Town of Rutland
Municipal Plan

Adopted by the Selectboard on October 15, 2019

VISION

Our collective vision for the future is for Rutland Town to continue to be a vibrant community for the benefit of both its own citizens and the regional population. It will afford opportunity to live and prosper with very desirable homesteads, excellent education and recreational foundations for families, protected property rights with respect for personal freedoms, and economic vitality, respecting environmental concerns and providing for the public safety.

The Town will enhance the attractiveness of the region so that commercial and industrial business will locate and expand operations in the area to provide good job opportunities. The ripple effect will allow organizations to maintain and implement latest technology and permit expansion of our professional base in banking, law, education, medicine and other services.

As ingenuity of our population continues to develop in the 21st Century, we shall meet the challenges presented and continue to keep Rutland Town responsive to its people through the generous contributions of work and time given by Town officials and volunteers.

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INTRODUCTION

A thorough analysis of a community's population, housing, and economy is an important feature of a municipal plan. In addition to helping determine how much a community has grown, such information allows a municipality to estimate whether or not (and if so, how much) it is likely to grow in the future; identify what impacts growth (or lack of growth) could have on its services and land use; and decide how best it might respond to growth trends.

A public hearing was held by the Planning Commission on September 4, 2014, and by the Selectboard on 10-9-14 and on 10-22-14. In addition, the Solar Facility Siting Standards were the subject of numerous other public meetings and hearings. All meetings and hearings were open to the public and broadcast on PEG TV.

The 2014 Town of Rutland Municipal Plan (the Plan) is an update of the 2009 Town Master Plan. The Plan addresses the need to balance growth in the Town of Rutland with neighborhood quality of life considerations. Through the public hearing process and open to the public Planning Commission meetings, Rutland Town residents have had the opportunity to offer their thoughts and recommendations on the proposed Plan.

The Plan is to be implemented through land use bylaws currently in effect (Town of Rutland Subdivision Regulations) and as a document to be given substantial deference in the Act 250 and Section 248 application review process. Clear community standards are provided in this document, which are referenced by the supporting Future Land Use and Natural Resources

Maps. Non-regulatory tools to implement the plan include: instituting and maintaining a Capital Expense Budget and Program; creation and/or nomination of historic districts; working with public and private partners to seek growth center designation from the State of Vermont; and working with active groups in land conservation to preserve land that has a clear value to the community.

COMMUNITY PROFILE

Physical Characteristics, Demographics, and Economy

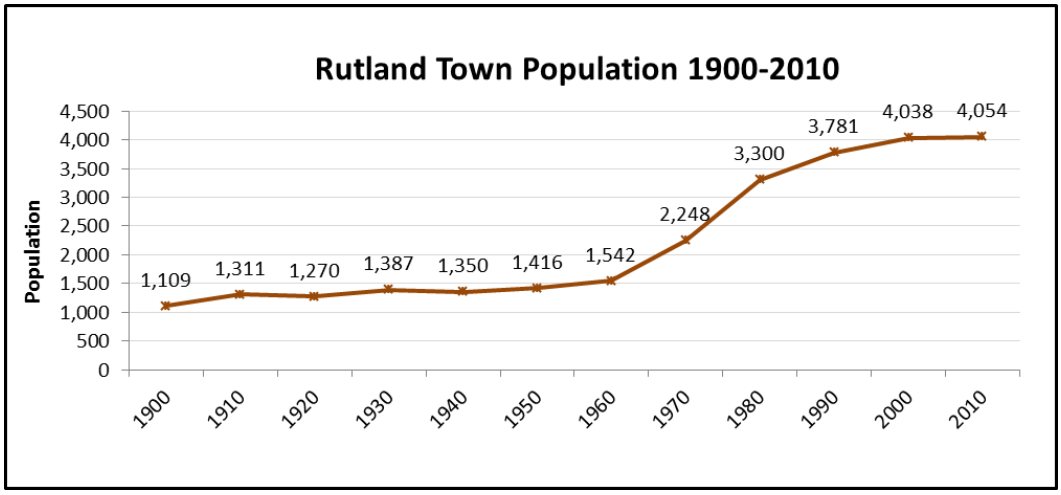
Rutland Town is located along the Valley of Vermont and has varying topography. It is bounded on the north by the Town of Pittsford, on the east by Mendon, on the south by Clarendon, and on the west by West Rutland and Proctor. Contained within the center of the Town lies Rutland City.

According to the US Census, Rutland Town's population was 4,054 in 2010, the 3rd largest in the Rutland Region.

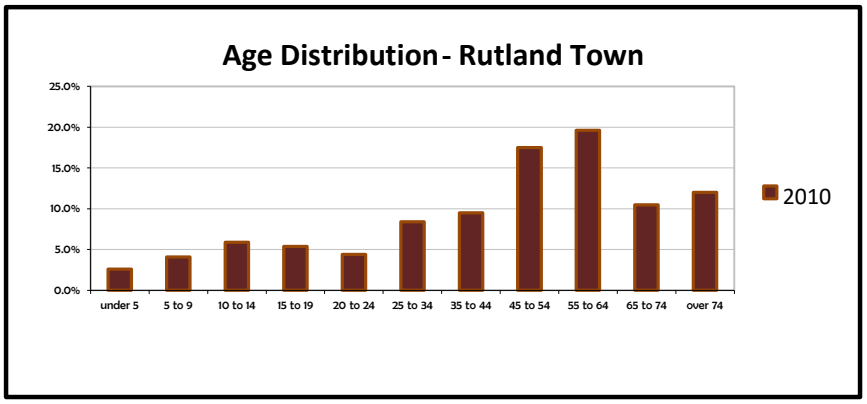
The Town's population increased substantially in decades prior to 1990. According to the US Census, the number of residents more than doubled between 1950 and 1990. Over the last 30 years, however, the rate of population growth has slowed.

Residents age 45 to 64 comprise approximately 40% of the town's population, an amount that corresponds with regional and state figures.

Rutland Town comprises the non-shaded area in the above aerial view.



Source: US Census



Source: US Census

The average household in the community is becoming smaller, reflecting national and statewide trends. In 1980, there were 3.04 persons per household. In 2010, this figure dropped to 2.27. Similar to population, the number of households increased dramatically from 1960 through 2000, with the rate of growth slowing since 2000.

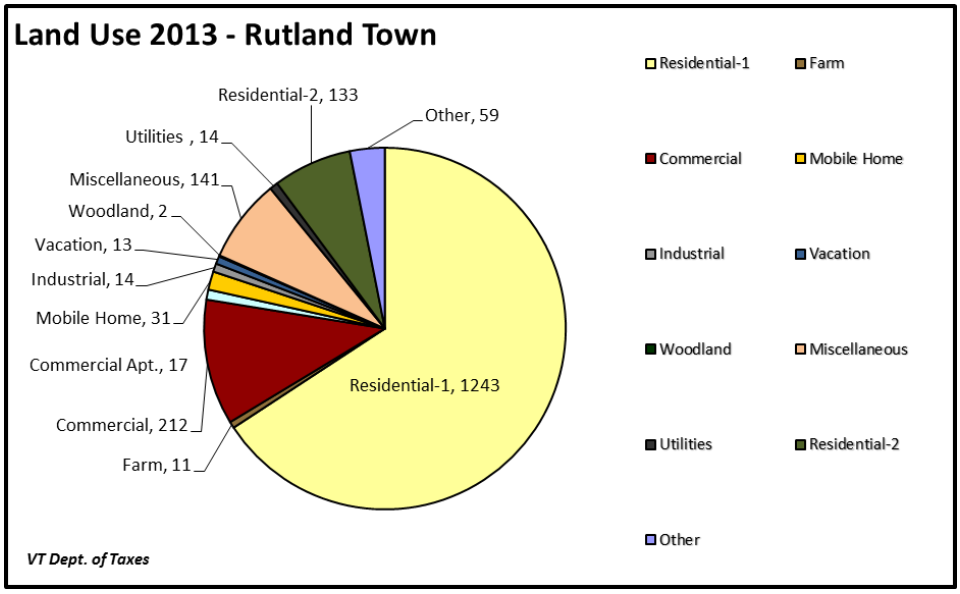
Source: US Census

Households and Household Changes, Town of Rutland

	1960	1970	1980	1990	2000	2010
Households	431	661	1087	1,412	1,691	1754

Percent Change	---	65%	53%	64%	30%	20%

As a result of the increase in housing units and proximity to Rutland City, and its related service, approximately 75% of the land in Rutland Town is used for residential uses. Corresponding with the town's growth trends, however, 71% of Rutland Town householders have moved into their units since 1990.



Source: VT Dept. of Taxes

The Town of Rutland has a thriving economy boasting high median household incomes and low unemployment rates. Median Household Income in Rutland Town is higher than the State of Vermont and national median, while the unemployment rate is the third lowest in Rutland County at 2.1%.

This Plan is compatible with the plans and development trends of its bordering communities and of the Rutland Region. Each of these plans has been regionally approved, indicating that they all have been consistent with the State Planning Goals outlined in 24 VSA Chapter 117.

The Town borders seven municipalities, including Rutland City, which it surrounds, and touches one other. Land development trends and plan policies relating to the borders of each of these communities has impacts on all towns involved.

An analysis of the plans of neighboring towns reveals several key trends and compatibilities:

- Rutland Town encircles the City of Rutland. Together, the two municipalities are home to the largest concentration of homes, businesses, and services in the Rutland Region. The Plan for Rutland City calls for "gateway" commercial districts at its borders with Rutland Town on Routes 7, 4, and Business 4, along with a primary business area in its downtown core. Uses encouraged in these gateway districts are compatible with those proposed in Rutland Town. Both towns promote prosperity, ease of transportation mobility, and sensitivity to natural resources. The

two communities have worked well together to resolve key issues such as Route 4 & 7 upgrades and should use this Plan as a model for future joint efforts. The City provides water and sewer services to Town business and residents of several areas of the Town, a benefit to both communities.

- Clarendon shares Rutland Town's southern border and road connections along US Route 7 and Creek Road. The two plans promote differing land use policies in the immediate area of Route 7; while Rutland Town proposes industrial and commercial uses, Clarendon proposes Residential and commercial activities. East and west of the Route 7 corridor, proposed uses are closely related. The Airport Industrial Park in Clarendon is served by sewer service provided by the City of Rutland; this line runs through Rutland Town and are further evidence of the close connection among the municipalities.

- West Rutland borders Rutland Town at its southwestern edge. The two communities share the Business Route 4 corridor and agricultural and residential lands. Both communities' plans encourage commercial development in the vicinity of Business Route 4. Through mutual partnership, West Rutland water and sewer services have been extended through this corridor and into Center Rutland, providing excellent opportunities for redevelopment. The towns have received joint planning grants and are partnering to study ways to promote business and mixed-use development, improve traffic safety and provide for bicycle and pedestrian amenities.

- Proctor borders Rutland Town at its northwestern edge and shares VT Route 3. The border area also includes the greatest concentration of undeveloped land in Rutland Town, stretching from Pine Hill Park in Rutland City to near the edge of Proctor's village. Proctor's plan calls for forested areas in the highlands and agriculture along Route 3.

- Pittsford shares Rutland town's northern border and the US Route 7 corridor. The area is primarily agricultural and rural residential in both communities, but is slowly converting towards greater concentrations of commercial and residential uses. Both towns will need to pay special attention to balancing their goals of promoting affordable housing, businesses, and agricultural activities.

- Chittenden and Rutland Town share a small border in the Town's northeast corner. The area has been popular for residential development in recent years. The Town of Chittenden adopted a Town Plan in 2010.

- Mendon forms Rutland Town's eastern border; the two share the US 4 corridor and a large stretch of watershed leading from the Green Mountains into the Otter Creek. The two also share Town Line road, whose eastern side is in Mendon and western side is in Rutland Town. The two will need to coordinate efforts in this area to ensure compatibility. The Route 4 area is designated for commercial activity in both communities, with Mendon slowly developing a village area near the Rutland Town border.

LAND USE

The purpose of the land use districts in this chapter is to guide development in Rutland Town. The Land Use Districts are shown on the Land Use Map entitled Town of Rutland, Vermont Land Use Map, which is incorporated by reference as a part of this Plan.

The districts were derived from the combination of the following:

(1) Existing land use patterns.

(2) The goals and objectives for accommodating future growth.

(3) The suitability of the Town for various prospective land uses.

Throughout the districts, a choice of housing, employment, shopping, educational, recreational, and cultural opportunities should be provided, with support from economical and high quality governmental and public utility facilities and services.

Information in this chapter and corresponding map shall be used to guide development, especially during the Act 250 and Section 248 review process. In absence of zoning regulations, uses and density requirements described below shall be adhered to for all new development.

Land Use Districts

In several of the following described districts, clustering or clustered development is encouraged as a means of preserving open land. In a clustered development, the open land must remain open in perpetuity, but may be conveyed – for example to a land trust or to the municipality – provided that the required easement or deed restriction maintaining open land and prohibiting future development is contained in any conveyance. The restriction maintaining open space and development rights shall be included in any conveyance.

[Any use not stated as "permitted" is prohibited.]

R40A - Neighborhood Residential - Minimum lot size: 40,000 square feet.

Description: Areas of existing settlement within the town, selected adjacent areas, and areas suitable for modest density residential development.

Purpose: To maintain the traditional social and physical character of these areas.

Permitted uses: Single and two-family dwellings, accessory facilities, and home occupations. One housing unit and one accessory unit are permitted per lot.

Development Density. Up to one residential unit and one accessory unit per 40,000 square feet.

R40B - Planned Residential - Minimum lot size: 40,000 square feet where water and sewer service not provided; 20,000 square feet where water and sewer service provided.

Description: Lands which are suitable for higher residential intensity development because of their suitability for on-site sewage disposal and/or the presence of municipal sewer systems.

Purpose: To provide for higher density residential development in areas that are suitable for such development due to the capability of the land or the presence of public sewer facilities. Residential development occurring in this district should provide for a variety of dwelling types and, through the use of clustering/PUD techniques and their associated higher density, allow for reduced construction costs, conservation of open space and prime agricultural soils, and buffering between lower and higher density development.

Permitted uses: Same permitted uses as allowed in R40A District, plus multi-family structures containing up to four (4) units, and residential clustering/PUDs

Development Density. Up to four residential units per 40,000 or 20,000 square feet, depending on water and sewer infrastructure.

Clustering/PUDs: Residential development may be clustered according to the following provisions:

Minimum Development Size. The minimum lot size for a clustered residential development/PUD is 80,000 square feet.

Open Space Requirement. Residential development may be clustered provided that at least one half of a parcel is designated as open space; the remaining portion is considered the parcel's developable area.

Development Density. Up to six residential units per 40,000 or 20,000 square feet, depending on water and sewer infrastructure.

Maximum Number of Units per Structure. The maximum number of residential units per structure is six.

R40C - Residential/Commercial - Minimum lot size: 40,000 square feet.

Description: Areas with residential uses and light commercial activity.

Purpose: To allow for a mixture of single-family residential, two-family residential, recreation and light commercial uses.

Permitted uses: Same as permitted in R40A, plus professional and recreation uses.

Development Density. Up to two residential units and one accessory unit or one commercial use per 40,000 square feet.

AH - Affordable Housing - Minimum lot size: 40,000 square feet where water and sewer service not provided; 20,000 square feet where water and sewer service provided.

Description: Lands which are suitable for higher residential intensity development because of their proximity to sewer service and transportation with potential for affordable housing development.

Purpose: To provide for higher density residential development at densities high enough to allow affordable per unit costs in areas that are suitable for such development due to the capability of the land or the presence of public sewer facilities. Residential development occurring in this district should provide for a variety of dwelling types and, through the use of clustering/PUD techniques and their associated higher density, allow for reduced construction costs, conservation of open space and prime agricultural soils, and buffering between lower and higher density development.

Permitted Uses: Same permitted uses as allowed in R40A District, plus multi-family structures containing up to six (6) units, open space, residential clustering/PUDs, and retail/commercial.

Development Density. Up to six residential units per 40,000 or 20,000 square feet, depending on water and sewer infrastructure.

Clustering/PUDs: Residential development may be clustered according to the following provisions:

Minimum Development Size. The minimum lot size for a clustered residential development/PUD is 80,000 square feet.

Open Space Requirement. Residential development may be clustered provided that at least one half of a parcel is designated as open space; the remaining portion is considered the parcel's developable area.

Development Density. Up to eight residential units per 40,000 or 20,000 square feet, depending on water and sewer infrastructure.

Maximum Number of Units per Structure. The maximum number of residential units per structure is eight.

AGR40 – Agricultural & Forest Working Lands – No minimum lot size.

Description: Lands presently used for or suitable to support agriculture, forestry, and related commercial, recreation and tourist related enterprises.

Purpose: To protect the existing scenic, rural working landscape and to acknowledge that owners of working lands contribute benefits to the town, region and state from the views, air, water and ecological qualities working lands sustain and from the opportunities for recreation, tourism and business attraction they provide.

Permitted Uses:

1. Agricultural, forestry, commercial enterprises related thereto;

2. Agri-tourism businesses and activities defined as the business of establishing farms as destinations for education, recreation, and the purchase of farm products;

3. Other small-scale commercial uses that preserve the setting, natural features and contours of the land;

4. Non-commercial entertainment, cultural and educational events;

5. Non-commercial recreational activities, athletic fields and trails;

6. Single family residences including related non-commercial outbuildings.

Development Density: One residence in any lot up to 10 acres in size; lots above 10 acres, one residence per 10 acres – except for clustered residential development.

Clustered development is encouraged provided that development density is not less than two acres per single family structure in the clustered residential development.

On any parcel under 20 acres, one residence is allowed. On parcels above 20 acres, the number of residences permitted shall be calculated by dividing the actual parcel size in acres by 10 acres, (Number of allowed residences =Total acreage/10 acres). The quotient shall then be rounded down to the nearest whole number that is smaller than the quotient. As examples: (a) on a parcel of 40 acres or more but less than 50 acres, four residences shall be allowed;(b) on a parcel of 56.34 acres, five residences shall be allowed.

The location of the residences may be dispersed or may be clustered, but each residence shall be allocated a discrete area of not less than two (2) acres in size.

RR10 - Rural Residential - Minimum lot size:10 acres.

Description: Areas which are presently wooded or open and have rural character that should be conserved through large lot development.

Purpose: To provide for residential and other compatible uses at low densities. Open space preservation and other techniques for preserving the rural character of these areas are encouraged.

Permitted Uses: Same permitted uses as allowed in R40A District, plus recreation uses, and two-family residences associated with agricultural uses.

Development Density. Up to one residential unit per 10 acres.

CNS - Conservation - Minimum lot size: 25 acres.

Description: Special forest and/or open lands which are of particular ecological or aesthetic importance. Includes public watersheds as well as certain lands that are not well suited for residential or commercial development because of topography, soil composition, or wetlands.

Purpose: To preserve certain forest and open lands in a relatively undeveloped state and/or to protect public watersheds, wetlands, and water supplies.

Permitted uses: Same permitted uses as allowed in R40A District, plus recreation uses.

Development Density. Up to one residential unit per 10 acres.

C - Commercial - minimum lot size: 40,000 square feet.

Description: Land that is suitable for commercial uses.

Purpose: To house a variety of retail and other commercial services in suitable locations to meet the needs of local and regional residents. The character of the area should be protected and enhanced with the provision of landscaping and screening. The scale of development in this district should be compatible with adjacent commercial and residential structures.

Permitted uses: Commercial uses and all uses permitted in R Districts.

IC - Industrial/Commercial- Minimum lot size: 40,000 square feet with sewer service, 80,000-sq. ft. without sewer service.

Description: Existing industrial and commercial developments that are serviced by public sewer and have access to arterial highways and/or rail facilities.

Purpose: To accommodate the expanding retail and industrial sectors of the town. Provides for employment opportunities in manufacturing, warehousing, research and development, and commercial uses which specifically serve the industries or their employees in areas serviced by good transportation facilities and public utilities.

Permitted uses: Industrial and commercial uses including light manufacturing and distribution of goods and materials, and all uses permitted in R Districts.

Municipal/Government/Utility

Description: Lands currently used or planned to be used, for municipal and governmental purposes, including schools, town offices, fire stations, police headquarters, recreation facilities, landfills, salt storage facilities, highway maintenance garages, cemeteries, and fire districts. Includes developed and undeveloped land owned by electric utilities.

Purpose: To accommodate essential public facilities and services and utility uses and facilities.

Permitted Uses: Municipal/ governmental uses and utility related uses.

TRANSPORTATION

Introduction

Transportation systems are perhaps the most influential force on land use development patterns. Communities that implement sound transportation and land-use policies are better able to provide revenue to the town, manage growth, improve the efficiency of travel and contain infrastructure costs. Transportation improvements provide greater accessibility to certain parcels of land, which increases the likelihood they will be developed as property values rise. As land use becomes more intense, the amount of travel generated increases, which spurs demand for additional transportation improvements for all modes of travel.

Goal:

To provide for a safe, convenient, economic, and energy-efficient transportation network that respects the integrity of the residential and natural environments, including public transit options and pedestrian and bicycle infrastructure.

Description of the Local Transportation System

The transportation system serving Rutland Town has many different components. These components include facilities, such as highways, streets, and bridges, as well as services, such as public transit.

Highways: Highways in Rutland Town include locally-maintained facilities such as Post Road, East Pittsford Road, and Creek Road, which are maintained by the Town (which has an elected Highway Commissioner, a crew of two, and contracts for various services). They also include state-maintained facilities such as Vermont Route 3 and US Routes 4 and 7. Under the administrative classification system established by Vermont transportation statute, Rutland Town has 8.8 miles of US highways on US 4, 7 and Business Route 4 and 1.7 miles of State highways.

According to the Vermont Agency of Transportation, one-half of Rutland Town's highways are class 3 highways and one-quarter are class 2 highways. There are no class 1 highways and a small percentage of class 4 highways. Class 1, 2 and 3 roads are those for which the town receives State aid grants, based on the number of miles in the town.

Highways by Administrative Class

Source: VTrans	US Highway	State Highway	Class 1	Class 2	Class 3	Class 4	Total
Miles	**8.84**	**1.73**	**0.00**	**15.05**	**31.48**	**1.6**	**58.7**
Percent of Total	**15.1%**	**3.0%**	**0%**	**25.6%**	**53.6%**	**2.7%**	**100%**

Under the functional classification system, highways are classified as arterials, collectors, or local streets: In this system, routes are assigned to categories that reflect their function and overall importance.

Arterials: Arterials located in Rutland Town include US 7, US 4, Business Route 4 and Vermont 3. These highways, which are designed to accommodate volumes of more than 500 vehicles per hour, carry the bulk of through-traffic. Protection of the traffic-carrying function of arterial highways is of great importance to the Town. In addition to serving as conduits for inter-state and inter-regional transportation and commerce, they also carry large numbers of commuters, shoppers, and visitors. If they become congested or otherwise decline in performance, there can be serious economic and social impacts. In the case of Business Route 4, where its function as an arterial roadway has become somewhat downgraded since the construction of the Route 4 bypass, further study of future use is needed. The Towns of West Rutland and Rutland Town have received joint planning grants and are partnering to study ways to promote business and mixed use development, improve traffic safety and provide for bicycle and pedestrian amenities in this corridor.

Collectors: Collector roads in Rutland Town include North Grove Street, East Pittsford Road, Post Road, West Proctor Road, Town Line Road Cold River Road, Stratton Road and Creek Road. These roads provide for through traffic on a local level. They connect arterial and residential streets and link Rutland Town with Rutland City, Pittsford, Chittenden, Mendon, Proctor, and Clarendon.

Local Streets: Local streets form the balance of the roadway network in Rutland Town. They are designed to allow access to adjacent land uses, not to carry through traffic. Careful attention to this design principle is needed to ensure that residential streets are not transformed into collectors.

Bridges: Bridges are critical components of the highway system, allowing travel over significant physical obstacles such as rivers, wetlands, and ravines. Bridges are also challenging to maintain and expensive to replace. Thus, they are a major focus of transportation planning and management.

Like highways, bridges may also be classified according to their state or local jurisdiction, with ownership generally determining responsibility for maintenance. Fortunately, repairs to many local bridges are eligible for at least some state funding under the state's local bridge assistance program.

Bridges with spans of 20 feet or more are generally eligible for federal support, while bridges (or culverts) with spans greater than 6 feet, but less than 20 feet are generally eligible for state funding. Every two years VTrans inspects all bridges over 20 feet. Bridges on town highways are the towns' responsibility and those on state roads are owned by the State.

Transit: Not all residents own automobiles or have access to those vehicles at all times. For these reasons and others, public and private transit services are an important component of the transportation system.

Public transit in Rutland Town is provided by the Marble Valley Regional Transit District (MVRTD), commonly known as "The Bus". In operation since 1976, MVRTD is the largest non-urban transit system in Vermont. MVRTD provides public fixed-route services, deviated fixed route and ADA complementary para-transit to the general public in Rutland Town, Rutland City,

and Proctor. It also provides para-transit services such as subscription for persons who cannot access fixed route services.

Services to Rutland Town residents are somewhat limited. MVRTD's fixed routes that serve the Town are as follows:

- The South Route operates south of the City, extending south on US 7 as far as the Green Mountain Plaza and Diamond Run Mall, as well as the Ludlow and Manchester Routes.
- The North Route operates north of the City of Rutland, briefly crossing into Rutland Town on North Main Street (US 7).
- The Proctor Route operates between Rutland City and Proctor, with stops along US Business 4A in Rutland Town.
- Middlebury Connector operates north of Rutland City and will deviate ¼ mile to serve parts of Rutland Town.

MVRTD's other fixed route, the Hospital Route, does not cross into Rutland Town. Commuter buses serving Killington Ski resort make stops in Rutland Town.

In addition to fixed route and para-transit services, MVRTD provides transportation to persons eligible for mobility services under Medicaid, which benefits a number of Rutland Town residents. Medicaid transportation is provided using MVRTD vans, taxis, and reimbursed volunteers. There are also commuter routes which extend service to Fair Haven and Manchester.

Finally, MVRTD also provides contract services to human service agencies including the Southwest Vermont Council on Aging, Rutland Mental Health, Vermont Psychiatric Survivors, Bridges and Beyond, Social and Rehabilitative Services (SRS), and many others.

Rail: Rutland Town residents are fortunate to be served by both passenger rail service (via Amtrak's Rutland City station) and freight rail service (via Vermont Railway and its subsidiaries: the Clarendon and Pittsford Railway and Green Mountain Railroad). Rail can be an important resource for transporting goods through the region while avoiding the impact of additional truck traffic.

Bike and Pedestrian Facilities: Bicycle and pedestrian travel are important elements in creating a balanced and sustainable transportation system. Bicycles are an efficient means of transportation, while walking provides basic mobility for residents. Currently, most land development patterns in the town discourage bicycle and pedestrian facilities.

There are no existing formal bicycle facilities designated in the town and pedestrian facilities are limited to sidewalks. Pedestrian facilities, where they are available, are discontinuous and therefore do not provide connections between key facilities. Furthermore, many roads used for cycling lack shoulders and /or have sharp drop-offs at the road edge.

Parking: Parking, or the lack thereof, has not been identified as a problem. New commercial development in the Town has ample parking available. It is important that new developments

consider public transportation and pedestrians in parking lot layouts so access throughout these is amenable to other modes.

Areas with Lack of Safety: Another way to identify deficiencies in the transportation network is to examine accident records to identify locations where there appear to be more accidents than would normally be expected. Such locations would be an indication of "geometric" features that are deficient and need to be addressed.

The State of Vermont Agency of Transportation examines sections of highways and intersections for accident rates. Those which exceed a critical rate, determined statistically, are considered high accident locations. High Accident statistics are often used in conjunction with severity statistics, which reflect the severity of the economic loss resulting from the accidents at a location.

Air Transportation: The Rutland Southern Vermont Regional Airport located in Clarendon serves private air service as well as commuter/passenger service to Boston. Funding to secure necessary upgrades to the facility is difficult at both the Federal and State levels. A mix of private and public funding may be necessary to ensure the long-term survivability of this facility. The Town Select Board supports the continued Federal and State funding for the airport.

The Town of Rutland benefits in numerous ways from the Rutland-Southern Vermont Regional Airport ("the Airport") located in the adjoining municipality of Clarendon, Vermont. The Airport provides air access to businesses and residents of Rutland Town that is often critical to such businesses and to the general welfare of Rutland Town residents. Availability of such air service is a transportation and economic resource of the Town.

While the Airport is located within Clarendon, Vermont, it has a Precision Instrument Runway running generally North- South from the northern end of Runway 01-19 ("the runway"). The Instrument Landing System (ILS) of the Airport extends northward from the northern end of the runway above southern portions of the Town of Rutland, then over the City of Rutland, and then over northern portions of the Town of Rutland. This ILS is critical to passenger and delivery services that go into and out of the airport as well as to business aviation and general aviation, all of which benefit the Town of Rutland in many ways.

It is contrary to sound land use planning to allow development that interferes with the ILS or operations at the Airport. Therefore, no development shall be permitted that interferes with or obstructs the air corridor of the Instrument Landing System that pass over the Town of Rutland, or obstruct or interfere with air operations of the Airport. To this end, no development, construction, or alteration of existing construction shall be allowed that (a) has an elevation greater than 200 feet in height above the ground level at its site, or (b) has a greater height than an imaginary surface extending outward and upward at a ratio of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the 01-19 runway at the Rutland Airport unless:

(a) The owner of the land and the developer (if not the owner of the land) upon which such construction, development, or alteration is proposed has given notice to the Federal Aviation Administration of an intention to cause such construction, development, or alteration, and

(b) Either (i) the Federal Aviation Administration determines that such development, construction, or alteration will not obstruct or interfere with the ILS and/ or operation of aviation or (ii) the owner and developer demonstrates that such development, construction, or alteration will conform to requirements, conditions, or recommendations respecting the ILS under Part 77 of the Regulations of the Federal Aviation Administration.

Transportation Advisory Council: The Town of Rutland Select Board has a "pipeline" for local transportation infrastructure projects through the Transportation Advisory Council (TAC), an adjunct council of the Rutland Regional Planning Commission. The Town has representation on the Council and TAC meetings are generally held on a monthly basis. The TAC serves to promote and support, throughout the Rutland Region, an integrated transportation system that facilitates commerce and communication and enhances quality of life, by involving citizens and local officials in the identification and development of solutions to transportation problems

Community Land Use Impacts of Transportation: Land use and transportation clearly influence each other. As has been summarized in the Rutland Region Transportation Plan, one of the most significant impacts of transportation on land use is as a catalyst to land development. In Rutland Town, the most obvious manifestations of the impact transportation has on land use are the areas of development along US 7 and US 4 entering Rutland, particularly from the east and south.

Access Management: Roads function to provide mobility and accessibility to adjacent land. The efficiency and safety of all town roads are directly affected by the frequency and location of points of access or curb cuts. The design of curb cuts also is important in terms of drainage and road maintenance. Consistent and comprehensive access management policies are necessary to balance the needs of motorists, pedestrians, bicyclists, and other users of the roadways system to travel in safety and with sufficient mobility.

Strategies for improving access management include:

- Adequate sight distance at a driveway or street intersection.
- Distance between curb cuts and distance between driveways and nearest intersection.
- Shared driveways.
- Appropriate driveway width.
- Driveway turnaround area (for small existing lots fronting the corridor).
- Appropriate on-site parking, shared parking, and parking design.
- Sizing of area and/or bays for loading and unloading.
- Landscaping and buffers to visually define and enhance access points.

Access Master Plan for US 7, Rutland Town: The Access Master Plan for US 7 is a Master Plan for future access breaks to the Limited Access section of US 7 in Rutland Town. The Town of Rutland Selectboard adopted the Master Plan in 2012, which was reviewed by the Transportation Board under consultation with VTrans, the Federal Highway Administration (FHWA), and the Rutland Regional Planning Commission (RRPC). The Access Master Plan for US 7 can be found in the Rutland Town Office.

Cut-through traffic: Cut-through traffic occurs when drivers take "short-cuts" through residential neighborhoods and other areas in order to minimize the amount of time it takes to reach their destinations. Rutland Town has historically had many areas affected by cutthrough traffic. Noise and disruption are some of the most significant negative impacts of cut-through traffic.

Air Pollution: Another impact of transportation is air pollution. In Rutland Town, transportation-related air quality impacts are greatest where traffic volumes are highest.

Thus, the most problematic areas include the US 4 and US 7 corridors, particularly those areas where vehicle delays are greatest.

Property Values: The net effect of numerous negative transportation impacts is the lowering of property values. While no locally specific analyses have been prepared to measure the financial ramifications of transportation impacts, anecdotal evidence suggests that the value of some types of properties, such as residential, may become depressed. However, commercial and industrial properties benefit from close proximity to major highways. The lack of proximity to an interstate system also affects property values for certain businesses.

Transportation System Issues

In addition to being affected by local transportation problems, Rutland Town is very much affected by regional transportation issues as well. The following paragraphs describe the most recent examples.

Rutland Bypass: Construction of a highway bypass around Rutland City was evaluated for decades at a cost of several million dollars. Rutland Town's position regarding the construction of a bypass around Rutland may be stated as follows: The construction of a bypass is not necessary given current and likely future traffic volumes; furthermore, even if built, a bypass would not solve congestion problems on US 7. The Town believes that, instead of a bypass, the Agency of Transportation and Federal Highway Administration should pursue a "limited" upgrade of US 7 and US 4. This limited upgrade would provide much sought-after congestion relief at several key intersections but with far fewer impacts than would result from the construction of a bypass—and at much lower cost. There are no current plans to construct the bypass.

Rutland Rail Yard Relocation Project: Studies, proposals and alternative designs have been developed to relocate the Rutland Railyard. The goal of this is to increase travel time through the City of Rutland, which presently is hampered by the fact the City yard has outgrown its functional capacity. It is the position of this Plan that, if the Rutland Rail Yard is moved, that its relocation should be extremely sensitive to the infrastructure needs of the region and Rutland Town. At the present time, there are no proposals to relocate the Rutland Rail Yard within the Town of Rutland.

Transportation Strategies

The Town of Rutland continues to support local and regional transportation planning to address transportation issues in the Rutland Region. Improved transportation would enhance economic development and commerce opportunities within the Town of Rutland and the region.

- Continue to develop a transportation capital program that refines and advances the aims of this Plan.
- Require that streets and roads are designed to be accessible for all modes of transportation.
- Ensure that VTrans provides adequate funding and a satisfactory maintenance schedule for Rutland Town's roads and bridges by actively participating in the Rutland Regional Transportation Council (TAC) planning.
- Continue to develop and complete the improvements to existing Routes 4 and 7.
- Employ best practices of access management by requiring, when appropriate, joint use of curb cuts, restricting curb cuts where alternative access is appropriate and requiring that all new roads, all private roads and driveway intersections with town roads meet the Town's safety and design standards.
- Reduce transportation energy consumption and trips.
- During Subdivision review, encourage an interconnected network of streets and roads for all development.
- Implement park and ride lots as appropriate, working with the state where desired.
- Encourage public transportation access for all multi-family development.
- Encourage provisions for bicycles and pedestrians during subdivision review.
- Participate in any future Rutland City Rail yard relocation planning.
- Pursue state and federal funding to study, design and build a new local road connecting the signalized Cold River Road intersection with Farrell Road in an effort to preserve capacity on US Route 7 and to better facilitate the movement of vehicles for pleasure and commerce.

EDUCATION

Introduction

Educational facilities are a focal point of land use planning. They serve functions that support strong communities, however are the most expensive public facilities to operate and maintain. Rutland Town currently pays 83% percent of total property tax revenues for public education; therefore it is an important component of the Plan.

Goal:

To broaden access to educational and vocational training opportunities sufficient to ensure the full realization of the abilities of all Vermonters.

Although school planning is the domain of the School Board, the Planning Commission and the Municipal Development Plan have a very important and necessary role in planning for the future of local schools. Development in Town can have implications on school populations. The Planning Commission should work closely with the School Board to identify school capacity and ensure that any population growth in the Town is accommodated by school facilities.

Educational facilities are an important factor in future land use planning. Historically, schools have served as a focus of community identity and gathering. In many instances, local schools have served as meeting places for social organizations. Future growth should be focused near schools and schools shall be accessible for all modes of transportation.

Rutland Town School

The Rutland Town School Board presently operates one school: Rutland Town School. The school is located off of Post Road and accommodates students in kindergarten through grade eight.

The current Rutland Town School building was opened in 1967 and then expanded in 1971. Over the years there have been numerous additions and expansions. The school currently consists of 31 classrooms plus additional space for administration, music, art, science, technology education, computers, family and consumer sciences, physical education, cafeteria, library, and other uses. Students in Early Essential Education (pre-Kindergarten) through grade eight are served at the Rutland Town School.

Enrollment and Capacity: The student enrollment at Rutland Town School was 349 in 20132014, up from 347 the year before and well above the recent low of 321 in 2007. Figures over the past seven years have fluctuated, with a high of 368 students in 2010. The number of teaching staff stood at 36 in 2014, plus 14 instructional assistants.

According to school officials, the practical capacity of Rutland School is 500 students, a level that could be increased if space located on the second floor of the most recent addition is finished off. Given current enrollments and growth rates, facility capacity is not likely to present problems for the community in the near future.

Administration: Rutland Town School is part of the Rutland Central Supervisory Union along with Proctor High, Proctor Elementary, and West Rutland School (K-12). The Union is headed by a Superintendent. Each town in the district has its own school board and each school has its own principal. Elections for school board are competitive and there is excellent parent support and involvement in school programs.

High Schools and Vocational Training

Rutland Town has no high school of its own. The Town pays students' tuition at public schools. Typically, students attend schools in the neighboring communities of Rutland City, Proctor, Brandon, Clarendon, or West Rutland. In addition, some students attend Mount St. Joseph Academy, a private parochial high school. High School students wishing to attend other non-parochial high schools may do so, with the town covering costs up to the amount charged by the most expensive local high school.

Secondary Schools Accessible to Rutland Town High School Students

Rutland High School: Rutland High School is located at the corner of Stratton Road and Woodstock Avenue in Rutland City. The school, which serves grades 9 through 12, offers a diverse curriculum including advanced placement (AP) coursework and honors classes. During the 2013-2014 school year, Rutland High School had an enrollment of nearly 870 students. There are a total of 99 town residents attending Rutland High School.

Mill River Union High School: Built in 1975, Mill River Union High School occupies a fortyacre parcel on Middle Road in Clarendon. For the 2013 school year, Mill River Union High School had an enrollment of 526 students. There were a total of 22 Rutland Town residents attending Mill River Union High School in 2013.

Proctor High School: Proctor Junior-Senior High School is located on Park Street in Proctor. Enrollment for the 2013 school year is 139 and one town resident attends Proctor High School.

West Rutland High School: West Rutland High School is located on Main Street in West Rutland. For the 2013 school year, West Rutland High School had an enrollment of 330 students. There are a total of 2 Rutland Town residents attending West Rutland High School in 2013.

Stafford Technical Center: Sharing its location with Rutland High School, the Stafford Technical Center serves full time and part time students. The Stafford Technical Center offers a wide variety of educational experiences for individuals of all ages. The Center is open for day programs which serve both secondary students and adult students. Students from throughout the Rutland Region attend classes at the Center to complement their high school program. The facility is used in the evening for specialized industrial training offered by local companies for their employees. Adult evening programs are available.

Education Strategies

- Support the Stafford Technical Center in providing job skills to area students, and to support a stronger adult curriculum at the Center for retraining displaced adults.
- Encourage the schools to utilize local cultural, historic and natural resource areas as part of their educational programs.
- Encourage continued citizen participation on the local school board so as to maintain educational opportunities at optimum costs to the taxpayers.
- Continue to adequately maintain and upgrade present buildings and grounds.

ECONOMIC DEVELOPMENT

Introduction

Rutland Town is a substantial force in the region's economic health and vitality. The town has a thriving economy boasting high median household incomes and low unemployment rates. Rutland Town is home to a major industrial park, bustling commercial/retail activity, and numerous professional service jobs, government operations, working lands, and homebased businesses.

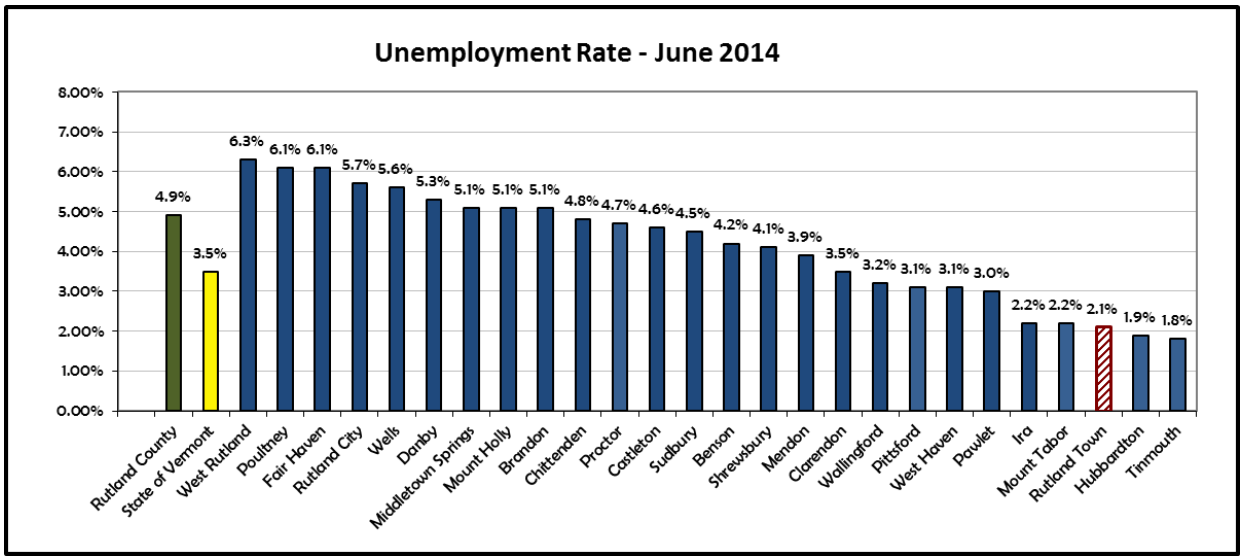
Goal:

To increase the economic vitality of the Town, including new business development that is balances with environmental concerns and the provision of public safety.

Rutland Town has a significant and growing economic base. The town's 2013 grand list includes 1,890 taxable properties valued collectively at $613.2 million. Of those, 257 valued at $242.8 million were commercial and industrial (additionally there is $226.3 million worth of machinery, equipment, and inventory) and 11 (valued at $5.6 million) were farm parcels. The remaining parcels were residential, utilities, and other miscellaneous properties. An increasing number and proportion of the town's tax base comes from residential properties, in part due to a statewide trend over the past 10 years towards increased residential property values and stagnant commercial ones.

Employment and Occupation

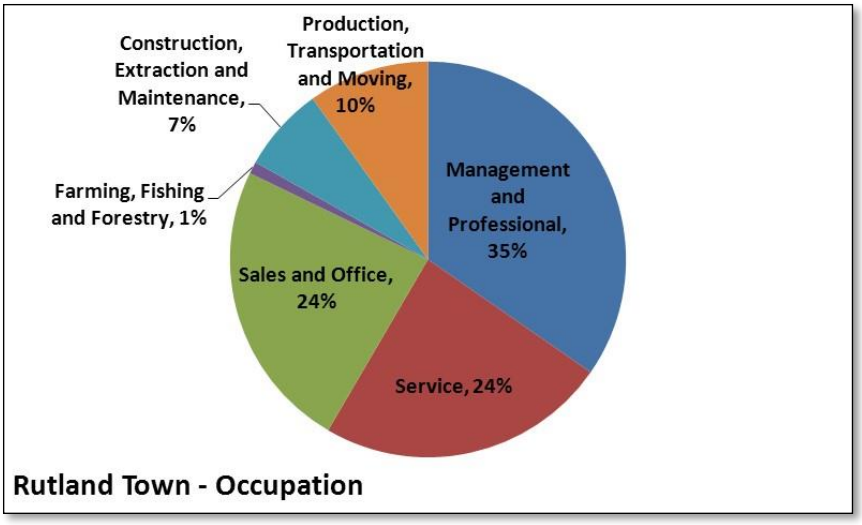
There were a total of 2,446 individuals in the civilian labor force and 296 individuals listed as being unemployed. There were 1,044 individuals not in the labor force. Rutland Town has consistently had one of the lowest unemployment rates in Rutland County.



Source: US Census, 2014

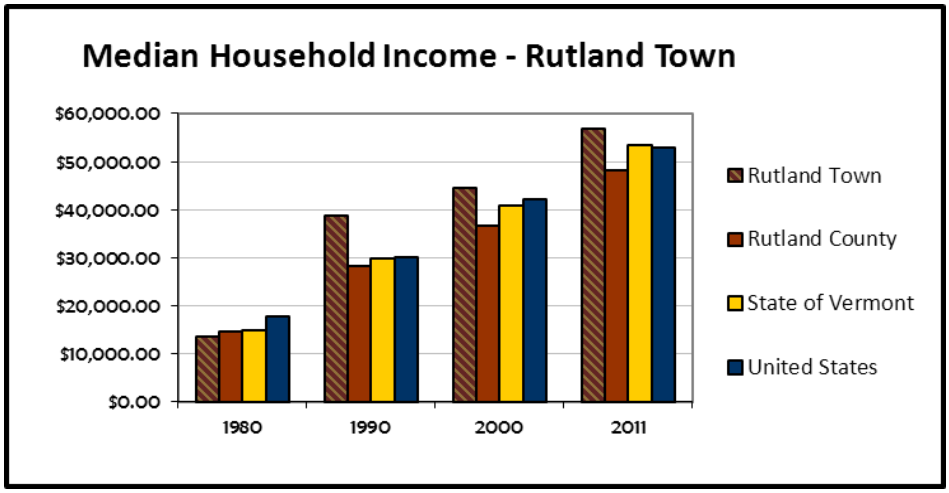
Residents of Rutland Town worked primarily in three employment fields in 2010: management & professional, sales and office and service.

Source: VT Dept. of Labor, 2014



The Town's employment base has undergone a dramatic shift in the past 25 years. The components of the two sectors – manufacturing and retail sales, respectively – have witnessed opposite trends. While manufacturing jobs accounted for nearly 65% of all jobs in the Town in 1992, and over 50% as recently as 1996, in 2005, they accounted for just 38% of all jobs in the Town. By contrast, jobs in retail have grown from just 12% of all jobs in 1992, to 24% in 2010. Even with the dramatic shift in occupations, the median household income for the town has remained higher than state and county averages for over thirty years.

In 2010, 93% of all jobs in Rutland Town were filled by people who lived within Rutland County. A total of 1,967 Rutland Town residents commuted to work: 1,852 drove alone, 115 carpooled, 77 walked, 19 used other means such as cycling and 40 worked at home. The mean travel time to work was 15. 6 minutes.



Source: US Census, 2014

Economic Development – Strengths, Weaknesses, Opportunities and Challenges

[Rutland Region Workforce Investment Board - 2005]

Strengths

- This part of Vermont is known for its hard work ethic. Rutland Town is no exception and the town's unemployment rate, perhaps for this reason, is very low.

- Rutland Town public officials have demonstrated their commitment to proactive economic development. They maintain an informative website, express a pro-growth attitude, and provide support to prospective developers during the Act 250 permitting process.

Weaknesses

- Rutland Town has limited capacity to directly provide wastewater treatment and water supply to its commercial and industrial areas. These services are provided through contractual agreements with Rutland City. This can cause some uncertainty for potential developers seeking extension of lines or new levels of service. It is also difficult for Rutland Town officials to control the fees.

- Rutland Town is currently a "one acre" town due to its lack of zoning regulations. This means that commercial/industrial development on more than one acre is subject to the Act 250 permit process. With zoning regulations, any substantial new commercial and industrial development on parcels under 10 acres could be exempt from the Act 250 permitting process, and permitting decisions made a the local level, if the legislative body elects to become a "ten acre" town. However, existing developments with an Act 250 permit on record would remain under the jurisdiction of Act 250.

- Transportation in this region, and within Rutland Town, is generally adequate. As the primary method of transport for goods and people, as well as emergency response, the road system is weakened by its limited redundancy (alternative routes). Needed freight rail line improvements, lack of an interstate highway, and limited and vulnerable road and bridges can present

challenges to the Rutland Region's economic growth. However, Rutland Town's commercial and manufacturing sectors occupy some of the best available locations with respect to transportation.

- The Population of Rutland County has remained virtually unchanged since 1990. The ability to find qualified employees is constraining business growth across industry sectors.
  Extensive interviews with the Region's employers have revealed that the availability of a trained workforce is limiting job growth. Skilled people, especially highly specialized professionals, set to retire are not easily replaced by the existing, younger workforce. This has resulted in some companies foregoing opportunities for expansion. In some sectors, there has been a need to import workers from outside the Region, including internationally.

- There are a number of highly visible properties in Rutland Town which were once in active commercial or industrial use that have fallen into disrepair, at times leaving a less than favorable impression of the area to people, including prospective developers.

Opportunities

- Seventy-four percent of all private businesses in the county are small, unincorporated businesses with owner operators and no employees. This region has a high rate of home-based businesses. From maple syrup producers to magazine editors, Rutland Town is home to many entrepreneurs using the Internet to conduct business and this sector has a vast potential for expansion.

- The Rutland region is located within less than one hour's drive from several small cities with strong economies that influence our area, notably Ludlow, Middlebury, Manchester, and Woodstock. Burlington, VT and Albany, NY – both sizable metropolitan areas – are within a couple of hours drive of this Region. Several major metropolitan centers including New York City, Montreal, and Boston are all within half-a-day driving distance.

- An inter-municipal committee exists that provides an opportunity for public officials from Rutland Town to communicate with public officials in Rutland City about key agreements and other matters.

- Stafford Technical Center has a flexible program design that seeks to meet the needs of local businesses by tailoring the training programs offered to students. It also offers evening programs to adults seeking to increase their skills.

- The area is home to four colleges: College of St Joseph, Community College of Vermont, Castleton State College and Green Mountain College. Vermont Technical College is within commuting distance. These schools are excellent assets offering programs that are responsive to community needs.

- Agriculture in the region is diversifying and changing, bringing new enterprises and direct marketing opportunities through expanded Farmers Markets and Community Supported Agriculture programs, as well as increased sales of local foods through more traditional retail outlets. This focus on "local foods" is increasing the economic viability of farms.

Challenges

- Numerous State regulations and legislative decisions have a direct impact on the town's economic future.
- High energy costs
- Waste disposal regulations

Economic Development Objectives and Strategies

Objectives

- **Improve business climate.** In order to foster a more favorable local economy, the available lands for development must be increased, delays and uncertainties in permitting process must be mitigated, and resources should be used to promote new business development and expansion.

- **Improve infrastructure.** Some of the most important projects fall into this category. Key areas of focus are strengthening the road and bridge network, improving rail infrastructure, increasing public transportation and bicycle and pedestrian network, and improving telecommunications.

- **Develop workforce.** The region's workforce needs to become more skilled and of higher quality, and needs to incorporate young professionals as well as non-traditional employees. This improved workforce will require higher wages, quality healthcare, and affordable childcare.

- **Support agricultural viability.** Agricultural viability depends on efficient distribution networks and a strong local market. There is a need to build infrastructure, such as processing facilities, to support year-round availability of local goods.

- **Proactive engagement with State Legislature.** There are a number of decisions that rest with the Legislature (such as allocation of transportation project dollars, passing along costs to municipalities, regulations) but which directly impact the town's ability to conduct economic development. In order to make an impact, Rutland Town needs to craft clear messages about what is in the town's best interest and bring that message to the Statehouse.

Strategies

- Identify community growth areas suitable for locating new firms that reflect the Region's value and quality of life.
- Seek resources to upgrade infrastructure, including roads, bridges, rail network, water supply, sewer, and telecommunications.
- Identify and assist in the redevelopment of vacant lots appropriate for infill development.
- Encourage design of commercial architecture in keeping with region's unique character.
- Identify opportunities for inter-municipal collaboration.

- Build agricultural viability by assisting efforts to improve distribution networks and necessary infrastructure.
- Help to create a region that attracts and retains young people and professional families.
- Continue to insist on governmental sensitivity to restrain and reduce increases in property taxation.
- Continue to fight for a drug-free community so as to protect the Town's children.
- Town officials should maintain support for operations of the prime identified employers.
- Establish a long-term water and sewer contract with City with favorable fee structures.
- Explore the development of more localized water and sewer systems.
- Recommend a review of local business taxes to determine if a revision is appropriate in order to be more supportive to new and existing businesses.
- Form a Legislative action group.
- Begin discussion with the City regarding creation of telecommunications infrastructure that will improve connectivity at a level of service needed by businesses.
- Support marketing efforts by the Rutland Economic Development Corporation and the Rutland Region Chamber of Commerce that represent the assets of Rutland City and Rutland Town as a package.
- Revisit the possible adoption of zoning for the Town so that more permitting decisions are made locally.

PUBLIC UTILITIES AND FACILITIES

Introduction

Public utilities and facilities play an important role in land use planning. These features, when combined with the transportation system, serve as the foundation for healthy communities and desirable land use and development patterns.

Goal:

***To plan for, finance, and provide an efficient system of public facilities and services to meet future needs; and to maintain and enhance recreational opportunities*.**

When planning future land use, it is crucial to understand where municipal facilities and infrastructure are currently provided and how much capacity they have to accommodate new growth. Once known, it is possible to plan for long-range growth needs at a reasonable cost to residents. In order to achieve its land use goals for a particular area, a community may need to explore the potential for initiating a new service. The service should only be supported if it encourages settlement patterns that provide tax revenues greater than the costs to maintain the service.

Town-owned land and buildings include the Town Hall on Business Route 4 in Center Rutland. They also include a two-acre cemetery alongside Business Route 4 in Center Rutland, an eight-acre cemetery at Cheney Hill, a nine-acre parcel purchased to provide access to an anticipated water project off Park St., the Community Center on a 1.1 acre site on Cedar Avenue, and 11 acres of land off Route 7 in the northern section of the town.

Sewer, Water, and Waste Disposal Facilities

Municipal utilities can be viewed, in most instances, as the basic building blocks for growth areas. Improvements to municipal utilities will also be influential in guiding decisions regarding economic development and housing. Businesses and industries are naturally drawn to these systems when choosing a site location within a community. Municipal water and sewer systems in particular also make it possible to permit higher development densities, which can help reduce housing costs. The town is presently working with the Town of West Rutland on a combined sewer and water project, which would provide service to all properties in the corridor along Business Route 4.

Sewage Disposal: There are several separate sewerage systems in Rutland Town. These systems include Center Rutland Fire District #1; extensions of Rutland City sewer system; and the Alpine Pipeline sewer along Route 4.

In addition, the Town of Rutland currently provides wastewater collection to areas in the southern, western, and northern quadrants of the Town. In the south and north, these systems serve commercial, industrial, institutional and educational, and residential uses, while in the west, it serves primarily residential and manufacturing users.

Treatment of wastes collected through these systems takes place at the Rutland City Sewage Treatment plant. Residential town users pay a rate per contract with the City would sunset for a given user after ten years to a reduced rate. An ad valorem tax applies to any business in Rutland Town which connects to the public sewer system. The business pays 5 times the city base rate for a period of 10 years. Additionally, the business has to pay the City 20% of the real estate taxes paid to the Town. As a result, the business pays 120% real estate taxes for a period of 10 years. After 10 years, the sewer rate reverts to the city rate and the additional real estate tax ceases. These additional costs apply to new businesses and to any existing Town Business that increases their wastewater discharge above what had been previously approved.

The rest of the town uses on-site septic systems for waste disposal. According to the US Census, in 2000 over 80 percent of all housing units disposed of septic wastes via in-ground septic systems. All Wastewater systems are permitted through the State of Vermont Department of Environmental Conservation.

The Town of Rutland operates and maintains its sewer lines through revenues available in the Sewer Operation & Maintenance Account and the Sewer Escrow Account. The Town of Rutland established a Capital Reserve Fund in conformance with 24 VSA 4756(4). The purpose of this fund is to provide for the repair, replacement and future upgrade of the wastewater collection facilities.

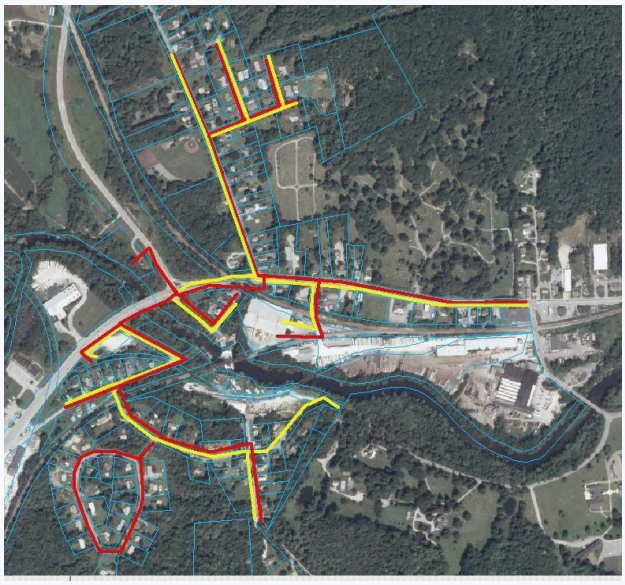
Water: Town water service along US 7 South is the result of a 1992 Inter-municipal Agreement with Rutland City. Town residents or businesses wishing to purchase City water are required to apply to the City Board of Aldermen. Effective June 20, 2008 Town water users pay $4.311 per 100 cubic feet or 748 gallons of drinking water. The Rutland City water filtration system is located in the easternmost edge of Rutland Town.

The Town has generally been developed with small water systems built by the developers of the land. The majority of these private systems have been developed in connection with residential subdivisions.

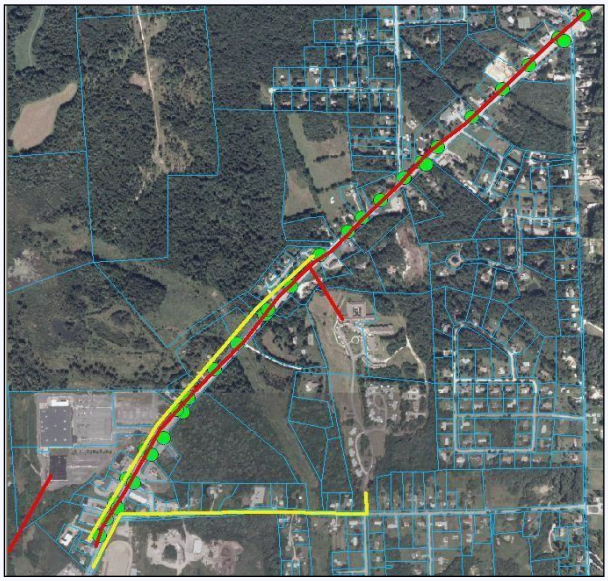
Special purpose municipalities known as Fire Districts serve many other residents and businesses, and "there are limited areas where the Town has provided or acquired water mains to service some customers using an interconnection to the Rutland City water system." Historically, Fire Districts were established in mixed-use areas such as Center Rutland (which is served by Fire District 1) or in larger residential areas. In recent years, however, a number of new Fire Districts were created or proposed as smaller private water systems sought ways to comply with new federal water system regulations. Those in the Town not served by water districts or community systems obtain water on-site using wells or springs.

Public water lines (in yellow) and sewer lines (in red) in Rutland Town

Business Route 4 West of Rutland City

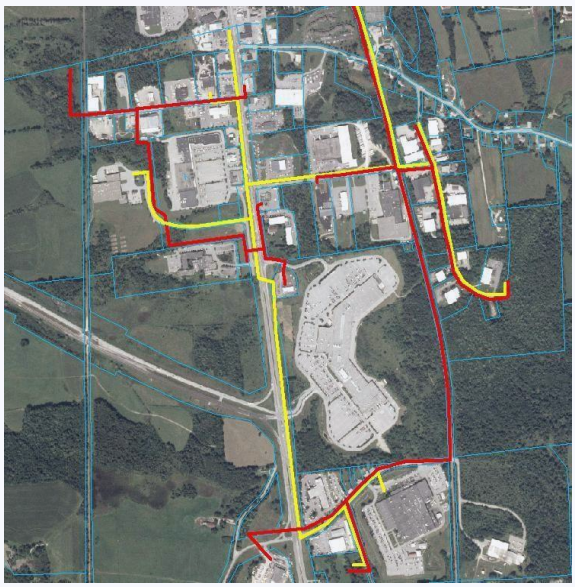


Route 4 West Northeast of Rutland City



Route 7 North of Rutland City

Route 7 South of Rutland City



Solid Waste Disposal and Recycling

The Town of Rutland operates a municipal Transfer/Recycling facility adjacent to the former landfill in Northwood Park. The landfill was closed and capped in November 1993 pursuant to state environmental regulations. Solid waste collected at the facility is hauled by a contractor off-site for disposal. Recyclable material is collected and processed by the Rutland County Solid

Waste District. Currently, residents may recycle the following materials: newspaper, cardboard, tin and aluminum, glass, clear and colored HDPE plastic, PET plastic, and white office paper, magazines, and catalogs.

In 2012, Act 148 - Vermont's Universal Recycling Law was passed. The intent of the law is to divert recyclable items, leaf and yard debris, and food scraps from landfills. By July 1, 2015 recyclables will be banned from landfills; by July 1, 2016 leaf and yard debris and clean wood waste will be banned from landfills; and by 2020 food scraps will be banned. Facility owners and trash haulers will need to collect and manage these wastes accordingly. The Town will have to work with the District to ensure compliance with Act 148. The Town of Rutland is a member of the Solid Waste Alliance Communities.

Sewer, Water, and Waste Disposal Strategies

1. Continue to adequately maintain and upgrade present buildings and grounds.
2. Provide sewer and water facilities in areas where the Town deems growth is desirable.
3. Continue developing and protecting underground water supplies.
4. Explore further cooperative agreements with surrounding towns to reduce negative fiscal impacts on the Town.
5. Monitor use of sewer allocations.
6. Study costs/benefits of extending existing sewer lines; continue to work cooperatively with the City of Rutland.
7. Continue recycling efforts.

EMERGENCY MANAGEMENT

Introduction

The analysis of emergency services is important to local land use planning as they are the basic municipal services to residences as well as commercial and industrial uses. Emergency services should be encouraged to locate in or near areas where existing development is concentrated

Goal:

To continue to provide and improve the current level of fire, police and emergency services to all town residents.

Typically, the most of vital services that local governments provide are emergency services. These services consist of the fire protection, rescue and ambulance services, and law enforcement. Together, these services form the core of the town's emergency management team, alongside town administrators and elected officials.

Emergency Management Planning

Having emergency services available is among the basic needs of residents in Rutland Town. The Town strives to be active in all four phases of emergency management:
mitigation, preparedness, response and recovery.

Mitigation: Mitigation means taking action before the next disaster to reduce losses of life and property. In 2004, the Town adopted an Annex to the Rutland Region All Hazards Mitigation Plan. The Annex identifies the natural and human-caused hazards that affect Rutland Town, and outlines mitigation actions and projects that the Town will undertake to reduce damages from future incidents. Having a FEMA approved hazard mitigation plan increases the Town's funding level from the State Emergency Relief and Assistance Fund, and allows the Town to access Federal Hazard Mitigation Assistance.

Preparedness: Preparedness involves activities and measures—such as training, plans, procedures, and equipment—taken in advance of an incident to ensure effective response. The Town has an appointed Emergency Management Coordinator, who is responsible for coordinating the various components of the emergency management system. One of the EMC's core functions is to maintain an up to date Local Emergency Operations Plan (LEOP). Rutland Town's LEOP was last updated and adopted on April 22, 2014 and it **Source: Taino Consulting Group** replaces the Basic Emergency Operations

Plan. The LEOP identifies emergency shelter sites: Rutland Town School and the Leahy Center at the Rutland Regional Medical Center. Also listed in the plan are high risk populations, vulnerable areas, emergency contacts, local emergency operations center sites (Joseph J. Denardo Fire Station, Rutland Town Municipal Offices, Mckinley Ave. Fire Station, etc.) The Local Emergency Operations Plan should be reviewed annually and updated and readopted as necessary by May 1st.

Response: Response activities address the short-term, direct effects of an incident and seek to save lives, protect property, and meet basic human needs. In Rutland Town response services include fire protection, rescue, and public safety/police.

Fire protection in Rutland Town is provided by volunteer fire department with assistance from surrounding municipalities under mutual assistance agreements. Many members of the Department have received over two hundred hours of training outside the department. This training has included courses in first aid, CPR, pumps, buildings construction, fire behavior, alarm systems, emergency vehicle operations and operations level Hazardous Materials training.

Facilities maintained by the Department include two fire stations, one on McKinley Avenue and another in Center Rutland. The Department continues to make facility improvements at both stations. A new Center Rutland Station was built in 2014 and the McKinley Avenue station was recently connected to a sewer line.

The Town's Police Department consists of 4 police officers, 2 of whom also serve as Town Constables and a third is a special officer. The Vermont State Police are also available, particularly for daytime calls. The State Police are dispatched from the local state police barracks, which is located in Rutland Town.

The Town uses the services of EMTs and paramedics through the Regional Ambulance Service. The RAS serves 12 communities. Replacement of vehicles and equipment takes place on an ongoing basis.

The Rutland Regional Medical Center is located in Rutland City and is a distance of approximately one to five miles for most Rutland Town residents. The hospital is a major facility.

New Center Rutland Fire Station constructed in 2014

Rutland Town is fully participating in the Enhanced 911 Emergency Response Program. All calls for emergency services are handled by a central dispatch center that automatically knows the location of the person making the call.

Recovery: Recovery is the process of rebuilding, restoring, and rehabilitating the community following an emergency. The town maintains records of cost incurred in the recovery from disasters, including road and culvert repairs. This information is reported to Vermont Division of Emergency Management and Homeland Security, and the local Agency of Transportation. The district office helps the state to apply for presidential declarations of disaster in larger events and can make the town eligible for substantial reimbursement of costs.

Emergency Management Strategies

- Continue to financially support the volunteer Fire Department, Town Constables and emergency response services.
- Continue to recruit new members to the volunteer Fire Department.
- Continue to provide specialized training as needed for Town Fire and Police services.
- Review and re-adopt the Town's emergency response plan annually.

- Review and re-adopt the hazard mitigation plan every five years.

FLOOD RESILIENCE

Introduction

Flood events are Vermont's most frequent and costly type of natural disaster. There are two types of flooding that impact communities in Vermont: inundation and flash flooding. Inundation is when water rises onto low lying land. Flash flooding is a sudden, violent flood which often entails fluvial erosion (stream bank erosion). The combination of flash flooding and fluvial erosion cause the most flood-related damage in the state. According to the Vermont Division of Emergency Management and Homeland Security, the state incurred costs of more than $850 million from Tropical Storm Irene. Prior to and since Irene, Vermont has experienced more frequent and severe flooding and will likely continue to in the future due to climate change.

Goals:

- ***Protect the citizens, property, economy, and quality of the Town's natural resources by using sound planning practices to address flood risks.***
- ***Ensure the Town is able to recover from flooding quickly and in a manner that improves flood resilience.***
- ***Encourage development in Town that does not worsen flooding, and restore natural river functions.***

Mapping Flood Hazard Areas

To meet the new state requirement of identifying flood hazard and fluvial erosion areas and designating areas to be protected, maps are an essential aid. Because the methods of mapping inundation and fluvial erosion corridors differ significantly, river corridor maps are a critical addition to existing flood hazard maps.

The National Flood Insurance Program (NFIP) was created by the Federal Emergency Management Agency to address inundation hazards. Flood insurance rates are based on Flood Insurance Rate Maps (FIRMs) or Digital Flood Insurance Rate Maps (DFIRMs) which delineate areas of the floodplain likely to be inundated during a flood. These are identified as a Special Flood Hazard Area (SFHA) or with a 1% annual chance of flooding. Town participation in NFIP is voluntary. In Vermont, two thirds of flood damages occur outside of federally mapped flood areas.

Vermont's River Corridor and Floodplain Management Program, developed by the Vermont Agency of Natural Resources (ANR), delineates areas subject to fluvial erosion. River corridor maps are designed with the recognition that rivers are not static. A certain amount of erosion is natural when Rutland Town floods because of the town's relatively steep terrain and frequent

storms. Development in the river corridor and stream channel engineering over time have increased channel instability. While these management practices may create the illusion of stability, these engineered channels when tested by a high flow cannot be maintained. Special mapping and geomorphic assessments can identify fluvial erosion hazard areas along rivers.

Numerous rivers and streams in Rutland Town have undergone Stream Geomorphic Assessment (SGA), and in some cases River Corridor Management Plans have been developed. These studies and plans are vital in determining river and stream alterations, which affect water flows and could potentially lead to future flood damage. The SGAs and River Corridor Plans suggest potential remediation actions that can be taken to reduce the risk of future flood damage including, planting stream buffers, stabilizing stream banks, removing berms, removing structures and restoring incision areas. Unmapped River Corridors/Fluvial Erosion Hazard (FEH) Areas of Rutland Town should be included in this Town Plan as they become available.

History of Flooding

Flood events are Vermont's most frequent and costly type of natural disaster. There are two types of flooding that impact communities in Vermont: inundation and flash flooding. Inundation is when water rises onto low lying land. Flash flooding is a sudden, violent flood which often entails fluvial erosion (stream bank erosion). The combination of flash flooding and fluvial erosion cause the most flood-related damage in the state. According to the Vermont Division of Emergency Management and Homeland Security, the state incurred costs of more than $850 million from Tropical Storm Irene. Prior to and since Irene, Vermont has experienced more frequent and severe flooding and will likely continue to in the future due to climate change.

The worst recurring flooding problems tend to cover the roads and disrupt traffic flow, but these are slow rising waters and damage to the roads, culverts etc. is typically minimal. Frequent problem areas include:

- Route 7 in the vicinity of a bridge over East Creek in the north section of Rutland Town (near Post Road).
- Business Route 4 in the vicinity of one of the Fire Stations (near the intersection of West Proctor Road).
- In the vicinity of the Fire Station on McKinley Avenue. The Fire Station itself is on high ground, raised above the floodplain. However, a State Police barracks, DMV and VTRANS garage are all located along State Place raised above the base elevation taking it outside of the floodplain – though technically surrounded by floodplain lands. The Fire Station is designated as a place to relocate State Police operations in the event flooding becomes a problem.

Flood Hazard Area Regulations

The Town's Flood Hazard Area Ordinance (adopted in 1999) meets requirements for participation in the NFIP. The bylaws, however, could improve flooding and fluvial erosion by avoiding new development/fill/removal of wetlands in the River Corridor or Special Flood Hazard Area. The current flood hazard regulations do not qualify the Town for favorable (17.5%) state reimbursement rates after disasters as established in the Emergency Relief and Assistance Fund (ERAF) rules.

E-911 mapping from July of 2013 indicates that 30 structures in Rutland Town are within the SFHA (1% annual chance of flooding) as identified on the Rutland County DFIRM dated 2008.

NFIP Participation

Rutland Town received a flood hazard boundary map in February of 1975 and joined the National Flood Insurance Program on September 29, 1978. The town's Flood Insurance Rate Map and Flood Insurance Study were first published in September of 1978. The Rutland County DFIRM became effective in August 2008. The hydrology and hydraulics were updated in the DFIRM.

As of September of 2013, the Town has 10 flood insurance policies in the SFHA, and 4 additional policies in town, through the NFIP. In total, these policies cover $2,674,500 in value. Flood insurance is available for any structure in town regardless of previous losses or location. The cost of flood insurance premiums rises in areas identified at a high-risk level. Flood insurance is not required where property (but not a structure) is in a flood hazard area.

Local Hazard Mitigation Plan and Local Emergency Operations Plan

The Rutland Town Local Hazard Mitigation Plan (LHMP) was adopted in 2004 as an Annex to the Rutland Region All-Hazards Mitigation Plan. Since the plan expires after 5 years, and since the Annex was not updated and re-adopted, the LHMP has expired. The Town should seek resources to update, gain FEMA approval, and adopt an LHMP. The LHMP identifies known hazard issues in town and allows the Town to seek FEMA Hazard Mitigation Assistance funds.

Rutland Town's Local Emergency Operations Plan (LEOP) was adopted in April of 2014 and is reviewed annually. The LEOP encourages flood preparedness and identifies a process for response planning.

Lands that Minimize Flooding

River corridor assessments aid communities in making knowledgeable and strategic decisions about how to best protect, manage, and restore watershed resources. Riparian buffers reduce flood hazards and stabilize stream banks, attenuate floods, provide aquatic and terrestrial habitat and wildlife corridors, filter runoff, absorb nutrients, and shade streams to keep them cool. Wetlands also prevent flood damage and are a vital component for maintaining the ecological integrity of land and water. In addition, upland forests also moderate flood impacts and attenuate flood impacts. Steep slopes, on the other hand, can be a detriment during flooding by amplifying water volume and velocity in rivers and streams. These natural features are identified on the Rutland Town Natural Resource Maps where are hereby adopted with this Plan. Development in these areas shall be avoided.

Because impervious surfaces prevent the infiltration of water into the soil, these man-made surfaces exacerbate flooding by increasing the amount and velocity of stormwater runoff, particularly in areas where these surfaces are prevalent.

Flood Resilience Strategies

1. **Identify all flood areas -** Areas not designated in FEMA's maps or in VT's ANR's maps, but which are flooded during a weather event, should be added to local flood regulations.

2. **Study River Corridors -** To identify areas subject to normal channel erosion processes and avoid loss of floodplain functions, the Town should seek a geomorphic assessment of its rivers and creeks to secure River Corridor Plans and River Corridor (FEH) delineations.

3. **Study Setbacks and Buffers -** In the absence of field-based river corridor assessments, the community will use setback and buffer standards to address hazards, water quality, and habitat impacts using Vermont DEC setback recommendations. Keeping structures 50 feet back from the top of stream banks is the recommended state minimum.

4. **Identify wetlands -** Work to develop more consistent, accurate and thorough identification of wetlands areas through the use of best available data and the adoption of local wetlands regulations and updated maps.

5. **Enhance flood hazard regulations to protect wetlands -** Require all wetlands which provide flood storage functions remain undeveloped or have compensatory storage constructed so as to achieve no net loss and, for the long term, restore and enhance additional wetlands to improve town's flood resilience. Prohibit structural development or intensive land uses in Class I or Class II wetlands unless there is an overriding public interest.

6. **Identify other lands to prevent flooding -** Maintain vegetated buffer strips in riparian zones surrounding streams and rivers. Maintain upland forests and watersheds for predominately forest use. Require new development to preserve vegetated riparian buffer zones that are consistent with state riparian buffer guidelines.

7. **Restore natural river functions -** Work with RRPC, ANR, towns and landowners to lessen flood risk by reconnecting river channels to historic floodplains through berm or dam removal or intentional lowering of stream banks.

8. **Discourage new fill, construction and infrastructure in flood hazard and fluvial erosion areas:**

    - Prohibit fill and new buildings within river corridors
    - Require all new buildings, other than accessory structures, in mapped flood areas, to have the lowest floor at least one foot above base flood elevation.
    - Emergency services, wastewater treatment plants, power substations, and municipal buildings shall not be built in special flood hazard areas unless flood-proofed or elevated to at least two feet above the base flood elevation and designed to withstand erosion risk.
    - Adopt road and bridge standards to the 50 or 100-year storm level for identified critical transportation routes.

9. **Reduce percentage of impervious surfaces -** Limit the number of rooftops and pavement, by using permeable surface materials, employing disconnection practices, by implementing Low

Impact Development (LID) principles, and other methods to increase stormwater retention and infiltration.

10. **Update Flood Hazard Regulations -** Update flood hazard area and river corridor standards to meet standards in the current Vermont flood hazard area regulation model #4. The Town should work with the RRPC to update its flood hazard regulations and secure geomorphic assessments and River Corridor data.

11. **Encourage green infrastructure techniques in subdivision regulations**

12. **Explore the removal or renovation of structures in flood areas -** Existing homes and businesses at serious risk of flood damage should be identified and prioritized by the town for mitigation actions such as elevation/relocation or purchase and demolition.

13. **Hazard Mitigation Planning -** Recruit and support a community committee to pursue flood hazard mitigation efforts.

14. **Emergency Operations Planning -** Develop and maintain a Local Emergency Operations Plan annually and work with first responders and the highway department to plan improved emergency response capacity (operations, training, and equipment) during natural disasters as identified in the Local Emergency Operations Plan.

15. **Education -** Establish and sustain a flood hazard area education and outreach effort to support flood damage mitigation and better insure community residents and property for future flood damage.

RECREATION

Introduction

Recreational facilities are a major factor to consider when developing a municipal plan. It is important to ensure that as a community grows, recreational resources are available and accessible.

Goal:

Maintain and enhance recreational opportunities in Rutland Town.

Facilities and Programs

Recreational facilities owned or administered by or through the Town include: Del Bianco Park at Dewey Field, Northwood Park, the Town Forest, Rutland Town Elementary School. In addition, the Spartan Arena, owned by Castleton State College, is located in Rutland Town at the Diamond Run Mall.

Rutland Town's parks and recreation facilities are supervised by a part-time Rutland Town Recreation Commission Director. They are responsible for administration and coordination of recreational programs, provision and maintenance of recreational facilities and identification of future recreational needs. A number of improvements have been made to Town parks over the past ten years. Two new soccer fields were built; construction of a multi-use recreation path separated from vehicle traffic is underway, and Northwood park's hiking paths are being extended. Additional accessible hiking and skiing paths are still needed, however.

Recreation Strategies

- Expand opportunities for adults to recreate together by offering more adult recreation programs.
- Require recreation facilities and dedicated open space lands during subdivision review.
- Develop a comprehensive aquatics program to make maximum use of Northwood pool, including instruction, competition, water carnivals, water ballet, etc.
- Organize sports leagues to serve Rutland Town residents.
- Continue development of Northwood in accordance with the master plan as approved by Act 250 for the site.
- Explore camping, trail, and nature study uses of the Town Forest property.
- Explore ways to ensure continued access to private property (e.g. Pine Hill, Boardman Hill, Otter and East Creeks) for recreational pursuits such as hiking, snowmobiling, cross-country skiing, biking, canoeing.
- Continue to receive input from residents to better determine interests and needs.
- Work to provide additional parking at Del Bianco Park and Dewey Field.

TELECOMMUNICATIONS

Introduction

Recent advances in wireless communications technology have resulted in a new generation of telecommunication services. Telecommunication towers and related infrastructure require careful consideration, as these structures tend to be located on highly visible locations on such as buildings, water towers and other similar structures; and in environmentally sensitive natural areas such as mountaintops and ridgelines.

Goal:

Provide for the establishment and/or expansion of telecommunication services within Rutland Town, while protecting neighborhoods and minimizing adverse visual and operational effects through careful design, siting and screening.

There are currently several telecommunication facilities located in the town. By virtue of its location, Rutland Town may be described as part of communications and transportation hub of the Rutland Region. Rutland Town is located at the center of Rutland County between the Towns of Pittsford, Mendon, Clarendon, West Rutland, and Proctor. Contained within the center of the Town lies the City of Rutland, the most populous municipality in the Region.

Rutland Town also encompasses the crossroads of two major highway arterials and three historically separate railroad lines, and lies just north of the Rutland State Airport. As a result of the location of these features relative to the Region's center for population, commerce, and transportation, Rutland Town is a desirable location for telecommunications facilities.

The State of Vermont Public Service Board and District Environmental Commissions have jurisdiction over the permitting of telecommunications facilities. The Town of Rutland has also adopted a Telecommunications Ordinance. The Telecommunications Ordinance and sentiments of this Plan are to be given substantial deference during the review and permitting of telecommunications facilities.

Telecommunications Strategies

- All telecommunications facilities shall be located in appropriate areas, respecting the integrity of residential areas, aesthetic concerns and natural resources areas.
- Wherever possible, facilities shall be co-located at or on existing structures or facilities.
- Towers and related facilities shall only be as tall as absolutely necessary and designed to blend in with their surroundings.
- Towers and related facilities shall be designed to avoid potential damage to adjacent properties from tower failure through engineering and careful siting of tower structures.
- Unless required by the FAA, towers shall not be illuminated. Where required, lights shall be shielded to minimize impacts, and so that light is cast only where needed.
- Electric or transmission lines shall be installed so as to minimize aesthetic and ecological impacts. For example, clear-cut swaths, created for power lines or access roads which go straight up the mountainside, often create more adverse impacts than the towers they serve, and are not acceptable.
- Regularly review and update the Town's Telecommunications Ordinance. Specifically, identifying sites where new telecommunications facilities are prohibited.

RUTLAND TOWN ENHANCED ENERGY PLAN

The purpose of the Rutland Town Energy Plan is to conduct comprehensive energy planning at the local level while also achieving state energy goals – most importantly, the goal to have renewable energy sources meet 90% of the town's energy needs by 2050. This in-depth energy planning is essential for addressing three crucial issues for the people of Rutland Town: energy security, environmental protection, and economic needs and opportunities. Rutland Town recognizes that as

conventional fuel resources dwindle, future resilience relies on lowering dependence on imported, non-renewable fuels, tapping local energy sources for enhanced self-reliance, and improving efficiency while maintaining a standard of living residents are accustomed to.

The State of Vermont has adopted a set of ambitious energy goals through its Comprehensive Energy Plan (CEP) which was updated in 2016. To help communities reach the sustainable energy future envisioned by the CEP, a central goal is to attain 90% renewable energy by 2050.

Rutland Town Energy Goals and Policies:

- Decrease overall energy consumption through conservation and efficiency;
- Reduce reliance on fossil fuels and imported energy sources;
- Develop renewable energy resources locally.

However, to achieve this goal, development of new renewable energy sources will not be enough. Since renewable sources yield less energy per unit than fossil fuel-based counterparts, a drastic reduction in overall energy consumption is critical to meeting this target.

VT Energy Goals and Policies (CEP 2016):

- Obtain 90% of energy for all uses from renewable sources by 2050;
- Reduce greenhouse gas emissions to 50% below 1990 levels by 2028 and 75% by 2050;
- Rely on in-state renewable energy sources to supply 35% of energy use by 2025;
- Improve energy efficiency of 25% of homes by 2025;

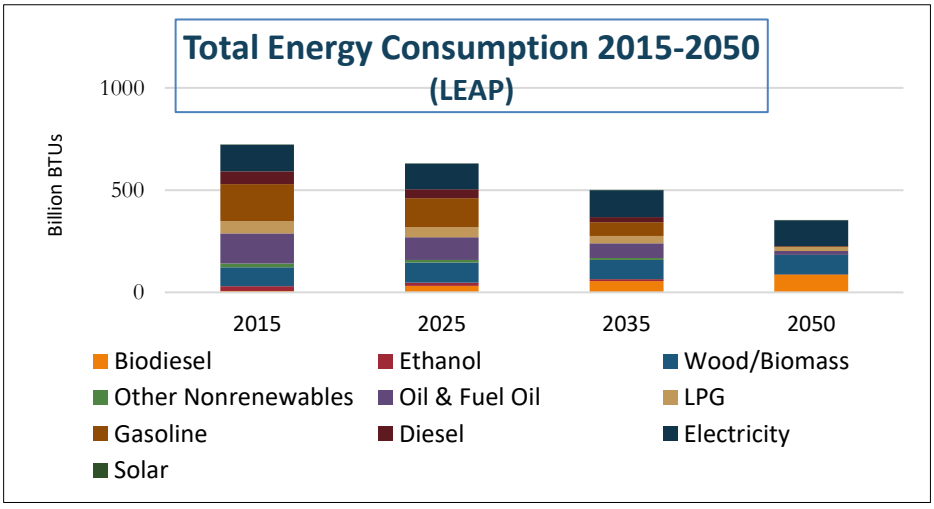
A critical facet of improved efficiency will be a greater reliance on electricity to power everyday needs. Since electricity can be generated from renewable resources and electric-powered technologies such as heat pumps and electric vehicles are highly efficient, switching to electricity will help lower overall energy consumption while at the same time, maintaining current lifestyles in Rutland Town. According to the 2016 Vermont Comprehensive Energy Plan, significant growth in electricity consumption is expected and will total 60% of all energy will be supplied through electricity by 2050.

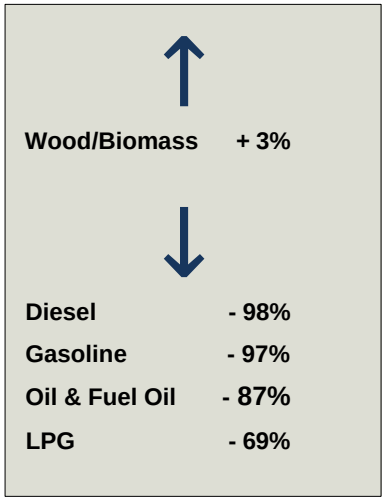
Courtesy: Rob Stubbins Solar Energy

This energy plan is intended to provide the residents and local leadership of Rutland Town with the information and strategies needed to maintain a vibrant community in coming decades while the energy sector is transformed to better preserve the environment, lower energy costs, promote local renewable energy development, and enhance the town's self-reliance.

Current and Future Energy Use

The draft Rutland Regional Energy Plan (2017) estimates current and future regional energy consumption using a computer modeling program known as LEAP (Long Range Energy Alternatives Planning System) that was developed by the Vermont Energy Investment Corporation. Rutland Town's estimates are based on these projections. The town uses nearly 721 billion BTUs (British Thermal Units) per year and should aim to reduce consumption to about half that or 353 billion BTUs by 2050.





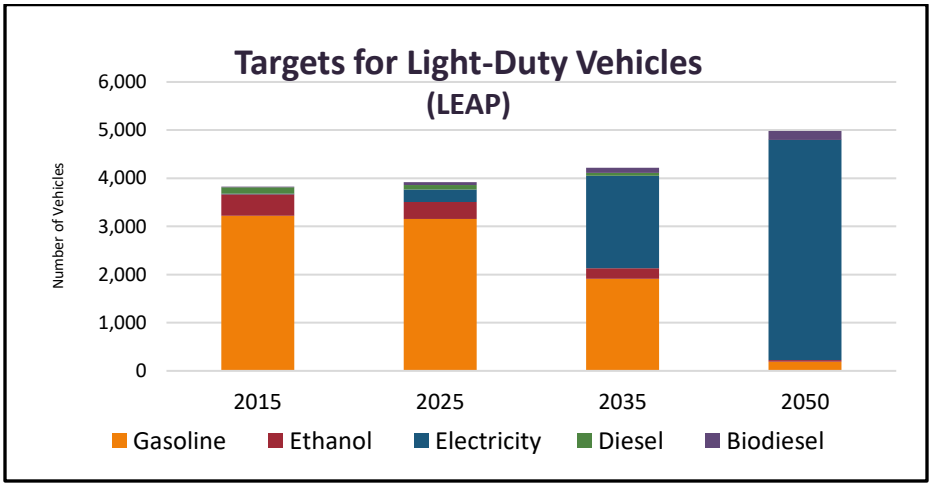
Energy use can be grouped into three major sectors: transportation, thermal (heating and cooling) and electricity. Rutland Town's 1,815 households and 115 commercial entities consume significant amounts of energy for transportation and to power equipment, to heat space and water, and to power lights and appliances with electricity. Rutland Town could see significant savings in energy consumption and costs by adopting conservation strategies, replacing

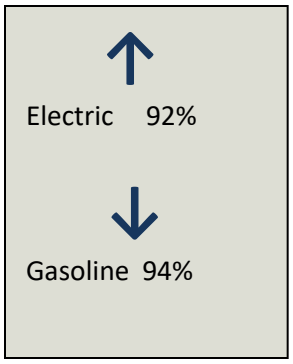
outdated appliances and switching to more efficient technologies, and participating in weatherization programs. By looking at consumption in three categories within these sectors – light-duty transportation, residential and commercial heating, and electricity use – a clearer picture emerges about what impact the town can have on overall energy use and in meeting the state's energy goals.

Transportation Energy Use

In Rutland Town, as in other municipalities in Vermont, transportation consumes the most energy of any sector. There are an estimated 3,102 light-duty vehicles in the town traveling 37 million miles a year - at a cost of more than $4 million a year and at a consumption rate of 241 billion BTUs. In Rutland Town, an average of $1,135 a year per capita is spent on gasoline. Of the 2,176 residents in the labor force, 1,770 (or 81%) drive to work alone.

In the next few decades, total energy for transportation will fall gradually to about 35% of current levels for light-duty vehicles. The efficiencies of electrification and a switch to biodiesel will account for much of this reduction. By 2050, electric vehicles are estimated to comprise more than 90% of the light-duty fleet in Rutland Town. It is expected that by 2050, there will be 4,573 electric light-duty vehicles in the town, up from 256 in 2025 and 1,922 in 2035. This represents less than 1% (.07%) of the fleet of light-duty vehicles in 2025; 46% in 2035; and 92% in 2050.





Requiring more compact land use patterns is an excellent means for towns to reduce vehicle mileage and consumption of fuel. Rutland Town is committed to promoting multi-use land use (housing mixed with commercial) in future development. The town also is committed to reducing energy use in transportation and will lead by example by purchasing electric or biodiesel vehicles (when feasible), encouraging the use of public transit, offering more park-and-ride opportunities and installing EV charging stations.

Residential and Commercial Energy Use

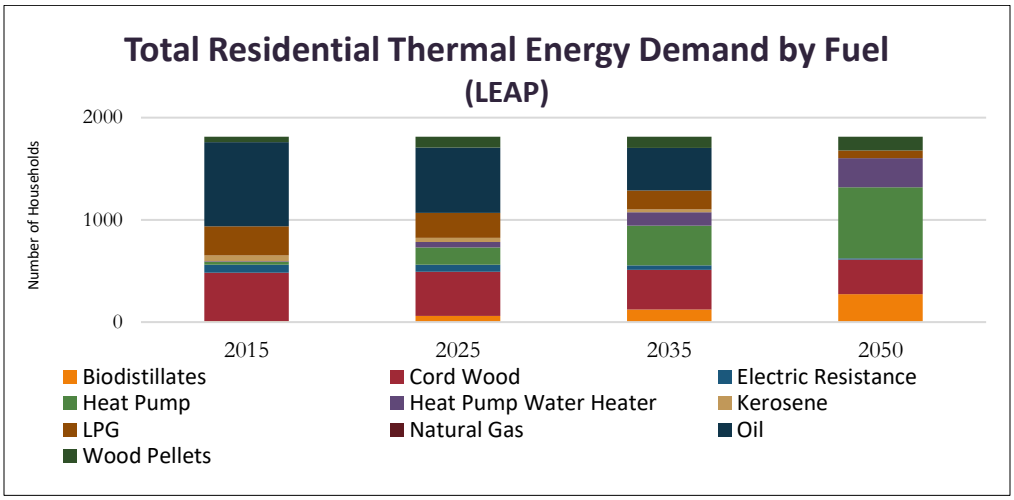
For the seven-month heating season, more than 70% of Rutland Town homes are heated with oil. With the projected future shortage of fossil fuels, it would be in the town's best interest to become less reliant on these sources of heating fuel and switch to efficient heating systems powered by local resources.

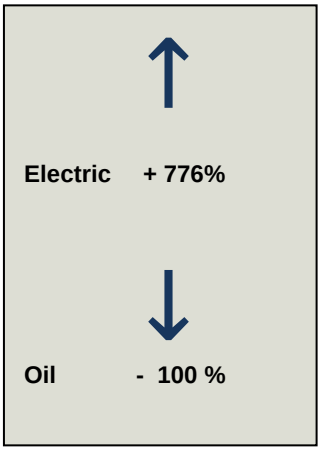
Current Rutland Town Residential Heating Energy Use (American Community Survey, US Census, 2011-2015)

Fuel	# of Households	% of Households	BTUs (in billions)
Natural Gas	65	3.6%	5
Propane	165	9.1%	15
Electricity	100	5.5%	6
Fuel Oil	1,314	72.4%	130
Coal	-	0.0%	0
Wood	163	9.0%	18
Solar	-	0.0%	0
Other	8	0.4%	1
No Fuel	-	0.0%	0
Total	**1,815**	**100.0%**	**176**

Conservation

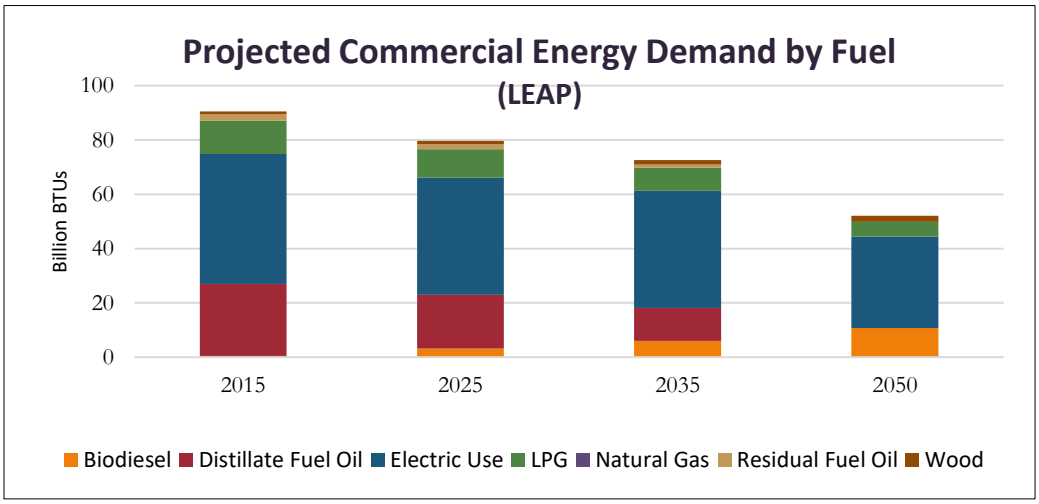
LEAP modeling shows how the town can conserve energy by transitioning to renewable energy sources for both residential and commercial structures through the increased use of bio-distillates and electricity. The use of fuel oil for heating drops precipitously in this modeling.





Currently there is an estimated 115 commercial establishments using about one Billion BTUs of thermal energy use per establishment for a total of 83 billion BTUs a year in Rutland Town. Energy use is projected to decrease due to less use of fossil fuels and a heavier reliance on more efficient

renewable sources such as biodiesel. Due to efficiencies, overall energy use declines, but as a percentage of overall energy use electricity increases by 2050.



Wood + 100%

Electric Use - 29 %

By switching fuels and relying on efficient heat pumps systems for both residential and commercial, the town's target is 185 units by 2025; 485 by 2035; and 942 by 2050. Conversions to new efficient wood heat systems are projected to decrease and be phased out in some cases for both residential and commercial uses, going from 19 units in 2025; to -17 in 2035; and to -29 in 2050.

The projected growth in the percentage of heating energy use coming from renewable sources is sharp: rising from 49.1% in 2025 to 92.3% in 2050.

Rutland Town resident Fred Nicholson checking his heat pump.
Courtesy: NeighborWorks of Western Vermont

Efficiency

Rutland Town is committed to meeting its residential and commercial thermal targets through increased conservation. The percentage of Rutland Town households that will need to be weatherized between now and 2050 to meet the state's goals is: 14% by 2025; 39% by 2035; and 85% by 2050. For commercial structures, weatherization targets are 29% by 2025; 47% by 2035; and 84% by 2050.

Electricity

Electricity, produced mostly by more expensive fossil fuel, is the third major sector of energy use so reducing usage and converting to renewable sources is critical to meeting the state's energy goals. Although electricity use will increase dramatically in the future since it is a conduit for making local renewable energy sources available for use, widespread adoption of efficient appliances, vehicles and thermal technologies powered by electricity is critical to achieving the state's energy goals for efficiency.

Rutland Town KWh Usage by Year (Efficiency Vermont)

Sector	2014	2015	2016
Commercial & Industrial	3,819,492	3,751,464	3,226,401
Residential	1,331,302	1,330,670	1,318,367
Total	**5,150,794**	**5,082,134**	**4,544,768**
Average Residential Usage	**6,526**	**6,491**	**6,494**

Data show that overall electrical use in the town is affected by electric efficiencies. Figures from Efficiency Vermont indicate that the town is seeing dramatic electric savings from efficiency measures, particularly in the commercial and industrial sectors. For instance, from 2014 to 2016, the commercial and industrial sectors went from saving 11,272 KWh to saving 521,499 KWh a year.

Further electricity efficiency savings are included in the LEAP modeling. The town's targets are 12.1% by 2025; 39% by 2035; and 69.8% by 2050. The targets for the use of renewable sources for this electricity are 1,585 MWh in 2025; 4,742 in 2035; and 14,369 in 2050.

The Town of Rutland is committed to energy conservation and will take advantage of Efficiency Vermont initiatives to upgrade the insulation of home and buildings to reduce heating and cooling energy consumption. The town will lead by example by ensuring all municipal buildings, including the Town Office, fire stations, town garage, and school, are audited for energy use and upgraded. The Town of Rutland will reduce municipal electricity use by installing renewable energy sources whenever feasible.

Data Sources

Efficiency Vermont, 2016
LEAP (Long-range Energy Alternatives Planning), 2017
U.S. Census American Community Survey, 2011-2015
U.S. Energy Information Administration, 2017
Vermont Department of Labor, 2016
Vermont Department of Public Service, 2017
VTrans (Vermont Department of Transportation), 2016
Vermont Community Energy Dashboard, Energy Action Network, 2017

Development and Siting of Renewable Energy Sources

As of March 2017, Rutland Town has 3.14 MW of total renewable energy generation. The data in this table are based on information available from the Vermont Department of Public Service and the Vermont Community Energy Dashboard. The town has 60 solar sites and two active hydroelectric dams.

Renewable Type	MW	MWh
Solar	1.29	1,586
Wind	0	0
Hydro	1.84	8,105
Biomass	0	0
Other	0	0
Total Existing Generation	**3.14**	**9,691**

This is the estimated renewable energy generation potential for the town. These data were based on mapping completed by the Rutland Regional Planning Commission (RRPC) and are based on the Municipal Determination Standards and associated guidance documents developed by the Vermont Department of Public Service.

Renewable Type	MW	MWh
Rooftop Solar *	5	5,877
Ground-Mounted Solar *	561	687,704
Wind (small scale)	449	898,540
Hydro	1	4,699
Biomass & Methane	0	0
Other	0	0
Total Renewable Generation Potential	**1,016**	**1,586,820**

*As technology advances, the Town of Rutland plans to promote the switch from primarily ground-mounted solar to primarily impervious and rooftop locations.

RRPC has suggested the following targets (in MWh) for Rutland Town for total renewable energy generation to meet the state's 90x50 renewables goal. The target of 14,369 MWh by 2050 is a fraction of the town's generation potential of 1,586,820 MWh.

2025	2035	2050
1,585 MWh	**4,742** MWh	**14,369** MWh

According to estimates by the RRPC, Rutland Town has sufficient land to reach 2050 targets for solar and wind based on the renewable generation potential in the town. For solar alone, there are 772 acres of prime solar which equates to 125,450 MWh of generation potential (772÷8=96.5x1,300=125,450). The potential for energy generation is more than enough to meet the town's target (above) especially since the town is encouraging a switch from primarily ground-

mounted to mostly impervious and rooftop solar and residential and small commercial wind projects. Even though the Town of Rutland has 1,896 acres identified as wind resources, developing these lands will not be needed to meet generation targets.

The Town of Rutland is maximizing its potential for renewable energy generation by identifying preferred areas for solar energy generation as well as adding more potential sites on impervious surfaces such as rooftops. The town is leading by example by already installing solar panels on its school rooftop; it is considering the addition of solar panels on other municipally-owned sites.

The approach proposed by this plan would not have the effect of prohibiting any type of renewable generation technology in all locations. The Town of Rutland Enhanced Energy Plan allows for the siting of all types of renewable generation technologies, wind, solar, hydro and biomass energy generation, but not necessarily all scales of a given technology. The town is certain that, if applied regionally, this is a fair and equitable approach that follows town and state priorities and still allows for sufficient land area to meet the town's and Vermont's energy targets and goals. If the approach taken by Rutland Town was adopted by all towns in the region, all four types of renewable energy generation could be sited in every town.

The Town of Rutland will reduce energy use by utilizing renewable energy sources whenever feasible.

Rutland Town Planning Commission Criteria for Net Metering Preferred Sites and Renewable Energy Siting Preferred Sites

How Town Plans influence state regulatory proceedings:

• Act 250 applications must conform to the municipal plan.

• Applications for a Section 248 Certificate of Public Good must give due consideration to the municipal plan; with an enhanced energy plan considered compliant, it is substantial deference.

Criteria:

1. Renewable energy generation potential is present on site (as indicated by the state's data layers for prime and secondary resources).

2. Each proposed project is considered in a transparent and non-arbitrary manner and that each proposal is consistent with other land uses in that district as specified in the Municipal Plan and Future Land Use map.

3. If located in the AGR40 (Agricultural & Forestry Working Lands) District: The proposed project meets the definition of "lands presently used for or suitable to support agriculture, forestry, and related commercial, recreation and tourist related enterprises."

4. If located in the AGR40 (Agricultural & Forestry Working Lands) District: The proposed project is considered small-scale commercial that "preserves the setting, natural features and contours of the land".

5. If located in one of the town's Scenic Resources (viewsheds) as specified in its Municipal Plan: The project does not have an "undue adverse impact on the visual or scenic resources of other locations within the town from which it can be seen" using what's known as the "Quechee Analysis" legal precedent.

6. The site avoids environmentally-sensitive areas (wetlands, flood hazard areas, wildlife habitat).

7. Prospective developers have notified all abutting property owners and taken all generally available and reasonable steps to mitigate the project's visibility.

8. Access must be available to firefighters and other emergency responders as defined in the town's Driveway Installations Ordinance, Article 1, § 181/20-24 (adopted in 1980).

9. Every alternative energy project larger than 15 kW shall include an action plan and a guaranteed funding source for decommissioning to ensure the site is safe, stable and free of structures and hazardous materials.

10. Once the town has met its renewable energy target, then any proposed project must demonstrate that potential local benefits far exceed any negative tax, environmental and scenic impacts.

Maps

Known Constraints

-High priority constraints that limit where energy can be generated.

Energy generation facilities are not very likely to be developed in Known Constraints areas due to the presence of natural resources that are regulated at the federal, state or local level. Accordingly, these constraints have been removed from the raw resource potential mapping layers. Site-specific study is required to ascertain whether one of the mapped constraints truly exists on the site and some sites not captured by the Known Constraints mapping may have such high-priority constraints, depending on the results of site-specific study. The maps are good indicators, but not definitive siting tools.

Included:

- Vernal Pools
- DEC River Corridors
- FEMA Floodways
- State-significant Natural Communities and Rare, Threatened, and Endangered Species
- National Wilderness Areas
- Class 1 and Class 2 Wetlands

Possible Constraints

-Lower priority constraints that may limit where energy can be generated.

Possible constraints can impact the siting process for generation facilities and should always be considered in planning for these facilities, but do not necessarily preclude placement in corresponding areas. Site-specific solutions are often possible when one of these conditions exists. Site-specific study is required to ascertain whether one of the mapped constraints truly exists on the site and some sites not captured by the Possible Constraints mapping may have such lower priority constraints, depending on the results of site-specific study. The maps are good indicators, but not definitive siting tools.

Included but not limited to:

- Agricultural soils (prime farmland, additional farmland of statewide importance, and additional farmland of local importance)
- FEMA Special Flood Hazard Areas
- Protected Lands (State fee lands and private conservation lands)
- Act 250 Agricultural Soil Mitigation Areas
- Deer Wintering Areas
- ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10)
- Hydric Soils

Prime Resource Areas

Areas with high resource potential and no identified constraints (Known or Possible).

Secondary Resource Areas

Areas with high resource potential and no Known Constraints, but where at least one Possible Constraint exists.

Wind Resource Areas (map on page 59)

-Areas where there is likely to be sufficient wind at a specified height for industrial scale wind energy development.

The mapping analysis used digital wind speed at various heights (30, 50, and 70 meters) and identified areas with the highest wind speeds at each of those heights. The mapping also considers various other conditions, such as ecological zones that may impact the feasibility of renewable energy development. These conditions are known as constraints. The strongest wind resources are generally located at higher elevations and that is where the state's utility-scale installations are located. But Vermont does have nearly 200 small-scale wind projects ranging from 0.95 kW to 100 kW of generating capacity.

Courtesy: Blue Spruce Farm, Bridport, VT

Rutland Town has decided not to include industrial scale wind (greater than 1 MW) in its renewable energy generation targets. Even though there are a few prime wind areas identified on the wind resource map, few of them could accommodate utility-scale wind. Because of that, the town envisions residential scale and commercial scale turbines or windmills in areas throughout Rutland Town that may not even require 30-meter hub heights.

Residential or commercial scale wind generation is referred to as **Distributed Wind.** Small Distributed Wind turbines can range from 1kW to 100kW (located at homes and farms). Medium turbines range from 101kW to 1MW (at manufacturing plants, schools or other institutions).

Due to anticipated technological advances, small and medium scale wind generation is projected to be feasible throughout most of the town at lower elevations in coming decades. It is town policy that the areas identified on the wind resource map and identified as resource areas for primarily industrial scale wind be designated as unsuitable given their valuable natural resource values and scenic resources values that limit other development.

The wind resource map is an inventory of potential wind resources, but the locations indicated on the map do not comply with the town's scenic resources protections as laid out in its Municipal Plan's

Scenic Resources (pages 72-74) and detailed in the Local Possible Constraints Areas section (page 52). In addition, the Rutland-Southern Vermont Regional Airport, while located in Clarendon, has an Instrument Landing System that extends northward into Rutland Town. As explained in the current Rutland Town Municipal Plan on pages 14-15, development that interferes with this implicit air corridor is not allowed. This prohibition would include some ridgetops
on the eastern end of the town.

Courtesy: EnergySage

The Town of Rutland is not saying "no" to wind generation. Instead, following
town land use policy, it would be most appropriate if residential and commercial systems were constructed at low elevations and on towers preferably not to exceed 150 feet in height.

Solar Resource Areas (map on page 60)
-Areas where there is likely to be sufficient solar radiation for solar energy development (solar photovoltaic or PV).

The GIS-based analysis factored in direction, slope and location of land to maps areas with high solar radiation potential. Certain areas where development was not possible – such as rivers and roads – were removed. The mapping also considers various other conditions, such as ecological zones that may impact the feasibility of renewable energy development. These conditions are known as constraints.

Community solar is a solar PV generation system that provides electricity, net metering, and return on investment to multiple participants. A community solar project—referred to as a solar farm, garden or shared renewable energy plant—is a solar power plant whose electricity is shared by more than one household.

Instead of installing panels on rooftops, these are ground-mounted solar projects. Participants subscribe to a portion of the energy produced in the community solar project, along with other residents (or investors). It could be a viable option for some of Rutland Town's neighborhoods.

Screening can be natural vegetation. To keep wildlife corridors open, fencing is not always required. There is precedent in Vermont for non-fenced solar arrays; the posts supporting solar panels are specially protected so that they're not safety hazards.

Rutland Town endorses the minimum setbacks required for ground-mounted solar generation facilities as enumerated in 30 VSA §248(s). See below:

Minimum Setbacks for Solar	
From a state or municipal highway	100 feet for capacity exceeding 150 kW; 40 feet for capacity between 15 and 150 kW
From each property boundary that is not a state or municipal highway	50 feet for capacity exceeding 150 kW; 25 feet for capacity between 15 and 150 kW

Rutland Town is projecting to help meet its renewable energy generation target with mostly non-utility and non-Standard Offer Program scale solar (≤ 500 kW). Because of the rapid pace of technological advances in the field of PV solar, it is expected that residential, commercial and industrial scale projects will dominate the region's solar generation by 2050. Solar generation facilities of a capacity less than 150 kW are highly encouraged throughout the town, especially on residential and commercial rooftops. Using the analysis provided in the Vermont Department of Public Service Guidance (2017), the 925 acres of impervious surface within one mile of existing 3-Phase power lines, can provide more than 115 MW of energy (925 / 8 acres per MW = 115 MW). If the town were to rely only on solar energy generation (just one scenario), it would need just 11.72 MW to meet its municipal renewable generation goal (11.72 MW = 14,369 MWh). This does not include another 1.8 MW of solar energy that could be generated on residential rooftops: ((1,1815 homes / 25%) x 4 kW) using a methodology developed by the Bennington Regional Planning Commission.

The mapping analysis (specifically for the Local Possible Constraints map on page 61) showed that there are 931 acres of impervious surfaces in the town not including residential rooftops. This should be more than enough area to accommodate small scale solar and meet the town's renewable energy generation target.

Hydro Resource Areas (map on page 61)

-Areas where there is likely to be capacity to accommodate hydroelectric energy development.

The mapping shows areas of potential electricity generation from hydro; locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. Existing, powered and existing non-powered dam sites where a generator could be installed or existing hydropower sites where equipment could be upgraded or expanded to provide additional generation (with potential production) were mapped.

The mapping also considers various other conditions, such as ecological zones that may impact the feasibility of renewable energy development. These conditions are known as constraints.

It is important to note that there is considerable time and expense involved with permitting hydropower projects, which are reviewed at the federal level.

Biomass Resource Areas (map on page 62)

-Areas where there is likely to be sufficient biomass resources for biomass energy development.

The mapping shows areas of potential electricity generation from biomass totaling 3,918 acres of prime and secondary biomass resource - locations with high woody biomass potential and where renewable energy generation would likely be most feasible according to the natural conditions of an area.

The mapping also considers various other conditions, such as ecological zones that may impact the feasibility of renewable energy development. These conditions are identified as Known and Possible Constraints in the maps' legends.

Siting Renewable Energy Generation in Rutland Town

Electricity generation and transmission systems powered by renewable energy are regulated by the Public Utility Commission (PUC) under 30 V.S.A. Section 248. As part of that process, the PUC must determine whether a proposed energy facility will have an *undue adverse effect* on aesthetics, historic sites, air and water purity, the natural environment, the use of natural resources, and the public health and safety, with due consideration having been given to the criteria specified in 10 V.S.A. § 1424a(d) (outstanding resource waters) and the Act 250 criteria set forth in 10 V.S.A. §6086(a)(1) through (8) and 9(K).

§248(b) (5), PUC Rule 5.108(A) requires the PUC to conduct the so-called "Quechee analysis" to assess whether a proposed renewable energy project would have an adverse impact by virtue of being "out of character with its surroundings," and if so, whether the adverse impact qualifies as "undue." Rule 5.108(A). A project's location, size, and visibility, together with the context of the surrounding land uses, will be relevant in the PSB's consideration of whether the proposed project would have an undue adverse impact. Among other things, the Quechee analysis requires the PUC to consider whether the proposed project would violate a "clear written community standard". Specific community standards for scenic resources have been part of the town's Municipal Plan since November 2016.

Local Unsuitable Areas

-Areas where the Town of Rutland prohibits most renewable energy generation. These are "no go" areas; designated unsuitable for a particular type or scale of renewable development, or in some cases, all development; must similarly prohibit other types of development.

The following areas are considered unsuitable in Rutland Town:

Utility Scale Wind

Few of the prime wind areas identified on the wind resource map could accommodate industrial scale wind; most of the wind resources identified are secondary and may not be suitable for energy development. Instead of industrial-scale wind, the Town of Rutland envisions residential scale and commercial scale turbines or windmills in areas throughout the town to help meet its renewable

energy target. This kind of wind energy development would not require prime resource areas or ridgeline locations.

Local Possible Constraints (map on page 63)

-Areas where the Town of Rutland discourages renewable energy generation. These areas might be developable, if certain constraints can be mitigated; must be similarly restrictive to other forms of development.

Scenic Resources

The Town of Rutland desires to protect its most important landscape (the 16 scenic resources or "viewsheds" listed in its Municipal Plan on pages 78-79). These areas offer commanding views of the Green Mountains to the east and south and the Taconic Mountains to the west and south. The Municipal Plan for Rutland Town states: "Of particular concern is the maintenance of scenic resources along the roadways of the Town… Pastoral and scenic views of mountains, ridges, and valleys must be preserved…While some development has already occurred that impairs those views, no further development should be permitted that has an undue adverse impact on those scenic resources."

The original list of scenic resources in the Municipal Plan listed 20 scenic resources. That number has been reduced to 16 as a result of an aesthetic analysis done by Middlebury College: *Scenic Road Viewshed Analysis and Inventory for Rutland Town*, December 8, 2018 (Appendix A). Going forward, all proposed renewable energy generation development in these scenic resource areas shall have site specific aesthetic impact analyses completed by a certified landscape professional - paid for by the developer – that are consistent with the methodology used in the Middlebury College analysis and inventory. Site specific aesthetic analyses will determine whether a proposed generation project will have an undue adverse effect on aesthetics, historic sites, air and water quality, the natural environment, the use of natural resources, and public health and safety.

Approved projects, as with other non-energy generation land use, should have a comparable or less of a negative impact on this landscape: "Little or no development shall occur that unduly disturbs or alters these scenic resources. While small, low, relatively inconspicuous uses may be allowed where such scenic resources are located, if a project or use has an undue impact upon the visual or scenic resources of other locations within the Town from which it can be seen, it shall not be allowed even if the proposed use is allowable generally in the district in which the subject property is located. While projects and uses can be relocated, there can be no replacement of a scenic or visual resource that has been lost" (page 76). Restrictions on development on Rutland Town's scenic resources list are applicable to other types of land development in Rutland Town.

At this point, without a more detailed aesthetics analysis of the town's Scenic Resources, it is not possible to estimate exactly how future energy development would be affected, if at all, since it is not known whether renewable resources exist in these areas. This will be determined on a site-specific basis if and when developers propose energy projects at these locations. Even if all 16 scenic resource locations now included in the Town Plan were to be found of aesthetic importance, that could equal approximately 9,834 acres or 80% of the town's total acreage. That would leave 185 acres with

renewable energy potential which is 100 acres more than the 84.8 acres needed to meet the Public Service Department's goal.

Conservation District

As defined in the Town of Rutland Municipal Plan (page 10), adopted November 29, 2016, the Conservation District contains lands that are protected from non-residential or non-recreational development and are now considered as local constraints for renewable energy generation: "Special forest and/or open lands which are of particular ecological or aesthetic importance. Includes public watersheds as well as certain lands that are not well suited for residential or commercial development because of topography, soil composition, or wetlands. The purpose of the Conservation District is "to preserve certain forest and open lands in a relatively undeveloped state and/or to protect public watersheds, wetlands, and water supplies."

Designated Rutland Town Historic Sites

The Center Rutland Historic District and historical properties around the town are of high importance for preservation. There are 95 historic structures listed on the Vermont Historic Places Register, 33 of which are in the Center Rutland Historic District. Development of renewable energy resources and facilities shall not cause an undue adverse impact on these town historic resources pursuant to state historic places standards:

- The installation of renewable energy generation facilities on historic buildings or on buildings within the Center Rutland Historic District shall be done in accordance with current Secretary of the Interior's Standards for Rehabilitation.

- The historic character of listed properties and structures shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

- Ground installations, to the extent functionally feasible, shall be installed in locations that minimize their visibility and shall be screened from view of adjoining properties.

In short, the local constraints mapped for the town are supported through data or studies; are consistent with remainder of the plan; and do not include an arbitrary prohibition or interference with the intended function of any particular renewable resource size or type. Even if all of the Local Possible Constraints mapped on page 61 are added together, the total acreage identified would equal 376 acres. Using the lowest capacity conversion factor (solar), that equals to a reduction the equivalent of 61,100 MWh or just 4% of the town's renewable generation potential of 1,586,820 MWh.

Local Preferred Areas (150 kW and greater) (map on page 64)

-Areas where the Town of Rutland encourages solar energy generation (≥ 500 kW)

As mentioned earlier in this plan, solar generation facilities with a capacity of less than 150 kW are highly encouraged throughout Rutland Town, especially on residential and commercial rooftops. The town also has selected the following preferred areas for the potential use as utility and Standard Offer Program scale solar (≥ 500 kW):

Foley/Baker Parcels

Approximately 50 acres owned by Mark Foley Sr., Joseph Baker Jr. and David Baker on the west side of South Main St/Rt. 7 South and within one mile of 3-phase power lines. The property owners have informed the town that they are interested in developing this property for solar or other renewable energy generation.

Municipal Land at Northwood Park

Four acres at Northwood Park (on top of the capped former landfill).

Route 7 Industrial/Commercial District parcels

Industrial/Commercial District adjacent to Rt. 7 South. (40.095 acres in prime solar/ 141.288 acres in secondary solar for a minimum of 6,515 MWh of potential renewable energy generation using the solar capacity conversion).

Calculating the renewable energy generation potential from just the first two areas mentioned – the Foley property and the town's capped landfill - 54 acres or 6.75 MW/ 8,775 MWh of potential energy generation would be added (using a solar capacity conversion). That is more than 90% of the town's total target.

Department of Public Service Preferred Areas

Where applicable, parcels containing any of these state-preferred areas for renewable energy generation: roof-mounted systems; former brownfield sites; disturbed areas such as gravel or sand pits; sealed and sanitary landfills and former quarries and mineral extraction sites; junkyards; parking lots; parking lot canopies over paved parking lots; previously developed sites; brownfields and Superfund sites; areas adjacent to large-scale commercial or industrial buildings; and areas where topographical features or vegetation naturally screen a site from common view.

Existing Renewable Energy Generation and GMP Grid Infrastructure (map on page 65)

-Sites where there is renewable energy generation in the town and current Green Mountain Power grid capacity for more energy development

This map is based on data in the Vermont Energy Action Network (VEAN) Community Energy Dashboard which reflects all renewable projects that have received Certificates of Public Good. As mentioned on page 44 as of March 2017, Rutland Town has 3.14 MW of existing renewable energy generation.

Another key element of the Resource Maps is the location of electric grid infrastructure, including three-phase and other high-capacity distribution lines. These are shown on each of the resource maps as well as the Existing Energy, Local Possible Constraints and Preferred Areas maps. Grid infrastructure location and capacity will play a vital role in determining the economic feasibility and timetable for development of a certain site for a renewable energy generation facility.

For more detailed information on grid infrastructure and capacity, Green Mountain Power's "Solar Map" shows the specific capacity of each section of the utility's grid. Red distribution lines indicate there is less than 10% capacity remaining; yellow lines show 10-20% capacity remaining; and green lines indicate more than 20% capacity remaining. As indicated on the map, the GMP grid infrastructure in the town is all green meaning there is capacity for accommodating additional energy generation.

Rutland Town Renewable Energy Summary

For a summary of the information included on pages 46-57, please refer to the table below. Rutland Town's target of 14,369 MWh by 2050 is attainable and planned for in this document. Based on mapping completed by the Rutland Regional Planning Commission and associated guidance documents developed by the DPS for solar capacity, the town needs 84.8 acres suitable for renewable energy generation to meet its target. In the table below, the town has 10,019 acres that are suitable.

Rutland Town Renewable Energy Potential Summary	
Town Target (by 2050) (in MWh)	**14,369**
Total Acres in Rutland Town	12,292
Acres Suitable for Renewables (Solar, Wind, Biomass – Prime and Secondary)	**10,301**
Local Possible Constraints – Conservation District, Historic District (in acres)	376
Scenic Resources Areas	*
Acres Suitable for Renewables (minus Constraints - in acres)	9,925
Local Preferred Areas (in acres)	94
Acres Needed to Make Target	**84.8**

* Number of acres is unknown pending professional aesthetic analysis. Data will become available on a site-specific basis as renewable energy generation projects are proposed.

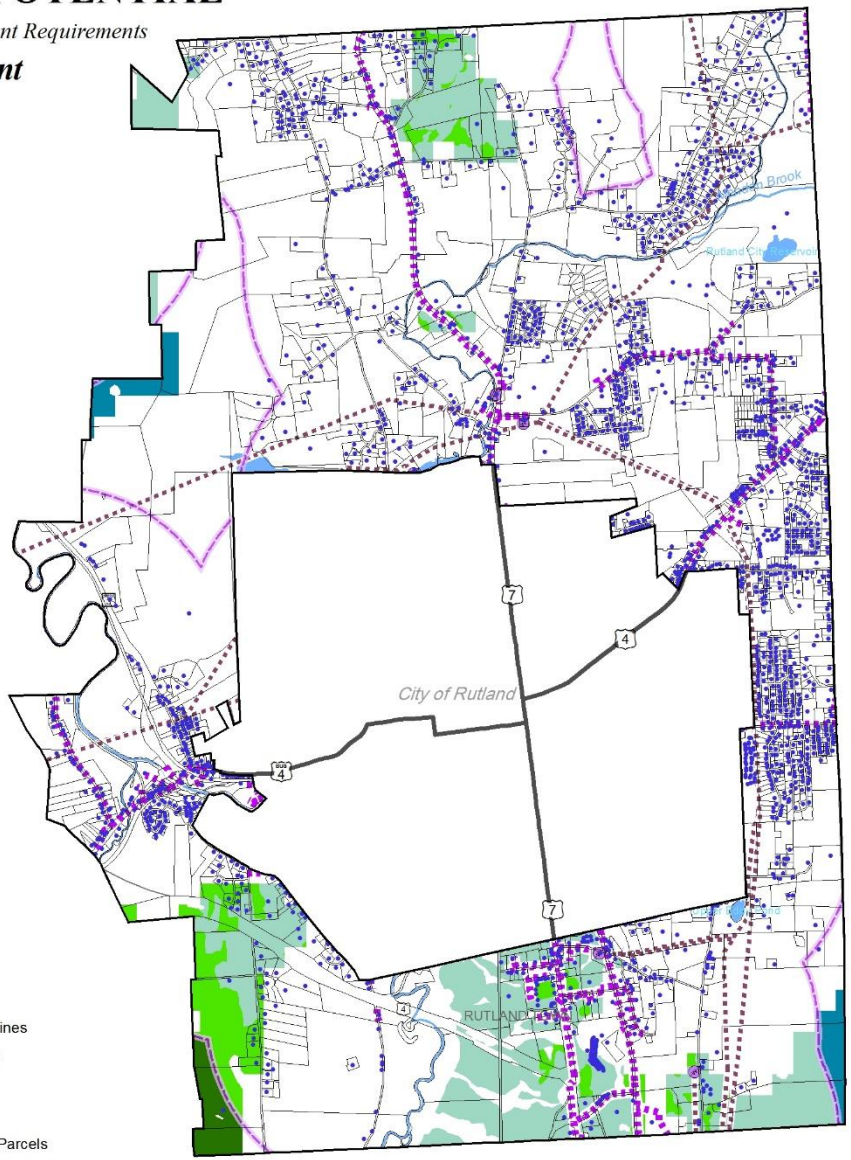
All calculations and conversions are conservatively based on DPS guidance and based on solar capacity factors. The numbers above and elsewhere in this document do not take into account the higher capacity factors of other renewables or the projected advances in

Although it is not known at this time how many acres and potential MWh could be lost to Scenic Resource concerns, some of this would be offset by the addition of Local Preferred Areas and Impervious Areas in town. In fact, the summary data do not include the state's preferred impervious surfaces sites would undoubtedly lead to additional acres being suitable for renewables. In the case of Rutland Town, it could mean an additional 931 acres.

WIND ENERGY POTENTIAL

Based on Public Service Department Requirements

Town of Rutland, Vermont



Methodology

This map shows areas of potential electricity generation from wind, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime wind potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

Areas with conditions that are likely to be hazardous or encounter significant obstacles to development, and therefore are very likely to make renewable energy generation development unfeasible, are considered Known constraints. These areas have been removed and are not shown in any way on this map.
Known constraints include:
FEMA floodways,
DEC River Corridors,
Federal Wilderness Areas,
Rare and Irreplaceable Natural Areas (RINAs),
Vernal Pools,
Wetlands Class 1 and 2.

Possible Constraints

Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.
Possible Constraint include:
Deer Wintering Areas
Public water sources, a 200 foot buffer added around the well head.
FEMA Special Flood Hazard Areas
Hydric Soils
VT Agriculturally Important Soils (prime, statewide and local classifications).
Act 250 Agricultural Soil Mitigation areas
Protected Lands (State fee lands and private conservation lands)
Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

Prime Wind, w/in 1 mile of 3 Phase power lines.

Prime Wind

Areas with high wind potential and no identified constraints (known or possible).

Secondary Wind, w/in 1 mile of 3 Phase power lines.

Secondary Wind

Areas with high wind potential and no known constraints, but where at least one possible constraint exists.

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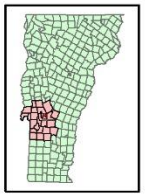
June 21, 2018



Legend

- Structures
- Substations
- 3 Phase Power Lines
- Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines

RUTLAND REGIONAL PLANNING COMMISSION

Miles

0 0.25 0.5 1 1.5 2

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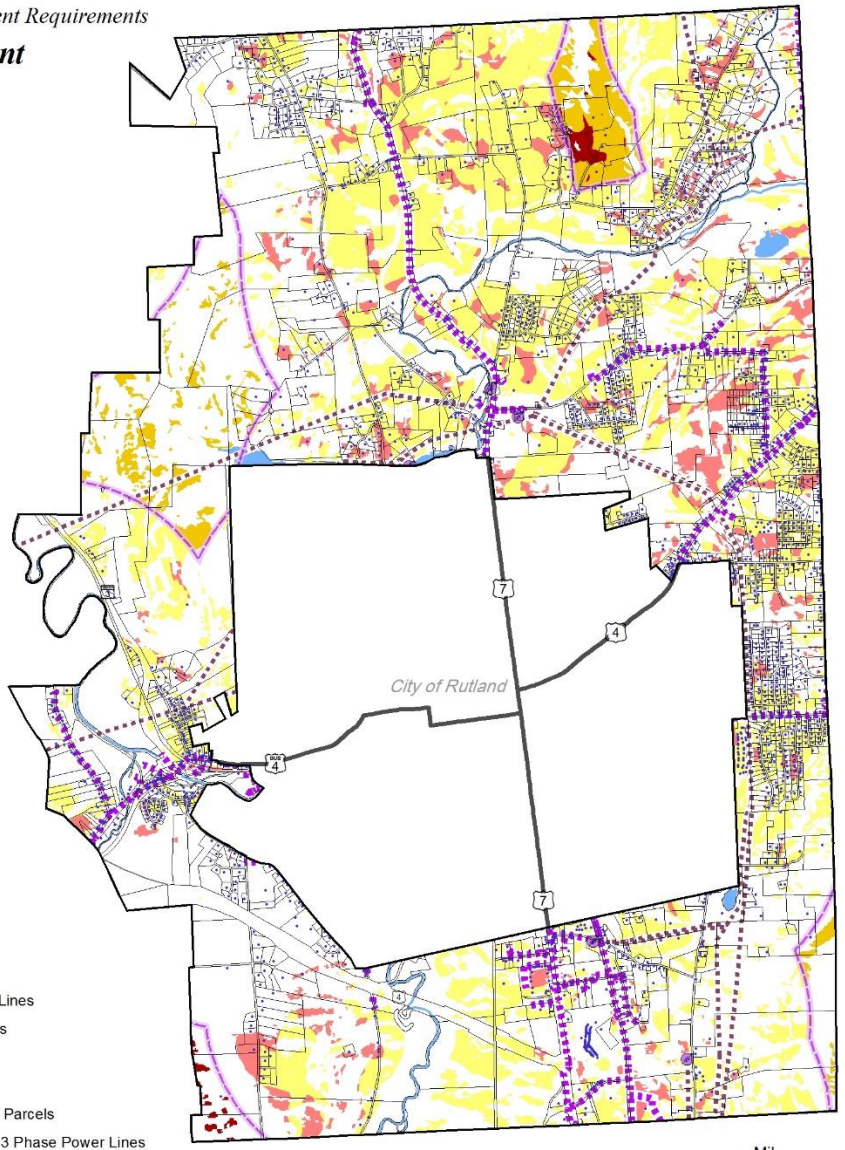
SOLAR ENERGY POTENTIAL

Based on Public Service Department Requirements

Town of Rutland, Vermont



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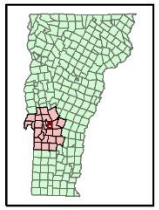

Legend

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Miles

0 0.25 0.5 1 1.5

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Setbacks

Under H.40, passed in 2015, minimum setback requirements for in-state, ground mounted solar generation facilities approved under Section 248 are:
From a state or municipal highway - 100 feet for a facility with a plant capacity exceeding 150 kilowatts and 40 feet for a plant capacity between 15 and 150 kilowatts.
From each property boundary that is not a state or municipal highway - 50 feet for a facility with a plant capacity exceeding 150kilowatts and 25 feet for a facility with a capacity between 15 and 150 kilowatts.

Methodology

This map shows areas of potential electricity generation from solar, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime solar potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

Areas with conditions that are likely to be hazardous or encounter significant obstacles to development, and therefore are very likely to make renewable energy generation development unfeasible, are considered Known constraints. These areas have been removed and are not shown in any way on this map.
Known constraints include:
FEMA floodways,
DEC River Corridors,
Federal Wilderness Areas,
Rare andl irreplaceable Natural Areas (RINAs),
Vernal Pools,
Wetlands Class 1 and 2.

Possible Constraints

Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.
Possible Constraint include:
Deer Wintering Areas
Public water sources, a 200 foot buffer added around the well head.
FEMA Special Flood Hazard Areas
Hydric Soils
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Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

- Prime Solar, w/in 1 mile of 3 Phase power lines.
- Prime Solar

Areas with high solar potential and no identified constraints (known or possible).

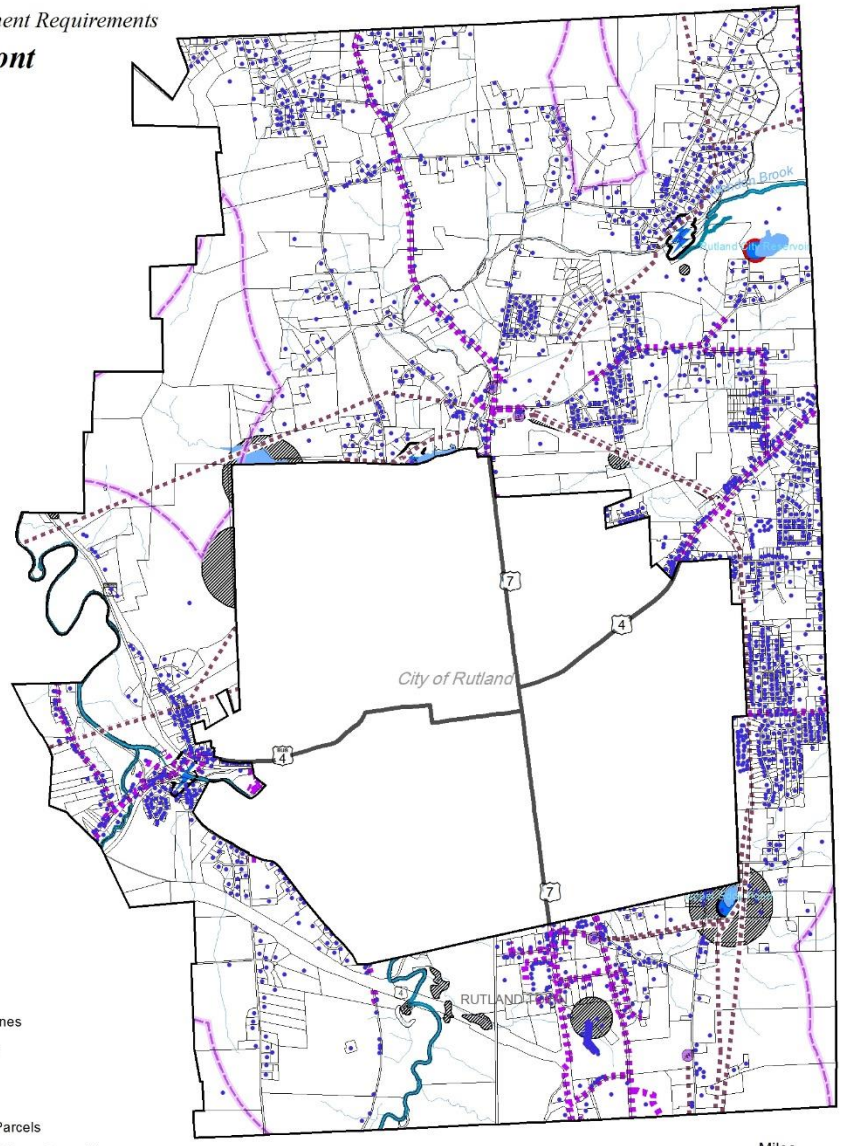
- Secondary Solar, w/in 1 mile of 3 Phase power lines.
- Secondary Solar

Areas with high solar potential and no known constraints, but where at least one possible constraint exists.

HYDRO ENERGY POTENTIAL

Based on Public Service Department Requirements

Town of Rutland, Vermont



Methodology

This map shows areas of potential electricity generation from hydro, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of hydro potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

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Wetlands Class 1 and 2.

Possible Constraints

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ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

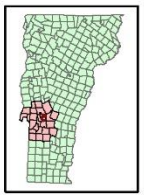
- RT4 and RT7
- Designated Outstanding Resource Waters
- Dams not on National Wild and Scenic Rivers

Potential Hydroelectric Facilities

- < 50 kW Capacity
- > 50 kW Capacity
- High Hazard with < 50 kW Capacity
- High Hazard with > 50 kW Capacity

- Impaired Waters
- Stressed Waters
- Rivers/Streams
- Rare and Irreplaceable Natural Areas (RINAs)

June 21, 2018



Legend

- Structures
- Substations
- 3 Phase Power Lines
- Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines

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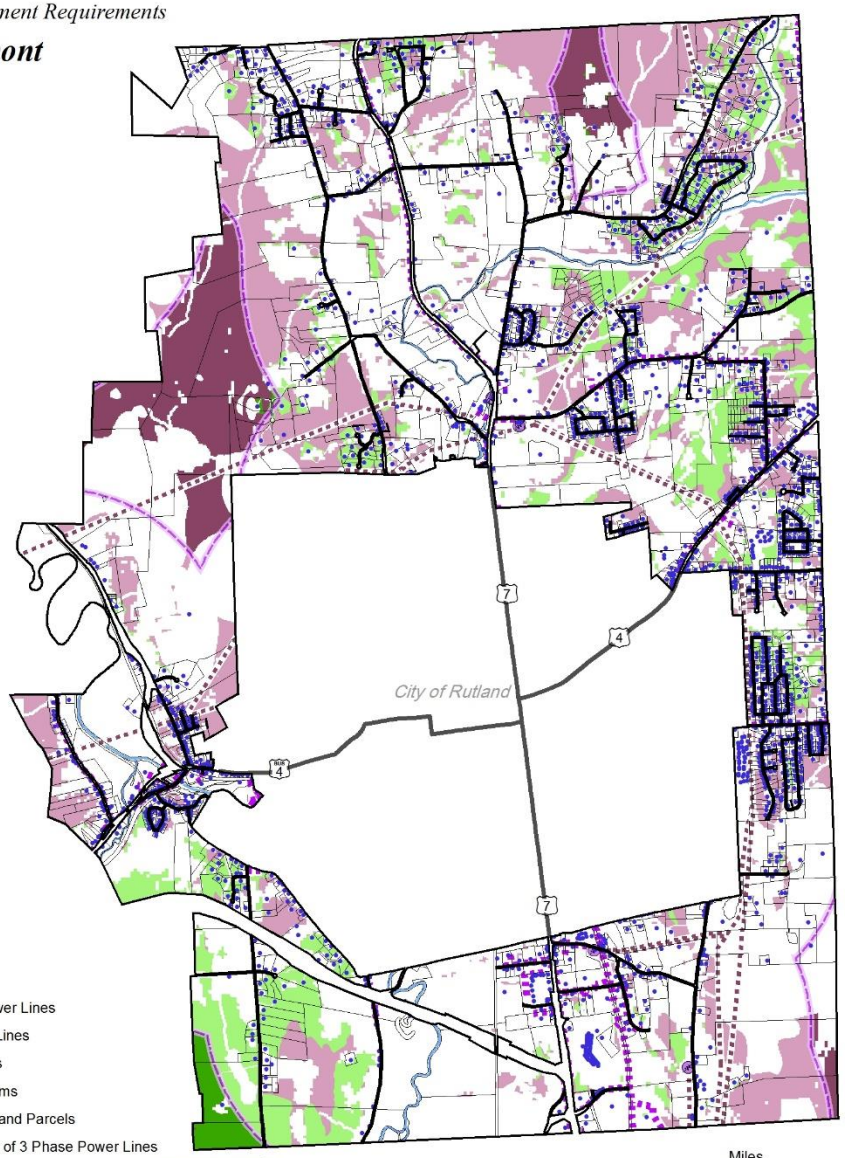
BIOMASS ENERGY POTENTIAL

Based on Public Service Department Requirements

Town of Rutland, Vermont



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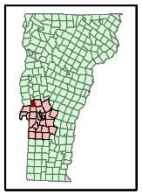

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Miles

0 0.25 0.5 1 1.5 2 2.5

Methodology

This map shows areas of potential electricity generation from biomass, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime biomass potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

Areas with conditions that are likely to be hazardous or encounter significant obstacles to development, and therefore are very likely to make renewable energy generation development unfeasible, are considered Known constraints. These areas have been removed and are not shown in any way on this map.
Known constraints include:
FEMA floodways,
DEC River Corridors,
Federal Wilderness Areas,
Rare andI irreplaceable Natural Areas (RINAs),
Vernal Pools,
Wetlands Class 1 and 2.

Possible Constraints

Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.
Possible Constraint include:
Deer Wintering Areas
Public water sources, a 200 foot buffer added around the well head.
FEMA Special Flood Hazard Areas
Hydric Soils
VT Agriculturally Important Soils (prime, statewide and local classifications).
Act 250 Agricultural Soil Mitigation areas
Protected Lands (State fee lands and private conservation lands)
Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

- Prime Woody Biomass, w/in 1 mile of 3 Phase power lines.
- Prime Woody Biomass

Areas with high woody biomass potential and no identified constraints (known or possible).

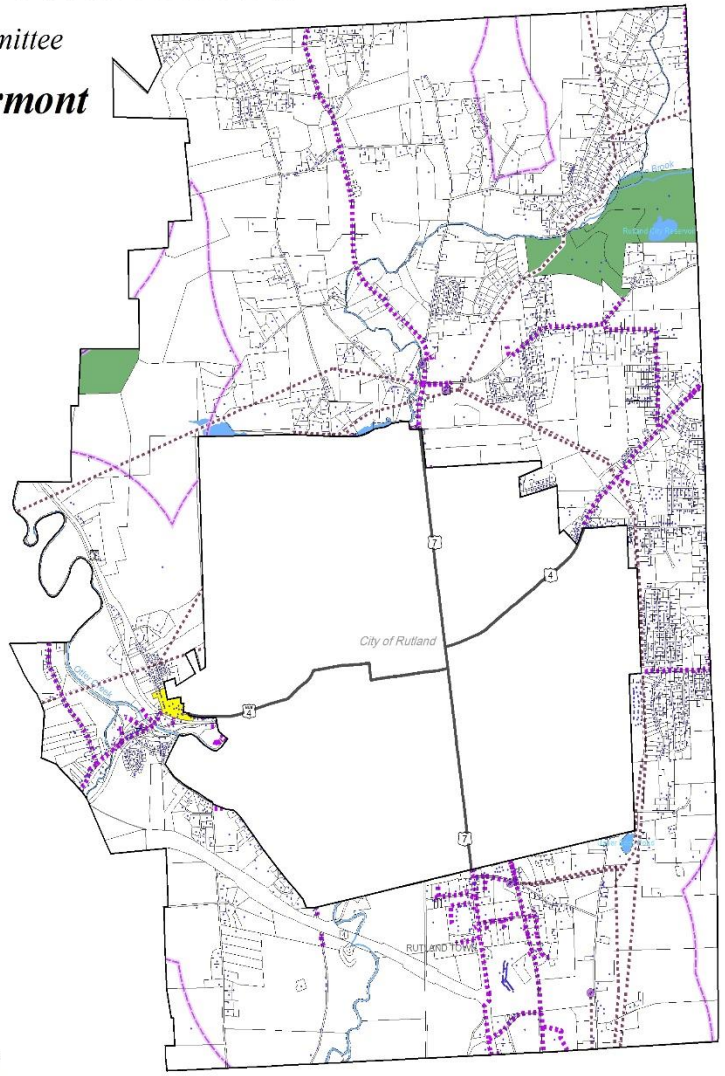
- Secondary Woody Biiomass, w/in 1 mile of 3 Phase power lines.
- Secondary Woody Biomass

Areas with high woody biomass potential and no known constraints, but where at least one possible constraint exists.

LOCAL POSSIBLE CONSTRAINTS

Based on RRPC Energy Committee

Town of Rutland, Vermont



June 21, 2018

Legend

- Structures
- Substations
- 3 Phase Power Lines
- Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines

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ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

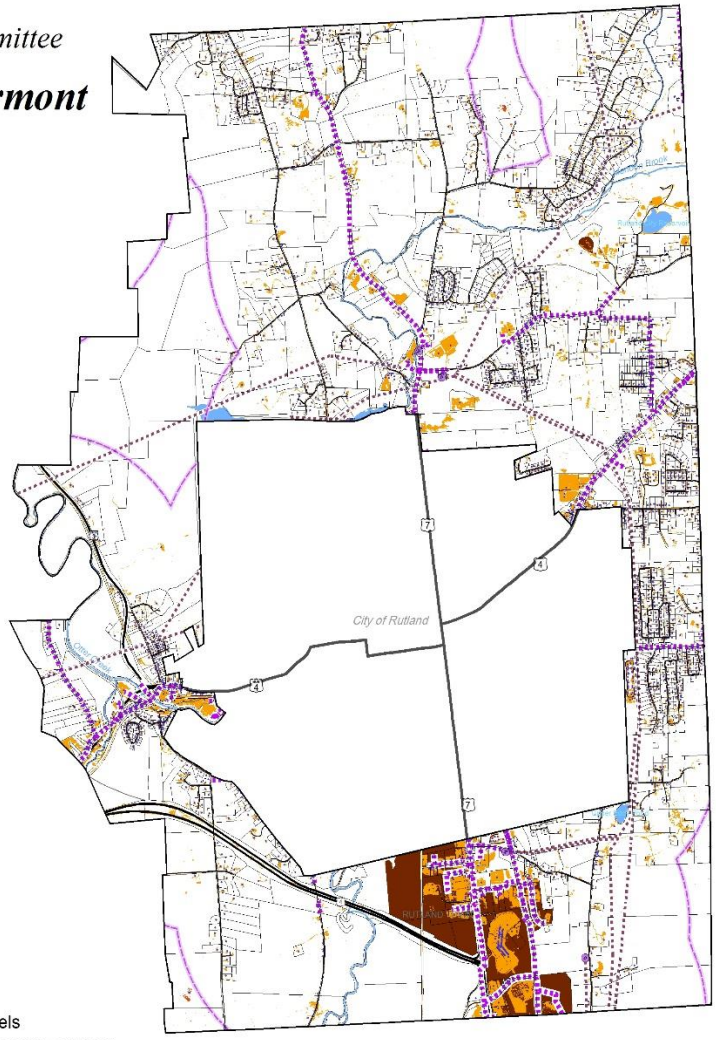
- Conserved Lands
- Center Rutland Historic District

Miles
1 0.5 0 1

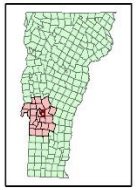
LOCAL PREFERRED LOCATIONS

Based on RRPC Energy Committee

Town of Rutland, Vermont



June 21, 2018



Legend

- Structures
- Substations
- 3 Phase Power Lines
- Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines

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ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
Regionally or Locally Identified Critical Resources

Legend

- Impervious Surface (preferred locations for solar only)
- Impervious Surface (preferred locations for solar only, within 1 mile of 3 Phase Power)
- Town of Rutland Preferred Sites

Miles

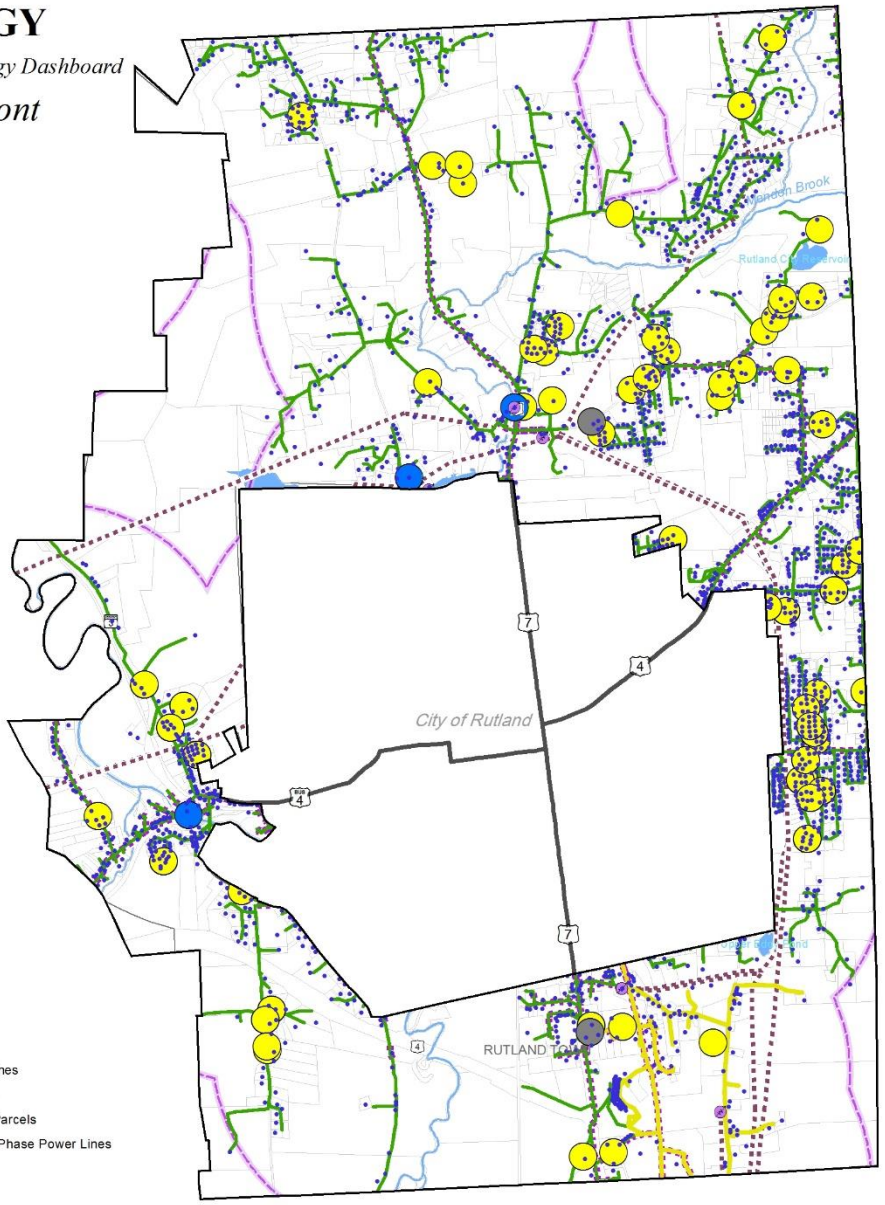
1 0.5 0 1 2

RUTLAND REGIONAL PLANNING COMMISSION

EXISTING ENERGY

Based on Vermont Community Energy Dashboard

Town of Rutland, Vermont



Legend

- Efficiency (Crowdsourced)
- Hydro
- Solar
- RT4 and RT7

GMP Distribution Circuits

DG Rating

- Unrated
- Good
- Fair
- Poor

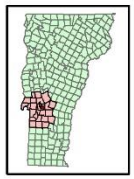
Green Mountain Power data is from: https://maps.gmpvt.com/arcgis/rest/services. Existing data is from the Vermont Community Energy Dashboard.

Miles

0 1 2

N W E S

June 21, 2018



Legend

- Structures
- Substations
- 3 Phase Power Lines
- Distribution Lines
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines
- Lakes/Ponds
- Rivers/Streams

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Energy Strategies and Policies to Achieve Town Targets

The purpose of this section is to identify specific actions that have the greatest potential for Rutland Town to greatly reduce fossil fuel use in a sustainable manner. Specifically, the following are strategies and policies to advance conservation and efficiency in space and water heating (thermal), and transportation and related land use changes.

The Rutland Town Selectboard may appoint an energy coordinator and/or energy committee as established by 24 V.S.A. § 1131 and 24 V.S.A. § 4433. (See organizational flow chart on page 70). The energy coordinator and energy committee shall be responsible for the assigned tasks below:

Conservation and efficient use of energy

To encourage energy conservation, efficient buildings and the efficient use of energy by individuals and the municipality, the Planning Commission with the assistance of the Energy Coordinator/Committee shall:

- Implement this plan and track progress on the policies and actions in this plan. This committee's task shall be to promote local residential and commercial efficiency and conservation improvements through coordination of information and technical assistance. This committee shall advocate for appropriate renewable energy generation throughout the town. This committee shall report regularly to the town Selectboard. Committee tasks include:
- Co-sponsor and organize weatherization workshops for homes and businesses for new construction, retrofits, and existing structures.
- Coordinate with the following programs:
  - "Energy Star" building performance rating system
  - Education programming and appliance upgrade rebates through Efficiency Vermont
  - Weatherization assistance provided by BROC Community Action in Southwestern Vermont and NeighborWorks of Western Vermont.
  - Provide information/resources to promote strategic tree planting to maximize energy benefits.
  - Promote the use of landscaping for energy efficiency.
  - Promote the use of cold climate heat pumps with education/presentations in coordination with Efficiency Vermont and electric utilities.
  - Support the use of ground-source heat pump heating and cooling systems for new construction.
  - Promote municipal solar, school solar, and community solar or other renewable energy projects on town land and take steps to help viable projects move forward.
  - Host an Energy Challenge to reduce energy use by residents and local businesses.

The Administrative Assistant to the Selectboard shall:

- Work with the Selectboard to establish a revolving loan fund for local energy projects. A potential model is Montpelier's Net Zero Revolving Loan Fund for financing municipal energy efficiency and renewable energy investments in the town.

- Promote the use of the residential and commercial building energy "stretch" standards by distributing code information and by hosting workshops.
- Encourage new municipal and existing town buildings to meet Leadership in Energy and Environmental Design (LEED) standards and encourage current structures to become more energy efficient.

To promote the decreased use of fossil fuels for heating, the Planning Commission with the assistance of the Energy Coordinator/Committee shall:

- Address fossil fuel reductions between 2015 and 2050 by incorporating solar production in order to reach its 2050 municipal target for renewable energy generation. All other alternative sources of energy would reduce fossil fuel consumption beyond the 90/50 target. Other renewable sources of energy may include small hydro projects, biomass and small wind.
- Support viable large-scale regional wood-fired heating districts and identify resource partners that make, sell and/or transport wood chips and/or wood pellets that could be used in a district heating system.
- Research the possible development of appropriately sited, cost-effective biomethane facilities and related infrastructure.

To demonstrate the town's leadership by example with respect to the efficiency of municipal buildings, the Town Office shall:

- Ensure all municipal buildings undergo an energy audit.
- Distribute (in person and via the town's website) utility energy transformation (reduction) information to promote greater energy efficiency as well as information regarding residential and group/community solar generation.
- Switch all interior and exterior municipal lighting fixtures to LED bulbs.

Transportation

To promote reduced transportation energy demand and single-occupancy vehicle use, use of renewable or lower-emission energy sources for transportation, and the increased use of public transit Rutland Town shall:

- Promote the expansion of service of the Marble Valley Regional Transit District in the town.
- Continue close collaboration and promotion with the MVRTD to encourage greater ridership by town residents.
- Make public transportation information/resources available at town buildings and facilities.
- Promote the Go Vermont webpage, which provides ride share, vanpool, public transit, and park-and-ride options.
- Encourage employers to have the necessary equipment and training to facilitate conference calls, webinars, and other virtual meetings and information sharing.

To encourage a shift away from gas/diesel vehicles to electric or other non-fossil fuel transportation options the Energy Coordinator/Committee shall:

- Promote the Drive Electric Vermont webpage which connects users to financial incentives, dealers, and recharging stations for EVs.
- Encourage major employers in the community that operate private fleets to switch some of their vehicles to alternative fuels, such as electric or biodiesel.
- Use town-wide events to promote different kinds of EVs and provide people interested in purchasing them an opportunity to talk with fellow community members who own them.
- Partner with Drive Electric Vermont, the Vermont Clean Cities Coalition, and other organizations to promote the expansion of workplace charging.
- Promote the installation of DC fast-charging infrastructure at strategic locations throughout town.
- Promote the installation of EV charging infrastructure as part of new or redevelopment, especially for developments subject to Act 250.
- Encourage the installation of EV charging infrastructure that is accessible to school buses, municipal vehicles, snow plows, fire and other emergency vehicles, and farm vehicles.
- Encourage the development of additional refueling stations for alternative fuels, such as biodiesel and renewable natural gas (a form of biogas from methane), for both private and public transportation fleets by sharing station development costs between public and private interests.

To encourage the development of walking and biking infrastructure the Selectboard, the Planning Commission and the Public Works Director shall:

- Encourage local planners, public works department, and others to implement complete streets concepts and provide sample language to include in municipal ordinances, regulations and bylaws to ensure that site plan reviews include pedestrian and bicycle access as well as safety and traffic-calming measures.
- Assess existing roads for their ability to accommodate safe and convenient walking and biking. Areas for improvement shall be prioritized and funding sought to align these areas with Complete Streets guidelines.
- Extend sidewalks and other types of bicycle and pedestrian facilities to high use areas and areas of new development.
- To better accommodate travel by bicycles, maintain a smooth roadway surfaces and sweep to remove sand, dirt, and trash as needed.
- Review state transportation projects in the town to ensure that Complete Streets are implemented.
- Use the Act 250 hearing process to ensure that local site plans include adequate bike and pedestrian infrastructure and safety measures.
- Close gaps in the transportation network by providing shared use corridors between important school and work destinations and nearby housing or between schools/colleges and downtowns or village centers and commercial districts.

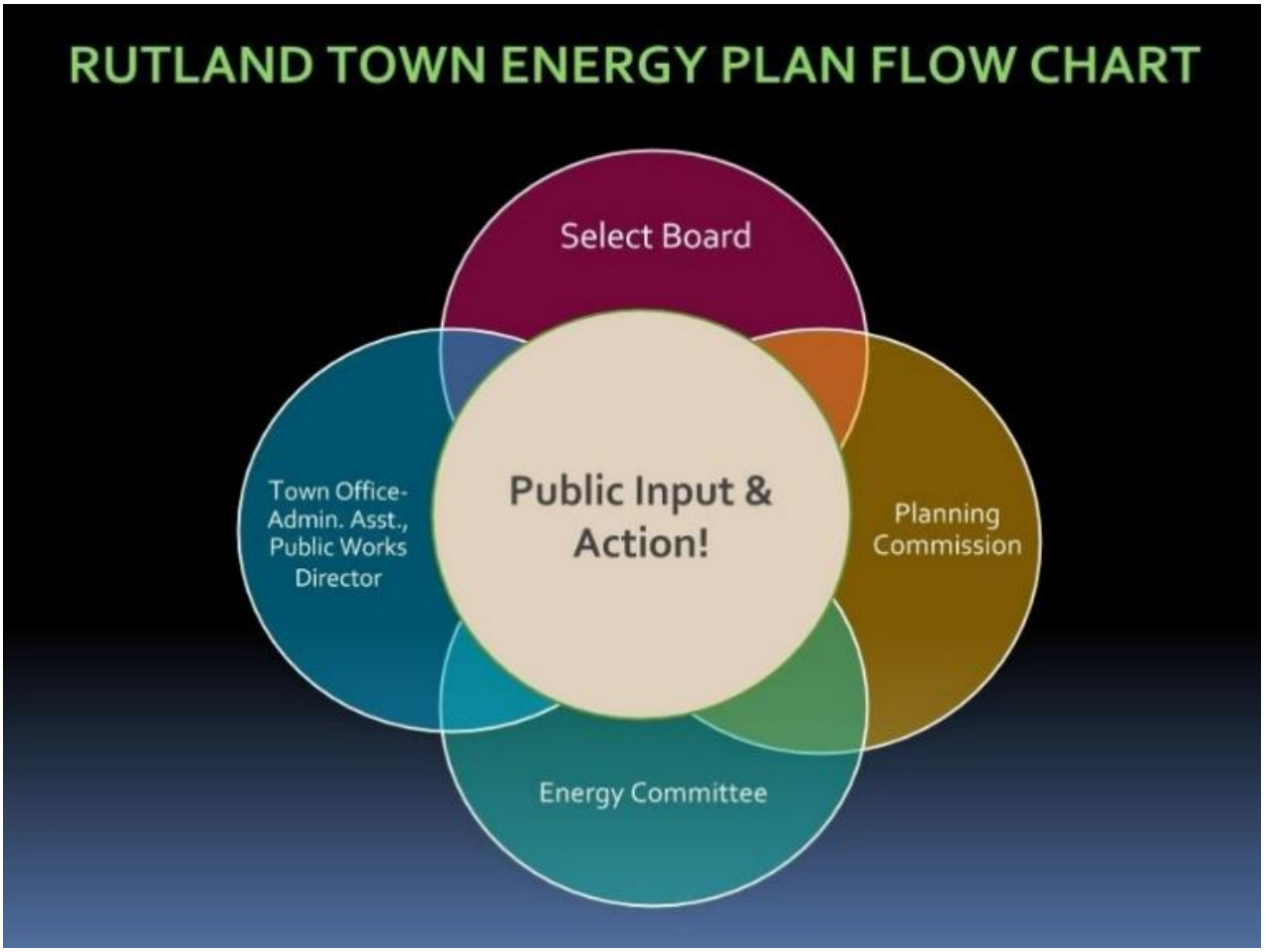
To lead by example by making municipal transportation more efficient, the Selectboard and the Administrative Assistant to the Selectboard shall:

- Purchase energy efficient municipal vehicles when practical.
- Encourage the installation of EV charging stations at the Town Office and other town buildings and facilities.

Land Use

Rutland Town is committed to land use policies that result in the conservation of energy, demonstrate a commitment to reducing sprawl/strip development, minimizing low-density development and making compact development more feasible. The Planning Commission with the assistance of the Energy Coordinator/Committee shall:

- Promote low-impact development and green infrastructure practices for new development.
- In collaboration with Rutland City, provide water and sewer services to areas that would allow fill-in development in existing developed residential, commercial and industrial areas.
- Prepare a plan for improving pedestrian and bike connections and for the consideration of funding through a capital budget and program.
- Review and update the town Future Land Use Map to reflect the vision and goals of this municipal plan.
- Promote future development along Business Rt. 4 (an under-developed commercial area in the town) so that it is a walkable, multi-use hub.
- Consider making the areas from the fire station to the town office building, from Rt. 3 to the East Proctor Road intersection, and Meads Falls to Ripley Road a designated Village Center for the town.
- Work with the Selectboard to develop a long-term master plan to address the infrastructure necessary for compact development, e.g., sewer and water, pedestrian and biking facilities and parking.
- Work with regional planning groups such as REDC and RRPC to promote Rutland Town as a site for energy efficient business development and green transportation.
- Accommodate the safe and effective use of renewable energy systems (residential and commercial scale) and consider town policies that address design, height, safety, siting, sound and decommissioning.


RUTLAND TOWN ENERGY PLAN FLOW CHART
Select Board
Town Office-
Admin. Asst.,
Public Works
Director
Public Input &
Action!
Planning
Commission
Energy Committee

NATURAL AND CULTURAL RESOURCES

Introduction

Before a community can plan for its future, it must identify natural and cultural resource assets and create clear standards for their protection. Natural and Cultural Resources are shown on Natural Resource Maps #1 and #2, which are hereby incorporated with this plan.

Goal:

- ***Protect natural and cultural resources from the impacts of development, while maintaining access to and appropriate use of those resources.***

Agricultural Resources

Although agriculture has been a prominent land use in the town since its original settlement, large-scale agricultural use of land has been steadily decreasing due to the proximity to Rutland City, demand for housing, and the increasing economic pressure on farmers within Vermont. Agricultural are located primarily along Otter Creek in the west/southwest sector of town and between North Grove Street and East Pittsford Road/Blueberry Lane in the north sector. A recent upswing in smaller-scale agricultural activities has increased the number of farms in the region and is supporting a growing agricultural economy.

An analysis of settlement patterns in Rutland Town indicate that only a small number of structures are currently standing on the highest quality soils in the community. Land designated as "prime" agricultural lands comprise 22% of the town's total and land. 17 structures (1%) of the total number of buildings in town are located on what are considered to be prime or statewide agricultural soils.

Forest Resources

Most of the forestland is located on slopes bounded by West Rutland and Proctor to the west and by Mendon to the east. There is a small amount of valuable timber, but most of the land is used as a scenic and recreational resource--hunting, hiking, bicycling, and crosscountry skiing.

Like high quality agricultural soils, high quality forest soils are scattered throughout the Town. High quality forest soils are not limited to any particular land form. It is important to note that many soils classified as having high potential for agricultural production may also have high potential for forestry. This is because many of the physical and chemical characteristics that make land productive for annual crops are also desirable for tree growth.

Forests serve important functions in maintaining wildlife habitat connectivity and managing stormwater and flood impacts. Forest areas shall be protected during development.

Thirty-eight parcels in Rutland Town are enrolled in the State of Vermont Use Value Appraisal Program (Current Use). In order to retain the potential for future agricultural and forest uses, development should be discouraged on the Town's limited amounts of these areas.

Mineral Resources

The extraction and processing of mineral resources is a significant economic activity in Vermont and Rutland County. Rutland Town lies just east of economically valuable slate and marble belts (although marble has been quarried in the past, there are no current commercial mineral extractions), and sand and gravel resources are present, particularly in the northeast corner of town.

Mineral extraction and processing operations shall not be located in areas which would adversely impact residential neighborhoods with regards to traffic, noise, dust, vibration, aesthetics and odors.

Steep Slopes

The degree of slope, defined as the number of feet of vertical rise in 100 feet horizontal distance, has direct implications for most land uses.

Development on steep slopes (over 15%) creates environmental issues such as increased erosion, sedimentation, and flooding. These areas are also home to sensitive natural and cultural resources. Costs of site improvement, construction, maintenance, and delivery of public services (school bus, fire, etc.) increases when development occurs on steep slopes.

Development shall be avoided in areas with slopes greater than 15%.

Rare and Endangered Plants and Animals and Wildlife Areas

Natural heritage sites incorporate rare plants and animals that are native to the state and considered rare for one or more reasons, as well as natural communities that are either rare habitat types in Vermont or among the best examples in the state of a common community type. There are four natural heritage sites in Rutland Town.

Rutland Town is an important wildlife habitat area and migration corridor. Because of its physical setting along the Otter Creek and at the confluence of the Region's two primary valleys, many larger and smaller animal and bird species make use of land and water within the Town. There are few undisturbed areas remaining in Rutland Town. Three key areas for wildlife habitat connectivity remain in the Town:

- In the northwest, between the Pine Hill Park area of Rutland City and the Town of Proctor (where two rare, endangered, or threatened species reside).
- In the southwest corner of the town, where limited undeveloped areas serve as the last connection between two habitat areas of the Taconic Mountains in Clarendon.
- In the southeast corner of the town, adjacent to another rare, threatened, or endangered species and linked to the larger undeveloped areas of Mendon and Shrewsbury. The most critical component of wildlife survival, according to Conserving Vermont's Natural Heritage, a book produced by the Agency of Natural Resources, is the maintenance of blocks of connected habitat and migration land. In other words, it is critical that large tracts of land be connected versus existing in isolation.

Deer, the largest of the animals typically found in Rutland Town, have several mapped deer wintering areas in the Town, which occupy a total of 1,627 acres, 13% of town. Typically, deer

wintering areas are located predominantly in areas of low, south facing slopes and along watercourses. In Rutland Town, they are located at the extreme northwest comer of the town, east of Prospect Hill, and in the southeast corner of the town.

Rare and Endangered Plants and Animals and Wildlife areas are shown on Natural Resource Maps #1 and #2. Development shall occur in these areas or in ways that minimize the loss of connected habitat areas.

Forest Fragmentation

Forest Blocks

Forest blocks are areas of contiguous forest and other natural habitats (wetlands, old meadows etc.) that are not broken up by roads, development, or agriculture. These areas provide significant interior forest habitat, ecological connectivity, or physical landscape diversity and can be different sizes. Forest blocks are identified by the land cover of an area and not bounded by political or parcel boundaries.

A forest block that is well connected to other forest blocks functions better than one that is completely isolated. When blocks are close in proximity, animals can use several connected small forest blocks, like stepping stones, to meet their life needs. In Rutland Town, the most significant forest blocks, Highest Priority Interior Forest Blocks, are identified in the map on the next page.

Habitat Connectors

Habitat connectors are land or water that links larger patches of habitat to allow for the movement, migration, and dispersal of animals and plants. They can be a forest block, riparian areas (along streams and rivers), or a specific road crossing that wildlife repeatedly use. This healthy forest pattern is a network of contiguous streams and forest blocks that extends across town, interrupted only by a few roads or non-forest land cover. The most valuable of these habitat connectors in Rutland Town, called Highest Priority Riparian Connectivity and Highest Priority Forest Connectivity Blocks, are shown on the map on page 72.

Movement of animals from one habitat patch to another is the value of habitat connectors. This is true for both wide and small ranged animals. Bobcats and black bears might use connections quite frequently, whereas spotted salamanders might use them only a few nights each spring to move from hibernation sites to breeding pools.

Even smaller blocks serve an important connectivity role. Small forest blocks, like those found in Rutland Town, can function as connecting habitat from the Appalachian Trail and Green Mountain National Forest to the east to the Taconics and Adirondacks to the west. Landscape scale connectivity is important for connecting populations of wildlife over large areas or within a region. This allows for genetic variability and ensures migration. The oval areas with hatch marks on the map on page 72 indicate where connectivity is likely present and where it should be protected in Rutland Town.

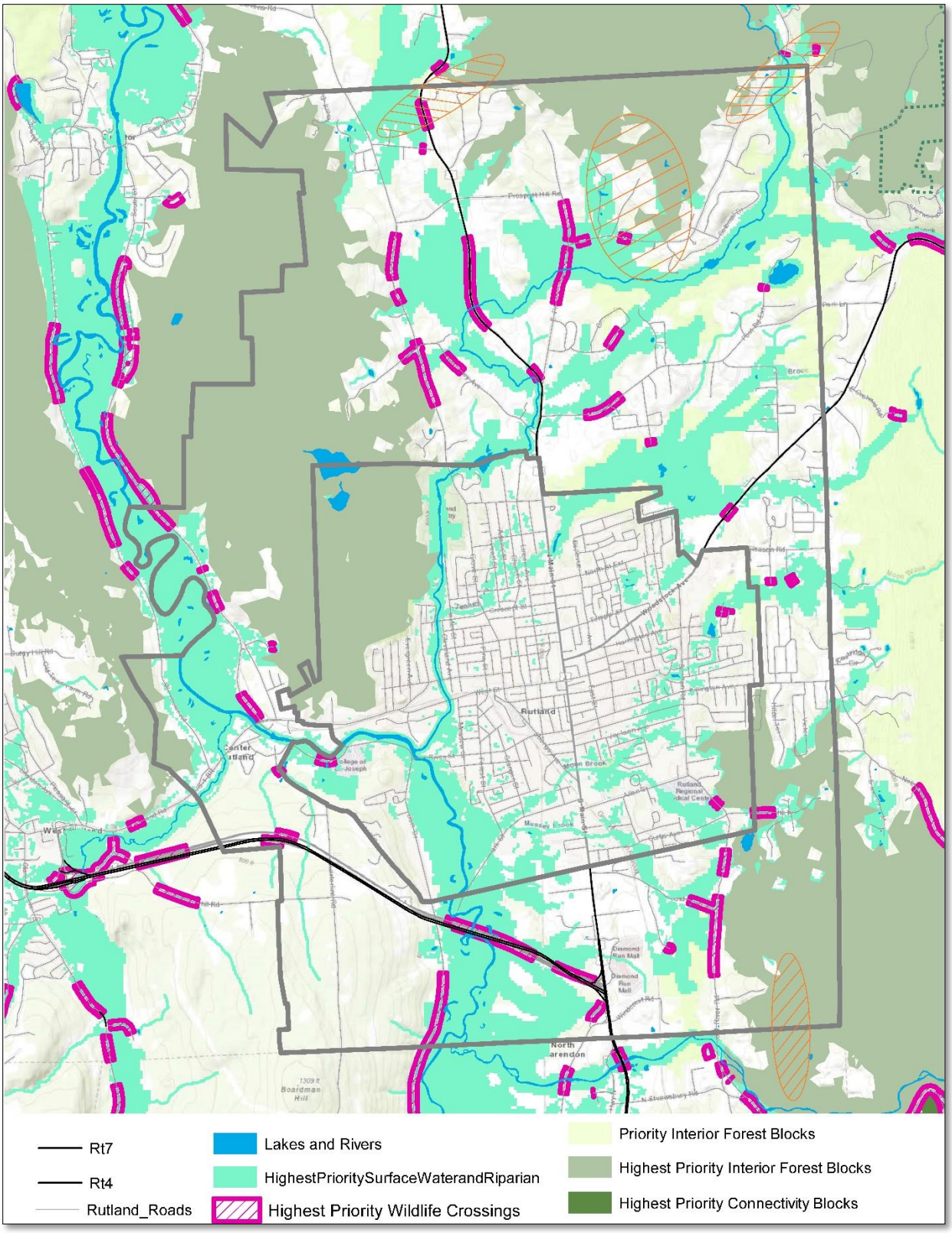
Policies to Protect Rutland Town's Forest Blocks and Habitat Connectors

Minimize Fragmentation of Forest Blocks and Habitat Connectors

- Roads, driveways, and utilities shall be designed to avoid the fragmentation of identified forest blocks and wildlife connectors.

Discourage Encroachment into Interior of Forest Blocks

- Development that takes place within identified forest blocks shall be located at the edges of the blocks to reduce fragmentation by roads, clearing, and development. If there is no land that is physically suitable for development at the edge of the blocks, the development must be located to minimize fragmentation of the block.


Rutland
Center Rutland
North Clarendon
Diamond Run Mall
Rutland Regional Medical Center
College of St Joseph
Rt7
Rt4
Rutland_Roads
Lakes and Rivers
HighestPrioritySurfaceWaterandRiparian
Highest Priority Wildlife Crossings
Priority Interior Forest Blocks
Highest Priority Interior Forest Blocks
Highest Priority Connectivity Blocks

Open Space and Scenic Resources

In the course of planning for Rutland Town's future, it is important that the presence of high quality open space and scenic resources--broad scenic areas as well as scenic landmarks-be recognized and the integrity of such resources be preserved. Open space and scenery entice many people to visit the area and add greatly to the quality of life enjoyed by the people who live here.

Open space and scenic resources are fragile. Misuse or overuse can destroy the delicate balance of form and pattern that defines scenic beauty and attractive open space. Open space and scenic resources shall be considered during subdivision review and protected from development.

Of particular concern is the maintenance of scenic resources along the roadways of the Town. These scenic qualities serve to differentiate the Town from the more urban character of the City of Rutland.

Pastoral and scenic views of mountains, ridges, and valleys must be preserved. While some development has already occurred that impairs those views, no further development should be permitted that has an undue adverse impact on those scenic resources. The scenic resources of the Town belong to all residents of the Town and to the Town itself. The Town's scenic resources are easily lost by ill-advised development. Once lost, they are irreplaceable.

It is the policy of this Plan that these locations, to the extent not previously developed, undergo no further development that unreasonably reduces or diminishes their scenic or visual qualities. Most roadways that are scenic in nature have occasional locations where distant views cannot be seen. These parcels are mere interruptions in a unified experience of scenic beauty. These parcels should be preserved to avoid disruption of a continuous scenic experience.

Little or no development shall occur that unduly disturbs or alters these scenic resources. While small, low, relatively inconspicuous uses may be allowed where such scenic resources are located, if a project or use has an undue impact upon the visual or scenic resources of other locations within the Town from which it can be seen, it shall not be allowed even if the proposed use is allowable generally in the district in which the subject property is located. While projects and uses can be relocated, there can be no replacement of a scenic or visual resource that has been lost.

In considering the question of "undue impact" by development upon visual or scenic resources hereunder, the standard that shall be utilized is the so-called "Quechee Lakes" standard.

Therefore, in areas that have an impact on visual or scenic resources of the Town described herein, the following guidance shall apply in a non-exhaustive manner to review of development in such areas. At a very minimum, all such development:

1. Must take into account the impact of the proposed project on the scenic and visual impacts of the project.
2. Must be located at a distance from the road that will lessen the visual impact of such project to the extent reasonably feasible and shall take into consideration the contour of the land. In determining what is reasonably feasible, mitigation methods such as setback, buffers, plantings, and berming must be considered as means to reduce visual and scenic impact.
3. Must provide in any plan for development a list, itemization, drawing, map or plat plan, of all measures that will be taken to reduce visual impact including but not limited to such measures (this list is non-exhaustive) as berming, planting, recontouring of land, shielding, reduction of lighting (including consideration of appropriate Dark Sky or similar measures), etc.
4. Excepting (a) projects in the Industrial district, (b) barns, silos, agricultural outbuildings actually used in agriculture, and/or (c) public safety facilities or projects, development within the Town:
    a. Must not include or involve large roof, parking, driveway, reflective, flat, curved, or other surfaces that are visible from areas of regular (meaning more than occasional) travel or occupancy. The term "large" shall be interpreted by reference to the road, parking, driveway, etc., surfaces of other projects and properties visible from the same point in roadways or residences from which the subject property can be seen.
    b. If replacing an existing building, structure, or facility, must not be taller than or have more volume than any project or building it replaces;
    c. Must be of a color and surface texture that is compatible with or consistent with the natural surroundings in which it is located;
    d. Must not result in more curb cuts, roads, driveways, or other visual connectors from road to building, than are reasonably necessary to provide access to the project;
    e. Must not result in utility lines, fuel storage, or other visible services that are unduly visible from areas of regular travel or occupancy.
5. Because distance from places of regular travel or occupancy can in some cases (but not all cases) reduce visual impact, buildings shall be constructed as far from the roadway affected as is feasible in order to reduce visual or scenic impact, in areas from which scenic resources are visible. It is the policy of this Town Plan that the larger a project is, the more distant it shall be from any roadway or residence that experiences the scenic resource. The point and purpose of this provision is to reduce scenic impact. The fewer degrees of azimuth and altitude that are affected, the less the impact will be.

The fact that a proposed project or structure does not violate the guidance of paragraph 1-5 above shall NOT mean that the project does not create an undue impact as described above. Rather, a project that does not comply with the guidance of paragraph 1-5 above is presumed to create an undue impact on scenic and visual resources. In addition, while considering undue impact, the cumulative impact of adding another project to the viewshed may be, but need not be, considered on a case-by-case basis, depending on the particular circumstance before the panel or commission considering the project's compliance with this Town Plan.

While the terms “visual” and “scenic” are used within this section, the terms are often used interchangeably herein. No significance shall be given to the use of one term as opposed to the other within the provisions of this Section.

To provide guidance to developers, townspeople, stakeholders, tribunals, commissions, or agencies respecting the intent and purpose of the above, the following locations are declared to be “scenic resources” of the Town of Rutland within the meaning of that term as described above. The inclusion of a location herein shall be conclusive evidence that the Town of Rutland has declared such location to be a “scenic resource.” However, the fact that certain locations are expressly defined herein to be a “scenic resource” shall NOT be considered to exclude other locations. The inventory listed here is to be considered as examples of the scenic resources of the Town:

- Boardman Hill – from Quarterline Road to the West Rutland Town Line – views to north
- Blueberry Lane – from Prospect Hill Rd. to end of Blueberry Lane - views in all directions
- Cedar Avenue – from the Community Center to North Grove St. – views to north and east
- Cold River Road – from Quality Lane to US Rt. 7 to the Clarendon Town Line – views to east, south and west
- Creek Road – from the US Rt. 4 overpass to Clarendon Town Line – views to east
- East Pittsford Road – progressing from Russell Drive to Tamarack Lane – views initially to north and west, then to north, east and west, then to south and east, and then to east, south and west
- Hawley Lane – all of Hawley Lane from beginning to end – views to south
- McKinley Avenue – from the fire station crossing North Grove St., to top of hills – views north and south
- North Grove Street – from McKinley Avenue to the Pittsford Town Line - views north, west and east
- Post Road – from Rob Shawn Place continuing on Post Road Ext. to Mendon Town Line – views in all directions
- Prospect Hill Road – US Rt. 7 to East Pittsford Road – views in all directions
- Sugarwood Hill Road – from US Rt. 7 to Oakridge Drive – views to south and east
- Tamarack Lane – from beginning of Tamarack Lane to the end – views in all directions

- US Rt. 7 North – from East Pittsford Road to Sugarwood Hill Road – views east, south and west

- US Rt. 4 East – from Post Road to Townline Road – views west and east

- West Proctor Road – beginning ½ mile from US Rt. 4 West to the Proctor Town Line – views to north and east

The following were eliminated from the original list and so are NOT considered scenic resources; East Proctor Road, Quarterline Road, Viewmont Drive and US Rt 4 Bypass.

Historic Structures

Areas that have historic value to present and future residents of the Town enrich the community greatly. As the Regional Plan states, "Standing buildings and structures may be important because of their significant architectural design and fine material and craftsmanship or because they illustrate an important aspect of history."

Often they too help tell the stories of everyday life that were never written down. These clues to understanding our past can be found in such individual structures as elaborate mansions, simple workers' houses, bridges, factories, and barns, as well as the groups they form in village centers, residential neighborhoods, and farm or industrial complexes. Historic structures, through their locations, architectural features, and historical associations, testify to patterns of Vermont life in the late 18th, 19th, and early 20th centuries and serve as the visible reminders of the occupations, activities, philosophies, and priorities of Vermonters who came before us.

The Town has a large number of historic structures, which are described in the Rutland Town chapter of "The Historic Architecture of Rutland County". According to this report, there are 86 properties listed on the Vermont Historic Places Register. Of these, the majority are residences. However, they also include farms, mills, a powerhouse, a bridge, a post office, and a church.

The Town also includes one officially recognized historic district. This district, which is located at the intersection of Business Route 4 and East Proctor Road and called the Center Rutland historic district, consists of 24 of the Town's 86 historic properties.

Water Resources

Water resources include both surface waters such as lakes, ponds, reservoirs, streams, wetlands as well as ground water contained in the pores of soil materials such as aquifers and springs. These resources are shown on Natural Resource Maps #1 and #2.

Watersheds

In order to discuss a community's water resources, it is important to understand the nature of the community's watersheds. A watershed is a distinct, topographically defined land area that drains into a single river, river system, or standing body of water. Because rivers join to become larger rivers, many watersheds may be considered "subwatersheds" of larger watersheds. The

activities taking place in a watershed play a critical role in the quality of the water draining from it. If a watershed is mostly agricultural, for example, then the quality of the water leaving that watershed will reflect prevailing agricultural practices. If a watershed is mostly forested, then the water leaving that watershed will reflect prevailing forestry practices.

A watershed also defines the land that contributes water towards the watershed's supply. Public water supply watersheds, inducing Rutland City's, lie within Rutland Town and need to be carefully guarded from contamination and adverse impacts to quantity of supply.

In Rutland Town, there are three watersheds that feed into Otter Creek: Cold River, Clarendon River, and East Creek. Since Otter Creek drains into Lake Champlain, the Town is part of the Champlain Basin. A number of small tributary streams drain the western flanks of the Green Mountains to form the headwaters of Cold, Moon, and Tenney Brooks.

The City of Rutland holds 4,400 acres of "Class A" Watershed in Mendon and water is transmitted to a filtration system in Rutland Town. These lands shall receive the highest level of protection. Should septic systems, faulty sewer lines, landfills or other types of development be located too close to the supply, contamination may result. Likewise, should significant or intense development requiring on-site water sources occur within or immediately adjacent to the watershed, the quantity available to the public system could be adversely affected.

Rivers and Streams and their corridors

Otter Creek is the most prominent watercourse in the town, providing a strong visual focus as it meanders through the fertile farmlands along the valley floor. Flowing northward, Otter Creek drains approximately 307 square miles of land by the time it reaches Center Rutland. Lands along the creek are highly productive wildlife areas offering significant habitats and range to wildlife and waterfowl. Otter Creek slopes very gradually, averaging only 1/2 to I foot per mile, contrasting sharply with its steep tributaries that may drop tens of feet per mile of river. Otter Creek is not subject to extreme flooding conditions because of its large valley storage capacities and tributaries that are well distributed along the river, helping to desynchronize flood crests.

East Creek, draining approximately 53 square miles, has several very steep tributaries draining the western slopes of the Green Mountain. Mendon Brook, a major tributary of East Creek, drains the majority of Green Mountain uplands in the Town of Mendon.

Stream Bank Erosion

The vast majority of flood damage suffered in Vermont is caused by "fluvial erosion", that is, stream bank erosion. To address this issue, the Vermont Agency of Natural Resources conducted a Stream Geomorphic Assessment (SGA) of the Otter Creek, Moon Brook, Mussey Brook and East Creek within Rutland Town. The data indicates that these streams have been highly modified in the past to make room for human investments such as roads and houses. These modifications have led to unstable stream systems resulting in increased flooding and erosion hazards, as well as compromised habitat for aquatic species.

Impaired Waters

There are several waterbodies that flow through Rutland Town that are considered "impaired", meaning that they consistently do not meet Vermont Water Quality Standards. These waters

include the Otter Creek, Mussey Brook, Moon Brook and East Creek. In addition, the Clarendon River is listed as "stressed" and has been identified as needing further assessment to address concerns about sedimentation, nutrient enrichment, high levels of pathogenic bacteria, and stormwater runoff due to agricultural runoff, industrial and urban runoff.

The Otter Creek mainstem is considered impaired due to high levels of pathogenic bacteria due to suspected agricultural runoff, malfunctioning septic systems, wastewater treatment plant overflows, and wildlife. In addition, the Otter mainstem is listed as "stressed" and has been identified as needing further assessment due to concerns about excessive sedimentation, organic enrichment, toxics, and metals.

The Moon Brook has been identified as consistently not meeting Vermont Water Quality Standards due to stormwater runoff. Increasing volumes of stormwater runoff from new impervious surfaces in the Moon Brook watershed are causing erosion, nutrient enrichment, toxicity in the water column or sediments and stream channel enlargement and /or movement. Stormwater management will be necessary for older intermitted and untreated stormwater discharges to Moon Brook. A hydrologic analysis of the watershed and delineation of stormwater impact areas will have to be completed.

East Creek is also listed as impaired due to stormwater runoff, but unlike the Moon Brook watershed, this impairment is primarily related to combined sewer overflows from Rutland City. However, the Creek has also been identified as "stressed" due to low dissolved oxygen levels from hypolimnetic withdrawals of unlicensed hydro-electric facilities in Chittenden and Rutland Town. Additionally, geomorphic assessment of East Creek indicates that it continues to adjust from historic, physical modifications.

Tinmouth Stream becomes Clarendon River just below a wetland complex in the West Rutland area. This is important in contributing to the high water quality and natural flow conditions in the Clarendon River. Thanks in part to this, the Clarendon River has very good spawning and nursery habitat throughout this reach for trout species which are an important sport fish on the river and in the State of Vermont. However, as the Clarendon River enters the more developed areas of West Rutland and Rutland Town, it becomes affected by thermal modification due to the loss of riparian vegetation as well as sedimentation from stormwater runoff and eroding streambanks.

Stormwater

The management of storm water runoff is at once a simple concept and a complex problem. Precipitation runs off impervious surfaces rather than infiltrating naturally into the soil. The cumulative impact resulting from the increased frequency, volume, and flow rate of stormwater runoff events can lead to destabilization of downstream channels and can also result in increased wash-off pollutant loading to receiving waters.

Recent development activities – most notably the addition of several new businesses and their parking areas - have presented the Town with a challenge of minimizing pollution resulting from stormwater runoff. Several of these new developments, however, have proposed innovative solutions that propose to address these concerns. The Town, and State regulatory bodies,

should pay close attention to these systems to determine their ongoing functionality. If they prove to be successful, officials could use them as models for addressing stormwater.

Floodplains

A floodplain is the flat land adjacent to rivers and streams that is periodically inundated to varying depths during periods of high water. Small floods tend to be more frequent than large ones. The 100-year flood frequency is used as the standard for delineating flood hazard areas by the Federal Insurance Administration. The 100 year flood will have a one percent chance of being equaled or exceeded in any given year.

[See flood resilience chapter]

New development or fill shall be discouraged in the Special Flood Hazard Area and Fluvial Erosion Hazard Areas. The potential for flood damage in these areas is high and is likely to cause expense to land owners, the Town, and State and Federal Governments. As a participating town in the National Floodplain Insurance Program, the town has municipal jurisdiction regarding floodplain protection through floodplain management regulations adopted by the town.

Wetlands

Wetlands are land areas that are saturated with water at least part of the year. Although precise definitions vary, wetlands are normally identifiable by vegetation, soil type, and/or frequency of ponding. Wetlands include marshes, swamps, sloughs, fens, mud flats, and bogs. In addition to providing important wildlife habitat, values (or functions) of wetlands include storing stormwater (they store large quantities of water during periods of high runoff and gradually release water during low flow periods), purifying surface and groundwater supplies, recharging aquifers, controlling erosion, providing areas for recreation, and serving as education and research areas. Wetlands are of crucial importance to the surface water regime. It is important to note that loss of this storage capacity will not only adversely affect stream behavior, but will also increase floods and reduce stream flow during critical low flow periods.

Wetlands play a vital role in protecting and maintaining the water quality of our rivers and lakes. Wetlands are also important for the preservation of water quality and wildlife. Biological activity of a wetland area enables absorption and assimilation of nutrients, purifying, to some extent, the water that is discharged. Wetlands also play critical roles in the reproductive cycle of many threatened species. Wetlands support plants that can help purify water by taking up nutrients and incorporating them into plant materials while releasing oxygen. Finally, migratory birds use wetlands in the area as stops along the Atlantic Flyway. This habitat is crucial during several periods in a bird's life cycle, supplying quality breeding grounds and resting or staging areas essential for migration.

The Vermont Wetland Rules identify and protect 10 functions and values of "significant" wetlands and establish a 3-tier wetland classification system to identify such wetlands. The first two classes of wetlands (Class One and Class Two) are identified on the Vermont Significant Wetlands Inventory (VSWI) maps and are protected under the wetland rules. Municipalities can further protect wetlands by limiting or prohibiting development in designated wetland areas in town zoning ordinances.

As shown on Natural Resource Map #1, the area in Rutland Town that is occupied by wetlands, as identified by the National wetlands Inventory is 562 acres, or 4.5 percent of the Town's area.

Farming wetlands or draining wetlands for agriculture is not a significant problem in Bennington and Rutland counties. Drainage, filling, and fragmentation are more of an issue associated with development and road construction. There is still a general lack of understanding by the public of the important functions and values of wetlands. The wildlife habitat values of wetlands are better understood and appreciated than others. Education and outreach conducted by conservation districts and other partners would educate citizens as to the value of wetlands to reduce flooding, filter nutrients, and recharge ground water. Several federal programs are available for landowners use to enhance or protect wetlands including: WRP (Wetlands Reserve Program), WHIP (Wildlife Habitat Incentives Program), CRP (Conservation Reserve Program), and Partners for Fish and Wildlife Program. The Vermont Land Trust, a nonprofit conservation organization, has also been very successful at protecting wetlands in Vermont.

State wetlands rules control development in wetlands rather than prohibit it outright. Farming and forestry uses, low impact recreation, utility poles, and incidental residential uses are allowed as long as the outlet of the wetland or its pattern of flow is not altered and dredge and fill restrictions are met. Federal law also governs the use of wetlands. Federal regulations are different from state regulations, although not necessarily more strict or more lenient. The primary federal law on wetlands is the Clean Water Act. The Clean Water Act regulates dredging and filling of all public waters, which include the nation's wetlands.

Ponds

Only a handful of small ponds exist within Rutland Town. No water quality data currently exists for the ponds within the Town**.** Muddy Pond has served the community as a recreational resource for a number of years. In order to help maintain water quality and wildlife habitats within the town, however, vegetated shoreline buffer areas should be present.

Groundwater

Groundwater is a critical water resource, particularly in a rural area such as Rutland Town. It meets needs for a range of uses, including residences, agriculture, and business.

The main reasons for planning for groundwater are to protect the health of area residents and insure adequate supplies of water for the future. Without clean groundwater supplies, the community could incur significant costs in terms of health and/or in locating alternative supplies.

Groundwater related planning issues include the potential impact of pollutants (particularly non-point pollutants) on the quality of local aquifer and groundwater supplies. Similar to other areas of Vermont, non-point source pollution is the major source of water use impairment to surface waters in the Rutland Town. Unlike point source pollution, such as a direct discharge or outfall pipe, non-point source pollution is more diffuse, harder to quantify and more difficult to control. Examples of these are runoff from parking lots, back roads, fertilized lawns, and runoff from agricultural fields. It has been well documented that urban and suburban non-point sources contribute more phosphorus and sediment per acre than runoff from the working landscape.

Natural and Cultural Resources Strategies

Land Resource Strategies

- Incorporate measures that provide protection for land resources during development
- The Town's primary agricultural soils should be conserved for agricultural uses if they are economically viable; development should be steered away from prime agricultural soils.
- Forested lands should be conserved to protect against erosion and to preserve their scenic and recreational qualities.
- Wildlife habitats in the Town should be conserved; the impacts of development and land use change on these habitats should be minimized through the use of conservation easements, purchase, lease, tax incentives, or other measures. prohibited
- Land development is discouraged on slopes greater than 15%.
- Sand and gravel operations should be carefully reviewed to ensure the public's safety and freedom from noise, dust, traffic and other intrusions in residential areas.
- Identify other lands to prevent flooding by maintaining vegetated buffer strips in riparian zones surrounding streams and rivers; maintaining; upland forests and watersheds for predominately forest use; and requiring new development to preserve vegetated riparian buffer zones that are consistent with state riparian buffer guidelines.

Historic Resource Strategy

- Preserve historic structures and scenic, cultural, recreational, and unique natural resources during development.

Water Resource Strategies

- Protect water resources so that water quality is maintained, access is preserved, erosion and encroachment are minimized, and public interests are advanced.
- Gravel aquifer and wellhead areas should be protected from development that would pollute or restrict the flow of water through porous soils.
- Any use or development proposed to be located within or adjacent to the watershed of a public water supply or community well system shall be carefully reviewed for potential detrimental effect to both the quality and quantity of the supply.
- No development or earth disturbance of any kind should occur within fifty (50) feet of any shoreline and no on-site septic disposal facilities should occur within one hundred and fifty (150) feet of any shoreline. This section shall not apply to any ponds smaller than 2 acres and contained entirely within one landowner’s property.

- Development in Special Flood Hazard Areas and Fluvial Erosion Zones shall be discouraged.

- Land development resulting in the loss of wetland storage capacity**,** or impacting negatively on water quality is discouraged.

- Work to develop more consistent, accurate and thorough identification of wetlands areas through the use of best available data and the adoption of local wetlands regulations and updated maps.

- Enhance subdivision regulations to protect wetlands and prohibit structural development or intensive land uses in Class One or Class Two wetlands unless there is an overriding public interest.

- Land development , including the construction of roads, that results in the loss of wetland storage capacity~~,~~ or negatively impacts water quality is discouraged.

- Consider creating a Regional Watershed Stormwater Management group with other area jurisdictions to reduce runoff pollution into local waterbodies.

- Reduce the percentage of impervious surfaces by limiting the number of rooftops and paved areas, by using permeable surface materials, employing disconnection practices, and by implementing Low Impact Development (LID) principles and other methods to increase stormwater retention and infiltration.

HOUSING

Introduction

Housing, especially housing that the average Vermonter can afford, is an increasingly important issue for communities in Rutland County and the State of Vermont. This chapter supplements information on Rutland Town's housing included in the Community Profile section of this plan, and includes an analysis of housing affordability in Rutland Town and strategies to achieve housing goals of the community.

Goal:

Promote a diversity of safe and affordable housing types and choice between rental and ownership in a variety of locations suitable for residential development and accessible to employment and shopping centers by all modes of travel.

Existing Housing

Rutland Town's housing stock was made up of 1972 housing units in 2012, up 8.6% from 1816 units in 2009, the majority being single-family units. In 2010, only 9.3% percent of the total was classified as multi-family units, which include duplexes.

Rutland Town contained 1,754 households in 2010, all but 47 of which were year-round. Of those, 22% were renter-occupied and 72% were owner-occupied, a figure that remained

essentially consistent from 1990. 6.2 percent of Rutland Town's housing units were vacant in 2010. Vacancy rates are viewed as an indicator of the "tightness" of a housing market.

Home Ownership 2010

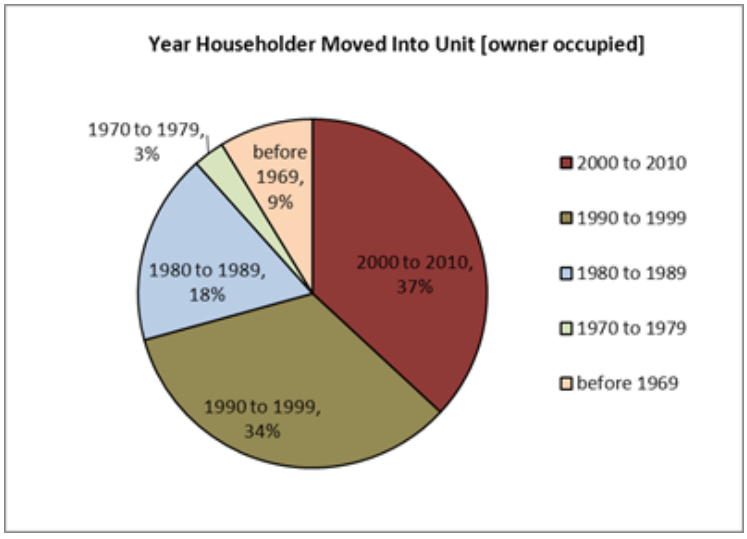
Source: State of Vermont housing data profiles 2010

2010 Households	Owning home	Renting home	Number of Families	Average household size	Average Family Size		
	1348	**406**	**1141**	**2.27**	**2.78**		

As a result of the increase in housing units and proximity to Rutland City, and its related service, approximately 75% of the land in Rutland Town is used for residential uses.

Corresponding with the town's growth trends, 70% of Rutland Town housing units have been constructed since 1970 and 71% of Rutland Town householders have moved into their units since 1990.

Source: US Census, 2014



Location of Housing

Homes are spread throughout most of Rutland Town, due to its location surrounding the City and relatively gentle topography. Homes to the north and west of the City are in mostly rural settings, while more widespread development to the east of the City has led to larger, more suburban-style neighborhoods. Multi-family housing is found primarily immediately adjacent to Rutland City to the east. Two senior housing complexes – the Gables and the Meadows - are also located in Rutland Town east of the City.

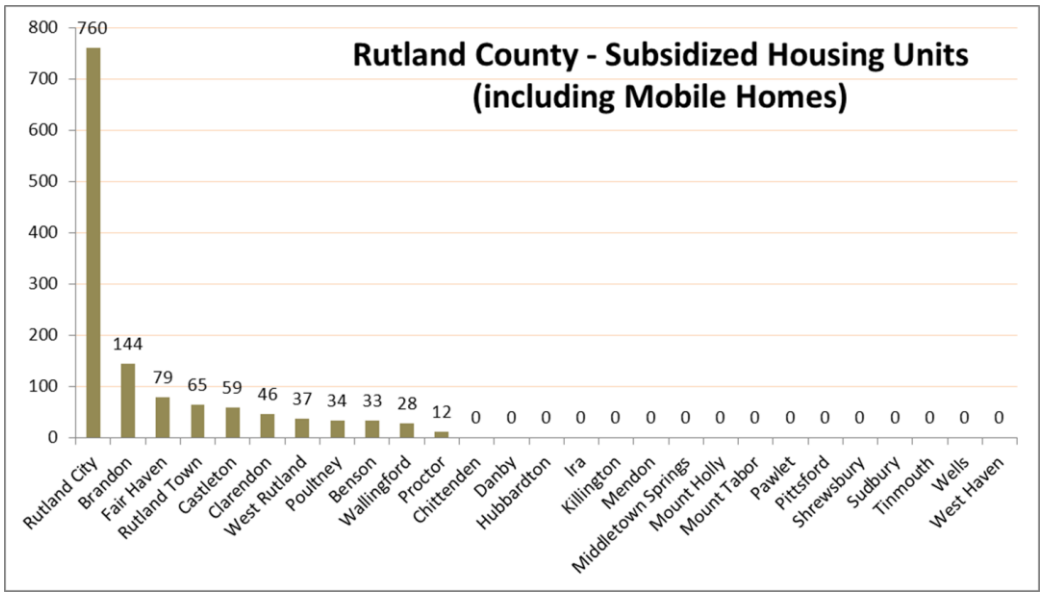
Housing and Rental Cost

The availability and affordability of housing can play a significant role in the health and development of a community, especially where increased industrial and commercial business development is desired. The cost of housing and land has risen throughout the Rutland Region over the past decade, and the price of homes in Rutland Town is consistently higher than the County as a whole.

According to the US Census, the median home selling price in Rutland Town in 2013 was $199,000, compared to the County median price of $140,000 and State of Vermont median of $200,000. In 2013, the average sale price of a primary residence in Rutland Town was $221,973.00, compared to the Rutland County sale price of $160,338.

Housing is generally considered to be affordable to a household when it is paying no more than 30% of its income for housing costs (rent, mortgage, electricity, water, etc.). In 2011, 47% of renters and 22% of owners were paying more than 30% of income on housing. These figures are slightly below the Rutland County and State of Vermont amounts.\

According to the National Low Income Housing Coalition, 2014 *Out of Reach* report, the fair market rent for a two-bedroom unit in Rutland County is $825 per month. The State of Vermont rate is $1,007 per month. In Rutland County, to afford this rent an annual income of $33,000 or hourly wage of $15.87 is required in order to not spend more than 30% of income on housing. At the Rutland County mean hourly wage of $10.35, an individual has to work 1.5 full time jobs to afford the fair market rent. Rutland Town has 65 privately-owned units of subsidized family housing units.



Source:

Housing Strategies

- Support the development of affordable housing, in areas most suitable in terms of housing need, environmental impact, employment opportunities, public services, and transportation.
- Encourage the retention of existing affordable housing, and encourage the maintenance of aging housing units.
- Assist public and private agencies involved in planning, financing, and developing affordable housing.
- During the Subdivision review process, require housing to be accessible to employment, services, educational, and recreational facilities by multiple forms of transportation.
- Modify the Land Use Map to provide new housing, including multi-family housing, in areas within or adjacent to exiting settlement patterns.
- Work to redevelop former industrial, commercial, brownfields and institutional buildings into housing and/or mixed-use structures.
- Allow the conversion of larger homes to multi-family housing if municipal sewer and water are available and as allowed by limits that control density.
- Explore the need for a set of housing and rental building codes that can be recommended to the Selectboard in order to protect the health and safety of Rutland Town residents.
- Provide easy access to information about affordable housing on the Town website. Include both educational material for the general public and information about housing resources available to those in need of affordable housing, or help purchasing a first home.

CHILD CARE

Introduction

Accessible, affordable, quality child care is an integral component of land use planning and closely linked to the affordability of communities. Many families lead lives that require some type of child care outside the home. Recognizing this reality, child care is an important community need. Availability of child care can have direct positive effects on the growth and vitality of the community.

Goal:

To provide access to quality and affordable child care for all Rutland Town residents.

Background

In 2013, there is 1 Registered child care provider and no Licensed child care providers in Rutland Town. It is important to recognize that while the Town's resident population is relatively small, its role as a primary employment center in the Region creates a much greater need for services such as child care providers. Information regarding providers can be found at www.brightfuturesinfo.org.

Throughout the Rutland Region there are 85 registered home care providers and 69 licensed child care centers, which include early childhood and school-age care programs. Rutland City accounts for nearly half of the capacity of the region's providers, with 30 registered homes and 27 licensed centers.

To improve the quality of services, Vermont has established the Step Ahead Recognition System (STARs) program to recognize regulated child care, preschool, and afterschool programs that take measures to exceed state standards in providing services to children and families. STARs ratings range from 1 to 5 stars, based upon their success in five areas of performance (e.g. staff qualifications). As of January 2014, 72 child care providers in the region were participating in STARs. Sixteen of those providers achieved the highest rating of 5 stars, and 18 had a rating of 4 stars.

Childcare Strategies

- Town policies and ordinances shall consider access to child care services.
- Town policies and ordinances shall provide quality environments for children in child care.
- Support programming by the Town's school and Recreation Department for kids during after school and summer time hours.

Scenic Road Viewshed Analysis and Inventory for Rutland Town

GIS for Environmental Science and Management
December 8, 2018

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1.0 INTRODUCTION

Vermont's scenic landscapes play an integral role in both enhancing the quality of residents' daily lives and generating revenue through tourism. Studies from private market research companies in conjunction with the Vermont Department of Tourism and Marketing have found that residents and visitors alike associate the word "Vermont" with descriptors such as "authentic," "natural," "unhurried," "not crowded" and "pristine" (1). For those who come to Vermont, two popular cultural experiences are driving back roads and sightseeing. Part of what makes Vermont and the "Vermont Brand" so compelling is the notable presence of scenic resources. The term "scenic resources" refers to public areas, features, and sites that are recognized, visited, and enjoyed by the general public for their inherent visual qualities and encompass all areas visible from scenic roads and the number of viewpoints of parcels along scenic roads. In fact, the average distance traveled on Vermont roads for a non-resident is about 150 miles per trip. A town's scenic resources, particularly those physically and visibly accessible from roads, are thus important to take into consideration in zoning and planning. Additionally, state guidance for regional and municipal enhanced energy planning standards specify scenic resource inventories as critical criteria for identifying possible location constraints for renewable energy development. Specifically, Act 174 requires such plans to identify potential areas and constraints for the siting of renewable energy resources and developments.

In the Town of Rutland, located in central Vermont, the Rutland Town Planning Commission recognizes the aesthetic and economic value that scenic resources hold. In the course of planning for Rutland Town's future, the Planning Commission is prioritizing the presence and preservation of its scenic resources. That is, it aims to emphasize its scenic resources to enrich the community and capitalize on the state's tourism industry base. The Rutland Town Municipal Plan (2) states:

> *"It is important that the presence of high quality open space and scenic resources be recognized and the integrity of such resources be preserved. Open space and scenery entice many people to visit the area and add greatly to the quality of life enjoyed by the people who live here... Of particular concern is the maintenance of scenic resources along the roadways of the Town. These scenic qualities serve to differentiate the Town from the more urban character of the City of Rutland... It is the policy of this Plan that these locations, to the extent not previously developed, undergo no further development that unreasonably reduces or diminishes their scenic or visual qualities… [Infrastructure and Town development] projects can be relocated, but there can be no replacement of a scenic or visual resource that has been lost."*

While scenic resources are critical to both town character and revenue, particularly where tourism is abundant, the appraisal of these resources is complex. Designation as a scenic resource is dependent on the quality of the view from a given viewpoint and the accessibility of the viewpoint itself. As such, a truly objective assessment of a view is impossible to achieve, especially for local town officials and stakeholders who make the final decisions on which viewsheds and roads should be considered a scenic resource and potential constraint to future development. The Town of Rutland, Vermont has identified 20 locally designated scenic areas for assessment. We conducted a viewshed analysis that combines both computational and observational methods by means of a rating system, taking into account

broadly accepted qualities that enhance views and accessibility. Viewshed mapping is an industry standard, used to determine what areas in a specified region might be visible from a given observation point(s). The primary goal of this scenic inventory was to quantitatively and qualitatively evaluate 20 scenic areas that have already been identified by the Town of Rutland in its Municipal Plan:

- **Boardman Hill** – from Quarterline Road to the West Rutland Town Line – views to north
- **Blueberry Lane** – from Prospect Hill Rd. to end of Blueberry Lane - views in all directions
- **Cedar Avenue** – from the Community Center to North Grove St. – views to north and east
- **Cold River Road** – from Quality Lane to US Rt. 7 to the Clarendon Town Line – views to east, south and west
- **Creek Road** – from the US Rt. 4 overpass to Clarendon Town Line – views to east
- **East Pittsford Road** – progressing from Russell Drive to Tamarack Lane – views initially to north and west, then to north, east and west, then to south and east, and then to east, south and west
- **Hawley Lane** – all of Hawley Lane from beginning to end – views to south
- **McKinley Avenue** – from the fire station crossing North Grove St., to top of hills – views north and south
- **North Grove Street** – from McKinley Avenue to the Pittsford Town Line - views north, west and east
- **Post Road** – from Rob Shawn Place continuing on Post Road Ext. to Mendon Town Line – views in all directions
- **Prospect Hill Road** – US Rt. 7 to East Pittsford Road – views in all directions
- **Quarterline Road** – from US Rt. 7 overpass to Boardman Hill – views to northeast and west
- **Sugarwood Hill Road** – from US Rt. 7 to Oakridge Drive – views to south and east
- **Tamarack Lane** – from beginning of Tamarack Lane to the end – views in all directions
- **US Rt. 7 North** – from East Pittsford Road to Sugarwood Hill Road – views east, south and west
- **US Rt. 4 East** – from Post Road to Townline Road – views west and east
- **Viewmont Drive** – all of Viewmont Drive including Crestway where appropriate – views to north, east and south
- **West Proctor Road** – beginning ½ mile from US Rt. 4 West to the Proctor Town Line – views to north and east
- **East Proctor Road** – beginning ½ mile from US Rt. 4 to the Proctor Town Line – views to north and west
- **US Rt. 4 Bypass** – from Quarterline Road to Otter Creek – views in all directions.

The main objectives of this analysis were to:

- Map the viewshed for each individual scenic road and all proposed roads combined
- Calculate the size and land cover composition of each viewshed
- Ground truth findings from the computer analysis and direct observation
- Combine the information from the previous objectives to score the proposed roads

Additionally, we used the viewsheds to determine the visibility of each town parcel from the town's designated areas, a metric which can ultimately aid in the selection of areas for development that are least disruptive to the scenic resources in Rutland Town.

Knowing the percentage of each parcel visible from scenic roads gives planners and developers an idea of how MUCH of a prospective development would be visible, while the number of viewpoints within view of the parcel indicate how MANY scenic views would be affected. That said, in any scenic resource analysis, there are limitations to the usefulness of assigning numeric values to inherently subjective characteristics.

2.0 METHODS & RESULTS

All data preparation and spatial analysis was conducted in ArcGIS v. 10.6. Prior to analysis, the team collected and prepared geospatial data from a variety of sources. These included:

Digital Surface Model (DSM), 1.7m resolution: a grid layer where each cell holds a value representing the elevation of features on Earth's surface in that location. This is not bare-earth elevation, but includes natural and built features like trees or buildings in the height value. The downloaded files are derivatives of data collected from a light detection and ranging (LiDAR) system and are made available through Vermont Center for Geographic Information's (VCGI) open geodata portal. The viewshed analysis relies on elevation values of each cell in the DSM to determine visibility to or from a particular location (Fig 1). As such, we modified this DSM to assure that the observer location would sit on the road, and not on any overhanging trees captured by LiDAR and included in that location's surface elevation.

Land Use/Land Cover (LULC), 10m resolution: Imagery from the Sentinel 2 satellite was collected from the US Geological Survey data portal and classified using an unsupervised method in GIS to provide data on land cover types in the viewshed. The classification was based on a principal components analysis of spectral reflectance values from all 13 bands and a segmentation of 3 band near-infrared false color composite. We focused primarily on developed, agricultural, forest (evergreen and deciduous), and open water land cover types.

Proposed Scenic Roads: Road centerlines for the 20 roads identified by Rutland Town were pulled from the state-wide database made available from VCGI. This layer was used to generate points along each road, 100m apart. These represent the locations from which observers view the landscape. As such, a single "viewshed" for a road will represent what parts of the landscape are visible from a collection of points along that road.

Town Boundaries and Town Parcels layers were also downloaded from VCGI.

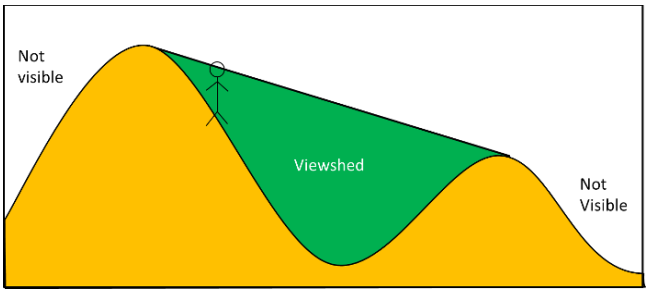
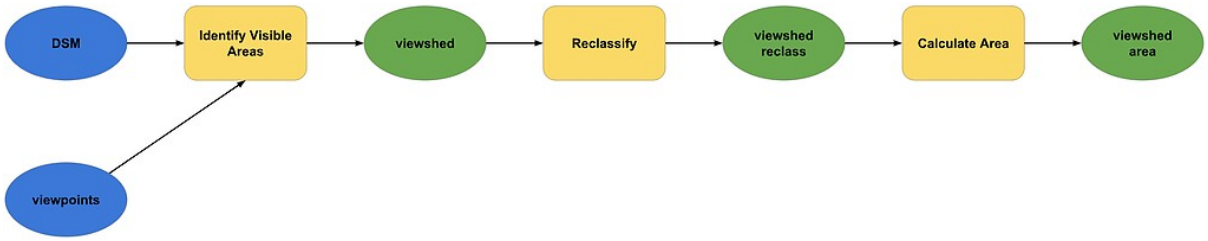


Figure 1. Diagram of how viewshed analysis works. The GIS determines which parts of a landscape can be seen at eye level by an observer at a particular location (given values of 1) and which cannot (given values of 0) based on topography and other vertical obstructions.

2.1 Computational Approaches: Viewshed Mapping

2.1.1 Viewshed Size

We first calculated the total area visible from each road. With this prepared data, we used the viewshed tool in ArcGIS to determine the extent of views from each of the 20 roads. The tool outputs a data layer of pixels, each given the value of 0 (not visible) or 1 (visible). This allows for the calculation of the area, in square meters, of each viewshed and was used as a quantitative assessment of how expansive the view is; roads with sweeping views in all directions will have higher view areas than roads that are tucked into the woods with limited views. Our workflow consisted of running viewsheds on every designated road, reclassifying these viewsheds to reflect whether a given cell is visible or not, and finally calculating the areas of the visible and nonvisible regions for each road. This process is illustrated below:



The result of this analysis was a table. Because most of the roads have at least some extent of mountain views, these areas are quite large. Some, like Prospect Hill Road and Route 7N, have views spanning more than 40 million square meters, or nearly 10,000 acres. Others, especially Crestway Drive, have drastically reduced view areas, indicating a high degree of enclosure by forest or other obstructions (Table 1).

<u>Broad Results</u>

- Cold River Road, Creek, McKinley, Prospect Hill, and Route 7N are the five largest viewsheds by visible area

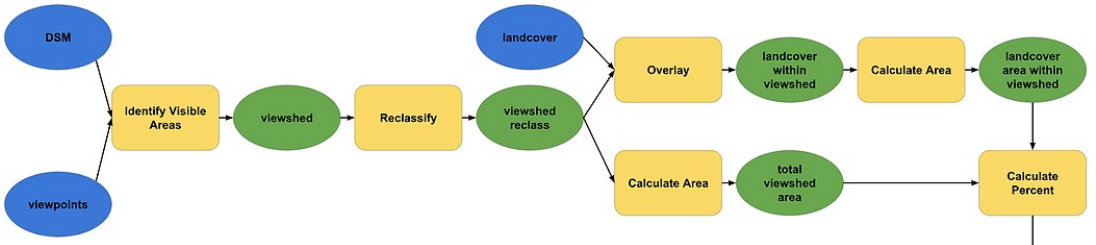
- Route 4W (Bypass), West Proctor, Quarterline, East Proctor, and Viewmont are the five smallest viewsheds by visible area

Table 1. Size (in hectares) and land cover composition of the viewshed from each of 20 proposed scenic roads.

	Open Water	Developed	Pasture/Crop	Deciduous Forest	Coniferous Forest	Area
Road	**%**	**%**	**%**	**%**	**%**	**ha**
Blueberry	1.8	2.5	3.4	68.9	23.3	2418.6
Boardman Hill	1.0	1.7	1.7	76.5	19.0	2336.5
Cedar	1.7	1.7	2.5	67.6	26.5	2192.4
Cold River	1.1	3.7	4.4	77.6	13.1	3828.4
Creek	1.6	4.8	9.3	60.8	23.4	3896.0
East Pittsford	0.6	2.8	2.5	76.6	17.4	3167.8
East Proctor	0.7	6.1	7.9	74.3	10.9	1594.5
Grove	1.2	2.8	3.8	66.2	26.0	3438.3
Hawley	0.3	3.0	2.3	80.4	14.0	3075.6
McKinley	0.8	3.7	4.6	69.8	21.1	3270.7
Post	0.3	3.3	2.9	78.6	14.9	3566.8
West Proctor	1.7	1.9	2.3	65.9	28.2	1594.5
Prospect Hill	1.2	3.5	4.3	70.4	21.0	4052.6
Quarterline	1.7	1.4	0.3	76.3	20.2	1042.2
Rt 4E	0.1	2.4	1.4	86.7	9.3	2103.7
Rt 4W	1.8	2.2	3.5	70.6	22.0	1221.4
Rt 7N	1.2	3.7	4.7	68.3	22.0	2079.3
Sugarwood	1.9	2.9	4.5	68.2	22.5	2150.5
Tamarack	0.3	3.0	1.7	80.7	14.3	2180.7
Viewmont	0.6	0.3	0.5	74.7	23.9	549.5

2.1.2 Viewshed Composition

The second way we analyzed view value is by calculating the make-up of each road's views by land use. Land was classified into five categories**:** developed, pasture/grassland, deciduous forest, evergreen forest and open water (see Fig 2). These categories were deemed most relevant as they are central to the character of the Vermont landscape and are known to entice tourists (for example, fall foliage on deciduous trees attracts many visitors each year). We quantified what proportion of the viewshed area was made up of each of these land cover classes by using the "Zonal Geometry" tool in ArcGIS (Table1).



Road	% Water	% Developed	% Deciduous	% Evergreen	% Fields
Blueberry Lane	1.4	1.8	70.4	21.0	5.5
Boardman Hill	1.0	0.9	77.0	17.8	3.3
...	...	...	...	...	...

We found that deciduous forest is the dominant landcover across viewsheds, constituting 69% of all areas visible from all roads surveyed (Fig 3). Deciduous forests are a key element of scenic views in Rutland Town because of their spectacularly colorful foliage in the fall. Every year, thousands of visitors from across the country travel to Vermont to witness the changing leaves. Preserving these unique views is a large motivation for conducting scenic viewshed inventories and analyses.

Percent Pasture/Cropland in a viewshed, an important indicator of landscape openness, varied from 0.3% on Quarterline Road to 9.3% on Creek Road. Pasture and grassland landcover are also often associated with pastoral scenes including cows and farm animals as well as wildflowers during certain seasons- all of which serve to enhance the aesthetic quality of a view.

<u>Broad Results:</u>

- The majority of the total viewshed composition is composed of deciduous forest, with low proportions of both developed land and open water (streams, creeks, rivers, wetlands)
- All viewsheds have similar percent land composition

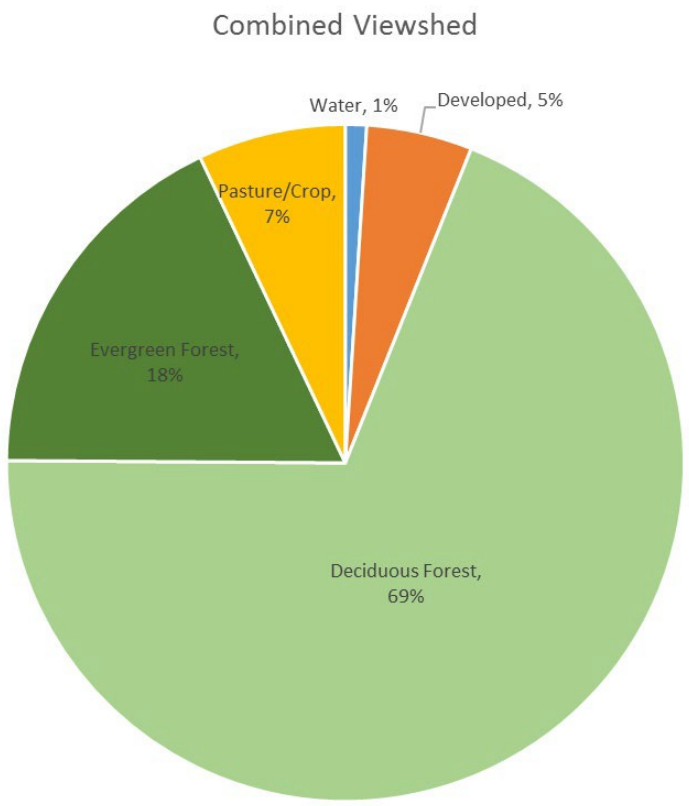


Figure 2. A pie chart showing overall land cover composition for the 20 viewsheds combined.

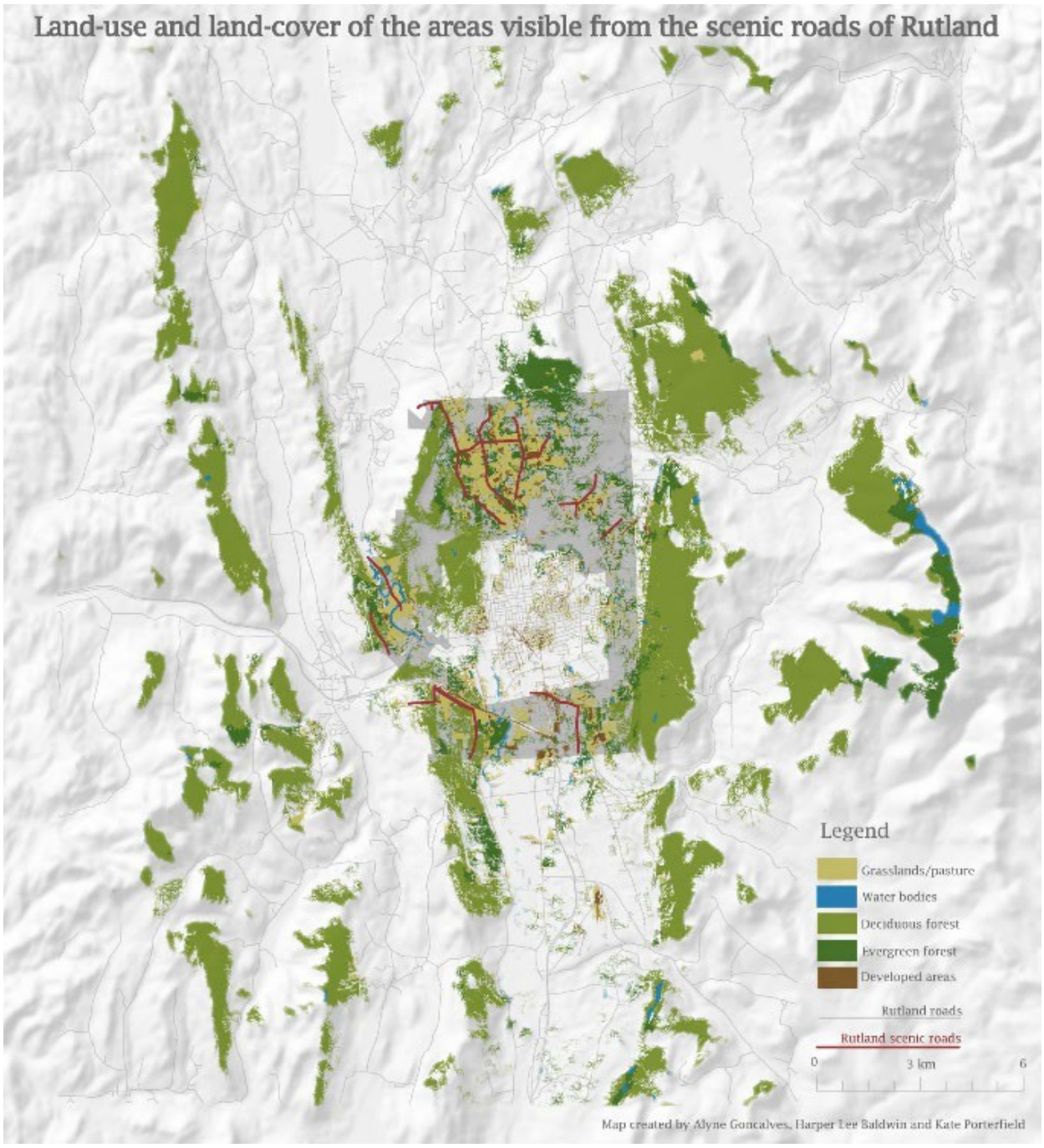


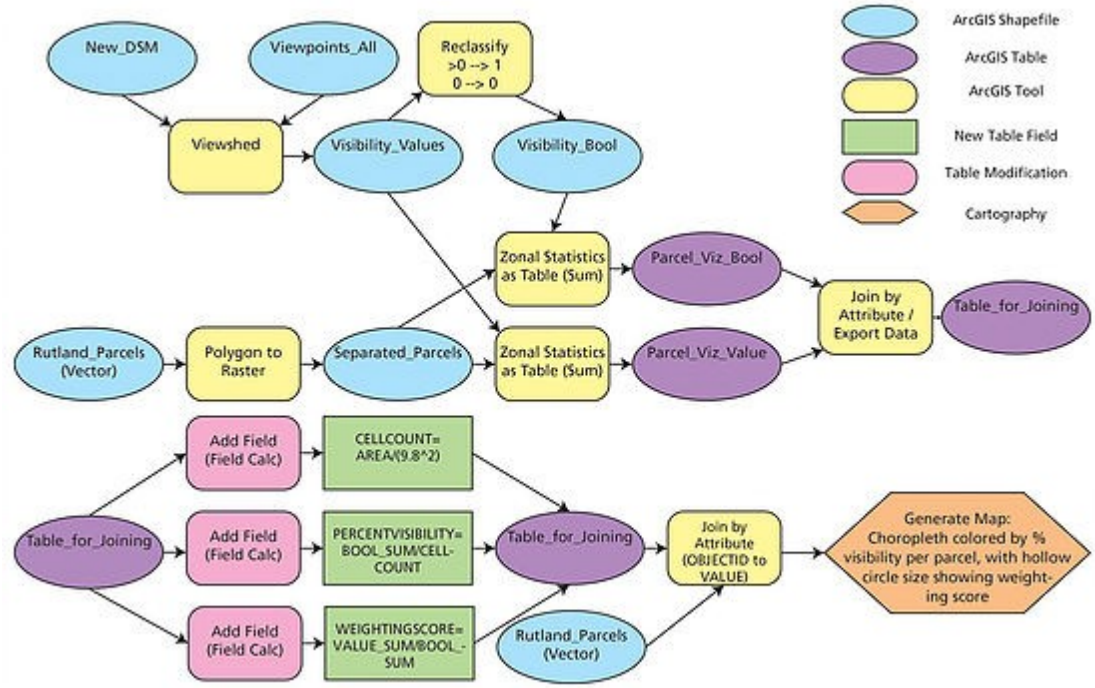
Figure 3. A map of the overall land cover composition for the 20 viewsheds combined. Different colors represent the land cover types present in that specific location. Data is overlayed on a hillshade showing elevations in the study area. Limitations to this analysis that should be taken into consideration: waterbodies located in the mountains in the eastern most part of the view were misclassified and should be included as forest cover.

2.1.3 Parcel Visibility

In addition to classification of scenic roads, we were interested in finding which parcels within the town are most visible from the proposed scenic roads. We took into account two different metrics for land parcel visibility in order to best inform future siting decisions for development:

- The percentage of each parcel visible from scenic roads
- The number of viewpoints along scenic roads with a view of the parcel

Both aspects are important to consider when determining if a location is highly visible. Knowing the percentage of each parcel visible from scenic roads gives planners and developers an idea of how MUCH of a prospective development would be visible, while the number of viewpoints within view of the parcel indicate how MANY scenic views would be affected. The latter was calculated as a weighted score of the number of visible observation points divided by the total visibility. This accounts for cases in which just one small spot along a single one of the scenic roads offers views of an entire property. Thus very visible parcels would have both a high percentage visibility and a high weighted score, and low-visibility parcels would have a low percent visibility and a low weighted score.



Essentially, the workflow involved generating a map of what can be seen from all the scenic roads cumulatively. Pixel values on the landscape represented how many of the observer points could see that particular spot. We then overlayed the parcel data, allowing us to determine what percent of each parcel could be viewed from any of the viewpoints. Since each pixel carried the number of viewpoints that could see it, we then calculated the average number of viewpoints that could see each parcel – the weighting score. Finally, we used these two metrics to generate the map displayed in Fig 4, with color intensity representing the percent visibility and circle size representing the weighting score.

Some of the most visible parcels are between Grove St. and McKinley Ave to the west and East Pittsford Road and Prospect Hill to the east, with Route 7N running down the middle. Although not all of these parcels are visible from many points, it is likely the roads bordering them get higher traffic because of their proximity to Route 7. Another area of high parcel visibility is along Route 4W (Fig. 4). Finally, the set of small parcels to the east of Rutland are cumulatively visible from several points.

Most of the land in between Grove St., McKinley Ave, East Pittsford Road and Prospect Hill Road is field or pasture, with one developed area of medium visibility. South of the Route 4E area there is mostly deciduous forest, while the area of smaller parcels to the east is mostly field with some coniferous forest. A second look at satellite imagery shows that this area is a residential neighborhood. (Large lawns and trees that overshadow houses likely skewed the results of Fig. 5 to look less developed.)

Figures 4 and 5 support our observational findings. All four of the roads mentioned above ranked high or medium in our quantitative analysis (Table 1), and the land around them is mostly open, suggesting that they would have wide views of the surrounding mountains.

Broad Results

- Some of the most visible parcels are between Grove St. and McKinley Ave to the west and East Pittsford Road and Prospect Hill Road to the east, with Route 7N running down the middle.
- Parcels with low visibility may be considered for development purposes, as they pose little threat to existing scenic resources in the Town of Rutland, whereas parcels with a high visibility should be protected (Figure 4).

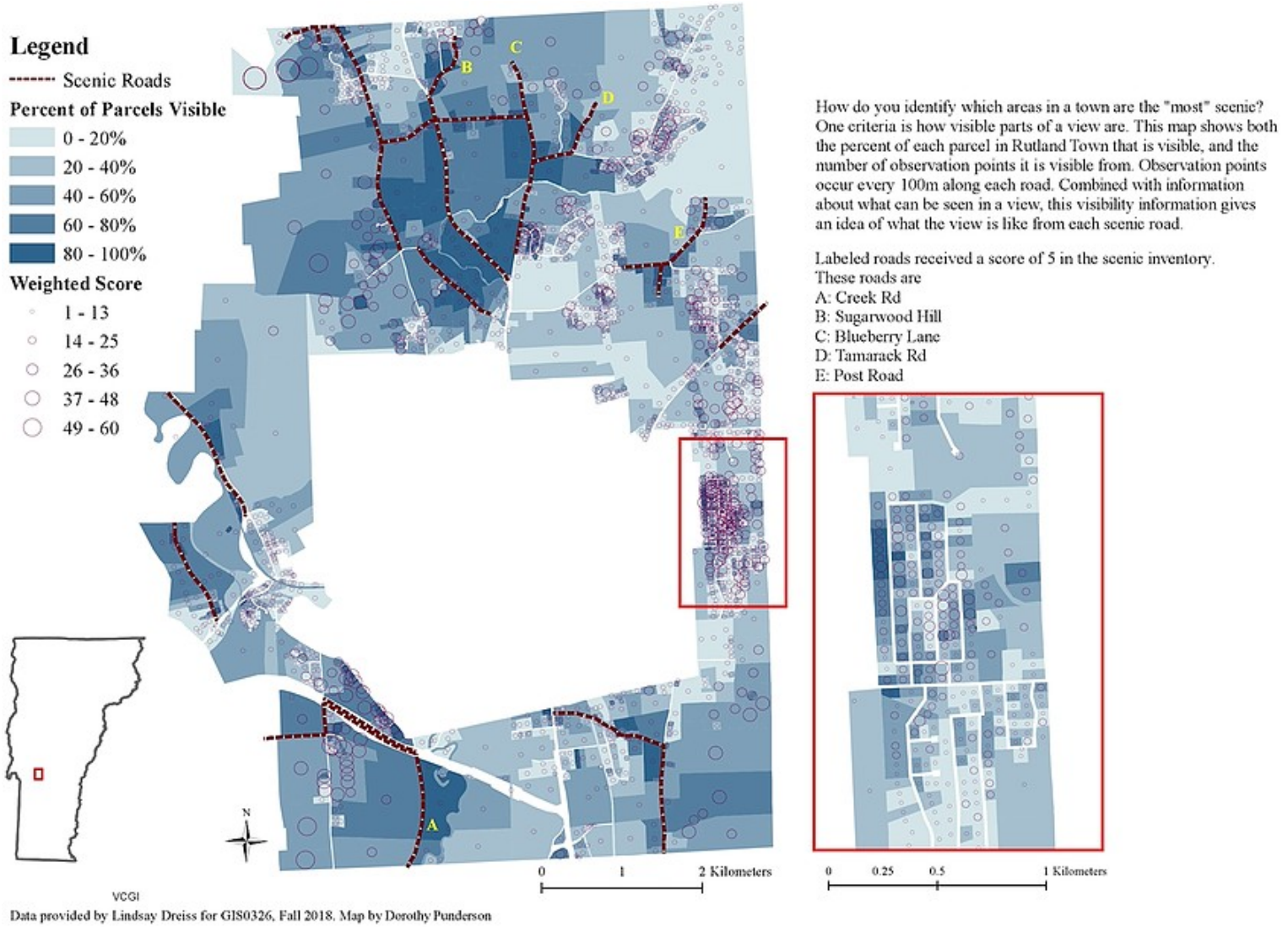


Figure 4. Parcel visibility based on two different scores. Parcel visibility is based on two metrics: the percent of the parcel that is visible from any point, and the number of observer points that can see any point within a parcel. This means that any parcel with a high percent visibility (dark blue) and a large number of points that can see it (large circles) are particularly visible. Conversely, those with a low percent visibility and a low number of points that can see it has a low visibility.

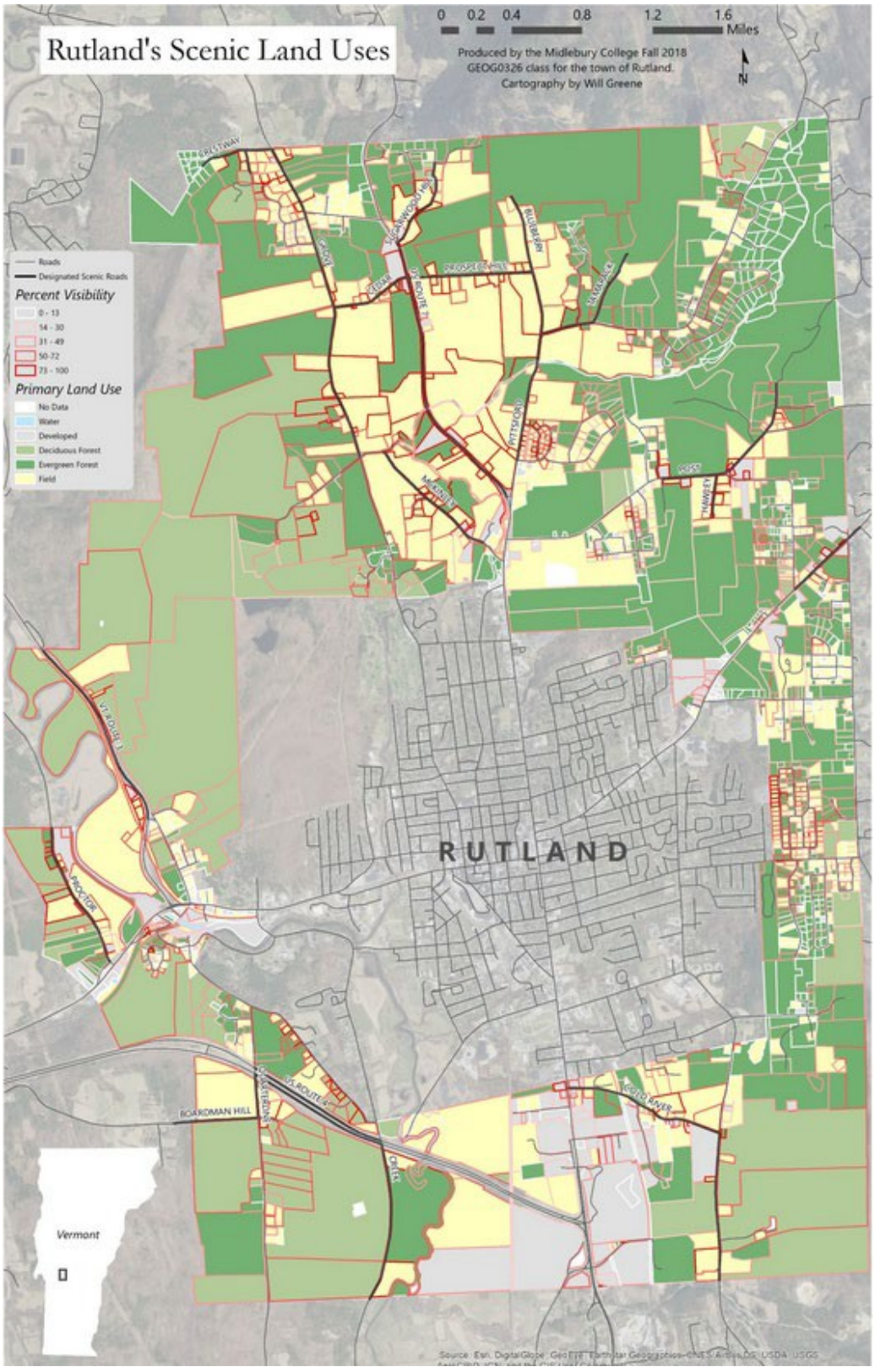


Figure 5. Parcel visibility overlayed with the primary land cover for each parcel.

2.2 Qualitative Approaches

To assess quality of the various viewsheds, we initially used a visual preference survey; a common technique for obtaining public feedback on design and planning alternatives. The survey consisted of a series of 20 images that participants were asked to score according to their preference (very appealing to very unappealing). The images were chosen specifically due to the variety of land cover types and compositions represented. Scores were tallied to determine images and landscape features deemed most and least visually appealing. Results indicated that views with waterbodies and mountains were scored higher, as were views where the majority land cover type was forest or pasture/cropland. Images with greater than 30% of the view in developed areas were scored the lowest. These findings were later used in a qualitative score of the viewsheds for each road (see section 2.3).

A second approach used a survey distributed to Rutland Town residents through the local newsletter and on the town website. In part one, participants were asked to select their top five favorite views from the list of 20 proposed scenic routes. In part two, participants were asked to select landscape features that they believe contribute to their favorite views. The options included land covers and other features that were not captured by the GIS analysis such as stone walls, historic landmarks, and sugar bushes. Although the sample size was small, just 35 respondents, the results of the town survey were also used in a qualitative score of the viewsheds for each road (see section 2.3).

Although ArcGIS can give quantitative information about a region, it may not always capture what it's like to actually be in a place. To experience Rutland Town ourselves, the class completed a scenic inventory of the designated scenic roads. The qualitative assessment of the scenic viewsheds consisted of appraising each road and its scenic resources using a weighted scoring system. On a sunny afternoon on September 27, 2018 we drove along each of these roads, filling out an inventory form that ranked characteristics of the surrounding environment and view. In making this inventory form we followed standardized methods used by towns in Vermont and Maine (3; 4). The criteria we evaluated included road, vegetation, and development quality, as well as the diversity of land-use/land-cover, topography, and vegetation within the viewshed. Roads were assessed from a car during a field outing. This process yielded a score of between one (not scenic) and five (scenic) for each of the scenic roads (Appendix I).

<u>Broad Results</u>

- Post Road, Blueberry Lane, Creek Road, Sugarwood Hill, and Tamarack Lane were given the top qualitative score of 5 out of 5 during the ground truth trip to Rutland Town
- Post Road, Boardman Hill, Prospect Hill, Blueberry Lane, and Grove St were named the roads with the best views by Town of Rutland survey participants (see Town Part I Response and Rank in Table 2)

2.3 Combined Score

Our final step was to develop a ranking system to compare the relative "scenic-ness" of the twenty roads. In order to combine both computational and qualitative results into a single scoring system that would allow for quantitative comparison, the final qualitative score (1-5) of each road was multiplied by the total area in its viewshed that was covered by the five aforementioned “important” land cover categories (Table 1). Each land cover area was weighted based on the results of the survey method. This scoring system thus took into account the road’s overall qualitative aesthetics, its visibility, and the relevant area of the view. Z-scores were then calculated to show the extent to which each road deviated from the mean and

allow for direct comparison between the different scores. Roads receiving more positive values have higher quality views and those with more negative values have lower quality views (Table 2 & Fig. 6).

2.3.1 Class Visual Preference Score

Results of the class survey suggest that views with 1) waterbodies present, 2) mountains present, and 3) larger percentages of forest and pastureland cover (and conversely lower percentages of developed land covers) are perceived as more scenic. Therefore, water and deciduous forests were given the highest weight (+1.0), followed by pasture and evergreen forest (+0.5). Developed land corresponded to a perception of not being scenic in the survey, so we gave those areas a slightly negative weight (-1.0). This methodology is hardly perfect, especially since it relies on the personal preferences of the small group of students in our class. However, it reflects findings similar to those in the visual preference survey literature and could easily be adapted to use the results of a survey with a larger sample size (see Class Zscore and Class Rank in Table 2).

Raw Score for Each View = [(-1 * Developed area) + (Evergreen forest area / 2) + (Pasture area / 2) + (Water area) + (Deciduous forest area)] * [Qualitative Score (1-5 scale)]

Z score = (Road score – Average of all road scores) / Standard Deviation of all road scores

2.3.2 Rutland Town Survey

Results of the Rutland Town survey similarly suggest that views with waterbodies, mountains, and greater percentages of forest and pastureland are considered of greater quality. However, the rankings were slightly different. A greater percentage of participants valued pastoral views (58.3%) than forest cover (33.3%) or open water (33.3%). We rescaled the survey answers to reflect land cover preference to sum to 100% and used these new weights to calculate the raw view scores (see below).

Raw Score for Each View = [(0.11 * Developed area) + (0.235 * Forest area) + (0.412 * Pasture area) + (0.235 * Water area)] * [Qualitative Score (1-5 scale)]

Z score = (Road score – Average of all road scores) / Standard Deviation of all road scores

The final Z scores based on the town survey matched closely with those from the class survey (see Town Zscore and Town Part II Rank in Table 2). However, they did not match well with the rankings from the first part of the town survey (see Part I Rank – Part II Rank in Table 2). This may suggest that factors other than those provided in the multiple choice question contribute to resident scenic view preferences and values.

<u>Broad Results</u>

- Zscores based on classroom visual preference surveys and town survey responses resulted in similar viewshed rankings with Post Road, Creek Road, Prospect Hill Road, Cold River Road, and Hawley Road scoring the highest and Viewmont Drive , Rt 4 E & W (Bypass), East Proctor Road, and Quarterline Road scoring the lowest in viewshed quality
- Zscores based on town survey visual preference results do not closely match class choices for best views, suggesting other factors at play

Table 2. Combined quantitative and qualitative viewshed scores and rankings based on results from a 1) town survey and 2) a classroom visual preference survey. Ranks are subtracted to show the difference between methods. Roads are listed in order of rank based on the town survey Zscore.

Road	Town Part I Response (%)	Town Part I Rank	Town Zscore (Part II)	Town Part II Rank	Part I Rank - Part II Rank	Class Zscore	Class Rank	Class Rank - Part II Rank
Creek	20	8	1.85	1	7	1.43	2	1
Post	48.6	1	1.41	2	-1	1.58	1	-1
Prospect Hill	34.3	3	1.13	3	0	1.11	3	0
Cold River	14.3	10	0.97	4	6	1.06	4	0
Hawley	14.3	10	0.67	5	5	0.85	5	0
Grove	34.3	3	0.67	6	-3	0.62	6	0
McKinley	20	8	0.57	7	1	0.51	8	1
East Pittsford	28.6	5	0.46	8	-3	0.57	7	-1
Rt 7N	22.9	7	0.41	9	-2	0.34	10	1
Blueberry	34.3	3	0.36	10	-7	0.38	9	-1
Tamarack	2.9	14	0.14	11	3	0.27	11	0
Sugarwood	31.4	4	0.13	12	-8	0.10	12	0
Boardman Hill	42.9	2	-0.15	13	-11	-0.04	13	0
Cedar	8.9	13	-0.64	14	-1	-0.65	15	1
West Proctor	11.4	12	-0.68	15	-3	-0.70	16	1
Rt 4E	17.1	9	-0.69	16	-7	-0.59	14	-2
East Proctor	2.9	14	-1.07	17	-3	-1.17	18	1
Quarterline	17.1	9	-1.08	18	-9	-1.06	17	-1
Rt 4W	25.7	6	-1.16	19	-13	-1.19	19	0
Viewmont	8.9	13	-1.49	20	-7	-1.52	20	0

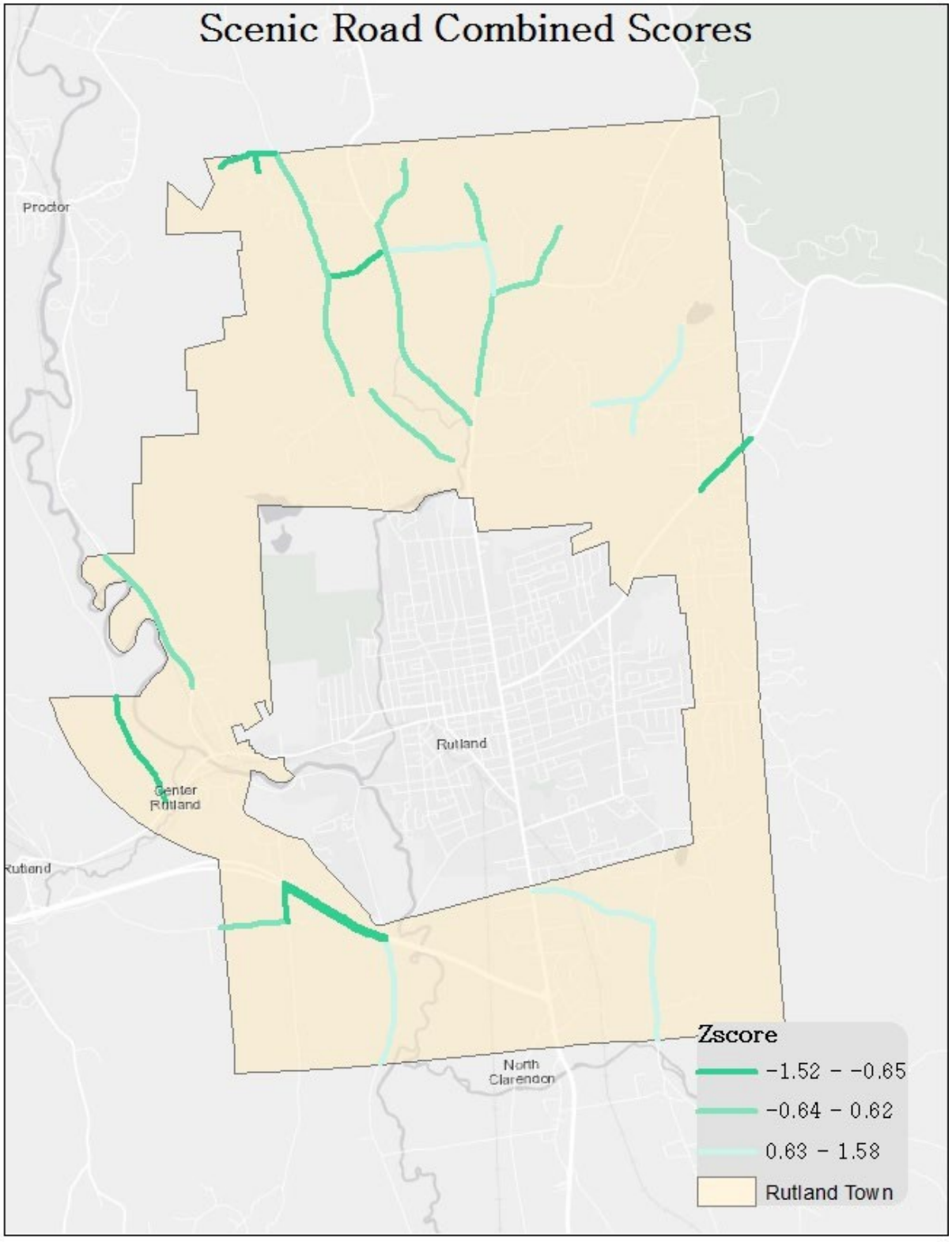


Figure 6. Scenic road Zscores based on GIS viewshed analysis and classroom qualitative surveys. More negative numbers indicate lower quality views.

2.4 Limitations

When conducting GIS analyses such as this one, it is important to note that while modelling the world can be incredibly helpful for decision-making, it is never a perfect representation of the real world itself. Our analysis thus has some notable limitations. First, the digital surface model (DSM) we used to generate our viewsheds is fairly accurate, but nevertheless cannot account for all obstructions and nuances to viewpoints, so the calculated viewsheds are imperfect. For example, given the abundance of deciduous forest, the amount of visible landscape and the aesthetics of the landscape are likely to vary with season. While we made every effort to be as objective as possible in the qualitative assessments, some personal bias is unavoidable when evaluating something like “condition of vegetation” from a moving vehicle. Ideally, the qualitative section of this analysis should thus be repeated at multiple times of year to give a more representative overall average score for each road.

The land-use / land-cover classification we used is also imperfect, since it relies on a computerized interpretation of satellite data. For instance, there are several locations within Rutland Town where solar panels were misinterpreted by the computer as a water body, and fields were misinterpreted as deciduous forest. An accuracy assessment should be conducted to determine specifics of omission and commission rates for the different land cover classifications. Despite these errors, an initial comparison of the land cover results and satellite imagery indicated that the classification is mostly accurate and still provides important information.

Another caveat in the computational aspect of this study was the fact that we only placed viewpoints at 100m intervals along the roads to ensure that the GIS software would be able to run the viewshed analyses within a reasonable timeframe. Ideally, this interval should be reduced in order to gain finer scaled information about the view from as many points as possible.

It is important to note that in condensing perceived aesthetic beauty or scenic value into numbers, a fair amount of subjectivity is introduced. The ground-truthing process was intended to balance some of the limitations of ArcGIS by comparing the quantitative results to what was actually on the ground. And discrepancies between the two scores may suggest that sometimes a place is best understood if it is experienced firsthand.

3.0 CONCLUSIONS/RECOMMENDATIONS

Since Act 174 requires such plans to identify potential areas and constraints for the siting of renewable energy resources and developments, we recommend **Post, Creek, Prospect Hill, Cold River, and Hawley** Roads as the five most scenic roads. Post Road's viewshed is quite large, it received a ground truth score of 5, and over 78% of the viewshed is deciduous forest. This result is unsurprising. Viewmont received the lowest score, due to its small viewshed area and a ground truth score of 4. Though we expected to find some commonalities in landscape characteristics amongst the highest ranked roads, we found no trends in land cover composition that set them apart from lower ranked roads. This is mostly due to the lack of variability in land cover compositions across viewsheds and may suggest that aspects of a viewshed that were not quantified in this study also contribute to a person's experience of a scenic view. In any scenic resource analysis, there are limitations to the usefulness of assigning numeric values to inherently subjective characteristics. The metrics used in this study to quantify the "scenic-ness" of a

viewshed were chosen in large part because the data already exist and are easily accessible. There are undoubtedly other aspects of a view that contribute to its scenic value which cannot be translated into a data layer and analyzed using GIS.

At the other end of the spectrum, there are several roads that were clearly less scenic in comparison. The class only ranked three roads as less than a 4 on the aesthetic scale - **Route 7N, Route 4W (Bypass), and Cedar Avenue** - which all received scores of 3. However, because of it's a large viewshed, Route 7N ended with a positive score. Route 4W (Bypass) and Cedar Road, as well as roads that scored lowest in the z-factor (**Viewmont, Quarterline, and East Proctor Roads**), should be considered for removal from the list. All three of these roads have relatively small viewsheds (Table 1) and received Z-scores lower than -1 (Table 2). The Town of Rutland could also consider portioning these roadways into different categories, for instance by calling all scenic roads that score above 0 "high quality," all those between 0 and -1 as "moderate quality," and those below -1 as "low quality" (or simply omitting these roads, as stated above). This higher-order classification could lead to more informed and effective management decisions. It is also critical to note that none of the members of our class have particular familiarity with the Rutland area, so we were lacking in local knowledge of historically important locations and other areas of special significance. Our products in this report are intended as guidelines and recommendations for the Town of Rutland to use at their own discretion.

Based on our analysis, it stands to reason that the best places to site future development would be in large parcels that are not particularly visible from the scenic roads, and have existing land uses that would be compatible. Areas that are highly visible should be marked as detrimental to scenic resources, and measures should be taken to safeguard these areas. Again, a qualitative categorization could be used to identify areas that have a high, moderate, and low visibility, and subsequent developmental regulations and land types could be put in place to avoid development in areas of high visibility. Additionally, land-use should be considered when deciding where to develop, as the destruction of important habitat (particularly forested land) could have negative environmental impacts (Figure 5). It is important to note that Figure 5 only represents the primary land use within each parcel (meaning that a yellow parcel doesn't mean the whole area is covered in pasture, but that particular land use is more prominent than others). Since much more information (owner, historic significance, access to the electric grid system, etc.) is needed to make recommendations about which specific parcels would be suitable for development, we provide only the maps to assist in decision making. Overall, these products are offered as resources for the Town of Rutland to make informed decisions to help it adapt to a changing world while still maintaining its rural character and scenic beauty.

A scenic inventory has uses beyond energy infrastructure planning. The mountainous and agricultural views in Rutland Town define the culture of the people who live here and are a major draw for tourism. Scenic resources, by extension, can also help conserve habitat for wildlife in Vermont; habitat that is part of the "natural" scenic views. With this inventory, the Town of Rutland Town and the Rutland Regional Planning Commission will ideally be able to better prioritize land parcels when considering future developments and minimize impacts on the views people most cherish.

4.0 REFERENCES

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2. Town of Rutland. 2016. Municipal Plan: Scenic Resources.

3. White, A. 1979. Designating Scenic Roads. Vermont Scenery Preservation Council.

4. DeWan, T. 2008. Scenic Assessment Handbook. Maine State Planning Office.

5.0 APPENDIX I: Scenic Drives Scoring Form

Road Name:
*Note direction

Topography
Features Visible:

Topo Diversity	Low	1	2	3	4	5	High
LULC Visible:							
LULC Diversity	Low	1	2	3	4	5	High
Water		yes		no			
Erosion	None	1	2	3	4	5	High

Roads

Surface Type		dirt		gravel		asphalt	other
Condition	Low	1	2	3	4	5	High
Congestion	Low	1	2	3	4	5	High
Accessibility	Low	1	2	3	4	5	High
Overlooks		yes		no			

Built Environment
Features Visible:

Diversity	None	1	2	3	4	5	High
Development Type	Residential		Commercial				
Dev Density	None	1	2	3	4	5	High
Condition of Public Features	None	1	2	3	4	5	High

Vegetation

Diversity	None	1	2	3	4	5	High	
Condition	Low	1	2	3	4	5	High	
Forest Type	Deciduous		Coniferous		Mixed			
Ag Setting	Pastoral		Industrial					
Crop Type	Orchard		Vineyard		Corn		Pasture	
Other Visible	Flowers		Invasives		Tree Cut			

Main Obstructions

Energy infrastructure	Trees	Buildings
Powerlines	Fences	
Other:		

Overall