Central Vermont Regional Planning Commission

MEMORANDUM

TO: Board of Commissioners

FROM: Eric Vorwald, AICP
Senior Planner

RE: **DRAFT 2016 Central Vermont Regional Plan Energy Element**

DATE: December 12, 2017

The Board of Commissioners should receive the draft update to the 2016 Central Vermont Regional Plan and be prepared to discuss the draft at the regular meeting on December 12, 2017.

The purpose of this memo is to provide the Board of Commissioners with an overview of the draft energy element and its relationship to the **Central Vermont Regional Energy Plan** and the **2016 Central Vermont Regional Plan**.

Since late 2016, the CVRPC has been working on a Regional Energy Plan that will meet the standards as outlined in Act 174 of 2016. A draft of the plan was presented to the Commission and forwarded to the Department of Public Service in June of 2017. The draft regional energy plan needs to be incorporated into the regional plan in order for it to have standing before the Public Utility Commission.

In order to incorporate the **Central Vermont Regional Energy Plan** in to the **2016 Central Vermont Regional Plan**, the energy element of the **2016 Central Vermont Regional Plan** will need to be updated. As such, a draft update to the energy element has been prepared for consideration.

The Plan Review Committee discussed the draft on November 2, 2017 and recommended several changes to be made. While there was not a quorum of the committee present, the members that were present indicated support of the draft and suggested that it be forwarded to the Commission for their consideration after the discussed changes were incorporated.

This update will serve as a short-term solution to incorporate the requirements of Act 174 into the **2016 Central Vermont Regional Plan**. It is anticipated that when Plan Central Vermont is finalized, the requirements of Act 174, including the **Central Vermont Regional Energy Plan** will be woven throughout the plan to better integrate energy planning in all aspects of the regional plan.

Energy Element

OVERVIEW & STATUTORY REQUIREMENTS

Title 24, Chapter 117, section §4348a(a)(3) of Vermont Statutes outlines the information needed to be included in the energy element of a region's plan. Specifically it states:

"An energy element, which may include an analysis of resources, needs, scarcities, costs, and problems within the region across all energy sectors, including electric, thermal, and transportation; a statement of policy on the conservation and efficient use of energy and the development and siting of renewable energy resources; a statement of policy on patterns and densities of land use likely to result in conservation of energy; and an identification of potential areas for the development and siting of renewable energy resources and areas that are unsuitable for siting those resources or particular categories or sizes of those resources."

During the 2016 legislative session, the State of Vermont passed Act 174 which is an act related to improving the siting of energy projects. Act 174 outlines a path whereby regions and municipalities could receive "substantial deference"[1] before the Public Utility Commission (formerly the Public Service Board) if certain considerations were incorporated into a regional or municipal development plan. The standards outlined in Act 174 align with the primary goal of State of Vermont's Comprehensive Energy Plan which is to have 90% of the state's energy needs being generated from renewable sources by 2050 (90 by 50).

RELATIONSHIP TO THE CENTRAL VERMONT REGIONAL ENERGY PLAN

The Energy Element of this plan consists of the information contained herein, as well as the complete Central Vermont Regional Energy Plan that is hereby adopted by reference and included as Appendix A-7. This energy element is intended to provide an overview and highlights from the Regional Energy Plan without duplicating that information. The Regional Energy Plan includes information on:

- Current energy use by thermal, electric, and transportation sectors
- Targets for reducing energy consumption by sector
- Targets for conversion to more fuel efficient technologies
- Implementation actions to address land use, transportation, and energy needs
- Resource maps to identify potential locations for renewable energy generation

[1] According to Act 174 of 2016, "substantial deference" means that a land conservation measure or specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy. The term shall not include consideration of whether the determination of energy compliance should or should not have been affirmative under 24 V.S.A. § 4352.

The Central Vermont Regional Energy Plan was developed by first examining the existing Central Vermont Regional Plan to identify existing information to satisfy the requirements of Act 174, but also to ensure consistency between the two documents. The Regional Energy Plan is intended to meet the standards outlined in Act 174, while also meeting the complete statutory requirements as noted above.

ACT 174 INFORMATION

In general, the requirements of Act 174 work in conjunction with the existing statutory information required to be included in a regional plan's energy element. Act 174 requires a more comprehensive analysis of existing conditions and requires the identification of targets for thermal, transportation, and electric sectors related to conversion or conservation of energy. Act 174 also identifies three distinct sections to identify this information including:

- Analysis & Targets
- Pathways & Implementation Actions
- Mapping

The Analysis & Targets section provides a baseline of information for where a region or municipality currently stands in terms of energy use and identifies the trajectories and pace of change needed to meet targeted reductions and conservation of energy. It includes information on current electricity use for residential and non-residential uses; existing and potential renewable resource generation; and current transportation energy use information. Additionally, targets are established to provide milestones for thermal efficiency; renewable energy use; and conversion of thermal and transportation energy from fossil fuel based to renewable resources. These milestones are intended to help the region measure progress towards the overall goals and not identified as requirements. Targets are established for the years 2025, 2035, and 2050 which coincide with the State Comprehensive Energy Plan.

The Pathways & Implementation Actions section provides the basis for how the region will meet their target year goals as noted in the Analysis & Targets. The implementation actions are categorized by:

1. Conservation & efficient use of energy
2. Reducing transportation demand and single occupancy vehicles trips, and encouraging the use of renewable sources for transportation
3. Patterns and densities of land use likely to result in conservation of energy
4. The siting of renewable energy generation

The implementation actions identified in this section focus primarily in areas where the Central Vermont Regional Planning Commission is already working to support its member municipalities through local land use, transportation, and environmental planning activities.

Finally, the Mapping section allows the region to visually identify where renewable energy generation is most suitable. This section combines resource information with specific known and

possible constraints to the development of renewable energy generation. The mapping section also allows the opportunity to identify preferred locations for renewable energy development and areas that are unsuitable for development of any kind. In addition, the maps identify existing infrastructure to support renewable energy development.

In general, the mapping information looks at state-level data and breaks it down to a regional perspective. From there, an analysis was done (as noted in Section I) regarding the potential renewable energy generation that might be possible based on resource areas and constraints. This information is useful to visualize what geographies throughout Central Vermont are most ideally suited or best to avoid regarding renewable energy siting based on available resources or identified constraints. This is intended to be a starting point and not the only basis for siting.

This section also contains specific policy information regarding the development and siting of renewable energy resources that are reflected on the maps. It was determined that no specific locations would be identified at a regional level as being prohibited areas for the development of renewable energy generation. It was also determined that preferred locations identified at the regional level would be consistent with areas identified by the state including gravel pits, brownfield sites, or parking lots. This was done to allow the municipalities to decide if it was appropriate to identify these areas locally, rather than have this information dictated by the region.

The Regional Planning Commission did, however, identify additional possible constraints to be considered. These include elevations above 2,500 feet, slopes greater than 25%, municipally owned lands, and lakeshore protection buffer areas of 250 feet. The decision was made to include these resources as possible constraints to allow for further analysis by the region or the municipalities to determine if development of renewable energy generation facilities may be appropriate based on specific conditions.

In order to address the requirements of Act 174, the Vermont Department of Public Service provided a guidance document that identifies how a region can meet the requirements including model language to be considered. When possible, this guidance was used to ensure consistency with statute and its intent for energy planning.

REGIONAL ENERGY PLANNING

Beginning in 2016, the Central Vermont Regional Planning Commission began working on the development of a Regional Energy Plan that would meet or exceed the standards as identified in Act 174. To achieve this, the Board of Commissioners appointed a steering committee to help guide the process. The steering committee included representatives from various perspectives including the commission, state agencies, selectboards, planning commissions, local energy committees, utility providers, private energy developers, the business community, and transportation providers. This group provided the input and insight into the development of the regional energy plan, which also includes the specific information to address the standards of Act 174.

Multiple sources of information were used to establish the regional overview of energy consumption and targets for reduction. These sources include the U.S. Census Bureau, the Vermont Department of Public Service, the Energy Action Network, the Vermont Energy Investment Corporation, The Vermont Department of Labor, the Vermont Agency of Transportation, and other sources.

Tables 1 through 3 identify the current energy use related to transportation, thermal, and electricity for the Central Vermont Regional Planning Commission area.

Table 1. Current Regional Transportation Energy Use

Transportation Data	Regional Data
Total # of Light Duty Vehicles	45,584
Average Miles per Vehicle	287,500 (12,500/vehicle)
Total Miles Traveled	567,650,000
Average Gallons Used per Vehicle per Year	12,239 (576/vehicle)
Total Gallons Use per Year	30,518,817
Transportation BTUs (Billion)	3,396
Average Cost per Gallon of Gasoline	$2.31
Gasoline Cost per Year	$70,488,465

Source: 2011-2015 U.S. Census Bureau - American Community Survey; Vermont Agency of Transportation

Table 2. Current Regional Residential Heating Energy Use by Fuel Source

Fuel Source	Regional Households	Regional % of Households	Regional Square Footage Heated	Regional BTU (in Billions)
Natural Gas & Propane	5,983	22.2%	9,632,438	578
Electricity	1,206	4.5%	1,494,263	90
Fuel Oil	14,238	52.9%	24,431,228	1,466
Coal	66	0.2%	132,664	8
Wood	5,031	18.7%	9,493,439	570
Other (Includes renewable sources)	392	1.5%	696,536	42
No Fuel	22	0.1%	42,680	3
Total	**26,938**	**100%**	**45,923,248**	**2755**

Source: 2011-2015 U.S. Census Bureau - American Community Survey

Table 3. Current Regional Electricity Use

Use Sector	Current Regional Electricity Use
Residential	241,268 megawatt hours
Commercial and Industrial	353,117 megawatt hours
Total	594,385 megawatt hours

Source: Efficiency Vermont

FUTURE CONSIDERATIONS

In order to better understand how the region can provide its share of renewable energy generation to meet the state goal of 90% renewable energy by 2050, the current potential for renewable energy generation needs to be quantified. Table 4 provides an overview of the current potential renewable energy generation for Central Vermont based on the prime and secondary resource areas that have been identified. Renewable generation potential is calculated from mapping completed by the Central Vermont Regional Planning Commission and is based on the Regional Determination Standards and associated guidance documents developed by the Department of Public Service. The renewable generation potential is expressed in megawatts (MW) and megawatt hours (MWh).

Table 4. Existing Potential New Regional Renewable Electric Energy Generation

Renewable Type	MW	MWh
Rooftop Solar	40	49,268
Ground-mounted Solar	15,622	19,160,098
Wind	23,050	70,671,678
Hydro	.01	28
Biomass and Methane	Unknown	Unknown
Other	0	0
Total Renewable Generation Potential	38,712.71	89,881,072

Source: Central Vermont Regional Planning Commission & Department of Public Service

Finally, Table 5 identifies the total amount of new renewable energy that would need to be generated by Central Vermont by 2050. In addition to the total renewable energy target for 2050, Table 5 includes targets for intermediate years to help track progress towards the 2050 goal.

Table 5. Regional Targets for New Renewable Electric Energy Generation

	2025	2035	2050
Total Renewable Generation Target (in MWh)	104,620	167,404	418,531

Source: Central Vermont Regional Planning Commission & Department of Public Service

KEY CHALLENGES AND TRENDS

Based on the information included in the Central Vermont Regional Energy Plan and noted above, Central Vermont has more than enough resource area available to meet its share of renewable energy generation by 2050. With that in mind, the more specific challenges that will be faced by the municipalities in Central Vermont are related to the guiding theme of the state comprehensive energy plan which assumes electricity is the primary power source to address the state's energy needs. As such, the following challenges and trends are noted for Central Vermont.

Grid Capacity/Infrastructure Needs

In order to effectively and efficiently transmit electricity throughout Central Vermont, the electric grid and other infrastructure, specifically three phase power, need to be adequate to support renewable energy development for the foreseeable future. It will be important to have accurate and up-to-date inventories of existing facilities to ensure upgrades or improvements are targeted to most effectively support additional electric loads on the grid. For example, some communities in Central Vermont do not currently have three phase power, however they do have prime resource areas to support renewable energy development. If three phase power is not in place, large scale renewable energy generation cannot currently be supported.

Livability Preferences

A major component of energy use is related to transportation. The vast majority of residents in the state, including Central Vermont, use personal vehicles for their daily travel needs. Only a fraction of the approximately 45,000 light duty vehicles in Central Vermont utilize alternative fuels. According to Drive Electric Vermont[2], as of July 2017 there were a total of 1,768 passenger electric vehicles in the State of Vermont Department of Motor Vehicles registration database. This includes 1,387 plug in hybrid and 381 all electric passenger vehicles. Replacement of vehicles that utilize fossil fuels with those that use alternative fuels is a component of the transportation policies noted in Central Vermont's strategy to help achieve the state's goal of 90 by 50.

Related to vehicle use is personal choice for where to live. During the eighties and nineties, the trend was to build larger houses on large lots further out from the center of the community. Trends are indicating a desire to live closer to amenities which are associated with cities and village centers. The ability to walk or use transit is becoming more popular. There is less interest in maintaining a large house and large property.

As residents begin to age and younger individuals and families look to set down roots, large lot housing choices may no longer be the desired scenario. However, large lot developments still need to be accommodated and planned for as a rural lifestyle is still preferred by many Central

[2] http://www.driveelectricvt.com/buying-guide/why-go-electric

Vermont residents. These factors will all contribute to changes in land use patterns that can support more energy efficient choices.

Alternative Transportation Options

As noted previously, changes in lifestyle choices for residents of Central Vermont will impact their choices for transportation methods. As trends towards more downtown style living continue, public transit, walking, and bicycling are becoming more widely seen as the primary means of transportation. This trend will influence the need for families to have multiple personal vehicles in exchange for alternative transportation options. As the primary public transit provider in Central Vermont, Green Mountain Transit (GMT) is consistently evaluating their service routes and making changes based on needs and demands for ridership. This includes extending routes, changing times, or adding more buses in certain locations to meet the demand. More specific information regarding transportation options, trends, and choices can be found in the transportation element of this plan as well as the Central Vermont Regional Energy Plan.

To help increase transportation options, municipalities are beginning to require amenities such as sidewalks, bicycle trails, or multi-use facilities to connect residential areas to activity centers with new land developments. This trend will continue to provide residents with choices for transportation options beyond the personal vehicle. Communities will need to continually evaluate their land use regulations to ensure density of development and mixing of uses will support alternative transportation options to maintain continuity and consistency into the future and to evolve as personal choices and trends change.

Development of Renewable Energy Generation

Development of renewable energy generation will be a key component to achieve 90 by 50. The Central Vermont Regional Energy Plan identifies specific areas where resource areas exist for renewable energy generation. These areas focus on wind, solar, and hydroelectric as they are locationally constrained. Other renewable energy generation such as woody biomass, biogas, and other renewable technologies do not require specific conditions for the location of the generation facility, however they do require resources such as wood or other organics to provide the needed fuel.

Siting of all renewable energy generation facilities will take careful planning to ensure infrastructure (including three phase power), land use regulations (including zoning if applicable), and community support exists before the development can occur. In this regard the Central Vermont Regional Energy Plan does not specify locations beyond what has been identified by the state as preferred locations[3] for renewable energy generation. This will provide opportunities for each municipality to identify locations that are preferred or restricted based on local insights and interests.

[3] Preferred locations are identified in the Central Vermont Regional Energy Plan and include parking lots, expired gravel pits, landfills, brownfield sites, and similar locations.

Changes in Technology

As noted previously, the state's comprehensive energy plan and subsequently the Central Vermont Regional Energy Plan are both written with electricity as the primary power source. This direction includes renewable energy technology that exists today such as wind, solar, hydroelectric, biomass, and biogas. As technologies change and advancements are made in both efficiency and sources of renewable energy generation, the region's municipalities will need to be flexible and adaptable to these changes.

With this in mind, the Central Vermont Regional Energy Plan acknowledges and recommends consideration for changes in technology that do not limit renewable energy development to known sources. This concept will need to be continually revisited to ensure current technologies are considered and outdated technologies are not recommended.

Weatherization

Weatherization of buildings is a pathway that will work towards the energy goals related to conservation of energy. A portion of Central Vermont's housing stock is older and was constructed at a time when no specific codes existed for energy efficiency. Now, with the passage of the Residential Building Energy Standards (RBES) and the Commercial Building Energy Standards (CBES), new construction is required to meet minimum thresholds for energy efficiency. This will ensure new construction addresses energy efficiency, however weatherization of existing construction will need to be addressed.

Incentives may be required to assist property owners upgrade their current homes and buildings to include more efficient windows, doors, insulation, or mechanical systems. These upgrades can be costly which is often identified as the primary barrier to completing the needed changes. If incentives are available to assist property owners with weatherization projects, this may increase the efficiency of buildings while decreasing the consumption of energy. This could prove a viable alternative to new construction thereby extending the lifecycle of existing buildings throughout the region.

System Conversions

Similar to weatherization, older existing buildings will commonly have outdated and inefficient mechanical systems. These often include oil based heating systems or wood-fired units. With advances in technology, cold weather heat pumps, high efficiency wood stoves, and other mechanical systems can provide efficiency improvements for existing buildings that will result in conservation of energy. As noted previously, new construction will generally include these high efficiency systems which will help address energy conservation. Like issues related to weatherization, however, the conversion to high efficiency systems will be a challenge as the costs for equipment and building modifications needed to install these systems may be cost prohibitive to many residents and business owners in the region. In this regard, identifying potential incentives will be beneficial to support conversions.

GOALS AND POLICIES

The following section outlines the general goals that will help shape the energy future of Central Vermont. Detailed goals and policies are included in the Central Vermont Regional Energy Plan, however the themes are included herein to provide an overall sense of the direction being provided. As noted previously, energy touches multiple sectors and elements of the 2016 Central Vermont Regional Plan therefore these tenants are woven throughout the various plan sections for consistency and integration across multiple elements.

GUIDING PRINCIPLE:

The Central Vermont Regional Planning Commission will support the state's comprehensive energy plan goal of having 90% of the state's energy needs generated from renewable sources by the year 2050.

CONSERVATION AND EFFICIENCY

GOAL: Conservation and efficiency is practiced by individuals and organizations regarding building construction, heating systems, and daily choices.

Policy: Increase conservation of energy by individuals and organizations.

Policy: Promote energy efficiency in the design, construction, renovation, operation, and retrofitting of systems for buildings and structures.

Policy: Identify ways to decrease the use of fossil fuels for heating.

REDUCING TRANSPORTATION ENERGY DEMAND, SINGLE-OCCUPANCY VEHICLE USE, AND ENCOURAGING RENEWABLE OR LOWER-EMISSION ENERGY SOURCES FOR TRANSPORTATION

GOAL: Support alternative transportation options and alternative fuel vehicles throughout the region.

Policy: Encourage increased use of transit as a primary method to complete daily trips and reduce demands on existing infrastructure such as roads and parking.

Policy: Promote the shift away from single-occupancy vehicle trips to reduce congestion, impacts to local facilities, and support alternative options for transportation needs.

Policy: Promote the shift away from gas/diesel vehicles to electric or non-fossil fuel transportation options to reduce dependency on non-renewable fuel sources for transportation.

Policy: Facilitate the development of walking and biking infrastructure to provide alternative transportation options for the community.

PATTERNS AND DENSITIES OF LAND USE LIKELY TO RESULT IN CONSERVATION OF ENERGY

GOAL: Land use policies support compact development in mixed-use centers

Policy: Central Vermont is committed to reducing sprawl and minimizing low-density development by encouraging density in areas where infrastructure exists or is planned to support growth.

Policy: Strongly prioritize development in compact, mixed-use centers when feasible and appropriate; and identify ways to make compact development more feasible throughout Central Vermont.

DEVELOPMENT AND SITING OF RENEWABLE RESOURCES

GOAL: Renewable energy generation is sited to maximize potential while minimizing locally identified impacts

Policy: Evaluate generation from existing renewable energy generation by municipality including the identification of constraints, resource areas, and existing infrastructure by energy type.

Policy: Evaluate generation from potential renewable energy generation by municipality including the identification of constraints, resource areas, and existing infrastructure by energy type.

Central Vermont Regional Planning Commission

MEMORANDUM

TO: Board of Commissioners

FROM: Eric Vorwald, AICP
Senior Planner

RE: **DRAFT 2016 Central Vermont Regional Plan Land Use Element**

DATE: February 13, 2018

The Board of Commissioners should receive the draft update to the 2016 Central Vermont Regional Plan and be prepared to discuss the draft at the regular meeting on February 13, 2018 and consider a possible motion to forward the draft to a public hearing.

The purpose of this memo is to provide the Board of Commissioners with an overview of the draft land use element and its relationship to the **2016 Central Vermont Regional Plan**.

In 2016, the Vermont Legislature passed Act 171 which requires regions and municipalities to consider forest integrity and habitat in their planning efforts. This requirement was made effective January 1, 2018. As such, any amendment or adoption of a regional or municipal plan after that date will need to comply with this statutory requirement.

To that end, the CVRPC is proposing targeted changes to the land use element of the **2016 Central Vermont Regional Plan** that will meet the requirements outlined in Act 171. This is being done considered since the CVRPC is amending the **2016 Central Vermont Regional Plan** to incorporate the Central Vermont Regional Energy Plan. Due to this amendment process, the **2016 Central Vermont Regional Plan** will need to be compliant with all existing statutory requirements.

The Plan Review Committee discussed the draft land use updates on January 31, 2018 and recommended several changes to be made. While there was not a quorum of the committee present, the members that were present indicated support of the draft and suggested that it be forwarded to the Commission for their consideration after the discussed changes were incorporated. It is anticipated that a more in-depth review and discussion of forest integrity will be included in the process during the update to Plan Central Vermont.

2016 Central Vermont Regional Plan
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:

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

- 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.

- 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 con- tribute 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 pre- serve 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

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

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 avail- able 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/NRCS, or online at:

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

http:/websoilsurvey.nrcs.usda.gov

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 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 dis- play 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.

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Forest Land

Although forests cover 74% of the state today, Vermont wasn't always the "Green Mountain" state. At the time of European settlement, forests covered almost all of Vermont, but wide-scale clearing begun in the early 1800s significantly changed the landscape to an agricultural haven. Clearing reached its peak in the mid to late 1800s and reduced forest cover to about 35% of the state. Over the last century westward expansion, the decline of the sheep industry, and reduced timber harvesting have contributed to the steady regrowth of Vermont's forests.

Forests provide many benefits to Central Vermont residents. The timber industry contributes to the economy, providing 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, forests, as is the aesthetic quality of the Region. Additionally outdoor recreation and tourism are major contributors the Vermont economy.

While approximately 77% of the total land area in Central Vermont is forest land, for the first time in a century Vermont is experiencing an overall loss of forest cover. While it is hard to pin down the exact amount of acreage, a US Forest Service report indicates Vermont may have lost up to 69,000 acres of forest land between 2010 to 2015. Forest fragmentation is due to the conversion of forests to agriculture and commercial uses, yet the main cause is scattered residential development. It occurs incrementally and over time non-forested pockets tend to multiply and expand. Eventually the forest is fragmented and reduced to scattered, disconnected forest islands. The remnant forest islands resulting from this fragmentation are surrounded by land uses that threaten the health, function, and value of those forest islands for animal and plant habitat, and for human use. As forest fragments become ever smaller, practicing forestry becomes operationally impractical, economically nonviable, and culturally unacceptable. Based upon information contained within the ANR Act 171 Guidance document, 25-years ago, 19,000 family forest landowners owned parcels up to 10 acres in size. By 2012, there were 43,000 family forest landowners. Overall, economically and environmentally sustainable forest management is very difficult on lands smaller than 50 acres.

In 2016, the Vermont Legislature passed Act 171 which amended multiple provisions related to timber harvesting and forest management. The act amends municipal and regional planning goals to encourage management of forestlands to improve forest blocks and habitat connectors and encourage the use of locally grown forest products. The Act defines a "forest block" as a contiguous area of forest in any stage of succession and not currently developed for non-forest use. A forest block may include recreational trails, wetlands, or other natural features that do not themselves possess tree cover. These can be different

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sizes and are identified by the land cover of an area and not bounded by political or parcel boundaries.

The State of Vermont maps and ranks important and significant landscape features, as contained within the online mapping tool BioFinder. To view the Region's Highest Priority Interior Forest Blocks and the Region's Highest Priority Connectivity Blocks see Natural Resource Map #3. Together these data layers represent a connected network of forest that provides high-quality interior forest habitat.

It should be noted this map does not identify all of the Region's productive forestland. Productive forestlands are defined as all large tracts which in themselves, or when combined, form a major economic unit for long-term timber production. It is important that these lands are conserved through sound, long-term forest management programs, and compatible patterns of growth and development.

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 environ- mental 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

Deleted: 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 be- comes difficult. Still, many large, healthy tracts remain.¶

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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: protected lands, wildlife habitat, high elevation areas, steep slopes, critical resource areas, groundwater recharge areas, surface waters, wetlands, floodplains and scenic areas. (See maps: *Natural Resources 1* & *Natural Resources 2*)

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.

Based upon information contained within the 12/14/17 draft ANR Act 171 Guidance document titled "Planning: A Key Step Towards Protecting Forest and Wildlife Resources", "habitat connectors" are those areas of land or water that links larger patches of habitat within a landscape to allow for the movement, migration, and dispersal of animals and plants. They can be a forest block, riparian area, or a specific road crossing that wildlife repeatedly use. Forest fragmentation contributes to the loss of wildlife habitat, and the loss or decline of habitat connectivity and minimizes a species' ability to travel between hunting, breeding and migration grounds.

As noted above within the Forest Lands section of this chapter, the State of Vermont maps and ranks lands

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and waters that support important ecosystems, natural communities, habitats, and species. The Region's Highest Priority Connectivity Blocks are comprised of habitat blocks that are of the greatest importance for wildlife movement and genetic exchange on a regional scale. Together with the Region's Highest Priority Interior Forest Blocks these data layers represent a regionally connected network of forest that provides high-quality interior forest habitat. The inclusion of Highest Priority Surface Water and Riparian Areas identifies additional lands along streams, rivers, lakes and ponds which also serve as wildlife corridors. See Natural Resource Map #3.

Additionally, the Vermont Department of Environmental Conservation has defined and mapped the following significant habitats: deer wintering habitat , bear reproduction zones, natural communities and any areas necessary to support the food, shelter or breeding needs of endangered species (See Natural Resources Map #1).[3]

High Elevation Areas and Steep Slopes

Areas of high elevation and steep slopes garner multiple considerations for resource protection. Slopes between 15-25% grade are typically considered "steep" in Vermont and elevations about 2,500 feet are regulated at the State level, with some com- munities regulating at lower elevations. Soils in these areas are often more sensitive to erosion, as at high elevation they can be shallow to bedrock, and on steep slopes are being willed by gravity to move. Where soils are more erodible, disturbance of them is more likely to lead to effects on water quality, as soils and their nutrients are washed into surface waters. Additional sediment in rivers can lead to bank destabilization and streambank erosion. High elevation areas also have an important role in the watershed overall, as the starting point for much precipitation that will eventually run over the land to valley water bodies.

Special scenic and wildlife habitat values are connected to high elevation areas as well.

At some elevations, climatic conditions are just right for supporting certain species that are rare at lower elevations. Vermont has long identified with the scenery of its mountains, and ridgeline vistas are inherently formed by lands at highest elevation. In Central Vermont the Camels Hump State Park is established as an ecological area**,** to protect scarce and rare plants and preserve natural habitat and wilderness aspect.

[3] Vermont. Department of Environmental Conservation. Critical Habitats.

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Critical Resource Areas

For the purposes of this Plan critical resource areas include:

- National Natural Landmarks: a designation that encourages and supports the voluntary conservation of sites that illustrate the nation's geological and biological history, and to strengthen the public's appreciation of America's natural heritage;

- State-designated Natural Areas: limited areas of land which have retained their wilderness character, although not necessarily completely natural and undisturbed, or have rare or vanishing species of plant or animal life or similar features of interest which are worthy of preservation for the use of present and future residents of the State and may include unique ecological, geological, scenic, and contemplative recreational areas on State lands;

- Sites listed on the Vermont Rare, Threatened and Endangered Species, and Significant Natural Communities as designated by the Vermont Natural Heritage Inventory; and

- Elevations over 2,500 feet as shown on USGS topographic maps.

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.

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

Supply quantity is threatened in some locations, as well, because of an increase in impermeable surfaces in aquifer recharge areas.

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. Al- though 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.

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

Canoeing on Wrightsville Reservoir, Middlesex, Vermont.

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.

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. This disaster response paradigm is changing, however, and CVRPC has been taking an active role in both inundation mitigation and fluvial erosion hazard mitigation.

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

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 procedures 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

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

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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

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]

6 Vermont Department of Labor Statistics

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 significance. For more discussion see: Economic Element.

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, anti- freeze, 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 in- crease flooding, that is not necessarily the case. Good land use planning and site de- sign 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. Environ- mental 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 environ- mental 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 assigned industrial, commercial, and mixed use zones.

FUTURE LAND USE

State Statute directs Regional Plans to include a "land use element, which shall consist of a map and statement of present and prospective land uses." (24 V.S.A. § 4348). The Map identifies general Planning Areas that will be used to guide land use and development in the Central Vermont Region.

The Planning Areas are not meant to be detailed representations of current conditions, nor are they intended to be distinct areas of segregated future land uses. The Planning Areas focus on the overall pattern and form of development across the rural to urban spectrum rather than on specific densities or uses, which are more properly defined at the local level.

Future Land Use Planning Areas

Regional Centers are the Region ' s core downtowns, plus their surrounding mixed- use neighborhoods, which accommodate high density commercial, institutional, industrial and residential uses. Regional Centers in Central Vermont include portions of the City of Montpelier, Barre City and Waterbury Village, each of which contains a state- designated Downtown district and infrastructure that includes urban road networks, sidewalks, public spaces and public water and wastewater systems. These areas pro- vide regional services and employment and are areas where efforts to reduce travel demand through ridesharing, transit and multi-modal transit options are critical.

Regional centers are not only the dominant attractors of work and personal business trips in the Region, they also attract significant numbers of trips from the outside the Region. The Region ' s greatest concentrations of office space, retail space, bankingservices and other generators of personal business are located in downtown Montpelier and Barre City. Relative to the other downtown areas, Montpelier and Waterbury have more office space (such as the State Office Complex). Barre City also has State Offices at the McFarland House and City Place, and has more manufacturing and industrial land uses.

Central Vermont Regional Planning Commission
Designating Future Land Uses

The following criteria and data are used when staff and Commissioners make land use area designations in the CVRPC Regional Plan. (Criteria are generally in order of priority.) Boundaries of land use area designations are for general planning purposes only and may contain errors and omissions. Data should be verified during permitting processes per the provisions of the regulatory authority.

Area Designation Criteria:

1. Is it consistent with the state land use planning goals found in 24 V.S.A., §4302 (compact centers surrounded by rural areas)?
- Proximity to villages/downtowns/growth centers designated by the Vermont Downtown Board and/or recognized hamlets, town centers or regional centers identified by CVRPC's Regional Plan
- Is the area walkable (compact configuration allowing for less than ¼ to a ½ mile round trip)?
- Is there a visual or physical break (river, steep slope, change in density or type)?

2. Proximity to existing infrastructure
- Public wastewater, water, sidewalks, highways and transit, schools, recreation parks, other town services

3. Current Conditions
- Orthophotos: development density and extent
- Road network: potential access and connections
- Resource constraints: conserved lands, steep slopes, rare threatened and endangered species and significant natural communities, wetlands, floodplains, elevations about 2500 ft, and lake shore buffers.

4. Town planning and zoning
- What does the locally adopted and regionally approved Town Plan say?
- Do the town zoning districts match current infrastructure and future land use plans?

There is one State-designated Growth Center within the Region and its boundaries are adjacent to the City of Montpelier's Designated Downtown. Growth Center designation in Vermont recognizes municipalities that demonstrate a capacity to plan and in- vest in vital, walkable, mixed-use centers and must include and support a designated Downtown, Village Center or New Town Center. A Growth Center has clearly defined boundaries that can accommodate a majority of commercial, residential, and industrial growth anticipated by the municipality or municipalities over a 20-year period.

Town Centers are less densely populated settlements and smaller than regional centers, but similarly accommodate many of the same residential, civic, commercial and light industrial uses. Typically referred to as "Villages," factors in determining the presence and boundaries of a Town Center include: a state-designated village center, local road network and availability of public utility infrastructure, relatively dense development and smaller lot sizes (1 unit per acre or higher), a mix of land uses, and a distinct separation from surrounding rural areas.

The Region's largest Town Centers that provide water and wastewater infrastructure and also serve as sub-regional retail and employment centers include Waitsfield Village/Irasville and Northfield Village. Additional Town Centers that provide water and/ or wastewater infrastructure, or both, include Warren Village, Cabot Village, Colbyville (Waterbury), Marshfield Village, Northfield Falls, Plainfield Village, Williamstown Village, Washington Village, East Barre, Worcester Village and Waterbury Center.

East Montpelier Village, East Calais, Maple Corner, Woodbury Village, Moretown Village, Duxbury Village, Middlesex Village and Roxbury Village round out the twenty existing Town Centers recognized in this Plan.

A subcategory of Town Centers in this Plan is New Town Centers. "New Town Center," as defined by the State, means the area planned for or developing as a community's central business district, composed of compact, pedestrian-friendly, multistory, and mixed use development that is characteristic of a traditional downtown, supported by planned or existing urban infrastructure, including curbed streets and sidewalks and on-street parking, storm water treatment, sanitary sewers, and public water supply." Though there are no state-designated New Town Centers within the Region, the Town of Berlin desires to encourage the expansion of the historic town area in the vicinity of Berlin Four Corners to adjacent areas to serve as a location of a mix of small-scale commercial, high density residential and civic uses in a traditional village setting.

Policies:

1. In order to maintain the existing settlement patterns, higher density residential, commercial, and industrial development should be located in Regional Centers and Town

Centers.

2. Small-scale shopping centers, designed to complement the historic character and support the vibrancy of community centers, are most appropriate in Town Centers or Hamlets (see Rural Areas). Community and Regional Shopping Centers, however, are less appropriate in Town Centers or Rural Areas and should be located in Regional Centers as a first priority and Mixed-Use Commercial areas as a second priority.

3. Encourage infill, redevelopment, adaptive reuse of existing buildings and reuse of "brownfield" sites in Regional and Town Centers. Encourage the revitalization and reuse of viable historic structures whenever possible.

Strategy 3a: Work with municipalities to align local capital planning and public investment strategies with infill and redevelopment goals.

Strategy 3b: Support implementation of infill and redevelopment activities identified in the 2015 Vermont Downtown Action Team reports (Barre City, Northfield, Waterbury, Waitsfield and Warren).

4. Municipalities should consider use of innovative tools such as "form- based" land use regulations. These types of regulations focus less on specific uses and more on the physical form of the built environment, utilize dimensional standards to shape how buildings relate to each other, to streets, and to other public spaces.

Strategy 4a: Explore opportunities to conduct a regional workshop focused on Implementing Form-based Land Use Regulations.

5. Continue to work with municipalities and VTrans to reduce conflicts between traffic needs and human-scale functions of Regional and Town Centers through practices like traffic-calming measures, pedestrian-safety improvements and gateway treatments. Priority for the use of public funding for the maintenance or improvement of infrastructure shall be for those that support concentrated development in Regional and Town Centers.

Shopping Center Definitions
(*Source: Bennington County Regional Plan*)

A shopping center may include one or multiple stores, in single or multiple ownership, functioning together as one integrated complex. For the purposes of the Regional Plan, the following definitions apply:

Small-Scale Shopping Center: A shop- ping center with a store or stores that sell daily living needs and convenience goods such as food, medicine, clothing, and hardware, and may also include service businesses (e.g., laundry, hair salon, bank, auto or bicycle shops). These centers range in size from 10,000 to 30,000 sq. ft. of gross floor area.

Community Shopping Center: A shopping center with a store or stores that sell a broad range of goods (such as food, clothing, furniture, appliances, sporting goods) and which also may include personal and professional service establishments. Large grocery stores, department stores, and movie theaters are often found in these centers. Gross floor area in a community shopping center may range from 30,001 to 300,000 sq. ft.

Regional Shopping Center: A shopping center (or "shopping mall") including stores that sell a wide variety of merchandise and services – similar to but larger and more extensive than a community shopping center – usually built around one or more large anchor department stores. These centers exceed 300,000 sq. ft. in gross floor area.

Strategy 5a: Support identification of corridors for new roads or road segments in and around Regional and Town Centers as part of a local planning process, and support for construction of those roads and utility infrastructure to help drive growth in a way that supports compact center development.

Figure 1: Connected Streets. *The diagrams above illustrate two different traffic patterns created by new development (shown in light gray). The diagram on the left highlights several smart growth principles by integrating the new roads with the existing road and providing for a mixture of uses at a density consitent with compact development (Smart Growth Vermont).*

6. Priority for the use of public funding for the development of affordable housing and assisted living facilities shall be for those located within Regional and Town Centers in order to increase access to services.

7. The placement of municipal and other government buildings should be in established Regional and Town Centers in order to maintain and enhance the vitality of these areas.

8. Encourage the development of public places and cultural events within Regional and Town Centers.

9. Support the creation of off-road bike and pedestrian paths that connect Regional and Town centers with residential areas and neighboring centers in a hub and spoke pattern.

10. Identify key areas with flood storage capacity and encourage floodplain protection measures such as land acquisition or restrictive land use regulation in areas up- stream of Regional and Town Centers.

Industrial consists of areas where existing and future commercial and industrial activities are encouraged, including new development and redevelopment. Largely clustered in the vicinity of the Region 's urbanized areas, these include industrial parks and active quarries in Barre City, Barre Town, Berlin, Montpelier, East Montpelier, Middlesex and Northfield. A small industrial district is also located on the border of Fayston and Waitsfield, the location of the Mad River Industrial Park.

The specification of commercial/industrial sites allows for location of these types of businesses without creating adverse impacts on adjacent land uses. Large-scale commercial/industrial uses, which are important to the region, need to be located in areas where off-site impacts such as noise, traffic and light/glare can be mitigated.

Policies

1. Industrial uses are encouraged to locate first in existing industrial areas and secondly in industrial areas assigned in municipal plans which are in accordance with the goals and policies included in this plan.

2. It is acknowledged that commercial activity and small scale, individual industrial activities will take place in other parts of the region as directed by town plans, which can address the town needs with more specificity.

Mixed-Use Commercial include areas of commercial, office and mixed-use development built in a spread out pattern and served by water and wastewater infrastructure. Typically dominated by commercial service industries, the intent of this land use cate- gory is to transform these areas into higher-density, mixed-use settlements through infill and redevelopment. These areas in the region are concentrated along US 302, Fisher Rd, VT 12 and south of Route 2 in Berlin, and also includes South Barre in Barre Town.

Planned commercial or mixed uses within existing linear commercial zoning districts along major road corridors must be developed carefully to avoid sprawl, traffic congestion, and safety hazards.

Municipalities should not encourage strip development because additional development of this type would negatively impact the economic vitality of commercial areas in nearby Regional and Town centers. Communities should give substantial consideration to the long term impacts of creating or ex- tending strip development.

"Strip Development"

Title 10: Chapter 151, the Vermont statute dictating the Act 250 land use permitting process, defines "strip development" as follows:

"Strip development" means linear commercial development along a public highway that includes three or more of the following characteristics: broad road frontage, predominance of single-story buildings, limited reliance on shared highway access, lack of connection to any existing settlement except by highway, lack of connection to surrounding land uses except by highway, lack of coordination with surrounding land uses , and limited accessibility for pedestrians. In determining whether a proposed development or subdivision constitutes strip development, the District Commission shall consider the topographic constraints in the area in which the development or subdivision is to be located."

Policies

1. Encourage the transformation of existing commercial areas into areas serving a mix of uses, including residential, and offering diversified transportation options, while also conforming to traditional historic development patterns.

Strategy 1a: Work with towns to incorporate standards such as placement of buildings near the road with parking areas to the side and rear, attractive building design, application of access management principles and provision of pedestrian facilities within the center and facilities that connect to sidewalks and public transit.

2. Large scale retail constituting a substantial regional impact should be permitted only if it includes exemplary building and site design as described above in Policy 1, and is determined to have a net beneficial impact based on an independent economic and community impact study that may be requested by the host municipality and/or CVRPC.

Resort Centers are developments that are associated with large-scale recreational facilities, which in Central Vermont are concentrated around ski area facilities in the Mad River Valley.

Downhill facilities and associated development at Lincoln Peak (Warren) and Mt. Ellen (Fayston) of Sugarbush Resort and Mad River Glen (Fayston) all provide recreational facilities, services and jobs and contribute to the Region 's seasonal housing stock. Sugarbush Resort has been undergoing substantial expansions at Lincoln Peak for the past decade as part of a Lincoln Peak Base Area Redevelopment Master Plan to im- prove base area/guest facilities and to increase the bed base of the resort.

Access to these resort areas are provided via VT Rte 100 together with VT Rte 17, German Flats Rd., the Sugarbush Access Rd. and seasonal transit services.

Policies:

1. The Towns of Warren and Fayston have developed specific ski area planning districts and regulations in its municipal plan and zoning bylaw to ensure that development is consistent with town goals. As the impacts of these resorts extend be- yond municipal boundaries, this Plan recognizes that the Town of Waitsfield participates with the Towns of Warren and Fayston participate in the Mad River Valley Planning District (MRVPD). Also including representation from Sugarbush Resort and the Mad River Valley Chamber of Commerce, the MRVPD carries out a program of planning for the future of the Mad River Valley and conducts studies regarding key issues, such as affordable housing, recreation and trail planning and economic development that are incorporated into local plans. Future growth at Sugarbush Resort and Mad River Glen that is compliant with local plans and bylaws is consistent with this Plan.

2. The focus of alpine ski area development in the Region should remain on the expansion of existing facilities rather than development of new ones.

Rural areas encompass the majority of the Region 's land area and are generally rural in character. Much of the Region 's residential development in recent decades has occurred in these areas in a low-density pattern along transportation routes. These areas encompass much of the Region 's large forest blocks, sand/gravel/mineral de- posits, and prime agricultural soils that, when in productive use, contribute to the working landscape and have significant economic value. Rural areas also include residential, small-scale commercial and industrial, and recreational uses.

New subdivisions can be planned to incorporate the positive characteristics of earlier rural settlements, such as a community identity, public open spaces, and preservation of important resources (such as agricultural soils and forest blocks). Many of these objectives can be realized by clustering lots to create a Hamlet-type character around the homes, while setting a significant percentage of the project area aside as open space reserved for agriculture, forestry, wildlife habitat or public recreation.

Hamlets are smaller than villages, and are typically concentrated residential settlements woven into the fabric of Rural Land Use Planning Areas that may or may not provide minor commercial and civic services. Hamlet areas are identified on the Future Land Use Map by center points; when making land use decisions using the policies in this Plan, Hamlet Areas must include the locally recognized extent of the hamlet as it is delineated in the appropriate town plan.

Hamlets in the Region include Riverton (West Berlin), South Village (Northfield), Cogswell, Upper Graniteville, Lower Graniteville, Upper Websterville, Lower Websterville, East Orange, Orange Village, Adamant, North Montpelier, East Montpelier Center, Putnamville (Middlesex), East Warren and South Woodbury.

Policies:

1. Development should be designed to minimize its impact on the viability of agricultural operations or its contribution to fragmentation of forest Blocks. .

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woodland

Strategy 1a: Provide guidance and training on regulatory and non-regulatory tools for open space and resource protection available to towns for use in town plans and regulations. Encourage implementation of tools such as conservation subdivisions, clustered development, transfer of development rights, building envelopes and variable lot size in all subdivision development, and especially within rural residential and productive rural lands.

2. Development is encouraged to be built outside of farms and along the edges of forests, preferably with buffers between such development and agricultural uses or environmentally sensitive areas.

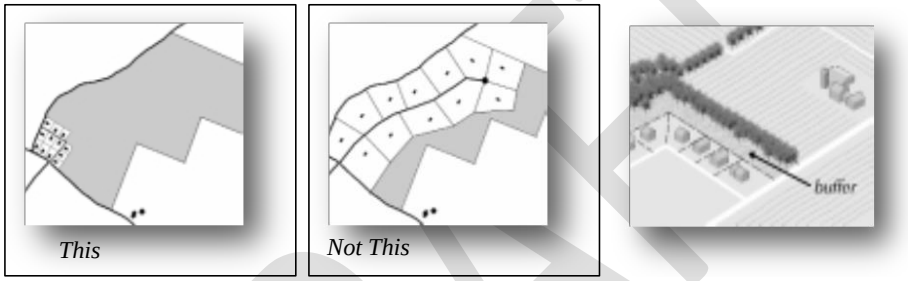

Figure 2. Avoiding Fragmentation and Minimize Use Conflicts*: Incorporate buffers between developed and resource lands to avoid conflicts between incompatible uses — maintain a well-defined edge between developed and open land. (Smart Growth Vermont).*

3. Policies that enable owners of farm and forestland to bear the financial responsibility of resource protection should be supported.

4. Development that diminishes the rural character of the area as defined by local and regional plans is discouraged. Development is encouraged to incorporate the following principles:

- Convenience and safety of vehicular and pedestrian movement, including measures such as traffic calming, within the site, and in relation to adjacent areas or roads.

- Compact development that allows for use of shorter power lines and shorter, narrower, and interconnected roads that result in lower maintenance costs.

- When new roads are being constructed, consideration should be given to burying power and phone lines, if practicable.

5. Develop and expand existing Hamlets in a form that maintains traditional density and residential settlement pattern. Encourage towns to enable this pattern of development in local land use regulations.

6. Wildlife connectivity areas should be protected from fragmentation and uses that reduce their viability for movement of wildlife, particularly where they connect forest blocks.

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7. Non-residential uses, including small service businesses, small professional offices and inns are acceptable land uses for Rural Areas provided that such uses are planned as relatively small in size or scale, are not primary or dominant uses in an area, do not unduly conflict with existing or planned residential, forestry or agricultural uses, and do not unduly affect rural character. Towns should limit the number and size of such establishments to prevent a proliferation of scattered commercial development that does not serve the needs of the community.

8. Occupations that are customarily practiced in residential areas, and which do not affect the character of those areas, are another form of small-scale commercial use common in and appropriate for rural areas. Small professional offices, antique shops, and craft studios are examples of such "customary home occupations."

9. Cross country ski centers, mountain biking facilities and other outdoor recreational areas represent an economically viable means of maintaining rural open spaces with little secondary development; both expansion and development of new facilities are consistent with this Plan.

Resource areas are dominated by lands requiring special protection or consideration due to their uniqueness, irreplaceable or fragile nature, or important ecological function. These include:

- Protected lands;
- Elevations above 2,500 ft (elevations above 1,700 ft in Waitsfield, as regulated);
- Slopes of 25% or more;
- Rare, threatened or endangered species and significant natural communities;
- Wetlands;
- Special flood hazard areas; and
- Shoreline protection areas;

Both Highest Priority Forest Blocks and Highest Priority Connectivity Blocks are also present within the high elevations and encompass areas of steep slopes, areas with rare, threatened or endangered species, significant natural communities and wetlands. As a subcategory of Resource lands, this plan recognizes *critical resource areas (see page 2-9 for a description)* as key sites that are particularly sensitive and should be given maximum protection. Please refer to the callout box on the following page for the methodology used to determine Resource areas.

Policies:

1. Conservation of the natural landscape and careful management of lands is sought for these areas. Development in these areas should be subject to extensive planning, review and conditions that ensure its protection.

2. Any development proposed within critical resource areas shall provide evidence as to why the development cannot be avoided, and shall provide mitigation for natural resources impacted by the development.

3. The extension of permanent roads, energy transmission facilities, and utilities into Resource areas is discouraged.

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4. Development on wetlands, steep slopes of 25% or more, and ridge lines should be avoided.

5. Avoid or limit development and investment in identified flood hazard areas, where feasible.

6. Avoid development that fragments forest blocks and habitat connectors.

Future Land Use Map
Resource Data and Sources

Data is for general planning purposes only and may contain errors and omissions. Data should be verified during permitting processes per the provisions of the regulatory authority. Scale limitations exist and data is only as accurate as the original source.

- Protected lands: This data consists of both private and public protected lands. These include VT State Forests, Parks, Wildlife Management Areas, Town Forests, and Land Trust Easements.
Source: Vermont Conserved Lands Database, VT Land Trust, and Towns

- Elevations above 2,500 ft (elevations above 1,700 ft in Waitsfield, as regulated): This data consists of all areas about the elevation of 2500 ft and in Waitsfield VT above 1,700 ft.
Source: USGS contours over 2500 ft and Town of Waitsfield Land Use Regulations

- Slopes of 25% or more: This data includes all areas with slopes of 25% or more.
Source: CVRPC slope analysis using 10 meter Digital Elevation Model.

- Rare, threatened or endangered species and significant natural communities: This data consists of all mapped rare, threatened or endangered species and significant natural communities as identified by the Vermont Fish and Wildlife Department, Natural Heritage Inventory.
Source: Vermont Fish and Wildlife Vermont Natural Heritage Inventory http://www.vtfishandwildlife.com/common/pages/DisplayFile.aspx?itemId=229831

- Wetlands: This data consists of all mapped class 2 wetlands as identified in the Vermont Significant Wetlands Inventory.
Source: Vermont Department of Environmental Conservation Water Quality Division Wetlands Section

- Special flood hazard areas: This data consists of FEMA mapped Special flood hazard areas Zone A and AE.
Source: FEMA Digital Flood Insurance Rate Map data

- Shoreline protection areas: This data consists of all lakes and ponds greater than 10 acres plus a buffer of 250 feet (Lake Shore Protection areas in Calais, as regulated) .
Source: CVRPC selected Vermont Hydrologic Dataset lakes and ponds greater than 10 acres and then buffered those by 250 ft and the Town of Calais Land Use Regulations.

GENERAL LAND USE GOALS, POLICIES, AND STRATEGIES

Goal 1:

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

Policies:

1. 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.

2. Encourage the improved identification and mapping of surface and groundwater resources.

Strategy 2a. Work with State and Federal partners, such as U.S. Geological Survey, VT Geological Survey, and the Agency of Natural Resources in delineating ground watersupply, aquifers, and groundwater protection areas.

Strategy 2b. Support towns in identifying wetlands and vernal pools that are not already mapped by the State of Vermont.

3. Support the betterment of surface water quality in the Region.

Strategy 3a. 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.

Strategy 3b. 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.

Strategy 3c. 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.

Strategy 3d. Native vegetated buffer strips in riparian zones and shoreland areas should be protected or maintained according to Best Management Practices outlined in the Vermont Handbook for Shoreland Development and VT ANR Guidance Regarding Riparian Buffers to protect functional habitat and improve water quality.

Strategy 3e. Encourage and assist with the acquisition of conservation easements along waterways according to priorities identified in River Corridor Plans.

Strategy 3f. Assist with and support efforts to remove dams that are not serving a useful purpose and other artificial barriers from rivers and streams. Help identify dams that are not serving a useful purposes and that should be listed for removal in conformance with state and federal rules and regulations.

Strategy 3g. Assist landowners in identifying funding opportunities to support buffer- plantings on their properties that would support stream bank and shoreland restoration.

Strategy 3h. 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.

4. Encourage enhanced educational opportunities on watershed functions, protection and restoration, particularly those targeted to youth.

Strategy 4a. Develop a clearinghouse of resources that could be used by teachers and other groups working with youth to provide education on these topics.

5. Avoid or limit development and investment in identified flood hazard areas. Where established economic and institutional centers exist , development in these centers shall adhere to strict floodplain management standards to minimize flood damage and public safety risk.

Strategy 5a. Continue to conduct outreach to municipalities regarding the most recent state River Corridor maps as delineated by the VT Agency of Natural Resources and their implications.

Strategy 5b. Encourage and provide technical assistance to municipalities in enhancing the regulatory standards in their municipal flood hazard regulations, including the in- corporation of River Corridor regulations.

Strategy 5c. Fill and new structures within mapped floodways as identified on FEMA Flood Insurance Rate Maps shall be prohibited, except where a substantial public benefit is provided. ”

Strategy 5d. Wetlands that provide a flood storage function as determined by the VT Wetlands Program should be left undisturbed or development should be required to provide compensatory storage or restoration on-site or in the immediate vicinity, if disturbed.

Strategy 5e. Assist municipalities in identifying and limiting development on lands adjacent to waterways that provide flood storage or other beneficial function through acquisition, easement, deed restriction or zoning that encourages cluster design, particularly for those upstream floodplains that provide flood protection functions for the Region ’s downtowns and village centers.

Strategy 5f. CVRPC will have a FEMA Certified Floodplain Manager on Commission staff.

6. Improve flood resilience planning, education and outreach activities to create a citizenry aware of flood risks, potential costs, and actions that can serve to reduce risk and future property loss.

Strategy 6a. Continue to assist municipalities in developing local hazard mitigation plans and flood resilience elements as part of municipal plans.

Strategy 6b. Promote participation in FEMA 's Community Rating System, where appropriate; Assist un-enrolled towns in applying for the Community Ratings System and assist towns already involved in the Community Ratings System in improving their rating.

Strategy 6c. Consider coordination of a multi-jurisdictional Program for Public Information, an ongoing effort to prepare, implement, and monitor a range of public information activities.

Strategy 6d. If requested, perform an audit of municipal web sites and communication methods and recommend additional information and communication methods that will increase local awareness of flood risks, municipal flood resilience planning, and actions property owners and residents can take.

Strategy 6e. Partner with the Vermont Agency of Natural Resources to coordinate Region-wide flood resilience-related trainings targeted to real estate agents, developers, business owners and other stakeholders with interest in floodplain management.

7. Minimize fragmentation of forest blocks and habitat connectors.

Strategy 7a. Promote the Use Value Appraisal (Current Use Program) and other non-regulatory approaches to forest conservation and management, including support of forest products and conservation easements.

Strategy 7b. Encourage municipalities to identify forest blocks and habitat connectors and plan for the minimization of forest fragmentation.

Strategy 7c. Work with municipalities to incorporate development review standards in zoning and subdivision regulations that address forest and wildlife resources.

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 pat- tern 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 sup- ports 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 land-owner'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 Pro- gram.
- 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 infra-structure 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 CVRPC 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 wildlife habitats and habitat connectors.Municipalities are encouraged to identify those of localimportance.

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Strategy 5a. Work closely with partners such as The Nature Conservancy, the Staying Connected Initiative and Vermont Fish and Wildlife to identify areas within the Region that are sensitive to development, which contains the most recorded species, the most diverse communities, etc., and have this data available for incorporation in member town plans.

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.

9. Prevent the spread of terrestrial invasive species and forest pests.

Strategy 9a. Work with partners to implement coordinated invasive species and forest pest education, detection, prevention and control measures.

Strategy 9b. Encourage landscaping with native species over the use of non-native species, particularly in non-urban environments. Work with UVM Extension Master Gardeners on educating homeowners on the use of native trees and plants.

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 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 recommended 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 is- lands 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 be- tween 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, run- off diversions
- Sediment control: sediment basins/traps, filter fabric/silt fences, hay bales, inlet protection
- Infiltration: infiltration basins, trenches, dry well, leaching catch basins, in- filtration 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 dis- charge 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.

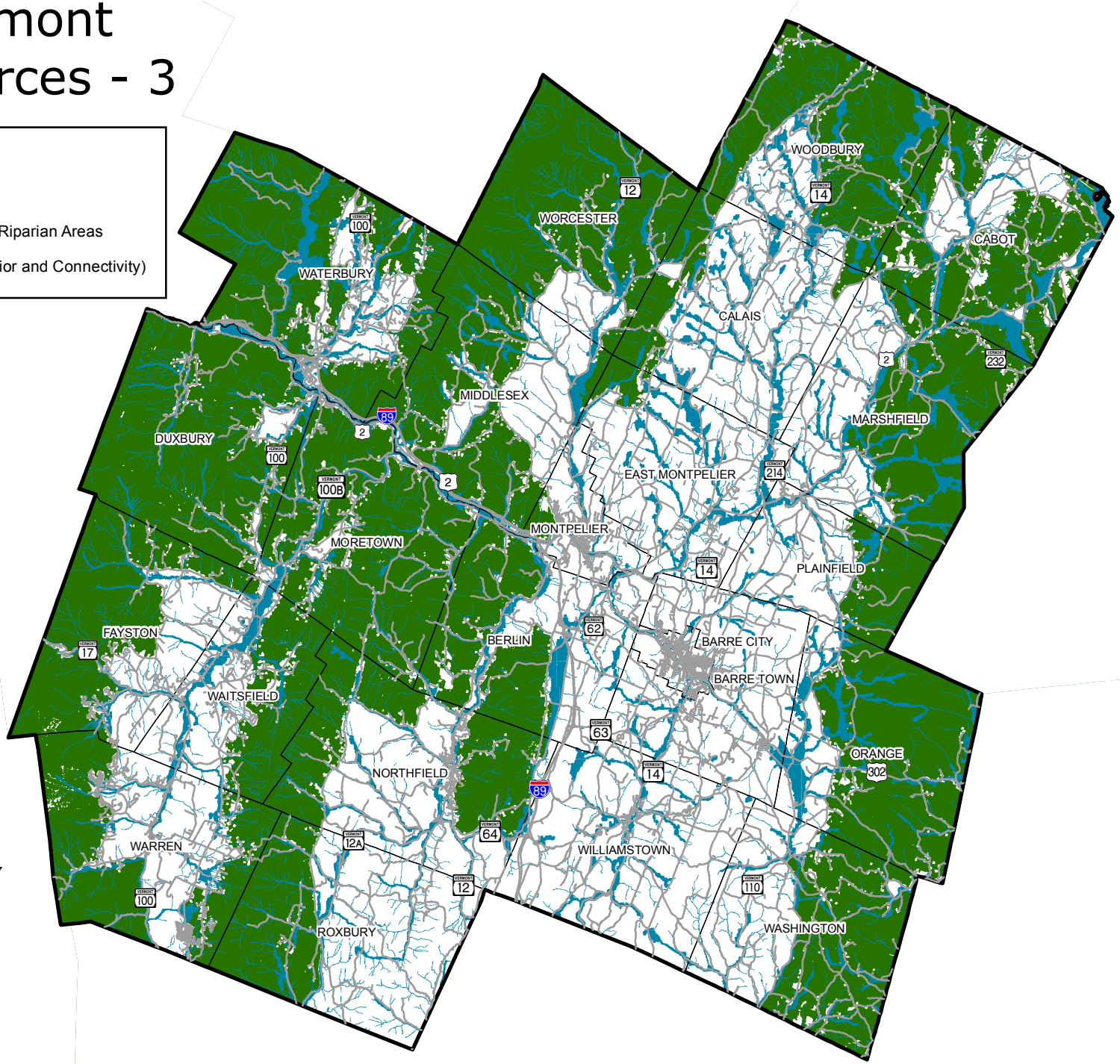
02/13/18

Board of Commissioners

Central Vermont Natural Resources - 3

Legend

- Roads
- Highest Priority Surface Water and Riparian Areas
- Highest Priority Forest Blocks (Interior and Connectivity)



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1 inch = 4.7 miles

CVRPC
CENTRAL VERMONT REGIONAL PLANNING COMMISSION

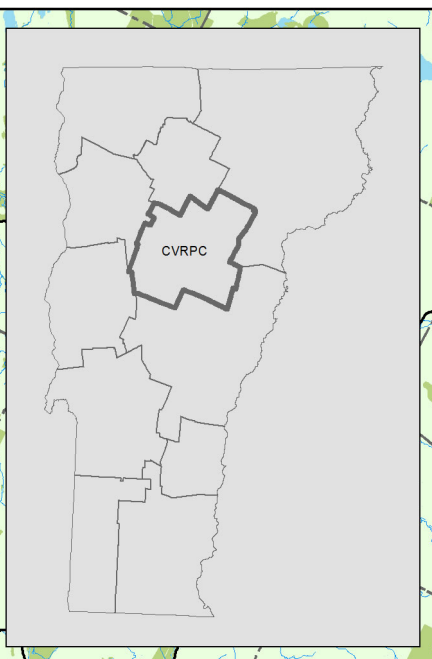
Data Source:
Surface Water and Riparian Areas: ANR Biofinder 2017
Forest Blocks: ANR Biofinder 2017
Roads - VTrans, 2017
Regional Boundaries - VCGI 2006

Created 1/18/18 by CVRPC
M/Regional Plan/2016 Regional Plan/
2017 Amendment/Land Use/Natural_Resources3.mxd

Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

02/13/18
Central Vermont Region
2008 Future Land Use Map

Board of Commissioners



WOODBURY
Woodbury Village
WORCESTER
South Woodbury
CABOT
Cabot Village
North Calais
Maple Corner
Worcester Village
CALAIS
East Calais
Marshfield Village
WATERBURY
Waterbury Center
Colbyville
Waterbury Village
Putnamville
Adamant
MIDDLESEX
Duxbury Village
DUXBURY
MARSHFIELD
EAST MONTPELIER
North Montpelier
Middlesex Village
East Montpelier Center
MONTPELIER
Plainfield Village
East Montpelier Village
MORETOWN
Moretown Village
PLAINFIELD
BERLIN
BARRE TOWN
FAYSTON
Riverton
BARRE CITY
Irasville
Waitsfield Village
South Barre
Lower Websterville
Upper Websterville
WAITSFIELD
Northfield Falls
Lower Graniteville
East Barre
ORANGE
NORTHFIELD
Upper Graniteville
Orange Village
Northfield Village
Cogswell
South Village
Williamstown Village
WILLIAMSTOWN
Washington Village
East Orange
Warren Village
East Warren
WARREN
Roxbury Village
ROXBURY
WASHINGTON

Future Land Use

- Resource
- Rural
- Regional Center
- Town Centers
- Industrial
- Mixed-Use Commercial
- Hamlets
- Resort Centers
- Villages

N

Adopted 10/13/2015

0 2 4 6 8 10 Miles

Data should be verified during permitting process per the provisions of the regulatory authority. This map is for general planning purposes only. This map may contain errors and omissions. See page 2-19 and 2-31 of the Land Use Element for a complete explanation.

CVRPC
CENTRAL VERMONT REGIONAL PLANNING COMMISSION

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