6. ACRPC TRANSPORTATION PLAN

6.1. Introduction

A. Vision and Mission for Transportation in the Region

We envision a transportation system that promotes the economy by effectively moving people and commerce, safely supports all modes of travel, promotes energy efficiency and conservation, enhances regional land uses and the Region's sense of place, exhibits resiliency to natural hazards, and receives sufficient funding to conduct timely, cost effective maintenance and growth or adaptation to meet the Region's emerging and future needs.

B. Overall Purpose of the Plan

The purpose of this Plan is to identify goals, policies and recommendations that will develop a more sustainable transportation system. To achieve this, the Plan sets forth a long-range agenda for the development and improvement of the regional transportation system, in all its parts. A regional planning effort helps to ensure a consistent, coordinated, and proactive response among all twenty-one of our member towns, the State of Vermont, and the various other providers of transportation services. Regional transportation planning promotes transportation as a complete system. That system implements the vision and mission noted above through the Goals, Policies, and Recommendations contained throughout the Plan.

This chapter is intended to be used for, but not limited to, the following purposes:

- To provide useful information regarding the condition of the existing regional transportation system to local and regional decision makers;
- To express the Region's transportation planning concerns and priorities at the State and local levels;
- To guide public investment in transportation infrastructure within the Region;
- To be consistent with state planning goals (24 V.S.A., Chapter 117 §4302);
- To implement the Transportation Planning Initiative and fulfill the duties of regional planning commissions in accordance with 19 V.S.A., Chapter 1 §10l(b);
- To serve as a basis for evaluating transportation programs and projects that impact the Region, including the regional Transportation Improvement Plan (TIP);
- To serve as the foundation for the RPC's annual transportation work plan; and,
- To implement the state's energy planning goals under 10 V.S.A. §§ 578(a) and 580.

This Regional Plan contains goals, policies and recommendations for action. The goals and policies frame a state which the Plan seeks to achieve and how to reach that state. The recommendations for action

implement the policies to reach the Region's goals. Each section of this Plan includes recommended actions which should be taken to implement the plan, who is responsible for implementation and a rough timeframe for implementation. The timeframe has five categories:

- **ASAP** – The recommendation for action should be implemented as soon as feasibly possible by the responsible party. These recommendations usually reflect an urgent need.
- **Short Term** – The responsible party should implement the recommendation for action within 1-3 years of the adoption of this Plan.
- **Mid-Term** – Mid-term recommendations for action should be implemented within 4-8 years of the adoption of this Plan. Recommendations of this nature often require specific funding that will need to be acquired before implementation, have multiple steps that must be taken to reach implementation, or require substantial public process.
- **Long-Term** – Recommendations for action that are important to this plan, but may take extensive effort and substantial shifts in policy at multiple levels of Government, are viewed as long-term. Implementation of these action items may take longer than the eight-year life of this Plan.
- **Ongoing** – Some the recommendations for actions contained in this Transportation Plan represent the day-to-day work of ACRPC and our municipalities. By designating these action items as ongoing, the Regional Plan is acknowledging that these items are always being acted upon to further the goals of the Plan and the State of Vermont.

The recommendations contained within this document, while extensive, do not constitute a complete and final listing of the Region's transportation needs over the lifespan of this document. Rather, it is a living, working document.

C. Transportation Advisory Committee (TAC)

The Transportation Advisory Committee was formed to provide local input and involvement in the transportation planning process. The TAC is composed of delegates from the region's 21 municipalities. Each municipality may have a delegate and an alternate. Alternates represent the municipality when the delegates cannot. The TAC was formed to provide local input to the VT Agency of Transportation, to identify needs and to develop transportation improvement programs.

The TAC is responsible for updating the Regional Transportation Plan, recommending transportation-related planning studies and projects in the region, and commenting on transportation policy. The TAC also is responsible for establishing local priority for capital program projects that are in the project development process. Each year the TAC solicits input on local and regional transportation or traffic-related issues and problems. The TAC works with regional planning commission staff, VTrans, and other agencies and officials to provide local input into the statewide transportation planning and project development process.

D. Long and Short Range Planning

The life of a regional plan is less than a decade, however. Regional Commissions must look beyond that short timeframe and consider how the region may change in the next 10, 20, even 30 years. This Plan takes two approaches. First (short-range planning) looks at the current transportation system and determines how to maintain it to serve the needs of the Region in the near term – the next 10-15 years. The second (long-range planning) looks at population trends, state and national policy, environmental changes, etc., and considers how the transportation system may need to be adapted to accommodate these changes in the more distant (15-30 years) future. In this plan, short term planning focuses largely on maintaining transportation corridors with a focus on roads and bridges. Long term planning focuses more on alternative modes of transportation, electrifying the vehicle fleet and energy conservation.

The State of Vermont recently passed legislation that sets very significant goals to reduce greenhouse gasses and overall energy use. These goals are long-range, reaching as far into the future as 2050. Working toward the state's emissions/energy goals will not have a significant impact on the region in the near term; however meeting the final targets by 2050 will dramatically change the system. To reach the targets, almost 90% of all vehicles will need to be powered by electricity. Additionally, the Region's pattern of land use and related travel would need to change to reduce daily trips. This plan seeks to balance the immediate short-range needs of the transportation system, with long-range planning goals.

The Regional Transportation Goals are intended to be universal and address both short and long-term goals. The portion of this Plan entitled the "Regional Transportation System" focuses on existing conditions. It includes recommendations for transportation infrastructure and modes of transportation for the near term. The portion of this Plan entitled, "Issues & Opportunities" considers planning for the transportation system of the future. It includes ACRPC's planning process, the intersection of transportation and energy planning; the intersection of transportation and land use planning and the intersection of transportation and natural resource planning. It also includes broader policy recommendations regarding each of those opportunities.

6.2. Regional Transportation Goals

The following goals support the vision and mission described above.

1. *Promotes the Economy.* Transportation networks serve the local, regional and the statewide economies. In some cases, these different levels will have different needs and uses of the transportation system. For example, bicycling on Addison County's scenic rural roads contributes to the local economy, as does large scale agriculture and trucking, and sharing the road between these two uses can be problematic. The policies in this Plan must balance the needs of the larger-statewide transportation system and its value to the economy with the needs of the Region and its municipalities. The impacts of transportation, both positive and negative, on the local economy must be considered in regional transportation planning.
2. *Safely supports all modes of travel:* Addison County's Transportation infrastructure should receive timely preventative maintenance and selected reconstruction of substandard elements in order to keep functioning safely and efficiently for residents, businesses and travelers using all modes of travel. Sections of several of the Region's roadway corridors experience conditions that strain their carrying capacity. Examples of strains include the burdens of many heavy trucks passing through downtowns on a daily basis; high volumes of commuter traffic on local roads challenging the ability of local residents to walk or bike safely; and heavy agricultural trucks and equipment damaging local roads.
3. *Promotes energy efficiency and conservation:* This plan encourages incremental and systematic changes to the Region's transportation infrastructure and practices to reduce transportation energy use and reduce greenhouse gas (GHG) emissions region-wide. Transportation contributes about 37.2 % of greenhouse gases in Vermont, by far the largest single source of GHG emissions. This Plan encourages reducing vehicle miles traveled by using alternative transportation modes, and promoting land use patterns and transportation design choices that reduce reliance on single-occupancy vehicles. It also promotes the use of electric vehicles and other technological innovations to reduce greenhouse gas emissions.
4. *Enhances Regional land uses and the Region's sense of place.* The Region's historic communities, buildings and landscapes constitute scenic and cultural resources unique to the Addison Region. All entities responsible for transportation infrastructure should choose and design transportation projects to enhance the land uses in the project's immediate vicinity. Transportation projects should support historic downtowns and village centers, and the rural, scenic landscapes that define this Region.
5. *Exhibits Resiliency to Natural Hazards*: The Region's transportation infrastructure should be designed, constructed, maintained and improved to survive increased rainfall intensity and flooding severity predicted under future climate change scenarios to preserve the infrastructure's use and promote clean water and functioning ecosystems.
6. *Receives sufficient Funding:* Investments in the Region's transportation infrastructure should position the Region for a more sustainable future in terms of energy utilization, environmental quality, and financial stability. Municipalities and the State should use a life cycle, least-cost approach in the planning and design of infrastructure, which considers the full costs and impacts to residents, municipalities, and state agencies. Investments should focus on achieving a system that reduces energy utilization per trip over time.

6.3. The Regional Transportation System

A. Existing Conditions

The following sections provide a description of the diverse elements that form the Region's transportation system. The Plan divides the system into four different types of infrastructure:

- Air
- Navigable Waterways
- Rail, and
- Roadways

Each section describes the existing conditions of each type of infrastructure. Each includes a description of the infrastructure's condition and use, the challenges or opportunities the infrastructure faces, and makes recommendations to maintain and/or improve the functionality of each type of infrastructure.

This works well for Air, Navigable Waterways and Rail because of their relatively limited use and scope within the Region. However, because roadways are so pervasive and also support many different modes of travel (cars, trucks, buses, bikes, walkers, etc.), this Plan further divides the Roadway Section as follows:

- Roadway network general conditions including:
    - functional classification;
    - traffic volumes;
    - high crash locations;
    - bridge infrastructure;

- Major roadway corridors

- Modes of transportation including:

    - Cars
    - Truck Traffic and Freight
    - Public Transit
    - Ridesharing, Car sharing and Ride hailing
    - Pedestrian and Bicycle Facilities

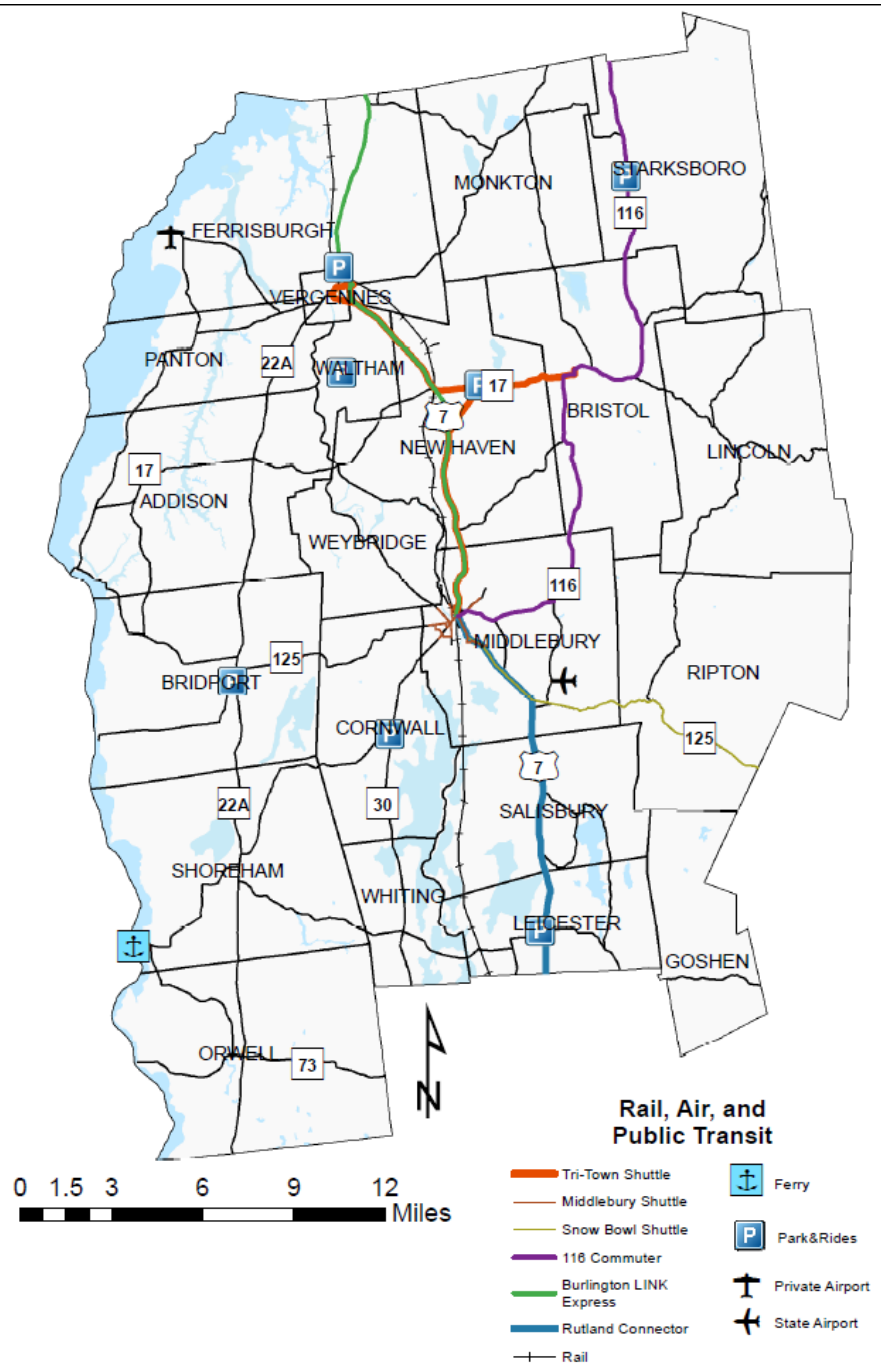


Figure 1: ACRPC's Air, Railroad, Transit and Park and Ride Infrastructure

B. Air Transportation

Middlebury State Airport, located just outside Middlebury's town center, is classified as a "local service" facility. Its primary purpose is to serve recreational and personal flying activities to the community – Sixty-six percent (66%) of all flights are made for local aviation purposes. Corporate activities include flight training, storage for aircraft, specialized local travel businesses, and most notably College use.

Middlebury College brings a large number of users to the airport, including students, their parents, and other visitors. While the Middlebury State Airport does not have national or international significance, it is an important asset to Middlebury and the Region.

The VTrans multi-year transportation program identified a need to improve runway safety by extending the runway and reconstructing the existing taxiway. This project has been largely completed. This Plan supports the safe, thoughtful expansion of the airport.

The Basin Harbor Airport is a specialty service facility for single-engine and smaller aircraft (e.g. ultralights and gliders). The airport is open seasonally, closing during the winter. The majority of flights to and from this location are transient general aviation, many of them relating to the Basin Harbor Club's operation (guests, etc.).

Goals

- *Promote the Middlebury Airport to support economic development in the Region*

Policies

- *Support infrastructure investment and services necessary to allow the Middlebury Airport to function effectively as a small, regional airport*

Air - Recommended Actions:		
Middlebury Airport	Construct additional hangers and parking	
	Responsible: VTrans	*Timeframe:* mid-term
General	Work with VTrans and Addison County Economic Development (ACEDC) to help recruit new business to use the Middlebury Airport facility	
	Responsible: ACRPC, VTrans, ACEDC	*Timeframe:* short-term

C. Navigable Water Transportation

The Addison Region borders Lake Champlain, a large navigable lake. Also, historically, many of the Region's rivers were used for travel corridors. Today however, water transportation is related almost exclusively to recreational uses. The Region's only formal water transport is the Ticonderoga Ferry, which connects Shoreham with Ticonderoga, New York. It was originally established in 1759 and operates seasonally on a cable system. Year round (weather permitting during winter) ferry service is available from nearby Charlotte, via Lake Champlain Ferry, connecting passengers to Essex, NY.

Goals

- *Maintain the Region's access to safe and efficient water transportation for commerce and recreation.*

Policies

- *Encourage continued use of the Ticonderoga Ferry and other ferry services just outside the Region.*
- *Promote the recreational travel aspects of the Region's Rivers and Lake Champlain*

D. Rail Transportation

The Vermont Rail System provides heavy haul freight rail service to Vermont, New Hampshire, and upstate New York through its five affiliated short lines. Vermont Railway passes through ACRPC member municipalities of Leicester, Salisbury, Middlebury, New Haven, Vergennes and Ferrisburgh parallel to Lake Champlain. This Plan supports opportunities for continued expansion of freight rail through the Region, particularly if rail can reduce truck traffic on the Region's roadways. Currently, the condition of the western rail corridor limits the amount and type of freight hauling via rail. Bridges that are underrated for heavy freight, along with tracks that limit speeds, limit the type of businesses that use the line. The 2015 Vermont State Rail Plan (SRP) recognizes the need to maintain the rail system in a manner that allows for growth of freight rail transportation. Significant improvements have, and are being made to the corridor to increase its capacity and desirability, including installing continuously welded track for the length of the line and construction of two replacement bridges over the rail line in Middlebury.

There is presently no passenger service along the Green Mountain Railroad line. ACRPC residents must travel to Amtrak stops in Port Henry, New York, Rutland or Essex, Vermont. The Amtrak Adirondack line, which runs from New York City to Montreal along New York's eastern border, can be accessed via ferry. The SRP identified extending the Amtrak's Ethan Allen Express to Burlington, Vermont. (It currently serves the "Empire Corridor" from New York Penn station to Rutland, Vermont) as a priority. As part of the SRP, the State secured funding to improve the rail line between Rutland and Burlington. Once completed, it will support minimum speeds appropriate for passenger rail. Middlebury is currently planning to construct a platform to accommodate new passenger service stops in Middlebury and Vergennes. The State has also relocated and nearly completed renovations of the historic Vergennes Rail station. The Station now sits on the tracks next to the Vergennes/Ferrisburgh Park and Ride in Ferrisburgh. Vergennes desires, and this plan supports an Amtrak stop served by both facilities in Middlebury and Vergennes.

ACRPC recognizes that the extension of passenger rail through the Region could have a number of benefits. Western Vermont is not served by an interstate highway. Extending the Ethan Allen Express would give the Region easy access to New York City and other parts of the Northeast Corridor. If extended from Rutland to Burlington and run on a reasonable schedule, passenger rail could provide a valuable transit service from and through two of Vermont's largest employment centers.

Goal

- *Increase (passenger, freight and rail) services in the Region.*

Policies

- *Improve existing rail infrastructure to broaden rail services and improve safety by working with the Vermont Agency of Transportation to prioritize investments.*
- *Encourage the development of truck to rail transfer stations, including the Middlebury OMYA Rail Spur (even though it is postponed) to carry additional freight and reduce truck traffic on the Region's roadway system, to reduce the number of truck trips through the Region while still encouraging freight travel.*
- *Encourage the use of rail freight where practical and economically feasible*
- *Support Middlebury Bridge & Rail Project as s part of the mainline in the context of the Tiger IV grant*
- *Continue to support the Vermont Western Corridor Transportation Management Plan and its recommendations for improvements.* *http://54.172.27.91/transportation/corridor_studies/western_corridor/*

Rail - Recommended Actions:		
General	Implement Western rail corridor recommendations to improve the safety and efficiency of the corridor to serve the Region's economy	
	Responsible: ACRPC, VTrans, towns	*Timeframe:* short-term
General	Complete rail tunnel and rail replacement in downtown Middlebury	
	Responsible: VTrans, Middlebury	*Timeframe:* short-term
General	Build rail platform in Middlebury and connect to downtown and ACTR	
	Responsible: VTrans, Middlebury, ACTR	*Timeframe:* short-term
General	Build rail platform and complete the renovation of the Ferrisburgh-Vergennes train station at the State park-and-ride facility	
	Responsible: VTrans, towns	*Timeframe:* short-term

6.4. Roadway Network

While the Region's transportation networks are complex and multimodal, the Region's roadway network currently serves as the Region's primary transportation infrastructure. The Region is bracketed by the

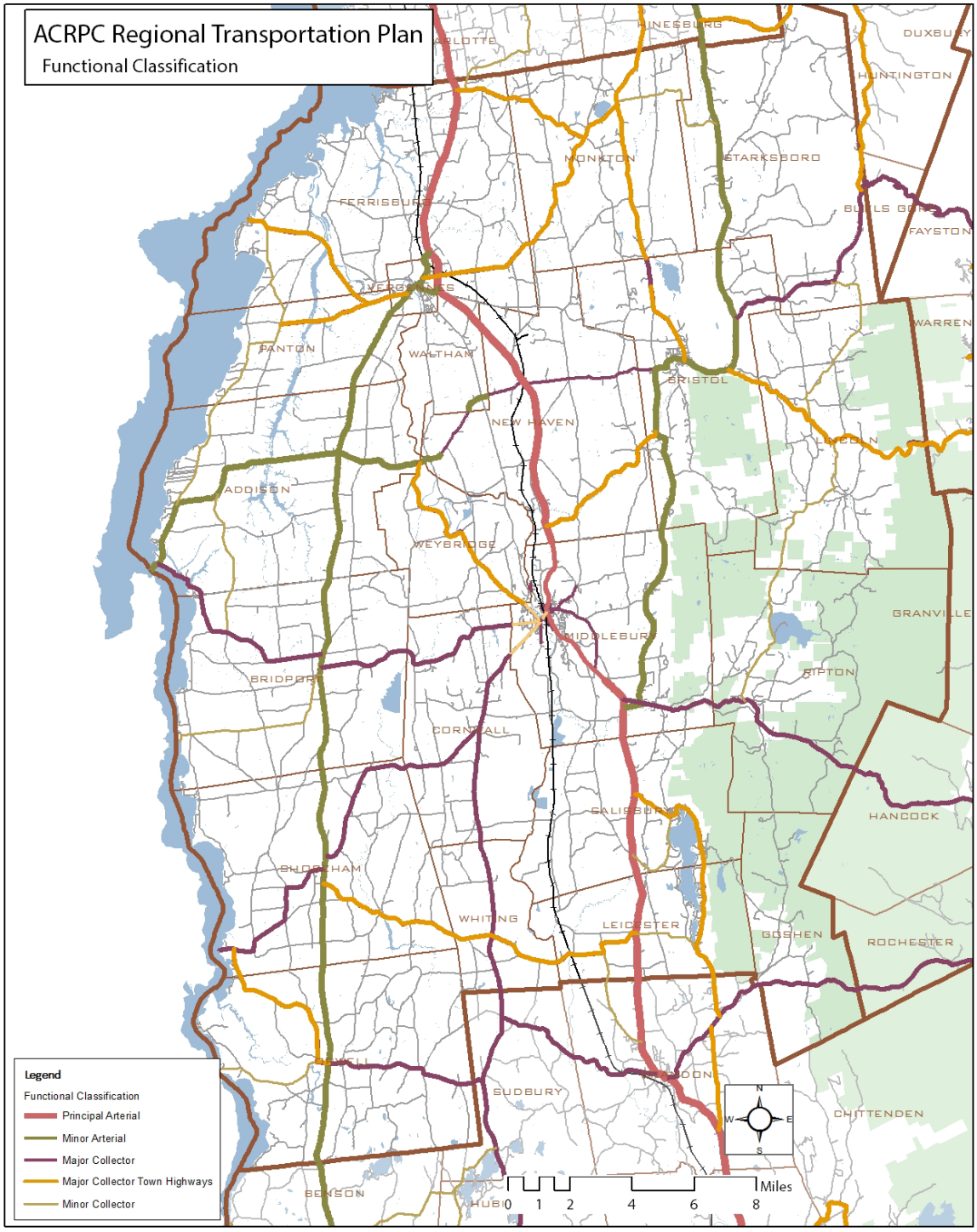


Figure 2: Functional Classification in the ACRPC Region (source: VTrans)

Green Mountains to the east and Lake Champlain to the west, which means that the primary movement corridors are north/south.

The following sections review the primary factors influencing the functionality of the roadway network, including classification systems, traffic volumes, crash and safety data and bridge sufficiency ratings.

A. Functional Classification

The State of Vermont maintains a system to classify state-owned routes by their highway function with US Route 7 as the highest level of Principal Arterial. While there are no interstate highways in Addison County, Route 7 is the most heavily traveled. Minor arterials are the next highest classification. Vermont Routes 22A, 17, and 116 are in this category. Among these, Route 22A has higher traffic and higher truck volumes than the other two routes. The remaining state highways, plus a number of more significant town highways that serve as key connectors between communities, are classified as "Major Collectors." The town-owned major collector routes can particularly impose a burden on municipalities, as they serve a regional need, but are funded and maintained through municipal budgets. In theory, major collectors are eligible for federal aid, but in practice, as funding is limited, these corridors seldom rise on the priority list for investment. While the state's functional classification system does not always match the local or regional perception of a road, it can affect both funding and state priorities. For example, as a Principal Arterial, the State is more likely to invest in Route 7 in priority over investments in Route 22A.

Definition of Functional Classifications

Principal Arterials – These highways serve major centers of population, provide a high degree of mobility and can also provide mobility through rural areas. Route 7 is Addison County's only Principal Arterial.

Minor Arterials – These roads provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system. This includes Routes 22A and 116 as well as parts of Route 17 in Addison.

Major and Minor Collectors – These roads serve a critical role in the roadway network by gathering traffic from local roads and funneling them to the Arterial network. In the rural environment, Collectors generally serve primarily intra-county travel (rather than statewide) and constitute those routes on which predominant travel distances are shorter than on Arterial routes. Roads like Routes 125 and 30 are classified as collectors. Several town roads within the Region also serve as regional collectors.

Local Roads – The most common roads in the Region. Local roads include most municipally managed roads. They see significantly lower volumes and are often posted at lower speeds than more significant highways. They are designed specifically to have high accessibility and to connect to collector and arterial roads, and are typically not used for through traffic.

B. Traffic volumes: Historic Trends and Future Projections

The traffic volumes on the region's roadways generally follow the patterns of the functional classification system, with the highest volumes found on the US Route 7 corridor. The highest traffic in the Region is in Middlebury, where the combination of local trips and through traffic on US Route 7 result in traffic congestion during peak hours. Volumes are also high on the northern end of US Route 7 as it enters Chittenden County, collecting commuters from Addison County. Route 22A through downtown

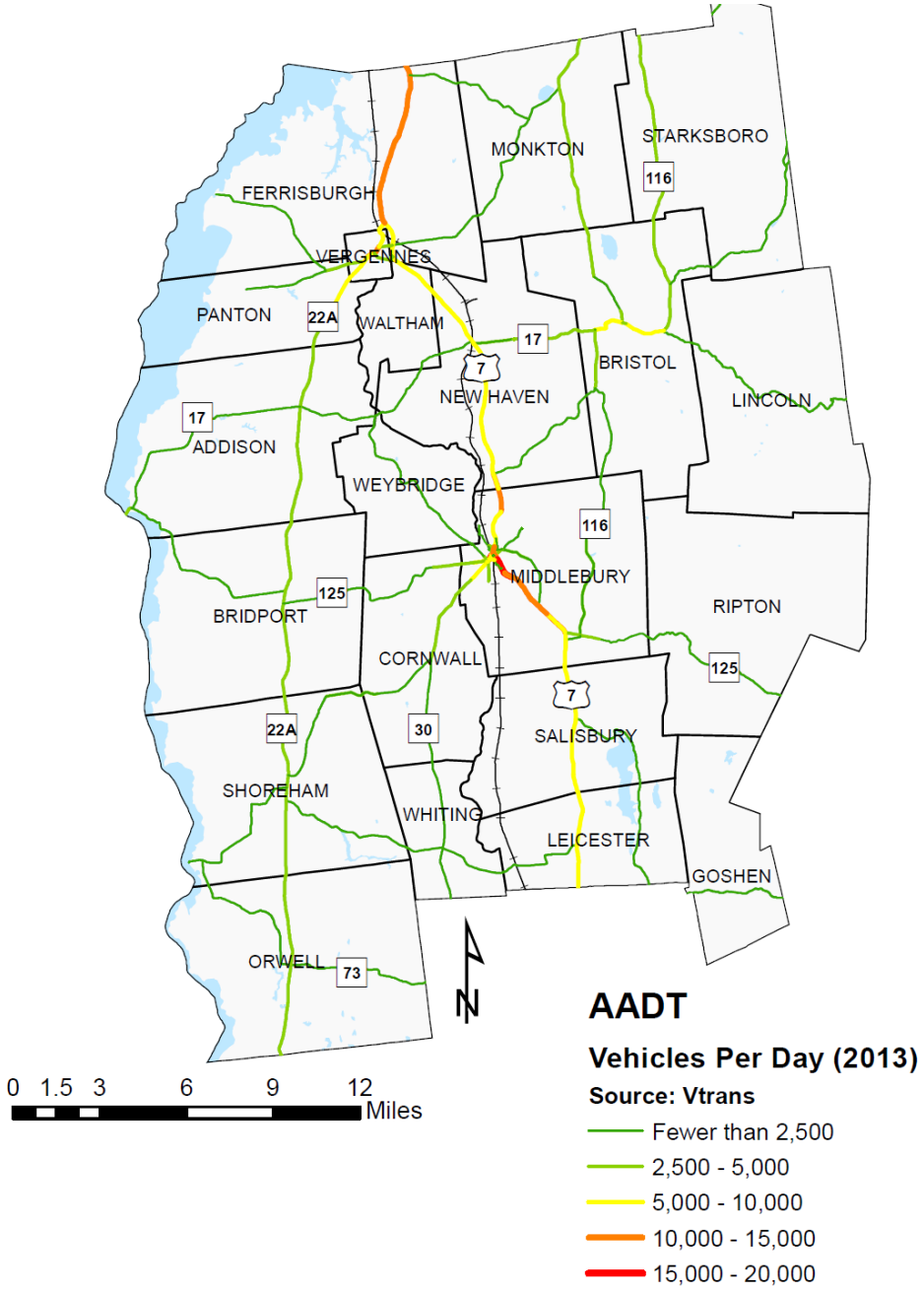


Figure 3: Traffic Volumes in the ACRPC Region (source: VTrans)

Vergennes and Route 116 through downtown Bristol sometimes experiences congestion as these routes serve both local and through-traffic. In the region's smaller communities, congestion is primarily associated school drop-off times.

Traffic volume trends in the region vary considerably, with some corridors seeing traffic growth, others are stable, and some are even declining. More detail on trends is presented later in the corridor sections.

C. Safety and Crashes

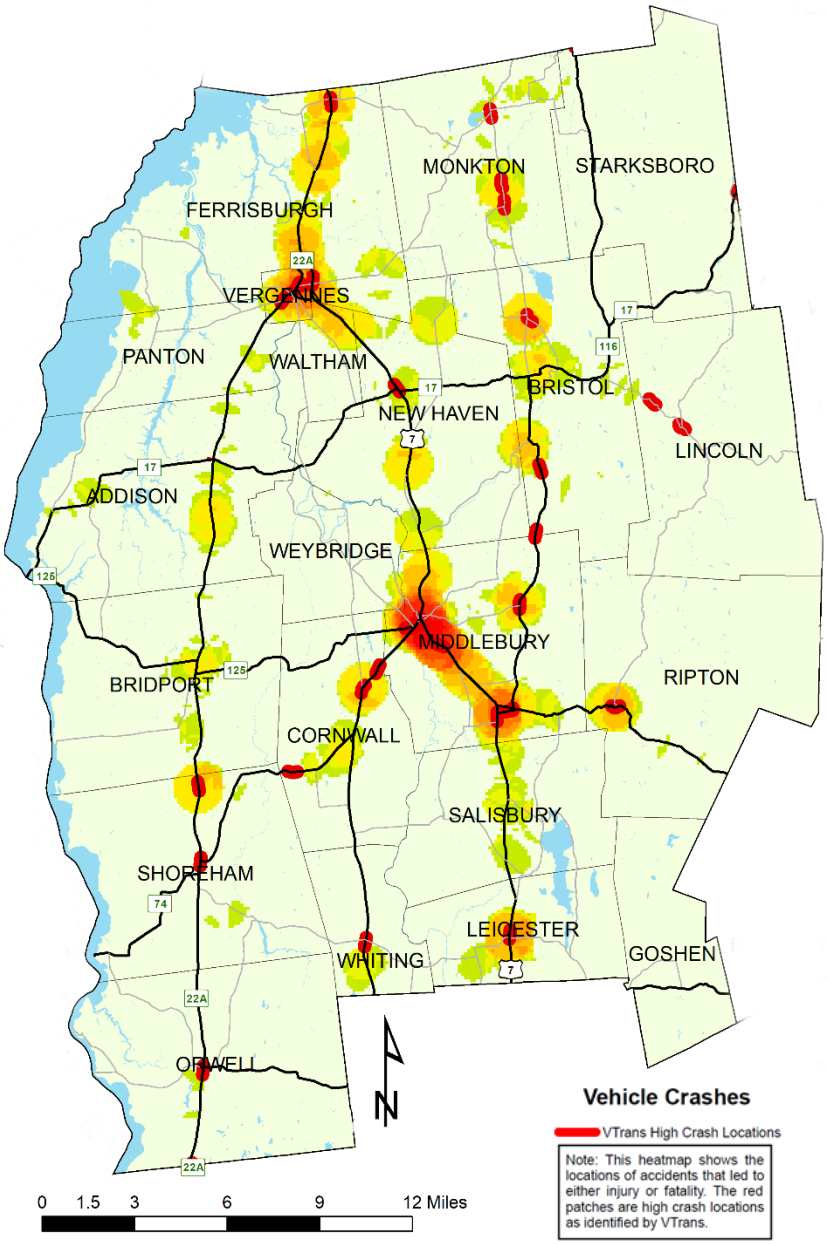


Figure 4: High Crash Locations and C

Crash data collected by the Vermont State Police and reported to the Vermont Agency of Transportation provides valuable data on the safety of our roadway network. Fatalities are

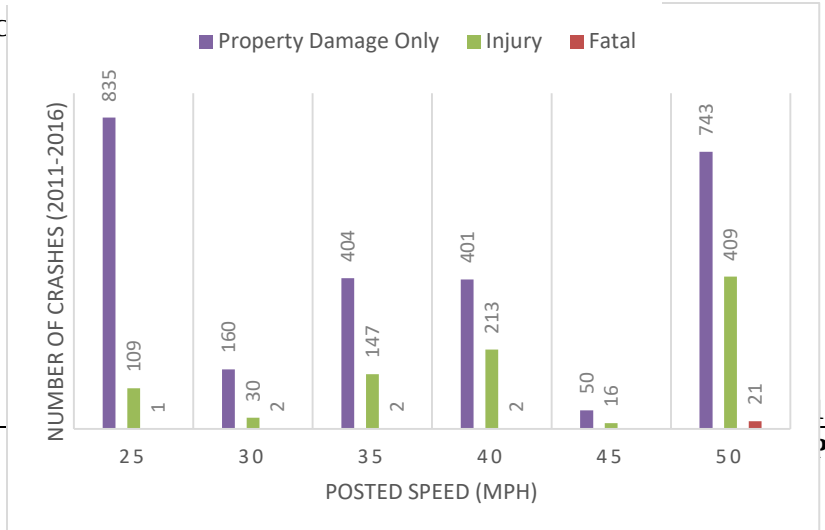


Figure 5: Number of Crashes, 2011-2016 (Source: VTrans)

relatively rare, with 28 occurring in the five-year period from 2012 through 2016. Crashes resulting in injuries are more common, and provide useful information on locations where recurring serious crashes should be evaluated for interventions or countermeasures. Figure 4 shows a "heat map" of injury crashes, and also "High Crash Locations" as reported by VTrans, which are highway segments or intersections with statistically elevated crash rates.

Figure 4 and Table 1 analyze the region's crash data, and provide some insights on the conditions that are associated with injuries and fatalities, in particular. Figure 5 shows that injuries and fatalities are most prevalent on roads with posted speeds of 50 mph. The table shows the type of collision, with the far most prevalent being a single vehicle crash, typically a driver leaving the road, often due to excessive speed for the road conditions or distraction. These types of crashes are not often correctable by infrastructure improvements, but rather might be prevented through education and enforcement. Additional crash data is available online through ACRPC's Crash Data GIS Database: (http://54.209.184.198/crash/crashmap.php) or the VTrans Crash Public Query Tool

Type of Collision	Fatal	Injury	Property Damage Only	Total
Single Vehicle Crash	12	487	866	1,365
Rear End	2	137	544	683
No Turns, thru moves only, Broadside ^<	2	85	210	297
Same Direction Sideswipe	1	28	237	266
Other - Explain in Narrative	1	18	192	211
Head On	6	65	98	169
Opp Direction Sideswipe	2	31	132	165
Left Turn and Thru, Angle Broadside -->v--	2	26	59	87
Rear-to-rear	0	4	67	71
Left Turn and Thru, Broadside v<--	0	20	40	60
Left Turn and Thru, Head On ^v--	1	4	20	25
Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--	0	1	21	22
Right Turn and Thru, Broadside ^<--	0	5	12	17
Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--	0	2	13	15
Right Turn and Thru, Angle Broadside -->^--	0	3	12	15
Left Turns, Same Direction, Rear End v--v--	0	1	5	6
Left and Right Turns, Simultaneous Turn Crash --vv--	0	0	5	5
Right Turn and Thru, Head On v^--	0	0	4	4
Left Turns, Opposite Directions, Head On/Angle Crash --^v--	0	0	1	1

Table 1: Vehicle Crash Types, 2011-2016

(http://apps.vtrans.vermont.gov/CrashPublicQueryTool/).

High crash locations are also shown as part of each roadway corridor in the Section 6.6. Recommended actions for each corridor include evaluating high crash locations for improvements to reduce their susceptibility to accidents.

6.5. Bridges

Bridges constitute an important part of the Region's roadway infrastructure. Bridge sufficiency ratings are developed by VTrans based on detailed bridge inspections to assess structural integrity, adequacy of hydraulic capacity (for bridges crossing a waterway), and "functional" components such as width and alignment. Any of these factors could indicate that a bridge might be considered for replacement or rehabilitation. It also looks at additional considerations such as the context, historical status, and cost of the various options. While deficiency status indicates the condition of the structure, the sufficiency rating determines eligibility for federal funding. The sufficiency rating is a score of 0 to 100. A rating of less than 50 means that the structure is eligible for federal replacement or rehabilitation funds; a score between 50 and 80 makes the structure eligible for federal rehabilitation funds. VTrans pays close attention to the condition of the bridges on state the system and town bridges of more than 20 feet in length.

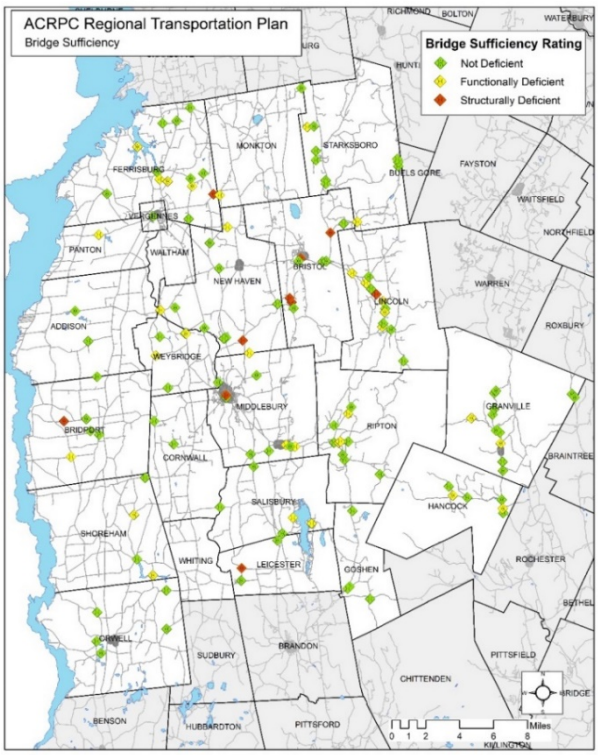


Figure 6: 2017 Bridge Sufficiency Ratings

Bridges Eligible for Federal Replacement or Rehabilitation Funds

Town	Location	River
Bristol	VT 116, near Carlstrom Rd.	New Haven
Salisbury	Swamp Rd./Creek Rd.	Otter Creek
New Haven	Halpin Covered Bridge Rd.	Muddy Branch
Lincoln	York Hill Rd	New Haven River
Middlebury	Pulp Mill Covered Bridge/Seymour St.	Otter Creek
Bridport	West Market Rd.	West Branch Dead Creek
Lincoln	Sugarbush Hill	New Haven River
New Haven	Plank Rd.	Little Otter Creek
Leicester	Old Jerusalem Rd.	Leicester River
Ferrisburgh	Monkton Rd.	Little Otter Creek
Goshen	South Hill Rd.	Neshoba River
Lincoln	East River Rd.	New Haven River
Middlebury	Main St.	Over RR
Bristol	South 116 Rd.	New Haven River
Lincoln	Grimes Rd.	New Haven River

Table 2: Deficient Bridges in the ACRPC Region in 2017

TAC Rank	Town/City	Bridge #	Location	River
1	Vergennes	27	Main Street	Otter Creek
2	Middlebury	101	Main Street	Otter Creek
3	Lincoln	46	York Hill Road	New Haven River
4	Bridport	5	Crown Point Road	West Branch of Dead Creek
5	Shoreham	8	Richville Road	Lemon Fair River
6	Bridport	4	Crown Point Road	Potash Brook
7	Starksboro	7S	Gore Road	Huntington River
8	New Haven	30	Dog Team Road	New Haven River
9	Lincoln	18	Grimes Road	New Haven River
10	Ferrisburgh	11	Little Chicago Road	Little Otter Creek

Table 3: 2017 TAC Identified Town Highway Bridge Pre-Candidate Prioritization (SFY 19)*

Recognizing that bridge ratings are not the only consideration when investing in bridge improvements or repairs, the agency also solicits input from the regional commissions through the Transportation Policy Initiative (TPI) consultation process on bridge priority. Regional commissions add qualitative factors that are difficult to quantify to be considered in selecting and advancing projects. In 2017, the ACRPC Transportation Advisory Committee (TAC) identified the facilities in Table 3 as their priority for 2019. The TAC rates bridges annually and ACRPC expects the rankings to change over time as bridges are repaired/upgraded, or are identified as needing rehabilitation. These rankings are incorporated into VTrans project prioritization on a yearly basis. Bridges prioritized for repair are also highlighted as recommended action within the roadway corridor they serve. As the list is updated, roadway recommendations should also change.

6.6. Major Roadway Corridors

Roadway corridors provide a useful scale for transportation planning. The character and conditions on ACRPC's primary roadway corridors varies widely with the Region's diverse topography, economy and environment. Corridor planning is an approach to understand transportation, environmental, land use and community development issues in a comprehensive manner that can help identify priorities for implementation. The following sections review the conditions and issues for the Region's primary roadway corridors to inform needs and priorities for action. For a section of road or intersection to be identified as a High Crash Location (HCL), the location must have experienced five or more crashes in a five-year period, or the average of one crash per year. The table below provides some summary information based on High Crash Location Reports published by VTrans:

Route Name	Maximum Volume and location	High Crash Locations	Features
US 7	17,700 Middlebury	10	Primary arterial travel corridor through the region, which also passes through a number of villages serving local traffic
VT 22A	11,400 Vergennes	5	High level of concern in Vergennes with increasing truck volumes and impacts
VT 17	4,000 New Haven	2	East-west route over the Appalachian Gap to Lake Champlain
VT 116	5,800 Bristol	5	Provides an alternate to US Route 7; passes through downtown Bristol
VT 125	4,700 Middlebury	6	East-west route over the Middlebury Gap Scenic Highway to Middlebury.
VT 73	1,400 Orwell	2	East-west route over the Brandon Gap to Orwell and Lake Champlain
VT 74	2,000 Cornwall	0	Major collector route
VT 30	6,350 Cornwall	0	Rural collector route parallel to US 7 and VT Route 22A
VT 53	2,100 Leicester & Salisbury	2	Town Highway major collector; eligible for federal aid; provides access to Lake Dunmore
Monkton Ridge/ Bristol Rd/Silver St	4,000 Monkton (South of Hinesburg t/l)	2	Aka Bristol Rd + Silver St Growing commuter traffic, avoiding US 7 and VT 116 corridors
Monkton Road	4,600 Vergennes (East of Main St)	0	Alternate route to US 7 for commuters traveling to eastern Chittenden County

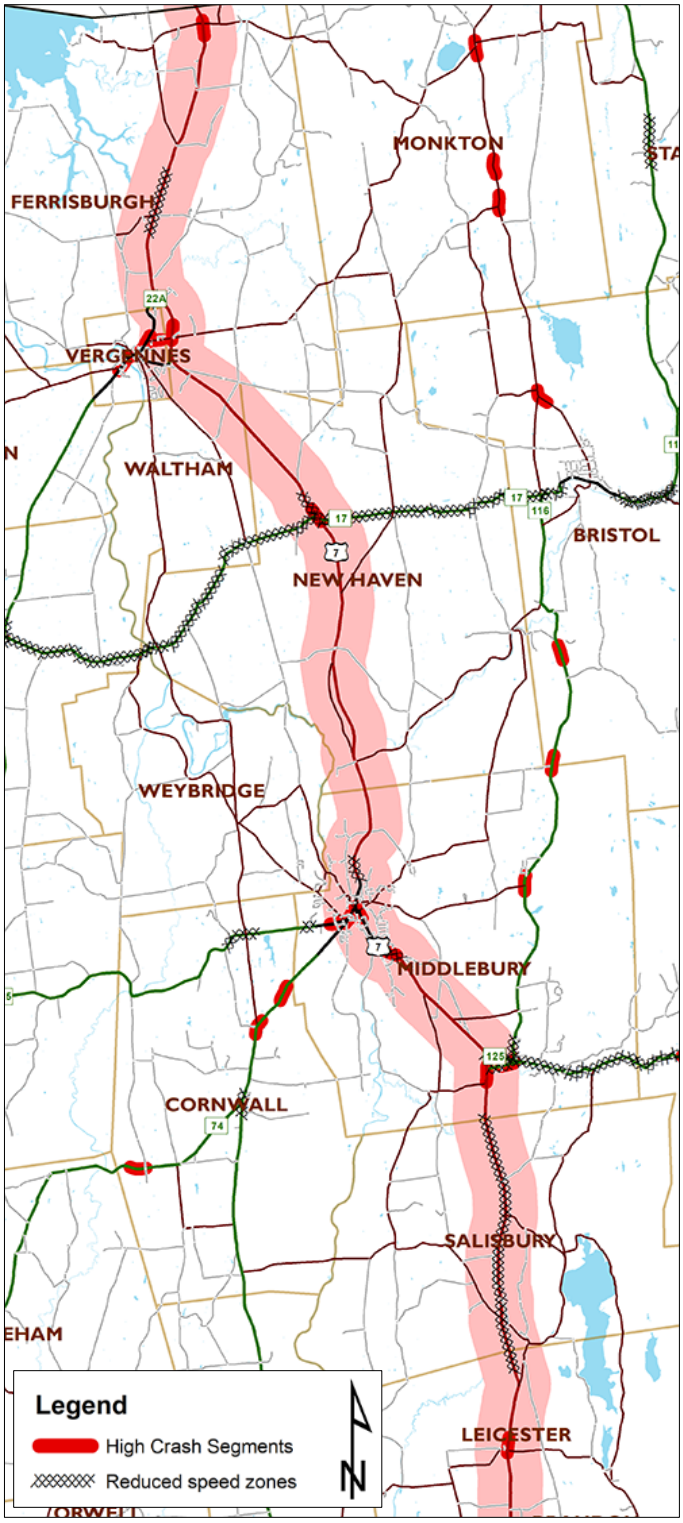
Table 4: Primary Corridors in the Addison County Region

A. US Route 7

Route 7 constitutes the primary route of travel through the Region, and is the primary north-south travel corridor in Vermont between the Green Mountains and Lake Champlain. Important considerations include:

- There are numerous high crash locations along the corridors, which primarily lie at intersections with higher volume side streets. Particularly in the northern end, high through volumes make it difficult for side road traffic to enter the corridor. Volumes in this area may be high enough to warrant the installation of roundabouts. ACRPC supports the installation of roundabouts, not signals, to preserve the carrying capacity of the route 7 corridor.
- High crash locations, including US Route 7/River Road in New Haven and US Route 7/Hollow Road in Ferrisburgh, warrant investigation through a road safety audit or scoping study.
- Exchange Street roundabout is advancing through VTrans Capital Program
- Bicyclists should be encouraged to utilize parallel north-south routes on local roads that are safer, more scenic, and nearly as direct (Greenbush Road in Ferrisburgh is a great example of this).

Figure 7 shows that traffic has increased overall since the 1970s, but has leveled off in the most recent decade. Several locations show a very recent uptick in volume, but not enough yet to indicate a long-term trend.



US Route 7 High Crash Sections

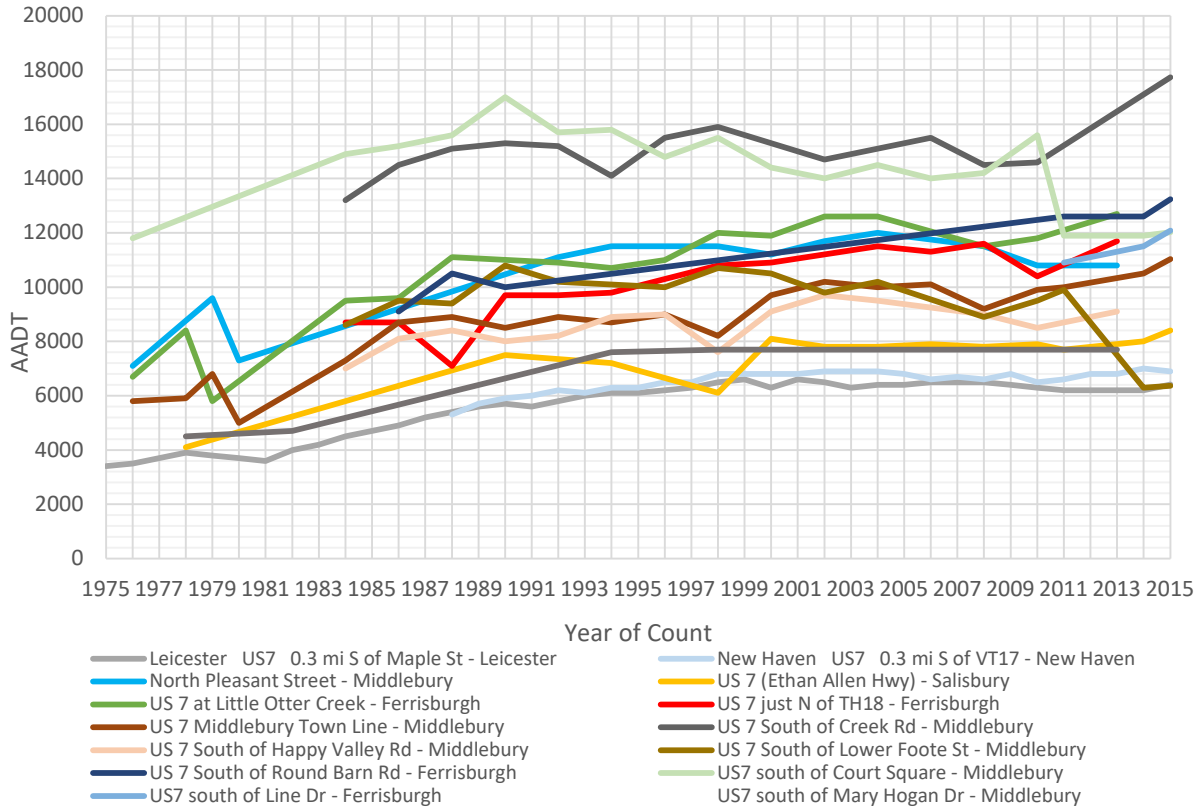


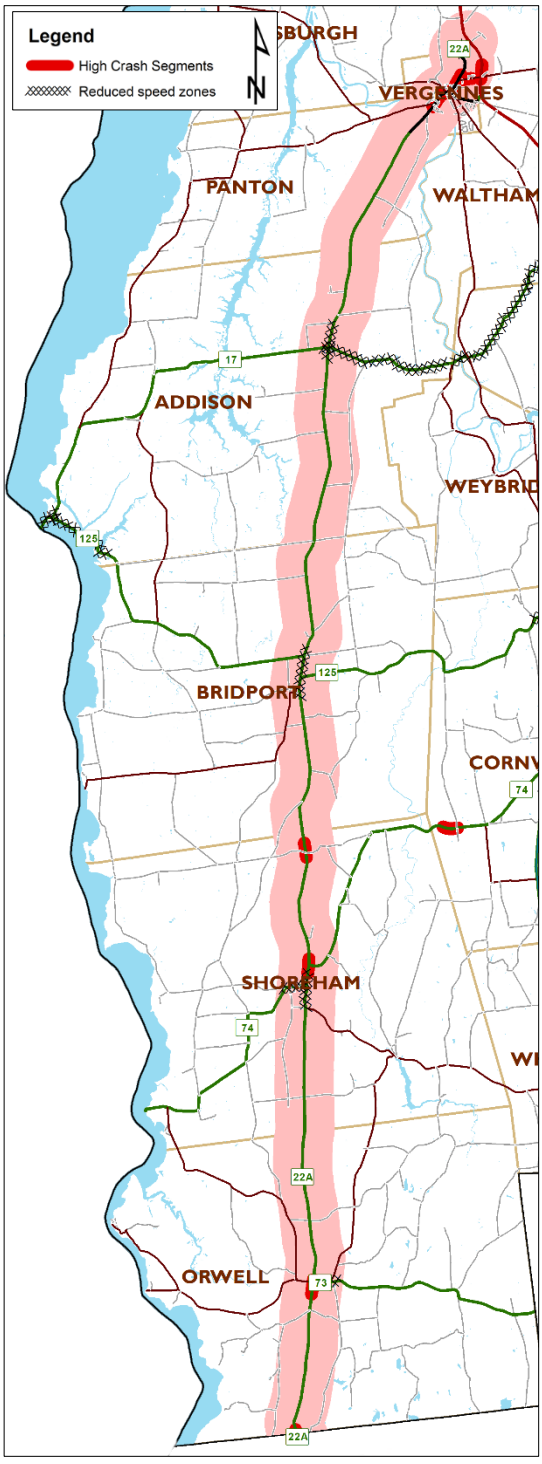
Figure 7: US 7 Historic Traffic Volumes

US Route 7 - Recommended Actions:		
Ferrisburgh	Stage/Old Hollow Roads: address existing safety issues and future congestion forecasted in 2030; a roundabout is preferred to stoplights.	
	Responsible: Town of Ferrisburgh, VTrans, ACRPC	*Timeframe:* short-term
Middlebury	Exchange Street: enhance U.S. Route 7-Exchange Street Gateway & construct the proposed roundabout	
	Responsible: Town of Middlebury, VTrans, U.S. DOT	*Timeframe:* short-term
Middlebury	Perform traffic study to address (1) congestion at Foote Street-Middle Road South-U.S. 7 and (2) congestion forecasted in 2030 at Boardman Street-U.S. 7 intersections	
	Responsible: VTrans, U.S. DOT, Town of Middlebury,	*Timeframe:* mid-term
Middlebury	Perform traffic study to explore improvements at (1) Charles Avenue-Monroe Street -U.S. 7 and (2) Court Street-Mary Hogan Drive intersections	
	Responsible: Town of Middlebury, VTrans, U.S. DOT	*Timeframe:* mid-term
General	Advocate for corridor improvements outlined in Western Corridor Plan, including: shoulder widening, truck climbing lanes, etc.	
	Responsible: VTrans, ACRPC	*Timeframe:* long-term
General	Study High Crash Locations along U.S. 7 and identify recommended improvements	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term

B. VT Route 22A

The Route 22A corridor is an important link connecting the Route 4 corridor in New York with Chittenden County. Compared to other major routes in the Region, it has higher rates of traffic growth. Concerns and observations include the following:

- Due to the impacts on Vergennes from an increasing number of through-trucks, and the upcoming bridge project on Route 17, the ACRPC can work with VTrans to explore the option of a signed alternate route for trucks. Study of potential truck bypasses can be revisited, but alternatives that were identified had very high costs and impacts, making it prudent to look at existing corridors to carry some of the burden.
- Outside of Vergennes, crashes primarily occur at intersections, involving conflicts between through traffic and turning or crossing vehicles. There are several intersections with poor sight lines and difficult turns in Addison, Bridport, Shoreham and Orwell, some are high crash locations. The rural stretches of the corridor need to provide passing lanes, to alleviate driver frustration and reduce risky maneuvers.
- Sections of the corridor near villages or intersections need improvements and management to enhance safety.
- Narrow shoulders along much of the length of the corridor is not adequate for bicycle use. However, the high speeds and high proportion of tractor trailers on the corridor make it a very low priority for bicycling.
- The Regional Planning Commission should discuss qualifications and benefits of reclassification of Route 22A as a Principal Arterial and pursue reclassification if warranted.



VT Route 22A High Crash Sections

Figure 8 shows that traffic growth along all segments in the corridor has been steady over the past four

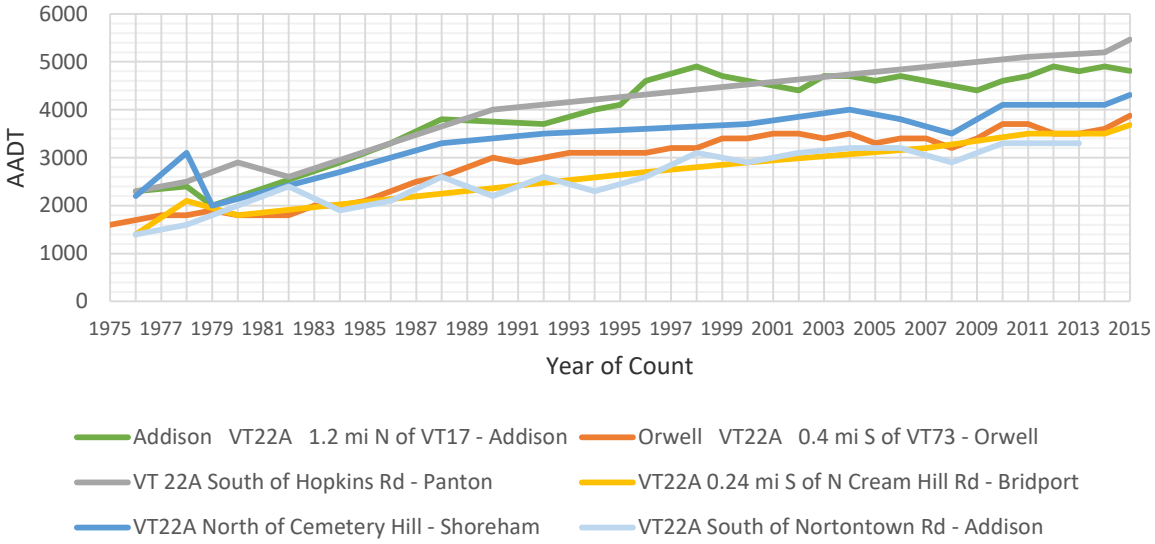


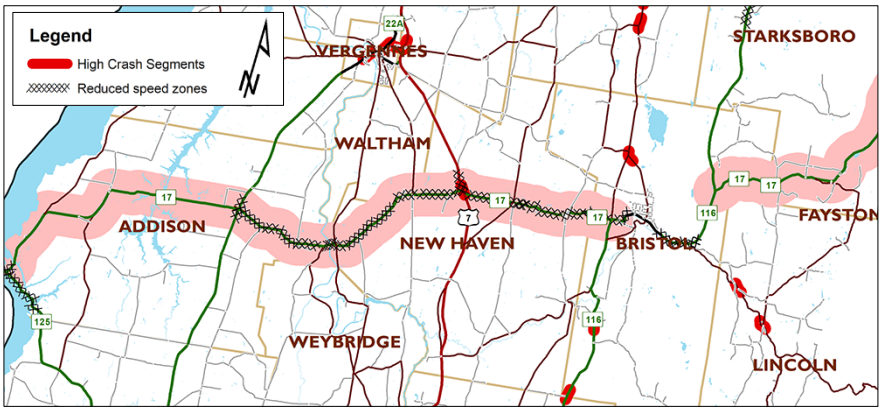
Figure 8: VT 22A Historic Traffic Volumes

decades, especially compared to other corridors.

VT Route 22A - Recommended Actions:		
Addison, Bridport & Shoreham	Apply traffic calming elements identified by previous studies, including the Western Corridor Plan, Middlebury Traffic Calming Feasibility Study (contains traffic calming toolbox applicable to entire region), Traffic Calming and Non-Vehicular Routes for Five Addison County Towns, and RRPC Route 22A Corridor Study (Orwell)	
	Responsible: Towns, ACRPC, VTrans	*Timeframe:* short-term
Vergennes	Reconstruct intersection at VT 22A-South Water Street-MacDonough Drive	
	Responsible: City of Vergennes, ACRPC, VTrans	*Timeframe:* short-term
Vergennes	Address congestion forecasted in 2030 at Panton Road-VT 22A intersection	
	Responsible: City of Vergennes, ACRPC, VTrans	*Timeframe:* long-term
General	Advocate for corridor improvements outlined in Western Corridor Plan, including: shoulder widening, truck climbing lanes, etc.	
	Responsible: VTrans, ACRPC	*Timeframe:* long-term
General	Explore and create truck routes that address concerns of Vergennes & neighboring communities	
	Responsible: VTrans, ACRPC, towns	*Timeframe:* short-term
General	Study High Crash Locations along Route 22A and identify recommended improvements	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term

C. VT Route 17

This corridor has relatively low volumes, limited traffic congestion and very few high crash locations. Its character is narrow and not well-suited for high volumes, and many stretches, especially between Addison and Bristol, have reduced posted speeds for this reason. Key issues to consider include the following:



VT Route 17 High Crash Sections

- Difficulty at VT Route 22A intersection for crossing traffic due to high volumes and speeds; yet volumes are not sufficient to warrant a traffic signal or roundabout.
- The City of Vergennes has suggested the segment between VT Route 22A and US Route 7 as a possible northbound truck route around Vergennes; lack of consensus based on public comments, concerns from neighboring communities (New Haven, Weybridge and Addison) and poor conditions of road preclude this until the bridge over Otter Creek between New Haven and Weybridge is replaced (on VTrans plan)
- Intersections (i.e. with Quaker Village Road) have poor sight lines
- East of Bristol, narrow shoulders and high bicycle popularity strain the corridor, and therefore there is a need to find a way to expand the corridor to allow for safe biking.

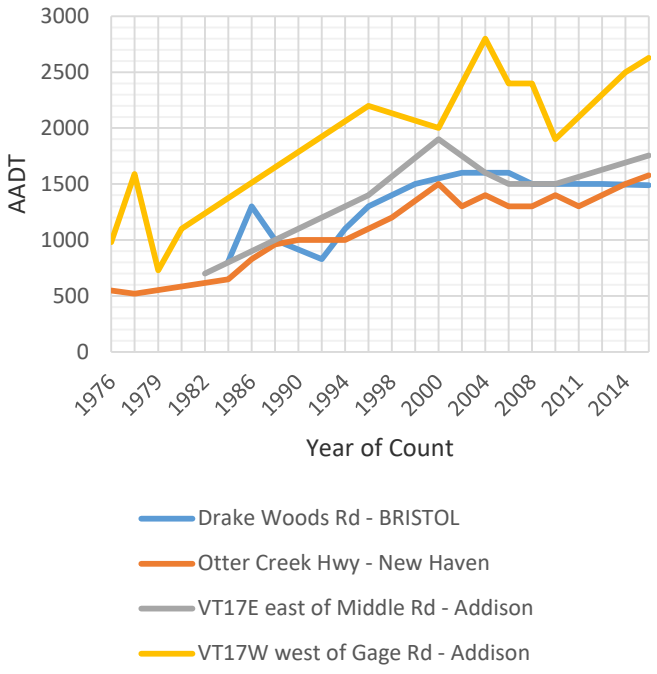


Figure 9: VT Route 17 Historic Traffic Volumes

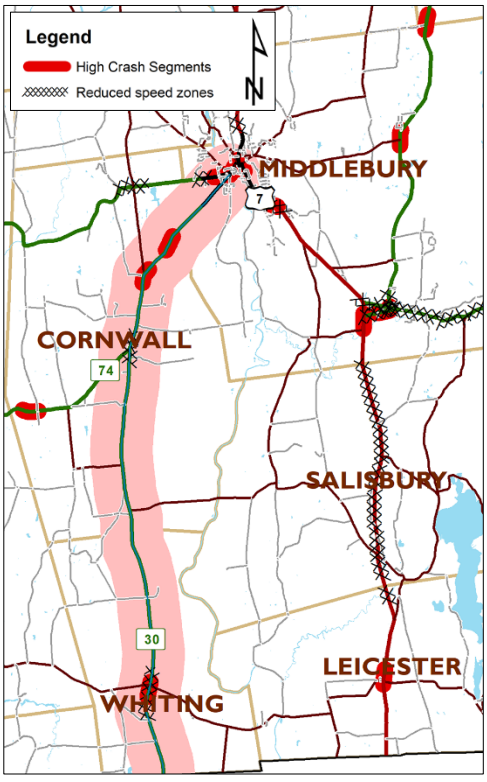
Figure 9 shows relatively low volumes, and low growth along VT Route 17.

VT Route 17 - Recommended Actions:		
New Haven	Address existing safety issues between mile 6.22 and 6.52: relocate East Street and reduce the crest at intersection of VT 17 and Sawyer Street	
	Responsible: VTrans, ACRPC, U.S. DOT	*Timeframe:* mid-term
Bristol	Repair road segments between US 7 in New Haven and VT 116 in Bristol	
	Responsible: ACRPC, VTrans, Bristol, New Haven	*Timeframe:* short-term
Bristol	Advocate for bicycle & pedestrian-related improvements east of Bristol Village, including recommendations in Bristol to Rockydale Bicycle and Pedestrian Feasibility Study	
	Responsible: Bristol, VTrans, ACRPC	*Timeframe:* mid-term
Addison	Complete study to explore safety improvements at Route 17-Route 22A intersection	
	Responsible: Addison, ACRPC, VTrans	*Timeframe:* short-term
General	Address all structurally deficient bridges identified in Table 2 on page 16	
	Responsible: VTrans, U.S. DOT	*Timeframe:* mid-term
General	Study High Crash Locations along Route 17 and identify recommended improvements	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term

D. VT Route 30

This corridor is very rural, also with low traffic volumes and low traffic growth. There are no High Crash Locations, and public comments were limited to the narrow shoulders, making bicycling challenging.

- VT Route 30 is a popular bike route. Like much of the region's roads, narrow shoulders and high bicycle popularity impact the route and, therefore, there is a need to find a way to expand the corridor to allow for safe biking.



VT Route 30 High Crash Sections

VT Route 30 - Recommended Actions:		
General	Promote the use of this scenic and low - volume corridor as a byway for traffic desiring to enjoy the Region's rural countryside.	
	Responsible: ACRPC, VTrans, towns	*Timeframe:* Short-term
General	Advocate for improvements necessary to promote as bike alternative to Route 22A and U.S. 7	
	Responsible: ACRPC, VTrans, towns	*Timeframe:* Short-term

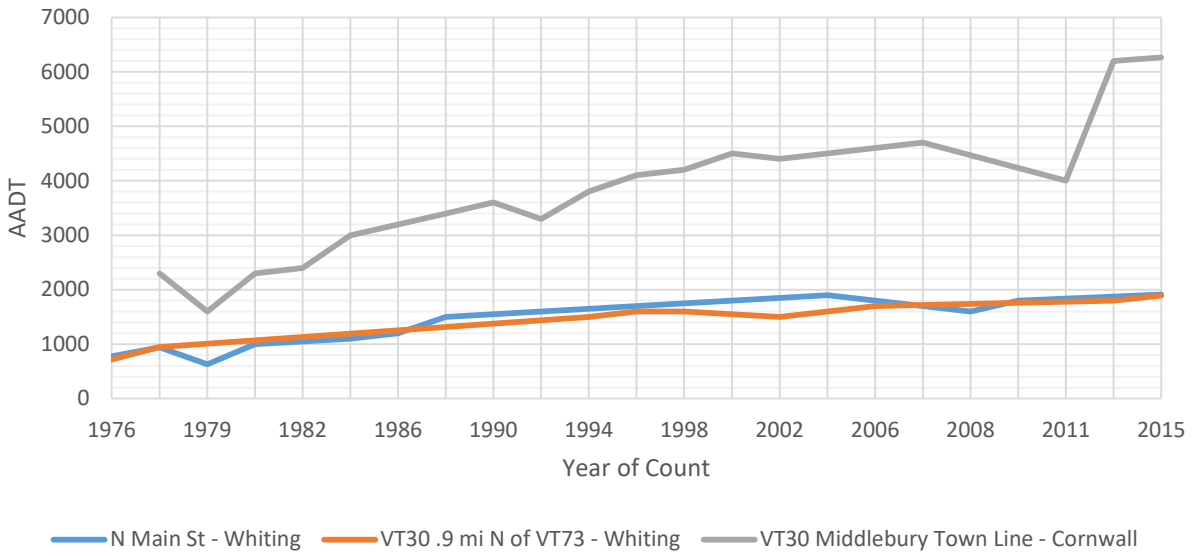


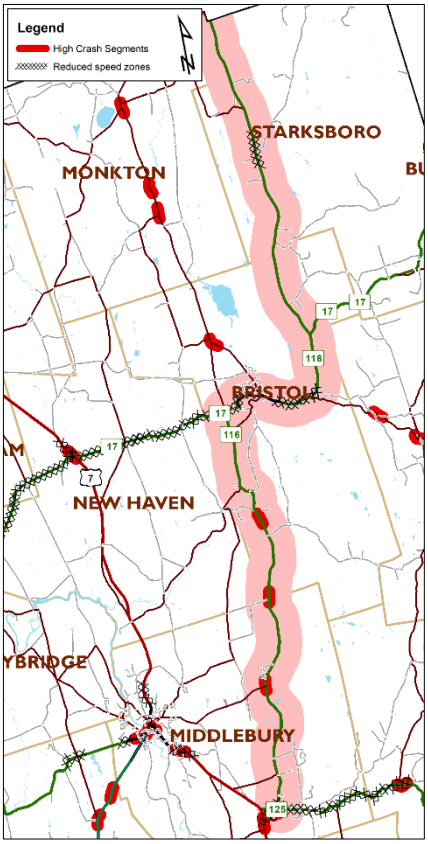
Figure 10: VT 30 Historic Traffic Volumes

E. VT Route 116

This corridor has relatively higher traffic volumes, and more recent growth in traffic. The perception is that this corridor is serving as an alternate to US 7 for commuters seeking to avoid congestion. There are numerous high crash locations along the length of the corridor, which primarily are at intersections with side streets that either have higher traffic volumes or poor sightlines at the intersection. These should also be evaluated for improvements such as roundabouts, or realignment to address visibility and safety.

Issues along this corridor include:

- East of Bristol, narrow shoulders and high bicycle popularity strain the corridor and, therefore, need to find a way to expand the corridor to allow for safe biking.
- Work with Bristol to create a gateway into the Village at the Daniels Four Corners intersection
- The high accident locations in Middlebury, Starksboro and Bristol should be studied in depth to determine how best to reduce the number of vehicle conflicts in these areas.



VT Route 116 High Crash Sections

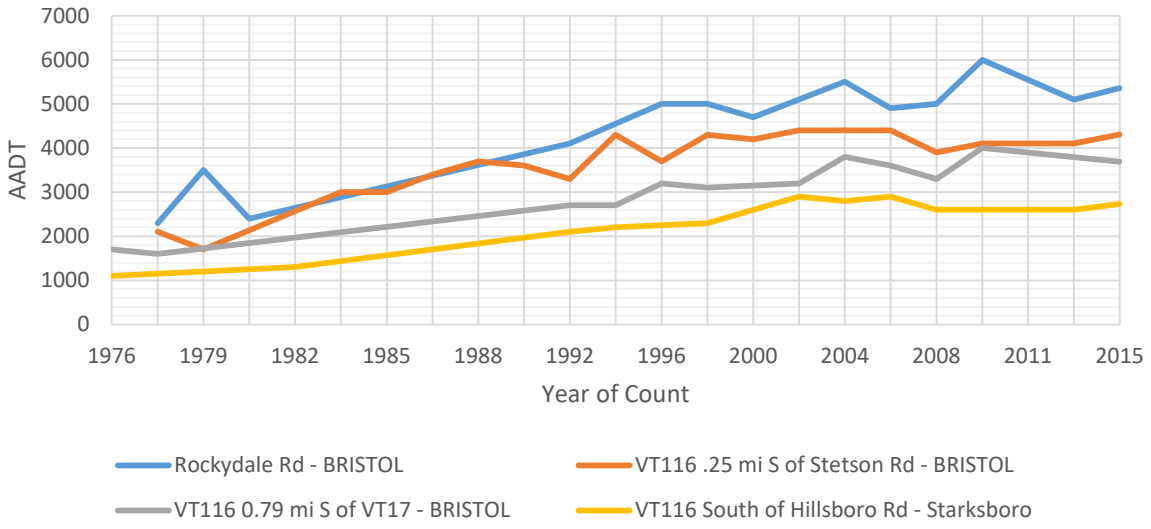
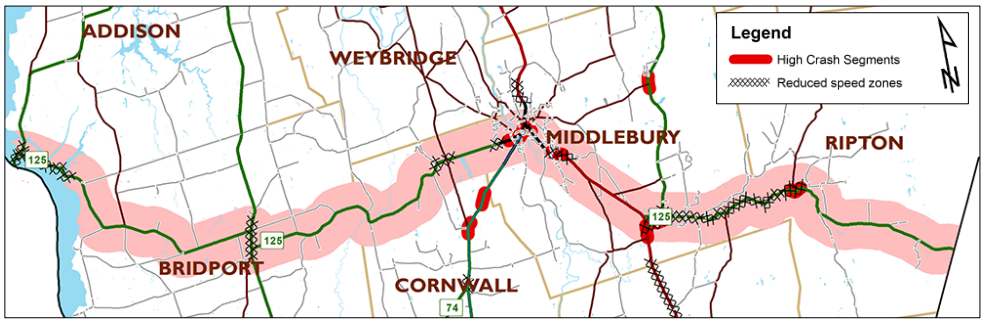


Figure 11: VT 116 Historic Traffic Volume

VT Route 116 - Recommended Actions:		
Bristol	Monitor capacity at VT 116-VT17 intersections both north and south of Bristol	
	Responsible: ACRPC, VTrans	*Timeframe:* mid-term
Bristol	Advocate for bicycle & pedestrian-related improvements east of Bristol Village, including recommendations in Bristol to Rockydale Bicycle and Pedestrian Feasibility Study	
	Responsible: Bristol, VTrans, ACRPC	*Timeframe:* mid-term
Bristol	Work with Town of Bristol to implement improvements to create village gateways	
	Responsible: Bristol, VTrans, ACRPC	*Timeframe:* short-term
General	Apply traffic calming elements identified by previous studies, including Middlebury Traffic Calming Feasibility Study, Starksboro Complete Streets study, and Traffic Calming and Non-Vehicular Routes for Five Addison County Towns (Starksboro)	
	Responsible: Town of Starksboro, ACRPC, VTrans	*Timeframe:* short-term
General	Address all structurally deficient bridges identified in Table 2 on page 16	
	Responsible: VTrans, U.S. DOT	*Timeframe:* mid-term
General	Study High Crash Locations along Route 116 and identify recommended improvements	
	Responsible: VTrans, ACRPC	*Timeframe:* short-term

The chart below shows traffic growth was more significant before the year 2000 than since that time.

F. VT Route 125



VT Route 125 High Crash Sections

Outside of Middlebury, the traffic volumes on VT Route 125 are generally very low. The character of the corridor varies tremendously from the Middlebury Gap Scenic Highway, through the Ripton Gorge, and then traversing rolling rural landscape to Lake Champlain. There are several high crash locations, again primarily at intersections. The section through the Ripton Gorge is narrow and winding, and is also a very popular bicycling route for advanced cyclists seeking a challenge. Issues include the following:

- West of Middlebury, narrow shoulders for walking and biking create conflicts. Demand is significantly higher for bicycling in this area, therefore it should be considered a high priority bike road.
- Resiliency through Ripton Gorge - Middlebury and Ripton recently preserved an alternate road corridor in the event that Route 125 suffers catastrophic damage from flooding.
- High accident locations should be analyzed to determine the most practical mitigation methods.

Traffic growth on the corridor has been nearly flat for decades, according to VTrans data.

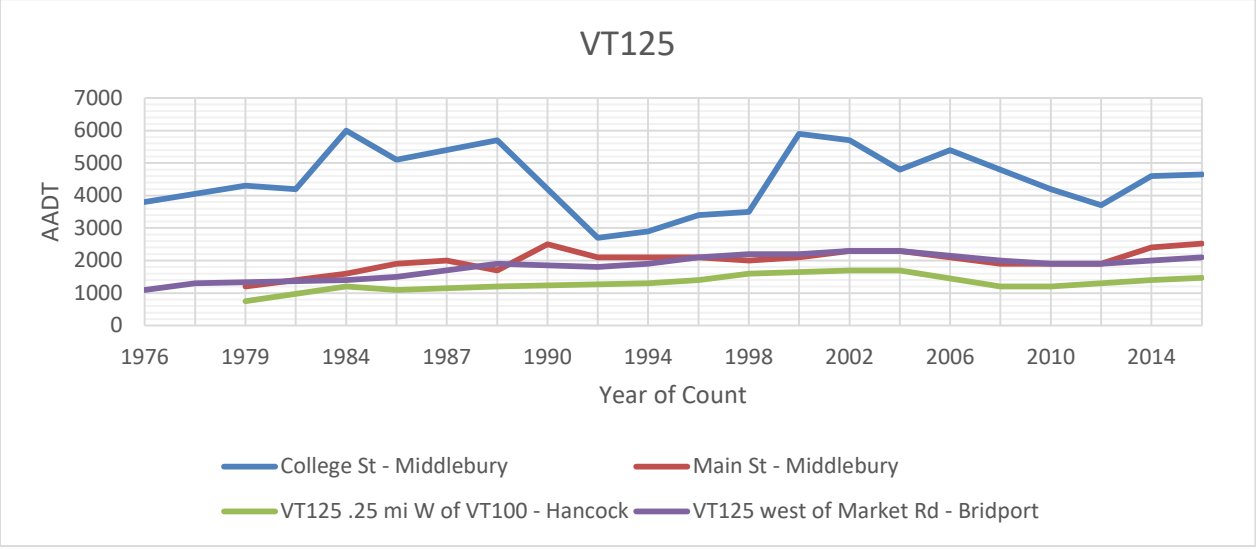


Figure 12: VT 125 Historic Traffic Volume

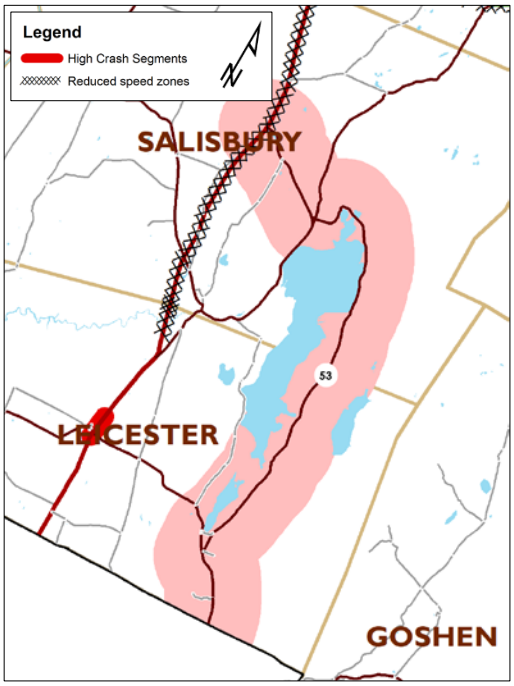
VT Route 125 - Recommended Actions:		
125 East	Identify and advocate for general corridor improvements, including shoulder widening, truck climbing lanes, , etc.	
	Responsible: ACRPC, VTrans	*Timeframe:* long-term
125 East	Implement flood and erosion-related resiliency improvements recommended by the Middlebury River/VT 125 Benefit-Cost Analysis	
	Responsible: VTrans, ACRPC, Middlebury, Ripton	*Timeframe:* long-term
125 West	Advocate for general corridor improvements, including shoulder widening and other bicycle & pedestrian safety improvements as identified in the VTrans On-Road Bicycle Plan or otherwise recommended by the Walk-Bike Council of Addison County	
	Responsible: VTrans, ACRPC	*Timeframe:* long-term
General	Address all structurally deficient bridges identified in Table 2 on page 6-16 as that list is amended annually	
	Responsible: VTrans, U.S. DOT	*Timeframe:* mid-term
General	Study High Crash Locations along Route 125 and identify recommended improvements	
	Responsible: VTrans	*Timeframe:* mid-term

G. VT Route 53

Route 53 is a small, rural highway that parallels Route 7 travelling on the Eastern side of Lake Dunmore. Issues include:

- Becoming a cutoff route between Route 73 east and US 7 north.
- The close proximity of Route 53 presents the potential for stormwater runoff impacts on Lake Dunmore.
- Increased traffic creates many conflicts in summer months especially with vehicles, walkers and bicycles.

VT Route 53 - Recommended Actions:		
General	Address safety concerns, including improvements to signs, sight distances, and drainage, especially in the High Crash Locations along Lake Dunmore in Salisbury and Leicester	
	Responsible: Salisbury, Leicester, ACRPC, VTrans, U.S. DOT	*Timeframe:* short-term
General	Work to identify and implement measures to reduce detour traffic traveling between U.S. 7 and Route 73 East	
	Responsible: VTrans, Salisbury, Leicester, ACRPC	*Timeframe:* mid-term



VT Route 53 High Crash Sections

- The area of Route 53 that passes through Salisbury is a high crash area. Efforts should be made to reduce vehicle conflicts at the "triangle" in Salisbury.

H. Local Corridors of Concern

There are a number of local road corridors that play an important role in the Region's roadway network as alternate routes or connectors between communities, and they can have a burden on local budgets. The following is a partial list of local corridors which have Regional use and demands:

- Old Hollow Road, Ferrisburgh – high speeds and conflicts with neighborhood uses
- Monkton Road/Silver Street - commuter traffic impacts
- Monkton Ridge - increasing use by commuters

Local Corridors - Recommended Actions:		
Leicester-Whiting	Address drainage and flooding issues along Leicester-Whiting Rd.	
	Responsible: ACRPC, VTrans, Leicester, Whiting	*Timeframe:* short-term
Monkton	Apply traffic calming elements and other improvements identified by previous studies in Monkton Ridge and Boro areas Commuter Corridor Planning & Feasibilit Complete Streets Planning & Feasibility Study	
	Responsible: Town of Monkton, ACRPC, VTrans	*Timeframe:* short-term
Ferrisburgh Old Hollow Road	Address intersection issues with RT7 (See recommended actions RT7 pg. 6-20)	

Truck Traffic in Vergennes

VT Route 53 High Crash Sections

In 2015, Vergennes proposed an alternative truck route that would divert northbound truck traffic away from the City of Vergennes via Route 22A in Addison Four Corners and east along VT Route 17 to Route 7 in New Haven.

The Towns of Addison, New Haven, and Weybridge strongly oppose the proposed alternative northbound truck route, citing their own concerns about road safety and damage to infrastructure. In November of 2017, ACRPC and VTrans held a regional forum with Vergennes and its neighbors. At the forum, all the parties acknowledged that heavy truck traffic significantly impacts the quality of life on Main Street in Vergennes. The parties resolved to study the issue, looking at all practical alternatives, including a truck bypass around the City of Vergennes. The parties, including VTrans, ACRPC, Vergennes and its neighbors, shall work toward completing the study and implementing the solution chosen to mitigate the impact of trucks on downtown Vergennes.

6.7. Modes of Transportation

A. Passenger Vehicles

Like most of Vermont, the rural nature of Addison County, which is made up of small communities connected primarily by a network of roadways, means that the most prevalent mode of transportation is the passenger vehicle. Residents use their cars or trucks to travel to work and to reach locations where goods and services are readily available, or to deliver goods and services.

When residents commute to work, they generally do so alone, the US American Community Survey (ACS) indicates that in 2016, 70% of Addison County's total working population drove by themselves. While 10% of workers carpool, the number of "workers per car" is only 1.8. Seventy percent (70%) of residents work in Addison

County, which means their mean travel time to work is roughly 24 minutes.

Single-occupancy vehicles, while incredibly convenient for those that can afford them, can also have negative impacts including the cost of fuel, energy use and impacts on the environment. To achieve more affordability and reduce greenhouse gases, this plan envisions offering the citizens of Addison County other options besides commuting alone. It anticipates that it can maintain access to jobs, goods and services, but reduce driving alone and promote switching to cleaner fuel sources. Many aspects of this plan discuss the actions necessary to enact these long-term shifts.

B. Truck Traffic and Freight

According to the 2012 Vermont Freight Plan, 80-90% of the trade between Vermont and its neighbors takes place by truck. Trade with New York in particular, accounts for 60% of all trade weight (15 million tons) and over 50% by value (14.7 billion). Overall freight transportation demand in Vermont is expected to grow 43 percent between 2007 and 2035, or 1.28 percent per year. This growth has a direct impact on the ACRPC region as two sections of the Vermont Truck Network (the road network designated for freight truck travel in Vermont) are located within the county. US 7 and VT22A are the primary north-south transportation corridors on Vermont's western edge. In a sampling of data taken between 2002 and 2014, it is clear that truck (medium and heavy) traffic is increasing region wide, with the most significant increases occurring in Middlebury (107%) and Vergennes (44%).

The growth of truck traffic puts pressure on roads and can present a hazard to the travelling public. Heavy vehicles also generate significant noise, dust and vibration that is detrimental to villages and downtowns. In addition to the physical impacts of truck traffic, many residents' express concerns about the materials transported through the Region. In an inventory conducted by ACRPC in 2010, it determined that roughly 8% of materials that trucks transport through Addison County are identified as hazardous. This includes the transport of combustible fuels, chemicals, blasting agents and other potentially dangerous products. The majority (60%) of hazardous materials constitute heating and vehicle fuels which are delivered by bulk rail and semi-truck to distribution centers around the County. More of these materials are transported along Route VT22A (11.8%) than other routes (6.8%).

The transport of hazardous materials via rail is more challenging to identify. Vermont Railway does not release information regarding hazardous materials for confidentiality reasons. However, during ACRPC's study of hazardous materials, it observed that Vermont Railway transports gasoline and related petroleum products to depots in Middlebury and Burlington. Each daily northbound train through Addison County includes roughly fifteen loaded gasoline tanks.

The most significant hazardous materials incident involved a 20-car train derailment in downtown Middlebury in 2007, which included 14 tank cars of gasoline. Several cars caught fire and some fuel leaked into the nearby Otter Creek. The incident required the evacuation of schools, homes and businesses and the activation of the State Hazardous Materials crew. While the instance of hazardous materials releases in Addison County is low, regular accidents occur that require notifying the state HazMat hotline. These shipments present the possibility of a danger to our communities and a challenge to local first responders. Local Emergency Planning Commission (LEPC) #8, which covers Addison County, adopted a Hazardous Materials Emergency Plan (HMEP) in August of 2016. This plan

formalizes the response procedures, emergency resources, hazard analysis and training requirements for municipalities and first responders in the event of a hazardous materials release.

Goal

- *Provide for the safe and efficient transport of goods through the Addison Region and mitigate the impact of heavy truck traffic.*

Policies

- *Structure, operate and maintain the Region's roadway network to mitigate the impacts of traffic and freight on the Region's communities, especially in villages and downtowns.*
- *Support sound, equitable and well-planned alternative routes for freight transport that will reduce negative impacts on our villages and downtowns, including investigating new, equitable & well-planned alternative routes.*
- *Support LEPC#8 and regular updates to the Hazardous Materials Emergency Plan and Local Emergency Operations Plans.*

Truck Traffic and Freight - Recommended Actions:		
General	Encourage towns to develop hazard mitigation plans that address hazards from materials transported through the community	
	Responsible: Towns, ACRPC, VTrans	*Timeframe:* short-term
General	Explore and create truck routes that address concerns of Vergennes & neighboring communities	
	Responsible: VTrans, ACRPC, towns	*Timeframe:* short-term
General	Study High Crash Locations along Route 22A and identify recommended Improvements	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term

See also rail recommended actions on page 6-9.

C. Agricultural Impacts

This Plan is intended to support agriculture. Agriculture plays a significant role in Addison County's economy. Our farms use our road system to maintain and harvest their crops and bring their foods to

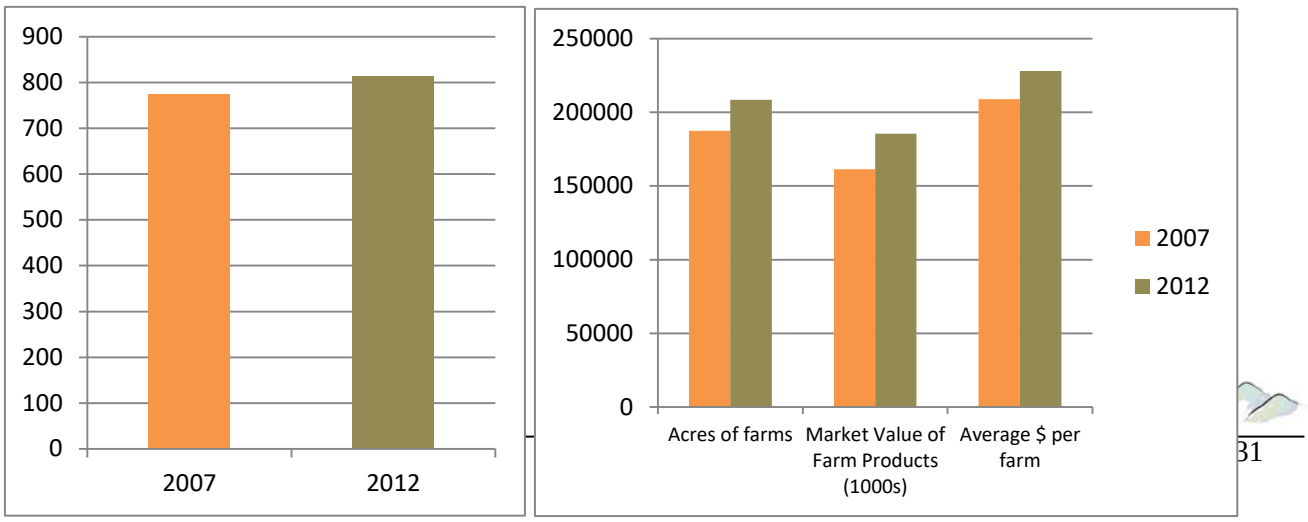


Figure 13: Data from the Addison County Farm Census, 2012: the number of farms (left) and Farm Activities (right)

market. However, residents of the ACRPC Region have voiced concerns about the impacts of agriculture on the road system. Addison County is home to some of Vermont's largest commercial agricultural operations. Overall, farm production and activity in Addison County is growing.

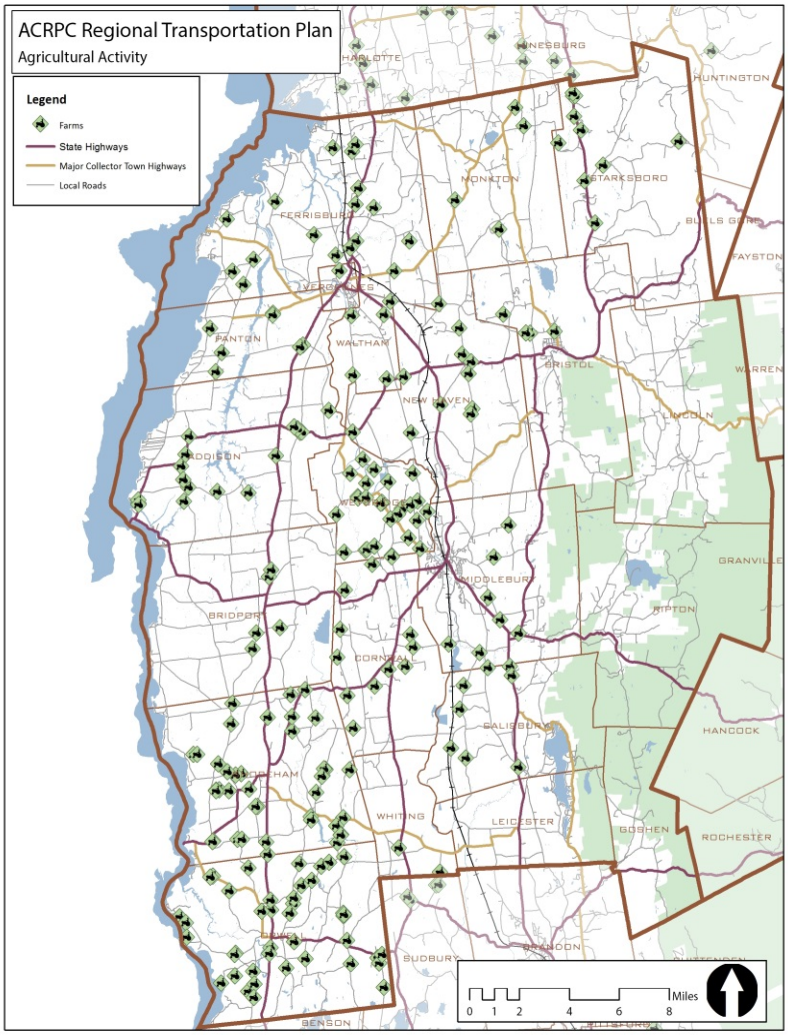


Figure 14: Map of Farms in Addison County

This growth in farm scale means that farms often have to move large agricultural equipment over longer distances via the road network, which can (over time) damage roads, cause traffic congestion and even present a safety hazard to other drivers. Although communities have the authority to set weight limits on local roads, there is a statutory exemption from permit requirements for agricultural vehicles up to 60,000 pounds. Communities are unable to require compensation for damages to municipal roads done by vehicles under 60,000 pounds without becoming involved in litigation with the towns within their jurisdiction. Heavier farm vehicles do require permits. Municipalities or the State also can control where agricultural vehicles access the public highway system and should carefully consider access requests. If not properly planned, access points can cause damage to road infrastructure and present a traffic safety hazard. A permit is required from either the state or municipality for any new road access.

Agriculture Impact-Recommended Actions:		
General	This Plan encourages farms and government agencies to use best management practices and work to minimize damage to the road system	
	Responsible: VTrans, ACRPC, towns	Timeframe: short-term

6.8. Passenger Transportation

A. Public Transit

Passenger transportation in the ACRPC Region is served primarily by Addison County Transit Resources (ACTR) a branch of Tri-Valley Transit, a non-profit public transit provider that offers a number of routes throughout the Region. ACTR's primary goal is to "provide services that are safe, reliable, accessible and affordable for everyone." Utilizing western Vermont's primary transportation corridor, US Route 7, ACTR links the three primary employment centers in the Region – Vergennes, Bristol, and Middlebury – with each other. ACTR also links many communities in the ACRPC Region to Rutland and Burlington, which is a particularly valuable resource for residents who are employed in those communities.

Overview of current routes

ACTR offers two distinct services, the Dial-a-Ride system, which provides elders, persons with disabilities and other vulnerable populations with access to medical services, shopping and eating destinations, and the ACTR Bus System, which runs to multiple locations within and outside of the ACRPC Region. For more up-to-date route information, go to http://www.ACTR-vt.org.

Potential Service Extensions

ACTR Bus routes are currently active Monday - Friday with Saturday service available on selected routes. Trips are generally offered multiple times a day, but are not available earlier than 5:30a.m. or later than 7:30p.m. depending on the route.

ACTR's long-range plans have identified several potential areas for expansion which would be dependent on available funding and ridership needs. In addition to the fixed routes discussed above, this plan also supports the expansion of ACTR's Demand Response services to meet the needs of the Region's transit dependent population. This includes harnessing new technology to facilitate ridesharing.

Communities that have a specific need, such as congestion, high levels of commuters, or an underserved population, should reach out to ACTR to determine what criteria they would need to demonstrate to allow ACTR to access State and Federal funding to support new services.

ACTR's Ridership

Between 2012-2015, ACTR experienced about a 5% increase in overall ridership between the Demand Response and Bus programs. Ridership on the ACTR bus line is heavily influenced by the cost of gasoline. During the most recent five-year period, ridership on the Bus line peaked in 2014, seeing a drop as high fuel prices relaxed. However, the Demand Response Program, because it supports those who are either unable or cannot drive (and are therefore less influenced directly by fuel costs), has continued to grow in ridership.

Year	Dial-A-Ride	Bus	Combined Total
2016	65,501	115,941	181,442
2015	49,591	121,414	171,005
2014	49,357	128,826	178,183
2013	51,707	125,981	177,688
2012	49,822	122,573	172,395

Table 5 - ACTR Ridership 2012-2016

ACRPC's Transit Dependent Population

	Disabled Residents Age 18 and up	People in Auto-Less Households	Residents Below the Poverty Line (Age 18 and up)	Residents Age 65+	Residents Age 15-19	Total Town Population
Addison	116	20	105	227	103	1403
Bridport	117	14	92	266	65	1172
Bristol	424	57	222	674	303	3903
Cornwall	61	3	26	193	51	1071
Ferrisburgh	195	23	158	411	203	2774
Goshen	32	0	22	42	8	149
Leicester	206	12	122	242	92	1231
Lincoln	146	6	83	209	87	1279
Middlebury	1269	336	972	1343	1355	8530
Monkton	221	8	73	250	146	2049
New Haven	201	30	87	257	86	1677
Orwell	208	15	99	243	111	1310
Panton	97	0	38	98	47	723
Ripton	55	13	71	115	36	619
Salisbury	138	10	121	185	46	1121
Shoreham	169	11	130	194	90	1170
Starksboro	112	13	129	132	91	1762
Vergennes	413	138	334	438	126	2629
Waltham	51	3	13	115	7	441
Weybridge	87	14	65	142	65	851
Whiting	43	6	53	47	26	424

Table 6: Transit Dependent Population by Town

The Region has a significant population of people characterized as "transit dependent" who may not be able to afford a car, are unable to drive, reside in a household without a car, are elderly or for other reasons are more likely to rely on the public transportation system. The chart above summarizes this population by town. It should be noted that the categories often overlap, resulting in a person being counted more than once. However, the numbers also demonstrate that a significant portion of the Region's population relies on public transportation. Projections expect these numbers to increase as the Region's population ages.

Emerging Infrastructure Needs and Opportunities

Infrastructure investments allow ACTR to operate efficiently and effectively and advance the state of public transportation in the Region in parallel with investments in other modes.

In the near term, ACTR's transit hub serving Middlebury's downtown needs a permanent location. The planned replacement of state-owned railroad bridges (planned for 2019) within the village will disrupt

ACTR routes in Middlebury. ACTR and Middlebury have agreed to a temporary hub located on Academy Street with satellite stops by the post office to serve the downtown.

A location in downtown Middlebury is most advantageous from a connectivity and land use perspective. It delivers riders and customers close to the businesses and services they desire to use. Any hub developed in downtown Middlebury should be sensitive to its effects on the on-street parking supply.

Goal

- *Create and sustain a Region-wide public transit system serving all citizens of the ACRPC region.*

Policies

- *Support ACTR and town and human service agencies in providing public transportation services for a greater percentage of the Region.*
- *Support the relocation of the ACTR transit hub to a permanent location in downtown Middlebury that is suitable for the organization's needs and accessible to places riders want to access.*

Public Transit - Recommended Actions:		
ACTR	Support actions which provide ACTR with the resources needed to provide optimum service	
	Responsible: ACTR, ACRPC	*Timeframe:* short-term
ACTR	Continue to explore pilot programs to expand potential ACTR services	
	Responsible: ACTR, ACRPC	*Timeframe:* short-term
ACTR	Continue assisting ACTR with planning, marketing, and general coordination	
	Responsible: ACRPC	*Timeframe:* ongoing
General	Support connectivity between transit and bicycling and walking	
	Responsible: Towns, ACRPC, VTrans	*Timeframe:* short-term
General	Incorporate transit planning into town plans, focusing on possible transit stops and hubs in proximity to parking availability.	
	Responsible: Towns, ACTR, ACRPC, VTrans	*Timeframe:* short-term
General	Monitor transit demand to ensure that service continues to perform at acceptable levels and connects to places where riders can access the system with Park & Rides	
	Responsible: ACTR, ACRPC	*Timeframe:* mid-term

B. Ridesharing-Carsharing-Ridehailing

To encourage reduced single-occupancy vehicle trips and to encourage collective travel either by ridesharing or by use of public transit, the Region contains a system of 12 formal and informal park and rides. Of the 12, one is maintained by the State of Vermont, 8 are maintained by municipalities and the remaining 3 are informal lots. These facilities are rarely at capacity, indicating that the number of spaces available at the existing park and ride facilities in Addison County is currently sufficient.

The VTrans "Go! Vermont" program helps commuters connect statewide to encourage ridesharing. As indicated in Figure 1 (pg. 6-6), ridesharing is encouraged at 12 park and rides in the ACRPC Region. The traditional ridesharing model, whereby a driver makes a seat in his or her vehicle available for passengers who may or may not pay for the trip, is changing due to growing technological connectivity. New models of ridesharing, often referred to as "ride hailing," are anonymous, dynamic, involve fares, and are commonly one way. Companies like Uber and Lyft have made ride hailing a popular way of travel in urban areas and are in the early stages of bringing these services into rural areas.

Highest Carpool Commute	
Shoreham	17%
Bristol	17%
Vergennes	13%
Whiting	13%
Waltham	13%
Leicester	12%
Middlebury	12%

Table 7 – Percentage of total commuters. Source: US ACS 2015

There is a single taxi service in the town of Middlebury. Car-sharing services, which have similarities to traditional car rental models, have expanded over the past decade. Services like Zipcar allow people to utilize cars for travel, booking the vehicles by the hour or by the day. Middlebury College students, and local residents alike, can sign up for a Zipcar account to use several vehicles located on campus.

Modern car-sharing or ride hailing services are generally more common and more effective in urban areas. However, Uber and Lyft are available in and around Middlebury and in areas near Burlington. As technology advances, these services will likely become more effective in the lower-density areas of Addison County. This may present an opportunity to provide transportation to populations that need it such as elderly individuals who are no longer able to drive themselves, people with disabilities and people with low incomes.

C. Travel Demand Management (TDM)

A vast majority of daily vehicle trips involve residents driving to and from work. Major employers in the ACRPC Region are well positioned to play an active role in reducing vehicle trips by encouraging carpooling, bicycling and allowing telecommuting. The Region's three largest employers are Middlebury College, The University of Vermont – Porter Medical Center, and UTC Aerospace. Local schools are also a significant employer. Employers can employ some or all of the following Transportation Demand Management (TDM) practices to reduce vehicle trips and increase vehicle occupancy:

- **Financial Incentives** - Employers can offer financial incentives to employees that reduce their single-occupancy vehicle (SOV) trips through carpooling or, like Middlebury College, they can provide free access to local public transit.
- **Facilities** - They can provide facilities for employees, such as secure locations for bicycles and access to showers and lockers, or carpoolers can be given preferred parking.
- **Services** - Employers can offer access to vanpooling, shuttles or car-sharing. In addition to their on-campus Zipcars, Middlebury College provides shuttle access for students and employees to the village.
- **Flexible Scheduling** - As access to the internet becomes more broadly available, the ability for an employee to work remotely has significantly improved. With the right equipment and a

connection to the internet, employees can access their office workstations remotely, make and receive calls via the office phone system and otherwise work productively from home. For those occupations that are not well-suited to telecommuting, employers can allow for flex time or a compressed work week. By enabling employees to be able to work more hours over fewer days, the number of vehicle trips to and from work can be reduced.

In 2012 the High Meadows Fund awarded ACTR a grant to develop TDM programs in Addison County. From 2012-2015 ACTR, ACRPC and several communities explored TDM strategies including outreach, education and the promotion of transportation efficiency options. Part of this process involved working with businesses to develop "Commute Trip Reduction" plans. Unfortunately, the effort proved unsuccessful at that time. ACTR concluded that programs of this nature require the following conditions:

- An ongoing commitment from leadership/management that results in assigning staff resources for implementation (i.e., an internal "champion" aka employee transportation coordinator).
- An investment on the part of the business to create a fringe benefit program that could:
    - Reimburse for bus passes;
    - Organize vanpool or carpooling options for its employees;
    - Create other fringe benefits such as investments to incentivize employees' technology shift to a higher MPG or zero emissions vehicle as well as the interest in or ability to offer flex time;
    - Provide showers for bike/walking commuters, along with bike racks, and offer a free annual tune-up for employees that ride to work on a regular basis;
    - Establish a telecommuting policy.
- The existence of significant barriers that jeopardize profitability or success of a business that could be mitigated with TDM techniques (parking constraints, retention/recruitment issues).

To a large extent, few of these conditions exist in Addison County at the current time.

Goals

- *Support transportation access for all Addison County residents.*
- *Provide alternative infrastructure to reduce single occupancy vehicle dependency.*

Policies

- *Continue to support public transportation, ride-share and car-share programs to reduce the Region's dependency on single-occupancy vehicle trips.*

Travel Demand Management -Recommended Actions:		
	Work with ACTR, GoVT and others to make emerging ridesharing technologies available in the Region.	
	Responsible: ACTR, ACRPC, VTrans	*Timeframe: Mid-term*

6.9. Pedestrian and Bicycle Facilities

Vermont's Complete Streets law, Act 34, requires that all users be considered in the planning, design, construction and maintenance of our roadway system. Under these Complete Streets principles, the context of each project is recognized in any recommendations for additional facilities or accommodations. In very rural areas, riders/walkers may share the road with vehicles, in other areas road shoulders provide a reasonable safe and cost-effective facility for pedestrians. In these cases, measures to maintain lower speeds to enhance safety, such as traffic calming, are appropriate. In areas with more multimodal activity, such as downtowns and village centers, there are a range of appropriate accommodations for non-

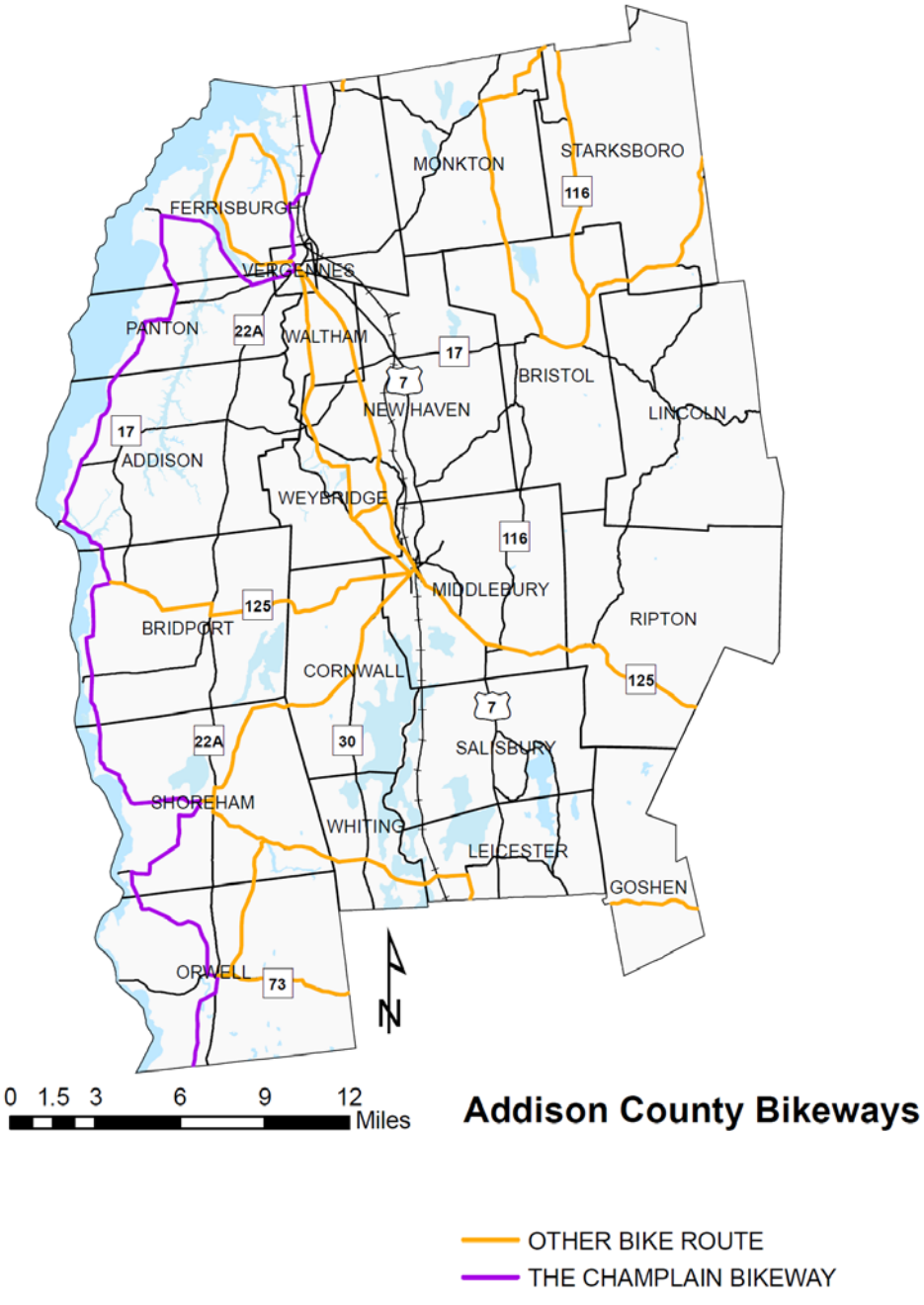


Figure 15: Bikeways in the ACRPC Region (Source: VT Dept. of Tourism)

motorized users, including sidewalks of varying widths and designs, bicycle lanes, shared lanes, and separated bicycle paths. Current or future transit stops should be designed to anticipate pedestrian travel to and from the rider's final destination. This Plan supports Complete Streets and its implementation on a rural scale that is appropriate for the Region.

Percentage of Workers 16 and Over Who Walk or Bike to Work	
Highest Walk Commute	
Middlebury	25%
Vergennes	11%
New Haven	8%
Whiting	7%
Addison	6%
Panton	6%
Highest Bicycle Commute	
Middlebury	2%
Weybridge	2%
Cornwall	1%
Salisbury	1%
Bristol	1%

Table 8 - Source: US ACS 2015

Walking and bicycling infrastructure is an important component of the Region's goals for sustainable transportation. Higher use of these modes will provide numerous benefits for the Region, including lower traffic volumes, lower emissions, and improved public health. While Vermont's Complete Streets policy should ensure that transportation improvement projects provide for these modes, there are additional considerations that can further the Region's goals. The Safe Routes to School program is a national initiative designed to promote walking and bicycling among school children. Improving safety is the primary program emphasis, but there are also other goals of improving physical fitness and mitigating school-caused traffic impacts. The Region has been supportive of federal and state initiatives that incorporate safe routes programs primarily in schools in or near our villages and downtowns.

Bicycle and pedestrian facilities in Addison County are generally concentrated in major villages and downtowns, although non-recreational bicycle travel on all of the Region's roads is seasonally common. This concentration in villages and downtowns is due primarily to the distances people are willing to walk and bike to work, recreation, school or services. Generally, between 2-5 miles is as far as the average person would bike to a specific destination (this figure does not include biking for recreational purposes, which can be significantly larger distances), and between half and one mile is as far as a person is likely to walk. In addition to distance, weather and topography can have a significant influence on one's willingness to walk or bike for transportation. Middlebury, Bristol and Vergennes have downtowns with a network of pedestrian infrastructure. Additionally, these communities - particularly Middlebury, which is home to two of the Region's largest employers - are job centers, which means that cyclists within the 2-5 mile range can bike to work. Over the past decade the Towns of Middlebury, New Haven, Weybridge, Vergennes, Bristol, Cornwall and Ferrisburgh have all actively planned for future improvements to their pedestrian and bicycle infrastructure. As topography is relatively favorable for bicycling, increasing travel by this mode could potentially alleviate traffic congestion and downtown parking demands.

The unique character and diverse topography make Addison County amongst the most desirable destinations in Vermont for recreational cyclists. The Lake Champlain Bikeway, a 1,400-mile bicycle route that circles Lake Champlain through parts of Vermont, New York and Quebec, passes through Addison County, as does the Western New England Greenway, which links Montreal, QC to New York City. In addition, there are many other recreational road bike routes that connect Addison County with other parts of the state. The Moosalamoo National Recreation Area offers off-road cycling opportunities.

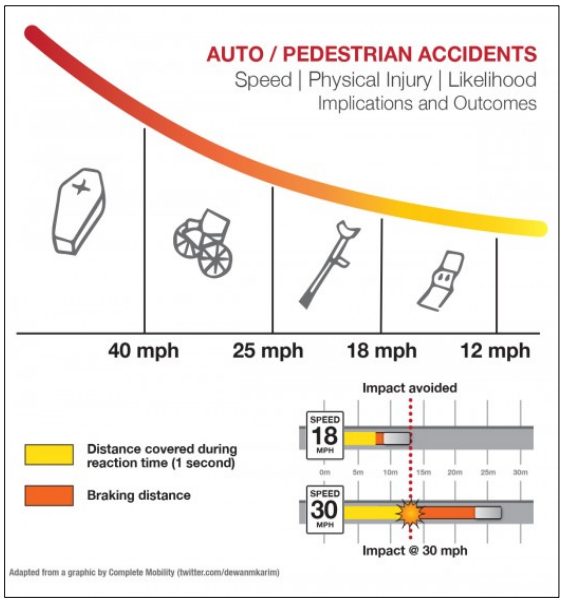


Figure 16: Likelihood of pedestrian/cyclist injury or death relative to speed

A. Bike and Pedestrian Safety

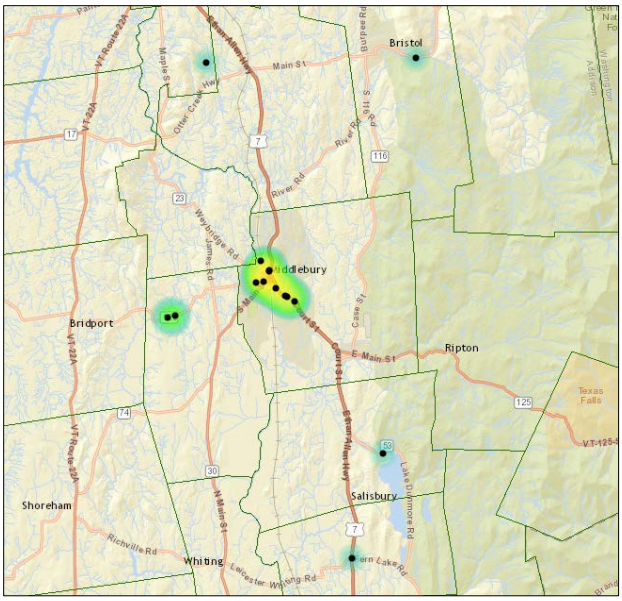


Figure 17: Crashes involving bicycles, 2011-2017 (VTrans)

The primary concern for cyclists as they travel through the Region is safety. While statewide bicycle crash trends have been moving slightly downward, the average yearly number of reported crashes in Vermont is 42. A majority of all bicycle crashes take place during the day, on a weekday at intersections.

In 2017, ACRPC collected citizen input with regard to bicycling and walking within the Region. Utilizing an online "wikimap," residents indicated areas where they experienced safety concerns, where they regularly walk and bike and where they would walk or bike if safety was improved (see appendix for details). Respondents identified 65 distinct areas of concern. Forty-one percent of all comments made were related to a lack of adequate road shoulders for bicycle safety throughout the Region. Traffic and traffic speeds, poor visibility, dangerous intersections and poor road conditions were also noted in locations around the Region. See ACRPC website at www.acrpc.org/programs-services/transportation for detailed information on the wikimap project.

It is unlikely that bike/ped improvements will occur in every area of the Region, therefore it is important to focus on where bike/ped infrastructure is used the most. A significant amount of foot travel occurs in areas where population density is highest – villages and downtowns. In these areas communities should:

- Develop bike/ped plans (stand alone or as part of their municipal plan) that plan for new pedestrian infrastructure (where appropriate) and provide connections between important areas of the community, whether for recreation or commerce, as well as connections between other communities.
- Identify local priority bike/ped routes.
- Utilize innovative and inexpensive techniques such as "tactical urbanism" to test possible bike/ped improvements.
- Maintain existing infrastructure and address safety issues quickly.

Tactical Urbanism

"Tactical urbanism" is an umbrella term used to describe a collection of low-cost, temporary changes to the built environment, usually in cities, intended to improve cycling and walking, local neighborhoods and city gathering places. Tactical Urbanism is also commonly referred to as guerilla urbanism, pop-up urbanism, city repair, or D.I.Y. urbanism.

Methods include installing temporary bike lanes, narrowing streets, pop-up parks, open Streets, de-paving, etc. Tactical Urbanism can be used to test concepts at little or no cost to the community, allowing municipal officials to gauge support for an idea before investing in implementation.

- Focus improvements on key intersections where pedestrian and bicycle movements conflict with vehicular traffic.

For cyclists, connections between population centers are also valuable. Many riders choose to commute via bike to their jobs, often traveling from more rural areas to employment centers such as Middlebury or Vergennes. This makes the stretches of municipal and state roads between the Region's population centers an important focus of any long-range transportation planning.

Complete Streets

Smart Growth America defines "Complete Streets" as "streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work."

The Vermont Agency of Transportation (VTrans) is developing an On-Road Bicycle Plan in support of enhancing on-road bicycle improvements on State roadways. The plan is expected to be completed in 2018. As part of the first phase of the On-Road Bicycle Plan's development, VTrans created statewide maps that prioritized current and future bicycle use on state roads. In Addison County, VTrans has identified the highest priority areas (see figure 18) along Route 116 in Bristol and Middlebury, Route 17 in Bristol and Starksboro and parts of Route 125 in Middlebury and Ripton. While these areas are important, the Regional Planning Commission remains concerned about areas of priority the State identified, as many of the best cycling opportunities occur on local roads. ACRPC believes the State Transportation plan must recognize these local roads as it develops its priorities in order to allow it to cost-effectively promote interconnected routes that provide the greatest benefit at the least cost.

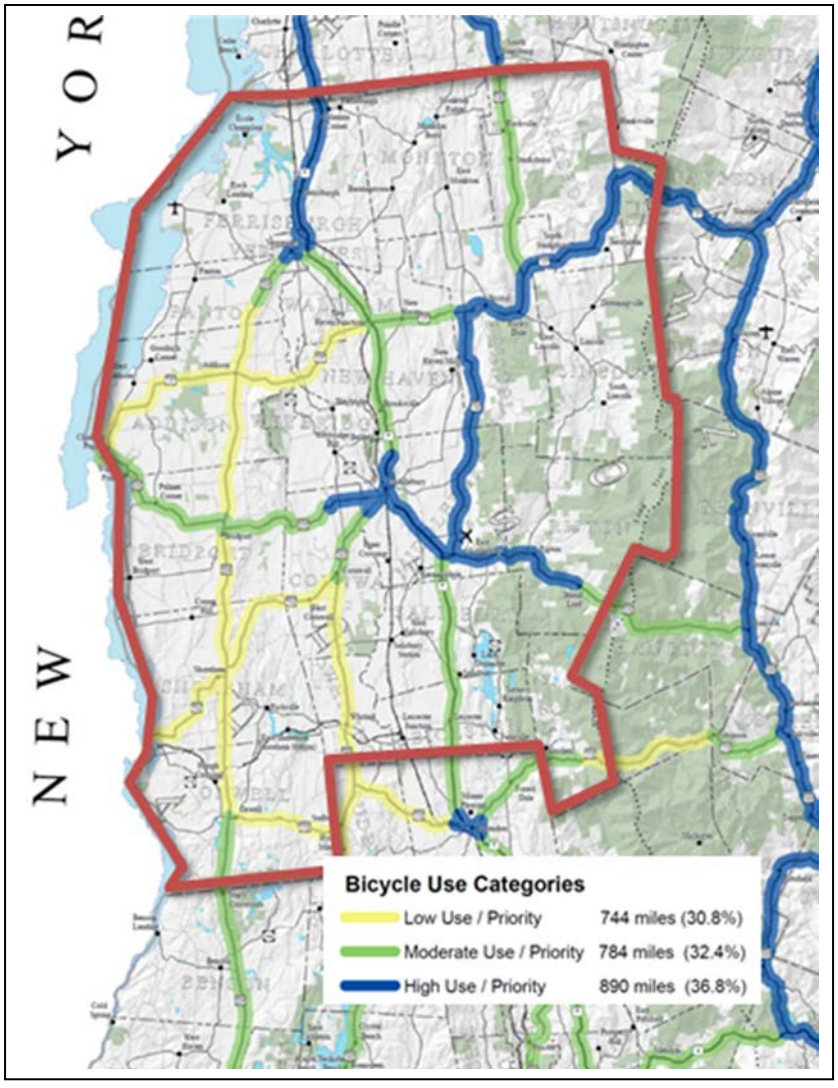


Figure 18: VTrans Bicycle Priority Map

Also, the state identified several significant bike travel routes as low priority. For example, the portion of the Lake Champlain Bikeway (shown in figure 15) in Addison County was

not identified as a priority area. Additionally, the statewide Plan identified important commuter travel corridors, from Vergennes to Middlebury, or the connection between Vergennes and Bristol as moderate priority. Much of the VTrans road system in the Region was considered low-priority.

B. Regional Health Benefits of Walking and Biking

It is important not to understate the added health benefits that safer walking and biking opportunities can bring to the Region. The Vermont Department of Health estimates that more than one in three adults in Addison County do not get the recommended amount of physical activity and more than half (63%) are above a healthy weight, making them susceptible to chronic disease.

Using a context sensitive Complete Streets approach to developing the Region's transportation system will support safe walking and biking. When safe environments for exercise exist, communities have been shown to experience a 35% increase in physical activity.[1] Residents are 65% more likely to walk in a neighborhood with sidewalks.[2] In 2005, a comprehensive study of walkability has found that people in walkable neighborhoods did about 35-45 more minutes of moderate intensity physical activity per week and were substantially less likely to be overweight or obese than similar people living in low-walkable neighborhoods.[3]

Designing our transportation system to encourage walking and biking expands economic benefits in a number of ways. The 2017 Burlington Walk Bike Master Plan describes the following:

- Walking/biking increases household purchasing power by reducing transportation related expenditures.
- Human-friendly streets boost retail performance.
- Walking/biking keeps people fit, healthy, and socially connected as they age.
- Walk/bike investments help attract and retain talent.
- Better walk/bike conditions contribute to a healthy and happy workforce.

C. Walk-Bike Council of Addison County (WBCAC)

While very few crashes are fatal, since January of 2014, there have been two fatal bicycle crashes in the Region. Following these fatalities, ACRPC partnered with nonprofit bike/ped advocacy group Local Motion and concerned citizens to form the WBCAC. The WBCAC includes residents and experts in such fields as law and enforcement, transportation planning, marketing, recreation, health and community planning. The Council's primary goals are to:

- Improve on-the-ground conditions for walking and biking through technical review of Regional transportation projects, walk-bike planning guidance and other technical assistance.

---

[1] VT Department of Health, 3-4-50 Vermont County Data Brief, Addison County, 2017
[2] Giles-Corti, B., & Donovan, R.J. (2002). "The relative influence of individual, social, and physical environment determinants of physical activity." Social Science & Medicine, 54 1793-1812.
[3] Besser, L. M. and A. L. Dannenberg. (2005). Walking to public transit steps to help meet physical activity recommendations. American Journal of Preventive Medicine 29(4): 273-280.

- Increase public officials' knowledge of and engagement in walk-bike issues by building relationships with law enforcement and local transportation officials, providing training and outreach to key stakeholders and reviewing local land use regulations.
- Build community acceptance of and respect for everyday walking and biking through grassroots outreach and the marketing of a "walk-bike identity" for Addison County.
- Increase rates of walking and biking across all ages, abilities, and communities by supporting the Safe Routes to School Program throughout the Region, identifying opportunities for promotions that incentivize and highlight biking and walking and advising businesses and municipalities about bike infrastructure.

As is the case in many parts of Vermont, not all areas of local transportation are well-suited for walking or biking. In order to ensure safe travel for pedestrians and cyclists, the road network must be designed and maintained to accommodate more than vehicular traffic.

Goals

- *A walking and biking network that is safe, enjoyable and well-maintained.*
- *A well-educated public that understands bicycle and pedestrian safety.*
- *Increased rates of walking and biking across all ages, abilities and the Region.*
- *Reduce energy use by encouraging walking and biking.*

Policies

- *Construction projects should consider improvements for bicyclists and pedestrians as central to project's purpose, rather than an "enhancement." Accommodations for pedestrians include not only the sidewalk surface, but amenities to make walking feel safer and more comfortable including trees, plantings, benches and lighting.*
- *Any future VTrans investments in bike/ped infrastructure in Addison County should include locally identified priority areas.*
- *Encourage the development of bike/ped connections between the Region's population centers, by providing adequate travel space along significant routes.*

Pedestrian and Bicycle Facilities - Recommended Actions:		
General	ACRPC will continue to support the Safe Routes to School initiative and encourage more schools to participate in these endeavors – especially those schools within densely settled villages or downtowns	
	Responsible: ACRPC	*Timeframe:* short-term
General	Continue to support the efforts of the Walk-Bike Council of Addison County, by providing staff assistance, outreach and coordination, especially as liaison to the TAC.	
	Responsible: ACRPC	*Timeframe:* ongoing
General	Pursue the projects identified in the Regional Bicycle and Pedestrian Plan and by the Walk-Bike Council of Addison County	
	Responsible: Towns, ACRPC, WBCAC	*Timeframe:* short-term
General	Assist communities with the development of local transportation plans and policies that consider and plan for multi-modal improvements	
	Responsible: Towns, ACRPC	*Timeframe:* short-term
General	Encourage Safe Routes to School programs/plans for all Village Center Designation areas	
	Responsible: ACRPC	*Timeframe: short-term*
Bristol	Develop separated path along New Haven River between South Street and Lincoln Road	
	Responsible: Town of Bristol, ACRPC	*Timeframe:* mid-term
Bristol	Complete sidewalk inventory	
	Responsible: Town of Bristol, ACRPC	*Timeframe:* short-term
Ferrisburgh	Consider paving segments of South Middlebrook Road and Shellhouse Mountain Road (both Class 3 town highways)	
	Responsible: Town Ferrisburgh, ACRPC	*Timeframe:* short-term
Middlebury	Complete local bicycle and pedestrian system plan	
	Responsible: Town of Middlebury, ACRPC	*Timeframe:* short-term
Middlebury	Consider bikeways and pathways in East Middlebury	
	Responsible: Town of Middlebury, ACRPC	*Timeframe:* mid-term
Middlebury	Consider link between Wright Park and Chipman Hill	
	Responsible: Town of Middlebury, ACRPC, VTrans	*Timeframe:* short-term
Monkton	Support safer connections from Ridge to Borough	
	Responsible: Town of Monkton, ACRPC	*Timeframe:* short-term
New Haven	Support follow-up to 2016 walk-bike survey work	
	Responsible: Town of New Haven, ACRPC	*Timeframe:* short-term
Salisbury/Leicester	Complete conceptual alignment analysis of route around Lake Dunmore & Fern Lake	
	Responsible: Towns of Salisbury & Leicester, ACRPC	*Timeframe:* short-term

Pedestrian and Bicycle Facilities - Recommended Actions (continued):		
Vergennes	Support implementation of Downtown-Basin Plan	
	Responsible: City of Vergennes, ACRPC	*Timeframe:* mid-term
Waltham	Complete conceptual alignment analysis for connection to path by Maple Street/Otter Creek; Support safe sidewalk/bike route connections to Vergennes	
	Responsible: Town of Waltham, ACRPC	*Timeframe:* short-term
Weybridge	Support walk/bike connections to downtown Middlebury	
	Responsible: Town of Weybridge, ACRPC	*Timeframe:* short-term

6.10. Issues and Opportunities

A. Promotes the Economy

Addison County's transportation network provides benefits – particularly economic benefits - by connecting us with the work we do, the services we need and our families. Our roadways and rail lines serve as the arteries feeding our facilities and by which our businesses transport our goods to market. Keeping traffic moving freely on our arterial roads is essential to our production economy. Additionally, visitors travel to the Region for leisure, business and personal travel. Seven percent of Addison County's business establishments cater directly to the recreation and tourism industry. Many other businesses benefit indirectly. The Vermont "brand" relies heavily on travel because of the unique rural qualities of the state.

Future transportation improvements must provide safe and efficient multi-modal travel that also preserves the characteristics that make Addison County unique. ACRPC desires a transportation system that allows all its citizens, businesses and visitors to safely and efficiently move from one place to another. Transportation improvements should utilize a Complete Streets approach which considers the context of an area as much as current and potential travel patterns. While sidewalks and well-defined bike lanes are appropriate in the context of a village or a downtown, in rural areas accommodations for multiple modes of travel might mean improving road shoulders to allow for separation between pedestrians and vehicular traffic.

ACRPC continues to support of all modes of transportation structured to help build stronger, more vibrant communities. Vibrant communities will attract new businesses and maintain economic stability.

Promotes Economy - Recommended Actions:		
General	Strategically improve arterial roads and practice access management to preserve travel times for commerce	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term
General	Build complete streets, especially in village and downtowns to create vibrant attractive communities	
	Responsible: ACRPC, towns, VTrans	*Timeframe:* mid-term
General	Support rail and air improvements within the western corridor to provide additional opportunity for commercial and passenger activity	
	Responsible: VTrans, ACRPC	*Timeframe:* short-term

B. Safely Supports All Modes of Travel

One of the Regional Commission's primary considerations is the safety of travelers throughout the region, regardless of mode of travel. In section 6.6, a number of high automobile crash locations were identified along the Region's major roadway corridors. Many of these locations can benefit from safety improvements, including the installation of roundabouts, which the RPC supports at specific locations.

Automobiles and other modes of transportation, such as bicycle or pedestrian, must exist safely within the transportation system. Throughout the region there are areas where existing infrastructure does not

provide a safe environment for multi-modal transportation. Future investments in these travel corridors should consider improvements that enhance the safety of bicycle and pedestrian travel.

Safe Modes of Travel - Recommended Actions:		
General	Support the installation of highway safety improvements at high crash locations as identified and recommended in the corridor plans	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term
General	Support context-sensitive roadway improvements that enhance bicycle and pedestrian safety	
	Responsible: ACRPC, VTrans	*Timeframe:* mid-term
General	ACRPC will continue to support programs like the Safe Routes to School, and Strong Communities, Better Connections to ensure safe multi-modal transportation	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term

Promotes Energy Efficiency and Conservation

The prolific use of fossil fuels over the past two centuries has had a significant impact on air quality, water quality, and climate patterns. Climate change, sometimes referred to as global warming, has resulted from the rapid release of billions of tons of carbon (also referred to as Greenhouse Gases or GHG) that had been locked in solid and liquid fossil fuels. The worldwide impacts of climate change—destruction of ecosystems, sea level rise, greater frequency and intensity of drought and severe storms that threaten millions of homes, farms, and businesses—are already being observed. The Addison Region chooses to write this Plan to limit future damage and adapt to a changing reality. In Vermont, climate change has the potential to alter the composition of our ecosystems, affect the viability of agriculture, and result in more damaging tropical storms, floods, and other severe weather events.

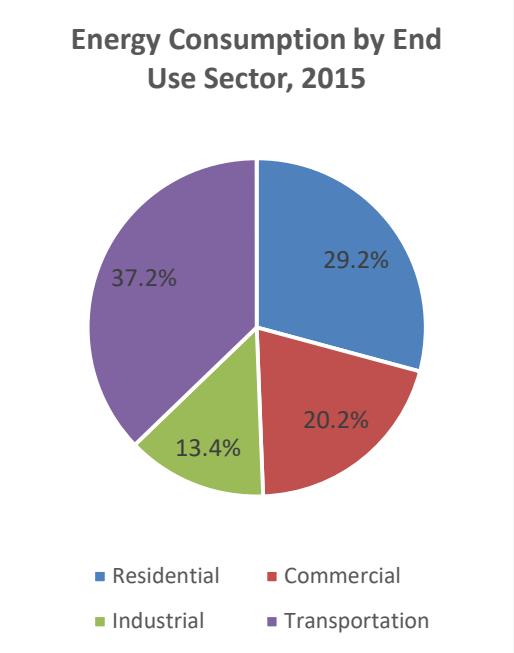


Figure 19: VT Energy Consumption by End Use Sector, 2015

In 2011, the State of Vermont released a significantly revised Comprehensive Energy Plan (CEP) intended to address Vermont's Greenhouse Gas emissions, and its energy future for electricity, thermal energy, transportation and land use. The 2011 CEP Plan represented a substantial change in approach to energy in Vermont by setting a very significant set of goals for the state, most notably to transition the state's energy use from 75% fossil fuels to 90% renewable. Since 2011, a significant amount of study and analysis has been done to further inform the question of "how" to achieve the goals of the CEP. Beginning in 2013, the Department of Public Service (DPS) conducted the Total Energy Study (TES), which reviewed the technologies and policies that might achieve Vermont's

greenhouse gas and renewable energy goals. The 2016 revision of the Comprehensive Energy Plan further refined the goals, policies and strategies of the 2011 CEP. Some of the goals of the Plan are to:

- Hold statewide Vehicle Miles Traveled (VMT) per capita levels to 2011 (11,402 VMT per capita).
- Reduce the number of single-occupancy vehicle (SOV) trips by 20% by 2030. (70% of vehicle trips in ACRPC Region are SOV).
- Increase public transit ridership by 110% to 1.9 million trips annually. For ACTR, this would mean adding an additional 199,500 trips annually (based on 2016 ridership).
- Quadruple Vermont base passenger rail trips annually.
- Increase the total number of Electric Vehicles (EV) statewide to 10% of the total fleet by 2025.

The ACRPC Regional Plan supports these goals as part of a strategy to reduce GHG emissions and overall energy use.

Transportation constitutes the most significant contributor to greenhouse gas emissions in Vermont, accounting for 37.2% of Vermont's total in 2015. Use of the automobile as our primary source of travel and truck freight transport is the root cause. Seventy percent of all commuters drive alone in single-occupancy vehicles. This creates a significant opportunity for the Regional Commission to play a role in the reduction of GHG's. ACRPC intends to use its plan to maintain existing economic vitality, but also adopt policies developed to shift future use patterns.

Goal

- *Reduce the Region's contribution to greenhouse gas emissions.*

Policies

- *Reduce vehicle miles traveled by supporting efforts to provide the Region with opportunities to work closer to home and encouraging public transit ridership.*
- *Support programs and planning initiatives such as park and rides and ridesharing that will*

Energy Efficiency & Conservation - Recommended Actions:		
General	Actively support ACTR and other forms of local public transit	
	Responsible: ACRPC	*Timeframe:* ongoing
General	Promote the expansion of the existing park and ride system, focusing on low-cost options in or adjacent to village centers	
	Responsible: ACRPC	*Timeframe:* ongoing
General	Encourage the expansion of Amtrak's Ethan Allen Express to bring passenger rail service to the Region	
	Responsible: ACRPC	*Timeframe:* short-term
General	Provide technical assistance to the Addison County Walk-Bike Council, and support their mission to increase walking and biking region-wide	
	Responsible: ACRPC	*Timeframe:* ongoing
General	Work with VTrans and GoVT to actively support and promote van pools between Chittenden and Addison County	
	Responsible: ACRPC	*Timeframe:* ongoing

reduce single occupancy trips throughout the Region.

C. Electric Vehicles

The current range of electric vehicles (EV) varies from 70 miles to over 200-300 miles on a full charge. Most EV owners charge at home, however given the distance between our communities and centers of employment, it is essential that the ability to recharge EVs is readily available to the EV owner, if more EVs are to be encouraged. An electric vehicle that has a range of 60-80 miles will take up to 10-14 hours for a full charge using a Level 1 charging station (120 volts), 3-7 hours using a Level 2 charging station (240 volts), and 30 minutes to an hour on a Level 3 Fast Charging Station (over 24 kW). While Level 3 chargers are the most appealing because of their short charging time, they are significantly more expensive to install and require the availability of 3-phase power. There are currently eight locations with public EV charging in the Region (including two at the ACRPC office); however, four are located in Middlebury and only one is a Level 3 Fast Charging Station.

In 2013 the State of Vermont developed an Electric Vehicle Fueling Infrastructure Plan which analyzed the potential for VTrans to provide charging stations statewide. Several state park and rides in VT were identified as good locations for Level 2 chargers, but none are located in the ACRPC Region. Additionally, the EV Plan indicated that while the early implementation of a Level 3 charging network was not recommended, it was very important to provide long distance travelers with EV charging options. Providing regular fast charging opportunities along the Region's major travel corridors (Route 7 and Route 22A) is essential to encouraging the use of EVs in the Region. In Addison County, a public/private partnership will be the most likely avenue to develop that network. By working with municipalities, major employers, energy providers and the State of Vermont, it is possible that over time such a network can be built.

Goal

- *Increase the number of Electric Vehicles region-wide.*

Policies

- *Encourage the development of public/private partnerships that will enable the creation of a network of EV charging stations along the Region's largest transportation corridors.*
- *To provide complete coverage for electric vehicle charging, encourage expansion of the DC Fast Charge (Level 3) vehicle charging station network throughout the region.*

Electric Vehicles - Recommended Actions:		
General	Identify ideal locations and develop strategies for construction of EV charging stations along major regional corridors	
	Responsible: VTrans, ACRPC	*Timeframe:* mid-term
General	Encourage municipalities to explore potential for EV charging stations in village centers or at other recreational/community facilities or Park and Rides	
	Responsible: ACRPC, towns	*Timeframe:* mid-term
	Encourage commercial development regulations to provide for charging stations in timed/metered parking areas.	
	Responsible: Towns, ACRPC	*Timeframe:* mid-term
	Encourage residential development regulations to provide for 220 volt receptacles in	

	accessible spaces.	
	Responsible: Towns, ACRPC	*Timeframe:* mid-term

D. Enhances Regional Land Uses & the Region's Sense of Place

Traditional transportation planning techniques have often focused primarily on enhancing auto-mobility – the ability to move freely and easily by car. In many areas nationwide, this focus has led to improvements that allow for faster traffic flow, such as the widening of roads or the installation of turning lanes and streetlights. While in some places these techniques may be the best choice, if applied universally to all locations, they can have detrimental effects. For example, the widening of rural back roads often requires removing the trees that line the road. Tree-lined rural roads are one of the distinct characteristics of rural Addison County. As an alternative to a one-size-fits-all approach to planning, New Urbanists developed the "transect" approach. This approach recognizes that there are different scales of development in every Region, ranging from sparsely developed rural areas, to small hamlets, to densely populated downtowns. Rather than apply one transportation approach to all areas, differing transportation techniques are encouraged in each area.

In the ACRPC Region, planners should focus on a healthy balance between mobility and livability. While moving people from one population center to another at optimal speeds is important along the Region's primary transportation corridors, it is less so along more rural roads. Along the Region's rural roads, it is important to recognize that the character of these roads have a direct impact on livability. Narrow, tree-lined dirt roads lend themselves reasonably well to walking and biking. By keeping these roads lined with trees and vegetation, roads feel naturally narrower, thus slowing vehicle speed. Likewise, the tree-lined road contributes to the rural aesthetic.

While multi-modal transportation is important Region-wide, transportation planning within the Region's villages and downtowns should focus directly on providing a diverse range of transportation options using Complete Streets policy as a guide. Providing pedestrian infrastructure such as sidewalks or walking paths, reducing traffic speeds through streetscaping and other traffic calming techniques, help encourage walking. Developing bike paths, incorporating bike lanes along streets and placing bike racks in useful areas are ways communities can encourage multi-modal transportation that is appropriate for their village. These transportation enhancements help preserve the traditional feel of our villages and downtowns and provide opportunities for residents to interact socially, which further enforces the sense of livability a community has. At the same time, encouraging a high volume of traffic through our villages and downtowns can have detrimental effects. As mentioned earlier, truck traffic through population centers like Vergennes is having a negative impact on the community. Evaluating options that reduce these impacts is important to striking a balance between mobility and livability.

A livable community is one that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life. It is important to recognize that land use decisions also have a significant impact on livability. Population centers should encourage a wide range of appropriately scaled (and affordable) housing and areas of mixed use that are easily accessible by foot.

Goal

- *A transportation system that successfully balances mobility with livability.*

Policies

- *Patterns of land use within the ACRPC Region should support the traditional pattern of densely populated villages and downtowns surrounded by open countryside.*
- *To enhance livability, investments in transportation infrastructure in villages and downtowns should incorporate Complete Streets design.*

Enhancing Regional Land Uses & Sense of Place - Recommended Actions:		
General	Encourage appropriately scaled roundabouts and other traffic calming features as preferred safety improvements and as community/village gateways	
	Responsible: VTrans, ACRPC, towns	*Timeframe:* ongoing
General	Complete Streets appropriate scale to location	
	Responsible: ACRPC, towns	*Timeframe:* short-term
General	Support access management efforts, focusing on keeping major arterial roads moving freely	
	Responsible: ACRPC, towns, VTrans	*Timeframe:* ongoing

E. Exhibits Resiliency to Natural Hazards

Shifting climate patterns have led to an increase in severe weather events. In Vermont, a vast majority of declared disasters are flood related. Floods often damage roads and bridges. The cost of repairing or replacing failed infrastructure after a severe weather event can be challenging for the Region's communities. To mitigate against future damages, hazard mitigation techniques such as culvert upsizing, lengthening bridges based on stream hydraulic studies and improved bank stabilization can be implemented. Funding is the primary barrier to implementation at the local level. ACRPC can pursue funding opportunities to advance the planning and construction of projects that preserve or enhance water quality, while also mitigating against future damage. Replacing deficient culverts and bridges has the best return on investment. Designing appropriately scaled structures that can handle flood events, stormwater runoff, and minimize the discharge of sediment has the dual benefit of protecting water quality and reducing the potential for failure during a severe flooding event. In some instances, there are locations that should be avoided or where transportation infrastructure or roadway growth should be limited so as to not exacerbate the potential for damage. In these cases, downgrading or relocating existing roadways may be the best option. In more urban areas, flooding can be reduced by installing green infrastructure, eliminating system

> Green Infrastructure
>
> Green infrastructure is an approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical, and enhances community safety and quality of life. It means planting trees and restoring wetlands, rather than building a costly new water treatment plant.

infiltration and/or separating stormwater systems from sewer systems. Green Infrastructure practices include rain gardens, vegetated swales, green roofs and porous pavements. It also includes preserving or restoring natural areas, such as forests, stream buffers and wetlands, and reducing the size of paved surfaces.

While the Federal Emergency Management Agency (FEMA) can cover a portion (generally 75%) of eligible expenses under a federally declared disaster, communities are responsible for the remainder (25%). Given the cost of rebuilding infrastructure, even one quarter of the total cost can be significant. Vermont created the Emergency Relief and Assistance Fund (ERAF) to help defray the cost to communities, contributing a minimum of 7.5% to their share. In return for taking additional flood mitigation measures, the State will contribute a higher percentage to cover municipal recovery costs. Mitigation measures include:

1. Participation in the National Flood Insurance Program;
2. Adoption of Town Road and Bridge Standards;
3. Annual adoption of a Local Emergency Operations Plan;
4. Adoption of a FEMA approved Local Hazard Mitigation Plan;
5. Adoption of River Corridor Protections.

Communities that take steps 1-4 will receive a 12.5% contribution from the state for their 25% share of the costs. Those communities who add the adoption of River Corridor protections to their mitigation efforts will receive a total contribution of 17.5% from the state. As indicated in the example in Table 10, the increased state contribution can defray a significant portion of the cost of a reconstruction project to communities.

	Example ERAF Percentage		
	7.5%	**12.5%**	**17.5%**
Total Disaster Cost	$1,000,000	$1,000,000	$1,000,000
Federal Share	$750,000	$750,000	$750,000
State Share	$75,000	$125,000	$175,000
Municipal Share	$175,000	$125,000	$75,000

Table 9: Total municipal portion of a $1,000,000 FEMA recovery project based on ERAF percentage.

In 2017, the Legislature passed Act 64, an act relating to improving the quality of State Waters. Act 64 establishes a number of water quality related regulations. In particular, municipalities are required to implement a customized, multi-year plan to stabilize their road drainage systems. These systems must be brought up to basic maintenance standards and corrective measures must be implemented to reduce erosion as is required to meet a Total Maximum Daily Load (TMDL) or water quality restoration effort. The Municipal Roads General Permit (MRGP) includes (but is not limited to) the following:

- A valid road inventory of roads that are hydrologically-connected to surface waters through ditches, culverts or other drainage structures.
- The development of an Implementation Plan that prioritizes road segment remediation to bring non-complying road segments up to MRGP standards.
- New projects must be designed to Vermont Stormwater Manual standards if over the permit threshold of 1-acre of impervious surface, or greater than 5,000 square feet.

Goal

- *To develop a transportation system that is safe, efficient and protected from damage during a severe weather event.*

Policies

- *Encourage the moving or abandonment of roads that often experience serious flood damage. Design culverts and bridges to provide the best possible mitigation of potential flood damage, which at a minimum should meet VTrans Hydraulics Manual and ANR Stream Alteration Standards.*

Resiliency to Natural Hazards - Recommended Actions:		
General	Assist ACRPC municipalities with efforts to conform to MRGP requirements.	
	Responsible: ACRPC, VTrans	*Timeframe:* ongoing
General	Continue to support LEPC #8 and encourage all communities to adopt Local Hazard Mitigation Plans and Local Emergency Operations Plans.	
	Responsible: ACRPC	*Timeframe:* short-term
General	Assist communities with the adoption of flood mitigation measures which increase the percentage of ERAF funding offered by the state in the event of a Federally Declared Disaster.	
	Responsible: ACRPC, VTRANS, ANR/DEC	*Timeframe:* short-term

F. Receives Sufficient Funding

Funding of maintenance and repair of roads remains the most tangible and immediate challenge for our communities. Town highway expenses are typically the second largest local expenditure after school budgets, often averaging several thousand dollars per mile to maintain. The State of Vermont provides an annual appropriation to towns for highway maintenance, but that amount generally falls short of the total cost to the community. Municipalities, with assistance from ACRPC, need to maximize potential alternative funding streams to offset maintenance costs. For example, the Better Roads program provides funds for planning and erosion control projects that protect water quality and reduce maintenance costs. Additionally, communities that implement a well-designed Capital Budget and Program for their road work are better able to predict and stabilize costs over the long term.

By supporting State, Regional and local transportation policy and action that strives to reduce SOV trips and VMT, increases ridership and access to public transit, and encourages biking and walking, ACRPC helps to create a more comprehensive, sustainable transportation system. In addition, assisting communities with applying for other funding sources to offset road management expenses and developing strong capital budgeting for transportation improvements and maintenance will be needed.

Sufficient Funding - Recommended Actions:		
General	Diversify transportation funding and policies to address rising maintenance costs	
	Responsible: ACRPC, VTrans, towns, ACTR	*Timeframe:* mid-term
General	Address limited availability of infrastructure and road maintenance materials	
	Responsible: ACRPC, VTrans, U.S. DOT	*Timeframe:* short-term
General	Help municipalities to plan for and implement capital budgeting for transportation infrastructure	
	Responsible: municipalities, ACRPC, VTrans	*Timeframe:* sort-term
General	Help municipalities access additional funding to improve water quality and reduce long term maintenance expenses	
	Responsible: VTrans, ANR, ACRPC	*Timeframe:* short-term
General	Evaluate amending classifications on arterial roads to access additional state support. (See Functional Classifications pg. 6-11)	
	Responsible: ACRPC, VTrans, Towns	*Timeframe:* short-term