties, acquisition in fee simple or less than fee simple is recommended.
3. Where a potentially harmful development or activity is proposed in proximity to a natural or fragile area, measures should be taken to ensure adequate protection.
4. CVRPC encourages the inclusion of natural and fragile areas information and mapping in local plans. (Municipalities should not be limited by the definitions and designations included here, as it is recognized that this Plan may not include all locally significant sites.)
5. It is the policy of CVRPC to encourage the maintenance of existing critical wildlife habitats. Communities are encouraged to identify locally important habitats.
6. Any activity that would degrade important groundwater supplies is discouraged. Specifically, development activities in designated WHPA's shall be carefully reviewed for groundwater impacts.
7. Hazardous wastes shall be disposed of properly to prevent any degradation of groundwater.
8. It is the policy of CVRPC to encourage the preservation of wetlands so as to protect their function and productivity. Efforts (including consideration of site design options) should be made to mitigate against the possible adverse impacts of development on the Region's wetlands.

Goal 5:

To preserve the aesthetic quality of the Region

Policies:

1. Municipalities and developers are encouraged, through design and siting of structures, to make a concerted effort to preserve access to and enjoyment of scenic

views for the public.

2. Unless effectively screened, or clearly in the best interest of the general public, ridge line development or conspicuous development on locally prominent landscape features is discouraged.
3. The scale and siting of new structures should be in keeping with the surrounding landscape and architecture; however, towers should utilize stealth technology.
4. Outdoor lighting should be limited to minimum levels necessary to ensure safety and security of persons and property.
5. Light sources shall be shielded and not directly visible from public roads or adjacent residences.
6. Landscaping with native species is generally preferred over the use of nonnative species, particularly in non-urban environments. The use of non-native trees and plants for landscaping can lead to unintended introductions of species which out-compete native vegetation.
7. Where possible, parking lots and storage areas should be well landscaped and/or otherwise screened from view on public roads.
8. CVRPC encourages the State and municipalities to maintain existing roadside views by means of vegetation clearing, where appropriate.
9. CVRPC will attempt to inventory and map the Region's scenic resources, with assistance from municipalities.
10. The location of telecommunication towers is a significant aesthetic issue within the Region. Policies intended to minimize negative impact are presented in the wireless telecommunication facilities policies of this Plan.
11. CVRPC will track indicators that show impacts on aesthetic quality and natural beauty in Central Vermont.
12. New development should make all reasonable attempts to minimize noise pollution and shall not exceed accepted standards in residential areas.

Goal 6:

To ensure that new development in the vicinity of the Region's interstate interchanges is appropriate to the setting and considers the impact of such development on adjacent village and urban centers.

Policies:

1. CVRPC encourages interchange modeling and identification of preferred development scenarios.
2. CVRPC will encourage and assist municipalities in planning for land use in and around interchange areas.
3. CVRPC will continue to support the Town of Berlin's efforts to plan for and implement the creation of a new village center in the vicinity of Exit 7.
4. CVRPC will encourage the concept of management associations (similar to transportation management associations) to promote master planning for interchange zones.
5. CVRPC will exercise its status as a statutory party in Act 250 whenever new development has the potential to impact the form and function of an interchange area or adjacent communities.
6. In support of Regional land use priorities that support the development of village and urban centers, CVRPC will not encourage development at interchanges where that development will result in a demonstrable negative impact on adjacent village or urban centers. CVRPC will, however, encourage development at interchanges that complements or appropriately expands existing growth centers according to a locally developed, Regionally approved plan.
7. New development should employ design guidelines that foster economic vitality in growth areas and encourage the maintenance of the rural, working landscape.

Goal 7:

To manage the quality and quantity of storm water runoff in order to avoid property damage and negative impacts on surface and groundwater.

Policies:

1. New development should, through design and maintenance, attempt to minimize changes in the volume and chemical composition of runoff. Methods rec-

ommended to achieve this objective include:

- Avoiding construction on steep or unstable slopes and in high elevations (Slopes in excess of 25% and elevations above 2,500 feet are generally thought to be prohibitive for most kinds of development.);
- Stabilizing entrances to construction areas to eliminate tracking of sediment onto paved public roads;
- Employing cluster/open space design techniques;
- Minimizing development road and sidewalk widths to those which are necessary for safety and access;
- Avoiding the use of wide radius, paved cul-de-sacs, where appropriate ("Hammerhead" turns, smaller radius turns, and landscaped cul-de-sac islands are some other options.);
- Minimizing the removal of native vegetation to the extent practical;
- Phasing new construction to minimize the amount of disturbed soil at any given time where practical; and
- Providing vegetated buffers between roof lines and paved areas and between sidewalks and roads, where appropriate.

2. Structural Best Management Practices (BMP's) should be used, as appropriate, to control storm water on new development sites before, during and after construction (including plans for long term maintenance and operations). Objectives and applications include:

- Storm water retention: wet ponds, artificial wetlands
- Storm water detention: dry basins
- Storm water filtering: bio-retention, sand filters, compost filters
- Storm water velocity control: filter strips, grassed swales, rock swales
- Erosion control: construction schedule, seeding/mulching, check dams, runoff diversions
- Sediment control: sediment basins/traps, filter fabric/silt fences, hay bales, inlet protection
- Infiltration: infiltration basins, trenches, dry well, leaching catch basins, infiltration islands, pervious surfaces

3. Acceptable Management Practices (AMP's, as defined by the Vermont Agency of Natural Resources) should be employed on all agricultural, silvacultural and earth extraction operations.

4. Efforts should be made to minimize the extent of impervious surfaces and surface runoff associated with parking facilities. The following methods are recommended:

- Constructing structured parking facilities (i.e. multi-level garages) where practical and appropriate in order to provide a higher ratio of parking spaces to impervious surface area;
- Using pervious materials in "spillover" parking areas;
- Integrating the use of landscaped areas as "bio-retention" filters; and
- Providing smaller spaces for compact cars.

5. Municipalities should consider adopting policies and practices to reduce the volume and impacts of storm water runoff, including:

- Encouraging storm water management through the use of BMP's (as outlined in policy 2) in local plans, zoning bylaws, and building permits;
- Minimizing zoning setbacks to allow for shorter driveways, and allowing shared driveways;
- Instituting maximum, as well as minimum, parking ratio requirements in local bylaws to prevent "overbuilt" parking lots;
- Allowing for shared parking facilities in local bylaws;
- Adopting "pooper scooper" ordinances to prevent the pollution of surface waters with pathogens and nutrients;
- Protecting high elevations and steep slopes from intensive development in local bylaws;
- Properly sizing and maintaining culverts;
- Properly maintaining ditches on dirt roads to slow runoff and filter sediments as per the "Road Design and Maintenance Handbook" published by the Vermont Local Roads Program;
- Separating combined storm water/sewer systems (CSO's) which can discharge raw sewage to surface waters during big storms; and
- Making sure road salt storage areas are covered.
- Consulting the "Erosion Control Prevention Manual" published by the Vermont Geological Survey.

Energy Element

The 2003 Central Vermont Regional Plan Energy Element began with the following statement:

"The environmental and economic implications of energy use have become critical factors in nearly all public policy decisions and in many private actions as well. Energy costs are a major line item in government, business, and personal budgets."

Just five years later, this reads as a gross understatement. The situation now seems far more critical than we could have imagined then. Consider that:

- Energy costs have sky-rocketed. (Oil was \$25 per barrel when the previous Plan was adopted. It is now, as of June 2008, approaching \$150 per barrel and it appears that price increase will continue.) Consumer fuel costs have more than doubled since 2003)
- War, terrorism, and political uncertainty plague the Middle East
- Global climate change is now universally accepted as a scientific fact and major threat to our environment and economy
- Global oil production has probably either peaked, or is close to peaking, but global demand (particularly in developing countries) grows exponentially
- The Nation's trade deficit has grown exponentially , primarily due to increasing oil imports at ever higher prices
- Vermont's biggest energy contracts are five years closer to expiration
- Inadequacies in the State's electrical transmission and distribution systems are becoming ever more apparent as they approach capacity.

Although the energy picture often appears abstract and beyond the influence of communities, the times call for decisive action and bold policies and programs that look well beyond the five year time frame of this Plan. Sound Regional and local planning can play a positive and effective role in guiding energy decisions. In fact, by promoting appropriate land use patterns, participating in energy development decisions, facilitating alternative transportation options, and encouraging energy conservation strategies, Vermont communities can lead the Nation toward a position of sustainable energy use which will not only maintain a healthy environment, but will also build a foundation for economic health and stability.

24 VSA, Chapter 117, Section 4347 requires that the Regional Plan contain an energy element "...which may include an analysis of energy resources, needs, scarcities, costs and problems within the Region, a statement of policy on the conserva-

tion of energy and the development of renewable energy resources, and a statement of policy on patterns and densities of land use and control devices likely to result in conservation of energy." Chapter 117 further requires that the Regional Plan "promote an efficient and economic utilization of drainage, energy, sanitary and other facilities and resources; promote the conservation of the supply of food, water, energy and minerals;" and "promote the production of food and fiber resources and the reasonable use of mineral, water and renewable energy resources."¹

The Energy Element of the Regional Plan seeks, in part, to satisfy these mandates. Title 30 VSA, Section 248 empowers CVRPC to appear before the Public Service Board to aid the Board in making determinations in Certificate of Public Good hearings. Title 10 VSA, Section 6068(a) empowers CVRPC to testify before the District Environmental Commission and Environmental Board (Act 250) regarding conformance of subdivisions and developments with criteria concerning energy conservation, private utility services, and public utility services and more generally with the Regional Plan.

Thus, the Energy Element of the Central Vermont Regional Plan is designed to assist in the decision making processes of state and local government, and to enhance the economic and environmental health of the Region.

DISCUSSION: TRENDS

Our society uses energy to heat homes and offices, to power an industrial economy and to transport people, goods and services from place to place. About 40% of the world's energy consumption occurs in the United States. Vermont is one of the nation's least energy intensive states; yet the average resident of Vermont consumes approximately 8.1 KW of energy each year, nearly two times more than the average Japanese or German citizen.

In Vermont, the primary sources of energy are fossil fuels (oil, gas, coal and liquid petroleum gas), nuclear generated electricity, local and imported hydro-electricity, and biomass (fuel wood). Renewable energy sources such as solar and wind currently account for only a negligible proportion of total energy use. Fossil fuels are used primarily for transportation and heating, while nuclear power (supplied from the Vermont Yankee Facility in Vernon, Vermont) and out of state hydro-power (supplied by facilities in New York state and Quebec) provide for the lion's share of our electricity demand.

¹ State of Vermont. Title 24 Vermont Statutes Chapter 177: Vermont Municipal and Regional Planning and Development Act. 1967

Statewide Energy Demand- All Sectors, by Fuel (KW/year)

	Fossil Fuels	Electric	Biomass	Solar
1980	2112	427	344	.3
	73.2%	14.8%	12.0%	0.0%
1990	2406	567	263	.2
	74.3%	17.5%	8.1%	0.1%
2010	3623	817	292	.7
(estimated)	76.5%	17.3%	6.1%	0.1%

Statewide Energy Demand- All Fuels, by Sector (KW/year)

	Residential	Commercial	Industrial	Transportation
1980	1000	364	387	1134
	35%	13%	13%	39%
1990	962	393	440	1444
	29.7%	12.1%	14%	44.6%
2010	1339	568	601	2229
(estimated)	28.3%	12.0%	12.7%	47.0%

SOURCE: Vermont. Public Service Department. Vermont Comprehensive Energy Plan, 1998

Although analyses of energy demand by fuel and by sector are not available for Central Vermont specifically, data generated for the State as a whole can be interpolated for planning at the Regional level.

Transportation stands as the sector where energy use has grown substantially during the past 30 years. During that time energy consumption in the transportation sector grew 97% primarily due to increased commercial and industrial uses. The transportation sector now accounts for over 45% of all energy, and approximately 60% of all fossil fuels, consumed in Vermont.²

Residential use, while decreasing as a percentage of total energy demand, is projected to have increased by over 334 KW/yr (34 %) between 1980 and 2010, presumably due to the significant increase in the State's total number of housing units and the trend towards larger homes with more gadgets. While fossil fuel use in the commercial and industrial sectors has been less pronounced, the total projected increase between 1980 and 2010 is projected to add up to over 334 KW/yr. (See map: *Energy & Communications* and for more discussion: Utilities, Facilities & Ser-

² Union of Concerned Scientists. Energy and National Security. December, 1990.

vices Element.)

Fossil Fuels

As shown in the above tables, fossil fuels account for over 3/4's of all energy consumed in Vermont. Approximately 65% of the oil consumed in the U.S. is imported , up from only 10% in 1960.³ In fact, oil imports account for approximately 50% of the total U.S. trade deficit. and the cost of U.S oil imports has increased. over 300% in this decade to a level of about \$340 billion in 2007.

Our economic system is so tied to the availability of fossil fuels that even modest increases in price can lead to high inflation, lagging economic growth and monetary instability. Dependence on fossil fuels inflates an already record high national deficit. It is estimated that as much as 90% of every household energy dollar permanently leaves the community.⁴ The remainder stays in the local economy to pay the overhead costs associated with the distribution system and to pay for locally produced forms of energy. As fossil fuel costs rise, a greater proportion of our income will leave the Region.

This situation can only become more critical as we approach peak oil production (Some experts believe we have already passed or reached it). The U.S Department of Energy's 2005 report "Peaking of World Oil Production: Impacts, Mitigation and Risk Management" states that:

"The peaking of world oil production presents the U.S. and the world with an unprecedented risk management problem. As peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social and political costs will be unprecedented. Viable mitigation options exist on both the supply and demand side, but to have substantial impact, they must be initiated more than a decade in advance of peaking."

The economic and social consequences of intensive fossil fuel use are only part of the story. The combustion of fossil fuels is by far the largest contributor of atmospheric "greenhouse gases" (primarily carbon dioxide). There is strong consensus in the scientific community that continued accumulation of "greenhouse gases" within the earth's atmosphere is creating a warming of the atmosphere, or "greenhouse effect." Such warming could cause severe coastal flooding and unpredictable climate shifts, threatening the viability of the earth's most significant urban and agri-

³ Union of Concerned Scientists. The Global Warming Debate: Answers to Controversial Questions. March 1990.

⁴ Kinsley, Michael J., Economic Renewal Program: An Introduction. (7). Rocky Mountain Institute.1989.

cultural centers. In Vermont, significant warming could cause irreparable harm to the State's largest industry, tourism. Reduced snowfall and a die-off of sugar maples could spell disaster for ski areas, syrup producers, and our fall foliage season.

Further, fossil fuel combustion is also directly linked to the acidification of rivers, lakes and soil, and human health hazards resulting from declining air quality. For reasons highlighted above, and because fossil fuels are an exhaustible natural resource, we must begin now to drastically reduce the magnitude of fossil fuel consumption in our society.

Nuclear

Over one hundred commercial nuclear reactors across the country supply about 20% of our nation's electric power. The Vermont Yankee Nuclear Power Plant in Vernon provides about 35% or one third of the current electrical power in Vermont. However, it is only licensed to operate until 2012⁵ and its future beyond that is uncertain.

The generation of electricity via nuclear fission is one of the more controversial energy issues in the U.S. Some view nuclear power as a clean and renewable choice, while others regard it a threat to the public health, safety and welfare. Although recent polling shows that most Vermonter's hold the latter view, it is gaining traction at the national (and international) level as an alternative to fossil fuels.

While there were no plants ordered in the U.S. between 1979 and 2005, there are currently several sites under consideration, nationwide, for new or expanded plants. Chief among opponents' concerns is the issue of spent fuel. Nuclear generated electricity produces various long-lived radioactive wastes which are highly toxic and require extraordinary precautions for safe storage. Existing technology does not guarantee safe disposal. Further, the industry has not yet resolved safety issues regarding fuel storage and the decommissioning of commercial nuclear power plants. These problems are in evidence at The Vermont Yankee Nuclear Power Plant in Vernon, as stated on its own web site:

"U.S. nuclear plants were designed under the assumption that the federal government would remove the used fuel in a timely manner throughout operation. The government however, has not yet begun removing the fuel. Not unexpectedly, a growing number of plants – including Vermont Yankee – have fuel pools that are nearing their storage capacity. In order to continue operating, these plants need to

⁵ Vermont. Department of Public Service. Electric Plan. 2005.

supplement their fuel pools.”

Yankee has requested, and received, approval from the Vermont Legislature to construct a dry cask fuel storage facility scheduled to be in place in 2008. The Facility will need the Legislature’s help once again if it is to continue operating into the future. The plant, scheduled to be decommissioned in 2012, has applied to the Nuclear Regulatory Commission for a 20 year license extension, and will likely receive a decision this year. However, in accordance with Vermont Act 160 (2006), the plant may not operate after its current termination date unless the State’s General Assembly finds that its continued operation will “promote the general welfare.”

Hydro-power

Currently, Vermont gets about half of its energy from hydro-power (about 10% from small, in-state sources; or about 50 private and utility owned sites) and the remainder from Hydro-Quebec and New York Power Authority.⁶ The Hydro Quebec contract is scheduled to expire in 2015.

It is estimated that Vermont has at least 174,000 KW of undeveloped hydroelectric potential. This represents about 22% of current use. Most of the sites constituting this additional capacity are classified a “mini-hydro” (under 1000KW) developable at existing, but unused, dam sites.

Hydroelectric development will require a balancing of priorities. While the benefits of generating electricity from local, renewable resources are evident, they are not without associated costs. The power output captured from a given stream must be moderated by environmental considerations. A minimum stream flow, adequate to support aquatic life forms, must be maintained and impoundments must be designed with water quality and land use/recreation considerations in mind

Hydropower potential lies not only within naturally flowing streams and rivers, but to some extent in potable water systems, as well. In fact, the City of Barre has recently contracted with a consultant to conduct a feasibility study for the development of “small scale, low impact hydroelectric systems to provide a source of local, renewable power that would reduce the cost of electricity for the City” within its water system. The first phases of this study have identified three sites (the Nolan Street PRV Regulation Vault, the Dix Reservoir and the Orange Dam) as having “no technical barriers” and being “worthy of more intensive study”. The City is continuing to pursue these possibilities.

⁶ Vermont. Department of Public Service. Biennial Report. July, 2000- June, 2004.

Wood Biomass

Forest land covers approximately 77% of Vermont's total land area. Total forest inventory amounts to approximately 475.5 million tons of living biomass and an estimated additional 80 million tons of salvageable dead wood. Estimated annual growth of forest biomass is approximately 12 million tons. In 1989 about 2.8 million tons were harvested from Vermont forests. While ownership patterns, ecological and physical constraints, public sentiment and market pressures will likely drive future forest harvests, consideration should be given to expanding the use of biomass to generate electricity and provide direct heat.

Unfortunately, biomass electricity has been decreasing as a percentage of Vermont's power mix (from 10% in 1980 to about 6% currently), and fewer homes are being heated with wood. However, the generation of electricity from biomass is a phenomenon that continues to hold the potential to benefit both the economy and natural environment of Vermont. Under proper management and replacing fossil fuel combustion, the generation of electricity from biomass could reduce greenhouse emissions. Importantly, this would also stimulate local economies. According to the Northeast Foresters Association, "The biomass market provides an important outlet for low grade wood, a material neither suitable nor economical to process as lumber or paper. Revenues from the sales of biomass chips in 2005 in Vermont totaled nearly 5 million dollars." The organization also estimates that annual cordwood sales (about 270,000 cords) net landowners about \$1.4 million in stumpage. These sales are good for the economy as estimates show that approximately 80% of each dollar spent on wood remains in the State while only 20% of each dollar spent on nonrenewable energy sources remains in the State.⁷

Intensive biomass extraction does carry ecological risks such as air pollution and depletion of soil nutrients. Before the expansion of biomass electricity occurs, careful analysis of the long term impact of large scale and sustained harvest should take place.

Currently, less than one-third of Vermont homeowners use fuel wood as a heat source. Increased use of fuel wood for heating would stimulate local economies and, if harvest and burning is executed in an environmentally sound manner, would decrease the environmental impacts of existing patterns of energy consumption. New technology is expanding the potential for implementing high-efficiency wood burning in buildings as a primary heat source. While wood burning does contribute a large proportion of atmospheric particulate pollution - pollution directly associated with respiratory damage - new wood burning technology and stricter EPA emissions

⁷ Vermont. Department of Public Service. Comprehensive Energy Plan.

standards are resulting in increased efficiency and reduced particulate emission.

Vermont also has two large scale wood-fired generators (Ryegate and Burlington) which produce about 244 GWh, or 4% to 6% of Vermont's electrical energy, one of which is capable of using natural gas as an alternative fuel. Between them, they use nearly one million tons of wood chips annually. Vermont also leads the nation in small-scale applications of biomass energy. The State of Vermont operates wood chip heating systems at the State Capitol complex and the Waterbury office complex. Such systems have also been installed in at least twenty-six educational settings, including U-32 High School and the Green Acres Housing project in Barre.⁸

Vegetable Biofuels

Biofuels are renewable, agriculturally derived liquid fuels that can be used to run vehicles and heat buildings. They include biodiesel, ethanol, and even straight vegetable oils. A variety of plants with high oil or cellulose content can be employed to produce these products. Some, including corn, sunflower, canola, soy and hemp, could be grown and processed in Vermont. Doing so could help keep money circulating in the community, creating jobs and sustaining local agriculture, while helping to avoid the external costs associated with fossil fuels. However, it may also take farmland out of food production.

Biodiesel, in particular, appears to be catching on in Vermont (and elsewhere), as it can be used in many existing vehicles and furnaces with minimal equipment modification. Furthermore, it is blended with petroleum fuels. As of January 2007, biodiesel fuel was available at about two dozen locations throughout Vermont.

Methane Production

The decaying organic materials of landfills, manure pits, and waste water treatment systems produce significant amounts of methane; a greenhouse gas 20 times more potent than carbon dioxide and a potential energy source. It has been estimated that methane from U.S landfills alone accounts for as much as 2% of global greenhouse gas build-up. Capture technologies have experienced tremendous growth in recent years rendering methane a valuable energy source.

Nationally, 415 Landfill Gas to Energy (LFTGE) projects are in operation, according to the EPA. However, Vermont currently has only two such systems, and a cow manure methane generating system, on line. A third landfill system proposed for the Moretown Landfill, has received CVRPC's tentative endorsement. This project would

⁸ Vermont. Department of Public Service. Utility Facts.

use captured methane to produce electricity in two generator sets with a combined capacity of 3.2MW and would connect to GMP's nearby 35KV line.

In the past several years, the Department of Public Service and the Department of Agriculture received a \$695,000 Federal appropriation to promote the use of methane recovery technology on Vermont dairy farms.

Wind-power

Essentially a form of solar power created by pressure and temperature differences across our planet, wind-power is one of the oldest and most environmentally benign sources of energy. In recent years it has experienced resurgence in its application, which is certain to continue. In fact, it is the fastest growing energy source in the world and a major contributor to the power portfolios of several European nations. Wind turbines are among the most economical of contemporary renewable energy technologies, and have become cost competitive with most conventional electricity sources (especially when indirect, avoided costs are factored in).

Although Vermont has potential for wind power, it is estimated that only 10 to 15% of Vermont's electrical power could be generated by wind because of its intermittent nature. Viable sites for wind turbines exist primarily between 2,500 and 3,500 feet in elevation. Some such locations, particularly those without existing development, may be aesthetically or ecologically sensitive.



Wind farm, Searsburg, Southern Vermont. Photo courtesy of Dan Emery.

The modern industrial wind turbine is not an insignificant piece of machinery. Mounted on towers ranging from 150 to 260 feet tall, with blades that can extend an additional 150 feet, they can be imposing structures. Consequently, wind generation proposals in Vermont have faced some opposition on aesthetic grounds. Other concerns raised have included noise, habitat issues, collateral bird and bat kill, and "ice throws" from the blades. Still, it is important to note that a recent poll conducted by the Vermont Public Service Board revealed that a majority of Vermont

survey respondents say they would support the technology, even if turbines were visible from their homes.

Currently, Vermont produces only 6MW of power (enough for about 2000 homes) by way of commercial wind power at an 11 turbine "farm" in Searsburg. However, over a dozen proposals which could supply as much as 500MW have been approved or proposed throughout the State. While none of these sites are in the Central Vermont Region, this does not suggest that we do not possess viable sites.

Finally, it should be noted that advances in small scale wind turbine technology figure to make them an increasingly viable option for private individuals or groups of individuals. State law restricts the regulation through zoning of turbines with blades less than 20-feet in diameter. Furthermore, any small scale turbine that returns energy to the power grid is exempt from local bylaws and is instead reviewed by the Public Service Board under Act 248.

Solar-power

Solar energy has tremendous potential for providing clean, reliable and safe energy, even in Vermont's climate. The application of both active (systems which collect, store and distribute solar energy within a building) and passive (systems which utilize a building's structure to trap sunlight and store it as heat) solar technologies have demonstrated their cost effectiveness in Vermont.

Solar-tempered buildings are buildings that have their long axis oriented within 30 degrees of true south and have an unobstructed net south facing window area equal to at least 7% of the total floor area. Solar-tempering coupled with proper insulating can offset heat costs in a building by 40%. Although solar-tempering at initial construction generally requires no additional investment, experts suggest that a majority of new buildings in Vermont do not incorporate such design principles.

Contemporary solar technologies have proven their value in Vermont, particularly in rural areas. As the technologies improve and costs decrease, solar thermal collectors and photovoltaics (technologies which can convert sunlight to electricity) will become more competitive in the marketplace even in less remote areas. As the power source of solar technologies is inexhaustible, and solar energy neither contributes pollutants to the atmosphere nor to our reliance on foreign energy suppliers, strategies should be developed to encourage its use.

Natural Gas

At present, there are no natural gas transmission lines in Central Vermont. How-

ever, natural gas use in Vermont is increasing at about 4-5% a year. Natural gas is the least carbon intensive of all the fossil fuels and therefore releases relatively small amounts of carbon dioxide upon combustion. Moreover, the combustion of natural gas produces no SO₂ and low NO_x. Both are acid rain precursors. Natural gas could be most appropriately applied in residential and commercial water heating, cooking and space heating, in various industrial processes, and in a small amount of electrical generation. Enabling the use of natural gas in Central Vermont will mean increasing and extending load capacity and is encouraged, where technically feasible and economically and environmentally appropriate, in the transition to clean fuels.

Demand Side Management

In 1990 the Public Service Board required the state's regulated utilities to carry out Least Cost Integrated Planning and implement Demand Side Management programs. In Central Vermont those utilities are investor owned municipal and cooperative electric utilities. Least Cost Integrated Planning requires that each utility "...meet the needs of its customers at the lowest total long term cost and...do so by giving equal consideration to all generation, transmission and energy efficiency options..." Demand Side Management programs promote the conservation of energy as an energy source available for future demand. Through their Demand Side Management programs, the Region's utilities will likely provide various incentives including financing and partial payment of certain efficiency improvements, energy audits and design services.

As the creation of excess generating capacity can be used to meet future electrical needs for Vermont, conservation must continue to be viewed as a source of electricity. Conservation is our least expensive and most environmentally benign source of electricity.

SUMMARY OF TRENDS

Despite the compelling need to change both the pattern and magnitude of energy consumption, the Vermont Department of Public Service predicts that energy consumption in Vermont will increase and that fossil fuel consumption will continue to grow as a proportion of total energy consumption. It is projected that the bulk of the increase in energy consumption will be for space and water heating and for transportation.

Fossil fuels must be replaced by renewable energy resources. As long as present patterns of energy consumption are continued, prices will rise, the nation's trade deficit will increase, pollution will continue and the potential for severe atmospheric

changes will grow. Sustained economic health and avoidance of continued environmental degradation will require a dramatic shift to renewable energy resources and improved energy efficiency. This shift will require not only strong market pressure, but also creative policy initiatives.

Besides the predicted increase in energy consumption, Vermont must plan ahead for expected energy source loss, as Vermont Yankee's license expires in 2012 and our contract with Hydro-Quebec ends in 2015. It is important that Vermont, and especially Central Vermont, begins to look for energy options before these events occur.

Because the external costs (i.e. the hidden social and environmental costs) of energy are not reflected in the current market, renewable technologies are forced to compete at a disadvantage. In effect, energy consumption is subsidized by the public (i.e. health insurance costs and environmental degradation). These circumstances must be altered in order to facilitate the emergence of a renewable energy economy.

IMPLICATIONS FOR LOCAL/REGIONAL PLANNING

Planning ordinances

Through the planning process, Vermont's municipalities are able to influence patterns of land development, guide capital investments, and impact the use of natural resources. A planning effort sensitive to energy issues will promote settlement patterns that minimize transportation requirements, encourage land use that conserves energy, and develop a policy which encourages the efficient use of energy resources.

The Vermont Planning and Development Act (V.S.A. 24, Chapter 117) enables Vermont's municipalities to adopt regulatory bylaws for implementing their town plan. Zoning bylaws and subdivision regulations are the most commonly used bylaws in Central Vermont. Each affords the opportunity to promote energy efficient development at the local level.

Zoning bylaws control the type and density of development. Encouraging high density and diverse uses in and around existing built-up areas will lead to more compact settlement patterns, thereby minimizing travel requirements. At the same time, zoning bylaws must be flexible enough to recognize and allow for the emergence of technological advancements which encourage decreased energy consumption, such as increased use of solar and wind-power and telecommunications technology.

Through setback and height requirements, zoning also controls the size and relative location of new structures. Chapter 117 permits communities to exempt moderately sized wind and solar energy devices from these restrictions. A zoning bylaw may allow for the consideration of solar access (exposure to sun) in reviewing projects at the local level.

Local zoning bylaws may also permit the creation of planned unit or planned residential developments (PUD/PRD). These are a grouping of mixed use or residential structures, pre-planned and developed on a single parcel of land. The setback, frontage and density requirements of the zoning district may be varied, in consultation with the town planning commission, to allow creative and energy efficient design (i.e. east-west orientation of roads to encourage southern exposure of structures, solar access protection, use of land forms or vegetation for windbreaks, and attached structures).

Subdivision regulations govern the creation of new building lots, as well as the provision of access and other services and facilities to those lots. Subdivision regulations, like the PUD/PRD, involve the town planning commission in the design process. As with the PUD/PRD, the planning commission should use the opportunity to ensure that the conservation of energy is considered in subdivision development. Except through the Act 250 process, there is no regulation of energy efficiency in new construction in the Central Vermont Region (about 1/3 of new residential and 3/4 of new non-residential construction go through Act 250.) Act 250 requires that "best available technology" for energy efficiency and recovery be used in construction.

In its review of development proposals, Act 250 applies a life cycle cost test to determine the "appropriate level" of energy efficiency. The "appropriate level" requires the developer to invest in energy efficiency up to the economic break even point for a particular structure, occupant and usage pattern. This standard allows for flexibility in design without sacrificing the energy efficiency of specific measures.

Transportation

According to the Vermont Comprehensive Energy Plan, the transportation sector accounts for over 45% of total energy demand and approximately two-thirds of all fossil fuels used in Vermont. As discussed in previous pages this situation imposes a tremendous economic and ecological detriment. Environmental degradation resulting from heavy petroleum use is well documented, as is the fact that the lion's share of money spent on fuel and automobiles leaves the state, thus undermining the local economy.

The rural character and decentralized settlement patterns of Central Vermont, the very qualities which render Central Vermont an extraordinary living environment, create difficult circumstances in which to minimize the consumption of traditional fuels in the transportation sector. Nevertheless, there are strategies which can be employed at the local, Regional and state levels which will bear influence within this context.

Because any gains in energy efficiency will be at least partially offset by increases in population, it is important that the Region and member municipalities plan for and promote alternative and public transportation options. Improved access to, and increased use of, alternative and public transportation options such as rail, bus, van-pooling, ride-sharing and bicycling, will not only decrease energy consumption, but will also reduce the infrastructure expenditures that are associated with the "car culture."

Another strategy by which the demand for transportation can be reduced is through encouraging settlement patterns which require less physical travel. The concentration of employment opportunities, housing and social services, the expansion of telecommunications potential, and the increased use of local resources may help achieve this objective.

Other important strategies, for reducing energy demand in the transportation sector include: promoting research and development of alternative fuels, incentives for the retirement of less efficient vehicles, and promoting increased efficiency standards for new automobiles. In the future, bio fuels are likely to be important sources of energy in the transportation sector, a phenomenon which could have a beneficial impact upon Vermont's economy.

For our part, CVRPC participates in and promotes the Way to Go! Commuter Challenge, an annual one week promotional event designed to encourage alternatives to the solo commute. We also work with our municipalities in identifying and implementing projects for VTtrans' Safe Routes to School Program whereby pedestrian infrastructure improvements are promoted and funded.

Buildings and Structures

According to the Vermont Comprehensive Energy Plan, approximately 30% of the total amount of energy consumed in Vermont is used for residential purposes. The Plan shows that growth in energy demand in the residential sector will be driven by increases in population and housing, and a corresponding increase in demand for space and water heating. This demand, when considered with the energy demand

associated with the space and water heating requirements of commercial and industrial buildings, represents tremendous potential energy savings.

Investments in energy efficiency improvements in new and existing buildings and appropriate site design in new development will result in the realization of this savings, and will demonstrate a significant impact on total energy demand. Ultimately, such investments will reduce the percent of income residents spend on energy, per capita energy consumption and environmental degradation.

Although investments in energy efficient technology often require a significant commitment of resources, initial expenditure generally more than pays for itself over the life-time of the technology. In almost all cases, it is cheaper for the homeowner to invest in energy efficient designs, materials, and weatherization projects than pay inflated operating expenses over the life of the mortgage. Nevertheless, current building practices, both new construction and renovation, do not include substantial investment in energy efficiency and conservation measures. Such investment, coupled with the increased use of renewables such as biomass, solar and wind-power, will stimulate local economies and will afford a measure of environmental protection.

Creative financing and investment schemes (both private and public) might provide builders and homeowners the incentive necessary to capitalize on energy efficiency and conservation technologies. Because increasing the energy efficiency of buildings is most effectively accomplished during initial construction or major renovation, local review procedures are a useful mechanism in promoting energy conservation.

Often rental occupants lack the incentive and/or financing necessary to reduce energy consumption for space heating. In many instances rental occupants are paying their energy costs directly, or their rents are adjusted to cover these expenses. Thus, the owners of the apartment buildings also have little incentive to retrofit their buildings for energy conservation. In fact, dis-incentives such as the ability of a landlord to deduct fuel costs as operating expense on federal tax returns and the possibility of increased municipal tax assessments if retrofit improvements are made may encourage the status quo in buildings that are energy gluttons.

Energy Programs and Resources

A variety of organizations and programs exist to provide assistance to citizens and local government in the realm of energy conservation and development. A partial list of Vermont based resources follows:

- The Alliance for Climate Action/10% Challenge – Community energy organizing

and programs. www.10percentchallenge.org

- Apollo Alliance Vermont – Coalition of labor , business and community groups dedication to energy independence. www.apolloalliance.org/state
- Biomass Energy Resource Center – Consults on biomass and cogeneration projects. 802-223-7779
- Efficiency Vermont – Financial and technical assistance for energy savings. EnergySmart home energy analysis. www.efficiencyvermont.org
- Renewable Energy Vermont – Trade association for renewable energy dealers. www.REVermont.org
- School Energy Management Program – Provides free energy assessments for schools. www.vtvsa.org
- Sustainable Energy Resource Group - Consults with communities on energy planning/programs. www.SERG-info.org
- Vermont Biodeisel Project – Collaboration designed to help accelerate emergence of industry in Vermont. www.vtbiodeiselproject.org
- Vermont Green Building Network – Promotes green building in Vermont. www.vgbn.org
- Vermont Energy Education Program. – Provides in school energy curriculum. www.veep.org
- Vermont Energy Investment Corp – Promotes energy efficiency and renewable technologies. www.veic.org
- Vermont Energy Star Homes – Technical assistance to build energy efficient homes. www.Vtenergystarhomes.com
- Vermont Peak Oil Network – Network of groups and individuals working on energy sustainability. www.vtpeakoil.net
- Vermont Rideshare- Promotes commuter carpooling. www.VermontRideShare.org
- Vermont Energy and Climate Action Network- Collaborative of organizations involved in energy and climate issues.
- Vermont Fuel Dealers Association – Trade association of fuel marketers. www.vermontfuel.com
- Vermont Biofuel Partnership – Resource for producers, wholesalers, retailers and users of bioheat and biodiesel fuel. www.vtbio.org

ENERGY GOALS AND POLICIES

Goal 1:

The efficiency with which energy is used should be increased.

Policies:

1. Before the construction, expansion or upgrading of new or existing public generation or transmission utilities and/or facilities, utilities shall demonstrate having employed reasonable measures to improve efficiency and promote energy conservation for consumers, as stated in Docket 5270.
2. Municipalities are encouraged to form a Town Energy or Climate Action Committee.
3. Municipalities and/or groups of municipalities are encouraged to consider the establishment of local, publically owned and operated bulk storage fuel facilities, as authorized under 24 VSA, Chapter 107, Section 3701, as a means of containing fuel costs for Central Vermont residents.
4. The conservation of energy should be integrated into local planning efforts. CVRPC will continue to provide technical assistance to municipalities and will encourage that municipal bylaws promote energy conservation and the development of renewable energy resources.
5. CVRPC will promote the conservation of energy, use of renewable energy resources and energy efficient design through participation in the Act 250 process.
6. Municipalities are encouraged to establish local energy codes requiring or promoting energy efficient design and renewable fuel use in new construction while promoting technological innovation and efficiency; thus increasing energy conservation in non-Act 250 projects.
7. CVRPC recommends that practical energy conservation measures be taken during the citing, design, construction or renovation, and maintenance of buildings. Building designs which incorporate the use of solar energy and other renewable energy technologies are encouraged.
8. Individuals are encouraged to consider the impact of their lifestyle choices on energy use and conservation. Factors such as the size and location of ones home can have a profound impact on energy use. Smaller homes, closer to jobs, resources and infrastructure use less energy and have less of an environ-

mental impact than larger more remote ones.

9. Towns and school districts should include energy efficiency and conservation in their plans and daily operations.
10. Supports efforts to create a fund to provide low interest capital to home owners, landlords, institutions, and businesses to assist in making cost effective investments in energy efficiency and renewable energy.
11. CVRPC encourages Regional lending institutions to adopt energy efficiency standards for new construction as well as for existing housing coming on the market.
12. CVRPC supports efforts to expand the Home Weatherization Program for low income Vermonters.
13. Municipalities are encouraged to review the Town Energy and Climate Guide (Vermont Energy and Climate Action Network, 2006) for ideas and suggestions on energy conservation and development.

Goal 2:

The use of non-renewable energy resources should be decreased, while the use of renewable energy resources, particularly those of local origin, should be increased.

Policies:

1. The Commission supports implementation of Least Cost Integrated Planning (as called for by Vermont's Twenty Year Electric Plan, PSB Final Order in Docket 5270, and the Vermont Comprehensive Energy Plan) and recommends that thorough consideration of the benefits of utilizing local energy resources be applied to all future LCIP analyses.
2. CVRPC will promote the development and use of renewable sources of energy, particularly those of local origin, through public education efforts and participation in Act 250 and Section 248 hearings.
3. CVRPC encourages State and federal funding targeting research and development of renewable energy and energy efficiency technologies.
4. CVRPC encourages efforts to determine the potential for sustainable large scale biomass/biofuel production in Vermont and Central Vermont in particular, and encourages concurrent efforts to evaluate the ecological impacts associated with long term, large scale biomass production and harvest.

5. Large scale wood using projects, such as power generators and wood pellet production, proposed for Central Vermont and adjacent Regions are encouraged. However, they must demonstrate that the project's demand for wood will not ultimately lend to Regional supply shortages. In the event that a wood energy plant is proposed within the Region, that proposal shall include a forest management plan which ensures that timber harvesting will occur in a sustainable manner.
6. CVRPC supports State funding to the Vermont Use Value Appraisal ("Current Use") Program.
7. The Agency of Natural Resources Comprehensive Rivers Program identifies river segments that should be targeted for protection. This program should be expanded to address the potential for hydro-power.
8. Expansions and efficiency improvements to existing hydro-power generators and transmission facilities are encouraged where such investments clearly benefit the residents of the Region.
9. CVRPC supports Barre City's efforts to identify and develop hydroelectric power sites for local needs and will assist in implementing the same as appropriate and possible.
10. Hydro-power development should not diminish water quality, habitat, or recreational opportunities. "Run-of-the-river" projects are preferred to projects which require impoundments with low or minimum flows. Fish ladders should be installed where appropriate and necessary.
11. CVRPC encourages the recovery of methane for use as an energy source from solid-waste, agriculture sites, or waste water treatment facilities wherever economically feasible. New landfills should be designed to enable the capture of gases during decomposition.
12. CVRPC encourages the development of biofuels to reduce gasoline consumption, which can be produced from local renewable resources. Local regulations should encourage alternative fuel businesses in local land use regulations.
13. CVRPC supports the use of biofuels and/or electric power in government and public transit vehicles.
14. In evaluating any commercial wind power generation proposals, CVRPC will con-

sider the economic, social, and environmental benefits (i.e. costs avoided) in addition to potential environmental/aesthetic impacts. CVRPC will help to identify those locations where wind turbines might be feasible and appropriate, as well as those sites where turbines would be considered inappropriate. For the life of this Plan, the Washington County portion of the Worcester Range and Camel's Hump are considered inappropriate locations for industrial turbines due to their inaccessibility, wilderness values, and aesthetic features. Conversely, the presence/proximity of existing development should be considered as a positive in evaluating potential wind sites.

15. CVRPC encourages the development of small scale wind, solar, or hydro power by individuals, or groups of individuals, to offset fossil fuel consumption and promote self-sufficiency. For this reason, it encourages municipalities to make provisions for the same in local plans and bylaws.

Goal 3:

Emissions of greenhouse gases, acid rain precursors, and other environmental toxins must be decreased.

Policies:

1. In considering public benefits of any construction, expansion or upgrading of existing public generation or transmission utilities and/or facilities, consideration shall be given to the external costs (economic, social and ecological) of any decision, and those external costs shall be reflected in the decision as the Public Service Board has recently recommended.
2. CVRPC supports proposals to deliver natural gas to the Region where such proposals are technically feasible, and economically, socially, and ecologically appropriate in the gradual transition to clean resources.
3. CVRPC encourages that the development of existing transportation systems incorporate design and location principles so as to:
 - complement the recommendations set forth in the Land Use and Transportation Elements of this Plan and in the Region's municipal plans;
 - encourage the concentration of social and civic services, employment and housing opportunities, and retail centers within or adjacent to planned or existing community centers; and
 - support the expansion of telecommuting, teleconferencing, and public transit.
4. CVRPC urges that land use planning and implementation programs promote planning for efficient non-motorized alternatives to the automobile by:

- provision of cycling and walking paths between or within population centers;
 - creation and maintenance of sidewalks or other pedestrian modes in areas of concentrated settlement; and
 - development of commuter parking lots, particularly on limited access highways.
 - accordingly, the Commission will continue our participation in the Safe Routes to School and Way to Go programs and will support the above measures whenever possible.
5. CVRPC encourages the maintenance, continued operation and expansion of the Region's railways.
 6. CVRPC encourages the establishment of incentives for developers and municipalities to accommodate public transit in their plans.
 7. The Commission encourages employers to support the use of public transit by their employees.

Transportation Element

The Central Vermont Regional Planning Commission also adopted the Central Vermont Regional Transportation Plan in its entirety. That Plan addresses all the requirements of State statute and is adopted, by reference, as part of this document. The following is an overview of the Regional Transportation Plan and its major goals and policies. The complete text is available upon request

EXECUTIVE SUMMARY

The 2008 Regional Transportation Plan (RTP) was completed by staff with technical support from a consultant under the direction of the CVRPC Transportation Advisory Committee. Preparation of the 2008 RTP occurred simultaneously with the update of the CVRPC Regional Plan. The 2008 RTP has a planning horizon and is based on the same land use assumptions and economic and demographic forecasts used in the Regional Plan.

The 2008 RTP is organized into five chapters and an appendix. Chapter One presents an overview of the Plan's purpose and process. Chapter Two presents the transportation goals developed specifically for the Regional Transportation Plan. Chapter Three contains descriptive material on the Region's land use patterns, on current and forecast population and employment in the Region, and on current work trip travel patterns in the Region. Chapter Four describes the existing transportation system, its performance, and projected future performance of the highway system. Chapter Five presents Regional, and corridor level recommendations. The Appendix examines ways existing and future transportation and land use planning can be better coordinated, project prioritization methodology, and detailed safety, bridge, and survey analysis.

The 2008 RTP is too large to present in the Regional Plan. This section presents the 2008 RTP's vision statement and goals, summarizes the key findings on transportation demand and system performance, and briefly describes the types of recommendations included in the RTP. Refer to the 2008 Central Vermont Regional Transportation Plan for more detailed information.

DISCUSSION:TRENDS

Demographic and Land Use Trends Affecting Transportation Demand

If current settlement trends continue, households will disperse throughout the Central Vermont Region while employment and services concentrate in a growing cen-

tral core consisting of Montpelier, Barre City, Barre Town, and Berlin. Smaller concentrations of employment are anticipated in the Waterbury, Waitsfield/Warren, and Northfield areas.

Driving alone to work is the dominant mode choice for Central Vermont workers and will likely continue to dominate as households disperse and employment concentrates within a few areas of the Region. Ride-share also plays a significant role in the journey to work and will remain a viable option as households continue to disperse and workers are imported from outside of the Region. Driving alone and ride-share account for 87% of the work trips in the Central Vermont Region. According to Vermont Public Service, road transportation accounts for 95% of transportation energy use.¹

Walking has a significant mode share in Montpelier and Northfield and is also an important mode for non-work trips in those communities.

Similar to national trends, the largest growing age cohort will be people over the age of 65. This age group will continue to fill jobs as noted above, and may also have special transportation needs. (See map: Transportation.)

Transportation System Performance

Highways: During the 2000's bridge conditions improved, but pavement conditions have declined. Congestion was limited to the Barre, Berlin, Montpelier, and Waterbury areas of the Region. Maintaining the condition of roads and bridges in the future will require sustained levels of funding for system preservation projects. Assuming no changes to the highway system, congestion is projected to spread to the rural areas of the Region.

Safety: Intersections are the most dangerous components of the Region's highway system. The intersections and road segments with the highest crash rates are located in the Barre City, Barre Town, Fayston and Northfield areas. Out of the twelve intersection high crash locations, seven have been studied, and four are included in projects. The Region will continue to conduct planning studies, and participate in State programs to address high crash locations.

Transit: Transit ridership increased significantly over the years due to expansion of service. Since 1995, ridership grew by 46%. The most notable recent addition was the Link Express service between Montpelier, Waterbury, and Burlington. A recent statewide assessment of all Vermont public transit providers found that Central Vermont's transit system had mostly positive use and cost performance measures for

¹ Vermont. Department of Public Service. Utility Facts. October, 2006.

its various routes. The increases in transit ridership underscore the desirability of continued transit service in the Region.

Transportation Demand Management: Transportation Demand Management (TDM) seeks to reduce the number of single occupant vehicle trips by encouraging people to share rides, shift travel to off-peak hours, tele-commute or use other modes such as walking, biking, or transit. Most of the ride-sharing in the Central Vermont Region occurs on an informal basis. The Park & Ride lots in the Region facilitate informal ride-sharing and have experienced a 79% increase in use since 1998. In the future, transportation demand management associations could help facilitate further use of TDM programs.

Bicycle & Pedestrian: There are a variety of bicycle and pedestrian facilities in the Central Vermont Region including sidewalks and cross walks in most cities and villages, paved shoulders in rural areas, and separated bike paths in various locations. Existing deficiencies include discontinuity of adequate shoulder widths in rural areas, constant need for maintenance of existing urban/village sidewalk networks, and a lack of sidewalks in the growing suburban commercial areas. Since 1995, there has been significant progress in planning and implementing bicycle and pedestrian facilities at the local and Regional level. This incremental progress, if continued over the next twenty years, will help the Region develop an interconnected network of bike and pedestrian facilities.

Freight Movement: The important products transported from the Region are specialty and dairy food products, granite, and wood. Most of these commodities are shipped by truck, with rail transporting a much smaller but significant share (7% statewide). Truck travel in the Region is constrained by highway geometry deficiencies and the hilly terrain. Arterials that carry truck traffic also pass through village centers creating safety and quality of life issues for residents. Rail plays an important role in the Region's trade with Canada. Preventive maintenance is needed to preserve the existing New England Central rail line that serves that international trade connection.



Edward F. Knapp State Airport, Berlin, Vermont.

Air Transportation: There are two airports located in the Central Vermont Region; the Edward F. Knapp State Airport in Berlin, and the privately owned Warren- Sugarbush Airport. The Region's public-use airports provide opportunities for public access to the National Airspace System, air

freight, emergency medical services, search and rescue operations, business aviation, recreational flying, and flight training. Knapp Airport is equipped for night operations and precision instrument landings. Since 1996, improvements at Knapp Airport have included runway rehabilitation, installation of navigational aids, and construction of jet fuel farm, hangars, and a taxiway. Future improvements have been identified that will preserve and enhance how the Airport functions.

REGIONAL TRANSPORTATION PLAN RECOMMENDATIONS

Specific project, program, and policy recommendations are presented on the Regional and corridor levels to address the issues identified in the performance assessment and during public meetings held in the Central Vermont Region. The recommendations also address the need for Regional planning and cooperation on transportation issues, transportation funding, and mitigation of development impacts to the transportation system, and the project development process. The Regional Transportation Plan also recommends ways to improve the transportation-land use connection based on ideas developed during a public workshop, and includes suggested changes to CVRPC policies for defining the Regional significance of transportation projects and how transportation should be considered in growth area planning.

Vision and Mission for Transportation in the Region

To emphasize the scope and scale of the Regional transportation issues facing Central Vermont and its communities, CVRPC established a vision and mission statement to guide the development of transportation goals, policies, and action items.

Vision - "To maintain and develop a transportation system that facilitates travel while preserving the Region's character."

Mission - "Preserve, enhance, and develop an integrated, multi modal Regional transportation system to accommodate the need for movement of people and commerce in a safe, cost-effective, environmentally responsible, and equitable manner, that conforms with other elements of the Regional Plan."

The vision and mission statements provide an overall direction that CVRPC believes should be followed. To guide these steps, CVRPC established a series of nine goals that further define this direction. These goals are described below, as well as the policies written to provide guidance of how the goals can be achieved.

TRANSPORTATION GOALS AND POLICES

GOAL 1:

To achieve a Regional transportation planning process that is comprehensive, multi-modal, and public, and is integrated with Regional and local land use planning as outlined in the Central Vermont Regional Plan.

Policies:

1. Encourage municipalities' analysis of transportation needs at the local level, including the relationships between development patterns and transportation needs, and which considers various modes of travel.
2. Encourage coordination and cooperation in comprehensive transportation planning among the various municipalities in the Region and at the Regional, State, and private levels.
3. Undertake a comprehensive Regional analysis of existing and anticipated travel behavior and multi-modal approaches to accommodating anticipated travel demand.
4. Balance Regional and local decision-making, and flexibility in transportation planning, when conflicts develop between local and State plans.
5. Promote a project prioritization process that takes the goals of the Regional Transportation Plan into consideration.
6. Promote open and inclusive public participation in the multi-modal planning and development of transportation projects.
7. Support the planning and design of the Region's transportation system to encourage development and re-development in existing villages, cities, and designated growth centers.
8. Encourage the full integration of transportation and land use planning at the Regional and local level.

GOAL 2:

To preserve and maintain the existing transportation system.

Policies:

1. Support the necessary steps for evaluating, prioritizing, and implementing preventive maintenance programs for all elements of the transportation system.
2. Promote a funding strategy that realizes maximum use of all available resources to ensure adequate maintenance of the existing transportation system.
3. Encourage development patterns that reflect the planned capacity of the transportation system. Level of Service C will be taken as the preferred condition. Level of Service D should be accepted within the more urban, built-up sectors of the Region (for example: Montpelier, Barre City, Northeast Berlin, South Barre, Waterbury Village, Northfield Village, Waitsfield Village, and Irasville).

GOAL 3:

Enable the transportation system to operate at it's highest efficiency by managing travel demand and encouraging shifts to under-utilized and more efficient travel modes.

Policies:

1. Develop a strategy that encourages maximum use of all available transportation resources and allocates those resources to the optimum functioning of the transportation system.
2. Support the education of the Region's employers in the development of Travel Demand Management Programs (e.g. tele-commuting, flextime, compressed work weeks, ride-share matching, preferential parking, commuter fringe benefit, etc.). Facilitate the establishment of Transportation Management Associations to organize and administer TDM programs.
3. Educate the public on modal choices available.
4. Encourage preservation of existing rights-of-way for future transportation purposes. In particular, work to retain abandoned railroad rights-of-way for transportation uses such as trails and bike paths.
5. Consider new or expanded public transit services that serve intra-Regional and intercity travel needs.
6. Encourage full accessibility to the Region's transportation services for the Region's residents in need.
7. Establish aggressive, but realistic, targets for modal shares along Regional trans-

portation arteries.

8. Support updating and optimization of traffic signal timings on a regular schedule and coordinate where appropriate.
9. Market public transit to new users.

GOAL 4:

To integrate modes of travel in order to allow for their most effective use and ultimately reduce dependence on single occupant vehicles.

Policies:

1. Encourage the development of park and ride lots for car and van pools, and encourage employers to provide incentives to car and van pool users.
2. Promote physical and operational connections between various modes of transportation.
3. Ensure adequate mobility for all segments of the population, including residents who cannot or do not use private automobiles.
4. Foster a sense of mutual respect among users of the various modes of transportation.
5. Encourage the availability of multiple options for the movement of people and goods.

GOAL 5:

To establish a transportation system that minimizes consumption of resources and maximizes the protection of the environment.

Policies:

1. Support efforts to minimize negative environmental impacts associated with the transportation system (including air quality, noise levels, surface water, vegetation, agricultural land, fragile areas, and historical/archaeological sites).
2. Encourage the preservation and enhancement of scenic views and corridors.
3. Support efforts to minimize energy consumption, especially nonrenewable energy resources, and explore expanded use of alternative fuels.

4. Factor direct and indirect costs and benefits into decision-making. Impacts that are not easily expressed in dollar values should also be considered.

5. Promote public awareness of the environmental impacts resulting from use of the Region's transportation system. 6. Promote a transportation system that encourages concentrated development, allows greater access to residences, employment, and services, and facilitates car pooling, bus and rail service, and non-motorized travel.

GOAL 6: To make necessary improvements to achieve a transportation system appropriately structured and designed to safely, effectively, and economically move goods and people.

Policies:

1. Encourage the appropriate scale and design of streets, highways, and other transportation infrastructure to serve local traffic, destination traffic, and through traffic.
2. Foster a neighborhood street system characterized by a network of interconnected streets that minimizes through traffic in residential neighborhoods.
3. Promote safety-targeted measures at High or Potential Accident Locations, and promote traffic safety Region-wide.
4. Promote projects that limit the conflicts between the motor vehicle traffic stream, pedestrians, and the rail system.
5. Encourage access management policies that reduce traffic congestion and maintain capital investment.
6. Consider new facilities when demand warrants (e.g. when alternatives to reduce congestion and improve safety have been attempted) and/or when other strategic state, Regional, or local goals apply.
7. Foster a sense of safety and comfort for riders of public transit.

GOAL 7:

Promote a transportation system design that strives for aesthetic and functional characteristics that improve the quality of life.

Policies:

1. Support the design of visually attractive and durable infrastructure such as roadways, pathways, and bridges.
2. Support high architectural standards for terminal buildings, stations, shelters, garages, and other facilities.
3. Respect and enhance the built environment by restoration of period transportation structures where possible, and maintain the natural environment through architectural, landscaped, and engineered features.
4. Encourage traffic calming efforts to minimize conflicts between traffic and surrounding neighborhoods.
5. When feasible, encourage restoration or preservation of historic bridges.
6. Foster improvements that are contextually appropriate.

GOAL 8:

To promote a Regional transportation system that preserves and enhances residential and economic development potential in growth areas.

Policies:

1. Provide transportation system improvements at locations where they will or can serve growth areas.
2. Foster transportation and commerce links that contribute to the economic health of the Region.
3. Encourage transportation system improvements that renew and improve downtowns, growth areas, and neighborhoods.

GOAL 9:

To promote a Regional public transportation system.

Policies:

1. Provide for basic mobility for transit-dependent persons.
2. Support public transit that provides access to employment.

3. Encourage congestion mitigation to preserve air quality and the sustainability of the highway network. Support public transit that advances economic development with emphasis directed toward tourist areas.

2008 CENTRAL VERMONT REGIONAL PLAN UTILITIES, FACILITIES AND SERVICES ELEMENT *-amended September 8th, 2015*

5

Public and private utilities, facilities, and services play a critical role in providing for the health, safety, and welfare of Central Vermont's citizens. All of us depend, in one way or another, upon water distribution systems, solid waste and sewage disposal, police and fire protection, health services, schools, parks, and electric power and information technology.

The location, condition and availability of services and facilities can have a profound influence on growth and development in a region. Homes, businesses, and industry tend to concentrate where utilities and facilities are readily available, while areas remote from infrastructure and services are more costly and difficult to develop (they often contain important natural resources as well). Hence, communities and regions, through the thoughtful placement of infrastructure, may direct growth to the most suitable location, or away from areas where change may have undesirable impacts.

The condition and scale of utilities also needs to be considered. Where facilities are over-sized and under-utilized they may encourage unplanned growth, or operate inefficiently and at unnecessary financial expense to residents. For systems that are at capacity and/or outdated, further development may cause environmental damage. Failure to upgrade urban systems may stall new growth or push it away from growth-designated areas. Communities and regions can avoid the above scenarios through the appropriate timing and sizing of infrastructure improvements¹.

¹ This text contains selected amendments to the 2008 Central Vermont Regional Plan. Comprehensive data updates have not been conducted for the purposes of amendment. Some statistics and figures (those labeled with "2008 Data") may not represent the most current data.

UTILITIES

Electric Power

It goes without saying that electric power is a vital component of life in modern America. When our sources of power are lost, even temporarily, as a result of weather conditions or technical difficulty, the result may be chaos and hardship. Perishables perish, business and industry halts, and the rhythms of domestic life are profoundly interrupted.

As the Region grows, so does its demand for reliable and affordable electricity, but existing sources of electric power are limited and the costs of developing new ones are dear. Neither is electricity completely benign in its impacts. Its generation, transmission, and distribution raise issues of environmental protection, public health, land use and aesthetics. Fortunately, studies have shown that kilowatt-hours can be saved at an expenditure of far less than it takes to generate them; furthermore, conserving electricity creates jobs, conserves natural resources, curbs pollution, and expands opportunities for self-reliance too.

Vermont has become a leader in the move towards energy independence and is undertaking an ambitious renewable energy program that could at least put it on a path toward obtaining 90% of its energy from renewable sources by 2050.

These facts did not escape the Department of Public Service (DPS) as it prepared its Comprehensive Energy Plan as directed by Executive order # 79. A fundamental theme of the DPS plan is its promotion of "least cost integrated planning" as "a way for electric utilities to plan for a portfolio of supply resources, demand-side management programs, and transmission and distribution improvements that will enable the company to serve its customers at the lowest life-cycle cost, including environmental and economic costs."

Regional electric markets have restructured, and electricity is now sold in a regionally competitive market. Recent narrowing between Vermont retail electric rates and New England rates is due in part to low natural gas prices driving costs down elsewhere in the region. However, challenges remain to carry out transmission upgrades needed in the years ahead and to ensure that long-term electricity needs are met in a cost-effective and environmentally-sustainable manner.

CVRPC's desire to ensure that energy generation, distribution and transmission facilities are located, designed and sized to support the Region's economic and life-style demands with minimal adverse impact, supports, and is supported by, the concept of "least cost integrated planning" and its attendant objectives.

The activities and choices of the area's utility companies can have direct and indirect impacts on land use (both locally and elsewhere). Locally, distribution line extensions can spur residential, commercial and industrial growth. Decisions regarding future power sources will also have regional or even global impacts.

Electric Utilities

Five different utility companies provide power to Central Vermont's homes and businesses. As of 2009, the majority of the electric power they provided came from Vermont Yankee, Hydro-Quebec, and the Ryegate and McNeil wood generating systems. Residential users demand about half of this power. (Further analysis of energy uses and sources can be found in the Energy Element.)

Green Mountain Power (GMP) is the Region's largest utility, serving a population of about 26,000 in Central Vermont. GMP's customers are located primarily in the more populous valley areas such as Barre, Montpelier, and many of the Region's villages. GMP is continually expanding and upgrading their facilities to meet new growth. According to Vermont Public Service, GMP's output in 2005 was 2,007 million kWh².

GMP also provides electric power to about 500 customers in Roxbury and Northfield and serves 123,048 residential customers and 17,851 commercial customers in total with output in 2005 of 2,300 million Kwh³.

The Washington Electric Cooperative Inc. (WEC) provides electricity to more rural areas throughout Central Vermont. Its service territory covers a larger area in Central Vermont than any other utility with 10,170 customers. Due to the rural nature of WEC's service area, residential users account for an unusually high percentage of total demand. In 2005, WEC's output was about 69 million kWh².

The Cooperative is committed to the concept of least cost integrated planning as

2 2008 Data

evidenced by its recent initiatives including programs to identify and install electrical efficiency measures in homes demonstrating high and moderate electricity use, such as: dairy farms, schools, small businesses, and new construction, as well as its recently released Interim Integrated Resource Plan. WEC is a member-owned utility run by a 9-person board elected by co-op members.

A small number of Central Vermonters residing in the Towns of Calais and Woodbury are serviced by the Hardwick Electric Department. This utility serves about 4,300 residential customers and 307 commercial customers total with a 2005 output of 32 million KWh³. The department is planning to expand its customer base in both of these towns.

The Northfield Electric Department serves about 1900 customers in Northfield and part of Roxbury with service to 1,646 residential customers and 254 commercial customers and a 2005 output of 27 million kWh³.

The Vermont Electric Power Company, Inc. (VELCO) provides the bulk of electrical transmission network (voltages 115 kv and above) for the entire state of Vermont. VELCO serves 14,705 residential customers and 547 commercial customers and 50 industrial costumers throughout the state. In the Central Vermont region VELCO has a 115 kv transmission line which leads from Wilder, Vermont, connecting with substations in Williamstown, Barre, Berlin, and Middlesex before continuing on to Essex with a 1999 output of 1238 million kWh. VELCO also maintains a 230 kv line extending from its Williamstown substation to Comerford, New Hampshire³.

To reinforce its transmission system VEC installed a static compensator in Essex. VEC in recent years has also increased the voltage the major transmission line between Cavendish and West Rutland to serve the growing electrical load. It is company policy to use existing transmission corridors to accommodate expansion "wherever possible."

Wastewater Systems

The proper treatment of wastewater is essential to a safe, healthy environment. Today, we do a better job treating waste than ever before. Treatment plants built in

the 60's and 70's reduced the impacts of effluent reaching our streams and rivers, including biological oxygen demand and microbe levels. In general, our surface waters are cleaner now than they were 40 years ago. Improved on-site septic system technology, regulation, and monitoring has had a beneficial impact on our environment too.

There is, however, much room for improvement. The volume of waste treatment byproducts (effluent and sludge) grows with the population. Disposal of these substances poses its own unique set of problems and issues. Though improvements have been made, combined sewer and storm water systems are still releasing raw sewage to receiving waters during heavy rains. In addition, there remain, in spite of new laws, many unregulated or "grand-fathered" on-site systems polluting our environment.

It is important then, that we provide for the safe and efficient treatment of sewage for current and future residents. As communities in Central Vermont plan for the future, wastewater treatment and disposal will continue to be a critical factor, particularly when considering encouraging higher residential densities or in permitting commercial or industrial uses.

Public Systems

There are eight municipal wastewater treatment facilities in the Central Vermont region that serve over 10,000 households and scores of businesses and industries (see Service Area Map). They range in size from the Montpelier Wastewater Treatment Facility with a design of 4 million gallons per day (mgd), to a .045 mgd capacity facility in Marshfield. All provide secondary treatment of effluent. All discharge treated effluent is released into class C receiving waters of the Winooski River or its tributaries. Combined, they retain over 4 mgd of reserve capacity. A more detailed analysis of each of the region's sewage treatment plants and their implications for future growth and development is shown in Table 1, followed by a brief summary of the individual systems.

The Barre Wastewater Treatment Facility serves the City and parts of the Town of Barre. It serves a population base of about 16,000. As of 2011, the town had an allocation of 1.5 million gallons per day. There is remaining capacity in the system

serve more than 4,000 additional homes. Through an intermunicipal agreement, Barre Town has discretion over if and where new connections will occur within its allocation. The wastewater treatment facility is limited to a maximum discharge of 7,306 pounds of phosphorus annually based on the Lake Champlain Phosphorus TMDL (total maximum daily load) established in 2002. Recent upgrades to the treatment plant have greatly improved the plant's effectiveness at phosphorus removal. The plant currently discharges 4.5 pounds per day or 22% of the maximum allowed

The Marshfield Wastewater Treatment Facility serves 100 residences, 5 commercial establishments, and 6 "other" users in the Village of Marshfield. The majority of the system was constructed in 2003. Increasing development of the Village sewer system might allow additional development outside of the Village limits; however, this is not the intent of the Village Trustees at this time.

The Montpelier Wastewater Treatment Facility serves a population of 8,300 in the Montpelier/Berlin area. The City has partially removed combined sewer lines, which previously discharged raw sewage during times of heavy runoff or rain, into the Winooski and North Branch Rivers. Berlin and Middlesex own parts of the distribution & collection system in their respective municipalities and have responsibility for determining new con-

Table 1: Wastewater Treatment Facilities (WWTF) (Source: VT DEC, Local Operators; MGD = million gallons per day)

Municipality	Facility Design Capacity (MGD)	Average Monthly Flow (MGD)	Percent of Design Hydraulic Capacity Remaining	Sludge Treatment	Sludge Disposal Location
Barre City (also serves parts of Barre Town)	4.000	2.911	27%	Anaerobic digestion	Landfill
Cabot	0.050	0.026	48%	Thickening only	Land application on sites certified to other permittees
Marshfield Village	0.045	0.020	56%	Lagoon system - no digestion	Landfill
Montpelier (also serves parts of Berlin and Middlesex)	3.970	1.778	55%	Anaerobic digestion	Landfill
Northfield	1.000	0.563	44%	Aerated storage/dewatering	Landfill
Plainfield (also serves parts of Marshfield)	0.125	0.058	54%	Aerated storage/dewatering	Barre or Montpelier WWTF
Waterbury	0.510	0.181	65%	Lagoon system - no digestion	Land application on sites certified to other permittees
Williamstown	0.150	0.070	53%	Lagoon system -	Multiple WWTFs

nections to those lines.

The Plainfield Wastewater Treatment Facility serves the village area, Goddard College and some homes that extend beyond the boundaries of the village into Marshfield. It was replaced in 1999 and is approximately halfway through its expected service life. The costs for sludge hauling and disposal have been increasing rapidly, adding significantly to operating costs. The facility is not allocating any additional connections to adjacent areas in Marshfield

Waterbury Wastewater Treatment Facility serves the extent of the incorporated village, including 800 connections and an approximate population of 1,760. The plant has much excess capacity, particularly as flows are down 30-40% from pre-Tropical Storm Irene levels with the scaling back of state workers at the State Office Complex. Substantial upgrades are planned to replace aging collection lines which will coincide with an upcoming Main St. road reconstruction project. The plant has been upgraded to improve its effectiveness at phosphorous removal.

The Williamstown Wastewater Treatment Facility serves about 1200 residents in the village area and could accommodate a little under 100 additional average single family residences. Originally constructed in 1969, the facility is due for major upgrades to address aging components, energy efficiency measures and phosphorous removal. Town voters have approved borrowing \$1.7 million for the refurbishment using grants and loans from USDA Rural Development.

The Northfield Wastewater Treatment Facility provides water to 4,000 residents in Northfield and has remaining capacity. A large share of the plant's current flow is dedicated to Norwich University. In 2004 the facility was upgraded, automated, and phosphorous removal incorporated in the process. The stormwater and wastewater collection system is still combined, which allows storm flows to the Wastewater Treatment Facility. The Town is planning to separate the system-

Cabot Village Wastewater Treatment Facility serves 173 connections in and adjacent to the village. Developing an allocation policy for remaining capacity, capital budget for system repairs, emergency preparedness and energy efficiency are currently local priorities for the system.

A community septic system has been developed for the village of Warren serving 65 connections, including municipal buildings and the Pitcher Inn. The construction

project financing for Warren combined EPA demonstration grant funds and traditional grant/loan funds (See Table 2).

Most municipal systems in the region are operating under hydraulic 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 amount of phosphorous in the treated effluent, and local decisions regarding how close to the theoretical limit the plant should operate, all affect the potential to use any remaining capacity. Generally when a facility is operating at 80 percent capacity regularly, the plant may be required to upgrade.

Warren Community Septic System. The historic settlement pattern of Warren Village, with houses concentrated at high densities along the Mad River and Freeman Brook, had led to serious problems for continued on-site water and wastewater disposal. The town underwent detailed studies to identify a cost-effective combination of onsite individual and offsite cluster systems tailored to the localized need and conditions which resulted in permits for the first municipal alternative system in the state. The decentralized wastewater management program in Warren included upgrading individual, onsite systems; building an innovative system at the elementary school; and building a small cluster system and large cluster system to which residences can connect.

The needs to address aging wastewater treatment systems are significant. Nearly all municipalities with aging wastewater treatment systems need assistance in managing their assets. Many systems must implement improvements to either maintain or attain compliance with state clean water standards to protect public health and the environment. While operators of the Region's larger systems report that their effluent contains well-under the current maximums for phosphorous content, some facilities may be required to meet phosphorous reductions as part of the Lake Champlain Total Maximum Daily Load currently underway. Upgrades to address this issue have increased the level of complexity and automation in some of the Region's facilities, creating considerations for staff capacity to manage these systems.

Lack of wastewater infrastructure has been cited as obstacles to promoting denser development and redevelopment in some of the Region's more rural villages. While new, centralized systems are a cost-prohibitive option, flexible or alternative wastewater solutions such as decentralized treatment systems may be a viable option for rural communities. Decentralized systems can include conventional or advanced on

-site septic tank systems with dispersal trenches that serve individual homes and businesses, larger septic systems that serve a cluster of buildings on one or more properties or a sewer system that connects to a neighborhood or community treatment unit.

The decentralized option can be used in a more targeted way so that communities are able to envision their land use and environmental protection goals first, and

then develop wastewater management solutions to best serve those goals. As decision-making related to wastewater solutions can be very complex, forming an advisory body or local

Active public involvement in the needs assessment planning process led to the collection of better information regarding onsite systems, site conditions, and potential effects on drinking water supplies and surface waters. In the long run, this involvement led to public support for proposed solutions in Warren, including passing a local bond vote.

wastewater committee can be an important first step for a community in understanding the problem to be addressed and planning for local action.

Sub-surface Disposal and Private Systems

Central Vermont is highly dependent upon on-site, underground septic disposal, as about half of our population lives in rural areas outside of the service territories of the above-described systems. Vermont's Indirect Discharge Permit Program regulates land-based systems with design capacities equal to or exceeding 6,500 gallons per day. There are 19 of these larger sub-surface discharge systems in the Region (see Table 2), including a municipally-owned community septic system in Warren and systems serving the Middle and High Schools in Duxbury. These systems are predominantly located in the Mad River Valley towns and are otherwise serving resort-related condominiums or facilities.

Most on-site septic systems require specific soils and site characteristics to enable the effective treatment of wastes. Where soils are impermeable, too permeable, shallow, or wet, or where slopes are steep, conventional septic systems are problematic and potentially hazardous. Accordingly, non-sewered areas displaying such site limitations have generally not been recommended for development.

Restricting such areas, however, intensifies development pressure on those soils

Table 2: Sub-surface Discharge Systems (> 6,500 gallons per day) (Source: VT DEC, MGD = million gallons per day)

Private (Design Capacity > 6,500 GPD)	Town	Design Capacity (MGD)	Average Monthly Flow (MGD)	Type of Connections
Harwood Union High School	Duxbury	0.02	0.004	High School
Crossett Brook Middle School	Duxbury	0.009	0.001	Middle School
Sandy Pines Mobile Home park	E. Montpelier	0.01	*	Mobile Home Park
Mad River Glen Ski Area	Fayston	0.012	*	Ski Area Development
Mountain Lodge at Sugarbush North	Fayston	0.018	0.004	Mountain Lodge
Mad River Green	Waitsfield	0.012	*	Shopping Center
Butternut Condominiums	Waitsfield	0.015	*	Condominiums & 3-lot Subdivision
Lincoln Peak WWTF Sugarbush	Warren	0.23	0.57	Ski Area Development
Southface I Condominiums	Warren	0.015	*	Condominiums
Southface II Condominiums	Warren	0.007	*	Condominiums
Club Sugarbush	Warren	0.018	0.004	Condominiums
Sugarbush Inn and Sugarbush One	Warren	0.0015	*	Inn, Conference Center, Condos
Sterling Ridge	Warren	0.007	*	Condominiums
South Village Condominiums	Warren	0.033	0.005	Condominiums
The Bridges Resort #3-#28	Warren	0.009	*	Resort Units
The Bridges Resort #29-54	Warren	0.012	*	Resort Units
The Bridges Resort #55-#74	Warren	0.007	*	Resort Units
The Bridges Resort #75-#102	Warren	0.008	*	Resort Units
Warren Community Septic	Warren	0.020	0.009	Public buildings and Single Family Homes

that can accommodate septic systems. Unfortunately, prime agricultural land contains such soils. Clustered subdivisions with community septic systems may help overcome site limitations and simultaneously protect resource lands. Historically, many communities in Central Vermont enacted health or zoning bylaws to regulate the installment and engineering of new septic systems.

In 2002, Vermont adopted new Wastewater System and Potable Water Supply rules in order to allow for more flexibility in the design of on-site systems, assure more consistency in the standards for permitting systems.

The new rules provided that all local ordinances and/or bylaws regulating water and wastewater would be superseded as of July 1, 2007, creating “universal jurisdiction” over permits for the Vermont DEC Waste Water Management Division. However, while municipalities may no longer adopt or administer local regulations, they may prohibit construction under a zoning permit unless and until a wastewater and potable water supply permit is issued by the State.

The innovative systems allowed under the new technical standards may allow historically “un-developable” land to be developed. As such, towns should consider the impacts on land use patterns and associated uses, and plan accordingly.

WATER SUPPLY SYSTEMS

Water is among the most basic of human needs. A clean and plentiful supply of water is essential to our very survival. We need water in our homes to cook, clean, drink and flush waste. Water is critical to our ability to fight fires. Our farms, businesses and industries depend on a plentiful water supply for their operations, as well.

Public Water Systems

Most of Central Vermont's residences and businesses receive their water from public supply systems. Defined by the Department of Health as those systems that have ten or more connections and/or serve twenty or more people, public water supply systems are regulated by that same agency to ensure their compliance with state drinking water standards. In total, there are 15 community water systems (including those operated by fire districts) serving portions of 13 municipalities (some communities have more than one system) and 12 school water supply systems. Most of these systems (87%) rely on groundwater as their source, although the largest systems (Barre City and Montpelier) are supplied by surface waters.

Municipally-owned community water systems in the Region are displayed below in Table 3. These systems serve populations ranging from approximately 134

(Websterville Fire District in Barre Town) to 8,700 people (Montpelier Water System).

Table 3: Municipal Water Systems (Source: VT DEC, local operators; MGD = million gallons per day, * = data not available at this time)

Municipality/System Name	Source Name/Type	Population Served	Average Demand (MGD)	Capacity (MGD)	Percent of Capacity Used
Barre City/Barre City Water System	Dix Reservoir Upper Orange Reservoir Lower Orange Reservoir	4,150	1.6	6	27%
Barre Town/Barre Town Water System	East Barre Town Well Graniteville FD Sources Dix Reservoir (Barre City)	1,220	0.08	*	*
Barre Town/ Websterville Fire District	Barclay Quarry	134	0.029	*	*
Barre Town/Graniteville Fire District	North Reservoir (Springs & infiltration galleries) South Reservoir (Spring & well) Former Rock of Ages Reservoir (Spring) Gale Reservoir (Infiltration galleries)	700	0.072	*	*
Cabot/Cabot Town Water System	Danville Hill Well (primary), Bondville Hill well (secondary)	104	0.05	*	*
Calais/East Calais Fire District	Spring 1 Bowen Spring	200	0.012	*	*
Marshfield/Marshfield Village Water System	Well Site #7	350	0.025	0.05	50%
Montpelier/Montpelier Water System	Berlin Pond	8,700	1	2	50%
Northfield/Northfield Water Dept.	Wells #1-3	4,000	0.72	1.4	50%
Plainfield/Plainfield Water System (serves Goddard College)	Fowler Springs 1-4 Perry Spring Hood Wellfield - Points 1-5		0.04	0.16	25%
Waitsfield/Waitsfield Water Supply	Well R-1	*	*	*	*
Washington/Washington Fire District	Well	170	0.011	0.022	50%
Waterbury/Waterbury Village Water System	Tyler Brook, Merriam Brook Wells 1-4 John Gibbs Spring, Grace Spring, Gibbs Mill Spring Merriam Spring Upper, Merriam Spring Lower, C.H.Stevens Spring	2,403	0.30	0.40	75%
Williamstown/ Williamstown Water Dept	Wells B1 & B2	985	0.077	*	*
Worcester/Worcester Fire District	Well	350	0.008	0.035	23%

The newest system to come online will be the Berlin Municipal Water System, a planned \$5.5 million community water system intended to supply drinking water and fire protection to the Fire Department, Elementary School and commercial and residential areas in Berlin Corners. The system will draw from wells drilled into bed-rock and consist of 32,000 ft of distribution mains, 40 fire hydrants, a 400,000 gallon water storage tank and a well pumping station. The system will make municipal water connection available in previously undeveloped areas on the rural urban fringe and it will be important to orient local planning and policies for desired growth.

Currently, five of the municipally-owned water systems are structured as fire districts. Fire districts in Vermont are all political entities (municipal corporations) established by acts of their respective towns under the authority of state law. Historically, fire districts have arisen and been established to meet public needs in a part of a town that the town itself declined to assume. In the past, the need for fire-fighting services often prompted the establishment of a fire district, but more recently the needs for public drinking water or wastewater treatment have been the catalyst.

Reasons for a community to form a fire district or to take over private systems as such include eligibility for various state and federal funding programs and municipal financing rates and terms that are not available to privately owned systems. Disadvantages include the extensive time commitment required from members and the high level of technical, managerial and financial skills required by volunteers to operate a water system.

The Region's newest fire district was formed in 2010 by a small group of volunteers in East Montpelier. East Montpelier Fire District #1 is exploring the possibility of taking over a private water company's operations servicing East Montpelier Village and the immediate vicinity. While a moratorium on new connections has been imposed by the State, transfer of ownership to the fire district could potentially alleviate that issue and support growth in the Village. Funding has remained a primary barrier to transfer of ownership.

Many water and wastewater systems operate under direction of the legislative body and a few communities in the Region operate their water and wastewater utilities under the authority of a separate water and wastewater commission. These include

Waterbury, Plainfield and Northfield, where powers to determine operational budgets and user fees have been delegated by the Selectboard or the voters to the commission.

In the past, conflicts have arisen between municipalities regarding the shared use of a supply owned and operated by one municipality. The City of Montpelier has advocated for tax-sharing agreements where its system is providing water (and wastewater) service to adjacent communities. Inter-municipal conflicts have also surfaced where one municipality's source of water is located in or near an adjacent municipality, and thus is potentially affected by activities beyond the control of its users.

The physical components of the municipally-owned water systems range in age from newly installed to approximately 95 years. The most common problem facing communities that have or seek to have public community water systems is obtaining funding to acquire or upgrade water supply facilities. One of the largest needs for water systems is for distribution and transmission infrastructure. This critical portion of infrastructure is often overlooked as it is mainly below ground, however this component accounts for most of a typical system's capital value. Managing hundreds, sometimes thousands, of assets with the staff capacity of most local utilities is a challenge in Vermont and the Region.

A strategy the State is employing to help address ongoing issues of system depreciation is an Asset Management approach geared towards changing the way water and wastewater utilities in Vermont think about their financial management and to aid in making decisions for how to most efficiently use limited resources. This program provides technical assistance to help local operators inventory and develop a prioritized list of water infrastructure improvement projects. A pilot Asset Management project was conducted in collaboration by the Vermont Agency of Natural Resources and the Village of Waterbury in 2012. The end result was a database of over 2,700 assets and their associated condition, lo-

What is Asset Management? The Environmental Protection Agency (EPA) defines asset management as "a process for maintaining a desired level of customer service at the best appropriate cost". It is designed to aid water and wastewater systems in making decisions for how to most efficiently use their limited resources. An asset management program is developed to minimize the total cost of asset ownership by helping to determine when to repair, rehabilitate or replace the asset.

cation and cost. This is a huge advantage to the Village of Waterbury both from a maintenance standpoint and from a financial standpoint.

The average life of the asset, along with its replacement costs are taken into account when making these choices. Managing hundreds, sometimes thousands, of assets is a daunting task. Many systems will simply wait for an asset to fail before it is replaced. This is not always the best method. Unexpected failures can lead to large debts for a small system. The development of an asset management program will inform the system when certain repairs or maintenance are needed and assist in developing a long-term funding strategy for larger assets. Issues related to aging systems combined with a loss of knowledge from personnel retirements, and public resistance to rate increases, results in a growing need to make every dollar count.

Another issue some water systems in the Region struggle with are source yield and the need to identify additional reliable sources. Some systems that provide fire protection are under strain as they weren't necessarily designed with adequate distribution systems/pipes for use in fire protection.

In addition to the municipal systems- there are another 121 systems in the Region that meet the state's definition of a public water supply system serving facilities like campgrounds, recreation areas, mobile home parks, commercial areas, general stores and private schools.. While 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-resort related development and in the Town of Berlin, which contains a large commercial and industrial center and has attracted considerable development during the past 40 years. Outside of the service territories of public and private systems, water is generally obtained from on-site wells or springs.

Drinking Water Source Protection

Each public water system has an accompanying source protection area. The Vermont Water Supply Rule defines a Source Protection Area as: *... a surface and sub-surface area from or through which contaminants are reasonably likely to reach a Public water system source.*

All public community and non-transient, non-community water systems must have

approved Source Protection Plans. These Plans address the actions the public water system will perform to minimize the contaminant risks to their drinking water supply source. Threats to groundwater and wells in the region include agricultural runoff, nearby salt storage areas, road salting, underground or above-ground storage tanks, contaminated runoff from paved areas, flood events, and failing septic systems. Specifically identified threats in local operating permits for municipally-owned systems primarily include roadways and impervious surfaces within 200 feet of the water source. Two communities respectively identify a nearby sewage treatment line and an adjacent excavating operation as potential threats to drinking water sources.

Within these source protection areas, the VT Dept. of Environmental Conservation reviews Act 250 and wastewater facility applications. VT DEC also requires that towns develop a plan for protecting source areas. Towns are not required to regulate land uses within source protection areas, but some communities in the Region choose to do so.

FACILITIES & SERVICES

Solid Waste

The proper management and disposal of solid waste is an important challenge facing the region today. Everyone in Central Vermont generates waste, often without ~~its~~ thinking about its ultimate destination or impact. In 2012, the Vermont Legislature passed the Universal Recycling Law (also known as Act 148), which made significant changes to solid waste management throughout the State. The Universal Recycling Law was prompted by Vermont's stagnant diversion rate.

In 1987, Vermont's first robust Solid Waste Law (Act 78) encouraged communities to create a new hierarchy of goals for solid waste management: source and waste reduction, followed by re-use, recycling, and lastly, disposal. This law succeeded in increasing the waste diversion rate in Vermont to between 30-36%, but by the mid-2000s, that rate had stagnated. This prompted Vermont to pass the Universal Re-

cycling Law.

The Universal Recycling Law has several key components.

- Banning the disposal of certain solid waste
- Requiring parallel collection at facilities and curbside pickup
- Allowing ANR to monitor rate structures to ensure transparency
- Creating a food recovery hierarchy
- Phasing in food scrap diversion
- Incentivizing variable rate pricing ("Pay as You Throw") for municipalities
- Requiring recycling containers wherever there are trash cans in public buildings and on public land

This law will change a great deal about the treatment of solid waste in Vermont, and the Region is no exception.

Solid Waste Districts

Three Solid Waste Districts and one Alliance operate within our Region. The Central Vermont Solid Waste Management District (CVSWMD) is our primary waste entity. CVSWD serves Barre City, Barre Town, Berlin, Calais, East Montpelier, Middlesex, Montpelier, Orange, Plainfield, Washington, Williamstown, and Woodbury. Marshfield and Cabot are served by the Northeast Kingdom Waste Management District. The Town of Worcester is the sole town in our Region participating in the Lamoille Solid Waste Management District. Finally, the Mad River Resource Management Alliance (MRRMA), was formed in 1994 and operates with assistance from CVRPC. MRRMA is responsible for the solid waste planning for Duxbury, Fayston, Moretown, Roxbury, Waitsfield, Warren, and Waterbury.

In 2006, CVSWMD adopted a policy/goal of working to achieve "zero waste" in the Region. CVSWMD believed that "by setting an extreme target for waste reduction, new levels of innovation and efficiency (will be) unleashed." That goal is now supported by the Universal Recycling Law. The economic and social benefits of a zero waste goal are indisputable. The District argues that a zero waste goal can help create new businesses and jobs through waste-based economic development,

strengthen existing businesses, and protect public health and the environment. It is estimated that landfilling/incineration creates one (1) job per 10,000 lbs of material, while composting creates four (4), sorting and processing of recyclables creates 10, remanufacturing 25, and reuse business between 28 and 296)

Landfills

In Central Vermont, residents currently generate about 40,000 tons of waste per year, Only about one third of this gets diverted from the waste stream through recycling, reuse, or composting. The rest must be disposed of through land filling (or incineration).

In their 2007 Solid Waste Implementation Plan, the Central Vermont Solid Waste Management District, estimates that between two and three million dollars is spent annually on the disposal of approximately 40,000 tons of trash.

Of this, most goes to a landfill in Coventry, In the past, solid waste has been disposed of at landfills in Moretown, Williamstown and Washington, but these facilities have been closed.

Recycling and Transfer Facilities

Recycling of appropriate components of the waste stream is one method available to reduce the burdens on disposal facilities. Available data indicate that source separation of recyclables produces a more acceptable market product. In addition, source separation keeps the management of solid waste closer to the point of generation, thus encouraging consumers to participate more fully in the management of their solid waste.

Recycling of clear glass, tin and aluminum cans, newspaper, and #2 plastic jugs was made mandatory for households, businesses, schools and municipalities in the CVSWMD in 1995. The Universal Recycling Law added new items to the list of mandatory recyclables, with the law being implemented in phases. After July 1, 2015, all of the above products, as well as all clean paper and cardboard, are prohibited from landfills. Leaf and yard debris and clean wood waste are prohibited af-

ter July 1, 2016, and haulers must provide services for those materials.

Food scraps are banned from landfills as well, with the ban being implemented between 2014 (for the largest food scrap generators) and 2020. This ban is discussed further in the "Composting" section.

Private waste haulers offer curbside collection of trash to approximately 90% of the households in the region. These materials are brought to private processing facilities. There are several public and private facilities for public recycling drop-off depots. These centers run the gamut between once a week drop off sites to full time transfer stations.

All transfer facilities perform the same two functions: desired materials are separated from a mixed waste stream, and are processed for further management. Such facilities are generally more cost-effective if operated on the regional rather than local level. Recycling is currently collected at the same transfer facilities throughout the Region that process trash. The recyclables are generally sorted at the Material Recovery Facility (MRF) in Chittenden County. CVSWMD is exploring a public drop-off facility for leaf and yard waste, clean wood materials, asphalt shingles and dry-wall, household hazardous waste, and other materials.

There is a need for facilities for less common recyclables. The MRRMA operates a textiles recycling program at the Moretown Town Office. This program diverts clean clothing, linens, plush toys and shoes from landfills. The CVSWMD operates an Additional Recyclables Collection Center (ARCC) in Barre, which collects "hard to recycle" objects such as prescription bottles, batteries, product packaging, textiles/clothing, electronics, books, sports equipment, and energy bar wrappers.

In our technology-based society, electronic waste is also a growing problem as various devices wear out and must be disposed of. E-waste is illegal in landfills, and the state requires that all electronics manufacturers who sell electronics in Vermont must help pay for their disposal. This makes e-waste disposal free for Vermont residents, as well as small businesses, schools and charities. Several facilities and businesses collect e-waste throughout the Region. Many towns also collect cell phones and rechargeable batteries at government buildings.

Composting

It is estimated that about 40% of the waste we generate is food and yard waste. Currently most of this is landfilled. The State of Vermont Waste Composition Study (2013) found that 28% of residential Municipal Solid Waste (MSW) disposed (after recycling and composting) and about 18% of industrial, commercial, and institutional (ICI) materials disposed were organic material.

Composting is a natural process of decomposition of organic materials. It is the biological process that allows leaves and grass clippings to degrade. Composting of the organic component of the solid waste stream could produce an end product that both saves landfill space and provides a useful soil amendment. Source separated organics can be managed locally to produce a compost that benefits local gardeners, farmers and plant nurseries.

The Universal Recycling Law made composting mandatory for all residents and businesses in Central Vermont. The law is implemented on the following timeline:

- July 1, 2014: Generators who produce 2 tons or more per week must divert their food scraps if there is a certified facility within 20 miles.
- July 1, 2015: Generators who produce 1 tons or more per week must divert their food scraps if there is a certified facility within 20 miles.
- July 1, 2016: Generators who produce 1/2 tons or more per week must divert their food scraps if there is a certified facility within 20 miles.
- July 1, 2017: Generators who produce 1/3 tons or more per week must divert their food scraps if there is a certified facility within 20 miles.
- July 1, 2017: Haulers must offer services for food scraps for all customers.
- By 2020, all food scraps must be diverted from all businesses and households, regardless of generation rate or distance to a certified facility. Haulers must also accept food scraps from customers.

Vermont Compost Company has facilities in Montpelier and East Montpelier for large-scale source-separated composting. The company receives organic materials and processes them in large quantities to make compost and potting soil, which is then sold in eight states and online. The CVSWMD anticipates the need for a new composting facility in the Region in the coming years. This facility will be needed to process the increased organic waste stream that will be created by the elimination of yard waste from landfills.

The CVSWMD is quite active in promoting composting. In addition to producing and distributing the booklet "The Dirt on Composting", the District operates a "Business Organics" and a "School Composting" program. The Business Organics Program works with restaurants and other commercial food waste generators to divert food waste from landfills to composting (as of FY14, over 1,396 tons). The CVSWMD School Composting Program works with school cafeterias and provides other resources for schools, including guidelines for setting up a "Green Team" or environmental clubs to coordinate waste reduction actions such as composting (done on-site or with local farmers or commercial composters), holding clothing or book swaps, conducting waste audits, or taking leadership roles to address environmental issues. The District also promotes household and school level composting of organic waste by providing plans for building compost bins selling pre-made compost bins and "Green Cones." Green Cones are in-ground digesters that facilitate the fast decomposition of animal byproducts such as meat and bones.

The MRRMA also encourages composting by selling compost bins and kitchen collectors for food scraps. Food scraps from the MRRMA's coverage area are collected by Grow Compost, located in Moretown. In 2014, 126.5 tons of food scraps were composted at that facility. The Highfields Center for Composting provides composting services for the Northeast Kingdom Waste Management District and the Lamoille Regional Solid Waste Management District. The Center runs a pilot project called "Close the Loop!" in both Districts. This project offers composting education and food scrap pickup to residents in both Districts.

Re-use

In current society we tend to throw away unwanted or unneeded objects. Many such objects are suitable for other uses or desired by other individuals for their original use. By matching would-be discarded products with those in need of them, we may conserve resources and save valuable landfill space and product production resources. The Re-Store in Barre provides an outlet for used office supplies, furniture, household goods and knick-knacks for art projects. The Region also has a variety of used clothing stores and a Salvation Army, which resell clothing and furniture. CVSWMD also helps facilitate several events throughout the year, such as "Drop-n-Swaps," coat drives, ski and skate sales,

assistive technology exchanges and “Wheels for Warmth,” a program that sells donated snow tires for a low cost and donates the money to Capstone Community Action.

Business and Household Hazardous Waste Collection Facilities

Although most solid waste is relatively benign, a percentage is hazardous in nature. In fact about 1% of the landfilled material (or about 400 tons in Central Vermont) falls into this category. The disposal of even small quantities of certain types of solid waste, including unregulated hazardous wastes may pose a risk to both human health and the environment.

Unregulated hazardous waste is comprised of two categories; household hazardous waste (HHW) and conditionally exempt generator (CEG) hazardous waste. Even though household hazardous waste exhibits characteristics of hazardous waste, they are exempted from State hazardous waste regulations and, for management purposes, are considered a solid waste. CEG hazardous waste is exempt from most regulations, provided that less than 220 pounds of hazardous waste (or 2.2 pounds of acutely hazardous waste) are generated per month.

The Region's growing population is projected to generate quantities of household and business hazardous waste that will need proper management and disposal. With the likelihood of fewer landfills and solid waste processing and disposal facilities, it is important that both present and future generations be provided with the following: information on reducing the use of hazardous chemicals whenever possible; opportunities for diverting hazardous waste from the municipal waste stream through hazardous waste collection programs; and programs for hazardous waste screening at landfills and other solid waste facilities.

The Central Vermont Solid Waste District, the Mad River Resource Management Alliance, the Northeast Kingdom Waste Management District and the Lamoille Regional Solid Waste Management District put on a variety of special one-day events for household hazardous waste collection. Household hazardous waste includes things such as batteries and fluorescent bulbs. CVSWMD also accepts liquid latex and oil paints at the Additional Recyclables Collection Center, which is open year-round.

Product Stewardship/Extended Producer Responsibility (EPR)

Product Stewardship, also known as Extended Producer Responsibility (EPR), is a system in which producers are responsible for their products when they are no longer in use. The system attempts to encourage producers to create product disposal methods that are more environmentally friendly and easier to dispose. Common industries that use EPR are tires and paints.

In Vermont, there are five EPR programs: paint, electronics, batteries, fluorescent lamps and thermostats, and auto switches. There are several businesses that offer options for recycling paint in Central Vermont. A Montpelier paint store, True Colors, offers opportunities for latex paint recycling by reprocessing and reselling latex paint. Additionally, PaintCare, a national non-profit organization that runs paint stewardship programs, has many locations for drop-off in Central Vermont, including the CVSWMD ARCC. PaintCare collects paint and then remixes and resells the paint.

At this time, there is no EPR program for tires. There is one facility for recycling tires in the Region: Budzyn Tire in Barre, and "Wheels for Warmth" is a tire re-use program. However, CVSWMD indicates that there is a significant need for more tire stewardship programs. Wal-Mart and Shaw's grocery stores both independently recycle the packaging from their products. Additionally, they offer plastic bag recycling collection in their stores. Compact fluorescent bulbs (CFLs) are recyclable at many hardware stores throughout the Region. CFLs are also accepted at the ARCC and at HHW events held around the Region.

Communications

Our era is often referred to as "the age of communication." Innovations in the way we process and transmit information have made the world a smaller place. Communication networks are rapidly linking the Region's residents, businesses, and governments with the rest of the world. While Central Vermont's existing communication facilities seem adequate to meet current needs, the maintenance and continued development of communications systems can help keep Central Vermont informed

and competitive. Many businesses and individuals seek out areas where high speed internet connections and cellular service are available to locate their businesses and buy a house. Ultimately though, such systems may make our current working and living patterns obsolete, as they change the elements of our lifestyle, such as the distinctions between home, the work place, and the marketplace.

Radio

Central Vermont is home to seven radio stations. WNCS and WSKI broadcast out of Montpelier; Waterbury is home to WDEV and WGLY; WDEV-FM in Warren, Goddard College's WGDR, and WSNO - WORK in Barre round out the field. The Region is also served by Vermont Public radio and several commercial stations broadcasting from locations outside Central Vermont, as well as HAM operators.

Newspaper

The Barre-Montpelier Times Argus, and the Burlington Free Press are the primary daily newspapers serving the Region and its residents. These publications cover international, national, regional and local news. Weekly papers, covering local and/or sub regional events include; The Valley Reporter (Waitsfield, Warren, Moretown, Fayston and Duxbury), The Hardwick Gazette (Woodbury, Cabot, Calais and Marshfield), the Northfield News (Northfield and vicinity), and the Washington World (all of Central Vermont). In addition, several community papers exist in the region.

Television

Most residents of Central Vermont are within receiving distance of signals from affiliates of the major commercial networks (ABC and CBS stations broadcast from Burlington and Plattsburgh, New York is home to an NBC affiliate). In addition, Vermont ETV, a public station, broadcasts from Colchester. Cable television is now available to over three-quarters of the Region's population². Under Public Service Board rules, cable television companies offer local access for community programs.

Vermont Interactive Television operates out of Vermont Technical College in

Randolph, feeding additional sites across the State, including Montpelier and Waterbury. This system allows people in distant locations to have visual and audio contact with each other for conferences, meetings and classes. This technology not only facilitates communication, but saves energy and reduces fossil fuel consumption as it obviates the need for long distance travel.

Voice Communication

Most of Central Vermont is served by FairPoint Telephone Company or a subsidiary of Fairpoint, the Telephone Operating Company of Vermont LLC. The Mad River Valley, where Waitsfield Telecom operates, and Northfield & Roxbury served by TDS Telecom, are outside of Fairpoint's service territory.

Vermont's telecommunications market has grown more competitive in the last ten years with the entrance of competitive local exchange carriers (CLECs), explosive growth of mobile wireless telephone service, and telephone service being offered from cable providers. In urban and suburban areas such as Chittenden County, this influx of competition has resulted in greater choice of services for businesses and residents.

Competition, however, is less abundant in rural areas. Incumbent local exchange carriers (ILECs) are very often the only wireline provider in the state's costliest to serve areas and act as the carrier of last resort. These two trends put great financial stress on ILECs, as they try to maintain an aging network for a dwindling number of customers.

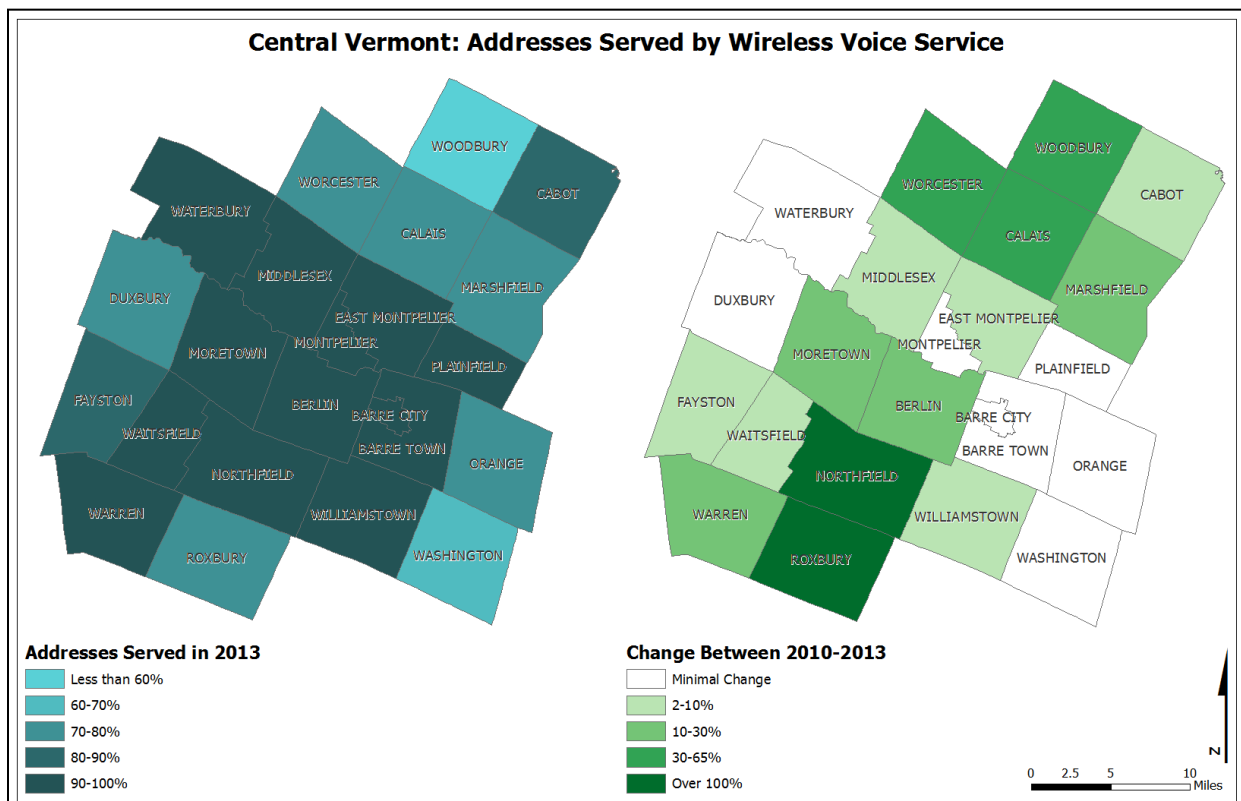
Technological changes are also affecting the voice market. Voice over Internet protocol (VoIP) is poised to replace circuit switched technology with a voice system that rides over data networks. In some rural communities, this may mean abandoning traditional wireline service altogether in favor of a wireless solution. Voice over Internet protocol (VoIP) has allowed a greater number of competitors to enter the market for voice service, such as cable and Internet content companies. More importantly VoIP has challenged the distinction between "telecommunications service" (previously referred to as a "basic service") and an "information service" (or "enhanced service").

Mobile wireless voice service is becoming more available. Vermonters' use and reliance on mobile voice technology has increased since the publication of the last telecommunications plan. Twenty nine percent of Vermont households are wireless-only households.

As of 2013, thirteen of Central Vermont's twenty-three communities have between 90-100% of addresses served by a wireless voice provider according to voice tests that were conducted throughout the state (displayed in Figure 1). Mobile data for smartphones or mobile hotspots is also typically available from these carriers in the same service areas that voice is available.

The Towns of Woodbury and Washington remain the least-served with less than 60% of Woodbury's addresses receiving coverage and between 60-70% of Washington's addresses. In recent years coverage has more than doubled in the Towns of Northfield and Roxbury and also increased significant in the Towns of Worcester, Calais and Woodbury.

Figure 1: Addresses Served by Wireless Voice Service (BroadbandVT.org)



Wireless Telecommunication Facilities

Wireless communication through broad band technologies has become a part of everyday life and a service relied upon by business, emergency services, and the public. Clearly, the ability to communicate to almost anyone, from almost anywhere, at almost anytime brings added convenience and security to our lives.

Throughout Central Vermont, we are seeing continuing applications for the installation of wireless telecommunication facilities. This is partly because the demand for wireless services is growing and partly because of changes in technology.

While Central Vermonsters want and expect good cellular service, they also expect the placement and design of new facilities to be guided by a respect for the integrity of the Region's landscape and compliance with microwave emissions standards. As such, it is im-

The 2014 Vermont Telecommunications Plan highlights the fact that technology is evolving very fast and that changes over the last 10 years have blurred the line between what is an essential service and what is not. For example, the 2004 Telecommunications Plan survey indicated that an overwhelming majority of Vermont households (77%) had not even considered the idea of giving up their traditional landline service in favor of wireless service. Today, 29.9% of Vermont adults live in wireless-only households, and that number continues to increase as service expands and becomes more reliable.

portant to balance aesthetics, signal quality, health, business and personal needs when deciding whether and where to build new towers and other facilities.

The Federal Telecommunications Act of 1996 does not allow local governments to prohibit the construction of wireless facilities on a town-wide (or city-wide) basis, or to make regulatory barriers so onerous as to effectively block service. However, municipalities did retain the right to place reasonable requirements and restrictions upon such facilities in order to protect community character and the environment, and encourage the efficient use of resources. In 2007, the Vermont Legislature created 30 V.S.A. § 248a. Section 248a provided telecommunications carriers seeking to construct telecommunications facilities the option of obtaining a CPG as an alternative to local zoning and Act 250 environmental review. Applicants using the Section 248a process are not obligated to adhere to zoning ordinances of the host town.

During the 2014 legislative session, the General Assembly crafted new provisions relating to town participation in 248a proceedings. Criteria is applied in the review of projects requiring the Public Service Board to give *substantial deference* to the land conservation measures in the plans of affected municipalities and the recommendations of the municipal legislative bodies and the municipal and regional planning commission regarding the municipal and regional plans, respectively, unless there is *good cause* to find otherwise.

Communities planning for the appropriate siting of wireless facilities have to ask themselves many questions as they proceed. Would they rather have several small scale, less visible, facilities closer to the population or a few large, highly visible sites in less populated spots? Are there certain locations that are so environmentally or visually sensitive that they should be “off-limits”? What areas are providers most interested in serving? Through careful planning and clear language in the duly adopted municipal plan, cities and towns can ensure good service without compromising their character or the welfare of their residents.

Broadband and Internet Services

Internet services have become an integral part of everyday life relied upon by business, emergency services, and the public. Clearly, the ability to communicate to almost anyone, from almost anywhere, at almost any time brings added convenience and security to our lives. Broadband is an oft-referenced essential telecommunication technology that refers to high speed internet access. Central Vermont has several internet providers, and high speed connections are now available to most residents in highly populated areas. Although service has improved beyond dial-up for many Central Vermont residents and businesses, the nature of “adequate” service is an evolving concept that will continue to present challenges for the region. As the broadband networks supporting the global and national economies are improved to meet demands for greater speed, residents and businesses in Central Vermont will need service that is adequate for them to participate. Broadband was originally defined as data communications at speeds faster than a dial-up connection, which is typically 56kbps or less. The Vermont Dept. of Public Service now defines high speed internet access as 4 Mbps download and 1 Mbps upload or greater.

Regional Broadband Plan. In 2011 CVRPC established a regional technology and innovation team with representation from a variety of sectors including business, education, libraries, government, media, health care and human services. Input from this teams shaped the goals, strategies and actions found in the region-wide commonalities and sector analysis sections of a completed Regional Broadband Plan. Five themes that were present included: the availability and affordability of broadband, the role of broadband in local government, telecommuting, digital literacy, and economic impact of broadband. For more detailed information, refer to the 2012 Regional Broadband Plan.

Although the majority of the Central Vermont Region is served by Broadband in some capacity, primarily through cable and DSL (digital subscriber line via a telephone provider), the maps of cable, DSL, and fixed wireless service (WISP) provided online by BroadbandVT.org show Roxbury, Washington, and Woodbury as the most underserved towns in our region. This is a concern for residents of those locales and an impediment to economic development and energy saving activities such as telecommuting. With large portions of the towns without access to Broadband service or with access at less than 25% of residences, these areas should be targeted for increased connectivity and access. Residents of rural areas generally have less competitive choice, but new options are coming online. Those in remote parts of the

Region will be best served with fixed and mobile wireless services.

Fortunately, the State has recognized the importance of this issue and continues to take steps to identify gaps and develop solutions. The Vermont Telecommunications Authority (VTA) is supported by Legislative appropriations and has been involved on an ongoing basis in three types of projects: broadband expansion, cellular service infrastructure and fiber optic infrastructure. Several commercial service providers are also investing significantly in their own broadband and/or cell service expansion projects. BroadbandVT.org, is an active cooperative effort that has developed a variety of maps that show elements of broadband and cellular coverage. BroadbandVT.org partners include the Vermont Center for Geographic Information (VCGI), VTA, Vermont Department of Public Service (DPS), and the Center for Rural Studies of the University of Vermont.

Landline High Speed Internet Access Expansion (DSL)

All incumbent local exchange carriers (phone companies) offer high speed Internet

access. FairPoint, Vermont's largest incumbent carrier, offers DSL service to an estimated 92% of the service locations in its territory. The other independent phone companies offer DSL within their entire service territories. Most offer service at speeds of 4/1 or higher. Notable is the widespread DSL availability in the Mad River Valley provided by Waitsfield Telecom.

Cable Internet Access

All cable providers in Vermont offer broadband service. All cable providers offer speeds of at least 4/1 Mbps and in most cases much faster speeds. Prices for broadband service are generally competitive with DSL, but cable offers higher speeds. In Central Vermont cable is available primarily in or in the vicinity to the Region's downtowns and larger villages.

Wireless Internet Service Providers (WISPs, or Fixed wireless)

Vermont consumers are served by several Wireless Internet Service Providers. These companies offer fixed wireless broadband service to residents within range of their facilities. Recent expansions include the development of the Cloud Alliance broadband network which, in partnership with the VTA and Central Vermont Economic Development Corporation, provided for new service to homes and businesses in Woodbury and Cabot and improved the speed of broadband service in Plainfield, Marshfield, East Montpelier and Calais. Vermont Telephone Company (VTel) also began a project in 2011 to bring wireless broadband service to Vermont using federal Rural Utilities Service (RUS) broadband stimulus grant. Wireless open world's (WOW) 4G/LTE network will reach Vermont's presently underserved and unserved areas.

Mobile Wireless Data Service

Vermonters are served by all of the major wireless network providers, but AT&T Mobility and Verizon Wireless have the deepest facilities-based penetration in Vermont. VTel recently launched a wireless service, which is anticipated to be operational

statewide. Vermonters may also choose service from a variety of pre-paid service providers and resellers of national service. As discussed more fully in the Voice portion of this chapter, mobile carriers are continuously expanding coverage and upgrading facilities to bring 4G/LTE service to existing coverage areas.

Vermont needs its wireline networks at this time. For rural residents and small businesses, wireline service is a necessity. Residents in rural areas may not have adequate cell coverage. DSL is also the best available broadband option in Vermont's most rural areas. Concerns over E-911 and the reliability of wireless service in a power outage are valid and should be carefully considered before the state accepts wireless services as a substitute for wireline services.

Fiber Optic

The VTA has developed fiber optic infrastructure to support broadband service and provide backhaul for cell sites wireline transmission from the cell site to the carrier's network. Its largest project to date is the funding of the Vermont Fiber Connect project, an initiative of the federal Broadband Technology Opportunities Program (BTOP) stimulus. The project connects over 340 community anchor institutions in the project area, encompassing seven of Vermont's fourteen counties. Vermont Fiber Connect serves Montpelier, Barre City and immediate surrounding areas in the Region. Fiber optic technology is also advancing rapidly. While older fiber in the State is becoming outdated and getting costly to maintain and run, it is still much better than any improvements in copper and wireless technology currently in place.

Emergency/Health Services

The availability of emergency services and health care facilities helps to ensure the personal safety and physical well being of Central Vermonters. As the Region grows, changes, and ages, new and increasing pressures will be brought to bear on service providers and existing facilities. While the cost of providing such services soars, public funding supplies are not keeping pace. Obviously then, it will take innovative thinking and action to address the Region's long term emergency and health care needs.

The Enhanced 911 Board operates nine 911 call answering points, known as public safety answer points or PSAP's. One of the nine PSAP's is located at the Montpelier Police Department. During 2001, 5,251 calls were answered for Central Vermont communities by the PSAP's. This represented 3% of the total calls made statewide. In 2002, the number of calls from Central Vermont increased to 9,557, or 6% of all statewide calls. It should be noted, however, that statewide calls were down by 8% in 2002⁴.

Fire Protection

Central Vermont is protected by over 20 local fire departments. Most of these are based in village or urban areas and staffed by volunteer crews. In some instances, the demands on local fire departments are beginning to outstrip their capabilities. Sprawling development patterns make response more difficult and time consuming. In addition, many departments are faced with a shortage of trained volunteers and less than state-of-the-art equipment.

All of the Region's fire companies are members of mutual aid systems. These associations provide for back-up assistance from neighboring member companies, when needed.

Police Protection

Although not immune to crime, Central Vermont has historically enjoyed low crime rates. The Region's crime rate of the 1990's has declined sharply in the more serious crimes (Part I crimes such as homicide, aggravated assault, etc) and less significantly in lesser crimes (Part II crimes such as forgery, vandalism, simple assault, etc.) since the high in 1993. The Part I crime rate dropped by 23% from a region-wide rate per 1,000 population of 33.42 in 1990 to 26.01 in 2001 while the state-wide rate decreased by 35% from 45.64 to 29.90. The Part II crime rate for the Region increased from 70.46 in 1990 to a high of 85.60 in 1993. However, the 2001 rate dropped to 78.10, a decline of 9% from 1993. The statewide rate in 1990 was 83.33 and in 2001 was 82.57, a slight decrease from 1990, but a decrease of 10%

4 2008 Data

from its peak of 91.03 in 1997. Our ability to maintain lower crime rates will depend on maintaining adequate police services at the local and regional level⁴.

Barre City, Barre Town, Berlin, Montpelier, Northfield and Waterbury maintain municipal police squads. The Washington and Orange County Sheriff's Departments, located in Montpelier and Chelsea respectively, provide contractual law enforcement services to some of Central Vermont's smaller communities. The Vermont State Police (with headquarters in Waterbury and barracks in Middlesex) provides primary police service to those towns without municipal squads or contracts with County de-

Table 4: Emergency Resources by Municipality in Central Vermont (Town Plan Data⁵)

Town	Police Force	Fire Protection	EMT
Barre City	Full Time	Full Time	Full Time
Barre Town	Full Time	Hourly	Full Time
Berlin	Full Time	Mutual Aid with Volunteers	Contracted from Barre
Cabot	State and Sheriff Contract	Volunteer	Volunteer
Calais	State and Sheriff Contract	Volunteer	Volunteer
Duxbury	State and Sheriff Contract	Mutual Aid	Mutual Aid
East Montpelier	State and Sheriff Contract	Full Time with Volunteers	Full Time
Fayston	State and Sheriff Contract	Mutual Aid with Volunteers	Mutual Aid, Volunteer
Marshfield	State and Sheriff Contract	Mutual Aid with Volunteers	Mutual Aid, Volunteer
Middlesex	State Contract	Mutual Aid	Contracted from Montpelier and Waterbury
Montpelier	Full Time	Full Time with Volunteers	Full Time
Moretown	State and Sheriff Contract	Mutual Aid with Volunteers	Purchased from Montpelier
Northfield	Full Time	Volunteer	Partially Volunteer
Orange	State Contract	Mutual Aid	Mutual Aid
Plainfield	State Contract	Volunteer	Volunteer
Roxbury	State Contract	Mutual Aid, Volunteer	Volunteer
Waitsfield	State and Sheriff Contract	Mutual Aid, Volunteer	Volunteer
Warren	State Contract	Volunteer	Volunteer
Washington	Sheriff Contract	Volunteer	Contracted from Barre
Waterbury	Full Time	Volunteer	Volunteer
Williamstown	State and Sheriff Contract	Volunteer	Full Time
Woodbury	State and Sheriff Contract	Volunteer	Mutual Aid
Worcester	State Contract	Mutual Aid with Volunteers	Volunteer
Data from town plans ⁵			

5 2008 Data

partments, and backup assistance to all others. In addition, the State Police patrols Interstate 89.

Police departments responding to CVRPC's survey cited increasing crime and lack of manpower as the greatest problem for the foreseeable future.

Ambulance/Emergency Medical Services

Some 17 ambulance and emergency medical squads operate in and around Central Vermont, providing first aid and medical transport to injured persons. Most of these operate with volunteer crews and are funded at least in part by donations and user/member fees. Lack of volunteers and members are cited by several squads as major concerns for the future.

Medical Facilities

The Central Vermont Medical Center (CVMC), located at Berlin Corners, is the Region's most significant medical complex. With 122 beds and a service area which includes all of Washington County and portions of neighboring counties, CVMC is truly a regional facility. A wide range of medical specialties and procedures including; emergency care, x-rays, rehabilitation, pre-natal and maternity care, pediatrics, physical therapy, mental health care, and cardiology, are available at CVMC. Some unusual and complex problems, however, may require more sophisticated treatment and/or equipment at tertiary care hospitals.

The Vermont State Complex in Waterbury, while now largely converted to state offices, still provides mental health care for some patients⁶. In addition, the Washington and Orange County Mental Health Agencies provide mental health counseling, adult day programs, and substances abuse services to those in need.

The Region's elderly population is expected to grow for at least the next several decades. Accordingly, elder care facilities and services will become increasingly important. Central Vermont hosts five nursing homes boasting more than 500 beds in total. In addition, there are several facilities which provide at home nursing and

⁶ 2008 Data

health care options.

Finally, Central Vermont is home to several health care clinics including Planned Parenthood of Northern New England (Barre and Waterbury), private facilities, and complexes of physicians.

Health care costs continue to rise at a rate faster than the rate of inflation. Consequently, access to adequate health care services has become an impossibility to many. It is the position of CVRPC that health care should be everyone's right.

Emergency Planning

Emergency planning is an important aspect of planning that is critical to every municipality in Central Vermont and the Region as a whole. The goal of emergency planning is to work toward the development of disaster-resistant communities; through land use planning that reduces the impacts of disasters on persons and property. Municipalities can utilize tools, such as town plans and zoning regulations, to implement sound land use practices that consider the consequences of disasters, whether they be naturally occurring or man-made. In order for a municipality or the Region to understand the types and extent of potential disasters, an assessment of all known risks from potential natural and man-made disasters needs to be completed. These identified risks can then be used to develop land use practices that will protect a community from disaster, based on mitigation, preparedness, response, and recovery.

Naturally occurring disasters, which are the most common form of disaster in Central Vermont, are those events that result from environmental conditions. These disasters vary in frequency and magnitude, but always pose a threat to the Region. In Central Vermont, the most common types of natural disasters include: floods, winter storms, hurricanes, landslides, wildfires, earthquakes, and even tornadoes. Although some of these disasters may seem unlikely in Central Vermont, it is critical to plan for them, so that the impacts from their occurrence can be mitigated if they do indeed hit the Region. However, those disaster events that occur more frequently in Central Vermont, mainly floods and storms, should be given priority in the planning process.

Between 1996 and 2006, the National Climatic Data Center reported 267 major storm events in the Central Vermont Region, all of which resulted in the loss of life or property. In total, these storm events cost Central Vermont \$21.083 million in property damage and resulted in 5 deaths. Based on this data, it is evident that Central Vermont is vulnerable to major storms and the damage resulting from them.

Man-made disasters are those events that are caused by humans, usually involving accidents with hazardous materials. Man-made disasters can occur either on-site, such as factory malfunction, or in transit, such as an accident involving a truck carrying hazardous materials. Although these types of events occur less frequently in Central Vermont than natural disasters, they can be extremely dangerous and a threat to public health. Title III of the Superfund Amendment Reauthorization Act (SARA), Emergency Planning and Community Right-to-Know Act (EPCRA), 42 U.S.C. 11001 et seq. (1986) gives a municipality the legal right to know what chemicals are being used, stored, made, or transported through the community. During a community's risk assessment, this information regarding the presence of chemicals can be gathered from businesses.

Mitigation is any action that reduces or eliminates long-term risk to people and property from disasters and their impacts. It involves an ongoing effort at the individual, local, State, and Federal level and is aimed at reducing the impact of disasters on families, homes, communities, and economies. Mitigation includes compliance with the National Flood Insurance Program (NFIP). Municipalities must be in compliance with this program in order for property owners to receive flood insurance to offset some of the costs of major flood events. All 23 municipalities in Central Vermont are in compliance, however, FEMA is currently updating Flood Hazard Maps and regulatory standards – actions that will require amending local bylaws in many cases, if eligibility is to be maintained. CVRPC has been assisting out communities in responding to these new mandates.

Municipalities in Central Vermont have a variety of tools and programs to assist them with mitigation activities. The Federal Emergency Management Agency (FEMA), through Vermont Emergency Management (VEM), administers the Hazard Mitigation Grant Program (HMGP).

This program allocates funding to municipalities, following a Presidential-declared

disaster, to implement mitigation projects. In addition, the Vermont Local Roads Program, administered through St. Michael's College, assists municipalities in setting the proper standards for planning roads, culverts, bridges, and access to local roads. Finally, the Central Vermont Regional Planning Commission is currently in the process of developing a Regional Pre-Disaster Mitigation Plan which will address vulnerabilities and relevant mitigation projects throughout Central Vermont. Depending on the availability of funds, local appendices covering specific concerns and projects for each municipality will be developed in consultation with local officials.

Preparedness is the process of inventorying and organizing the people and tools available for responding to an emergency event. A municipality's Rapid Response Plan (RRP) is the first step towards emergency preparedness. An RRP, which identifies key emergency personnel, contact numbers, locations, tasks, and an evacuation plan, is a guide for use in the early stages of disaster response. Although RRP's are not required, all municipalities in Central Vermont are strongly encouraged to have one in place and to update it annually. The Local Emergency Planning Committee (LEPC) is comprised of one emergency coordinator from each municipality. The LEPC is responsible for developing a disaster response plan for the Region, including training and exercises. Currently, not every municipality in Central Vermont has a representative on the LEPC; only Barre City, Barre Town, Middlesex, and Northfield do. However, all local leaders and emergency personnel are encouraged to participate in the Committee⁷.

Response is a time sensitive reaction to an emergency event designed to save lives, save property, and stabilize the situation. Response to an event includes warning, evacuating, rescuing, sheltering, informing, and providing medical care to the public.

Recovery is the effort to restore the infrastructure and the social and economic aspects of communities after a disaster occurs. In the case of severe events in which the President of the United States declares a disaster; Federal funds will become available to assist impacted communities with recovery efforts.

Emergency Management

Emergency management in Central Vermont is handled at the local level. It is led by a municipality's emergency managers and emergency personnel who are either professional or volunteer-based depending on the community. Emergency management deals with the emergency events that occur on a regular basis, such as fire, injury, accidents, and crime. It is very important to the social and economic stability of Central Vermont and should be a high priority in the Region. Due to limited emergency resources and the geographic extent of certain towns, emergency management is sometimes coordinated among municipalities. This is especially true with ambulance and rescue services in Central Vermont.

As a result of towns lacking sufficient resources to meet FEMA requirements to prepare for disasters, VEM looked to the regional planning commissions to contribute educational information, training, and emergency expertise. In 1999, VEM contracted with the regional planning commissions to administer the Local Emergency Management Program (LEMP). This required the regional planning commissions to work with local municipalities on emergency planning, mitigation, education, exercises, and response.

CRIME AND SAFETY

Central Vermont is a relatively safe place to live where neighbors tend to look out for each other, and conflicts between members of the community are the exception rather than the rule. Vermont's crime rates are considerably below national averages and there wasn't a dramatic increase in those rates during the 1990's. It continues to be in the best interest of the Region and its residents to maintain and improve upon this enviable position.

At first glance, crime may not seem like an issue that bears much relation to land use planning. However, these issues do share many of the same peripheral concerns. Population growth tends to increase the opportunity for both interpersonal and land use conflicts. In addition, crime prevention experts and land use planners are both interested in many of the same "quality of life" issues, including: livable wage, the availability of meaningful jobs, access to education and training, access to transportation, community stability and vitality, recreational opportunities and even the aesthetic quality of the places where people live. It is widely accepted that

vibrant, pleasant, well-planned communities can avoid many of the socio-economic conditions that lead to conflict. Conversely, low crime rates are essential to the creation and maintenance of these kinds of places. To the extent that this relationship exists, it can be said that this Plan deals with the issue of crime prevention by default in the policies and programs espoused in its required elements. However, CVRPC believes the connection between land use planning and community conflict is important enough to merit direct attention.

Crime prevention is only one piece of the puzzle, however. The others may be found in the answer to the question "What happens after a crime has been committed?" The components of the answer involve the exploration of such concepts as justice, punishment, rehabilitation, restoration, and re-integration.

The traditional justice model is founded on the concept of retribution. The offender is generally punished for his or her offense by jail time, fines, or probation. The sentence is intended to be both the punishment and the rehabilitation with the prospect of returning to jail serving as the incentive to reform behavior. The offender has little or no contact with the victim of the crime and no requirements (or opportunity) to make amends directly. Some crime experts argue that this traditional justice model is responsible for over-crowded prisons, high recidivism rates, and an unsatisfactory outcome for crime victims.

Corrections agencies around the country, however, (including Vermont's Department of Corrections, DOC) are beginning to operate under a new paradigm that stresses "restorative" over "retributive" solutions for non-violent crimes. This new model (called the "Restorative Justice Program" and authorized in Vermont Statute Title 3 Section 163) is intended to make offenders answer directly to those they have wronged and begin to make amends to their victims and the community. Often this approach can maximize public resources by having offenders perform community services instead of serving costly prison sentences. In addition, it can reduce court loads and the associated expense to the taxpayers. However, there is the danger of the cost of delivering justice in this format being shifted from the State to the municipality.

Under the "restorative" model, justice for non-violent crimes may be prescribed by those closest to the offender and the victim through the establishment and operation of community reparative boards and/or restorative justice centers. Such an ap-

proach could work hand in hand with other local initiatives, such as neighborhood watch programs and “reintegration panels.” While community-based justice would be in keeping with CVRPC’s commitment to “bottom up” public processes, valid concerns exist over impartiality, over-zealousness, and personal vendettas whenever small town dramas play out. Consequently, the community restorative justice model demands protection against abuse. In addition, financial incentives to municipalities are an integral part of the success of the community restorative justice model. The costs usually borne by the State should not be passed on to the municipalities.

Obviously, this model is not applicable to violent or serious crime. In such instances the need to protect the public from further harm requires that offenders be incarcerated even as it is becoming increasingly difficult to house the prison population.

EDUCATIONAL FACILITIES AND SERVICES

A commitment to education is the hallmark of an enlightened society. A well-educated citizenry contributes to the societal, economic, and cultural well being of a place. Education expands the horizon of individuals, families, communities, and nations. It is the laboratory in which new ideas develop, ideas that may one day mold the future, or correct the mistakes of the past. Further, education should be a life-long process, not a luxury of youth.

While the link between education and regional planning is not particularly obvious, there are in fact connections. Planning decisions regarding the location and amount of future growth may influence the location and size of future schools or the stability of existing ones. Planning can help schools project future needs and assist municipalities in financing capital improvements. CVRPC hopes this Plan can be used to broaden access to educational and vocational training opportunities, so as to help ensure the full realization of the abilities of Central Vermonters.

Central Vermont is home to 17 public elementary/middle schools, eight middle and /or high schools, and two schools (Cabot and Twinfield) which host students K - 12. Many of these institutions are either approaching or over their capacities.

Higher education thrives in Central Vermont. Norwich University in Northfield, its affiliate, Vermont College in Montpelier, and Goddard College in Plainfield offer four-

Table 5: Public School Enrollment (Vermont Agency of Education)

School	2013-2014 School Year	10 Year Change
Union Elementary School	522	36%
Rumney School (Middlesex)	176	28%
Calais Elementary School	133	22%
Fayston Elementary School	120	20%
Washington Village School	96	17%
Warren Elementary School	184	16%
East Montpelier Elementary School	219	10%
Doty Memorial School	78	10%
Thatcher Brook Primary USD #45	444	3%
Williamstown Middle/High School	318	1%
Orange Center School	103	-1%
Barre City Elementary/Middle School	902	-2%
Woodbury Elementary School	55	-5%
Berlin Elementary School	213	-7%
Northfield Elementary School	297	-7%
Waitsfield Elementary School	155	-9%
U32 High School UHSD #32 (School)	781	-10%
Barre Town Elementary School	856	-14%
Harwood UHSD #19 (School)	544	-16%
Twinfield USD #33 (School)	406	-20%
Cabot School	182	-22%
Moretown Elementary School	117	-23%
Spaulding HSUD #41 (School)	734	-24%
Crossett Brook Middle USD #45	264	-24%
Roxbury Village School	41	-29%
Harwood Union Middle UHSD #19	135	-29%
Main Street School	192	-30%
Montpelier High School	285	-30%
Northfield Middle/High School	308	-38%
Williamstown Elementary School	23	-92%
Total	8883	-14%

year degree programs, in a variety of disciplines. Associates Degree programs and about 100 different courses are offered through the Community College of Vermont

(CCV). CCV maintains central administrative offices in Waterbury and conducts classes in Montpelier. Woodbury College, in Montpelier, offers training in mediation, Para-legal skills, counseling and human relations. Montpelier's New England Culinary Institute trains in the culinary arts and operates two restaurants where skills are honed.

Vocational training opportunities are available to Central Vermonter's primarily through the Barre Regional Vo-Tech Center which offers programs in: accounting/bookkeepers, typing/general office skills, general marketing, allied health, food service, vocational home economics, brick/stone masonry, automotive mechanics, and drafting. Some area high schools offer courses in vocational skills as well.

Despite declining enrollment, some public schools face major expansion, renovation, or construction costs due to State public facility standards, as well as other factors.

Child Care

Overview: The availability of safe and affordable child care services is critical to the Central Vermont Region. Quality child care benefits families by preparing children for schooling and social interaction while enabling parents to work and provide income. It benefits businesses by expanding the workforce and creating more reliable, productive employees. Furthermore, child care facilities are businesses themselves and their existence expands local and regional economies directly through the hiring of workers and purchase of goods and services. Research has shown that investment in early child development programs brings a real (adjusted for inflation) public return of 12% and a real total return, public and private, of 16%.

Availability: Despite the economic and social good created by child care services, Vermont appears to have a shortage of such facilities. In fact, the Child Development Division of the Vermont Agency of Human Services estimates that the capacity in regulated facilities meets only 50-60% of the State-wide need. Consider the following statistics:

- 80% of Vermont workers with children under the age of six work outside the home.

- 87% of Vermont women with school age children work outside the home.
- There are 93,436 children ages birth through 12 in the State. An estimated 60,733 of those require child care.
- There are currently only about 36,000 children in regulated care.
- Only 35% of licensed centers serve infants and toddlers.
- On average, children under six receiving child care spend 8-9 hours per day with their care providers.
- Only 25% of the demand for infant care is being met.
- An estimated half of all Vermont businesses have employees with a child or children in child care.

Table 6: Regulated Child Care Providers in Central Vermont, Vermont Agency of Human Services

Town	Registered Home Care Providers	% Regional Total	Licensed Providers	% Regional Total
Barre City	20	22%	6	27%
Barre Town	18	21%	3	14%
Berlin	2	2%	1	5%
Cabot	1	1%	0	-
Calais	0	-	0	-
Duxbury	2	2%	0	-
East Montpelier	5	6%	2	5%
Fayston	0	-	1	5%
Marshfield	2	2%	0	-
Middlesex	1	1%	0	-
Montpelier	6	7%	3	14%
Moretown	1	1%	0	-
Northfield	5	6%	0	-
Orange	0	-	0	-
Plainfield	3	3%	0	-
Roxbury	1	1%	1	5%
Waitsfield	0	-	3	14%
Washington	0	-	0	-
Waterbury	9	10%	3	14%
Warren	1	1%	0	-
Williamstown	7	8%	0	-
Woodbury	2	2%	0	-
Worcester	1	1%	0	-
Total	87		27	

Source: Vermont Agency of Human Services.

In Central Vermont, there are 87 registered home care providers and 22 licensed care providers (see Table 6 for breakdown). However, there are only 7 “quality” providers (licensed with 4 or 5 STARs in the Vermont Step Ahead Recognition System and/or with national accreditation). Furthermore, if we assume that each center is licensed for 50 children (some are less and some are more) then there are 350 spaces for an estimated 21,000 working population. This suggests that we have a crisis that is affecting the social and economic well-being of Central Vermonsters.

Affordability: According to the Child Development Division of the Vermont Agency of Human Services, the average cost for center-based care for infants is \$140.92 a week and \$125.71 for pre-schoolers. This means a family with an infant and a pre-schooler in licensed care would pay \$266.63 a week, or \$13,865 a year, for child care. (These figures may be the average for all providers, but are low for quality ones. Costs range from \$8,000 to \$11,000 per year per child depending on age. State subsidies are available, but fall short of actual tuition.) This equates to 29% percent of the median household income for Central Vermont.

It is probable that the high cost of child care keeps some residents of the Region out of the workforce. Simply put, for some families the cost and inconvenience of putting children in daycare outweighs any potential income gain. Even moderate income families that do opt for a daycare solution, often pay a large portion of their total income for these services and consequently struggle to get ahead.

While the financial challenges of child care are certainly daunting, the State of Vermont DCF Subsidy Program, operated by the Agency of Human Services, does provide some financial assistance to low and moderate income families. The amount of the subsidy available is based on a formula (tied to the poverty rate) which takes into account both income and family size. Unfortunately, the formula has not been changed since 1999. Consequently, the percentage of families qualifying for subsidies has been decreasing. It would cost an estimated sustainable \$18 million to bring subsidies up to date. Therefore, many working poor families are caught in a downward spiral. Both parents need to work, can’t afford child care and education which then affects their ability to survive.

Resources: While child care “slots” are scarce, resources for parents, providers and would-be providers are abundant. Among the many sources of information and assistance are:

- The Family Center of Washington County/Child Support Services – Offers referral services, operates care programs. www.fcwvt.org/child care. (802)-828-8771 (referral), (802) 828-8774 (subsidy).
- Bright Futures Child Care Information System – Web based resource providing

comprehensive information on child care in Vermont, as well as municipal level data on regulated care providers. www.brightfuturesinfo.org

- Vermont Association of Child Care Resource and Referral Agencies – Works with parents, care providers, businesses and community organizations to provide quality child care services throughout the State. www.vermontchildcare.org
- Vermont Child Care Consumer Line – Provides access to records of violations, counseling regarding child care concerns. www.dcf.state.vt.us/cdd/programs/childcare/cccl.html.

OUTDOOR RECREATION

Recreation is a basic psychological need; not a frivolous luxury. To recreate (literally, to “make new”) is to refresh minds, bodies, and spirits. The ability to recreate enhances the quality of our lives immeasurably. Where the opportunity for recreation is denied, history and science have shown the spirit withers.

Recreation contributes not only to our individual well being, but to the health of our society as well. Throughout Vermont, recreation breeds tourism, which in turn provides an influx of imported wealth. Recreation also improves the health and productivity of our work force, thereby saving untold dollars for health care. In addition, a region that boasts recreational amenities has a competitive advantage in attracting new entrepreneurs.

One of Central Vermont's greatest recreational "facilities" is its landscape. Besides being home of Vermont's last undeveloped mountain range (the Worcester Range), a bounty of mountains, rivers, lakes, forest and fields, provide a virtual playground for residents, neighboring regions, and out-of-state visitors alike. The Region boasts some 59,194 acres of public outdoor recreation lands. These include a National Forest, eight state forests, three state parks, four wildlife management areas, and about a dozen municipal forests. In addition, there are public parks and playgrounds, as well as State surface water access points.

In addition, an impressive network of trails traverses the region. While these lands contain some of Central Vermont's finest scenery, natural resources, and recreational opportunities, such values are abundantly represented in many of the region's private holdings, as well. Accordingly, un-posted private lands are an important fabric in Central Vermont's recreational tapestry.

Given the Region's natural endowments, it is not surprising that recreational pursuits dependent upon or enhanced by natural resources and scenery flourish here. Skiing, snowmobiling, hiking, jogging, hunting, fishing, golf, cycling, boating, swim-

ming, camping, picnicking, and auto-touring are examples of some of our popular outdoor activities. So popular are they that occasionally their practitioners find themselves in conflict with each other over scarce resources. Furthermore, the Vermont State Outdoor Recreation Plan (SCORP) has predicted that water-based recreation, bicycling, day hiking, walking and X-C skiing will witness increasing popularity over the next few decades, and the public demand for a more elaborate network of trails and green-ways, for recreation and transit, will increase accordingly.

Alpine skiing has, however, shown a decline in terms of participation, although the enthusiasm of its adherents has not been tempered. Recent mild winters, the sport's expense, and the popularity of X-C skiing as an alternative are all factors in the recent decline. However, alpine skiing is a major industry in Central Vermont, and one of the economic mainstays of the region in general and the Mad River Valley in particular.

The SCORP report also identified several societal trends that may affect recreation in Central Vermont in the years to come. Among these are: decreasing leisure time/shorter vacations; aging population/life long interest in recreation; recreation for fitness; increased privatization and commercialization; continued low levels of public funding for public recreation; resources threatened by recreation/overuse; resources/opportunities threatened by development and pollution; redistribution of population and decline in community spirit; changing households; loss of opportunities on private land due to fear of liability, property damage, and fragmentation of large land holdings; and increases in travel and tourism.

CVRPC faces the challenge of promoting and capitalizing on those trends which bode well for the region, countering those which may have negative impacts, and adapting to those which are neutral and unavoidable.

CULTURAL RESOURCES

The word "culture" refers to the development, improvement or refinement of the mind, emotions or interests, through ideas, customs, skills and arts. The opportunity for cultural experiences like recreation, theater, the arts, craft making, and public discussion is critical to our well being, happiness, and fulfillment. Culture, while universal among humans, is manifested differently, and with varying intensity, in different places. While the more urbane among us may perceive rural areas as existing in a cultural void, this is never true. Such an assumption about Central Vermont would be particularly erroneous. We are, in fact, in possession of cultural resources of unusual richness, quality and diversity for an area of our size and population.

This wealth of culture is partly responsible for Central Vermont's popularity as a tourist destination. At the same time, tourism bolsters our cultural resources. The link between culture and the economy is becoming ever clearer.

Central Vermont is home to a talented array of artists, musicians and crafts people, including many who have migrated here seeking a fertile ground and supportive environment for their endeavors. A multitude of festivals, galleries, playhouses, concert halls, and patron organizations exist in support of these talents.

The Region's public libraries (of which there are more than one dozen) conduct and sponsor readings, discussions, lectures and other literary activities. In addition, a few local literary publications provide a forum for amateur writers.

Central Vermont has several facilities capable of housing large cultural events and programs, including the Barre Opera House (seating capacity 645 and recently renovated to be handicap accessible), Montpelier's City Hall Auditorium (seating capacity 600-650), Barre City Auditorium, and Barre City Recreational facility (the BOR). The Region's colleges, and primary and secondary schools also provide space for cultural happenings.

Museums are archives of our culture. Central Vermont's cultural treasures are well protected in a diversity of small museums. Montpelier is home to the T.W. Wood Art Gallery (Vermont College), the Statehouse Museum, the Children's Museum of Central Vermont, and the Vermont Historical Society Museum. The former Kent Tavern Museum in Calais remembers 18th and 19th century agrarian life. In Northfield, the Norwich University museum displays a variety of military artifacts. Several local historical societies maintain small displays as well.

HISTORIC AND ARCHEOLOGICAL RESOURCES

Preserving an accurate and tangible record of historic and prehistoric endeavors of the people of Central Vermont helps us to develop a better understanding of the past and an awareness and appreciation of our cultural lineage. Significant properties and historic resources edify and provide important benefits to individuals, municipalities, and the Region in the forms of aesthetics enhancement, economic revitalization, tourism, job creation and investment tax credits.

Central Vermont harbors a rich historic record, in its buildings, in its soil, and in the very fabric of its landscape. It is a goal of this Region to preserve, protect, and perpetuate this record as an important part of Vermont's heritage.

FACILITIES, SERVICES AND UTILITIES GOALS, POLICIES AND STRATEGIES

WASTEWATER TREATMENT GOAL: Improvement and expansion of wastewater treatment facilities and options so as to protect public health, maximize public investment, and reinforce desired patterns of growth.

Policies:

1. This Plan supports efforts to improve existing wastewater collection and treatment systems.
2. Encourage municipalities to establish a schedule indicating when and for what uses remaining capacity should be allocated. A schedule of the number and types of hookups can serve a similar purpose.
3. Encourage continued efforts to improve water quality through the separation of combined sewers or other method to ameliorate the harmful impacts of combined sewer overflows.
4. Support efforts to upgrade components of aging wastewater systems to address depreciation, improve energy efficiency and increase flood resilience of the Region's systems.
 - A. Encourage coordination of upgrades to coincide with other municipal infrastructure projects (i.e. roads).
 - B. Perform outreach to municipalities whose systems are approaching 20-yr design life and connect local operators/commissions with available technical assistance.
5. In order to encourage municipalities to optimize the use of wastewater treatment capacities, municipalities are encouraged to participate in inter-municipal facilities or agreements. Inter-municipal facilities can prove cost effective for the communities involved. At the same time, capacity allocation agreements offer individual communities the option of encouraging or discouraging growth.

Provide model inter-municipal agreements upon request.

6. New or expanded wastewater treatment facilities should be planned where municipalities have immediate need or where additional growth is appropriate, including *Regional Centers, Town Centers, Hamlets, Resort Centers, and Mixed Use Commercial and Industrial* areas.

Explore opportunities to develop a region-wide water and wastewater study to identify priority investments to supporting desired growth patterns.

7. Encourage planning for and installation of decentralized community wastewater treatment systems in villages, hamlets, and in clustered housing developments, and ensure that agreements for those facilities adequately provide for ongoing maintenance and oversight.

- A. Encourage formation of and support efforts of existing local Wastewater Advisory Committees.
 - B. Assist with grant writing and coordinate provision of technical assistance (i.e. soil mapping, wastewater studies, capacity-building) to local efforts to identify wastewater solutions.
 - C. Assist with public outreach and engagement efforts in planning for wastewater infrastructure.
8. This Plan encourages the extension of municipal sewage treatment collection systems to existing developments within currently un-sewered drinking water source protection areas in order to protect underground water supplies from harmful septic system leachate.
9. Wherever possible, extensions of municipal wastewater collection systems should occur, along or within existing public rights of way.
10. CVRPC will promote and encourage environmentally and fiscally sound solutions to the Region's sludge disposal problem.
11. Work with municipalities to improve outreach to on-site sewage disposal system owners through provision of guidance material explaining how to properly maintain their systems.
12. Support programs to assist with the replacement of failed on-site sewage disposal systems.
13. CVRPC encourages the use of shoreline zoning powers (24 V.S.A., Chapter 117, and Section 4411), in compliance with the Vermont Shoreland Protection Act, to regulate the design of sanitary facilities on lands adjacent to surface waters.
14. CVRPC urges communities to establish retrievable record keeping systems for "as built" municipal waste water system engineering plans, so as to ensure exact knowledge of the placement of underground collection lines.

WATER SYSTEM GOAL: Improvement and expansion of public water system facilities so as to protect public health, maximize public investment, and reinforce desired patterns of growth.

Policies:

- 1. Where existing water supply systems are functioning properly, they should be utilized. Particularly when located in combination with the region's wastewater systems, the service areas of water supply systems are recommended for high intensity development.
 - 2. Land uses or activities that would measurably degrade the quality of water supply sources should be prohibited.
- Assist communities in developing local regulations and/or incentives to protect aquifer recharge areas and source protection areas.

3. Work with the region's small water supply systems to build administrative capacity, coordinate with each other and develop capital improvement plans and budgets.
 - A. Encourage participation in VT DEC's Asset Management trainings.
 - B. Incorporate outreach and education regarding water and wastewater infrastructure planning into Municipal Transportation Capital Improvement Planning task in the Transportation Planning Initiative.
4. Inter-municipal water supply agreements are encouraged. The sharing of water resources can be a cost effective method of insuring that water supply adequately supports the municipal plan.
5. CVRPC encourages municipalities that have not already done so, to identify and protect backup or alternative sources of water.
 - A. Assist such efforts at the request of local officials.
 - B. Raise awareness of groundwater mapping resources available from the VT Agency of Natural Resources and U.S. Geological Survey.
6. Water service area expansions should be designed to encourage development in areas where growth is appropriate including Regional Centers, Town Centers, Hamlets, Resort Centers, Rural Commercial and Industrial areas and growth centers as identified by town plans.
7. Capacity expansion and water quality improvements to existing water supply systems are encouraged where such problems are impediments to concentrated growth.
8. CVRPC urges communities when designing and constructing public water systems and, to require the site engineer to provide "as-built" plans so as to ensure exact knowledge of the placement of underground collection lines. when the need for repair or replacement arises.

ELECTRIC POWER GOAL: Improvement, and expansion of electric power generation methods and infrastructure so as to provide adequate service, conserve energy, maximize benefits of public investment, minimize impacts on aesthetic, ecological and recreational resources, and protect public health.

Policies:

1. CVRPC supports the concepts of "demand side management" and "least cost integrated planning" as mechanisms to reduce electrical power consumption, and its attendant costs (both financial and environmental) through conservation and energy efficiency
2. CVRPC encourages the development and use of renewable energy sources to meet the region's electrical power needs, while minimizing impacts on aesthetic, ecological and recreational resources (see *Energy* element of this Plan).
3. CVRPC encourages diversity in the region's future power supply so as to establish

flexibility and avoid reliance on any single source.

4. CVRPC encourages utilities and the Public Service Board to give greater consideration to making service territories more flexible by allowing for inter-utility connections and deregulation where there will be beneficial impact to the consumer and the environment. Such flexibility will help promote the Region's goals regarding settlement patterns, and save money as well.

5. Proposals to introduce extra high voltage and ultra high voltage transmission lines (capacity greater than 345 KV, AC or DC) to Central Vermont should be carefully scrutinized pending satisfactory resolution to the health and safety issues concerning their operation.

6. The Commission encourages adherence to environmentally and ecologically sound utility line maintenance practices.

Plans and designs for utility infrastructure and corridors should incorporate climate projections and be reviewed for long-term reliability, safety and economic, social and aesthetic impacts.

7. The corridor concept is generally supported by this Plan. As such, the location of new transmission lines should share existing power line routes as illustrated on the Central Vermont utilities map. However, it is recognized that existing routes may not always be optimal for additional or expanded transmission lines. It is also recognized that the construction of distribution lines within, or adjacent to, public highway rights-of-way may, in some instances, have more negative aesthetic impacts than would a parallel route away from the road.

8. Utility infrastructure and corridors shall be sited so as to minimize aesthetic impacts, particularly in areas of local and regional scenic importance.

- A. Wherever practicable, utility lines will be installed underground or behind structures in downtowns and village centers
- B. The use of wood support structures, appropriate conductor colors for the background, and landscape compatibility techniques are encouraged.
- C. Municipalities, in their plans, should consider the visual impacts of the siting of utility poles. Traffic safety and water quality issues may also be pertinent in certain locations.

9. Resource areas, as identified by this Plan, shall be avoided wherever possible, in the location or routing of new substation or transmission facilities.

10. Substation facilities should be located in industrial areas or in those planned for industrial use whenever practical. In any case, such facilities should be sited as unobtrusively as possible.

OUTDOOR RECREATION GOAL: To promote adequate access to a wide range of high quality outdoor recreation experiences to all sectors of the population.

Policies:

1. CVRPC will encourage and foster the provision of diverse outdoor recreational opportunities, with consideration given to the needs of the elderly, disabled, and economically disadvantaged.
2. CVRPC encourages, in particular, those recreation activities that focus on, respect, enhance, and educate, about the natural environment.
3. Recreation inventories and needs assessments should occur at the local and regional levels in order to determine deficiencies and conflicts, and to identify key recreational resources and opportunities on both public and private land.
4. Municipalities should develop and implement strategies to protect important recreation lands. Actions such as securing voluntary easements, fee or less than fee acquisition, subdivision or zoning regulations which contain provisions for common open space, impact fees or other contractual arrangements are encouraged as alternatives for achieving permanent or semi- permanent protection.
5. Public access to rivers, streams, lakes, ponds and recreation lands is a need in the Region. Municipalities, the State, and private groups, such as land trusts, should coordinate efforts to provide for improved access to the Region's surface waters. At the same time, significant water related natural areas should be maintained and protected.
6. Priority consideration should be given to rehabilitating and upgrading existing recreation facilities.
7. CVRPC supports the maintenance or upgrading of existing surface water classifications to reflect their actual recreational uses, except where lower classifications may be needed for municipal sewage treatment projects.
8. Landowners are encouraged to voluntarily keep their lands open for public recreation and enjoyment where possible, so as to maintain the Region's tradition of informal, resource based recreation on private lands.
9. CVRPC will support future legislation to alleviate landowners of unreasonable liability burdens.
10. New development proposals are encouraged, through design, to make an effort to preserve access to recreational uses for the general public.
11. The Commission supports and encourages the creation and existence of inter municipal recreation districts. (Inter-municipal districts are legal arrangements whereby a governmental entity joins with another to provide recreational facilities or services. Through these arrangements, increased opportunities may exist for municipalities to acquire or develop land, provide services, or manage an area).

Accordingly, we will continue to provide administrative and technical assistance to the Wrightsville Beach Recreation District Board of Directors.

12. CVRPC will work towards and support the maintenance and development of trail and greenway networks to provide for recreational diversity, tourist amenity, habitat linkage, and low impact transportation choices. Specifically, the Commission will strive to:

- work with individual municipalities, at their request, to help plan local trails and greenways;
- work with groups of municipalities and/or citizens to promote the concept and realization of a regional trail and greenway network that connects and builds upon local initiatives;
- encourage the paving of shoulder for safe bicycle and pedestrian travel on all state highways in the region;
- encourage the development of multi-purpose trail corridors along abandoned rail beds;
- encourage municipalities to retain Class IV roads and public trails for public recreational use; and
- encourage the provision of recreation along utility corridors, as appropriate.

13. Downhill ski areas provide valuable recreational and economic benefits in Central Vermont. However, certain external costs (e.g. expanded demands on facilities and service, environmental impacts, etc...) are inherent in their operational and expansion activities, too. It is CVRPC's goal to enhance the viability of existing ski areas and foster their development in a manner which will enable them to remain competitive while ensuring that they will protect and co-exist with the natural, physical, and socio-economic environment. Equitable means of sharing external costs between ski areas and their host towns are encouraged where such costs cannot be avoided. The Memorandum of Understanding between the Sugarbush Area Resort, CVRPC, and the Mad River Valley towns is a model for such positive coordination and communication.

14. Atmospheric pollution has become an increasing problem over the past few decades. It now threatens to disrupt global weather patterns and endanger public health. The impacts of air quality on recreation and tourism are also recognized. CVRPC will support measures to address air quality at the local, regional, state, federal, and global levels. Promotion of energy conservation practices will be the focus of such support (see Energy Element).

CULTURAL RESOURCES GOAL: To promote adequate access to a wide range of high quality cultural experiences for all sectors of the population.

Policies:

1. CVRPC encourages the development of new cultural facilities and services (including studio space), in Central Vermont, particularly in or near existing settlements and growth centers, as such areas are most accessible to all segments of the population, and the proliferation of culture in such areas will strengthen their vitality.

2. The protection and preservation of existing cultural resources and activities is a goal of the Commission.
3. CVRPC will continue to work with cultural organizations where appropriate, to support cultural resources in Central Vermont.
4. The Commission encourages the rehabilitation or adaptive use of sites and structures for cultural pursuits.
5. CVRPC supports strengthening the role of cultural and artistic disciplines in public education.

HISTORICAL AND ARCHEOLOGICAL RESOURCES GOAL: To promote the protection and use of the Region's historical and archeological resources.

Policies:

1. Municipalities are encouraged to provide a historic preservation section in their municipal plans. (CVRPC will assist in such an effort, if requested.)
2. CVRPC encourages development which preserves the historic and architectural character of town and village centers and the rural landscape.
3. Therefore, it is the policy of this Commission to support and encourage downtown revitalization programs and Downtown and Village Center Designation. Downtown revitalization efforts are means to create jobs and to preserve our national heritage.
4. CVRPC encourages the restoration, rehabilitation and adaptation of historic structures where feasible, as this minimizes the environmental impact of development by conserving raw materials, using land already developed, employing existing services.
5. Where economically practical, rehabilitation of a historic site or structure should be designed to minimize the architectural impact and maintain the historic character of the site or building.
6. Where an area is not designated as a historic district, but where there are buildings of local historical significance, projects should be designed to maintain and protect the historic character of the area. Municipalities are encouraged to develop criteria that would assist in protecting the character of an area considered historic, whether designated as such or not.
7. The impact upon the historic character of the area should be considered when public or private municipal improvement projects (such as sidewalks, roads and traffic improvements) are proposed.
8. Activities having substantial impact on an important historical site or structure should be planned in consultation with the Division for Historic Preservation, Agency of Commerce and Community Development.
9. Additions to a historic building should be designed to minimize the visual impact upon the site or building.

10. Land development adjacent to or on an important prehistoric or historic archeological site should be designed to minimize the impact upon the site.

11. Prehistoric and historic archeological sites are recognized as important to Vermont's history. Any activity that may have an impact on a prehistoric or archeological site should be planned in consultation with the Division for Historic Preservation, Agency of Commerce and Community Development.

12. CVRPC will provide support to local, regional, and state non-profit historic preservation trusts upon request.

13. CVRPC will promote the awareness of historic preservation through periodic publication of funding sources available to municipalities and investment tax credits available to individuals.

WIRELESS TELECOMMUNICATION FACILITIES GOAL: ~~To promote~~ Effective and efficient communication systems.

Policies:

1. Telecommunication facilities should not be sited where they may create an attractive nuisance.

2. Telecommunication facilities should be sited, designed, maintained and operated so as to minimize negative impacts on natural, cultural and scenic resources. Use of stealth design and/or use of existing structures are encouraged where appropriate. New towers should be no taller than necessary to provide coverage. The policies of this Plan addressing ridgeline and hilltop development (see Land Use Element, Goal 5) are intended to apply to telecommunication facilities.

3. Use of existing towers, communication facilities, and structures where possible, is encouraged and expected rather than development of new transmission and receiving stations. Permits for tower facilities should require permittees to accommodate additional users, appropriate to the structure, at a fair market rate.

4. Permits for towers should require a financial mechanism to ensure their removal by service providers should they be abandoned or rendered obsolete by advances in technology. Processes for establishing bonds should take inflation into account as many years can elapse between construction and removal.

5. Applicants must demonstrate that telecommunication facilities comply with FCC emission standards in order to protect public health and safety.

6. Assist service providers and municipalities to identify appropriate locations for the construction of new tower (or other facilities) necessary to achieve adequate coverage of the Region as well as locations that are not appropriate for new towers. CVRPC will act to implement the results of this effort through its participation in the Section 248 Process.

7. CVRPC will provide its "Model Telecommunication Facility" bylaw to all member municipalities and work with towns and cities to develop bylaw, ordinance, and/or town plan language to address facility siting. The Commission encourages municipalities that adopt telecommunications regulations to provide for an expedited per-

mit process for small scale facilities.

8. New towers should be constructed in areas served by existing roads or trails.

9. Access roads should be designed to minimize their impact on scenic, agricultural, forestry, and natural resources.

EMERGENCY/HEALTH SERVICES GOAL: To promote effective, efficient and accessible emergency and health care services.

Policies:

1. Adequate health care facilities and personnel should be planned and located throughout the Region so that all residents have access to such services. It is necessary that planning for these facilities be coordinated with population distribution and existing and future transportation patterns.

2. For all aspects of emergency/health service delivery, full consideration of the costs and benefits of cooperative and regional provision of these services is encouraged.

EMERGENCY MANAGEMENT GOALS:

1. To build disaster resistant communities in Central Vermont through sound emergency planning and management.

2. To ensure that all communities in Central Vermont have the appropriate information, resources, and tools to respond to disaster events and recover from their impacts.

Policies:

1. Promote the importance of local emergency management plans to municipalities in Central Vermont.

2. Encourage municipalities to annually review and update their Rapid Response Plans for the new contact information and to identified risks.

3. Encourage municipalities to undertake and periodically review an all-hazards assessment in their community to identify potential hazards and the at-risk people and property.

4. Encourage municipalities to adopt minimum standards for public roads, bridges, and culverts (using the Vermont Local Roads Program and FEMA's standards).

5. Encourage municipalities to implement land use policies and development regulations that consider the potential impacts of disasters on people and property.

6. Discourage residential, commercial, or residential development in flood plains.

7. Maintain, wherever possible, vegetated buffer strips adjacent to all waterways to reduce the occurrence and magnitude of flooding.

8. Encourage municipalities to amend flood hazard regulations so they comply with current NFIP requirements.
9. Provide local officials with information on programs and funding available through FEMA and/or VEM for emergency management and hazard mitigation projects.

CRIME AND SAFETY:

Overall Goal: To minimize community conflicts within Central Vermont, reduce the Region's already low crime rate, and protect the community from violence and serious crimes.

Goal 1: To prevent the social and economic conditions that often lead to community conflicts.

Policies:

1. To encourage the use of early intervention and prevention strategies in schools
2. To work to implement the other goals and policies of this Plan, particularly those regarding education, housing, and employment.

Goal 2: To foster safe and supportive communities by educating municipal officials on crime issues, supporting prevention programs, encouraging rehabilitation strategies, and fostering public safety.

Policies:

1. To encourage municipalities to investigate the establishment of community based, victim focused crime prevention/justice initiatives.
2. To work with municipalities, SRS, and the Vermont criminal justice system to support the establishment of a regional restorative justice center.
3. To support the use of conflict reduction/resolution techniques and restorative processes in schools, law enforcement, and communities.
4. To gather and report information on crime and safety indicators as related to other indicators of community health to establish data on possible relationships therein.
5. To coordinate all crime/rehabilitation related efforts with municipalities and the Vermont criminal justice system.
6. To encourage State financial and technical support for community restorative justice programs.

Goal 3: To protect the community from violence and other serious crimes.

Policies:

1. To support incarceration of violent offenders.
2. CVRPC should consider the need for, costs, benefits, and detriments of construc-

tion of new prison facilities within the Region.

EDUCATION GOAL: To promote effective, efficient, accessible, and affordable educational facilities and services.

Policies:

1. New development that places a significant impact on local and regional educational systems must address and mitigate these impacts.
2. The construction of new educational facilities should occur in locally designated growth areas or in other locations that will maximize their convenience and accessibility to the population and infrastructure, and will contribute to the vitality of communities.
3. Through improved coordination among planning commissions, school boards and the State Department of Education, a regional approach to planning for the placement and timing of construction of educational facilities is encouraged.
4. Municipalities and school districts are encouraged to employ capital budgeting and programming as a means to anticipate and plan for the payment of capital improvements to public schools.
5. CVRPC supports and promotes efforts to broaden access to adult and senior educational opportunities.
6. CVRPC supports and promotes efforts to broaden access to vocational education opportunities.

CHILD CARE GOAL: To ensure the availability of safe and affordable child care and to integrate child care issues into the planning process.

Policies:

1. Continue to inform municipalities of their statutory responsibility to plan for child care and assist in this effort upon request.
2. Encourage municipalities to assess local barriers (regulatory or otherwise) to the provision of child care services and to support them in taking action to remove or reduce those barriers.
3. Consider undertaking, in partnership with local advocacy organizations, a region-wide needs assessment for child care services. As part of such a program, CVRPC could examine the relationship between the location of jobs and the location of child care facilities.
4. Encourage the location of child care facilities in growth centers and existing settlements, near residential clusters, schools, and large employers, and along public transportation routes. Such locations can help reduce traffic, energy consumption, and the overall financial cost of day care for families.

SOLID WASTE GOAL: Safe, sound, cost effective, and efficient solid waste management.

Policies:

1. For both environmental and economic reasons, support waste reduction as a top priority of the Region and support the concept of “zero waste” as outlined by Vermont’s Universal Recycling Law and the policies of the Central Vermont Solid Waste Management District, Northeast Kingdom Waste Management District, Lamoille Solid Waste Management District and the Mad River Resource Management Alliance.

2. Encourage managing solid waste as close to the source as is reasonable, with a preference given to local or sub-regional solutions to waste management. Proper management of municipal solid waste should utilize environmentally sound systems and programs at the least cost possible.

3. Promote education about composting, recycling and waste reduction in the Region.

4. Encourage individuals or businesses in the Region to bear the cost of proper management of the waste generated.

Support Extended Producer Responsibility (EPR) programs and sites for industries to recycle their own byproducts in the Region.

5. Support recycling and composting facilities and programs that promote individual participation and responsibility.

Encourage the convenient and de-centralized placement of local drop-off facilities

6. Support the maintenance of collection centers for hard to recycle materials within the Region.

A. Support the siting and building of a permanent location for the Additional Recyclables Collection Center (ARCC) in a location central to the Region

B. Support the siting and building of a facility to collect and recycle asphalt shingles and drywall in a location central to the Region

7. Encourage composting of residential, commercial and institutional organic waste in order to maintain the materials' highest re-use value. Composting efforts should move toward being financially self-supporting and locally controlled.

Support the continuing presence and establishment of composting centers at appropriate sites within the Region

8. Continue to implement recycling and waste reduction measures in our internal operations, in accordance with Vermont’s Universal Recycling Law.

9. Support projects that involve the distribution of Class A Biosolids from municipal wastewater treatment facilities only when only when Central Vermont Solid Waste Management District, Northeast Kingdom Waste Management District, Lamoille Solid Waste Management District or the Mad River Resource Management Alliance has worked with municipalities to ensure that said biosolids are safe and that municipal officials and other decision makers have been educated about the issue.

BROADBAND GOAL: Universal broadband availability and affordability.

Policies:

1. Encourage Municipalities to include broadband goals and strategies within local plans as tools to enhance economic development, education and overall resiliency.
2. Promote awareness of broadband informational resources, such as BroadbandVT.org, to inform residents, businesses and local planning processes.
3. Support expansion of broadband services and enhancements in underserved areas, *Regional Centers* and *Town Centers*.
 - A. Encourage creation of public wi-fi zones in *Regional Centers, Town Centers and Hamlets*.
 - B. Encourage expansion of wireless internet service providers in rural communities.

Housing Element

Housing is the foundation of our historic towns and villages. The size, location and cost of housing shape the communities in which we live. Providing a range of housing options for a variety of income levels and lifestyles contributes to the vitality of our communities. Housing impacts local economic development, school enrollment, land use, and traffic patterns, among others. Currently in Central Vermont:

- Average household sizes are decreasing; yet new construction house size is increasing;
- The population of people between ages 45 to 69 is expected to grow more rapidly than any other age group;
- Incomes are not keeping pace with dramatically increasing home costs;
- New housing creation is falling just short of the 5-year demand for housing;
- Much of the recent housing growth in the Region is happening outside of town and village centers.

This chapter reviews the number and types of housing units currently in existence, future trends in housing demand and costs, and outlines strategies to meet identified housing needs. Finally, it concludes with a list of resources that can be used by town officials and residents who are interested in this important issue.

DISCUSSION: TRENDS

Population & Households

The 2000 Census showed the population of the Central Vermont Region at 63,276 and estimates the Region's 2005 population to be at 64,842.¹ According to the EPR Forecast, the Central Vermont Region's population is expected to reach 67,297 by 2010 and 73,080 by 2020.² This is an increase of 6.3% between 2000-2010 and an

Central Vermont Population and Household Growth, 2000- 2020

	2000	2010	2020	% Change (2000-2010)	% Change (2010-2020)
Total Population	63,276	67,297	73,080	6.3%	8.6%
Total Households	25,675	28,708	33,534	11.8%	16.8%
Household Size	2.46	2.34	2.18	(4.8%)	(6.8%)

SOURCE: US Census 2000 and EPR Forecast (2010, 2020)

¹ U.S. Census. 2000. American Factfinder www.factfinder.census.gov.

² Economic & Policy Resources, Inc. 2001. Economic & Demographic Forecast: Central Vermont Region 2000-2020
Central Vermont Regional Plan 2008

Households, By Age of Householder, 2000-2010 (Washington County)

Age Group	2000	2005	2010	%Change (2000-2010)	Change in # Households (2000-2010)
15-24	1,040	1,116	1,158	11%	118
25-34	3,514	3,402	3,367	-4%	(147)
35-44	5,402	5,315	5,225	-3%	(177)
45-54	5,593	6,083	6,414	15%	821
55-59	1,855	2,230	2,509	35%	654
60-64	1,432	1,634	1,892	32%	460
65-69	1,286	1,348	1,501	17%	215
70-74	1,145	1,197	1,235	8%	90
75-79	1,002	943	955	-5%	(47)
80-84	751	820	870	16%	119
85+	639	683	767	20%	128
Total	23,659	24,771	25,893	9%	2,234

SOURCE: VT Dept of Housing & Community Affairs

increase of 8.6% between 2010-2020.

Between 1970 and 2000, the Region's population increased at an average rate of just 8% while the Region's number of households increased at an average rate of 20%. The reason for the significant difference between population growth and household growth is the increasing population has been distributed into a greater number of smaller households.

The average household size in 2000 was 2.47 people, down from 2.64 people in 1990. The number of households in the Central Vermont Region will increase from 25,675 in 2000 to 28,708 in 2010 and 33,534 in 2020. This is an increase of 16.8% between 2010- 2020. One reason is the average household size is projected to continue to decrease to 2.34 persons in 2010 and 2.18 persons in 2020. The increasing number of households containing a smaller number of people will have a significant effect on housing demand.

Central Vermont will experience substantial changes in the growth and decline of certain age groups between 2000-2010. Most notably, householders between the ages of 25-44 are expected to decline while most of the growth will occur in householders between ages 45-69. There will also be a fairly significant increase in the number of householders over 80 years old.

In 2000, there were 5,287 households with residents aged 65 years or older, representing 21% of all the households in the Central Vermont Region. According to the Washington County Housing Needs Assessment, between 2000-2010 these households are expected to grow by 12.25%.³ These types of households generally require smaller units with one or two bedrooms and as they age, may need access to housekeeping, personal-care, or medical services.

According to the Vermont Department of Housing and Community Development, "In 2000, more than 1,800 Washington County elderly households had some type of mobility and/or self care limitation. The problem was noted especially for elderly or extra-elderly (age 75+) owner households. However, non-elderly households experienced even higher levels (21% of renter and 35% of owner households). The total number of households with mobility and/or self care limitations represents 17 percent of all Washington County households."

General Housing Demand by Age Group		
Age Group	Characteristics	Housing Demand
20s	-lower incomes -high mobility -small households	Apartments
30s	-beginning families -small children -low savings -growing income	1 st time homebuyer Mobile homes Condos
40s	-growing families -growing income	Step up to larger house Additions, home improvements
50s	-stable housing -empty nest -income peak	Live in existing homes Renovate and improve housing
60s	-end of income producing years	Begin process of "downsizing"
70s	-retirement -reduced income -risk of frailty	Smaller homes Condos Retirement developments
80's/90's	-risk of frailty or dementia -more single (widowed) households than couples	Assisted living At risk of institutional care

SOURCE: VT Dept. of Housing & Community Affairs, VT 2005 Housing Needs Assessment

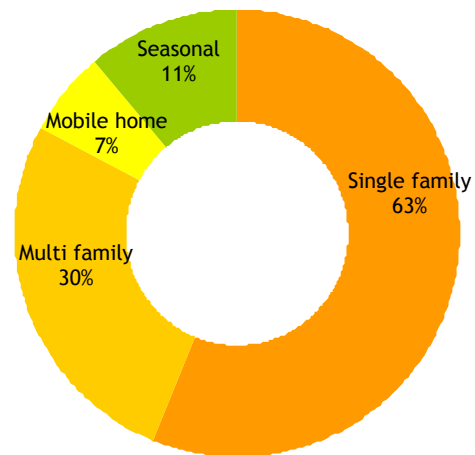
Number & Type of Housing Units

The last Census found there were 29,912 total housing units in the Central Vermont

³ VT Department of Housing and Community Affairs. 2005. Washington County 2005 Housing Needs Assessment.

Region (2000 Census). Of this total 3,285, or 11% of the total, are seasonal units leaving 26,627 year-round units that are occupied or available for occupancy. Having 11% of the total housing stock as seasonal, recreational, or occasional use housing is well above the national average of only 3% and points to the strong vacation home market in Central Vermont.

Composition of Housing Stock, 2000

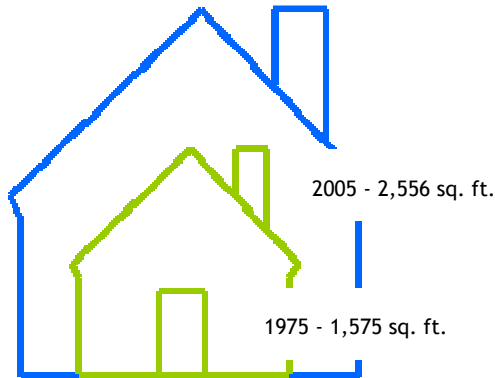


Total housing units = 29,912

Single family homes make up the majority of the housing stock in the Region (63%). Thirty percent (30%) of the housing stock consists of homes that contain more than one housing unit, for example — condominiums, two-family houses, or apartment buildings, and the remaining 7% are mobile homes. If trends over the last 30 years continue, about

70% of these households will be owners and 30% will be renters. The high cost of housing could push many households out of the home buying market. (See Housing Affordability section)

Average Home Size 1975 & 2005



While the average household size is shrinking, the average single-family house size continues to increase. According to the Vermont Finance Agency “the average size of a newly-constructed home has increased dramatically over the past 30 years. According to Census data, in 1975, the average new home in the Northeast measured 1,575 square feet of living space. By 2005, that average new home had grown by 62 percent, to 2,556 square feet.”⁴ (For more information see: Land Use & Energy Elements)

One measure of a healthy housing market can be indicated by the vacancy rate. In general, a rental vacancy rate is considered healthy when it is approximately 5% and a healthy ownership vacancy rate is 3%. Any rate below the one considered “healthy” indicates that choices will be limited and prices generally increased. On the other hand, vacancy rates much above 5% for rental units and 3% for ownership units may signify an oversupply of that type of housing or disinvestment in a

⁴ Vermont Housing Finance Agency. 2006. Housing Matters Newsletter.

Central Vermont Housing Supply- 2000

	Number	Percent of Total Units
Year-Round Housing Units	26,627	89%
Seasonal Housing Units	3,285	11%
Occupied Units	25,675	86%
Owner-Occupied Units	17,926	70%
Renter-Occupied Units	7,749	30%
Vacant Units (includes Seasonal)	4,237	14%
Vacancy Rate*		3.6%

*Vacancy Rate = (Year-Round Units- Occupied Units)/ Year-Round x 100

SOURCE: Census 2000

particular area. According to a housing needs analysis performed by the state, there is concern about the health of Washington County's housing market because at the time of the last Census, it had a rental vacancy rate of 3.3% and an ownership vacancy rate of 1.4%, well below the rates considered healthy (Vermont Dept. of Housing & Community Affairs, 2005).

Any discussion of the quantity of housing units available should also include the quality of those units. One rough measure of the quality of the housing stock is its age. In Washington County, 38.1% of the housing units were built prior to 1939 and only 6% of the units were built since 1999.

Housing Affordability

Housing costs in Vermont have increased significantly over the last ten years. It is not uncommon for housing prices to rise as wages and income rise, yet throughout Vermont housing costs are rising much faster than income. A few facts from the Vermont Housing Awareness Campaign's "Between a Rock and Hard Place" 2007 Update on housing and wages in Vermont illustrate this issue:

- A Vermont household would need an annual income of \$66,000 to purchase the median-priced single family home (\$197,000). Sixty-seven percent of Vermont's households have incomes below that figure.
- The average Fair Market Rent for a modest, two-bedroom apartment in Vermont reached \$797 in 2006, a 10 percent increase since the year before and a 42 percent increase since 1996.
- A Vermont household would have to earn \$15.34 per hour, or \$31,897 annually,

Working with the Central Vermont Community Land Trust

Many towns and community groups in the Region have worked with the Central Vermont Community Land Trust (CVCLT) to develop affordable housing to meet the needs of their community.



River Station Apartment, Montpelier

River Station Apartments: CVCLT worked closely with the City to gain funding for the project. “The Central Vermont Community Land Trust has played a vital role in helping to address Montpelier’s need for new affordable housing. This project was extremely challenging. It involved a difficult site, a multitude of funding sources, environmental issues, and permitting difficulties. The Central Vermont Community Land Trust’s years of experience and expertise were essential to bringing this project to completion” said George Seiffert, former Community Development Specialist for Montpelier, about working with CVCLT.

Cabot Senior Housing: Cabot Senior Housing was developed to allow area elderly residents and past residents to live in town. This project became a reality through the hard work of a community group called Cabot Commons who partnered with CVCLT to build and manage eight units of senior housing in Cabot. According to Sue Carpenter, Board President of Cabot Commons, “This project has been very successful. There is a real internal support system for the residents as well as a great deal of community involvement in providing services and activities for these residents.”

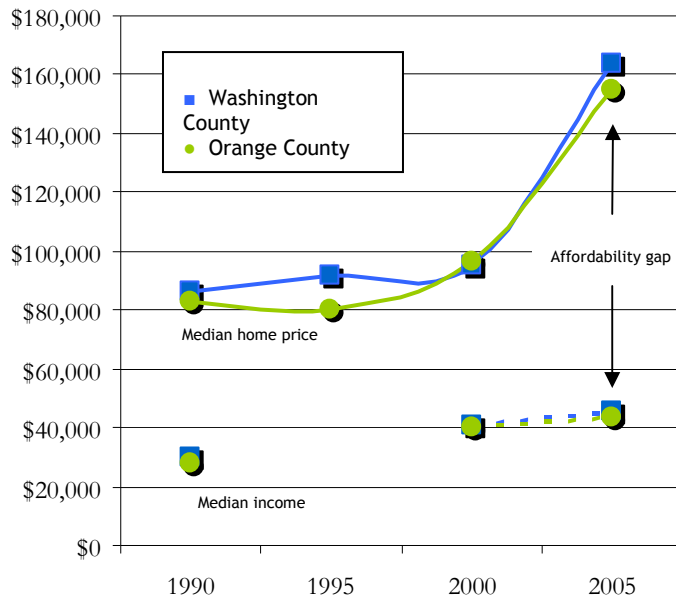


Evergreen Place, Waitsfield

Evergreen Place: This project, completed in May 2006, contains 18 units of housing for elderly or disabled residents as well as the senior center and local food bank. It is located within walking distance to the cafés & stores in Waitsfield. All of the units in this project will be affordable to low income households.

For more information on these projects or on how your community can partner with the CVCLT, call (802) 476-4493

**Median Home Price vs.
Median Household Income**



to afford that Fair Market Rent. At least 59 percent of Vermont's non-farm employees – more than 163,000 people – work in occupations with median wages below that level.⁵

Housing costs are identified as a "burden" by State planning statute (Ch. 117) if they consume more than 30% of the household's income. In the Central Vermont Region, at the last Census in 2000, 23% of all homeowner households and 36% of all renter households lived in homes that cost more than 30% of the household income. Many of these residents are earning less than the area median income. These

residents include families, schoolteachers, child care workers, and service workers.

In Washington County, the median home price increased by just 10% between 1990 and 2000, but by as much as 73% in the five years between 2000- 2005. In order to afford a median home in Washington County in 2005 a household would need to earn a yearly salary of \$59,169.

According to a Housing Needs Assessment undertaken by the Vermont Department of Housing and Community Affairs in 2005, the gap between the income needed to buy the median priced home and the actual median income of residents in Washing-

Comparison of Affordable Home Prices and Incomes, Washington County

	Median Income	Median Home Price	Affordable home based on median income	Income needed to afford median home	Gap between affordable home and median home price	Gap between income needed and median income
2000	\$41,387	\$95,000	\$110,719	\$43,235	\$15,719	\$1,848
2005	\$47,857	\$158,562	\$139,187	\$59,169	(\$19,375)	(\$11,312)
2010	\$54,089	\$192,809	\$115,987	\$88,752	(\$76,822)	(\$34,663)

SOURCE: Vermont Department of Housing and Community Affairs, Washington Co. Housing Needs Assessment

⁵ Vermont Housing Council. Between a Rock and a Hard Place. 2006.

CV Region Housing Cost Burden 1989 & 1999*

Tenure	Number of burdened households	Percent of total households
Owners		
1989	1878	20%
1999	2459	23%
Renters		
1989	2360	36%
1999	2657	36%

*Selected monthly owner costs (or gross rent) as a percentage of household income

SOURCE: Housingdata.org (from Census)

ton County is \$11,312 and expected to increase by 306% (to \$34,663) by the year 2010. It should be noted that according to the Washington County Needs Assessment "the estimated 'affordable homes based on median income' decreases in 2010 because the calculation includes expenses beyond the mortgage, such as taxes and insurance which are based on the increasing median home price. This leaves less income available for mortgage payments."

The number of burdened households will rise given the significant increase in median house prices over the last five years. This increasing gap between what families are forced to pay for housing costs and what their incomes afford has several negative side effects on quality of life and the local economy. Burdened households may not be able to afford medical or educational costs. These households also have less disposable income to spend in local stores, restaurants and entertainment venues.

For many low income residents of the Region, homeownership is not an option. In 2005 a household in Washington County would need to earn \$13.15 or \$27,360 annually in order to afford a two-bedroom apartment. In Orange County the 2005 housing wage was \$12.54 or \$26,080 for the same size apartment.

According to Between a Rock and Hard Place, out of the ten occupations employing the most Vermonters only two of them paid median wages above both the Washington and Orange County housing wage. (For more information about jobs in Central Vermont see: Economic Element). The Vermont Department of Housing & Community Affairs estimates that households earning \$38,286 per year (80% of the county median household income) can afford to pay about \$957 monthly for rent (including utilities). There are 5,111 households with incomes below 80% of the county median.

CV Region Number of Subsidized Rental Units, 2006

Number of Bedrooms	Total
SRO	39
0	142
1	651
2	254
3	114
4	13
TOTAL	1,213
Elderly or disabled only	(750)
Total unrestricted	584

SOURCE: Vermont Directory of Affordable Housing

In 2005, an estimated 7,058 affordable rental units were available in Washington County with rents below \$978. However, more than half of these units are estimated to be occupied by upper income households (i.e., not low or moderate income) and an additional 5% are assumed to be vacant at any given point in time, leaving only 2,978 available for low-income renters. In 2005, there were an estimated 3,053 very low-income households (those making less than 30% of the county median income, see Table A above) and only 1,213 subsidized rental units in the Central Vermont Region. Seven hundred and fifty of them are restricted to elderly or disabled residents only. According to the Washington County 2005 Housing Needs Assessment this creates an estimated shortage of 2,134 affordable rental units in Washington County.

Many households find more affordable housing farther away from employment centers causing long commutes and reduces the amount of time to spend with family. The cost savings on a home farther from town centers may be deceptive. Commuting costs increase substantially as families move farther away from jobs. These households also have less disposable income to spend in local stores, restaurants, and entertainment venues. (Also see Location of Housing section.)

Costs of Commuting*

	40 mile round trip commute	15 mile round trip commute
Monthly Costs	\$404	\$151.5
Yearly Costs	\$4,848	\$1,818

*Assumptions: commuting 5 days per week x 2008 IRS rate (\$0.505 per mile).

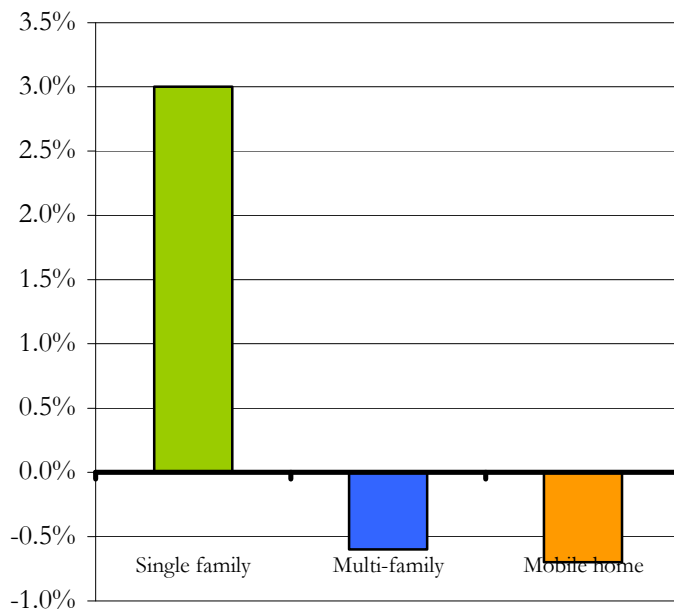
Long commuting times have an impact on more than just quality of life, traffic, air pollution levels, natural resources. (For more information see: Land Use & Transportation Elements) These long commutes also cost residents a significant amount of money. According to the Internal Revenue Service's 2008 standard mileage rate a resident who drives 40 miles round trip per day to work will spend about \$404 per month (\$4,848 per year)⁶ on commuting expenses alone, a 15 mile round trip commute would cost significantly less. Current development patterns which locate housing far from jobs and services are costing residents both time and money.

In any market area there is a percentage of the units which are rented or sold at affordable rates, yet they may be in older buildings or in less desirable locations.

⁶ Internal Revenue Service. 2008 Standard Mileage Rate. The standard mileage rate for business is based on an annual study of the fixed and variable costs of operating an automobile.

However, in Central Vermont public housing authorities and the community land trust are working to provide our Region with perpetually affordable rental and homeownership units. Affordable housing developers can use Federal and State funding resources in order to subsidize units that will be maintained at affordable rates for income eligible tenants. Affordability covenants or deed restrictions can be added to homeownership units to ensure homes remain affordable for a set period of time, even during re-sale, a mechanism used by community land trust model. (For more information see section: Working with the Central Vermont Community Land Trust.)

Growth Rate by Housing Type 1990-2000



Housing Growth

During the ten-year period between the last two Censuses, 2,141 homeowner units and 915 rental units were created, representing a growth rate of 13.5% for all occupied housing units. Over this same time period, the total number of single-family units grew while the number of multi-family and mobile home units declined. If this trend continues it could/will present a problem as multi-family and mobile home housing is a necessary option for households that require more affordable forms of housing.

The CVRPC Regional forecast states that "as the Region's population has grown, population densities in the less dense areas tend to show a pattern of dramatic increase" indicating the more rural towns are experiencing the greatest housing growth. According to data collected by CVRPC, 1,709 building permits for housing have been issued in the Region between 2001 and 2005. Of these permits, only 138 have been for multi-family units, the rest for single-family units. While building permits issued cannot be considered the same as the number of housing units that have actually been constructed, it does give us some idea of the number and type of units that are being produced between Censuses.

Central Vermont is falling just short of the 5-year demand for housing— forecasted at 1,755 housing units. It will be important to at least keep this pace, if not increase it, over the next 15 years to meet projected demand for housing. According to the CVRPC Economic & Policy Resources forecast, 3,890 new housing units will

need to be created between 2005 - 2015.

It should be noted that all projections of future trends are the best guesses of experts and computer models. Anything as complex and dynamic as the Region's housing market must be constantly monitored to identify any changes in supply or demand and respond to them. It is therefore recommended that housing needs analyses be updated at least every five years.

Care should be taken to create the type of units, in both size and price that are needed by the Region's current and future residents. Keeping prices from soaring higher will require not just a raw increase in the number of housing units but the production of specific types of housing units, in the locations that are needed in the Region. The sections above show a growing demand for housing that fits the needs of people ages 45-69 as well as householders over 80 years old.

Location of Housing/Density

In the early twentieth century towns and villages were characterized by compact neighborhoods; yet today much of the housing growth in the Region is happening outside of town and village centers. According to the 2007 CVRPC Northwest Build-Out Study, most municipalities within the study area support 'smart growth' principles as a matter of policy, but have not been able to put them into practice.⁷ (For more information about the Northwest Study visit www.centralvtplanning.com)

Low-density scattered development has been a significant concern to many towns in the Region as reflected in their town plans. Most towns now have land use and housing goals that include some version of the following statement: "Goal: The preservation of the Town's historic settlement pattern, defined by compact villages surrounded by rural countryside." (Warren Town Plan 2005) The benefits of developing more dense, compact housing within or close to village and town centers at historic settlement densities are numerous and include:

- decreased land costs due to smaller lot sizes
- decreased development costs due to proximity to existing infrastructure
- increased opportunities to develop a variety of housing options for different lifestyles
- decreased automobile dependency due to proximity to amenities such as schools, shops, services and jobs
- increased viability of mass transportation
- preservation of natural resources such as agricultural land and water resources.⁸

⁷ Central Vermont Regional Planning Commission. 2007. CVRPC Northwest Build-out Study Summary Report.

⁸ Local Government Commission and U.S. EPA. 2003. Creating Great Neighborhoods: Density in Your Community.

In spite of these benefits, rural municipalities continue to see higher housing growth than larger communities with the infrastructure available to support more dense growth. While it is widely believed that this is driven by market forces/consumer preference, that perception may not be the entire story. In fact, a 2005 survey by the Vermont Forum on Sprawl concluded that 80% of Vermont residents believe that “action should prevent sprawl,” and, more surprisingly, that 33% of Vermonters would choose to live in an urban/village setting over a rural one if such a choice was available. This latter figure represents a 65% increase over the number making this choice in a 1998 poll.

Local regulations and attitudes may be compounding the problem as well. GIS “Density Sampling”, conducted as part of the Northwest Build-out Project indicated that, in many traditional village and urban areas, allowable densities are often considerably less than that displayed by existing neighborhoods. NIMBY-ism (not-in-my-back-yard) has also been cited as a factor occasionally inhibiting denser new development.

Rural communities can also do more to promote compact housing by providing density bonuses and other incentives for “clustered” development, or finding suitable locations for village expansion or the development of new villages and “rural hamlets.” (For more information on residential development patterns see Land Use Element)

In addition to the cost of land, there are other factors that affect the real cost of housing. The fact that housing development is occurring farther away from village and town centers also generally means that people are located farther from the sources of employment. Over the ten years between 1990 and 2000, the percentage of Central Vermont Region residents who drive 60 minutes or more roundtrip to work each day increased from 22% of working residents in 1990 to 27% of working residents in 2000. (See Housing Affordability section.)

In May 2006 the Growth Centers bill (S.142) was approved by the State legislature. CVRPC has endorsed the growth centers concept for over a decade and this legislation has created a new process for the designation of growth centers. According to the Vermont Growth Center Planning Manual, a growth center is “a compact area planned for concentrated, mixed-use development.” Like the Village, Downtown and New Town Center designation programs, the Growth Center program offers financial and regulatory incentives to promote planned growth, including housing.

Homelessness & Transitional Housing

Homelessness in Central Vermont is growing yet it is a problem which is not easily tracked. Homeless persons are not counted in the Census and many times they do not seek assistance or shelter at local facilities. Some 'couch surf' at homes of friends and family, some seek shelter in tents or in their cars. Others may find shelter in abandoned lots or buildings.

Currently there is one overnight shelter in Central Vermont, the Good Samaritan Haven in Barre. It operates on a first-come-first-serve basis and is open from 6 p.m. to 7 a.m. in the winter and from 7 p.m. to 7 a.m. in the summer. In addition to the overnight shelter there is one transitional housing site. Transitional housing provides the bridge between homelessness and permanent housing. Good Neighbors offers both short term housing and case management to assist families transitioning from homelessness into permanent housing.

According to the Washington County Needs Assessment average stays at the Good Samaritan Shelter have dramatically increased in the last 10 years. In 1998 the average stay was between eight days to two weeks, in 2004 the average stay was two months. More people who are seeking shelter are not transient but are local Vermonters who are working multiple jobs and can not afford rent.

Fair Housing Laws & Municipal Responsibility

State and Federal housing laws help protect against housing discrimination. Under the Federal Fair Housing Act and its 1988 amendments, individuals may file complaints alleging housing discrimination on the basis of race, color, national origin, religion, gender, handicap, or familial status. Individuals may also allege related acts of discrimination that are governed by other federal laws such as the Civil Rights Act of 1964. Vermont law (9 VCS 4503) prohibits any person from engaging in unfair housing practices such as the refusal to sell or rent, as well as many other actions involved in the advertisement, financing, and brokering of a dwelling.

A municipality has fair housing responsibilities regardless of whether or not the Federal government has funded the activity that is the basis for the complaint. A fair housing violation does not require a discriminatory intent; a violation can be found simply because municipal officials carried out regular activities in a routine way and failed to recognize their special fair housing responsibilities. In addition Chapter 117 section 4412 outlines required provisions and prohibited effects by which municipalities must abide.

Municipalities carry out four broad categories of activities that affect housing. Each can trigger municipal fair housing responsibilities:

- Regulatory activities – When a municipality enacts and administers regulations (e.g. zoning or building codes) that affect existing or potential residential properties;
- Provision of services – When a municipality provides routine services in residential areas or to residents;
- Provision of subsidies – When a municipality offers financial incentives (e.g. grants, loans, or loan guarantees) or special services (e.g. infrastructure projects or housing rehabilitation services) to residential property owners or to residents; and
- Proprietary activities – When a municipality buys or sells real property, particularly if the property was used or will be used as a residence.

Under the Fair Housing Act, a person who believes that he or she is a victim of housing discrimination may file either a complaint with the Department of Housing and Urban Development (HUD) or a lawsuit in federal or state court. If a municipality must defend itself against a complaint based on the Fair Housing Act, or if it is found to have violated the Act, the costs can be considerable. For more information on Fair Housing laws, visit the HUD website at <http://hud.gov>.

MEETING CURRENT & FUTURE NEEDS

Advocacy & Housing Committees

In February 2006, the Central Vermont Economic Collaborative, of which CVRPC is a member, initiated a Regional summit called "Housing Strategies 2006". Seventy-five Central Vermont residents attended this meeting and many of them volunteered to be on one of three task forces in order to work on the following issues:

- Planning / Zoning / Permitting
- Incentives to create or purchase housing
- Public Awareness / Education / Involvement

Each task force has developed strategies for implementation that could foster increased housing. The Planning/Zoning/Permitting Committee (of which CVRPC is a member) created a GIS model to identify land available for housing development within towns with municipal sewer and water systems. The Incentives group identified five financial incentives which currently do not exist in Central Vermont which would benefit the creation, rehabilitation and purchase of homes. They are: 1) development of low-interest loans for landlords to renovate existing apartments, 2) develop more incentives/tax breaks/abatements/credits and assistance to attract the private sector to develop housing within existing infrastructure, 3) expand assistance for accessory apartment conversion, 4) develop community support for

creating mixed uses and mixed housing types, and 5) develop employee pre-tax house savings accounts. The Public Awareness/Education/Involvement committee developed an educational flyer and compiled a comprehensive list of media contacts and other forms of information outlets. Currently, the Collaborative is working on a housing guidebook (entitled "The Central Vermont Housing Menu") combining the efforts of all committees.

The Mad River Valley Housing Coalition (MRVHC) is organized as a not-for-profit housing group and continues to work on the following projects in the Fayston, Waitsfield and Warren area:

research and develop an accessory apartment program,
implement the recommendations of the Mad River Housing Study;
support local housing projects;
educate the public on local housing needs.

The Montpelier Housing Task Force (MHTF) was organized in 1999 to assist with the preservation and enhancement of residential opportunities in Montpelier for households of all income levels. Working with community residents, City staff and elected officials, landlords and financial institutions, and community organizations, recent accomplishment of the task force include:

- creation of a City housing trust fund,
- implementation of an accessory apartment program,
- recommended changes to municipal ordinances
- conducted public outreach and education,
- continuation of tracking City housing data.

Local housing groups have proven effective at addressing local housing needs and can be a valuable resource in assisting town select boards and planning commissions in decision making. Yet no single municipality acting alone can address the Region's housing needs. All 23 cities and towns can work together in advocacy and partnership with other housing organizations (see CVCLT feature on p. 5) in order to meet current and future housing needs in sustainable ways. The Regional Housing Distribution Plan, as detailed below, is one way the Region's municipalities can continue to work cooperatively towards this important goal.

Regional Housing Distribution Plan

The Regional Housing Distribution Plan is a pro-active Regional approach developed by CVRPC and designed to assist local towns in their planning for housing. It is a critical step in the Region's on-going effort to address the housing needs of Central Vermont residents. Given the interdependent economy and society of the Region,

the housing needs of the Region affect every community. The purpose of the Housing Distribution Plan is to establish a long-term vision for Central Vermont and is to be used to measure progress.

The number of housing units for which each town is expected to plan was derived from the report titled Economic and Demographic Forecast: Central Vermont Planning Region 2000-2020 prepared by Economic and Policy Research, Inc (EPR) for CVRPC. In the year 2000 each town contributed a certain percentage of housing units to the Regional total. The EPR forecast indicated that the larger towns in our Region, with infrastructure capacity, are projected to contribute lower percentages to the Regional housing total as the year 2020 approaches. (This is in part due to a combination of factors including land costs are cheaper in more rural areas, causing an increase in scattered residential development outside of town and village centers. This pattern of decreasing population in our larger towns has been the basis for future forecasts.) Therefore, the Housing Distribution Plan was formulated with the aim to ensure that all towns continue to contribute similar percentages of the Regional total, or more, as they were in the year 2000 to fulfill the needs of the future. The Regional Housing Distribution Plan results in planning for a total of 8,835 new housing units in Central Vermont between 2000 and 2020. (See Appendix)

Under § 4347 of Chapter 117, the State mandates CVRPC to plan for anticipated growth and promote the development of housing suitable to the needs of the Region. In § 4348a, the State also mandates that the Regional plan housing element "identifies the need for housing for all economic groups in the Region and communities." Therefore the Regional Housing Distribution Plan is a method to be used by municipalities, in conjunction with information contained within this Housing Element, to help meet the future housing demand.

- The Regional Housing Distribution Plan is intended to be used by municipalities when updating their land use plans and regulations.
- Town Plans adopted after January 1, 2009 are expected to incorporate this Housing Distribution Plan into their town plan housing element.
- The Regional Planning Commission has established a town-by-town housing distribution plan at least 15 years into the future. The formula and allocation will be reviewed and updated with each Regional Plan's five year update.
- Town plans shall contain a detailed map or maps of the town showing the town's preferred locations for future housing units – consistent with current or proposed zoning* – for 80 percent of the anticipated 10 to 15

Regional Housing Distribution Plan
Number of net, year-round, housing units to be planned for per municipality

Municipality	2000-2004	2005-2009	2010-2014	2015-2020	TOTAL
Barre City	110	163	199	295	767
Barre Town	107	199	268	382	956
Berlin	112	139	125	116	492
Cabot	37	43	23	57	160
Calais	40	100	88	118	346
Duxbury	54	82	90	106	332
E. Montpelier	74	94	87	206	461
Fayston	48	55	89	134	326
Marshfield	44	55	46	72	217
Middlesex	76	68	84	151	379
Montpelier	97	206	177	299	779
Moretown	60	86	98	129	373
Northfield	62	138	113	197	510
Orange	31	37	40	53	161
Plainfield	18	28	22	42	110
Roxbury	13	15	25	36	89
Waitsfield	73	75	76	88	312
Warren	85	87	69	143	384
Washington	24	37	38	51	150
Waterbury	109	138	148	269	664
Williamstown	84	131	140	184	539
Woodbury	37	33	57	63	190
Worcester	35	26	24	53	138
TOTAL	1,430	2,035	2,126	3,244	8,835

year housing demand. ("Demand" is the difference between the number of units at the time of town plan approval and the Housing Distribution number at least 10 years thereafter.)

- Town plans shall also provide mapping updates that identify the locations and number of housing units created in the town since the previous town plan adoption.
- Towns and cities are required to demonstrate the community's intent to meet the proposed housing unit numbers laid out in the Housing Distribution Plan or to describe in detail the obstacles that make attainment impossible. CVRPC will consider the planning effort to encourage housing development in relation to the Housing Distribution Plan when approving a municipal plan.
- CVRPC can and will work with municipalities to overcome any local barriers to housing production that prevent attainment of the housing unit numbers, and suggest programs of local actions to address those barriers. Towns unwilling to implement programs to address barriers to housing may have their plans denied Regional approval.
- The Regional Housing Distribution Plan is not proposing quotas that municipalities must achieve within the time frame of their next municipal plan update; rather it is to identify the locations where the Region welcomes and encourages the housing residents need.

*For towns without zoning bylaws: Town plans shall contain a detailed map or maps of the town showing the town's preferred locations for future housing units consistent with the town plan's housing goals and policies and be compatible with other plan elements as outlined in § 4382 "the plan for a municipality." (See Appendix.)

Note: The Distribution Plan total numbers are somewhat higher than the actual projected unit totals for the Region, as well as for some individual municipalities. The Distribution Plan numbers are not meant to replace the projections that appear elsewhere in this Plan, but rather are intended to ensure that communities plan for potential demand.

HOUSING RESOURCES

Advocacy

- Vermont Affordable Housing Coalition. www.vtaffordablehousing.org. Organization working to promote awareness and policies for affordable housing.

- Vermont Coalition to End Homelessness. www.helpingtohouse.org. Organization working to monitor the needs and stream line the services and housing.

Data Sources

- American Factfinder. www.factfinder.census.gov. Data base of Regional and national statistics.
- Vermont Housing Data. www.housingdata.org. Data base of Vermont including a directory of affordable housing, housing profiles and policy resources.

Guides

- Affordable Housing Design Advisor. www.designadvisor.org. U.S. Department of Housing and Urban Development website which includes tools, resources, ideas and a guide to affordable housing design.
- Central Vermont Housing Resource Guide. www.centralvtplanning.org. A guide to renters and homeowners looking for information about subsidized housing; mobile homes; and mortgage and home improvement financing. Hard copies are available at CVRPC Offices, 29 Main Street, Montpelier.
- Housing and Vermont's School Enrollment, VHFA Issues Paper. www.vhfa.org. Explores the relationship between home building and school enrollment levels. Includes a guide to help communities make decisions about the impact of housing development on school enrollment.
- HUD's Regulatory Barriers Clearinghouse. www.huduser.org/rbc/. U.S. Department of Housing and Urban Development's guide to solutions to state and local regulatory barriers to affordable housing.
- Vermont Housing Needs Assessment Guide. www.housingdata.org. Guide to help community groups determine the need for affordable housing within their cities or towns.

Organizations

- Central Vermont Community Land Trust. www.cvc.lt.org. Organization working to develop and manage affordable rental and homeownership housing opportunities in Central Vermont.
- Vermont Forum on Sprawl. www.vtsprawl.org. Organization dedicated to promoting research-based smart growth. Includes resources to assist towns with including density and affordable housing.

HOUSING GOALS, POLICES & ACTIONS

Goals:

1. To promote the development of housing opportunities for all residents of the Region, including and especially, affordable, elderly, and special needs housing.
2. To encourage innovative planning, design, and development of housing which minimizes its costs, energy consumption, and environmental impacts.
3. To promote preservation of the existing housing stock and the development of future housing in the village/town and employment centers of the Region, or those areas designated as Growth Centers.
4. To support the coordination between public, private, and non-profit agencies involved with planning, financing, and developing affordable housing.
5. Encourage large employers to explore and implement employer assisted housing.

Policies:

1. The Region's towns, non-profits, and state agencies should work collaboratively to address the Region's housing needs.
2. Municipal plans should assess the community's ability to meet the goals set out in the Regional Housing Distribution Plan.
3. Municipalities should encourage housing at the maximum densities allowed by local plans and regulations and at densities at or above those of their traditional/existing neighborhoods.
4. Municipalities should seek to ensure at least 20 percent of the housing stock is affordable, as defined by 24 VSA, Chapter 117, Section 4303.
5. The majority of new housing should be constructed in town centers and designated growth centers.
6. The Region's existing housing stock should be preserved and renovated. Adaptive re-use of older and historic buildings should be encouraged especially in town centers.
7. Housing units that are affordable to households below the area median income

and housing near employment centers should be encouraged.

Actions

- Assist towns in finding the resources needed to carry out housing needs analyses to identify the specific types of housing most needed by the community.
- Provide communities with the tools and resources needed to implement the Regional Housing Distribution Plan.
- Encourage the adoption of local land use regulations and bylaws that allow concentrated development where appropriate infrastructure can be made or is available.
- Review town plans to assure that all towns in the Region have a housing element that identifies housing issues and outlines steps through which housing needs will be addressed.
- Assist towns with the process of designating growth centers
- Help towns to identify potential partners for affordable housing development.
- Continue advocating for state policies and funding initiatives that increase housing opportunities for the Region's residents.
- Make Geographic Information System technology and other tools available to communities so they may analyze the impact of existing and/or proposed zoning policy on the potential for housing development.
- Continue support of local housing groups.
- Promote the density building land use strategies discussed in this Chapter and in the Land Use Element as a matter of course through our technical assistance programs.
- Provide municipalities with copies of "The Central Vermont Housing Menu" when completed.
- Actively participate in the Act 250 process to support appropriate housing development.
- Actively support the economic incentives identified by the Central Vermont Eco-

conomic Collaborative (see page Advocacy & Housing Committees section.)

- Continue to assist any municipalities which have not yet adopted the 2004 housing-related changes to 24 VSA, Chapter 117.
- Encourage towns to develop a streamlined permitting process for housing along with density bonuses and lowering of impact fees in growth centers, village centers and downtowns, and other areas where housing growth is desired.

2008 CENTRAL VERMONT REGIONAL PLAN

ECONOMIC ELEMENT

-amended September 8th, 2015



A healthy economy is essential to maintaining Vermont's quality of life. A diversified and dynamic economy provides employment, stimulates social and cultural interaction, and provides the resources for the provision of a wide variety of community services, including education, health care and a well maintained physical infrastructure. On the individual level, a diversified economy offers greater opportunities for individuals to engage in satisfying and meaningful occupations and pursuits.

Economic vitality is a balance between human, natural and capital resources. The interaction of these factors determines the scale and intensity of growth and development. The Economic Element of the Central Vermont Regional Plan focuses on making effective use of the wide range of resources available in the region, while maintaining the balance of these resources.

DISCUSSION: GENERAL ECONOMIC PROFILE

Like the rest of Vermont, the Central Vermont economy has evolved from an agricultural/ manufacturing emphasis to a more complex mixture of economic activity. The growth of the travel/ hospitality/recreation industry, for instance, has contributed to the expansion of the retail and wholesale trades, and other services like construction and mortgage banking. Manufacturing, which has expanded to include food processing, plays a significant role in the attraction of tourists and the diversification of agriculture. No one sector can stand alone; changes in one will have an effect on all the others.

Total employment in Central Vermont is expected to increase by approximately 14,000 over the 2000-2020 period at an average rate of 1.4% per year. However, given a sharp drop in employment in 2008 and 2009, the Region exhibited only 1.3% growth between 2003 and 2013. While Washington County is expected to see

an increase in employment over the forecast horizon, it is expected to decrease its share of the total northwest region's (including Chittenden, Franklin, and Lamoille Counties) employment.¹

The region's diverse economy is divided among a variety of activities. This industry distribution is supported by an equally diverse educational and occupational profile of the work force. Of the adult population in Central Vermont, 92.6% have a high school diploma or better. 44.7% have either an Associate's degree, Bachelor's degree or graduate-professional degree. Central Vermont has a higher relative number of collegiate degrees, including Associates, Bachelors and Graduate/ Profes-

sional, compared to Vermont (42.3%) and the United States (35.8%). Within the Region there is significant variation in educational attainment with levels of adults with a high school diploma or less at 48.5% in Barre. These percentages have increased significantly since the 1990 census. The occupational profile of the work force indicates that the largest category falls into public administration, health care and social assistance or retail trade.



Cabot Creamery, Cabot, Vermont.

Approximately 60% of the region's employment is concentrated in the urban core, which is made up of Montpelier, Berlin, Barre City and Barre Town, with most of the balance of employment opportunities found in Waterbury, Northfield and the Mad River Valley towns. Together the region's employment centers account for about 89% of the region's employment and approximately 73% of its population.

Just as the region's economy has evolved from locally focused agriculture and manufacturing to its current place in the more complex New England and national marketplace, it will continue to evolve as markets change and competition in all sectors becomes more global.

1 United States. Census Bureau. Population and Housing Census. 2000

2 Vermont. Department of Labor. Vermont Employment Projections. 2000.

Projections developed by the Office of Policy and Information of the Vermont Department of Employment and Training help to identify the shifts that are occurring in the state and regional economies. National and international forces have a tendency to have greater influence on manufacturing, while state and regional market forces combine to influence the non-manufacturing side.

The growth of the state economy is closely linked to the expansion of trade and service industries which meet the demands of residents and tourists. Our proximity to the urban centers of the Northeast plays a major role as a market in our recreation/tourist activities. The growth in resident income also contributes to the importance of the trade and service industries.

While the next two decades are expected to produce employment growth at a rate of about 1.4% per year, approximately 84% of this growth is expected to be in the non-manufacturing sector with the addition of approximately 11,000 jobs over the forecast period (1.6% annual growth). Most of this increase (62%) will be in service industries that will grow faster than the rest of the non-manufacturing sector.

Employment in the manufacturing sector is forecast to grow 1.1% per year or by 1200 jobs by 2020. The government sector is expected to add the same number of new jobs while growing at an annual rate of only 7%.

The granite industry has long been at the heart of the Central Vermont Region's manufacturing sector. The region is a melting pot of ethnic heritage brought about by the influx of immigrants drawn to the region's granite quarries and manufacturing plants. The industry continues to be a major employer, with over 1,000 jobs and in excess of \$100 million in sales. In recent years, the industry has emphasized diversification of its product line and improvement of its fabrication processes. Innovation has led to reductions in such health and environmental hazards as dust and sludge, and has led to greater utilization of processing wastes.

Ski areas are viewed as one of the Region's resources, combining economic benefits and recreational opportunities. Ski area growth has direct implications for the natural, physical and socio-economic environments. The ski industry also presents the potential for secondary impacts through associated employment in the service and

construction sectors, as well as the expansion of seasonal and permanent housing. A challenge exists to balance the competing demands of accommodating growth while preserving resources.

By its nature, the ski industry operates within some of the more environmentally sensitive areas of the Region. The ski areas, themselves, have often recognized the strong relationship between the health of the environment and the health of the ski industry and have demonstrated a desire to ensure that ski-related development respects the natural environment.

Central Vermont continues to have significant ties to the agricultural and forest-based economies. In addition to direct economic contribution, farms and forests helps to define the Region's cultural identity and provides Central Vermont residents with open space, recreational opportunities, aesthetic pleasure, and a sense of place. The continued economic viability of these highly valued working landscapes will be a key factor in preventing the conversion of these lands to other uses.

Though a variety of economic and social factors continue to threaten the local sourcing that was common in the past, new economic and social forces make this a good time to look anew at local food and wood product manufacturing. Many farmers are growing for local markets, local processors are feeling pressure for growth, the majority of maple producers have diversified their operations, and public interest in maintaining our agricultural economy is clearly on the rise.

ECONOMIC DEVELOPMENT

Self Sufficiency

Research has shown that community and economic development are best supported when local solutions and resources are brought to bear on local problems.

Small, new businesses are the backbone of economic development and job creation. In Washington County, enterprises with less than 20 employees comprise 90% of total private businesses while providing for 38% of total private employment.

(National figures are 87% and 26%, respectively.) Even though initial employment gains may be small, start-up businesses have immediate impacts on the local economy. Small companies tend to hire locally, buy locally and put more money into the local economy than they take out.

Over the past decade Vermont has become a leader in small business formation, with the Central Vermont region adding its share of new, small, innovative businesses to the list. In Central Vermont the vast majority of the more than 2000 employers fit the definition of small business.

Business development is influenced by a number of factors, as is the ability of the Central Vermont region to nurture, attract, and retain the businesses that are crucial to the economy. The Central Vermont Regional Plan attempts to capitalize on the region's positive factors, and also identify problems along with potential solutions.

Education

The quality of the work force and quality of life are directly related to community emphasis on education. Elementary and high school education are the basis of the human infrastructure. They provide the skills necessary for individuals to interact with one another in civil and meaningful ways. They are also the source of basic vocational skills in communications, mathematics, and problem solving.

As our society becomes more technologically advanced, these elementary skills take on even greater importance. Complex manufacturing techniques require workers who can process information and manipulate advanced machinery. Information management requires the ability to identify, isolate and utilize a wide variety of data.

The Central Vermont region is served by a high quality public and private school system. The region's seven high schools provide curricula ranging from college preparatory to vocational education. Several high schools have received state recognition for excellence in education. The region's elementary schools are in the forefront of the educational reform movement, making great strides in performance based

programs, several of which have been recognized at the national level, and curriculum integration.

Institutions of higher education play an important role both as major employers and as support institutions for technology based industry. The Central Vermont region hosts six colleges and post-secondary schools. Spin off institutes and for-profit ventures undertaken by the higher education community have added substantially to the economic and cultural wellbeing of the region. Advanced educational institutions also play a major role through the provision of programs that advance technical and problem solving skills.

While an elementary and high school education can provide the building blocks for an educated work force, individual advancement and technological improvement will depend on the development of life-long learning habits and opportunities for all workers. The public education system must expand to meet the vocational needs of adults. Public and private institutions and employers must take a proactive role in identifying the skills necessary for economic vitality in the future, and take the steps necessary to prepare and retain the work force.

Transportation and Communication

A number of factors contribute to the appeal of Central Vermont to businesses. The transportation system in Central Vermont provides ready access to markets for goods produced here, as well as facilitating the flow of tourists into the region from the major northeast metropolitan areas. The region is served by the interstate highway system and national freight and passenger rail service. Private business and general aviation are served by the all-weather Edward F. Knapp State Airport, and passenger air service is readily accessible through the Burlington International Airport.

The State's communications policy and planning have benefited Central Vermont in the form of a network of telecommunications infrastructure that enables information-based industries to link into a worldwide telecommunications network. There remain challenges to both take advantage of this advanced technology, and to keep pace with the developments of this quickly changing industry. The increasing region

-wide availability of the state-of-the-art telecommunications/information technology infrastructure (including high speed internet access and wireless communications) is increasing work options for Central Vermonters.

Quality of Life as an Economic Consideration

Quality of life is a difficult concept to define, yet many would agree that it stems from the sense of security and well-being that comes from being part of a community. Central Vermont's small town character, with its opportunities for participatory government, diverse social interaction, and human scale commerce plays a major role in maintaining an excellent quality of life.

Essential to a high quality of life is a dynamic and varied cultural experience. The village as the center of social activity provides the critical mass necessary for a flourishing interchange of ideas, art and culture. The traditional New England village is a virtual textbook of human history. The variety of architectural styles reveal the economic and social fortunes of its inhabitants, past and present.

The New England village is considered by many to be the pinnacle in land use design. In scale and function, it satisfies our needs for privacy, community and livelihood. Maintaining historic development patterns of village centers surrounded by resource based agricultural, mineral, forest and recreational activities balances economic and environmental interests. Concentrating growth and development within the confines of a village or "growth center" allows the community to implement infrastructure improvements in an efficient and effective manner that will improve the quality of life while limiting the degradation of the environment.

Central to the preservation and development of village patterns and commerce are affordable public utilities and services that allow increases in residential and commercial densities. While the costs of water and sewer for dispersed development can be borne by individual owners and users, public systems that benefit the entire community are frequently beyond the capacity of individual users to support. Equitable methods of financing that recognize the social, economic and environmental

³ Vermont has the highest tuition costs in the nation for state universities and colleges while ranking 47th out of 50

benefits of public infrastructure must be developed.

The availability of safe and affordable child care services is critical to the Central Vermont Region. Quality child care benefits families by preparing children for schooling and social interaction while enabling parents to work and provide income. It benefits businesses by expanding the workforce and creating more reliable, productive employees. Furthermore, child care facilities are businesses themselves and their existence expands local and Regional economies directly through the hiring of workers and purchase of goods and services. The need for childcare is prevalent across the state: 71% of Vermont children under 5-years old are in the care of someone other than their parents for at least part of the day.

CHALLENGES

A number of obstacles have been identified as impediments to economic development. The limited number of clearly identified, well-served, commercial/industrial sites hampers the ability of local businesses to expand and new ventures to develop. Some sites are identified as commercial or industrial in town zoning ordinances, but lack the needed sewer, water, electrical services or transportation infrastructure, while other areas have services available, but are not zoned for commercial/industrial use.

Similarly, the capacity of some of the region's existing public infrastructure is being severely strained by age, quality and the demands being placed on it from all sectors. The costs of upgrading and expanding public facilities often out pace the ability of users to pay.

The lack of venture and expansion capital is a serious obstacle to business development, especially for smaller enterprises. In Vermont's small business climate, where loans have traditionally been made as much on the credibility of the individual as on the assets of the company, the effect has been profound.

Utility costs represent a substantial portion of the operating costs of many businesses, primarily in the manufacturing sector. Vermont's climate and location alone mean increased energy use and cost compared to other areas. Conflicting and

sometimes lengthy permit decisions have also complicated the development process. Development proposals are reviewed by numerous state agencies, local boards and regional planning and environmental commissions, each adding its own perspective and requirements. The myriad of permits that are sometimes required can tend to discourage the inexperienced business-person.

There has been much discussion in recent years regarding salaries in Vermont and the desirability of compensating workers with a “livable wage” (defined as the hourly wage/annual income necessary to cover all basic needs plus all relevant local, Federal, and State taxes. Basic needs include: food, housing, child care, transportation, health care, clothing, household and personal expenses, and insurance). It is an often heard refrain that our young people often leave the State to find higher paying jobs elsewhere. The fact that Vermont placed in the top five states in multiple job-holders in 2000 may provide further evidence that low wages may be a problem here. Unfortunately, this trend is actually accelerating.

The Region’s downtowns and villages were primarily established along the Winooski River and its major tributaries. This development pattern leaves our communities very susceptible to flood damages amongst other natural hazards and weather events that can affect community vitality and economic activity. This vulnerability became extremely evident during 2011 flood events, including Tropical Storm Irene, during which a great number of businesses were directly impacted by flood damage or indirectly impacted due to road closures, tourism impacts or dips in local spending. There is a need to incorporate an economic component into future analyses related to our communities’ flood vulnerabilities and to include actions to better prepare businesses for future flood events.

The Demographic Challenge

Continued economic vitality depends on the existence of a skilled, knowledgeable and innovative “next generation” workforce. With an older than average and rapidly aging population, along with the lowest percentage of people in the 25 to 29 age group in the nation, Vermont faces some serious challenges in this regard.

Recent studies in the State suggest two different points of view on, and approaches

to, solving the State's demographic problem. The 2006 report of the Governor's Next Generation Commission espouses the belief that many young people are "forced" out of the State by the high cost of post secondary education, lack of available training, and lack of early awareness regarding career/educational choices. Its recommendations focus primarily on retaining young people already in the State by providing them with financial and other incentives for them to stay, helping them develop skills to offer employers, and providing them the information to make better decisions about their futures.

Another point of view, delivered in a 2007 report commissioned by the Vermont Department of Economic Development, argues that the so called "youth flight" or "brain drain" is a natural, perhaps even healthy phenomenon common to all rural areas. This document (Growing Vermont's Next Generation Workforce) suggests that instead of trying to prevent out-migration, the State should instead focus on "brain circulation" – "The capture of new talent and the recapture of native talent after they have experienced other places." CVRPC believes both approaches have validity and merit and that the data they present and recommendations they offer are not mutually exclusive, and are probably complementary.

The later study included sizable surveys of recent alumni of Vermont colleges. Among the positive revelations of these surveys was that a high percentage of the respondents had an interest in moving back to, or remaining in, Vermont. Notable among the reasons offered was an affinity for the State's environment and culture. Chief among the barriers were our relatively low wages and high cost of living – a daunting financial "double whammy." While stating that 80% of the State's college students move out of Vermont within one year after graduation, the report did cite a number of unique opportunities for Vermont and makes a case for optimism. Among the encouraging factors are:

- Colleges and universities are already actively engaged in attracting young people to Vermont – over 50% of those enrolled are from out of State.
- Vermont's tourism/recreation industry is a "natural draw" for young people to experience Vermont's quality of life.
- The younger generation is less bound to the notion of corporate employment and

more inclined to make "value-based" career choices than previous ones. Both of these factors bode well for entrepreneurial, innovative, "socially responsible," small business development.

- Information technology has widened the horizons for recruitment and marketing.
- According to survey results, "Students who become interns at area companies are up to 75% more likely to stay in Vermont."

CVRPC must recognize these trends and strive to support and cultivate opportunities for young people to stay in, return to, or discover our Region as an exciting and affordable place to work and live.

SUMMARY

Vermont's "quality of life," its work force, the environment, and Vermont's positive marketing image are assets to doing business in Central Vermont.

Central Vermont has the underpinnings of a strong economy. The diversity of its larger employers, the number of small employers, the variety and level of skills found in its labor force, and the quality of life are its prime assets. In conjunction with local governments, businesses and other regional development groups, the Central Vermont Regional Planning Commission will participate in economic development efforts by helping communities capitalize on their assets and helping the region and state to overcome economic obstacles.

The purpose of this element is to guide and plan for economic development that will create employment in Central Vermont which keeps pace with the region's labor force, provides an adequate flow of taxable economic activity to fund State programs, and increases the wealth and economic well being of residents.

ECONOMIC GOALS, POLICIES AND STRATEGIES

Goal 1: Full employment⁴ and the creation and preservation of high quality jobs in a diverse range of occupations.

Goal 2: Business retention, growth and development that anticipate and meet market opportunities.

Policy 1: Promote career exploration and education planning for all young people and reduce barriers to participation in some form of post-secondary education or training.

- A. Promote sharing of best practices within the Region's supervisory unions with regards to dual-enrollment, work-based learning internship and apprenticeship programs and assist with identifying resources and incentives for these efforts.
- B. Promote an annual regional Student Career Day/Job Fair event targeted to High School students for summer employment, job shadow opportunities and internships.
- C. Facilitate effort to identify partners and formalize network of STEM-related (science, technology, engineering and math) companies, high schools, educational institutions, Tech Centers, and Community College of Vermont (akin to Vermont Youth Conservation Corps. concept, applied to STEM sectors) to provide hands-on training and internships.
- D. Identify, inventory and support resources programs that place emphasis on sound management and mentorship for young workers, particularly at-risk youth, in partnership with service providers such as Washington County Youth Services Bureau and ReSource/ReBuild.

⁴ The level of employment, or unemployment rate, which provides the maximum sustainable rate of economic growth and Gross Domestic Product without resulting in accelerating inflation. A Full Employment rate that is also just above the rate which will cause inflationary pressure, is called the Non-Accelerating Inflation Rate of Unemployment (VT Dept. of Labor).

E. Support and engage with Young Professionals organizations to better understand professional development needs and barriers to workforce stability in younger workers.

Policy 2: Deliver training and life-long learning to retain and expand a robust workforce with skills to match needs for current and future available jobs.

A. Support availability and awareness of training programs for underutilized workforce populations (e.g. dislocated, special needs and older workers) to attain skills to transition to new careers.

B. Increase local delivery of information regarding regional workforce training resources (e.g. Front Porch Forum, employer groups/trade associations, municipal web sites).

C. Promote partnerships with digital workforce training programs such as those piloted by the Vermont Digital Economy Project to increase access to workforce training opportunities, including those in more rural communities.

D. Encourage and collaborate with the State to conduct or reference existing labor skills gap analyses, where available, to: i) improve workforce data availability, ii) identify the types of jobs that businesses need to fill, and iii) document anticipated skills shortages.

Policy 3: Focus retention, growth and development efforts on industries and businesses that are a good fit with the Region's existing economic base and support sustainable economic development.

A. Increase collaboration between regional planning and economic development organizations, such as Central Vermont Economic Development Corporation, Capstone Community Action and Central Vermont Chamber of Commerce, in order to accomplish strategies identified in Policy 3.

B. Support and encourage expansion in sectors that are poised for growth, such as: health care, high tech manufacturing, software development and information technology, value added agriculture, higher education and recreation and tourism.

C. Support education on sustainable business best practices, on topics such as recycling, use of environmentally friendly materials and processes, and implementing energy efficiency improvements.

D. Explore opportunities to expand value added manufacturing networks (i.e. processing, storage, distribution, wholesale, retail, direct-to-consumer) and information exchanges.

E. Develop and disseminate information on development incentives, techniques and resources for towns and local development groups.

F. Provide a range of information regarding regulatory processes and available financial and technical resources and, where feasible, facilitate trainings for developers, entrepreneurs and business owners.

G. Research cooperative development models (e.g. Evergreen Cooperatives in Cleveland, Cooperative Development Institute in Massachusetts, Cooperative Vermont in Burlington) and identify potential partnerships between the Region's cooperatives (the credit unions, food coops, and few worker-owned cooperatives) and other major "anchor" institutions (the State, educational institutions, etc.) to encourage more cooperative development in the Region.

Policy 4: Promote entrepreneurship and innovation in all business sectors and encourage small and micro business development.

A. Assess zoning and other regulatory barriers to entrepreneurship and small and micro business development, including home-based businesses and diversified agricultural enterprises.

- B. Continue to expand availability and improve the quality of broadband to enable telecommuting and home-based work opportunities, particularly in more rural areas of the Region.
- C. Identify policy and programmatic gaps and opportunities to expand access to capital for businesses, particularly knowledge-based.
- D. Work with Capstone Community Action partners to explore opportunities to develop a network (e.g. "Community Capital Exchange") where local businesses and investors come together to identify capital needs, investment, and opportunities to apply commercial strategies to maximize improvements in social and environmental well-being, such as Capstone Community Action's Community Capital Exchange initiative.
- E. Encourage organizations or professional associations to provide networking and a unified voice to creative economy sectors (writers, web designers, etc.).
- F. Explore opportunities for regional innovation partnerships and/or technology transfer with employers, educational and research institutions and other public partners.
- G. Encourage online marketing training and technology use for small and micro businesses, including participation in Vermont Digital Economy Project trainings and use of aggregated web platforms such as the Vermont Food System Atlas or Made in Vermont.
- H. Increase collaboration with business development organizations to enhance delivery of technical assistance to the wide range of small and micro businesses and entrepreneurial enterprises serving the Region.

Policy 5: Implement the goals and policies presented in the Utilities, Facilities and Services and Land Use elements of this Plan that enhance and optimize quality of place to attract and retain employers and residents.

These efforts to enhance and optimize quality of place include preservation of historic and cultural assets; maintaining the scenic qualities of our agricultural and forest lands, protection of natural resources and environmental quality, expansion of local food systems and healthy lifestyles, and increased access to recreational opportunities and amenities

POLICY 6: Ensure availability of commercial and industrial space to meet employment and business expansion needs.

A. Assess capacity of commercial and industrial space using available data, including existing GIS information, and identify the various types of commercial and industrial space needs.

B. Assist municipalities in promoting marketable sites and identifying assets, deficits and options available to meet industrial and commercial site development needs; for example, the potential for use of small wastewater treatment systems.

C. Maintain inventory and support the reclamation and redevelopment of blighted, contaminated or potentially contaminated sites (i.e. "brownfields"). Continue to actively seek funds to facilitate this effort.

D. For uses that do not require a rural location, guide and assist commercial, industrial and institutional uses to locate in downtowns, villages and adjacent industrial areas, or at those locations in the fringe areas that have been significantly developed and are zoned for such purposes.

Policy 7: Implement the goals and policies presented in the Energy, Utilities, Facilities and Services and Transportation elements of this Plan to maintain and plan for adequate infrastructure, energy, telecommunications, and transportation systems to accommodate and support business growth and expansion.

These efforts to maintain and plan for adequate systems to support business growth and expansion include support of:

A transportation system that efficiently transports goods and services and employees to their place of work;

An efficient and stable energy system that provides for reduced costs, consumption and reliance on nonrenewable energy sources;

State-of-the-art telecommunications/broadband infrastructure that would increase work options and reduce commuting and its impacts on the transportation infrastructure and the environment; and

Water, wastewater and storm water management systems in locations that allow for appropriately-scaled commercial and industrial expansion, higher densities and co-location of jobs, housing and services.

Policy 8: Support the continued use and sustainability of our natural resources and associated industries.

A. Encourage the continued productivity of viable mineral resources.

B. Facilitate the use of locally obtained materials for building and highway construction and maintenance. Assist municipalities in mapping the important, accessible resources.

C. Ensure that resource extraction operations follow best management practices to minimize impacts to the local and surrounding environment and other land uses, and to allow for site restoration.

D. Implement the goals and policies presented in the Land Use element of this Plan related to continued use, sustainability and protection of productive forests and prime agricultural soils.

Goal 3: Incomes sufficient to meet or exceed basic needs with opportunities to advance and to achieve financial security.

Policy 9: Support and encourage the business community and policy makers in developing strategies for the retention and creation of jobs that pay a livable wage.⁵

⁵ Defined in statute as the hourly wage required for a full-time worker to pay for one-half of the basic needs budget for a 2-person household, with no children, and employer-assisted health insurance, averaged for both urban and rural areas (VT Legis. Joint Fiscal Office).

A. Research and develop case studies of businesses that are pursuing or have achieved a livable wage for employees as a goal, research and identify primary barriers to businesses being able to pay livable wages, and research impacts of livable wage policies and incentives on the economies of other places.

Policy 10: Implement the goals and policies presented in the Housing, Transportation and Utilities, Facilities and Services elements to expand access to resources that promote stability in the workforce, including workforce housing, transportation solutions, affordable child care, and medical and mental health care.

Policy 11: Support efforts to develop and disseminate information on career pathways and advancement opportunities for industry sectors poised for growth.

A. Encourage employers to provide for training and education opportunities for employees of all ages to acquire, maintain, and improve the skills and knowledge necessary to advance.

B. Support statewide initiatives such as the STEM (science, technology, engineering and mathematics) Equity Pipeline and other Statewide Consortia developing career pathways in priority sectors identified in the 2020 Statewide CEDS, such as health care and value-added agriculture.

Policy 12: Support projects identified in the 2020 Statewide Comprehensive Economic Development Strategy.

Goal 4: Dynamic and resilient downtowns, villages and commercial districts.

Policy 13: Find new uses and opportunities for vacant and under-utilized sites and buildings.

- A. Encourage and assist applications for Village Center designations in existing compact settlements not yet designated by the Agency of Commerce and Community Development.
- B. Assist participating municipalities in designation renewals and in utilizing technical assistance and incentives offered by State designation programs to preserve and reuse significant, economically viable, and historic structures.
- C. Support rezoning of village centers for mixed-use development, encompassing commercial, light manufacturing, artisan and residential uses at traditional village density.
- D. Assist municipalities in: planning for capital investments, identifying barriers to redevelopment or reuse, and planning for adaptive reuse of buildings.
- E. Support and prioritize assistance with community-identified priority/anchor revitalization projects in our downtowns, village centers and growth centers as they are identified.

Policy 14: Focus infrastructure investments in downtowns, village centers and growth centers and promote use of healthy community design principles in public investments and land use regulations.

- A. Promote incorporation of Healthy Community Design⁶ and Complete Streets⁷ principles into public infrastructure, redevelopment projects, land use regulations and community engagement efforts.
- B. Assist municipalities in pursuing resources to upgrade infrastructure, including roads, sidewalks, bike paths, multi-use paths, bridges, rail, water, wastewater, and stormwater. Promoted shared services via inter-municipal agreements where appropriate.

⁶ Healthy Community Design links traditional concepts of planning (land use, transportation, community facilities, parks and open spaces) with health themes (physical activity, public safety, access to nutritious food, air and water quality, mental health and social equity) (Vermont Dept. of Health).

⁷ Complete Streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities (Smart Growth America).

Policy 15: Increase economic resilience by mitigation of and adaptation to extreme weather events and flooding.

- A. Encourage and assist employment centers with participation in FEMA's Community Rating System to enhance community-wide floodplain management efforts and reduce flood insurance premiums.
- B. Develop and implement outreach strategies targeted to business and residential property owners to raise awareness of flood risk and promote strategies and resources to reduce vulnerabilities.
- C. Work with communities to upgrade flood hazard bylaws and improve storm water mitigation strategies in order to minimize risks to homes, businesses and public infrastructure.
- D. Encourage communities to direct new commercial or industrial development to areas not at risk from erosion and inundation flood hazards, where feasible.
- E. Consider the benefit to local and regional economic resilience when prioritizing assistance with Hazard Mitigation Assistance grants.

Policy 16: Support coordinated and complementary efforts to market the Region's unique, yet-connected downtowns and villages.

- A. Utilize results from Vermont Downtown Action Team retail market analyses to assist with marketing available commercial space, business recruitment and start-up support.
- B. Promote collaborative marketing with common themes among regional downtowns and villages, chambers of commerce, scenic byway committees and Vermont Tourism via region-wide events and tours (e.g. cycling; hiking; food, farm and brewery; covered bridges; stone arts; and fall foliage) targeted to both visitors and residents.

- C. Support formation and expand capacity of community-based or business associations focused on village vitality, marketing and enhancements.

Goal 5: Sustainable and viable agricultural and forest lands.

Policy 17: Promote and expand asset-based recreation and tourism with an emphasis on year-round offerings.

- A. Support efforts to develop and update local and region-wide inventories of natural, historic, scenic, agricultural and recreational assets at the local level to support tourism and quality of life promotion.
- B. Investigate feasibility of a region-wide promotion effort similar to Newport's "Fresh by Nature."
- C. Identify gaps in offerings and support expansion of facilities to develop off-season activities, host multi-day events, conferences and weddings and various related support services.
- D. Work with municipalities to identify viable options for expanded commercial and public outdoor recreational facilities, including trail development and related infrastructure that are environmentally and culturally sustainable.
- E. Explore options and pursue resources to update VT TrailFinder web site.

Policy 18: Foster collaborative partnerships among regional food system stakeholders.

- A. Assist with identifying sustainable collaborative frameworks and funding sources to continue the work of the Central Vermont Food Systems Council.
- B. Collaboratively host an annual meeting focused on best-practice-partnerships among economic development, land use planning and conservation stakeholders to support local food systems.

C. Promote representation of the agricultural and/or forestry sector on town and regional economic development committees/boards.

D. Promote Handbook for Local Action in Sustainable Agriculture developed by the State and targeted to municipal officials, boards and staff and local volunteers.

Appendices

A-1 REGIONAL HOUSING DISTRIBUTION PLAN METHODOLOGY

In August 2006, the Central Vermont Regional Planning Commission formed a Housing Committee to discuss a pro-active approach to planning for housing in Central Vermont. Commissioners representing the Towns of Calais, East Montpelier, Middlesex, Plainfield, Orange, Waitsfield, and Williamstown met monthly for seven months. The result of the Committee's work is the Regional Housing Distribution Plan.

The Housing Distribution Plan is based upon the "Economic and Demographic Forecast: Central Vermont Planning Region 2000-2020" prepared for the Central Vermont Economic Development Corporation, Central Vermont Chamber of Commerce and Central Vermont Regional Planning Commission in November 2001 by Economic & Policy Resources, Inc. (EPR). The formula for the housing plan is based upon historical patterns and trends in population and employment change.

The following steps outline how the number of net, year-round, housing units to be planned for per municipality was formulated:

1. The EPR forecast projects the Region's need to develop approximately 7,800 new housing units between 2000 and 2020, bringing the total from 25,675 to 33,534.
2. In 2000 each town was contributing the following percentage of housing units to the regional total:

Town	Housing units in 2000	Percent (%) of region	Town	Housing units in 2000	Percent (%) of region
Barre City	4220	16.44%	Orange	362	1.41%
Barre Town	2951	11.49%	Northfield	1819	7.08%
Berlin	1109	4.32%	Plainfield	487	1.90%
Cabot	452	1.76%	Roxbury	227	0.88%
Calais	616	2.40%	Waitsfield	734	2.86%
Duxbury	498	1.94%	Warren	742	2.89%
E. Montpelier	1007	3.92%	Waterbury	2011	7.83%
Fayston	484	1.89%	Washington	406	1.58%
Marshfield	575	2.24%	Williamstown	1248	4.86%
Middlesex	663	2.58%	Woodbury	329	1.28%
Montpelier	3739	14.56%	Worcester	346	1.35%
Moretown	650	2.53%	Total	25,675	100.00%

3. Each town's 'percent (%) of region' was calculated for the years 2005, 2010, 2015, and 2020 housing forecast.
4. Each town's 'percent (%) of region' in the year 2000 was applied to the 2005, 2010, 2015, and 2020 forecast.
5. If each town's 'percent of region' for the years 2005, 2010, 2015, and 2020 was higher than the 'percent of region' in the year 2000 then the EPR forecasted housing projections were used as is (which was the case for the majority of towns in the region.) If the town's 'percent of region' for the years 2005, 2010, 2015 and 2020 was less then the 'percent of region' in the year 2000, then the mid point between the projection and the 'percent of region' in the year 2000 total was applied. This was the case for Barre City, Montpelier, Northfield and Plainfield.

The Housing Distribution Plan results in planning for a total of 8,835 housing units in Central Vermont between 2000 and 2020, ensuring the region is prepared for future housing growth and encourages towns to continue to contribute similar percentage levels of housing units into the future.

It should be noted that all projections of future trends are the best guesses of experts and computer models. Anything as complex and dynamic as the Region's housing market must be constantly monitored to identify any changes in supply or demand and respond to them.

It is, therefore, recommended that local and regional housing needs analyses, economic and demographic forecasts, and the Regional Housing Distribution Plan be updated every five years.

A-2 24 V.S.A. § 4382. THE PLAN FOR THE MUNICIPALITY

Title 24: Municipal and County Government
Chapter 117: MUNICIPAL AND REGIONAL PLANNING AND DEVELOPMENT
24 V.S.A. § 4382. The plan for a municipality

§ 4382. The plan for a municipality

(a) A plan for a municipality may be consistent with the goals established in section 4302 of this title and compatible with approved plans of other municipalities in the region and with the regional plan and shall include the following:

- (1) A statement of objectives, policies and programs of the municipality to guide the future growth and development of land, public services and facilities, and to protect the environment;
- (2) A land use plan, consisting of a map and statement of present and prospective land uses, indicating those areas proposed for forests, recreation, agriculture (using the agricultural lands identification process established in 6 V.S.A. § 8), residence, commerce, industry, public and semi-public uses and open spaces reserved for flood plain, wetland protection, or other conservation purposes; and setting forth the present and prospective location, amount, intensity and character of such land uses and the appropriate timing or sequence of land development activities in relation to the provision of necessary community facilities and service;
- (3) A transportation plan, consisting of a map and statement of present and prospective transportation and circulation facilities showing existing and proposed highways and streets by type and character of improvement, and where pertinent, parking facilities, transit routes, terminals, bicycle paths and trails, scenic roads, airports, railroads and port facilities, and other similar facilities or uses, with indications of priority of need;
- (4) A utility and facility plan, consisting of a map and statement of present and prospective community facilities and public utilities showing existing and proposed educational, recreational and other public sites, buildings and facilities, including hospitals, libraries, power generating plants and transmission lines, water supply, sewage disposal, refuse disposal, storm drainage and other similar facilities and activities, and recommendations to meet future needs for community facilities and services, with indications of priority of need, costs and method of financing;
- (5) A statement of policies on the preservation of rare and irreplaceable natural areas, scenic and historic features and resources;
- (6) An educational facilities plan consisting of a map and statement of present and projected uses and the local public school system;
- (7) A recommended program for the implementation of the objectives of the development plan;

- (8) A statement indicating how the plan relates to development trends and plans for adjacent municipalities, areas and the region developed under this title;
 - (9) An energy plan, including an analysis of energy resources, needs, scarcities, costs and problems within the municipality, a statement of policy on the conservation of energy, including programs, such as thermal integrity standards for buildings, to implement that policy, a statement of policy on the development of renewable energy resources, a statement of policy on patterns and densities of land use likely to result in conservation of energy;
 - (10) A housing element that shall include a recommended program for addressing low and moderate income persons' housing needs as identified by the regional planning commission pursuant to section 4348a(a)(9) of this title. The program may include provisions for conditionally permitted accessory apartments within or attached to single family residences which provide affordable housing in close proximity to cost-effective care and supervision for relatives or disabled or elderly persons.
- (b) The maps called for by this section may be incorporated on one or more maps, and may be referred to in each separate statement called for by this section.
- (c) Where appropriate, and to further the purposes of section 4302(b) of this title, a municipal plan shall be based upon inventories, studies, and analyses of current trends and shall consider the probable social and economic consequences of the proposed plan. Such studies may consider or contain, but not be limited to:
- (1) population characteristics and distribution, including income and employment;
 - (2) the existing and projected housing needs by amount, type, and location for all economic groups within the municipality and the region;
 - (3) existing and estimated patterns and rates of growth in the various land use classifications, and desired patterns and rates of growth in terms of the community's ability to finance and provide public facilities and services.
- (d) Where appropriate, a municipal plan may provide for the use of "transit passes" or other evidence of reduced demand for parking spaces in lieu of parking spaces. (Added 1967, No. 334 (Adj. Sess.), § 1, eff. March 23, 1968; amended 1971, No. 257 (Adj. Sess.), § 7, eff. April 11, 1972; 1975, No. 236 (Adj. Sess.), § 2; 1979, No. 174 (Adj. Sess.), § 8; 1985, No. 188 (Adj. Sess.), § 10; 1987, No. 200 (Adj. Sess.), §§ 8, 10, eff. July 1, 1989; 1989, No. 280 (Adj. Sess.), § 7; 1991, No. 130 (Adj. Sess.), § 2; 1995, No. 122 (Adj. Sess.), § 2, eff. Apr. 25, 1996.)

A-3 "ECONOMIC AND DEMOGRAPHIC FORECAST, CENTRAL VERMONT PLANNING REGION, 2000 TO 2020" –POPULATION BY TOWN

FINAL3_2020G

POPULATION BY TOWN

Town	1900 Census	1910 Census	1920 Census	1930 Census	1940 Census	1950 Census	1960 Census	1970 Census	1980 Census	1990 Census	2000 Census	2005 EPR	2010 EPR	2015 EPR	2020 EPR
Washington County	42,860	47,659	52,393	54,928	58,039	59,671	63,408	63,506	63,408	63,408	63,408	63,408	63,408	63,408	63,408
Barre City	10,387	10,209	9,824	9,482	9,291	9,186	8,911	8,763	8,625	8,451	8,325	8,181	8,043	7,905	7,767
Barre Town	4,580	6,509	7,090	7,411	7,602	7,802	8,177	8,451	8,747	9,023	9,299	9,575	9,851	10,127	10,403
Berlin	1,306	2,050	2,454	2,561	2,884	3,010	3,164	3,325	3,515	3,681	3,847	4,013	4,179	4,345	4,511
Cabot	763	663	938	1,043	1,213	1,271	1,323	1,375	1,427	1,479	1,531	1,583	1,635	1,687	1,739
Calais	684	749	1,207	1,521	1,829	2,137	2,445	2,753	3,061	3,369	3,677	3,985	4,293	4,601	4,909
Duxbury	546	621	877	976	1,289	1,379	1,475	1,571	1,667	1,763	1,859	1,955	2,051	2,147	2,243
E. Montpelier	1,200	1,597	2,205	2,239	2,578	2,691	2,804	2,917	3,030	3,143	3,256	3,369	3,482	3,595	3,708
Fayston	158	282	657	845	1,141	1,252	1,363	1,474	1,585	1,696	1,807	1,918	2,029	2,140	2,251
Marsfield	891	1,033	1,237	1,331	1,496	1,531	1,619	1,703	1,787	1,871	1,955	2,039	2,123	2,207	2,291
Middlesex	770	857	1,235	1,514	1,729	1,874	2,026	2,230	2,460	2,690	2,920	3,150	3,380	3,610	3,840
Montpelier	8,782	8,609	8,241	8,247	8,035	7,982	7,899	7,832	7,780	7,728	7,676	7,624	7,572	7,520	7,468
Moretown	788	904	1,221	1,415	1,653	1,768	1,892	2,047	2,301	2,555	2,809	3,063	3,317	3,571	3,825
Northfield	4,511	4,870	5,435	5,610	5,791	5,899	6,012	6,162	6,311	6,460	6,609	6,758	6,907	7,056	7,205
Plainfield	966	1,399	1,249	1,302	1,286	1,292	1,295	1,300	1,306	1,311	1,316	1,321	1,326	1,331	1,336
Roxbury	364	354	452	375	576	606	636	666	696	726	756	786	816	846	876
Wardsboro	658	837	1,300	1,422	1,659	1,777	1,914	2,071	2,230	2,387	2,544	2,701	2,858	3,015	3,172
Warren	459	585	956	1,172	1,681	1,832	1,996	2,135	2,281	2,420	2,559	2,698	2,837	2,976	3,115
Waterbury	4,303	4,614	4,465	4,559	4,915	5,041	5,172	5,350	5,579	5,808	6,037	6,266	6,495	6,724	6,953
Woodbury	317	399	573	766	909	891	873	855	837	819	801	783	765	747	729
Worcester	417	505	727	906	902	951	999	1,049	1,098	1,148	1,197	1,247	1,296	1,346	1,395
County Total	42,860	47,659	52,393	54,928	58,039	59,671	63,408	63,506	63,408	63,408	63,408	63,408	63,408	63,408	63,408
Orange County Towns	430	540	752	915	965	1,030	1,101	1,181	1,276	1,361	1,446	1,531	1,616	1,701	1,786
Orange	430	540	752	915	965	1,030	1,101	1,181	1,276	1,361	1,446	1,531	1,616	1,701	1,786
Washington	565	667	855	937	1,047	1,095	1,156	1,226	1,311	1,396	1,481	1,566	1,651	1,736	1,821
Williamstown	1,553	1,822	2,284	2,839	3,225	3,393	3,631	3,901	4,224	4,547	4,870	5,193	5,516	5,839	6,162
Subtotal:	2,548	3,029	3,891	4,691	5,237	5,518	5,885	6,308	6,811	7,314	7,817	8,320	8,823	9,326	9,829
CV REGION	45,408	50,688	56,284	59,619	63,276	65,189	69,293	73,014	76,225	79,436	82,647	85,858	89,069	92,280	95,491

As modified by Scurie & Policy Resources, Inc. November 2002

A-4 "ECONOMIC AND DEMOGRAPHIC FORECAST, CENTRAL VERMONT PLANNING REGION, 2000 TO 2020" –HOUSING UNITS BY TOWN

FINAL3_202003

HOUSING UNITS BY TOWN									
Washington County	'60	'70	'80	'90	'00	2005	2010	2015	2020
Town	Census	Census	Census	Census	Census	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC
Barre City	3,523	4,003	4,048	4,220	4,242	4,267	4,350	4,462	
Barre Town	1,788	2,256	2,632	2,951	3,026	3,216	3,525	3,907	
Bedford	642	858	938	1,109	1,221	1,360	1,485	1,601	
Cabot	195	323	365	452	489	532	555	612	
Calais	213	422	547	616	656	756	844	962	
Duxbury	176	308	363	498	552	634	724	830	
E. Montpelier	455	698	827	1,007	1,081	1,175	1,262	1,468	
Favston	88	252	327	484	532	587	676	810	
Marshall	307	411	450	575	619	674	720	792	
Midsex	200	417	547	663	739	807	891	1,042	
Montpelier	2,841	3,254	3,546	3,739	3,757	3,904	3,979	4,153	
Moretown	294	458	540	650	710	796	894	1,023	
Northfield	1,164	1,497	1,682	1,819	1,858	2,005	2,095	2,282	
Palmyra	295	421	450	487	501	521	530	558	
Hoxbury	109	162	207	227	240	255	280	316	
Waitsfield	264	321	374	452	482	514	558	616	
Warren	178	374	512	742	827	914	983	1,045	
Waterbury	1,099	1,504	1,754	2,011	2,120	2,258	2,406	2,675	
Woodbury	180	221	275	329	366	399	456	519	
Worcester	145	250	324	346	381	407	431	484	
County Total:	14,146	18,613	20,948	23,659	24,724	26,348	28,044	30,668	
Orange County Towns									
Orange	139	241	312	362	393	430	470	523	
Washington	176	267	329	406	430	467	505	556	
Williamstown	499	761	1,036	1,248	1,332	1,463	1,603	1,787	
Subtotal:	814	1,259	1,677	2,016	2,155	2,360	2,578	2,866	
CV REGION	14,960	19,872	22,625	25,675	26,879	28,708	30,622	33,534	

As modified November 2002 by Economic & Policy Resources, Inc.

A-5 "ECONOMIC AND DEMOGRAPHIC FORECAST, CENTRAL VERMONT PLANNING REGION, 2000 TO 2020" —HOUSEHOLD SIZE BY TOWN

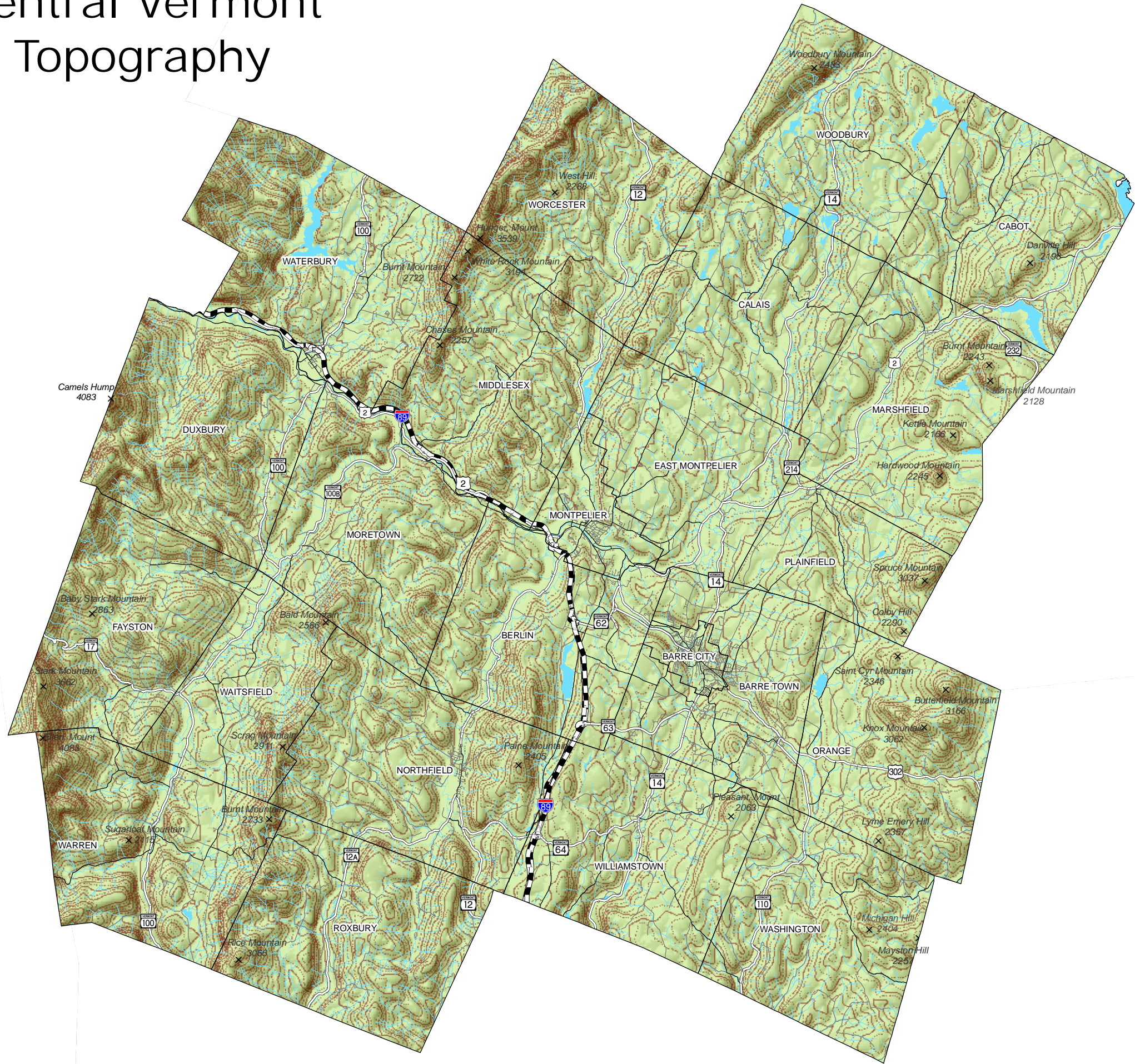
FINAL3_2020G

Household Size by Town																
Washington County Town	'60		'70		'80		'90		2005		2010		2015		2020	
	Census		Census		Census		Census		EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC	EPR-CVRPC
Barre City	2.90		2.45		2.34		2.20		2.17		2.09		2.01		1.93	
Barre Town	3.64		3.14		2.82		2.58		2.58		2.54		2.40		2.24	
Berlin	3.19		2.86		2.73		2.58		2.47		2.33		2.24		2.20	
Cabot	3.40		2.97		2.86		2.68		2.60		2.49		2.27		2.37	
Celais	3.52		2.86		2.78		2.48		2.46		2.29		2.22		2.13	
Luxbury	3.53		2.85		2.69		2.59		2.50		2.33		2.24		2.19	
E. Montpelier	3.51		3.16		2.71		2.56		2.49		2.41		2.37		2.15	
Fayston	3.32		2.61		2.59		2.36		2.35		2.34		2.27		2.18	
Marshfield	3.36		3.06		2.77		2.60		2.51		2.40		2.37		2.30	
Middlesex	3.57		2.96		2.77		2.61		2.54		2.51		2.50		2.36	
Montpelier	3.03		2.53		2.33		2.15		2.12		2.02		1.97		1.87	
Moretown	3.07		2.67		2.62		2.54		2.49		2.38		2.29		2.25	
Northfield	4.18		3.63		3.34		3.18		3.17		3.00		2.94		2.77	
Plainfield	4.74		2.97		2.83		2.64		2.58		2.49		2.45		2.34	
Roxbury	3.25		2.79		2.78		2.54		2.53		2.49		2.39		2.23	
Waitsfield	3.17		2.50		2.48		2.25		2.20		2.17		2.16		2.15	
Warren	3.30		2.56		2.29		2.27		2.21		2.18		2.17		2.15	
Waterbury	4.20		2.97		2.62		2.44		2.38		2.29		2.22		2.09	
Woodbury	3.07		2.59		2.79		2.46		2.43		2.40		2.27		2.12	
Worcester	3.48		2.91		2.80		2.61		2.50		2.45		2.43		2.29	
County:	3.37		2.81		2.62		2.45		2.41		2.33		2.26		2.16	
Orange County Towns																
Orange	3.88		3.12		2.93		2.67		2.62		2.56		2.51		2.47	
Washington	3.79		3.20		2.85		2.58		2.55		2.48		2.43		2.36	
Williamstown	3.65		3.04		2.77		2.58		2.55		2.48		2.43		2.36	
Subtotal:	3.72		3.09		2.80		2.60		2.56		2.50		2.45		2.38	
CV REGION	3.39		2.83		2.64		2.46		2.43		2.34		2.28		2.18	
2.34 in 2010																

2.34 in 2010

As modified by Economic & Policy Resources, Inc November 2002

Central Vermont Topography



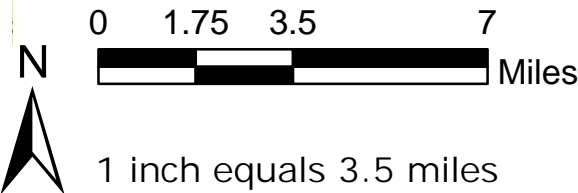
Legend

Roads:

- Class 1 Town Highway
- Class 2 Town Highway
- Class 3 Town Highway
- State Highway; US Highway
- Interstate
- Stream/River
- Surface Water
- Summits

Contours (100 ft. intervals)

- 500 - 3900 feet (odd values)
- 600 - 4000 feet; < 500 feet (even values)

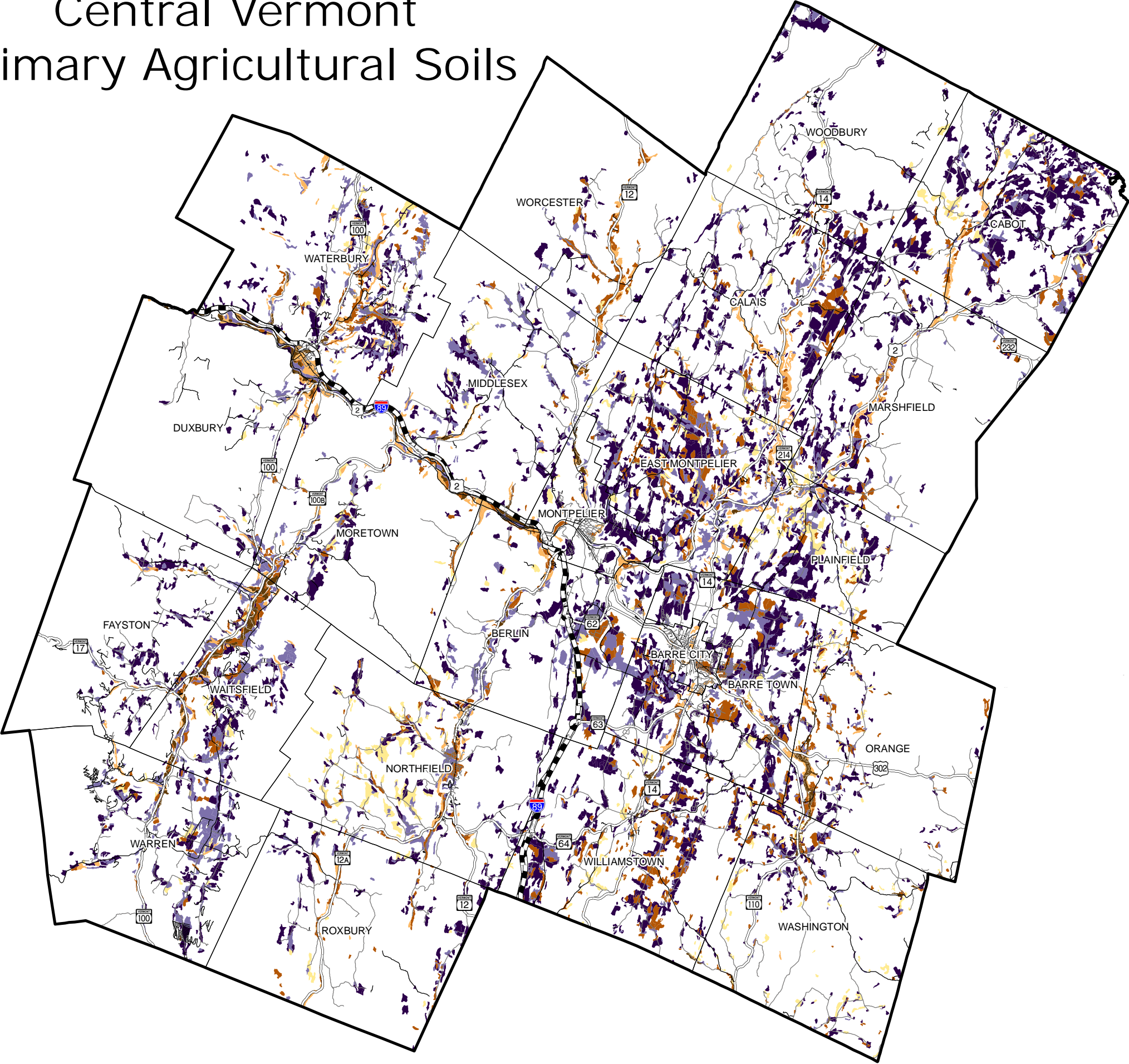


Data Source:
Roads - VTrans, VGIS 2007
Surface Waters - VT Hydrologic Data, VCGI 2007
Regional Boundaries - VCGI 2006
Topologic - USGS 1999

Created 12/19/07 by CVRPC
M:/Region/RegionalPlan_Update2008/GIS/
Maps/Topography_HillShade.mxd

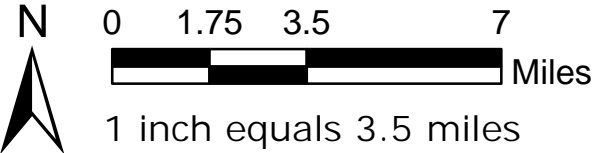
Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Primary Agricultural Soils



Legend

Agricultural Value

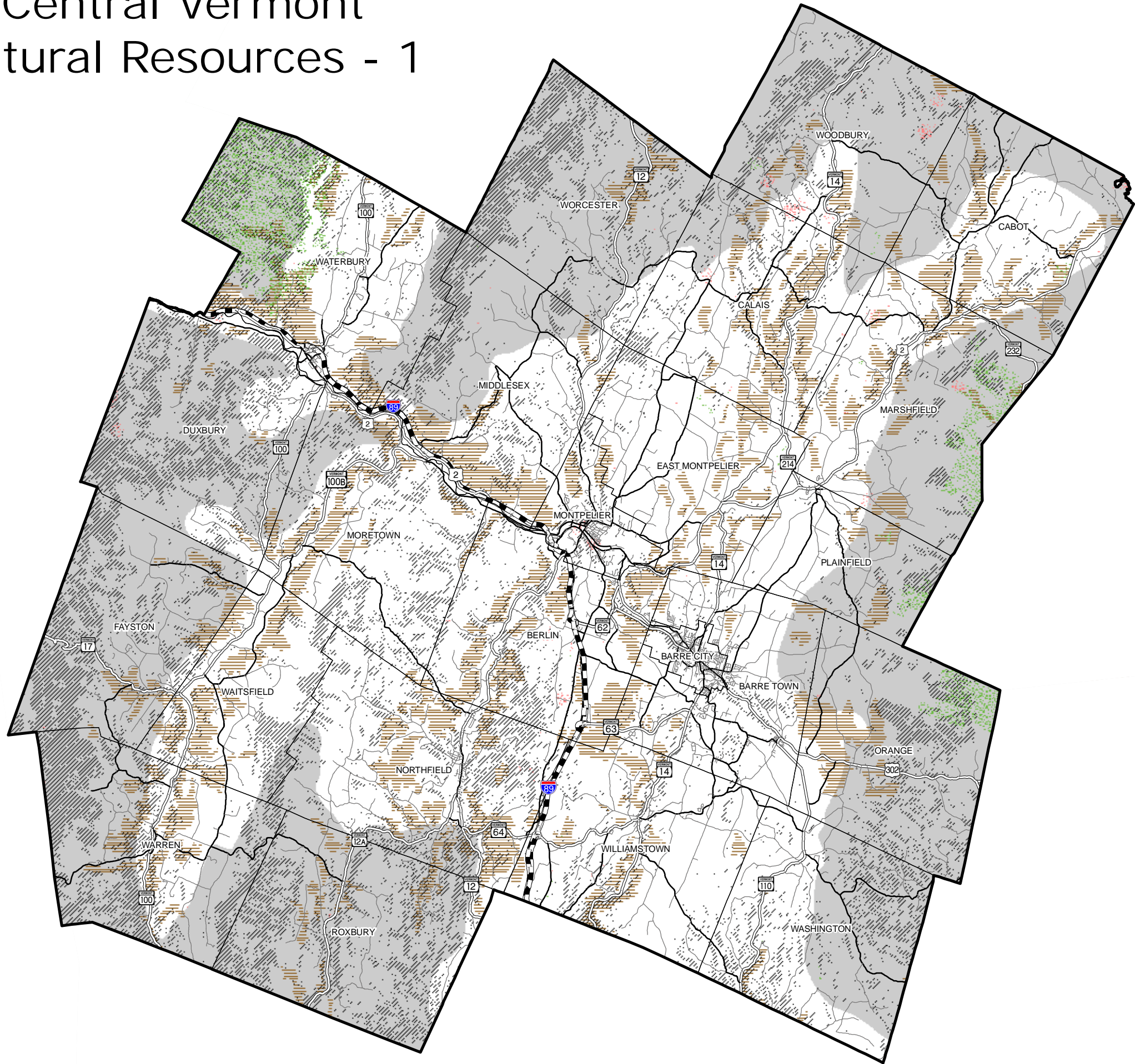


Data Source:
Soils - ANR 2004
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 12/27/07 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Agricultural Soils.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Natural Resources - 1



Legend

Natural Communities

Endangered Species

Deer Wintering Habitat

Bear Reproduction Zones

25% Slope or Greater

Roads:

Class 1 Town Highway

Class 2 Town Highway

Class 3 Town Highway

State Highway; US Highway

Interstate



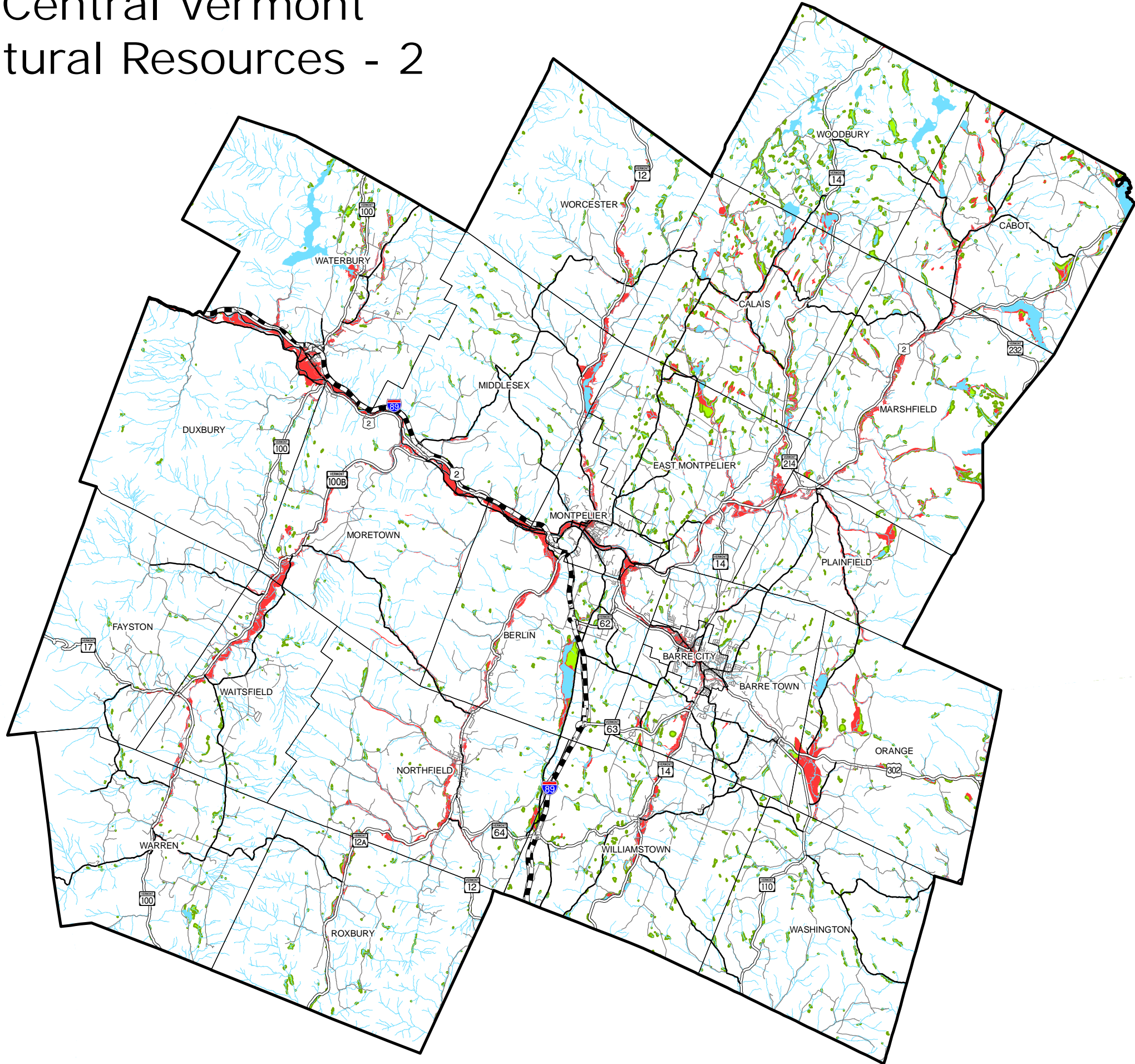
Data Source:
Deer Yards - ANR
Bear Habitat - ANR
Slopes - ANR
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 12/27/07 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Natural Resources 1.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont

Natural Resources - 2



Legend

Fema Floodplain

Wetlands

Streams/Rivers

Surface Water

Roads:

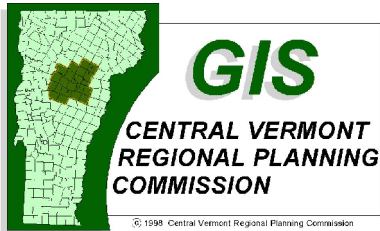
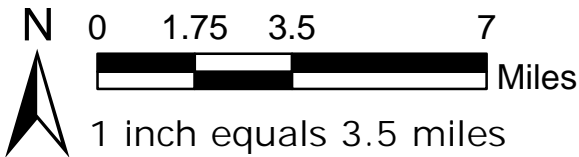
Class 1 Town Highway

Class 2 Town Highway

Class 3 Town Highway

State Highway; US Highway

Interstate

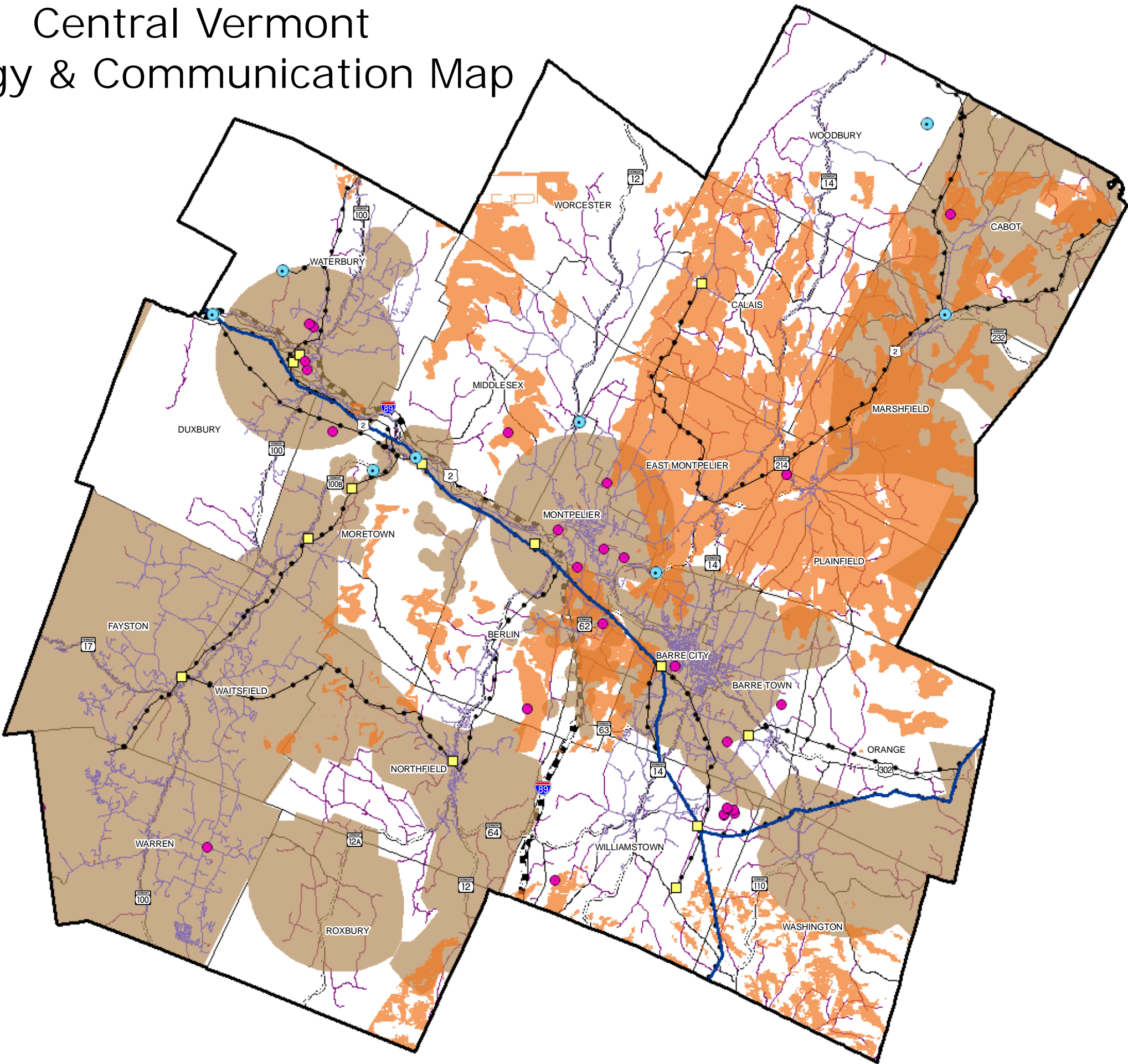


Data Source:
Wetlands - ANR
FEMA Floodplain - FEMA
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 3/10/08 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Natural Resources 2.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Energy & Communication Map



Legend

Energy Generation

Substations

Hydro Plants

Communications

Cell, Radio, and TV Towers

Cable TV Lines

Cable Modem Lines

Wireless Service Area

DSL Service Area

Both Service Areas

VELCO Transmission Lines

Electrical Distribution Lines

Roads:

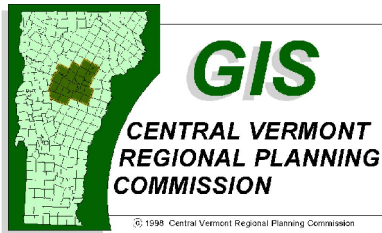
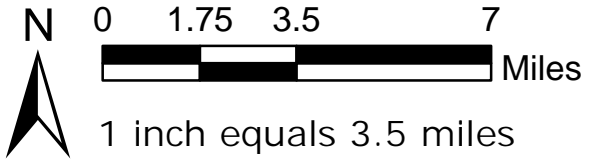
Class 1 Town Highway

Class 2 Town Highway

Class 3 Town Highway

State Highway; US Highway

Interstate

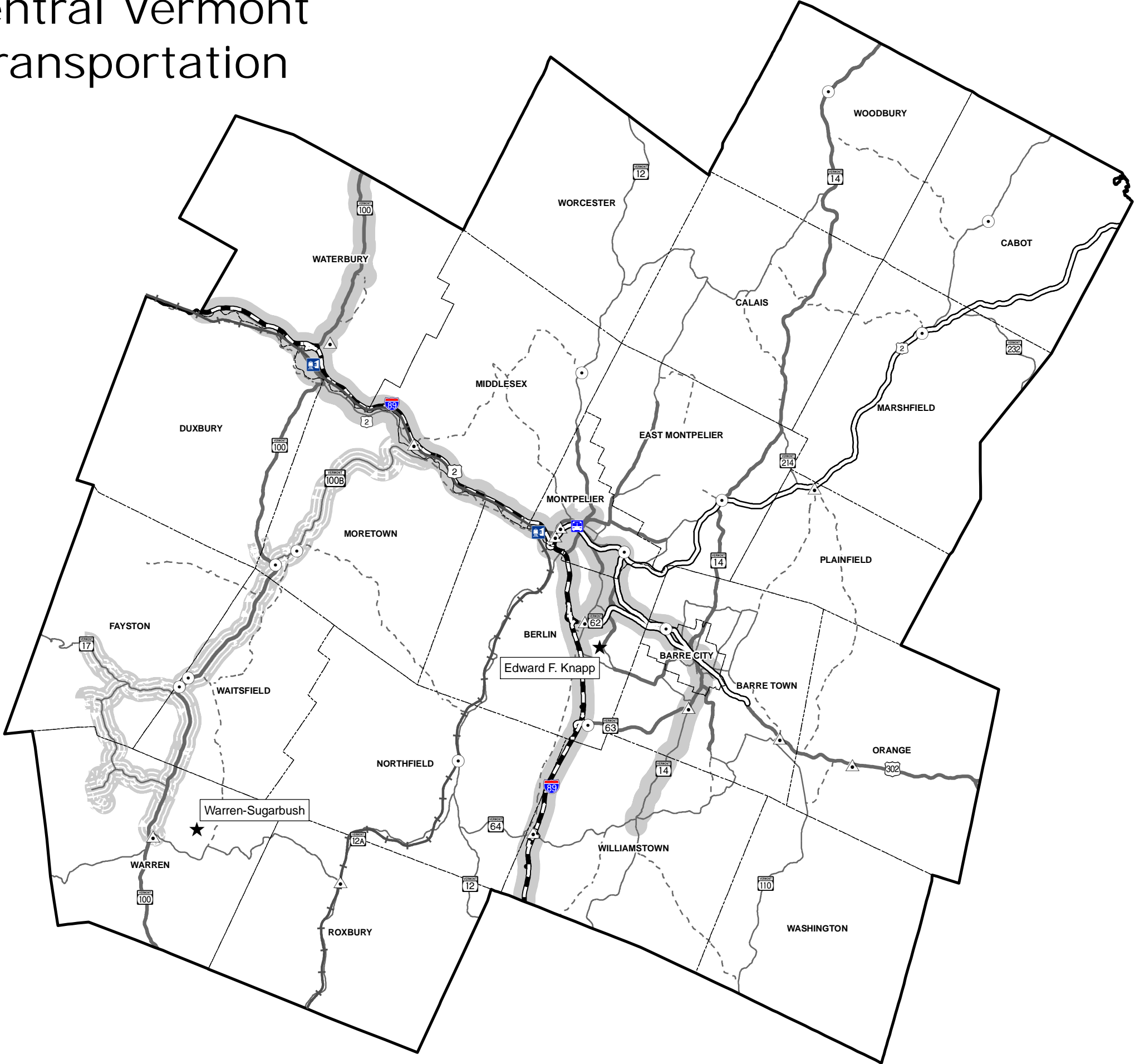


Data Source:
Telecommunication: Data obtained from
VCGI, ANR, and CVRPC
Roads - VTrans, VGIS 2007
Tourism Trails: ANR, 2007
Regional Boundaries - VCGI 2006

Created 2/25/08 by CVRPC
M:/Region/RegionalPlan_Update2008/GIS/
Maps/Energy & Communications.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Transportation



Legend

Functional Class

Interstate/Expressway

Principal Arterial

Minor Arterial

Major Collector

Minor Collector

Airports

Bus Service Areas

Year Round

Seasonal

Vermont Transit Stop

Park and Ride Lots

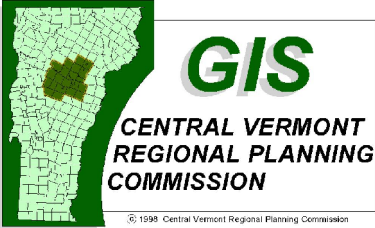
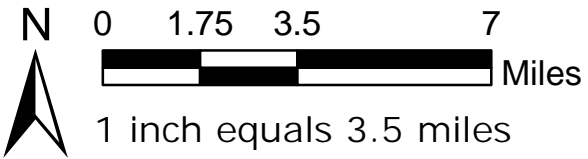
Existing Lots

Future Lots

Amtrak Route

Central Vermont

Amtrak Stops

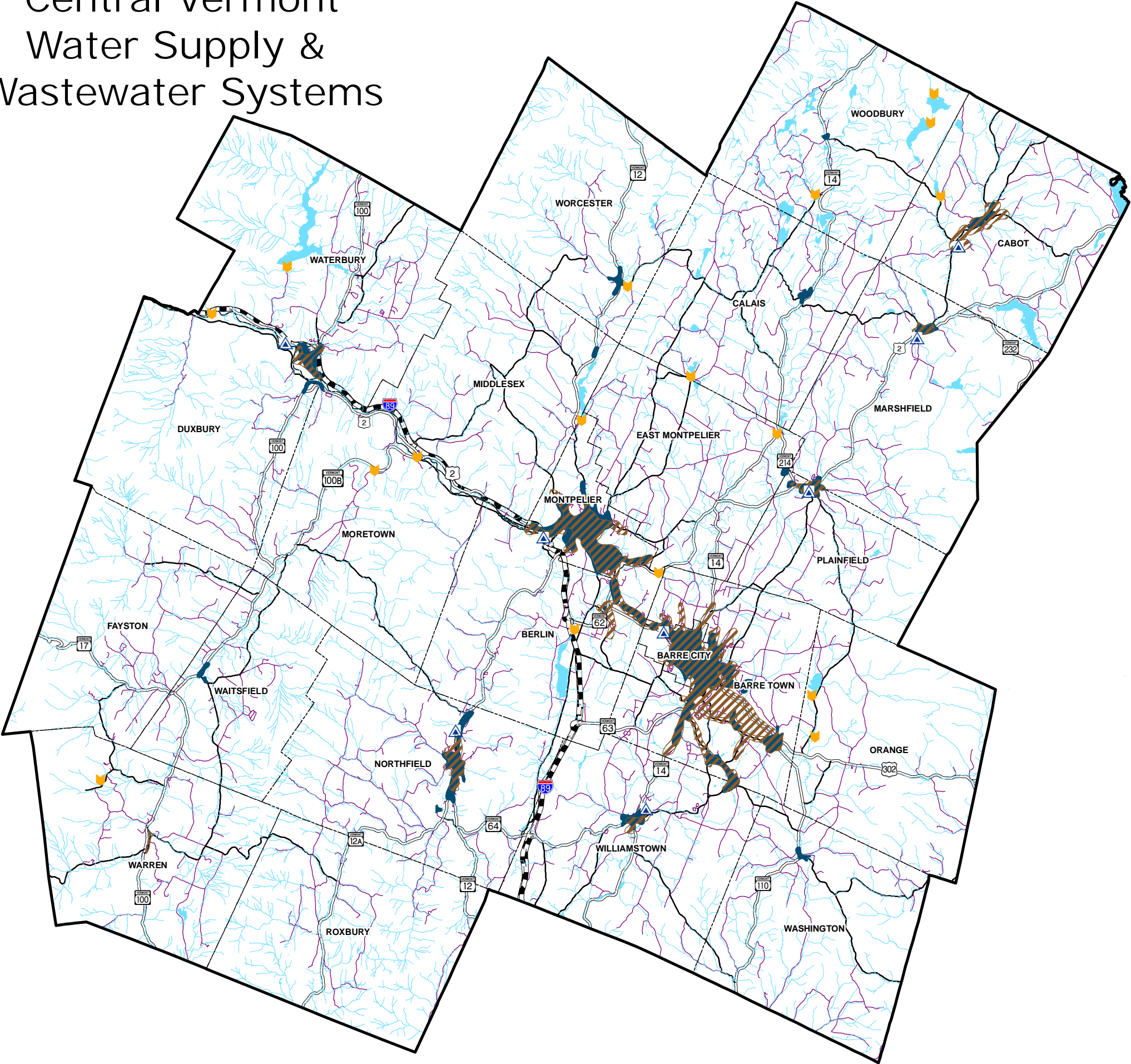


Data Source:
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 3/10/08 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Transportation.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Water Supply & Wastewater Systems



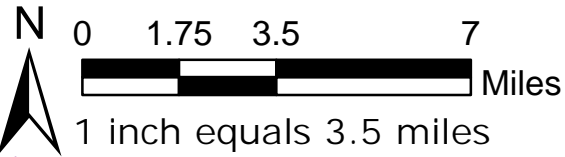
Legend

Facilities
Public Wastewater Treatment Plants

Sewer & Water Service Areas
Public Wastewater
Public Water Supply

Dams
In Service (Water Storage, Supply, & Flood Control)

Roads
Class 1 Town Highway
Class 2 Town Highway
Class 3 Town Highway
State Highway; US Highway
Interstate
Surface Water
StreamRiver

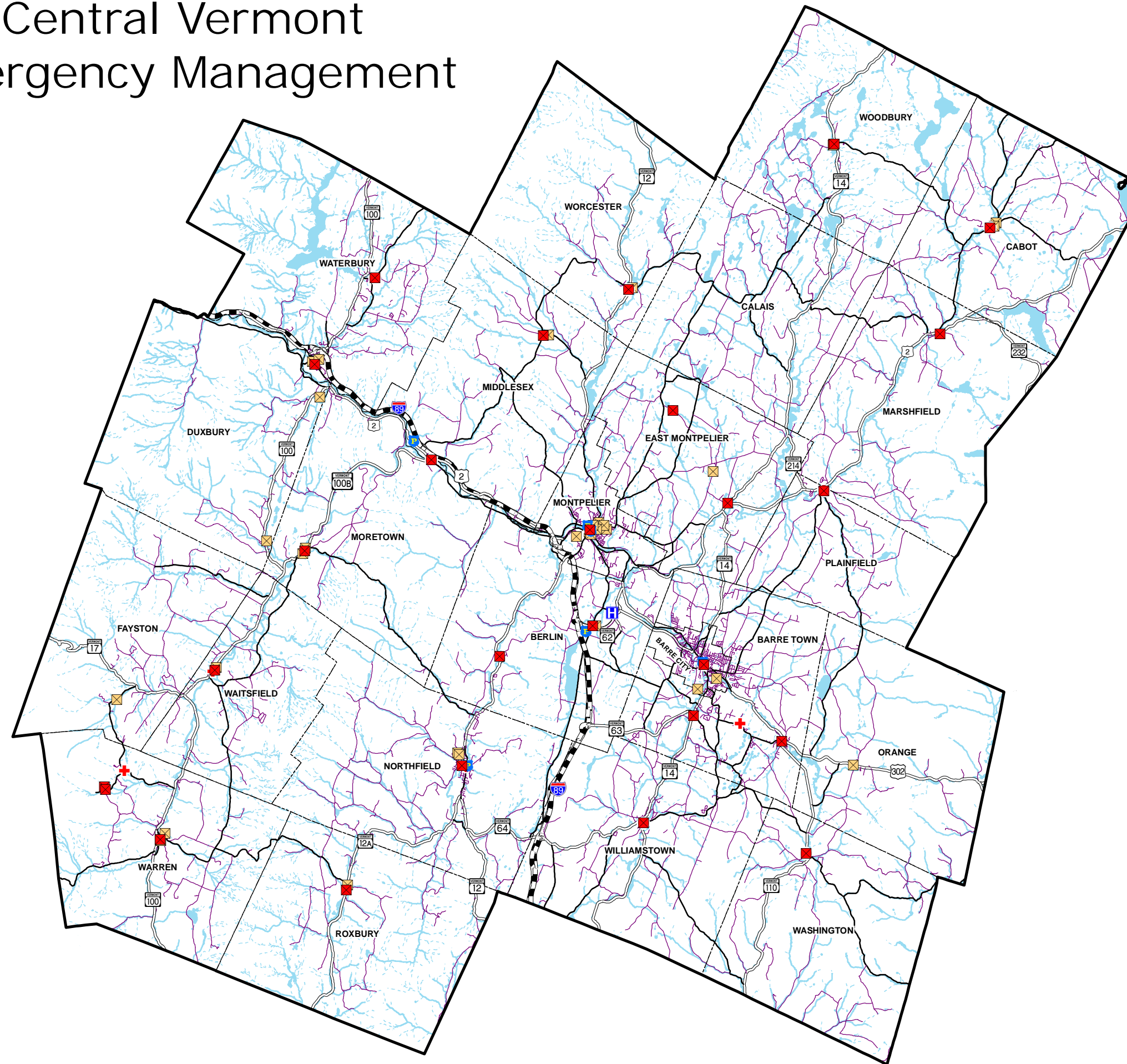


Data Source:
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 3/10/08 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Wastewater_Systems.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Emergency Management



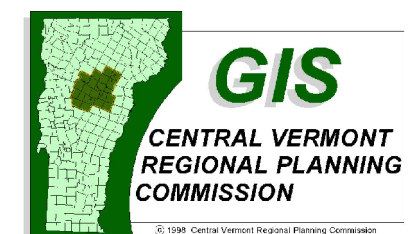
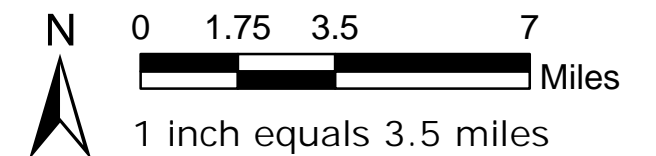
Legend

Emergency Operation Facilities

- Fire Station
- Police
- H Hospital
- + EMT Station Locations
- Emergency Shelters

Roads:

- Class 1 Town Highway
- Class 2 Town Highway
- Class 3 Town Highway
- State Highway; US Highway
- - - Interstate

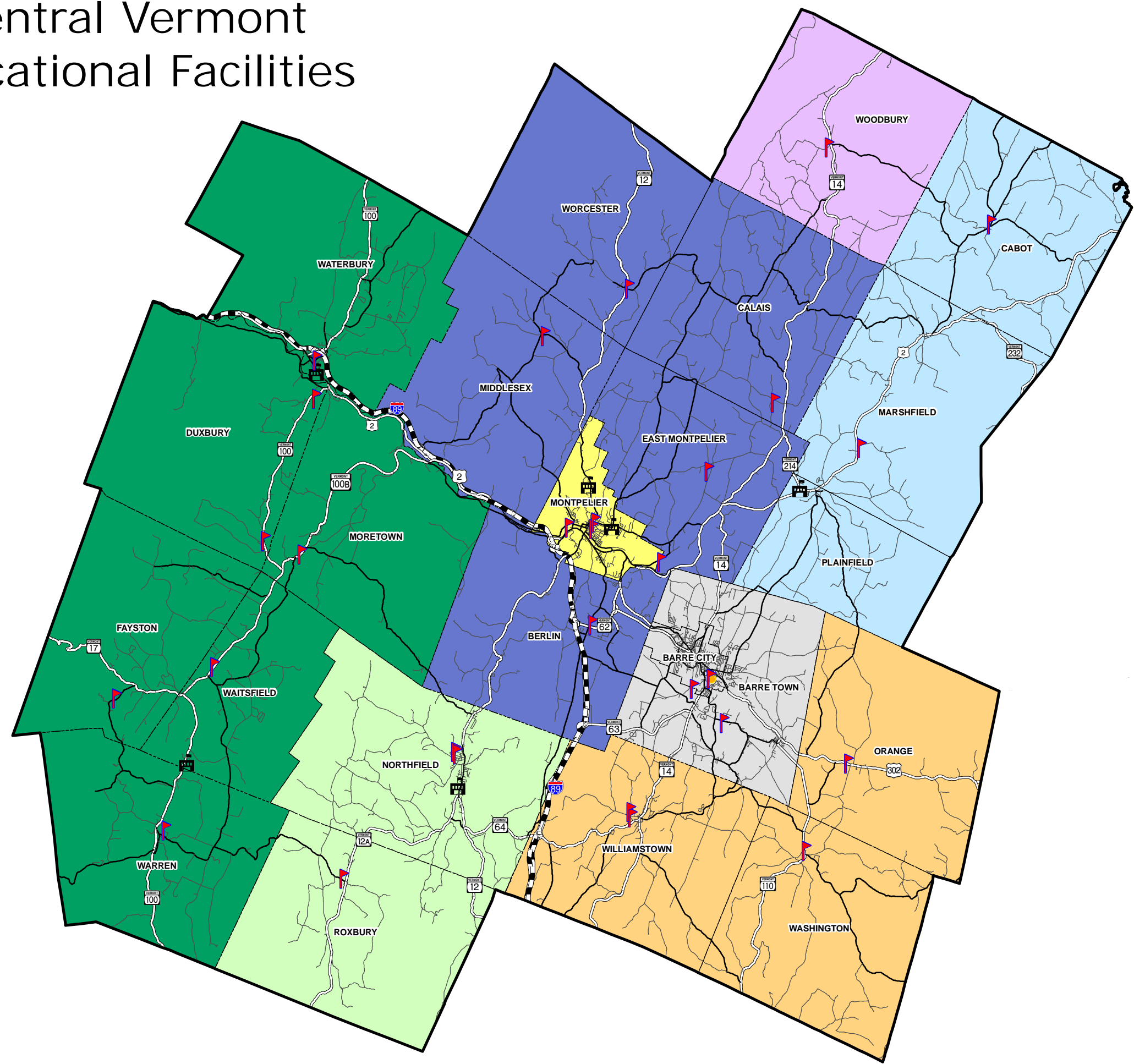


Data Source:
Emergency Operations Facilities - CVRPC, 2007
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 2/29/08 by CVRPC
M:/Region/RegionalPlan_Update2008/GIS/
Maps/Emergency_Management.mxd

Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

Central Vermont Educational Facilities



Legend

School Districts

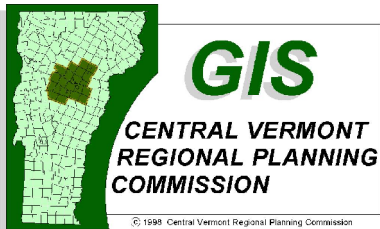
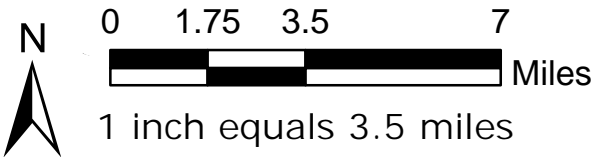
- Barre Town/City
- Montpelier School District
- Orange North
- Orleans Southwest
- Washington Central
- Washington Northeast
- Washington South
- Washington West

Public Schools

- Elementary, Middle, High School
- College / Post Secondary School
- Vocational School

Roads:

- Class 1 Town Highway
- Class 2 Town Highway
- Class 3 Town Highway
- State Highway; US Highway
- Interstate

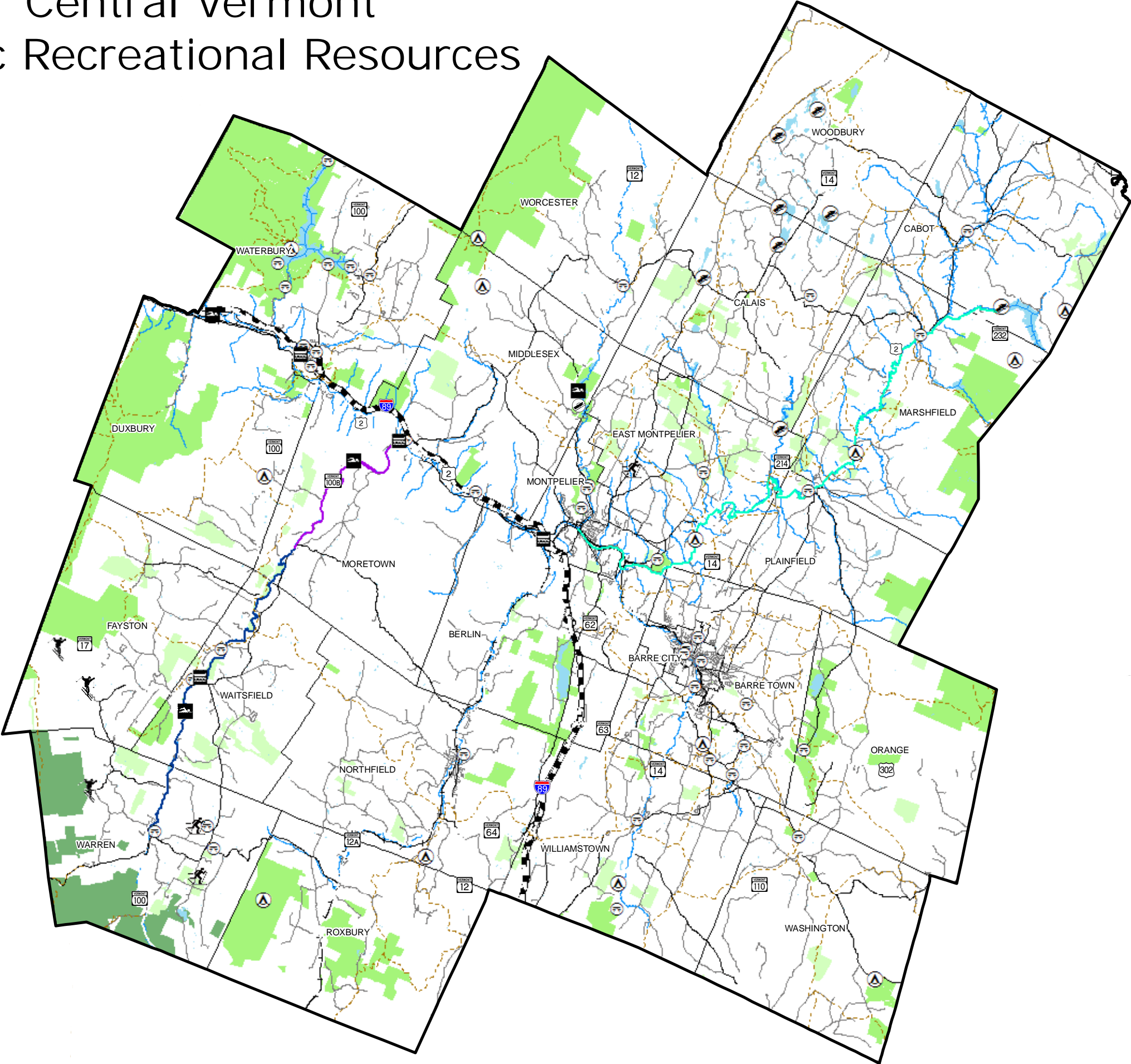


Data Source:
School Districts & Facilities - VCGI, 2007
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 12/27/07 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/Educational_Facilities.mxd

Data is only as accurate as the original
source materials. This map is for planning
purposes. This map may contain errors
and omissions.

Central Vermont Public Recreational Resources



Legend

Conserved Lands

- Green Mountain National Forest
- State and Municipal Public Lands
- Private Conserved Lands

Recreational Sites

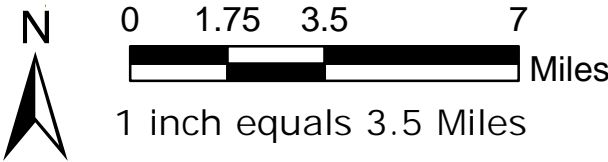
- Alpine Skiing
- Nordic Skiing
- Boat & Fishing Access (Lakes, Ponds, & Marshes)
- Swimming Areas
- Canoe Access
- Public Campgrounds
- Public Recreational Fields & Parks
- Trails (VAST, Long Trail, Catamount Trail, etc.)

Recreational River Uses

- Expert Kayaks & Open Boats
- Mixed / Whitewater Rapids
- Open Boats

Roads:

- Class 1 Town Highway
- Class 2 Town Highway
- Class 3 Town Highway
- State Highway; US Highway
- Interstate

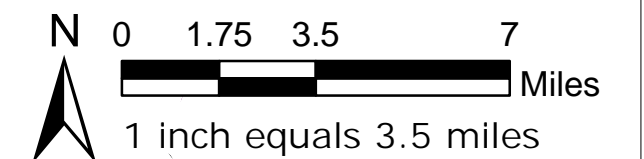
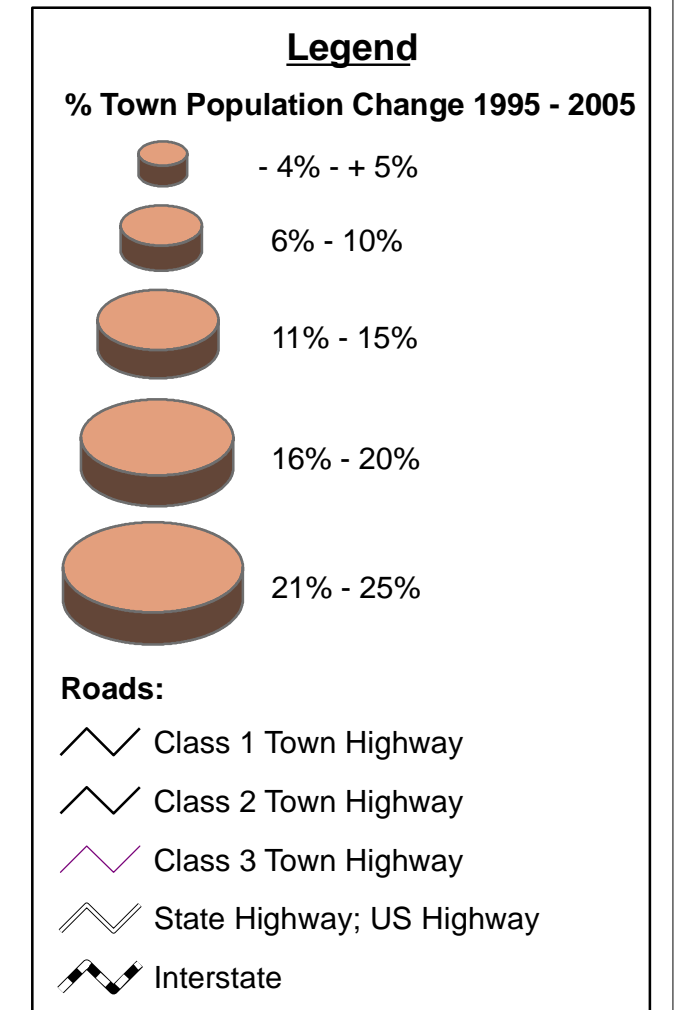
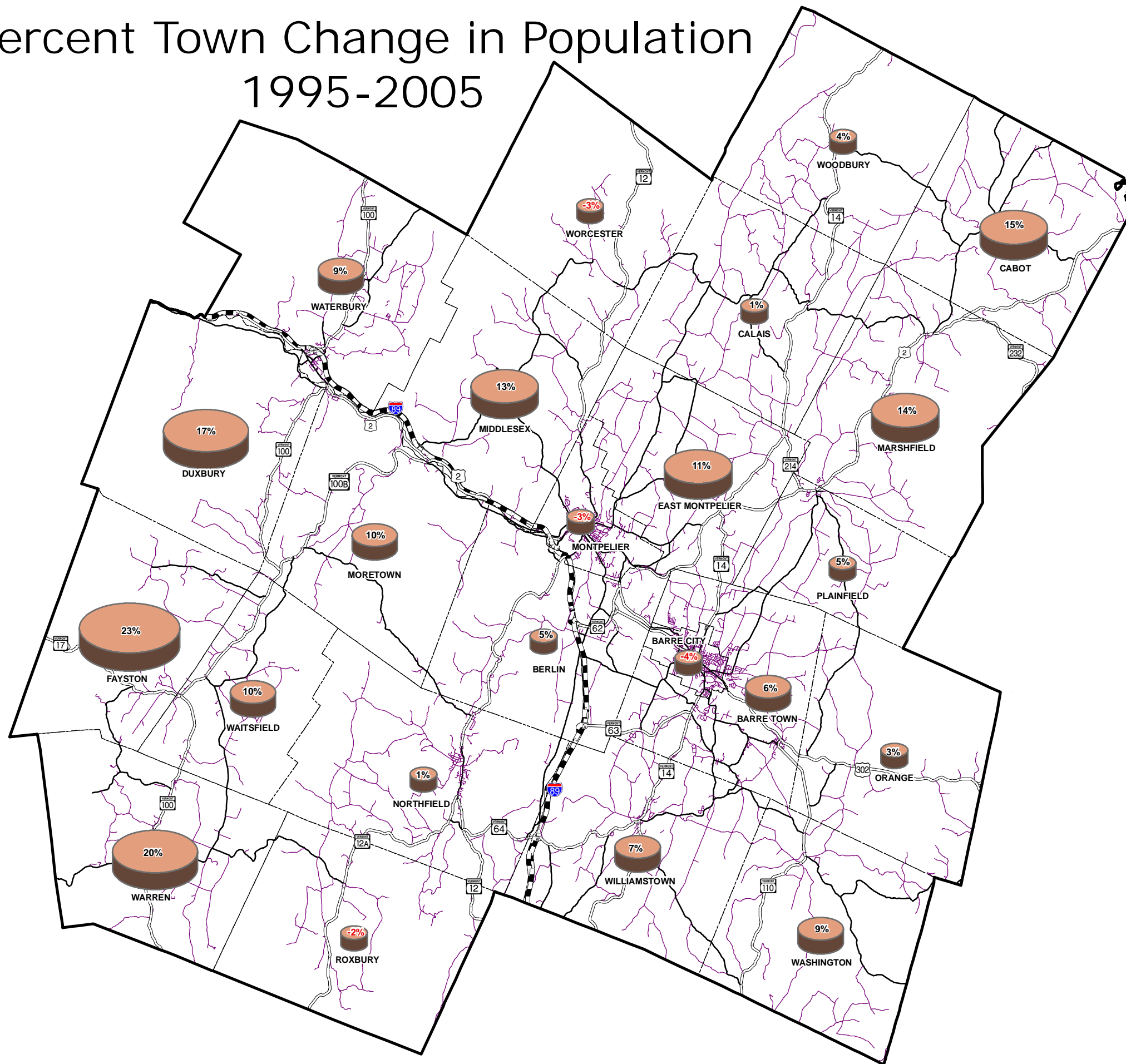


Data Source:
Conserved Lands: UVM, 2005
Recreational Sites: VCGI, 2007
Recreational River Reaches: ANR, 2007
Roads - VTrans, VGIS 2007
Tourism Trails: ANR, 2007
Created 2/25/08 by CVRPC
M:/Region/RegionalPlan_Update2008/GIS/
Maps/Public Recreational Resources.mxd

Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

Central Vermont

Percent Town Change in Population 1995-2005

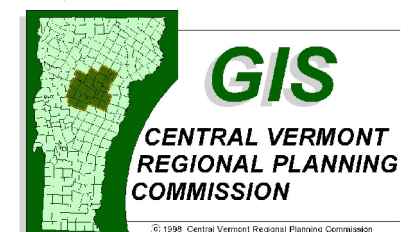
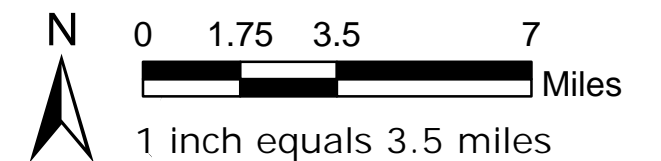
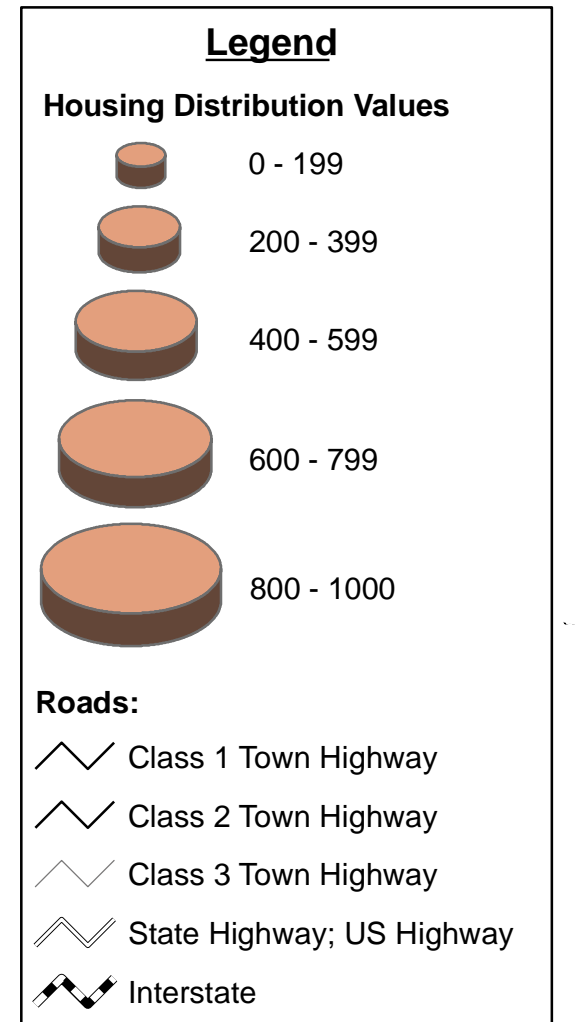
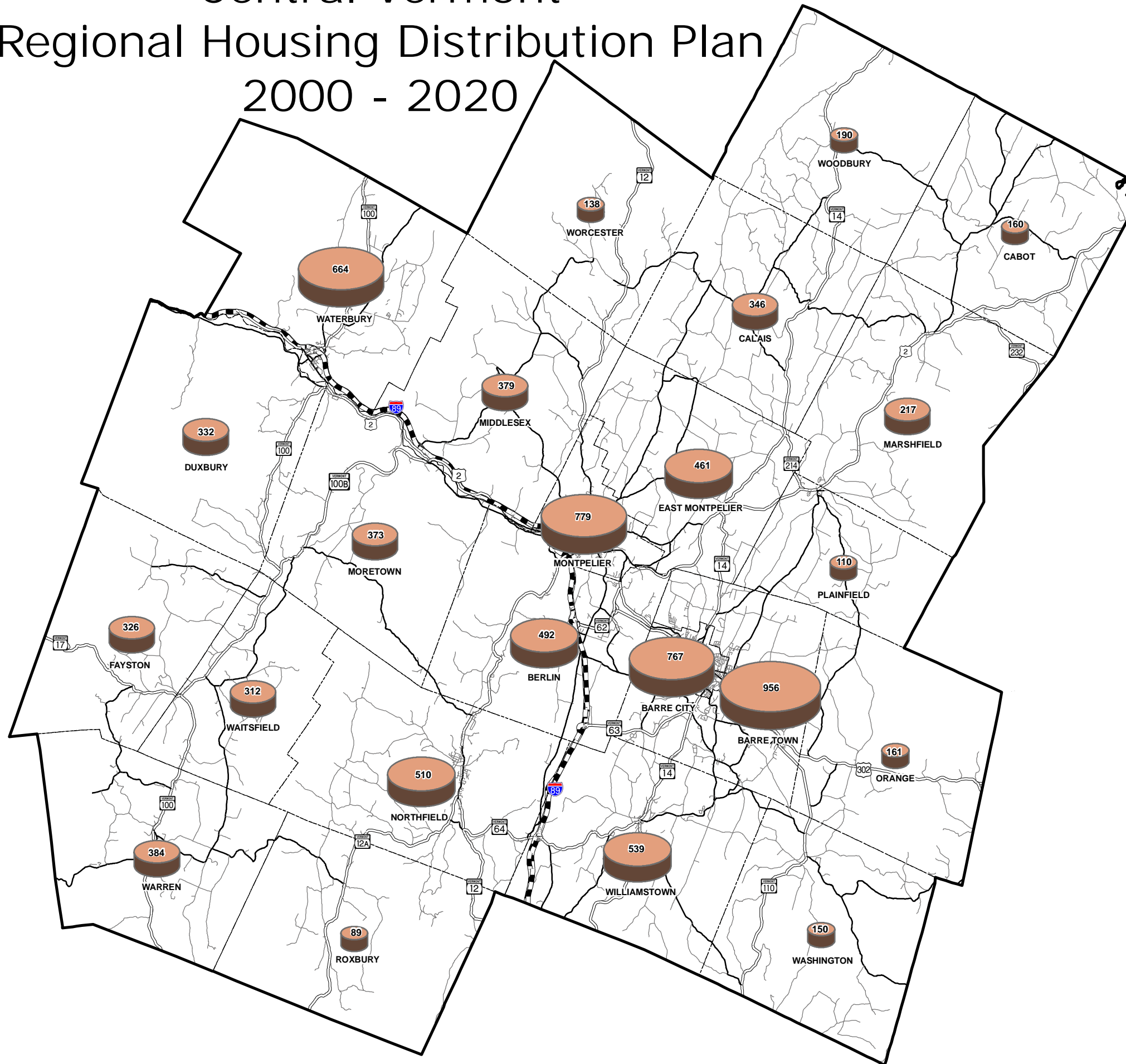


Data Source:
Population : Percent change was calculated use the Vermont Department of Health 1995 and 2005 population values.
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 12/27/07 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/Maps/Population_changes.mxd

Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

Central Vermont Regional Housing Distribution Plan 2000 - 2020



Data Source:
Housing Need : Housing need values are derived from Regional Housing Distribution Plan 2000-2020 totals.
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 3/10/08 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/Maps/Housing_needs.mxd

Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

Central Vermont Zoning by Town

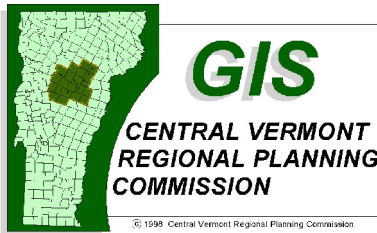
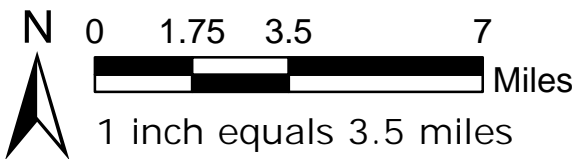
Legend

Residential Zoning by Density

- White No Development
- No Minimum Lot Size
- 0 - 0.49 Acres
- 0.5 - 0.99 Acres
- 1 - 2.99 Acres
- 3 - 4.99 Acres
- 5 - 9.99 Acres
- 10 and Greater Acres

Commercial Zoning by Density

- White No Development
- No Minimum Lot Size
- 0 - 0.49 Acres
- 0.5 - 0.99 Acres
- 1 - 2.99 Acres
- 3 - 4.99 Acres
- 5 - 9.99 Acres
- 10 and Greater Acres
- No Zoning



Data Source:
Zoning: Data obtained from Towns
and CVRPC
Roads - VTrans, VGIS 2007
Regional Boundaries - VCGI 2006

Created 3/11/08 by CVRPC
M:/Region/RegionalPlan_Update200/GIS/
Maps/CVRegion_Zoning.mxd

Data is only as accurate as the original source
materials. This map is for planning purposes.
This map may contain errors and omissions.

