Land Use Element

2

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

[1]Vermont. 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

Canoeing on Wrightsville Reservoir, Middlesex, Vermont.

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.

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 floodwater 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 munipalities 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 occuring 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:

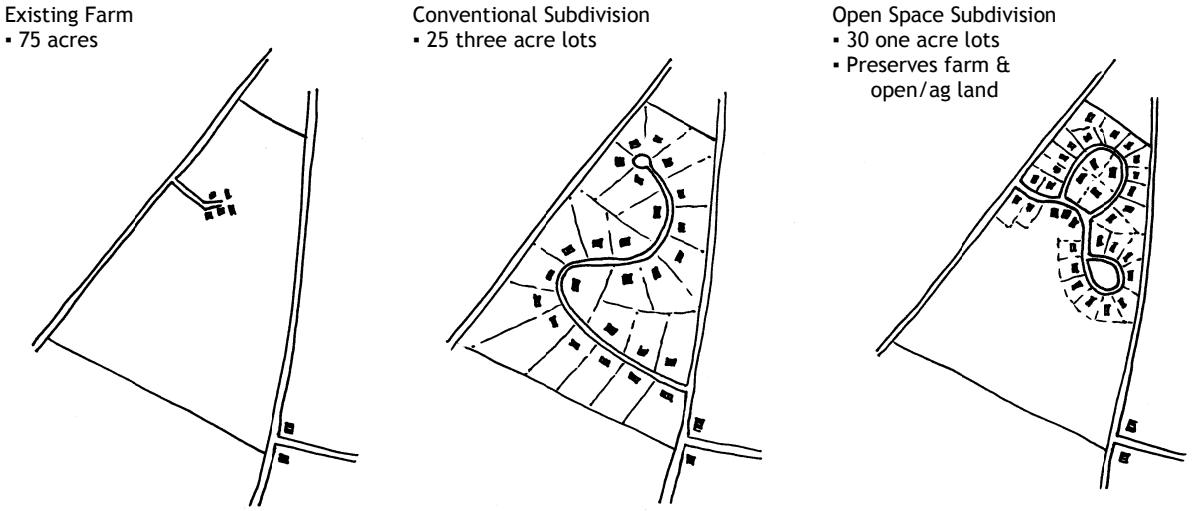
- Eligibility for Tax Increment Financing (TIF) (This allows municipalities to borrow against future tax revenues of properties benefiting from public improvements, thereby facilitating infrastructure development.)
- Relaxation of Act 250 standards including: higher jurisdictional thresholds for affordable 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



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 bylaws 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 has 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 brownfield 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 brownfield 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

Polices:

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 outcompete 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.