Southern Windsor County Regional Planning Commission

2009 REGIONAL TRANSPORTATION PLAN

Volume 2 of 2

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Table of Contents

I. INTRODUCTION 1
A. Southern Windsor County Transportation Advisory Committee 2
B. Public Participation and Plan Adoption Process 2
C. Regional Transportation Issues 3
1. Transportation Funding 3
2. Aging Highway Infrastructure 3
3. Rural/Community Character 3
4. Demographic Shifts 3
5. Land Use Development Patterns 3
6. Access to Jobs / Commuting Options 4
7. Alternative Modes of Transportation 4
8. Tourism 4
D. Vision for the Region's Transportation System 4
II. Regional Trends 6
A. Vermont Transportation Characteristics 6
1. Transportation Implications 6
B. Population Characteristics 7
1. Population Growth 7
2. Age Characteristics 7
3. Transportation Implications 7
C. Housing Characteristics 8
1. Seasonal/Second Home Population 8
2. Transportation Implications 8
D. Characteristics of the Region's Economy 9
1. Status of the Regional Economy 9
2. Employment Characteristics 10
3. Transportation Implications 10
E. Commuting Patterns 10
1. Comparison of State, County and Regional Commuter Patterns 11
2. Regional Commuting Patterns 11
3. Modes of Transportation 15
4. Travel Time to Work 16
5. Vehicles per Household 17
6. Transportation Implications 17
F. Mobility Status 18
1. Density of Transit Dependent Populations 18
2. Percentage Ranking of Transit Dependent Populations 18
3. Transportation Implications 20
III. Land Use and Transportation 21
A. Historic Overview 21
B. Early Settlement Patterns and Historical Trends 22
C. Current Land Use and Transportation 23

D. Future Land Use and Transportation 24
1. Regional Centers 25
2. Town Centers 26
3. Village Centers and Hamlets 27
4. Medium-Density Neighborhoods 28
5. Resort and Recreation Area 29
6. Industrial Sites 30
7. Rural Areas 30
8. Resource Areas 31

E. Special Considerations for Land Use and Transportation 31
1. Smart Growth 31
2. Ski Corridor Traffic 31
3. Maintain Rights-of-Way for Future Needs 32
4. Traffic Calming 32
5. Access Management 33
6. Transportation Interchanges 34
7. Corridor Preservation 35
8. Community Design 36

IV. Regional Road Network 38

A. Roads and Highways 38
1. Functional Classification 38
2. Town Highway Classification 39
3. National Highway System 41
4. Scenic Roads and Byways 41

B. Goods Movement 42
1. Goods Flow through the Region 42
2. Truck Traffic 43
3. Transportation Implications 43

C. Traffic 44
1. National and State Trends in Traffic Volume 44
2. Regional Trends in Traffic Volume 45
3. Future Traffic Volume Trends 47

D. Traffic Congestion: Level of Service 48
1. Congestion in Southern Windsor County 49

E. Road Sufficiency: Structure, Service, Safety 49
1. Sufficiency Ratings 49
2. Highway Sufficiency in Southern Windsor County 50

F. High Crash Locations 50

G. Bridges 51
1. Bridge Sufficiency Ratings 51

H. Parking Facilities 52

I. Environmental Issues 53
1. Air Quality 53
2. Stormwater Issues 53
3. Other Environmental Issues 54

J. Transportation Implications 54
V. Alternative Modes of Transportation 57
A. Rail Service 57
1. Passenger Rail Service 57
2. Freight Rail Service 58
3. Transportation Implications 59
B. Air Service 60
1. Hartness State Airport 60
2. Transportation Implications 61
C. Public Transportation 61
1. State Transit Planning 62
2. Regional Transit Planning 62
3. Existing Transit Services 63
D. Bicycle and Pedestrian Facilities 66
1. Regional Bicycling and Walking Plan 66
2. Bicycling 67
3. Pedestrian Facilities 68
4. Safe Routes to School 70
5. Trails 71
E. Regional Issues 71
1. Intermodal Connections 71
2. Tourism Travel Choices 71
3. Park-and-Ride Facilities 72
4. Ridesharing and Carpooling 73
5. Transportation Demand Management 74
APPENDIX A: MAPS 77
1. Regional Transportation Network 78
2. Functional Road Classification 79
3. Scenic Byways & Highways 80
4. Vermont State Truck Network 81
5. Average Annual Daily Traffic 82
6. High Crash Locations 83
APPENDIX B: GLOSSARY 84
APPENDIX C: Funding Sources 87
APPENDIX D: Highway Sufficiency Ratings (State Highways) 98
APPENDIX E: Highway Sufficiency Ratings (Major Collector Town Hwys) 99
APPENDIX F: Bridge Sufficiency Ratings 100
APPENDIX G: 2008 Regional Transportation Survey Results 101

I. INTRODUCTION

The Southern Windsor County Regional Transportation Plan (RTP) represents Volume 2 of the 2009 Regional Plan, and serves as the transportation element pursuant to 24 V.S.A., Chapter 117 §4348(a)(4). It also represents a long-range transportation plan to guide transportation decision-making in support of the Region's Transportation Planning Initiative pursuant to 19 V.S.A., Chapter 1 §10l. It documents a vision for transportation and serves as the basis for determining future transportation investments. The Plan outlines specific steps that can be taken to improve the regional transportation network (see Regional Transportation Network map – **Appendix A, Map 1**) and provide for future transportation needs. Aside from the traditional vehicular modes of transportation, the Plan addresses other modes such as railroads, airports, public transportation, and bicycle and pedestrian travel.

The RTP is intended to be used for the following purposes:

- To serve as the transportation element of the Regional Plan;
- To provide a wealth of information regarding the condition of the existing transportation system in the Region;
- To provide a means to express the Region's transportation planning concerns and priorities at the State and local levels;
- To guide public investment in transportation infrastructure;
- 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); and,
- To serve as a basis for evaluating transportation programs and projects that impact the Region, including the regional Transportation Improvement Plan (TIP).

This document is intended to guide the Southern Windsor County Regional Planning Commission (RPC) in evaluating public and private actions affecting the Region's transportation system and is the foundation for the RPC's annual transportation work program.

In 1992, the RPC entered into a partnership with the Vermont Agency of Transportation (VTrans), entitled the Transportation Planning Initiative (TPI). The TPI seeks to decentralize transportation planning and encourage participation at the local level in setting transportation investment priorities. This Plan was developed based on the TPI process, and to conform to the general intent of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and subsequent reauthorizations, including the Transportation Equity Act of the 21st Century (TEA-21), Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and its forthcoming reauthorization.

The RTP is updated every five years or sooner in order to reflect the changing conditions of the transportation system and the changing demands of the Region.

A. Southern Windsor County Transportation Advisory Committee

The RPC established the Southern Windsor County Transportation Advisory Committee (TAC) to advise the RPC on regional transportation issues. Representation on the TAC consists of one representative from each community, an ex-officio representative of the Agency of Transportation and provision for two "at-large" members. The primary mission of the TAC is to develop and update the RTP and the TIP, as approved by the RPC.

B. Public Participation and Plan Adoption Process

The RTP was first developed and adopted by the RPC in 1995 and updated previously in 2005. It was updated again and adopted by a vote of the RPC on Month Day, Year following public hearings and a formal recommendation by the TAC. This Plan was adopted as the transportation element of the Southern Windsor County Regional Plan pursuant to 24 V.S.A. §§4348 and 4348(a).

The RPC sought public participation in the 2009 update of the Regional Plan. In updating the RTP (Volume 2 of 2), the RPC developed and conducted a regional transportation survey (Survey) and various outreach efforts in order to consult with local and state officials, local businesses and the general public. The Survey was conducted in March 2008 in order to get input into the transportation planning process, inform the RPC's transportation project prioritization process, and evaluate regional attitudes on current transportation issues and priorities. Outreach included focus group meetings, public information meetings on key topics (i.e. freight), and consulting with town officials, businesses, and regional and state agencies. Key findings included:

- Safety of the transportation system is a primary concern;
- The RPC should prioritize system preservation over building new capacity;
- The top three challenges for the Region's transportation system, listed in priority order, are:

    1. A lack of funding;
    2. Project cost increases;
    3. Deferred maintenance;

- Eighty-five percent responded to the survey indicating that current funding levels are not sufficient. The top four funding options were identified as the best course of action to increase revenues:

    1. Developer cost sharing (Capital budget, impact fees);

2. Additional federal or state gas tax;
3. Additional state vehicle registration fees;
4. Enable alternatives to the gas tax, such as road user fees.

C. Regional Transportation Issues

The regional transportation system needs to be dynamic as the population, economy, land use patterns and traffic demands continue to change over time. This section highlights the key transportation issues in the Region at this time.

1. Transportation Funding

State and Federal Transportation Funds, which are the primary revenue sources for transportation projects, are not keeping pace with inflation and are, therefore, loosing purchasing power. Neither the Federal nor State gas tax has been increased for many years. The recent high cost of fuels and the resulting shift to more fuel efficient vehicles and/or driving less, further reduces these revenue sources. This lack of adequate funding poses significant budgetary challenges for Federal, State and local decision makers. When combined with the needs to address the aging infrastructure, this situation is very serious at this time.

2. Aging Highway Infrastructure

The state highway infrastructure in the Region has not changed appreciably since 1970. Funding levels have not allowed the State or towns to keep up with routine preventative maintenance. Currently, many of the roads and bridges are aging and require investment, while traffic volumes and vehicle miles traveled continue to increase. Maintaining the roads and bridges in safe and passable condition is essential for the safety of residents and health of the economy of the Region. Maintenance of the existing highway infrastructure is prioritized over the construction of new roads.

3. Rural/Community Character

The unique Vermont character of the landscape and existing scenic qualities of the roads should be protected. Roads and bridges should be reconstructed as safety and deteriorating conditions require, but the Region's natural, cultural and community features should not be adversely impacted.

4. Demographic Shifts

The population in the Region is getting older which is subsequently changing the demands of the transportation system. As the Region's population over 65 years of age continues to increase as "baby boomers" reach retirement age, personal mobility will likely decline without access to quality public transportation services. Aging drivers will also require other special considerations including more visible signs and road markings, and may demand other facilities including improved sidewalks and more recreational facilities.

5. Land Use Development Patterns

A significant amount of the Region's recent development has been occurring in rural areas with limited transportation options, and has not been well coordinated with the goal of

improving the functionality of the regional transportation system. More emphasis on better coordination between land use development and transportation investments is needed. To do that, the RPC is exploring ways to encourage highway corridor management efforts, access management, traffic calming, and provide model local land use regulations.

6. Access to Jobs / Commuting Options

As the Region's economy has changed in recent years, residents' access to jobs has changed dramatically, now requiring longer commutes and reliable transportation. In order to provide access to those jobs and offer commuter options, efforts should be made to expand and diversify the economy in regional growth centers, and to provide public transit and carpooling access to job centers, including Ludlow, Brattleboro and the Upper Valley. Creating and maintaining the appropriate multi-modal infrastructure to support local businesses is also a primary consideration in this Region.

7. Alternative Modes of Transportation

As the demands on our roads and bridges continues to increase, investments in alternative modes and transportation demand management efforts can encourage a more efficient transportation system, and can help to reduce those demands on highways. Railroads are currently underutilized for freight and passenger services, and require investment to encourage more use. Public transportation is an essential link to services for segments of the population, and provides important choices for commuters. Park-and-ride lots serve the public transportation systems and encourage ridesharing, but improvements are needed to address capacity problems. Bicycle and pedestrian facilities are important within villages and downtowns, and as connections between residential areas and local destinations, including schools and recreation areas. Larger towns have difficulty maintaining their pedestrian facilities, and there are limited funding sources for sidewalk maintenance needs. Investments in alternative modes of travel can increase the life of our highway infrastructure and improve quality of life for residents.

8. Tourism

Tourism is an important sector of the Region's economy, and should be enhanced through transportation efforts including effective highway corridor management, intelligent information systems and other traveler information, increased travel choices and intermodal connections.

D. Vision for the Region's Transportation System

This section describes the vision that should guide future development and transportation investments in the Region. It is the vision that the southern Windsor County regional transportation system will:

1. Support a diverse economy and high quality of life for all residents.

2. Provide for the safe, efficient and cost-effective movement of people, goods and services.

3. Address the mobility needs of all residents.

4. Offer diverse travel choices throughout the Region with an integrated and seamless multi-modal transportation system.

5. Strive to provide transportation infrastructures that efficiently and safely handle traffic during natural hazard events and other emergency situations.

6. Preserve environmental, historic, scenic and cultural resources.

7. Integrate land use and transportation in a comprehensive and cooperative decision-making process.

8. Implement a transportation planning process that is responsive to local, regional and state needs, and seeks to engage the public in the decision making process.

9. Promote a funding strategy that realizes the maximum use of all available resources to ensure adequate funding to address the Region's and towns' priority needs of the existing transportation system.

II. Regional Trends

The basic function of transportation is to move people and goods. This Plan seeks to serve that function in the safest and most efficient manner possible. All facets of transportation analysis for any given area must be done with a thorough understanding of the people and goods being moved. This chapter examines relevant data to better understand the transportation situation in this Region.

A. Vermont Transportation Characteristics

Table 2.6 in Chapter 2 of the Regional Plan (Volume 1 of 2) shows select transportation-related characteristics for the State of Vermont. Vermont is a rural state, and is heavily dependent upon the automobile to meet the transportation needs of the state. In summary of the discussion in Volume 1, recent statewide transportation trends between 1980 and 2000 are as follows:

- Motor vehicle use (vehicle miles traveled or "VMT") increased 76%;
- Population grew 19%;
- Total road miles increased 1.5%;
- Automobile registrations increased 63%; and
- Truck registrations increased 101%.

These trends indicate that roads are experiencing much more use. The resulting wear and tear from this increased roadway traffic will be expensive to address. For the first time in decades, VMT decreased by 3.3% in the U.S. from 2007 to 2008 (through August), according to Federal Highway Administration, U.S. Department of Transportation. In addition, VMT in Vermont decreased 4.5% from 2007 to 2008 in the month of August. These decreases are probably largely attributable to the recent increases in fuel costs. Despite this recent decrease in driving, the overall long-term trend shows a significant increase in VMT.

1. Transportation Implications

Given this sharp long-term increase in motor vehicle use and the fact that the current state highway infrastructure is aging, difficult decisions will need to be made in the future. Significant increases in funding will be needed to maintain this infrastructure in safe condition under these conditions. The increasing pressure on state highways will lead to increased wear and tear on roads and bridges, congestion, potential expansions of the road network and/or seeking to maximize other, more efficient modes of travel. The potential expansion of highway capacity and increased motor vehicle travel will have a drastic affect upon the social and environmental fabric of Vermont.

Chapter 2 of the Regional Plan (Volume 1 of 2) contains a regional profile. The following sections summarize demographic trends in the Region and examine the related transportation implications.

B. Population Characteristics

The following summary highlights key trends and examines the transportation implications of the changing population characteristics.

1. Population Growth

According to U.S. Census figures, the population in southern Windsor County was 25,105 in 2000, and was estimated to be 24,836 in 2007. The population is decreasing in both Springfield and Windsor. Factors contributing to such decreases included the loss of major employers (especially those in the machine tool industry), reduction in average household size, and rising costs of living.

Ludlow has experienced recent population gains, following losses in the previous decades, primarily attributable to growth at Okemo Mountain Resort in Ludlow. The remaining towns in the Region are generally increasing in population. In recent years, the most rapid growth has been in the most rural towns.

2. Age Characteristics

According to the U.S. Census, the Region experienced a decline in the school aged and younger cohort group (less than 18 years in 1970-1990, under 20 years in 2000).

The 18-64 age group (U.S. Census changed this to 20-64 in 2000), which represents the labor force, has remained relatively stable since 1980.

The 65 and older age group, representing the retired and elderly, continued to increase from 1990 to 2000, but at a slower rate than the previous two decades. According to a study conducted by the Vermont Department of Aging and Independent Living, this population group is projected to continue increasing in Vermont (Massachusetts Institute for Social and Economic Research, UMass, August 2003). Increases in this age group pose significant challenges to the transportation system as discussed later in this chapter.

3. Transportation Implications

The transportation system will need to accommodate the changing demands based on population growth. Growth in this Region has largely been taking place in the more rural areas, rather than within the regional centers. This dispersed settlement pattern can have a dramatic effect upon communities and the regional transportation system. While the regional centers have the infrastructure for more intensive land uses, the rural areas generally do not. Residents of rural areas who do not drive can have a significantly difficult time accessing jobs and essential services. In the future, these rural areas will need to address the resulting infrastructure upgrades needed to support the growing population. Those upgrades may include, but are not limited to, paving dirt roads, signalizing intersections and increased police services.

Encouraging greater population densities and land use diversity near community centers would enable more residents to choose transportation alternatives such as walking, bicycling, and public transit. This would effectively cut transportation expansion costs by eliminating the need for expensive infrastructure improvements. Increased levels of general public volunteer transportation services will be needed to serve the populations of rural areas.

Growth in the retired and elderly share of the population is expected to continue as "Baby Boomers" age and life expectancy remains high or increases. Resort and retirement related development and increased services for the elderly are expected to reinforce this trend in the Region. Travel needs for this segment of the population has its own unique characteristics. General driver safety may require more visible road markings and signs suitable to this age group. The freedom from work schedules and parenting responsibilities frees up time for longer and more frequent leisure trips. However, a large proportion of the population – including the elderly and children – is unable to drive or has no vehicle. In instances where family and friends do not provide transportation, these individuals must rely on public transportation. The provision of adequate transportation services to meet at least the basic mobility needs among these groups is a matter that must be addressed. For further discussion of these issues refer to the Mobility Status section in this chapter and to Chapter 5, Alternative Modes of Transportation.

The feasibility and applicability of public transit is especially affected by population density characteristics. The towns of Chester, Ludlow, Springfield, Weathersfield, and Windsor have the greatest populations and population densities in the Region. All have total populations exceeding 2,000 residents and population densities at or above 50 persons per square mile. These characteristics, along with other relevant factors, suggest that these towns could be considered for transit potential. However, based on population trends, of these five, the two most densely populated - Springfield and Windsor - can expect the least growth. Transit potential can only be enhanced if growth is concentrated in core areas that lend themselves to transit service.

C. Housing Characteristics

The following summary is focused on the occupancy status of housing in the Region and how it relates to transportation.

1. Seasonal/Second Home Population

Seasonal housing units are a significant portion of the Region's housing stock at 21% of all housing units (2000 U.S. Census). Increased emphasis on tourism and recreation, combined with the growth in the second home market, resulted in significant fluctuations in the seasonal population between 1980 and 1990. Total seasonal units decreased from 3,096 in 1990 to 3,003 in 2000. Springfield added six units and Ludlow increased by 226 (13.7%). All other towns decreased their numbers of seasonal units, possibly indicating these were converted to year-round residences. (See Regional Plan Housing Chapter for further discussion.)

2. Transportation Implications

Seasonal housing units increase demand on the transportation system on weekends and during peak recreational seasons. Year round units tend to increase system demand during peak commuting hours (Monday-Friday, 6:30-8:30 A.M. and 3:30-5:30 P.M.). The net effect is that towns with high numbers of seasonal housing units experience peak demands different from job and population centers. Major highways in the Region, such as Routes

103 and 131, provide transportation access for both seasonal visitors and resident commuters and thus bear the greatest burden of traffic volume.

Seasonal influxes in population are especially problematic for towns such as Ludlow and Chester which have seasonal traffic congestion problems. Efforts to provide shuttle service for major tourist related activities, temporary or permanent satellite parking sites away from congested areas, specialized transit service, and other traffic mitigation efforts could help alleviate traffic problems related to seasonal activities.

D. Characteristics of the Region's Economy

A summary of the regional economy is highlighted below and expanded upon to discuss the transportation implications of each relevant facet.

1. Status of the Regional Economy

The regional economy (1.05%) has not kept pace with either statewide (2.13%) or national average job growth between 1980 and 2000. Likewise, overall growth in personal incomes in this Region (6.6% per year) is less than the growth rate for both Vermont (7.0%) and nationwide (6.8%) in the same time period. In that same 20-year period, average annual wage rates in the Region (4.25%) also lagged behind statewide (4.76%) and national rates.

The Region's manufacturing sector – mostly traditional machine tools manufacturing – has experienced a dramatic 73% decline since the hey-days of the late 1970s through the early 1980s. However, recent job growth in the Region includes North Springfield Industrial Park and Seldon Technologies in Windsor. In addition, there is growth in the tourism sector, especially with Okemo Mountain Resort's recent expansions and related service industry in and around the Ludlow area.

The economy is more diversified now than it was in 1979, and is significantly less susceptible to the risks of just a few major sectors or employers. The Region is experiencing an increasing number of home businesses.

Residents also travel to surrounding towns for work – such as Claremont, Rockingham and Rutland – and the nearby employment center in the Upper Valley, including Lebanon and Hanover, NH.

The Region's key industries include:

- Specialty food products;
- Publishing;
- Natural resource based manufactured products, such as furniture, log homes and other wood products;
- Engineered products and design support, including fabricated specialty plastic and metal goods;
- Traditional machine tools;
- High value-added professional, scientific and technical services;
- Timber and mineral resources; and,
- Destination family resort and recreation.

2. Employment Characteristics

Wage growth in Windsor County has lagged behind growth in wages statewide. However, underemployment is rising in the Region. Wages in the State of Vermont have historically fallen, and continue to fall, far below the national average. According to the 1996 State Plan for Housing and Community Development Programs, Vermont's average wage fell by 1.5% from 1992-1993 due, in part, to the changing structure of the State's economy from manufacturing to service-related jobs and to the proportional increase in nondurable goods-related jobs within the manufacturing sector itself.

Median adjusted wages decreased by an average of 12.3% throughout the Region between 1990 and 2000. With a reduction in the average family median income, combined with the increasing health insurance and housing costs, a low- to moderate-income family will likely struggle to make ends meet. The second largest investment in many people's lives is buying and maintaining an automobile. This becomes more and more difficult to do given these economic realities. Unfortunately, in most communities, having access to a reliable car is the sole means of access to quality employment.

There has been a significant decrease in the number of persons (22%) and families (19%) living in the Region below the poverty level between 1989 and 1999, as reported by the US Census Bureau.

3. Transportation Implications

For the regional economy to remain strong and continue to grow, the transportation system must accommodate the mobility needs of commuters and businesses in a safe and efficient manner. This means maintaining good access to major market areas by keeping existing infrastructure in good working condition. Freight, commuter and tourist travel should be made more efficient through intermodal connections; for example, "ski train" connections between Amtrak and/or the Green Mountain Railroad with express bus services.

As the regional economy lags behind economic growth in Vermont and in the Upper Valley, increasing numbers of commuters will travel outside of the region for employment. As that trend increases, so too will single-occupant vehicle use increase unless other modes are incentivized. Other modes should be marketed and made available to employees by businesses. Infrastructure improvements, such as expanded or new park-and-ride lots and increased fixed-route transit service, would help provide commuters with cheaper and more efficient travel options.

E. Commuting Patterns

To determine the need for capacity improvements to existing road systems, it is helpful to analyze the number of trips commuters make to and from their places of employment. The volume of traffic between residential and business sites largely determines the necessary carrying capacity of any individual road at any given time. The following narrative provides an analysis of commuting patterns within the Region and the most common commuter modes of transportation. The data presented in this section was largely provided by the US

Census Bureau Decennial Census. Travel patterns of non-workers is also important but, due to a lack of data, is not analyzed in this section.

1. Comparison of State, County and Regional Commuter Patterns

Southern Windsor County was associated with a total of 15,743 commuting workers in April of 2000, according to the U.S. Census Bureau, a 19.8% increase since 1990. These workers represented about 5% of Vermont's total 310,176 commuters and 46.5% of Windsor County's (see **Table 2.1**).

Most of the 11,577 people who work in the Region commute from within the Region (8,089 workers in 2000 or about 70%). Twenty-six percent of commuters residing in this Region travel to jobs outside of the Region. At the State level, 7% of commuters traveled to or from work out of state, while at the County level, about 30% commuted out of the County. Windsor County and southern Windsor County draw a larger proportion of their inbound commuters from out of state, 20% and 22% respectively, compared to 5% statewide. This variance is natural given the different geographical sizes of the compared areas. However, it also demonstrates the strong bi-state economic connection in the Connecticut River Valley.

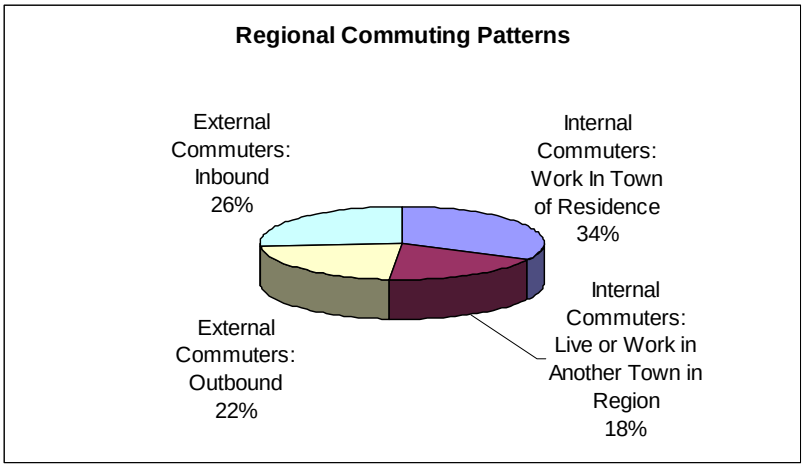
Table 2.1 - 2000 Commuter Pattern Comparison: Residents & Nonresidents who work in same geographic area

Commuters Age 16+		Area Residents				Non-Area Residents	
Area	Total	Work in Area	%	Work Out of Area	%	Work in Area	%
Vermont	310,176	272,842	88	21,346	7	15,988	5
Windsor County	33,848	17,063	50	10,068	30	6,717	20
Region	15,743	8,089	51	4,166	26	3,488	22

Source: U.S. Census Bureau, Census 2000; SWCRPC

2. Regional Commuting Patterns

According to the U.S. Census, there were 15,743 commuters in this region in 2000. This number includes residents who live and work in the Region, residents who live in the Region but commute to work outside the area, and non-regional residents who commute into the Region for employment. The traffic generated by these workers, particularly during peak hours, provides insight into the Region's commuter traffic patterns. The distribution of workers is shown in **Figures 2.1** - **2.8**.

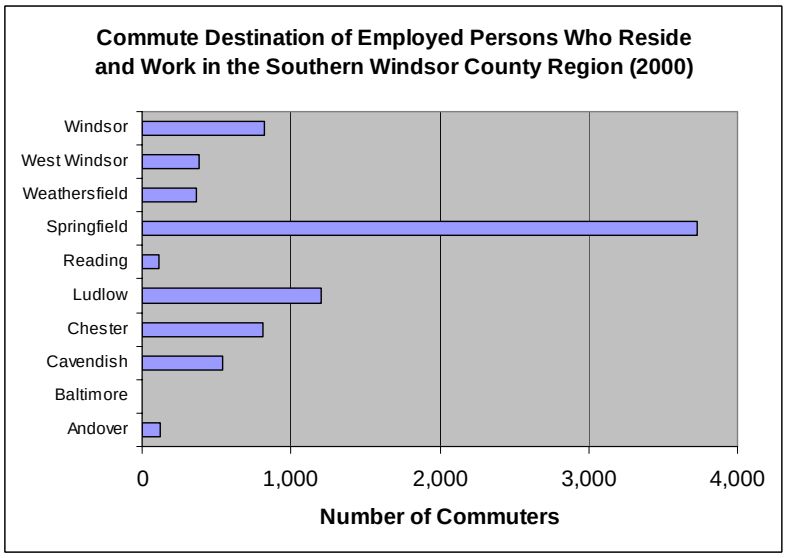


Source: U.S. Census Bureau, Decennial Census

Figure 2.1 – Regional Commuting Patterns (2000)

a. Internal Commuting

Internal commuting refers to commuters who live and work in the ten towns of southern Windsor County. In April of 2000, there were nearly 8,100 workers in this category, or about 51% of all regional commuters. Commute destinations of internal commuters are listed by town of employment in **Figure 2.2**. The Town of Springfield had the largest share (about 46%) of the Region's internal commuters.



Source: U.S. Census Bureau, Decennial Census

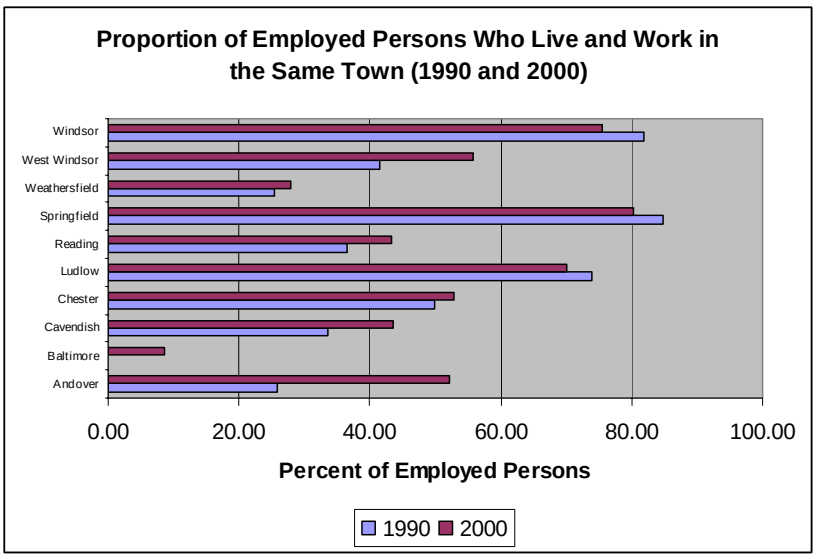
Figure 2.2 – Destination for Commuters Who Work in Town of Residence (2000)

i. Internal Commuters: Work in Town of Residence

Of all internal commuters, 64% or 5,181 worked in their hometown. Springfield had the highest share at 2,634. The Towns of Ludlow (637), Windsor (575), and Chester

(537) also had significant numbers of hometown workers, an increase since 1990 for both Ludlow and Chester, and decrease for Windsor.

The proportion of residents who work in the same town in which they live indicates a relatively shorter commuting trip. Those individuals who work and live in the same town have a greater potential opportunity to walk or bicycle to work than those who commute longer distances to another town. **Figure 2.3** shows the percentage of employed persons who live and work in the same town in 1990 and 2000. Most towns experienced an increase in the proportional number of residents who commute to another town. Only the regional centers – Springfield, Windsor and Ludlow – experienced a decrease between 1990 and 2000. It should be noted that such statistics are dynamic and can change drastically with the opening or closing of a single employer, as may have been the case in Springfield and Windsor.

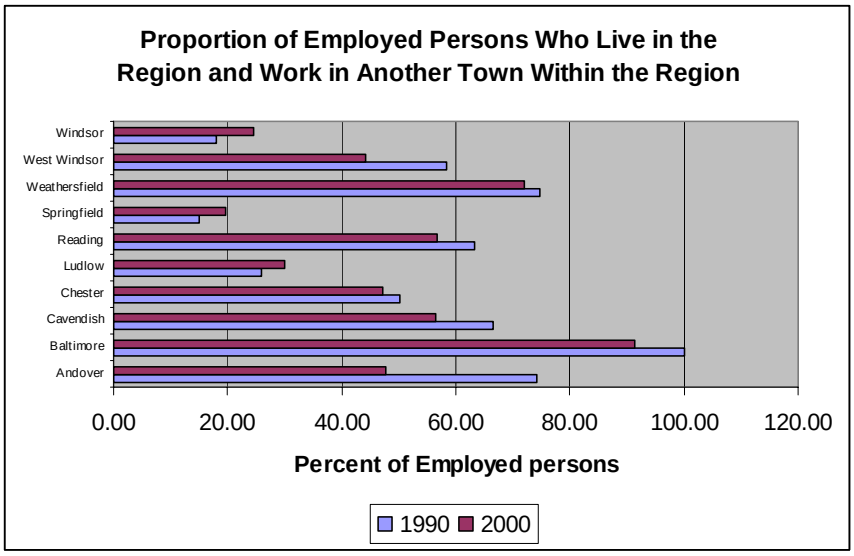


Source: U.S. Census Bureau, Decennial Census

Figure 2.3 – Hometown Commuter Comparisons (1990-2000)

ii. Internal Commuters: Live or Work in another Town in the Region

About 18.5% of regional commuting is done by workers who travel from one regional town to another regional town (See **Figure 2.4**). The vast majority of Baltimore's resident commuters worked out of Town in 2000, down slightly from 100% in 1990. As would be expected, the regional centers exhibit fewer residents who commute outside of the town where they live. The rural towns have fewer job opportunities, thus, proportionally more residents work outside of town. However, proportionally few of those who travel outside of their home town, work within southern Windsor County.



Source: U.S. Census Bureau, Decennial Census

Figure 2.4 – Commuter Comparisons (1990-2000)

b. External Commuting

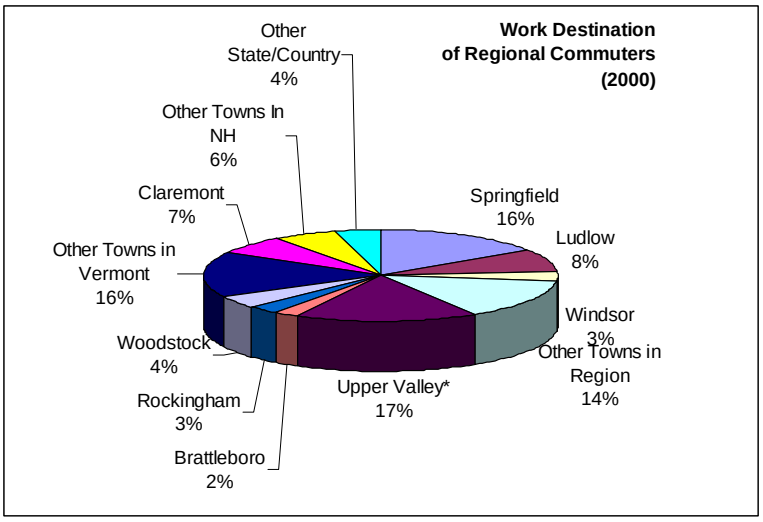
External commuting refers to regional residents who travel to work outside the Region, or to residents from outside of the Region who commute into southern Windsor County.

i. External Commuters: Outbound

Close to 27% of employed persons living in the Region commute to jobs in locations outside of the Region. **Figure 2.5** provides a breakdown of work destinations for all regional commuters. The patterns observed in the 1995 and 2005 Regional Transportation Plans still hold true, Connecticut River communities' ties to NH, Hartford and Rockingham are strong, while Ludlow and Cavendish have stronger economic ties to other Vermont towns. However, 2000 U.S. Census data suggests that more commuters are traveling to the "Upper Valley," consisting of Hartford, VT and Lebanon and Hanover, NH. This is likely due to the Upper Valley's currently strong job growth, while jobs have been lost or are not growing as quickly in Springfield, Windsor and Claremont. The majority of external commuting trips are destined for NH communities along the Connecticut River Valley, as well as to Hartford, Rockingham and Woodstock. See **Figure 2.5** depicting work destinations of regional commuters in 2000.

ii. External Commuters: Inbound

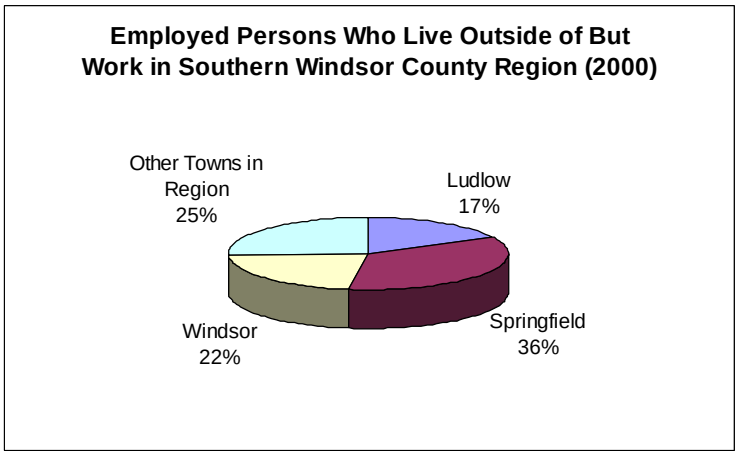
Commuters entering the Region are tabulated in **Figure 2.6**. Springfield, Ludlow and Windsor are employment centers; the greatest proportion of inbound commuters from outside the Region commute to these three towns. Commuters bound for Ludlow have increased significantly since 1990, from 12% of the external inbound commuters to 17%. This is likely due to the growth at Okemo Mountain Resort. Springfield and Windsor remain important job centers for the Region extending beyond southern Windsor County.



Source: U.S. Census Bureau, Decennial Census
* Note: "Upper Valley" includes Hartford, VT and Lebanon and Hanover, NH

Figure 2.5 – Work Destinations of Regional Commuters (2000)

The number of commuters that enter the Region for employment is distributed almost equally between residents of other Vermont towns and those who live out of state. Residents from non-regional Vermont towns represent about 2% more of these commuters than do residents from other states.



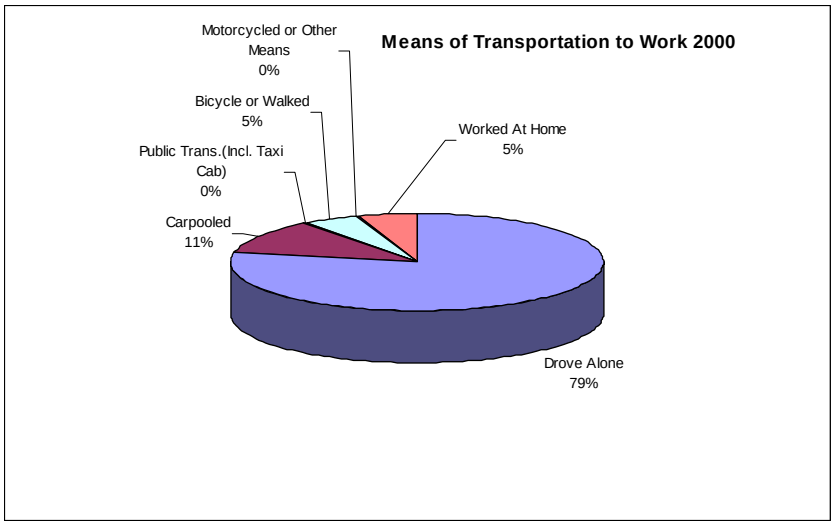
Source: U.S. Census Bureau, Decennial Census

Figure 2.6 – Work Destinations of Inbound Commuters (2000)

3. Modes of Transportation

As illustrated in **Figure 2.7**, the single-occupancy vehicle (SOV) was the most common mode of transportation used by commuters in southern Windsor County. About 79% of the Region's commuters drove alone. Little variation occurred in 2000 with a range of 72% to 82% of SOV use at the town level.

The next most popular mode of transportation was carpooling, with about 11% of commuters choosing this option. Approximately 5% commuted by bicycling or walking. Public transportation was not a significant factor in traveling to work, used by only 53 or 0.4% of workers. (Given that regularly scheduled public transit was initiated in Springfield in July of 1993 [Chapter 5, Alternative Modes of Transportation], these numbers may not be currently applicable).

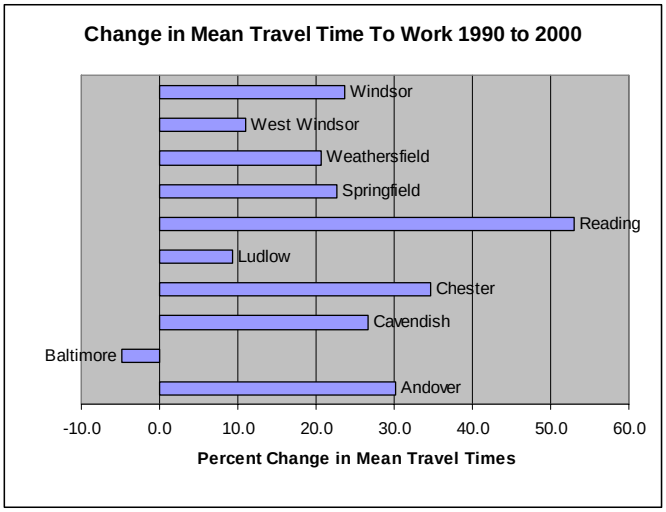


Source: U.S. Census Bureau, Decennial Census

Figure 2.7 – Means of Transportation to Work (2000)

4. Travel Time to Work

The distance traveled to work is indicated by the length of time it takes commuters to get to their place of employment. **Figure 2.8** illustrates the percent change between 1990 and 2000 in the average number of minutes required by commuters to travel to work.



Source: U.S. Census Bureau, Decennial Census

Figure 2.8 – Change in Mean Travel Time to Work (1990-2000)

According to available information, commuters from the all towns increased their travel time over the ten year period, with the exception of Baltimore. The more rural communities experienced the highest rate of increase. For instance, Reading commuters experienced a 53% increase in average travel time to work from 1990 to 2000.

Springfield and Windsor had increases of around 23% and 24% respectively. These figures support the likelihood that the loss of employment in these two towns resulted in increased commuting time for area residents.

Increased travel distance also increases the likelihood of commuters driving alone. More diffuse commuting patterns result in less commonality of origin and destination thus discouraging carpooling. This situation will persist unless other options are made available and more attractive.

5. Vehicles per Household

The number of vehicles available per household has significant implications for transit demand. Vehicle miles traveled are constrained when few households have access to two or more vehicles, particularly where average household size is above two. With no surplus vehicles, members of these households must either forego additional travel, or if possible, choose a different transportation mode.

The trend in vehicle availability has been upward. Between 1980, 1990 and 2000 the percentage of households in southern Windsor County with no automobile dropped from 10% to 8% to 7%; the percentage of households with only one vehicle fell from 40% to 36% to 35%. At the same time, average household size declined from 2.7 to 2.5 to 2.3.

6. Transportation Implications

Approximately 51% of the Region's commuters live and work within the ten member towns. Twenty-two percent live outside of but work in the Region. The remaining nearly 27% travel to work outside the Region. The proportion of regional commuters who work or live outside of the Region (49%) has grown since 1990 (40%). Their commuting patterns have implications relating to all aspects of transportation planning. Of particular concern are single-automobile use, traffic flow, peak hour traffic patterns, carpooling, parking, and the capacity and maintenance of the infrastructure.

The 49% of regional commuters who travel daily across the Region's border underline the importance of formulating strategies that address transportation needs without limiting their focus to geographic or political boundaries.

The size, density, and location of population and employment centers, both within and outside of the Region, combined with their proximity to transportation corridors are the principal determinants of commuter behavior. Transportation planning that considers these regional aspects of commuter patterns will be more likely to avoid the pitfalls associated with commuter travel.

As previously indicated, the factor with the greatest potential to impact transit demand is vehicle availability. The decline in the percentage of households not possessing multiple

automobiles, as well as decreases in household size, are correlated with more vehicles traveling more miles. The upward trend in vehicle availability also suggests a partial explanation for the slight declines in carpooling and other low impact commuting modes. More access to private vehicles equals less incentive to carpool, bicycle or walk to destinations.

The single-occupancy vehicle is currently the preferred mode of transportation in the Region. Among the possible modes, this one also has the greatest impact on the transportation system per commuter. A comparison of available 1980, 1990 and 2000 census data reveals that regionally, although the total number of commuters has increased by about 20%, modal choices have remained the same with few utilizing the lower impact forms. The reported means of transportation in 2000 did not change significantly from 1990. This over-reliance on SOVs, combined with the average increase in travel time to work, has resulted in greater stress on the road system, particularly during peak commuter hours. Should these trends and the trend toward an increased number of total commuters continue, the impacts to the road system will continue to grow.

As commuter travel from this Region, and areas south, to the Upper Valley grow, the need to expand park-and-ride lot capacity and public transit capacity increases. As more commuters travel to adjoining rural Vermont communities in diffuse patterns, few travel options are available. In those cases, infrastructure conditions and job access for low-income workers becomes paramount.

F. Mobility Status

A transit dependency analysis was conducted to identify the relative need of residents who's mobility needs are not currently being met.

1. Density of Transit Dependent Populations

As indicated in the following analysis, the "areas with the highest transit needs…are in the immediate areas of populated towns," and include downtown Springfield, North Springfield, downtown Windsor, the Village of Ludlow and Chester-Chester Depot. Areas of moderate transit needs include the remainder of the towns of Ludlow and Springfield, as well as Weathersfield. The remainder of the Region is identified as low relative need.

2. Percentage Ranking of Transit Dependent Populations

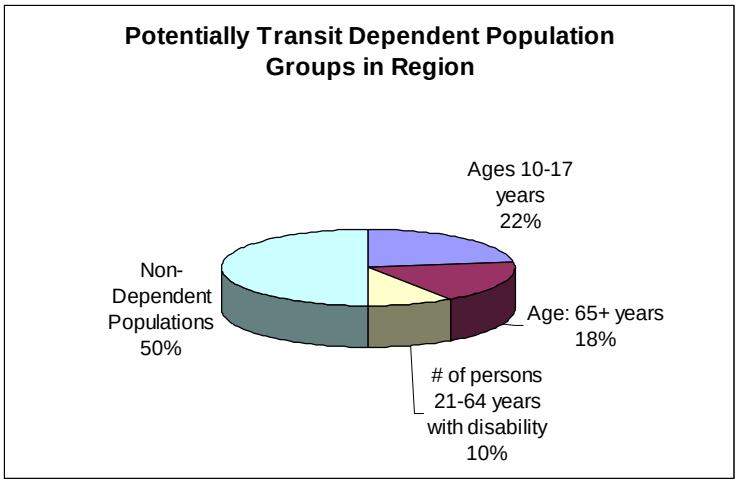
The percentage of potentially transit dependent persons' analysis includes five variables that generally indicate population groups that have a high likelihood of requiring assistance to meet their daily mobility needs:

- People generally below the legal driving age;
- People age 65 or older;
- People between the ages of 18 and 64 with a disability;
- People living below the federal poverty level;
- Autoless households.

These variables were ranked separately and then the five individual rankings were combined to indicate overall rankings. The results are shown below in **Figure 2.9** and **Table 2.2**, and

are very similar to the density analysis. The areas of highest relative transit need include Springfield, Windsor and Ludlow.

More than half of the regional population exhibits transit dependent traits.



Source: U.S. Census Bureau, Decennial Census, SWCRPC

Figure 2.9 – Population Groups in Region That May Exhibit Transit Dependent Traits (2000)

a. People generally below the legal driving age

Most children rely on walking, bicycling, school busses or rides from parents to meet their mobility needs. The ability to walk or bicycle to their destinations affords children independence and freedom. However, many parents do not allow their children to ride a bicycle along the state highways for safety and security reasons. The current lack of bicycle and pedestrian facilities in many communities and the growing traffic volumes on the roadways, contribute to worsening independent transportation for children. Children make up approximately 22% of the Region's population.

b. People Age 65 or Older

Many people age 65 or older are able to meet their own mobility needs by personal car. However, many due to health or financial reasons lose that ability to drive and become dependent upon others for their travel. As baby boomers begin to reach retirement age, this population group will become increasingly more important. Approximately 18% of the Region's population is 65 or over.

c. People between the Ages of 18 and 64 with a Disability

People with one or more disabilities often rely on public transportation or other services to meet their mobility needs. Ten percent (10%) of the Region's population (ages 18 to 64) was reported in the 2000 Census to have a disability.

d. People Living Below Federal Poverty Level

Buying and maintaining a reliable automobile is expensive. Those individuals living under the poverty level have a high likelihood of not owning a reliable car and, therefore, rely on public transportation or other means to meet their travel needs. Eight percent of the Region's population falls under this category.

e. Autoless Households

Residents of households without an automobile, as noted in a previous section, need to find alternative means of transportation, and are often reliant upon public transportation. This category accounts for about seven percent (7%) of the Region's households.

Table 2.2 – Relative Transit Dependency (2000)

Relative transit need	Name of Jurisdiction	Combined Score, independent of available transit services
	Springfield	17
High	**Windsor**	27
	Ludlow	37
	Chester	46
Moderate	**Weathersfield**	47
	Baltimore	54
	Cavendish	59
	Reading	66
Low	**West Windsor**	70
	Andover	77

Source: US Census Bureau, 2000; SWCRPC

3. Transportation Implications

While certain demographic trends - including fewer autoless households and increasing car ownership rates - indicate greater mobility in the Region, a significant portion of the population exhibits transit dependent traits. Approximately half of the Region's population may have some need for public transportation. As the Region's population continues to age – with baby boomers reaching retirement age – these needs can be expected to increase in the next 5 to 10 years.

Mobility limited individuals often need assistance in terms of transportation from home to a variety of daily trip needs. Elderly populations may need more assistance with transportation to medical facilities, shops, and senior and adult day centers. Children may require help getting to school, recreation facilities and friends houses. A large segment of the Region's population may need assistance getting to and from work and daycare facilities. An increasing elderly population suggests an increasing need for demand responsive public transit services to access essential services (i.e. to access flu shot clinics or other medical appointments). Decreasing median adjusted wages for families, suggests a need for additional public transportation services for commuters. The implications for the transportation system have to do with providing such assistance as specially equipped buses and vans to assure that this segment of the population has adequate access to public transportation.

III. Land Use and Transportation

Transportation and land use are inextricably linked, each effecting how the other functions. This chapter will focus on the interrelationships between land use and transportation, and the role transportation has played in facilitating and responding to land use changes in southern Windsor County.

Historic sites and structures, utilities and facilities, community services, commercial and residential development, employment, transportation, recreational opportunities, farms, and other features are all woven together with the natural environment to make up the unique fabric of the Region. The predominant pattern of village centers surrounded by rural working landscapes reflects the history of the Region, and contributes to the quality of life that residents cherish. The transportation system that has developed over time to serve these areas is an essential link to the quality of life of the Region. In general, the municipal plans in the Region seek to preserve these historic land use patterns and maintain the existing transportation network. However, much of the recent residential development has not been focused within historic village areas and, together with the changing commuting patterns, is changing the demands on the regional transportation system.

A. Historic Overview

The linkage of land use to transportation is related to early settlement patterns, to the continuous investment in roads and highways, and to state and federal policies. Past investment in roads and highways had a significant impact on land use by allowing the efficient movement of people, goods, and services. The construction of the interstate system in Vermont and across the U.S. had a profound effect on land use patterns particularly in areas previously not served by major roadways. This expanded highway system, while allowing for greater mobility, made people increasingly reliant on the automobile.

Historically, the towns and cities developed along rivers and lakes due to the ease of transporting raw products such as timber, grain, and other agricultural products by water in addition to using water as a source of power. During the nineteenth century, the railroad provided an alternative to water-related forms of transportation. The major advantage of the railroad was the ability to inexpensively ship bulky natural resources such as minerals, timber, and manufactured goods over great distances. As the railroads developed, depot towns flourished into centers where people lived, recreated, and worked.

During the twentieth century, federal and state policies focused transportation investment in roads and highways and encouraged home-ownership, which facilitated residential, commercial, and industrial development away from city and village centers nationally. Federal and state policies subsidized the highway system through taxation at the expense of railroads and other modes of transportation. The consequence of these policies enabled the development of suburban land use patterns and the inevitable decline of many cities and villages nationally.

B. Early Settlement Patterns and Historical Trends

Towns in southern Windsor County were first established in the mid 1700s. Settlers came primarily from southern New England attracted by the availability of land and an abundance of natural resources. The earliest forms of transportation included footpaths, horse and carriage trails, the Connecticut River, and railroads in the mid to late 1800s. The steep slopes and extensive water courses in the area required the early settlers to address transportation issues immediately. Acceptances of surveyed roads and the height of the Mill Brook Bridge were issues at a meeting in Windsor in 1770. In 1796 the first bridge across the Connecticut River linked Windsor, VT and Cornish, NH.

The beginning of Routes 5, 103, and 131 can be traced back to early Indian trails and military routes. The Crown Point Military Road, which ran northwest from Charlestown, NH to Crown Point, NY, was constructed in the 1760s and played a significant role in the early settlement of Cavendish, Ludlow, and Springfield. For many years it was the only road across the Green Mountains.

As the history of the Region progressed, transportation continued to play a significant role in both determining and responding to development patterns. Early transportation routes were improved to accommodate the movement of people and goods into and out of the Region. The seeds of economic development including agriculture, forestry, and tourism took root and began to flourish. The increased need to transport goods required roads to be of sufficient size and quality to allow large wagons access to and from the Region. In the early 1800s, canals were built along the southern Connecticut River allowing large flatboats access to southern New England markets.

Some of the first products from the Region were provided through agricultural activities. By the mid 1800s, Windsor County was one of five Vermont counties with the highest density of sheep in the State. As a result, factories and mills were spawned along the Black River between Springfield and Ludlow to process the wool of the prevalent Merino sheep. In the late 1800s, dairy farming and the production of milk, cheese, and butter surpassed sheep farming. Events and economic forces outside the Region, including major wars and the growing demand for industrial goods to accommodate national needs, stimulated additional manufacturing activities in Ludlow, Springfield, and Windsor. Notably, the Towns of Springfield and Windsor became nationally recognized for the production of machine tools.

As early access routes into the Region improved, and as additional routes were established to reach local economic resources, a transportation network began to form. Local roads were constructed or upgraded to improve accessibility. These improvements made it easier for residents living outside the concentrated village areas to travel for commerce and employment. Better roads also led to dispersed development along these routes.

Rail service, established by 1869, increased the shipment of goods to distant markets and boosted the tourism industry. Early Vermont tourist attractions of the 1800s included mountain tops, mineral springs, and spas which became the trendy vacation retreats from hot summer weather. These attractions were forerunners of the resorts, bed-and-breakfast hotels, and other vacation and recreation activities available today. Additional growth was

stimulated as major state highways were paved to accommodate traffic flowing through the Region.

The construction of Interstate highways 91 and 89 in the late 1950s and early 1960s had an enormous impact on land use patterns. The relationship between construction of the two Interstate highways and the placement of the access ramps had a particularly profound effect on development in the Upper Valley area. The development pattern near this hub provides tangible evidence of the effect of high speed, limited access transportation routes.

Southern Windsor County has direct access to I-91 at three points: Hartland/Windsor, Weathersfield, and Springfield. The proximity of the I-91 and I-89 interchanges also affected the Region by providing rapid access to distant markets along the Interstate system. Not only were the Region's abundant tourism and recreational resources made readily available to visitors, but residents were provided easy and timely access to the larger shopping and employment centers in the Brattleboro, VT/Keene, NH area and the Upper Valley area (White River Jct. and Hanover/Lebanon, NH.).

Growth in the Region was expansive during the 1960s and early 1970s, primarily resulting from the effects of Interstate access. However, the decline in the Region's economic base and in its population during the 1980's provides evidence that improving access to outside markets does not necessarily guarantee stability or sustained growth. Maintaining sustainable growth relies upon achieving a balance between the provision of infrastructure including transportation, the economic and social conditions, and the natural resources that exist within the Region. It is necessary to understand the interconnection of these different systems, their influence, and their limitations to achieve sustainable communities.

C. Current Land Use and Transportation

The historic settlement pattern of traditional village centers surrounded by working rural landscapes predominates today's landscape. Village centers generally consist of relatively dense development and a mix of uses that form the backbone of each community. The mixed uses in most villages, including civic buildings, stores, restaurants and other commercial establishments, provide some of the daily needs of residents within walking distance of homes, but many residents rely on roads to access jobs and more specialized or diverse services in other parts of the Region or beyond.

Access to metropolitan areas, recreational opportunities, water, good soils, and other social and environmental factors continue to determine where growth is likely to occur. More recently, the growth in the popularity of the Region for skiing and tourism has increased development in the Towns of Andover, Chester, Ludlow, Reading, and West Windsor. The influence of tourism is now felt throughout the Region. Most of the commercial and industrial development has occurred along the major highways interconnecting the villages, and along the state and interstate highway systems. Because of this trend, sprawl, strip development, and seasonal traffic congestion are emerging problems in the Region. Towns should remain aware of the potential for strip development, and include prevention strategies and tools such as overlay access management districts, cluster development, mixed use zones, and the official map in their town plans and zoning regulations.

As the Current Land Use/Land Cover map shows (**Appendix A** of the Regional Plan), large areas of the landscape in southern Windsor County are forested. Although this map is based on orthophotographs taken in 1994, the distribution of land uses has remained fairly consistent over the last decade. Those lands that are forested for timber usage contribute to the local economy, and those that aren't provide wildlife habitat and recreational opportunities, and maintain the air and water quality that are important for the quality of life of the Region's residents.

U.S. Census 2000 population figures show a clear trend of residential growth in outlying rural towns and slower growth in areas of concentrated development. Growth in town population centers would maximize the existing road systems and capacity in those areas. These areas offer a larger, more diverse local road network, and better access to jobs, services and public transit. However, the predominant growth trend in recent years has been growth in rural areas with limited transportation options. If this trend continues, the burden to maintain existing roads and add capacity will become more costly.

Over the last five years, the greatest development trend has been single family homes and small subdivisions in the more rural towns where no municipal water or sewer services are available. Development in these areas has been largely dependent on site limitations. Changes to state regulation of residential on-site wastewater systems lifted many of the restrictions on the use of land with limitations to bedrock and seasonal water table and gave the State universal permitting jurisdiction starting in 2007. The changes significantly increase the amount of land potentially available for development, as much of the land was off-limits to development solely because of physical constraints for supporting on-site septic systems.

Near Okemo Mountain Resort in Ludlow, the development of second homes and vacation condominiums has occurred at a rapid pace. According to 2000 Census figures, the number of seasonal housing units increased by 13.7% in Ludlow between 1990 and 2000. As buildable land on the mountain becomes scarce, these larger vacation-oriented developments are likely to move to outlying towns such as Andover and Cavendish.

Residential development in towns with easy access to I-91 has increased in recent years due to expanded employment opportunities in the Upper Valley.

Towns such as Windsor and Springfield that have extended water and sewer service to industrial parks outside the downtown should consider carefully the area between the industrial park and the downtown. With available water and sewer, these areas could easily experience future strip development and sprawl. The trend toward revitalization of downtowns and redevelopment of brownfield sites can help to counteract this development pressure outside downtowns and encourage more efficient travel.

D. Future Land Use and Transportation

As the Region's population and economy grows and expands, each community will be affected differently. The existing regional transportation system will have to be dynamic to meet changing demands, as large-scale roadway infrastructure expansion is unlikely in the near future due to funding constraints. Factors such as geographic location, natural resource

constraints, regulations, public policy, and public investments contribute to the direction that new growth takes in any community.

Job growth in the tourism-related industry in this Region and in the Upper Valley employment center can both be expected to continue into the near future. If the low availability and high cost of housing in those respective job centers continues, the increase in commute times can also be expected to increase. Access to those jobs becomes particularly important for lower-income workers. Therefore, park-and-ride lot capacity and increased transit services become important to provide adequate job access to those markets. To make the existing transit systems more efficient, land use development and transportation investments should support smart growth, as discussed below. Economic reinvestment in Regional and Town Centers can also help to employ residents locally and improve the efficiency of the transportation system.

The Regional Plan encourages growth in the traditional villages and downtown areas surrounded by open fields, farms, large tracts of forested lands and low-density development. The Regional Plan also establishes future land use categories to serve as a guide for the desired types and intensities of future land uses. (See Future Land Use Map, **Appendix A** of the Regional Plan.) The concentration of growth in established areas has many benefits. It preserves the character of communities, engenders a sense of place and civic pride, and ensures the maintenance of the high quality of life residents of the Region enjoy and expect. It also saves residents money, time, and natural resources. Concentrated development allows for the safest and most efficient transportation systems, the most efficient provision of public services, convenient access to businesses, and the most economical use of land. It ensures a more effective use of tax dollars on public infrastructure, and can create stronger local and regional economies. It can also benefit public transit by promoting greater efficiencies, village circulator routes and bus friendly community design. Any local public investments should reinforce the general character and planned growth patterns of the town as indicated in the town plan.

The future land use categories consist of the following types:

1. Regional Centers

Regional centers provide services, shopping, and employment opportunities to communities within and beyond the Region's boundaries. The core area of a typical regional center consists of a mix of land uses, including residential, commercial, and industrial development at higher densities than surrounding areas. Existing transportation routes provide access for both local and through traffic. Commuters may generate traffic loads during peak hours and public transit service may be provided as greater concentrations of people reside within these Centers. A full range of governmental services and institutions, including hospitals, schools, water and sewer service, and fire and police protection are offered. The core areas of Ludlow, Springfield and Windsor are designated as regional centers.

a. Transportation Characteristics of Regional Centers

Regional centers are the commercial, industrial, and social hubs of the Region. Historically, goods distribution congregated at access points to the transportation network which in turn attracted additional development. The early transportation

system consisted of a network of interconnecting sidewalks, rail lines, roads, and access points to the Connecticut River. The disappearance of river transport, the decline of the railroads, and the growth in vehicular modes of transportation has focused attention and investment on roadway improvements. This trend has resulted in a disproportionate aging of the infrastructure for non-vehicular modes of transportation, such as railroads and sidewalks.

Today, roads within regional centers must serve a diverse group of users including commuters, tourists, industry, commerce, pedestrians, bicyclists, and public transit providers. These diverse users often have conflicting expectations for how the transportation system should function, underscoring the complexity of transportation issues within these centers. In addition, roads and parking facilities have become the dominant features.

The road system in Ludlow, Springfield and Windsor consists of a network of local streets that feed into collector and arterial roads. Traffic volumes along the primary roads range from 14,000 Average Annual Daily Traffic (AADT) in Springfield, 12,000 AADT in Ludlow, to 8,000 AADT in Windsor. Although these routes are numbered (e.g. US 5, VT 11, VT 103), the Towns are responsible for maintenance of the Class 1 Town Highway portions which lie within the limits of the urban or village boundary. Traffic flows are influenced by frequent curb cuts, low travel speeds, and are prone to commuter peak hour congestion.

b. Desired Functions

As the economic and employment centers of the Region, the transportation infrastructure of regional centers must be capable of handling higher traffic volumes created by dense development. The transportation system in these areas should support many different users while providing safe and reliable links to outside markets and resources. Opportunities for enhancing intermodal connections should be encouraged. Roadway improvement standards should be sensitive to the historic and cultural integrity of regional centers. Access to alternative modes of transportation, such as rail facilities, now available in Windsor should also be preserved.

2. Town Centers

A town center provides localized services, such as shopping and employment that may only partially address the needs of town residents. Development is concentrated in a smaller geographic area but is similar to regional centers in character with high density mixed commercial, residential, and industrial uses. Limited governmental services and institutions are offered, such as schools, libraries, and clinics, which are typically sub-regional in nature and not significantly influential in a regional context. Services and amenities may attract residents from communities that are immediately adjacent to town centers. Police and fire protection may be provided and municipal sewer and water services are generally available. Existing roads generally provide access for the local community and from beyond the area. Town centers include the Chester-Chester Depot, Cavendish, North Springfield and Proctorsville. Ascutney is encouraged to grow as Town Centers with the provision of adequate public water and/or sewer services.

a. Transportation Characteristics of Town Centers

Like regional centers, the transportation infrastructure within town centers must serve multiple users with often conflicting expectations. Although rail facilities are within close proximity, connections are limited. Pedestrian walkways are present but may be deteriorating or lack interconnections. As the cultural and social meeting center of the community, the interaction between vehicles and pedestrians plays an important role.

Typical traffic volumes range from 3,300 AADT in Cavendish to 9,100 AADT in Chester. The primary state roads are functionally classified as principal arterials and major collectors. In addition, VT Route 103 is one of only three east-west travel corridors in southern Vermont and is a designated state truck route. These roads experience seasonal peak traffic congestion during ski and fall foliage weekends, an opportunity for tourist related transit services. Through truck volumes are comparably high. Accommodating both on-street and off-street parking while sustaining local businesses is also a concern.

b. Desired Functions

The transportation infrastructure within town centers should support economic development opportunities and local business interests, and simultaneously accommodate through traffic while maintaining the safety for non-motorized forms of transportation. Preservation of historic resources and "community character" should be a primary concern for all road improvement projects. Although peak hour congestion is an acknowledged problem, village character should not be sacrificed for capacity improvements. Alternative methods of addressing seasonal peak traffic including improved pedestrian and bicycle circulation, enhanced rail usage, off-street parking, and seasonal re-routing of traffic should be investigated. Access to alternative modes of transportation, such as rail facilities, now available in Chester and Ludlow should also be preserved.

3. Village Centers and Hamlets

Village centers include the smaller villages of Brownsville, Perkinsville and Feltchville, and hamlets include Downer's Corners, Gassetts, Peaseville, Simonsville, South Reading and Weathersfield Bow. These areas have a small area of concentrated development with one or more commercial establishments. Though limited services and amenities may be available, industrial development is minimal or non-existent. The proximity of adjacent industrial facilities may also influence village centers and hamlets. State highways that pass through most of these areas serve primarily through traffic. Local roads serve primarily the local population, but may include services for moderate traffic flow related to specific destinations or through traffic. Conflicts between through traffic and the community are prevalent.

There are densely settled areas in the Region which were formerly villages or hamlets but now consist of small concentrations of historic structures, primarily residential, with little if any commercial development. There is, typically, no other development except for a church or community center. Government services and institutions are not generally provided and residents must travel to other communities for shopping and employment. Transportation

issues are typically minor but may arise in relation to outside influences or natural resource constraints. These areas include Amsden, Hammondsville, and Weathersfield Center.

a. Transportation Characteristics of Village Centers and Hamlets

Historically, transportation infrastructure played an integral part in the formation of village centers and hamlets that provided the social, cultural, and commercial center of the community. With the arrival of automobiles, roads were widened or bypasses constructed to accommodate vehicles, often at the expense of a pedestrian-friendly environment. Pedestrians were forced to share roads with motorized vehicles. As roads expanded, additional traffic followed and the comfort level of pedestrians was sacrificed. The primary focus became the roads that passed through the village centers and hamlets.

The Region's village centers and hamlets occur exclusively along major collector roadways. Moderate traffic volumes vary between 6,500 AADT in Gassetts to 3,000 AADT in Perkinsville and 500 AADT in South Reading. The traffic flow is comprised of a mix of local, intra-regional and through traffic.

b. Desired Function

The transportation system should not be the dominant feature of villages/hamlets, and roads should compliment the aesthetics, history and function of the community. Infrastructure improvements should accommodate all modes of transportation, but not at the expense of human scale and pedestrian friendliness. Transportation improvements and design standards should reflect the unique historic character of each village. Vehicle speeds and the use of traffic calming techniques should be addressed as part of any roadway improvement project. The routing of traffic should strive to minimize the impact on villages/hamlets.

4. Medium-Density Neighborhoods

These areas include the medium-density neighborhoods that immediately surround regional and town centers. They are primarily residential, but typically also include limited commercial and civic uses. Medium-density neighborhoods are generally served by public water and sewer systems. These neighborhood areas include portions of Chester, Ludlow, Springfield and Windsor.

a. Transportation Characteristics of Medium-Density Neighborhoods

Medium-density neighborhoods are typically served by a network of interconnected Class 2 and 3 town highways and limited portions of state highways. These areas are generally within walking distance of the Regional or Town Centers. Sidewalks are typically present, but often lack connectivity. Public transportation services are present but fixed routes are limited primarily to Springfield and Ludlow.

b. Desired Function

The transportation system should provide an interconnected urban road network with street trees, sidewalks and buildings oriented to the street to create pleasant pedestrian environment. Infrastructure improvements should accommodate all modes of transportation.

5. Resort and Recreation Area

Resort and recreation areas are unique features that influence the balance of the cultural, natural, and infrastructure systems surrounding them. Typically, they are located in areas with abundant scenic and natural resources that are attractive for their recreational, tourism, and/or second home opportunities. They generate significant traffic during the peak tourist seasons of summer, autumn foliage, and winter. The influence of resorts extend throughout and beyond the regional context. Though resorts offer significant seasonal employment opportunities, the high cost of housing and typically low wage scale can result in increased commuting from beyond the host community. Transportation issues are complex, fluctuating seasonally. Development often includes condominiums, second homes, and recreational structures. Resort and recreation areas in the Region include: Okemo Mountain Resort in Ludlow, Ascutney Mountain Resort in Brownsville and the Lake Rescue and Lake Pauline area in Ludlow.

a. Transportation Characteristics of Resort/Recreation Areas

Resort and recreation areas serve an important economic function for residents and visitors to the Region. As magnets for tourism, jobs and second home development, high traffic levels create transportation issues that are unique to these areas. For example, VT Route 103 in Ludlow serves not only traffic destined for attractions in the Region but also to other resorts in surrounding counties. Resort traffic combined with local and through traffic results in seasonal congestion. Adding to the complexity of the problem, the transportation infrastructure is designed around the constraints of steep terrain, scenic river valleys, and historic villages. Although no one solution will solve the entire problem, the situation requires an innovative approach to address the transportation needs of resort and recreation areas. For example, Okemo Mountain Resort provides shuttle service and traffic control assistance during seasonal peaks. This initiative has significantly improved traffic flows through downtown Ludlow. Specific issues with ski traffic are discussed later in this chapter. Roadways serving the development around the lakes contribute to water quality threats, including pollution and aggradation.

The traffic volumes of roads accessing resort and recreation areas vary from 12,000 AADT in Ludlow to 2,100 AADT in West Windsor.

b. Desired Function

The development of resort and recreation areas has, in the past, been closely allied with improvements in the transportation system. Traffic congestion is a problem along VT Route 103 in Chester and Ludlow during peak tourist travel times. Potential solutions to mitigate this congestion include consideration of expanding rail and bus public transportation services, expanding shuttle service, promoting pedestrian and bicycle use, traffic demand management and coordination of existing transit services. The ability to develop cost effective and convenient links between the modes should be the primary goal for transportation improvements in resort and recreation areas. Roads serving the lakes area should incorporate best practices to improve water quality. The Vermont Better Back Roads Manual (George D. Aiken

and Northern Vermont Resource Conservation and Development Councils, 1995) is an excellent resource on BMPs and ways to mitigate stormwater.

6. Industrial Sites

Industrial sites are significant because of their role in providing local jobs and municipal tax base. Industrial sites include: Dean Industrial Park in Ludlow, Luzenac mine sites, North Springfield Industrial Park, Windsor Industrial park and other industrial activity areas shown on the Future Land Use Map (see **Appendix A** of the Regional Plan). Growth of these areas is encouraged; however, providing adequate access for cars and trucks is a primary concern.

a. Transportation Characteristics of Industrial Sites

Industrial sites are trip-generators and centers of economic activity. While railroads may be used to haul freight by a few industrial businesses in the Region, the predominant transportation mode for industrial uses is the road system. Traffic volumes attributed to industrial sites vary widely, but trucks comprise a high percentage of the traffic flow. Trucks compose about 20 percent of the traffic on Precision Drive, serving the North Springfield Industrial Park. The Park is estimated to generate about 300 average daily truck trips per day (North Springfield Truck Study, 2008).

b. Desired Function

Preserving easy access between industrial sites and the larger transportation network is a primary concern. Industrial sites located close to I-91 are prime locations for industrial uses that generate large-truck traffic. Industrial sites in more remote locations should consider infrastructure improvements to maximize truck access, while also minimizing the negative impacts on neighboring properties. The function and safety of adjacent state highways and Class 1 and 2 town highways needs to be considered in any development proposal in these areas. Existing local roads and bridges may need to be upgraded to better withstand heavy truck traffic. Access management should play an important role in preventing strip development and/or unsafe traffic conditions in close proximity to industrial sites.

7. Rural Areas

Rural areas show no discernable concentration of development other than dispersed development, primarily residential, and a working landscape, including farms, forestry and earth extraction activities. Traffic volumes are typically low, and consist primarily of through traffic on state highways and local traffic on town highways and private roads. Certain routes which pass through rural areas may be considered scenic by travelers and may attract bicyclists and tourism-related traffic. Transportation issues related to rural lands are less complex, but issues may arise related to specific infrastructure needs or natural resource concerns.

a. Transportation Characteristics of Rural Areas

The transportation system that serves rural areas consists of a vast network of local, private and state roads. The roads serve a diverse group of users including tourists,

bicyclists, cars, trucks and, to a limited degree, pedestrians. Traffic volumes vary widely from only a few cars a day to several thousand per day.

b. Desired Function

Access through rural areas should not result in the loss of Vermont's trademark, its rural character. Instead, emphasis should be placed on properly maintaining the existing network of roads and bridges. Infrastructure improvements should address safety concerns of motorists, bicyclists and pedestrians alike.

8. Resource Areas

Resource areas represent natural areas that require special protections because of their fragile nature, irreplaceable value, and unique or important ecological functions. Resource Areas are comprised of a variety of very low density land uses, including conservation lands, state parks or forests, working landscape activities, outdoor recreation, hunting, fishing and very low density residential. Transportation characteristics and desired functions are the same as for Rural Areas.

E. Special Considerations for Land Use and Transportation

It is important for a coordinated vision for how changes in land use and transportation should take place in the future. However, the interrelationships between land use and transportation are complex. The following special considerations further define how future growth should occur in order to encourage an efficient transportation system.

1. Smart Growth

Smart Growth is discussed in the Regional Plan and in the Future Land Use and Transportation section in this chapter. It entails encouraging clustered development and mixed land uses within areas of concentrated development.

Clustered, mixed-use development is more efficient and less land-consumptive than dispersed, sprawling development. Clustered development generally encourages less vehicular travel and more pedestrian, bicycle and transit travel. It can also reduce the total road miles maintained by municipalities. Development in rural areas outside of villages and downtowns makes travel by alternative modes impractical in many cases and increases the vehicle miles traveled in the Region. The Future Land Use and Transportation section in this chapter encourages development in areas of concentrated development or in clusters.

Promoting commercial development, higher-density residential development, multi-family residential units, workforce housing and housing for other potentially transit-dependent individuals along transit routes and within downtowns and villages, can improve access to jobs, essential facilities and services for residents.

2. Ski Corridor Traffic

Both Okemo Mountain Resort and Killington Resort have developed master plans to expand their ski trails and the amount of skier visits each year, and to transform their ski areas into four-season resorts. Traffic from these resorts tends toward VT Routes 100 and 103, and US Route 4 north of the Region. Villages along these routes experience congestion

problems during peak ski days, and can expect additional traffic as a result of the expansion of the ski resorts. Because the Act 250 review process will not allow such heavy increases in traffic volumes, the two resorts have been working with regional planning commissions to develop a plan for these corridors.

The RPC, the Rutland Regional Planning Commission, and the Two Rivers-Ottauquechee Regional Commission, working in partnership with VTrans and the Okemo and Killington ski areas, developed an analytical tool for assessing the impact of development-related traffic growth in regionally-significant highway corridors. The tool measures traffic impacts in terms of reductions in travel time along highways corridors (VT Routes 100 and 103, and US Route 4). It establishes a measure of traffic impact that goes beyond the typical level of service (LOS) analysis. The effort is three-fold: Measure traffic, define at what level traffic becomes unacceptable, and then determine ways to mitigate. The process to maintain and refine this travel time model is ongoing and will continue over time.

The Ski Corridor planning and evaluation process will work continuously to identify creative and innovative demand-related techniques to mitigate and reduce the influence on the existing regional traffic patterns of new ski resort development. In addition, Connecticut River Transit, the Ludlow Municipal Transit System, Okemo Mountain Resort and the RPC continue to work on utilizing existing transit services to reduce "internal" auto trips in and around the resort.

3. Maintain Rights-of-Way for Future Needs

As communities grow, new roads may be needed to facilitate the safe and efficient movement of goods, people and services. Maintaining existing rights-of-way is advisable in order to preserve public rights to lands needed for future travel needs.

Rights-of-way can also help to protect the safe functioning of intersections, as well as preserve the ability to expand the intersection based on future demand. State- and town-owned rights-of-way that serve these purposes should be protected as well.

4. Traffic Calming

According to the Institute of Transportation Engineers, traffic calming is the combination of physical measures that reduce the speed, alter driver behavior, and improve conditions for non-motorist street users. Examples of traffic calming techniques include: narrowing roadway travel lanes, landscaping, the use of curb extensions and striping to clearly define pedestrian crossings, bike lanes, lighting, and raised pavement. The major advantage of traffic calming over more traditional speed reduction measures, such as police enforcement, is that traffic calming measures are "self enforcing." Because traffic calming devices force drivers to slow down, they can be more effective than measures that rely on enforcement. Traffic calming in villages achieves three results: increased pedestrian safety, lower traffic speeds, and more livable village centers.

VTrans developed Traffic Calming Standard Drawings as design guidelines for traffic calming on state highways. These guidelines can be used by the designers and engineers at VTrans who work on paving and roadway projects. The development of traffic calming

typical sections marks a significant change in the way VTrans now approaches project design.

Certain traffic calming techniques may be appropriate and should be considered in all areas of concentrated development in this Region where a reduction in traffic speed would enhance pedestrian and bicycle safety as well as improve community quality of life. The impact of traffic calming on adjacent corridors should also be considered.

5. Access Management

Access management involves managing traffic flow and safety, and preserving the carrying capacity of roads through the design and spacing of driveways and street connections ("curb cuts") to public roadways in order to preserve safety, reduce congestion, and promote desirable land use patterns. Access management focuses on the connection between transportation and land use.

Access management is not a critical problem in this Region at this time. However, the following corridors would benefit from access management to improve safety and address capacity before becoming a critical problem: VT Route 106/River Street in Springfield, VT Route 11 in Springfield, VT Route 103, and along the other major travel corridors. In addition, the RPC encourages towns to implement sound driveway policies that seek to reduce drainage impacts to town roads and to maximize safety.

In 2001, the RPC undertook an access management study to categorize all major state routes in the Region based on: traffic volume, travel lanes, speed limit, number of access points per mile, and existing and future land use. With this information, the Vermont Agency of Transportation with the assistance of the RPC established Access Categories for the Region's state highways. The majority of southern Windsor County roads were given an Access Category of 4. Category 4 is described as follows:

- Daily traffic volumes below 5,000 AADT
- Speed limit varies from 30-50 mph
- Provide for inter-town and intra-town travel needs
- There is a reasonable balance between access and mobility

VT Route 103, a major east-west arterial for the Region's auto-users, trucks and for Vermont as a whole, is the primary exception to Category 4. VT Route 103 was given an Access Category of 3 and 6 - six for the villages of Chester and Ludlow, and 3 for those areas outsides the villages. Access Category 3 is defined as follows:

- Daily traffic volumes above 5,000 AADT
- Travel speeds 50 mph or higher for long distances
- Provide interregional travel needs
- Principal Arterial
- Generally a National Highway System (NHS) Route

Category 6 is described as follows:

- Daily traffic volumes over 5,000 AADT
- Speed limit varies from 25-40 mph
- Typically exhibits access density of 40 accesses per mile or greater (on both sides of the roadway)
- Provide for inter-town, intra-town and intro-community travel needs
- There is a reasonable balance between access and mobility; however, functions as an "urban" roadway

Roads such as US 5, Vermont 11, and Vermont 106 that pass through village and town centers such as Chester, Reading, Springfield, and Windsor were also given an Access Category of 6.

In cooperation with VTrans, the RPC is working with towns to explore access management, identify techniques to apply in each community, and develop the necessary tools with which to implement those techniques. Coordination between state and local decision makers is essential to make access management work well, as it involves sometime complex interrelationships between subdivision and other land development decisions, and access permitting. The RPC encourages all towns to consider access management in local land use regulations.

6. Transportation Interchanges

The RPC completed a study of the Region's interstate interchanges: Interstate Exits of the Region: Study and Policies in March 2004. The purpose of the study was to protect the aesthetic and natural resources of the land around the interchanges and the economic and cultural viability of traditional village and town centers by carefully considering the kinds of uses to be allowed at interchanges and the site plan review conditions to regulate those uses. In addition, this information may be used to protect valuable land for conservation through easement with a land trust or other measures. And finally, the information was used to formulate regional goals and policies concerning interchanges in the southern Windsor County Region.

A land use analysis was conducted to establish a clear picture of the existing land use patterns and traffic volumes; suggest policies and recommendations to local municipalities interested in addressing development at each interchange in the Region through their own plans; guide future investments; and facilitate state policies.

Three interstate exits serve the Region. They are located in Springfield (Exit 7), Weathersfield (Exit 8), and in Hartland (Exit 9). Although Exit 9 is not in the Region, it provides interstate access to the Town of Windsor. The study indicated that all of the interchanges are unique.

Exit 7, Springfield, is developed with two gas stations, one of which is a truck stop, and a Holiday Inn Express hotel with a Howard Johnson's restaurant. Adjacent to the hotel is the Springfield Correctional Facility, and an industrial area is planned nearby. Springfield has created a new "Exit Seven District", which will allow the Town to control the growth and

construction around the interchange. Sewer and water has been extended to the correctional facility, Howard Johnson's and gas station areas. Most of the developable property at the interchange has been developed, although re-development may expand existing uses and increase traffic impacts. The Exit Seven District requires site plan review that addresses signs, lighting, noise, aesthetics, parking, and access management.

Within a half mile from the interchange and along four-lane Route 131, Exit 8, Weathersfield has four gas stations, three with convenience stores and three with garage service provided on site, one restaurant (1799 Ascutney House) and a cafe. The village of Ascutney is in close proximity to the interchange, along Route 5 just north of Route 131. The Weathersfield Town Plan addresses the interchange area generally but does not address commercial strip development, and its current zoning would accommodate commercial strip development in this area. The Town of Weathersfield developed an Exit 8 Interstate Interchange Master Plan in 2007. The Master Plan calls for access management and traffic calming improvements along VT Route 131 in the interchange area. In addition, the Master Plan identifies zoning changes to encourage a more pedestrian-scaled development pattern in this area. It also calls for integrating the current commercial strip development area into the village of Ascutney, including street and sidewalk connections. Any revision to the Town Plan and Regulations should directly address the interchange area, consider site plan review and access management, and connection of the area to the village with bicycle and pedestrian facilities.

Exit 9, Hartland is discussed in the Hartland Town Plan. The Town Plan notes the benefits that the interchange brings to the communities north and south of the interstate exit onto Route 5. Much of the land surrounding the interchange lacks commercial development and has a significant amount of undeveloped pasture land, in contrast to other parts of Route 5 and exits along Interstate 91.

The Hartland Town Plan requires that development at the interchange must be compatible with its "rural surroundings," and recommends that proposed uses be subject to site plan review. The Plan further requires that development around the interchange needs to preserve the "rural Vermont business image." Several types of uses should be encouraged around the interchange: "professional offices, clean light industry, and small specialty retail including farmers markets, nursery and landscaping businesses, and arts and crafts." However, Hartland does not have zoning bylaws to regulate land development at this time.

In addition to Interstate Exits, the functionality of intersections along all major travel corridors should be preserved to maintain or improve capacity, reduce vehicular delays and to not preclude future intersection expansion needs. The RPC encourages sound access management at all intersections for safety reasons.

7. Corridor Preservation

Corridor preservation, in terms of prioritizing maintenance over new construction, has been recognized by the TAC as a regional transportation priority for over ten years. Corridor preservation also refers to efforts to preserve and maintain the existing transportation roadways, particularly state highways and Class 2 town highways, in order to protect future mobility. Corridor preservation entails sound road maintenance techniques to extend the life

of existing roadways, access management to preserve capacity and encouraging land use development that maximizes existing highway capacity and safety. These efforts are needed to prolong the life of the existing transportation infrastructure and protect the public investment in roadways, while meeting growing future demand with limited budgets.

8. Community Design

Community design, as regulated through local site plan review and design review, can encourage more inviting places for residents and visitors, and can promote a safer and more efficient transportation system. Such design features might include building setbacks, structure height and scale, and quality pedestrian facilities connecting adjacent properties and communities, that all combine to enhance the community character and transportation functionality. Community design, as addressed through zoning bylaws, site plan review and design review, can contribute toward preserving community character and encouraging pedestrian activity.

LAND USE GOALS

1. Promote sound land use planning that minimizes the need to expand the existing highway infrastructure and maximizes transportation system efficiency and safety.

2. Preserve rural and village character by recommending projects that balance the transportation needs of roadway users and residents.

3. Protect the economic, aesthetic, natural resource and cultural viability of traditional village and town centers through careful planning and review of development proposals.

4. Implement access management strategies as a means of preserving the financial investment and functional capacity of the regional roadway network.

LAND USE POLICIES

1. Preserve the character and environmental integrity of existing settlement patterns through maintenance and/or development of transportation improvements that are consistent with or enhance these resources.

2. Preserve existing historic, cultural and natural resources.

3. Encourage the enhancement, preservation, capacity and efficiency of the Region's road network by controlling access, minimizing curb cuts, discouraging land use patterns that promote strip development and encouraging development consistent with the future land use categories established in the Regional Plan.

4. Continue to encourage greater town participation in the issuance of access permits on state highways.

5. Encourage VTrans to reduce speed limits on the Region's State Highways that pass directly through village centers where towns have no jurisdiction.

6. Implement traffic calming techniques in the re-design and construction of village streets and bridges to reduce vehicle speeds and improve pedestrian circulation.

7. Encourage the efficiency of the Region's road network by promoting access to jobs and services through bicycle and pedestrian facilities, park-and-ride lots, public transit services and ridesharing.

8. Encourage VTrans to develop guidelines for design exceptions for roads on the National Highway System.

9. Preserve the functionality of interstate highway interchanges and intersections of state highways for existing and projected traffic volumes.

LAND USE RECOMMENDATIONS

1. Work with Planning Commissions to implement sound land use planning techniques that promote compact development patterns and designated growth centers.

2. Promote limited numbers of curb cuts, shared parking facilities and pedestrian links within regional centers, villages and existing strip development areas in order to improve or maintain highway capacity. Discourage new areas of strip development.

3. Work with VTrans to implement traffic calming techniques into the design of projects that may impact town and village centers.

4. Encourage the use of the techniques identified in the Ski Corridor Traffic Management Plan to monitor traffic increases from large trip generators, such as resorts, and allow for implementation of methods to offset peak period traffic.

5. Any proposed development adjacent to an interchange should be clustered within existing development to limit the number of direct access points on to arterial roads. Any proposed project that would significantly alter traffic flow or volume of should be discouraged and/or mitigated to the greatest extent possible.

6. Any proposed development that is to be located at an interchange should enhance the existing economy and environment. Any retail and commercial business best suited for village centers/downtowns should be discouraged from locating near the Region's interchanges.

IV. Regional Road Network

Roadways form the backbone of the Region's transportation system. To provide a basis for planning a network of roads, highways, bridges, and parking areas that will adequately serve the future needs of southern Windsor County. This Chapter will assess the existing system, and focus on functional characteristics such as traffic volume, type of travel, connectivity, operational sufficiency, structural condition, safety, and service to the user.

A. Roads and Highways

To know which roads to prioritize for transportation projects, it becomes necessary to describe the importance of a given road segment or corridor. Variables such as a road's geometry, capacity, traffic volume, or the origins and destinations that it connects might be used to judge the importance of a road. It is more useful in transportation planning, however, to integrate these variables and consider the overall context of the road in order to understand how it functions within the entire roadway network. Different road classification systems, then, are essentially different approaches to describing and summarizing a road's functional importance.

Two methods currently used in Vermont for classifying roads are:

- *Functional Classification* - a concept that originated in the U.S. Department of Transportation which evaluates roads based on a hierarchy of uses.
- *Town Highway Classification* - the method used to determine allocation of funding from the state to towns.

1. Functional Classification

The functional classification system represents an effort to group roads and highways according to the character of service they are intended to provide. It recognizes that individual roads do not serve travel independently; rather, most travel involves movement through a network of roads. Functional classification describes the role that any particular road plays in serving the flow of trips through the network. It considers such characteristics as average speed, convenience, access, and the type of travel a road carries.

Functional classification is based on the principle that roads fit along a spectrum between access, at one end, and mobility (vis a vis ease and speed of travel) and convenience at the other. As represented in **Figure 4.1**, where mobility and convenience are maximized, access between the highway and surrounding land is minimized. Moving toward the other end of the spectrum, access to individual land parcels increases, but speed and convenience are appropriately reduced. The critical point here is that where a road is forced to serve opposing functions -- such as carry both local and inter-regional travel -- there exists an inherent functional conflict. As a result, mobility, convenience, and safety all suffer.

a. Functional Characteristics in Southern Windsor County

The road network in the region has been described by the Vermont Agency of Transportation in terms of the USDOT's Functional Classification for Rural Areas. A summary of these classes is shown in **Table 4.1**. See the Functional Road

Classification Map (see **Appendix A – Map 2**) for the functional classification of roads in the Region.

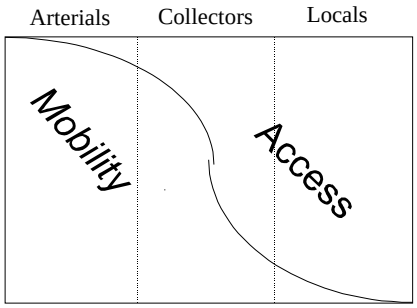


Figure 4.1 – Mobility vs. Access

Table 4.1 – Highway Functional Classification

Functional Class	Class Description	Regional Examples
Rural Principal Arterial	Trip length and travel density indicative of substantial statewide and interstate travel. Serve virtually all urban areas with more than 50,000 people and a large majority of those with more than 25,000. Provide an integrated network.	I-91 VT 103
Rural Minor Arterial	Link cities, larger towns and other traffic generators that attract travelers over a long distance. Form an integrated network that provides interstate and inter-county service. Spaced at intervals consistent with population density so that all developed areas of a state are within a reasonable distance of a principal arterial highway. Trip length and travel density are greater than those served by rural collectors or local roads.	VT 10 VT 11 (west of Chester) VT 100
Rural Major Collector	Provide service to any county seat, larger towns and other generators, like schools, shipping points and employment centers, not already served by a higher system road. Link these places with larger towns, cities and routes with higher classification. Serve more important intra-county travel corridors.	VT 44 VT 131 Weston Andover Road
Rural Minor Collector	Spaced at intervals consistent with population density to collect traffic from local roads and bring all developed areas within reasonable distance of a major collector road. Provide service to smaller communities and link the locally important traffic generators with their rural hinterland.	Tyson Road Weathersfield Center Road
Rural Local	Serve primarily to provide access to adjacent lands. Provide travel over relatively short distances.	Residential streets

Source: US DOT 1989, VTrans, SWCRPC

2. Town Highway Classification

Town highway classification is based on the significance of each roadway for mobility and access, and who is responsible for maintenance. These classifications are summarized in

Table 4.2. Town highway classifications, as they relate to the regional highway network, are illustrated in the Regional Transportation Network (**Appendix A, Map 1**). A mileage breakdown for each class by town is shown in **Table 4.3**.

Table 4.2 - Town Highway Classification System

Class	Criteria
Class 1 Town Highway	Form the extension of a state highway route and carry a state highway route number, but are town maintained. Determined by VTrans.
Class 2 Town Highway	The most important highways in each town based on their through connection between towns. The selectmen, with the approval of VTrans, shall determine which highways are to be class 2 highways. (Usually paved)
Class 3 Town Highway	All traveled town highways other than class 1 or 2 highways, and are negotiable under normal conditions all seasons of the year by a standard manufactured pleasure car. The selectmen, after conference with a representative of the agency shall determine which highways are class 3 town highways. (Typically unpaved)
Class 4 Town Highway	Class 4 town highways are all other town highways. The selectmen shall determine which highways are class 4 town highways.
Legal Town Trail	Public right-of-way. Trails shall not be considered highways and the town shall not be responsible for any maintenance including culverts and bridges.
Private Road	Privately maintained, not a public responsibility.
Interstate Highway	Signed with an interstate highway number, limited access.
U.S. or State Highway	Signed with a U.S. or State highway number and maintained by the state.
U.S. or State Forest Highway	Responsibility of the U.S. Forest Service or State Dept. of Forests, Parks and Recreation.

Source: Vermont Statutes Annotated T.19 Sec. 302
* Note: Roads may have additional designations such as scenic road or inclusion in an historic program that will affect how the road is maintained and improved.

Table 4.3 Town Highway Classification Mileage By Town

Town	Town Highways by Classification						State Highways			
	Class 1	Class 2	Class 3	Total Town-Maintained Road Miles	Class 4**	Trails	Interstate	State Highways	Total State Maintained Highways	Total Traveled Highways
Andover	0	9.930	30.200	40.130	4.410	1.52	0	3.886	3.886	44.016
Baltimore	0	4.360	2.810	7.170	0.150	0	0	0	0	7.170
Cavendish	0	11.850	42.950	54.800	3.930	0	0	11.822	11.822	66.622
Chester	2.500	12.609	75.250	90.359	7.110	0	0	19.107	19.107	109.466
Ludlow*	2.295	5.050	55.720	63.065	3.480	0	0	11.957	11.957	75.022
Reading	0	9.100	30.240	39.340	17.360	0.25	0	7.481	7.481	46.821
Springfield	2.879	19.940	100.720	123.539	2.490	4.71	9.034	19.073	28.107	151.646
Weathersfield	0	14.180	54.940	69.120	4.430	0	7.487	23.559	31.046	100.166
West Windsor	0	5.931	41.300	47.231	4.700	0	0	5.044	5.044	52.275
Windsor	4.135	5.300	22.750	32.185	0.990	0	6.429	10.145	16.574	48.759
Regional Totals:	11.809	98.250	456.880	566.939	49.050		22.950	112.074	135.024	701.963

Source: VTrans
*Includes the Village of Ludlow
** Class 4 mileage may be underestimated because accurate estimates are not maintained

Act 178, enacted in May 2006, established a new town highway classification for "unidentified corridors," and encourages towns to conduct research to inventory all ancient

town roads. Prior to adoption of this legislation, there was never a reason to include Class 4 town highways on the Town Highway Maps developed by the Agency of Transportation, as they were an inventory of those local roads eligible for state aid Town Highway Grants. As a result of this law, legal town roads become classified as Unidentified Corridors after July 1, 2010 if they are not "clearly observable" on the ground, are not Trails, and are not on the VTrans Town Highway Map. Currently, most towns in the Region are conducting research to identify these old roads.

3. National Highway System

In terms of functional characteristics, it is also important to mention the National Highway System (NHS) program. Vermont Routes 103 and 12/131 from the New Hampshire state line to the I-91 interchange are the only roads in the Region designated for the NHS. NHS roads represent about 5% of the total road miles in the state but are the backbone of the system, providing statewide mobility.

The emphasis on National Highway System roads is placed on improving the function of the existing transportation facilities rather than on capacity improvements. The network of NHS highways receives special consideration for federal funding. NHS roads are also required to meet certain federally specified standards associated with their design, improvement and performance. The application of these standards may not be entirely appropriate to Vermont given these roads' local context. To address this concern, the federal government provides waivers, available through the planning process that would exempt a given road from certain standards.

4. Scenic Roads and Byways

The National Scenic Byways program was established under the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 in order to "identify, designate and promote scenic byways and to protect and enhance the recreational, scenic, historic and cultural qualities of the areas through which these byways pass." Scenic Byways are eligible for federal funding for tourism or resource conservation activities along designated corridors (Vermont's Highway System Policy Plan, VTrans, 2004).

The Connecticut River Scenic Byway was designated in 1998 encompassing highways in both New Hampshire and Vermont. The segment of the Byway in this Region encompasses the US Route 5 corridor, as well as two spurs including VT Route 44 to Brownsville and VT Route 11 to downtown Springfield.

State scenic roads may be established by recommendation of the Scenery Preservation Council per 19 V.S.A. §2501. Any construction or maintenance work on designated state scenic roads must be consistent with the standards established by VTrans pursuant to 10 V.S.A. §425. The segment of VT Route 131 in Cavendish is the only designated Scenic Highway in this Region. (See Scenic Byways and Highways Map – **Appendix A, Map 3**)

Towns in Vermont are enabled to designate municipally-maintained roads as "scenic roads," as established by 19 V.S.A. §2502. Town scenic roads are also subject to the standards established by the State Transportation Board. Those standards for scenic roads address

appropriate minimum roadway widths, alignment, landscaping and traffic control methods, pursuant to 10 V.S.A. §425. There are no scenic roads in this Region at this time.

B. Goods Movement

The movement of goods within and through the Region is important for the health of the Region's economy. Goods movement is challenging to plan for given the conflicts between truck traffic and communities. Also overweight and overlength permitting issues, and a lack of public-private coordination make freight issues complex.

1. Goods Flow through the Region

Trucking is the primary means of goods movement in Vermont -- accounting for 91% of all goods movement into, out-of and through the state (VTrans, 2001). According to the Vermont Statewide Freight Study, the top commodity groups in Vermont include:

- Primary forest products (15%);
- Clay, concrete, glass or stone (13%);
- Food or kindred products (13%); and
- Warehouse, distribution and intermodal (13%), (VTrans 2001).

The Vermont Truck Network consists of designated trucking routes including the interstate highways and a few strategic state highways. The network was established to better facilitate trucking by allowing up to 72 foot long trucks with no permits required. Designated truck routes in this Region include:

- Interstate 91 – Limited access (no overall length limit)
- VT Route 103 – 72 foot length limit, including the cab and trailer (no permit)

VTrans' State Truck Route Map shows designated truck routes in Vermont. Local businesses indicate that the current "over-length" truck permitting system for roads off this Network is problematic. The Vermont Truck and Bus Association and Associated Industries of Vermont are discussing possible legislative changes to addresses these problems.

Major issues with moving freight through Vermont are identified in the Statewide Freight Study. It is important to understand those issues at the regional level for the project prioritization process. Vermont freight issues include:

- Rural character and mountainous topography presents a challenge to moving freight in Vermont;
- A lack of an east-west limited access highway is a hindrance to moving goods. Those existing east-west connections (US 2, VT 9, VT 103 and US 4) are not limited access highways, pass through villages and exhibit other physical constraints;
- Lack of intermodal or transload facilities to facilitate rail to truck freight connections; and

- There is a significant conflict between providing an efficient freight network, and protecting the beautiful landscape and maintaining a high quality of life in Vermont.

VTrans conducted a comprehensive analysis of the State Truck Network in late 1999 as part of the Statewide Freight Study. The study, conducted by Vanasse Hangen Brustlin, Inc., (VHB), looked at the geometrical constraints (alignment, narrow bridges or turns that interfere with the flow of traffic) along the Truck Network. Seven areas were located along Route 103 in the Region:

- Cavendish: VT 103 between mile markers 0.4 and 1.3;
- Chester: VT 103 between mile markers 8.13 and 8.52;
- Chester: VT 103 between mile markers 6.93 and 7.07;
- Chester Depot: VT 103 between mile markers 2.58 and 2.72;
- Ludlow: VT 103 between mile markers 4.5 and 5.1;
- Ludlow: VT 103 between mile markers 5.2 and 5.5; and
- Ludlow: VT 103 between mile markers 2.23 and 2.37.

Each of these constraints comprises approximately one quarter mile of roadway (2000 +/- linear feet) and the estimated cost to remedy the seven constraints is more than $7.3 million (1999).

The RPC is committed to working with VTrans and affected communities to further define these deficiencies and to identify appropriate solutions.

2. Truck Traffic

Truck traffic has been of great concern to the Region's communities, especially those along VT Route 103. Several segments of VT Route 103 within southern Windsor County carry in excess of 500 trucks per day. Route 103 is a part of the NHS and is a key component of the recently established Vermont State Truck Network (see Vermont State Truck Network Map – **Appendix A, Map 4**). These two designations are crucial in that they set VT Route 103 above other, non-Truck Network, state routes in priority for improvements.

The RPC is also committed to working with VTrans and communities to further explore the conflict between trucking and quality of life in villages that are bisected by state highways.

3. Transportation Implications

Based on a goods movement analysis conducted as part of the 1995 Regional Transportation Plan, all industries rely on some form of goods movement to maintain commerce. In order to support a diverse economic base in the Region, the transportation system should offer a full range of service options, giving companies the ability to ship everything from quantities of bulk commodities to overnight packages.

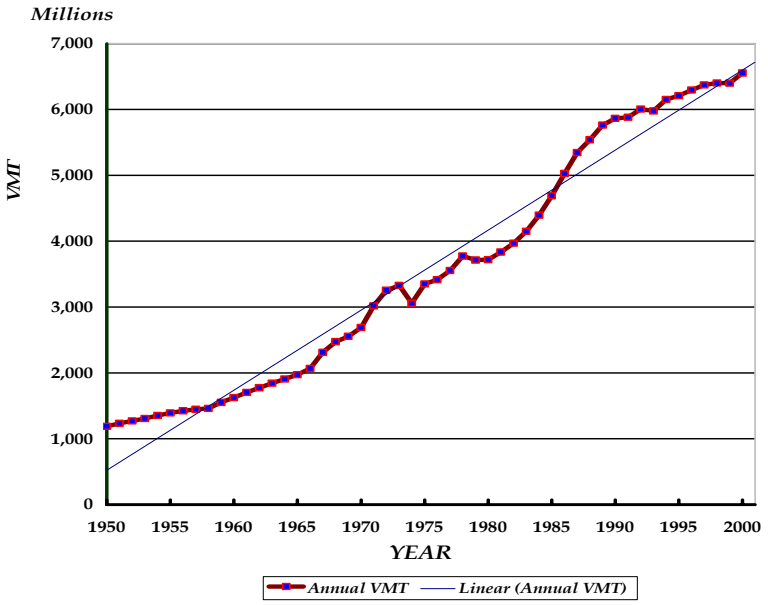
In the Region, however, trucking is the primary mode for moving freight. Rail and air account for only a small percentage of good movement in this Region. Chapter 5 – Alternative Modes of Transportation.

The interstate highway through the Region provides excellent service for truck traffic. The Region's other highways are generally not congested, with poor levels of service found only in localized areas in some of the village centers. However, the growing number of trucks on some of the Region's two-lane highways is of increasing concern to residents along these routes and contributes to the deterioration of roads. A balance must be achieved between facilitating truck movement along state highways and protecting the quality of life in villages.

C. Traffic

1. National and State Trends in Traffic Volume

Personal mobility in the U.S. and in Vermont is at its highest point in history and continues to rise. As noted in Chapter 2, each person, on average, takes more trips and travels more miles than ever before. **Figure 4.2** shows how vehicle miles traveled in Vermont has increased dramatically in fifty years.



Source: VTrans

Figure 4.2 – Vehicle Miles Traveled in Vermont

Much of this increase in personal travel is not altogether surprising, given changes to the Vermont economy and land use patterns in the last 50 to 60 years, and the movement of women into the workforce in the 1970s and '80s. Economic growth has generated more transportation demand while rising incomes have afforded increased consumer spending -- including spending on transportation -- particularly in its automotive form. This, however, is not to suggest that increased automobile traffic is the inherent and unavoidable outcome of a growing economy. Rather, the number of trips and the distance that people travel by car is still controlled as strongly by land use patterns (relative locations for housing, employment, shopping, and recreation, etc.) and availability of car alternatives, as it is by economics.

As discussed in Chapter 2, due to the recent increases in fuel costs, VMT recently decreased for the first time in decades (decreasing 3.3% nationally and 4.5% in Vermont from 2007 to 2008 in the month of August, according to Federal Highway Administration, U.S. Department of Transportation). It is unclear if this downward trend will continue. However, at this point the long-term trend shows dramatic increases in VMT since 1950.

2. Regional Trends in Traffic Volume

The dramatic national and state trends toward increasing traffic volumes are visible within some parts of the Region, while other areas have, so far, seen only gradual changes.

Traffic volume data are measured as Average Annual Daily Traffic (AADT) which is the average number of vehicles per day which use a road in both directions at a given point. The approximate distribution of traffic flow volumes in the Region is shown on the Average Annual Daily Traffic Map (see **Appendix A, Map 5**). High traffic volume areas are largely associated with increases in tourist traffic in the winter and summer. Large traffic volumes can also be seen on roads that link commercial and industrial land uses with residential areas and each other, although increases have been smaller in the past decade. The most noticeable increases have been on I-91, due to its use not only for freight, business and tourist travel, but also for the growing commutershed of the Upper Valley, as discussed in Chapter 2.

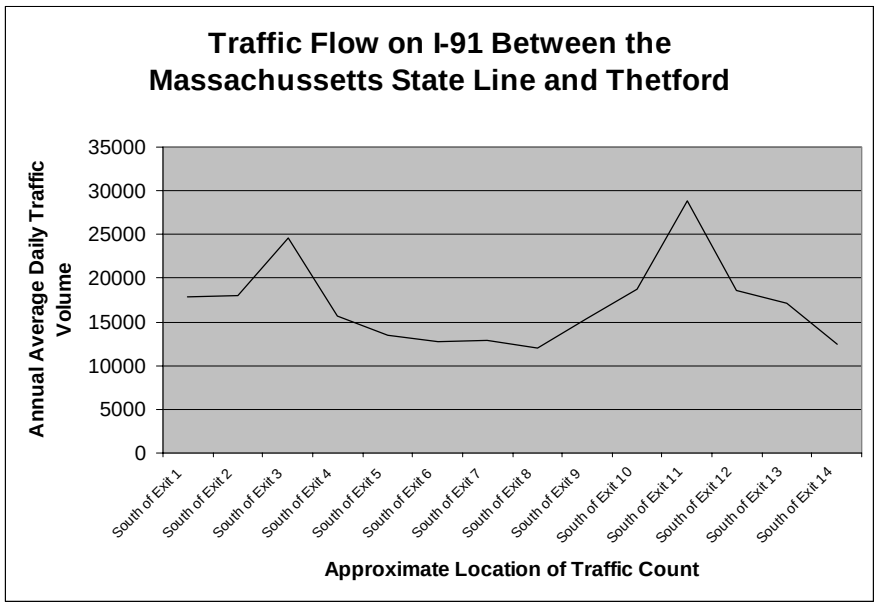


Figure 4.3

Traffic flows along I-91 in southern Vermont (**Figure 4.3**) indicate the centers of activity for this area, with traffic volumes highest near Brattleboro (Exit 3) and the Upper Valley (Exits 10-11). Traffic volumes have grown quickly along this corridor with 6.6% annual increase between 1986 and 2002 (**Figure 4.4**).

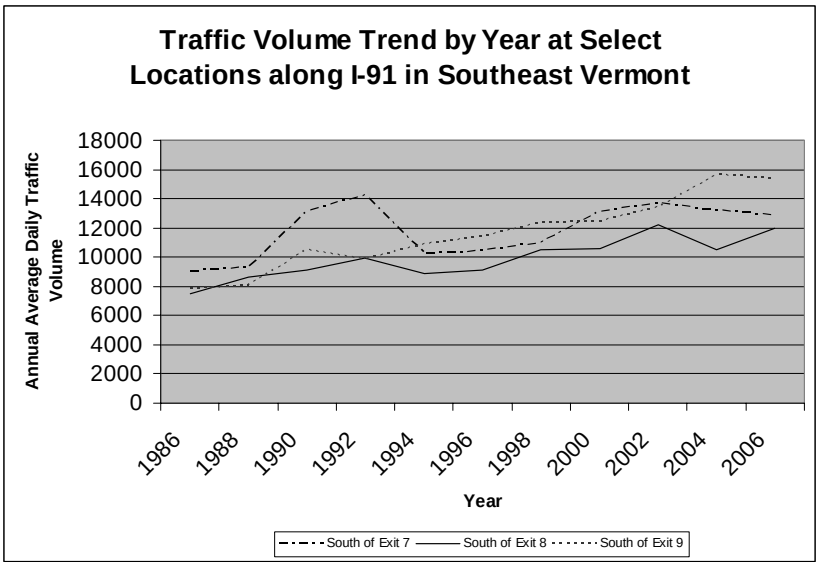


Figure 4.4

Traffic volumes on VT Route 103 (**Figure 4.5**) vary significantly along the sections between I-91 in Rockingham and the Ludlow/Mt. Holly town line. Volumes are highest within the villages of Chester and Ludlow as well as near the approaches to Okemo Mountain Road. Traffic volumes have been increasing steadily in the last decade, a 3.1% annual increase between 1986 and 2002 (**Figure 4.6**).

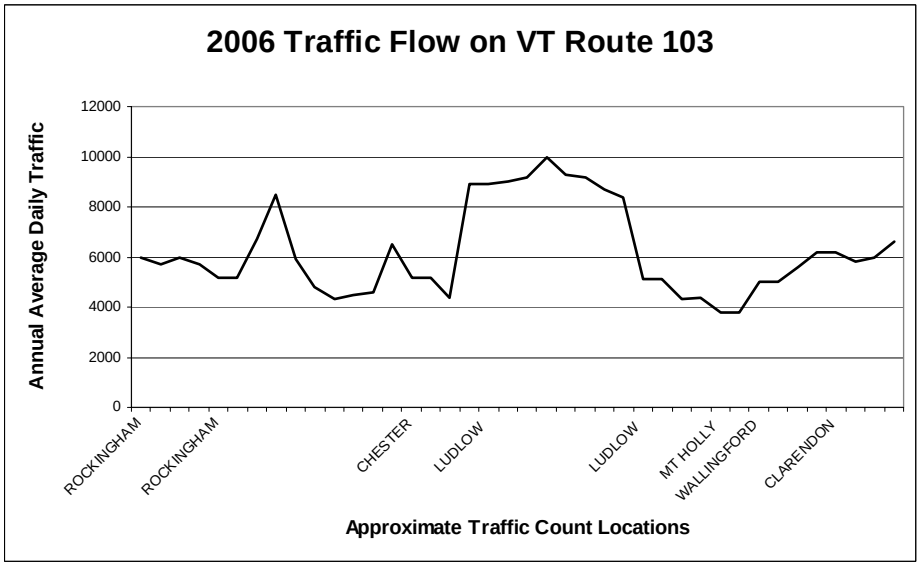


Figure 4.5

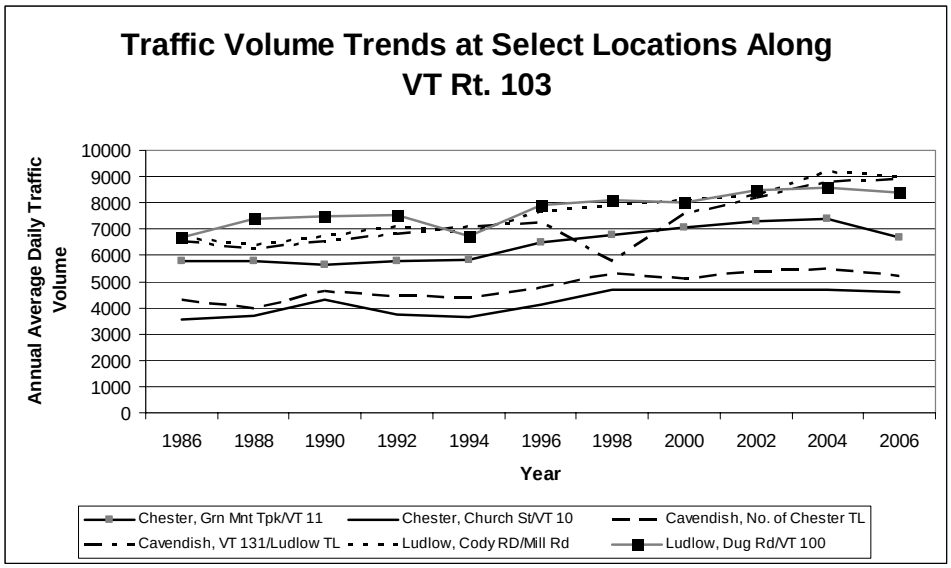


Figure 4.6

3. Future Traffic Volume Trends

Historically, variations in traffic volumes in the Region have fluctuated with local employment, housing trends and, more recently, with fuel costs. In an effort to project future traffic trends, growth rates published by VTrans were used to project traffic growth. These rates are based on state averages for highways by functional classification and are similar to observed historical traffic trends at permanent traffic counter locations on Route 103 in Mt. Holly (1965-2002) and on Route 12 in Claremont, NH (less than 150 ft east of the state line at the Ascutney Bridge crossing) between 1974-2002. The growth rates do not account for 2008 reductions in VMT, but are based on the best available information at the time this Plan was written.

A representative sample of traffic count locations throughout the Region was selected as shown in **Table 4.4** below. The state growth rates represent an approximate 1% annual growth rate. Table 4.4 also shows the projections that result from applying the growth rates for five and 20 year periods.

I-91 and VT Route 103 will likely continue to experience higher levels of traffic volume growth than other highways, due to increasing ski traffic and changing commuter patterns.

To varying degrees, roads throughout the Region will be diversely affected by increased traffic volumes. Roads such as Route 11 in Springfield from I-91 to the former Jones & Lamson Plant currently have sufficient capacity to absorb increased traffic volumes. On the other hand, Route 103 in Chester, Cavendish and Ludlow will continue to experience traffic slowdowns and reduced levels of service particularly during seasonal peaks. Although these projections should not be viewed as definitive estimates of future traffic volumes, they do highlight potential trouble spots and traffic bottlenecks. Given the limited funding for roadway expansions, careful consideration should be given to development proposals in order to maximize the existing capacity of the Region's highway network.

Table 4.4 – Traffic Volume Projections for 5 and 20 year Periods

Town	Route/Road Name	Location Description	Base Year 2007	5 Years * 2012	20 Years* 2027
Andover	VT Route 11	.5 mi W of Gates Rd (TH35)	2,700	2,862	3,294
	Andover/Weston Rd.	.6 mi W of Potash Brook Rd	830	880	1,013
Baltimore	Baltimore Rd	1 mile NW of VT 10	380	403	464
Cavendish	VT 103	Near Ludlow Town Line	8,990	9,529	10,968
	VT 131 (Main St)	.1 mile E of Depot Street	3,300	3,498	4,026
	Depot Street (TH 1)	200' S of GM Railroad	1,100	1,166	1,342
Chester	VT 10	1000' W of N Main St.	3,300	3,498	4,0226
	VT 11	.2 mi E of Green Mtn Tpk	4,100	4,346	5,002
	VT 103	.3 mi W of VT 103	8,590	9,105	10,480
Ludlow	Okemo Mt Rd	300' from VT 103	2,200	2,332	2,684
	VT 103 (Main St.)	B/w Bowker & West Hill Roads	8,600	9,116	10,492
	VT 100	1000' N of VT 103	2,900	3,074	3,538
Reading	VT 44	.2 mi E of VT 106	1,190	1,261	1,452
	VT 106	B/w Tyson Rd & Benjamin Dr.	1,400	1,484	1,708
	Tyson Rd	.4 mi W of Puckerbush Rd.	470	498	573
Springfield	VT 11 (Clinton St.)	Just NW of Nortrax	10,000	10,600	12,200
	VT 106 (River St.)	3.2 mi N of VT 11/N. Main St.	6,400	6,784	7,808
	VT 143 (Skitchewaug)	B/w Maple Dell & Campground	1,110	1,177	1,354
Weathersfield	US 5	Just S of Wilgus State Park Rd	1,600	1,696	1,952
	VT 12 (Claremont Rd)	B/w US5 and NH State Line	9,010	9,551	10,992
	VT 106	50' N of High St.	3,000	3,180	3,660
	VT 131	.2 mi E of Ascutney Notch Rd.	3,200	3,392	3,904
West Windsor	Hartland-Brownsville	.6 mi N of VT 44	1,000	1,060	1,220
Windsor	Bridge Street (TH4)	.1 mi E of US 5	2,800	2,968	3,416
	US5/Main St. (TH1)	B/w Hemlock & Runnemede	6,630	7,028	8,089
	VT 44	.1 mi W of Ascutney/Union Sts	2,870	3,042	3,501
	VT 44A	.1 mi S of I-91 bridge	1,100	1,166	1,342

Source: VTrans, SWCRPC
*Notes: Based on growth factors for rural primary and secondary highways published in Growth Factors and DHV Chart Report (VTrans).

D. Traffic Congestion: Level of Service

Traffic congestion, usually experienced most acutely at road intersections, is the most obvious consequence of rising traffic volume. A concept known as Level of Service (LOS) is often used to characterize how congested or free-flowing a given intersection or road is. **Table 4.5** summarizes the LOS categories.

Table 4.5 – Levels of Service (LOS) for Roads and Intersections

LOS	Category	Description
A	Free Flowing	Individual freedom to maneuver unaffected by other vehicles
B	Stable Flowing	Freedom to maneuver and select speed is beginning to be affected by other vehicles
C	Stable Flow	Freedom to maneuver and select speed is significantly affected by other vehicles
D	High-density flow	High-density but stable flow. Speed and freedom are severely restricted.
E	Operating conditions at or near capacity	All speeds reduced to low, but uniform level
F	Severe backup problems	Where traffic flow exceed the roadway or intersection capacity.

Source: Highway Capacity Manual, 1992

Traffic models have been developed that can help planners estimate levels of service using information on traffic flow, speed, signalization, intersection geometry, and other factors (these models are useful to identify potential problem areas, but cannot fully substitute for direct observation). Whether the amount and frequency of congestion problems is "acceptable" may depend on the judgment of the community or other factors. In general, though, an estimated LOS of D or below is often used to suggest the need for some type of improvement.

Improvements in road or intersection operation are typically achieved by redesigning features such as lane width, number of lanes, designation of turning lanes, adjacent parking, and signalization. One should be careful, however, when examining trends in levels of service, not to see congestion problems only on a case-by-case basis. Other tools of comprehensive transportation planning, including redirecting traffic flow, reducing traffic demand, and land use planning that fosters fewer and shorter trips can also directly mitigate existing or potential congestion problems.

1. Congestion in Southern Windsor County

Traffic congestion is not severe at this time within southern Windsor County; however, several intersections currently have notably reduced levels of service. Problem intersections are generally located within downtown Springfield and in villages along the VT Route 103 corridor. These areas experience varying levels of congestion during peak commuting hours in Springfield, and during peak tourist travel times along Route 103. Tourist traffic generally occurs Friday through Sunday and during holidays. Future projections of traffic flow suggest worsening levels of service in these areas and an increase in the number of problem intersections. Future revisions to the RTP will thoroughly address this issue.

E. Road Sufficiency: Structure, Service, Safety

1. Sufficiency Ratings

In light of the previous discussion of functional characteristics of roads, it becomes important to determine whether the design and condition of the road are adequate or sufficient to accommodate the function that it is serving. An evaluation method known as Sufficiency Rating is used by the State of Vermont to evaluate roads in terms of their need for repair or other improvement. A point value from 0 (completely deficient) to 100 (sufficient in every way) is determined by a weighted combination of scores as shown below.

a. Criteria for Evaluating Road Sufficiency

- Structural Condition (up to 50 Points):
  - Structural condition describes the physical state of the highway and its ability to carry its present traffic load. Points are deducted for problems with the road foundation, earth slides, drainage and pavement conditions.

- Safety (up to 25 Points):
  - Safety evaluations consider design characteristics such as roadbed width, surface width, sight distances, consistency of alignment and grade, as well as accident frequency.

- Service (up to 25 Points):
  - Includes factors such as the efficient movement of traffic, excessive grades, surface width, restricted clearance or any other combination of elements that curtails service to the motorist.

2. Highway Sufficiency in Southern Windsor County

The Road Sufficiency Rating System is based on national standards that may not always be appropriate for Vermont. Sufficiency ratings are useful in assessing the overall condition of the regional roadway system, but should be combined with other criteria and considerations of good judgment when making planning decisions.

Secondly, only roads that have been functionally classified as major collector or higher currently have received a sufficiency rating from the Agency of Transportation. The condition of minor collector and local roads can be evaluated using a method known as the Road Surface Management System (RSMS). All towns have evaluated the condition of their roads with RSMS or a similar system.

Of the approximately 182 miles of highway that have received a sufficiency rating in the Region, 61% (nearly110 miles) fall into the good or fair range while 39% (almost 72 miles) fall below 60 points into the poor and bad range (see Highway Sufficiency Ratings, **Appendices D and E**). It is more useful to see how sufficiency is distributed across functional and town highway categories (**Table 4.6**).

Table 4.6 – Road Sufficiency Ratings by Functional Classifications (Miles)

Functional Class	Good (80-100)	Fair (60-79)	Poor (40-59)	Bad (0-39)
Rural Principal Arterial – Interstate	32.81			
Rural Principal Arterial – Non-Interstate		11.65	4.35	
Rural Minor Arterial	2.57	16.90	10.86	
Rural Major Collector	7.32	12.19	49.20	1.87
Rural Major Collector – Class 2 Town Hwys	0.69	25.53	5.07	0.22
Urban Principal Arterial – Other		0.31		
Total Miles by Sufficiency Rating	43.39	66.58	69048	2.09

Source: VTrans, State Highways = 2001, Class 2 Town Highways = 2003

F. High Crash Locations

In addition to the safety evaluation that is a component of the sufficiency rating, it is useful to examine high crash locations (HCL) in the Region (see High Crash Locations Map – **Appendix A, Map 6**). HCL are either road segments or intersections where the actual crash rate exceeds the crash rate that would be statistically expected, on average, for that specific category of highway (called the critical rate). HCL are also ranked by a severity index -- a measure of the total damage caused by crashes at a given location.

Both the risk and the severity of documented crashes as well as the feasibility of correcting the problem should be considered before planning to make safety improvements at a high accident location.

G. Bridges

In this mountainous and water-endowed Region, traversed and dissected by a high density of streams and drainages, bridges and culvert structures are pivotal components of the roadway network. The 100 state-owned and 84 town-owned long bridges (greater than 20' span) are noticeable features in the Region, while the 70 state-owned and 212 town-owned short bridges and smaller culvert structures are numerous, but easily overlooked. Current discussions of climate change (as discussed in the Energy Chapter of the Regional Plan) suggest Vermont might experience greater rainfall and storm severity in the future. This increased wetness might in turn require increased structure sizes.

1. Bridge Sufficiency Ratings

Like roads, bridges can also be evaluated according to their structural integrity and their functional significance to the roadway network. Unlike roads, however, there is only a single sufficiency rating system for bridges that incorporates structural, operational, and functional considerations. A bridge sufficiency score from 0-100 is assigned based on the criteria shown below and in **Table 4.7** (see **Appendix F**). Based on available data from VTrans, 23% of the 168 long bridges in their sufficiency database are in poor enough condition to be federally eligible for replacement. Additionally, 42% are eligible for rehabilitation and 35% are in relatively good condition. Furthermore, 28% are rated as "structurally deficient" and 9% as "functionally deficient."

Table 4.7 – Bridge Sufficiency for Region

Bridge Type	Eligible for Replacement	Eligible for Rehabilitation	Other
	(0-50)	(50-80)	(80-100)
State Long Bridges	10	41	30
Town Long Bridges	34	28	19
State Short Bridges	n/a	n/a	n/a
Town Short Bridges	n/a	n/a	n/a

Source: VTrans
Notes: Long Bridge = >20 feet in length

There are not enough funds at the present time for the state or towns to do adequate rehabilitation, which, if deferred, will lead to much more costly future reconstruction.

Three of the town-long bridges rated as "eligible for replacement" were replaced within the last two years.

Short bridges are not evaluated in the same manner. Towns maintain culvert and bridge inventories and condition assessments for all structures on town highways.

Criteria for Evaluating Bridge Sufficiency

- Structural Adequacy and Safety (up to 55 Points):
  - Condition of superstructure, substructure or culvert to support traffic.

- Serviceability and Functional Obsolescence (up to 30 Points):
  - Evaluates other maintenance and performance issues, the volume of traffic that the bridge serves and the ability of the bridge to accommodate current traffic demands.

- Essentiality for Public Use (up to 15 Points):
  - Evaluates the impact of retiring the bridge in terms of traffic volume and length of the consequent detour.

H. Parking Facilities

The availability of parking spaces is often a key issue for economic development. For the Region's significant traffic-attracting areas, parking can be a dominant transportation issue, particularly in downtown commercial districts and recreational areas. Parking issues in the Region's villages usually revolve around the number of on- and off-street spaces available. Successful parking solutions, however, should also consider the distribution and design of parking facilities to fit into existing circulation patterns and the aesthetic character of downtown and village districts. **Table 4.8** summarizes the parking conditions in some of the Region's villages.

Table 4.8 – Parking Inventory in Selected Downtowns and Village Areas

Town	Parking Inventory	Issues
Chester	* On-street parking spaces * Few small (<8 Space) commercial off-street lots * No large private or public lots	Parking is not judged to be a significant issue at present
Ludlow Village	* 92 designated on-street spaces * 304 off-street spaces * No municipal lot	Total capacity is adequate, but on-street parking is used by employees and other long-term users instead of shoppers and visitors. New development mandated to provide sufficient parking. Investigating potential sites for municipal parking lot.
Springfield	* 113 on-street spaces * 107 municipal off-street spaces * 590 commercial off-street spaces (476 at Plaza Shopping Center)	Parking can be difficult to find in core commercial district. Problems with employee and other long-term period parking in on-street spaces; inadequate enforcement of two hour limit. Considering new municipal lot or structure.
Windsor	* 132 designated on-street spaces * Estimated at least 150 private off-street spaces * Approximately 50 municipal lot spaces	Capacity appears adequate at present, but foreseeable need for more parking. New municipal lots are proposed, including 31 new off-street spaces and 6 on-street spaces.

Source: Town Staff 1994, SWCRPC

Parking, while important for businesses and civic activity, also should be recognized as a source for potential problems. Parking is very expensive to build and maintain. Parking lots

also generate stormwater runoff and are likely non-point pollution sources. Designs can make parking areas function better and mitigate drainage issues. Free parking is also a tremendous incentive for automotive use. Coordinated private or large municipal lots in downtown or villages areas, combined with safe pedestrian accommodations can facilitate more efficient traffic circulation patterns and preserve highway and intersection capacity.

I. Environmental Issues

Maintaining the environmental qualities that make this Region special is a basic goal of this plan. This section outlines current environmental issues that should be addressed in the planning, engineering and construction phases of all transportation projects.

1. Air Quality

Air quality is an important aspect to the Region's environment as poor air quality can have serious adverse effects on natural resources and human health.

Vermont currently has good air quality, relative to the US Environmental Protection Agencies (EPA) air quality standards. According to these standards, Vermont's air quality is in "attainment," which means that no special remediation is needed at this time. In addition to these federal standards, Vermont instituted a State Air Pollution Control Program in 1970 to protect Vermont's environment (Long-Range Transportation Plan, VTrans 2002).

Despite having relatively good air quality now, certain trends threaten to worsen the air in this Region. The increasing use of motor vehicles and ever increasing use of electricity are key sources of air pollutants that, if left unchecked, may make Vermont an area of EPA "non-attainment."

According to the EPA, motor vehicles, including automobiles and trucks, contribute more than half of New England's nitrogen oxide emissions. Nitrogen oxide is a key ingredient in the formation of ozone smog. Motor vehicles are also sources for particulate matter, air toxics, carbon monoxide and carbon dioxide. These pollutants pose serious health risks for the public, especially for people with respiratory problems as well as children and the elderly. Smog also reduces visibility and detracts from the scenic vistas in this Region

Factors that can contribute toward a reduction of air pollutants – and thus help to maintain our good air quality – include, but are not limited to:

- Reductions in motor vehicle miles traveled;
- Improved motor vehicle fuel economy;
- Increased use of alternative fueled vehicles, such as natural gas and bio-diesel;
- Increased efficiencies in the shipment of goods and services;
- Community development that encourages alternative modes of travel.

2. Stormwater Issues

Stormwater drainage is an important consideration in transportation planning. Draining stormwater off road surfaces is one of the primary goals to maintaining a road in good

condition. Allowing water to collect and stand on roadways not only poses a safety risk for motor vehicles, but also increases the potential for roadway deterioration exponentially. Therefore, maintaining proper drainage systems on all roadways and paths is desirable in order to help maintain the Region's transportation system.

Stormwater runoff is an important environmental consideration for all transportation projects. Stormwater refers to rain and snow-melt caused water that collects on the built environment, including roads and parking lots. If treated improperly, stormwater can cause soil erosion, water quality degradation and even infrastructure damage or loss during large storm events.

There have been recent regulatory changes to stormwater, including 10 V.S.A. § 1264 and Phase II of the US EPA stormwater program. Regulatory stormwater issues are discussed in the Natural Resources Chapter of the Regional Plan.

Best Management Practices (BMPs) should be used at all times to minimize impacts from stormwater. BMPs refer to the proper siting of development and engineering techniques that utilize good stormwater management techniques. Such techniques might include:

- Minimizing impervious surfaces;
- Maintaining adequate vegetated buffers along all surface water bodies;
- Vegetating or stone-lining ditches to reduce soil erosion;
- Use a variety of techniques to slow the flow of stormwater, filter sediments and facilitate maximum ground water infiltration.

All transportation surfaces can contribute to stormwater problems, even hiking paths and driveways. Dirt roads are also a concern, since many of the rural roadways are in close proximity to rivers and streams, and may be a source for sedimentation. The Vermont Better Back Roads Manual (George D. Aiken and Northern Vermont Resource Conservation and Development Councils, 1995) is an excellent resource on BMPs and ways to mitigate stormwater.

3. Other Environmental Issues

It is also important in the construction and reconstruction of roadways to balance the desires for motor vehicle safety with preserving natural, cultural and historical resources. Roadway projects should employ appropriate designs as to be sensitive to the environment and not adversely impact the function and aesthetics of the Region. For example, avoiding fragmentation of wildlife travel corridors, or upgrading culvert sizes appropriate to drainage area, and to accommodate aquatic organism travel and minimize maintenance.

J. Transportation Implications

All parts of the roadway network are not created equal. Each road, bridge, and parking space plays a different functional role for motorists, bicyclists, and pedestrians. Roads and streets comprise many of the Region's most important public spaces, contributing their own character and value to the community. Maintenance, improvement, and other transportation

projects will change the role and character of roads and the communities they pass through over time, hopefully for the better.

Sustaining roadway infrastructure is, however, costly. Therefore, choices must be made as to how to prioritize project funds. Choosing wisely requires an understanding of the transportation, land use, and social context of the roadway network. The incumbent challenge is to insure that road-related projects complement and enhance, as much as possible, the Region's economic, social, and environmental goals.

ROAD NETWORK GOALS

1. To preserve and maintain the existing system of transportation facilities and services; expand the system only if there is a clearly documented and defined need and no other alternative is feasible.

2. Preserve and maintain the function of all state and regional highway corridors for the safe and efficient movement of people, goods and services.

3. Promote transportation infrastructure decisions that meet the needs of the Region's businesses, and foster economic growth and diversity consistent with local and regional plans.

4. Encourage a multi-modal transportation network, including roadway design, construction and maintenance, that minimizes negative impacts on the environment, historic and cultural resources.

ROAD NETWORK POLICIES

1. The Regional Plan ,including the Regional Transportation Plan, should be used to guide the reconstruction of the Region's roads and highway network.

2. Encourage the accommodation of increased transportation demand within the constraints of the existing transportation network.

3. Encourage the preservation and maintenance of the function of the VT Route 103 corridor as an important regional, state and national highway, and state truck route.

4. Encourage the maintenance of existing infrastructure, including rehabilitation or in-kind replacement of deficient roads and bridges, rather than new construction or reconstruction.

5. State and Town Highway projects should use the existing road alignments. Maintenance or rehabilitation will be given priority over increasing speed or capacity.

6. Encourage economic growth along state highway corridors that is consistent with smart growth principles and does not degrade the function of the transportation system for any transportation modes.

7. Encourage cost-effective efforts to increase safety and efficiency in the use, maintenance and performance of transportation infrastructure.

8. Preserve existing public rights-of-way, including roadways, Class 4 town highways, legal trails and other transportation facilities, for future use.

ROAD NETWORK RECOMMENDATIONS

1. Support increased funding for the local transportation network including the Town Highway Structures Program, Town Highway Bridge Program, State Aid Town Highway Grants, Town Highway Class 1 Supplemental Grants, and Town Highway Class 2 Roadway Program.

2. Continue to collect data to better understand the types of users on the Region's highways such as motorists, commuters, bicyclists, etc.

3. Work with Towns along state highway corridors to inventory and assess access management constraints.

4. Work with local Planning Commissions to develop access management regulations for inclusion in zoning bylaws.

5. Continue the planning process for the VT Route 103 corridor that involves towns, the State and private corporations with an interest in maintaining the integrity of the corridor.

6. Promote the preservation of historic resources by encouraging in-kind replacement of bridges and discourage road widening within village settings.

7. Assist communities develop parking plans and identify potential funding sources for public parking facilities.

8. Work with communities and VTrans to improve safety at high crash locations.

9. Continue to study highway corridors and work with communities and VTrans to implement identified solutions to maintain capacity, and improve safety and access for all modes of travel.

V. Alternative Modes of Transportation

While the roadway system is the primary transportation infrastructure in the Region, other modes of transportation are vitally important for the economy and for the mobility of residents and travelers. A goal of the RTP is to encourage a fully multimodal network, providing reasonable travel and freight choices in this Region. This section details the current conditions and issues of these other modes of transportation.

A. Rail Service

Rail service, as discussed in this section, is comprised of both passenger rail and freight services. Each is respectively discussed below.

In 2006, VTrans completed an update of its Rail Policy Plan which evaluated the overall operating structure and financial arrangements of rail services operating in the State, and presents policies which address the present, near-term and long-range needs of Vermont's railroad industry. The policies encompass the protection and maintenance, of the State's existing railroad assets and the responsibilities of both the public and private sectors as the Vermont rail system is expanded. The plan addresses the issues and associated policies of both passenger and freight.

In this Region, considerable interest has been focused on the possible expansion of both passenger and freight rail service provided by Green Mountain Railroad (GMR), which runs between Bellows Falls and Rutland. A few railroad bridge replacement projects on the GMR line are included in the Capital Program (FY 2009) and the Statewide Transportation Improvement Program (FFY 2009-2012).

1. Passenger Rail Service

The State of Vermont has had a longstanding interest in trying to link Vermont by rail with other larger cities in New England and points beyond. Given the small population of the State, extra efforts will need to be made to increase the level of service for passenger rail services. Within Vermont, VTrans should consider the potential of tourist train services. Expansion of passenger and freight rail service will be constrained until better maintenance and improvement programs are initiated for the rail infrastructure.

a. Amtrak

Amtrak passenger service currently passes through the Region twice daily along the New England Central Railroad tracks. The "Vermonter," with service between St. Albans, VT and Washington D.C., currently stops in Windsor, as well as in nearby White River Junction, Bellows Falls, and Claremont, NH (See Regional Transportation System Map). This daytime service, which replaced the Montrealer in 1995, is geared more to the needs of tourists rather than business travelers. The State of Vermont currently subsidizes the Vermonter to maintain services in this portion of the State. The uncertainty of long-term Amtrak funding may lead to further cuts in passenger rail service.

Amtrak also serves Vermont on the western side of the State with the "Ethan Allen Express," which provides service from New York City to Rutland, via New York State. The Ethan Allen has a shorter travel time to New York and has provided competition for Vermonter ridership.

Ridership on both the Vermonter and Ethan Allen trains declined significantly between 2000 and 2006 based on a number of factors, including a reduction in the number of trains and increases in competitive airline travel. However, in 2007 ridership increased nearly 17% and revenues increased nearly 14% for the Vermonter. There were over 107,000 riders on both lines in 2007.

A "Knowledge Corridor" planning project is now underway, administered by the Pioneer Valley Regional Planning Commission in Massachusetts. The study is intended to explore the feasibility of increasing the speed of existing passenger rail service between New Haven, Connecticut and Springfield, Massachusetts, with continued service to White River Junction. As part of this study, reestablishing Amtrak service on the Connecticut River Line in Massachusetts is being considered. With track upgrades, this would greatly enhance the current service and reduce travel times.

b. Green Mountain Flyer

The Green Mountain railroad provides tourist-oriented passenger service on the "Green Mountain Flyer" between Bellows Falls and Chester, VT. This special scenic excursion service is available from early summer through the fall with expanded service to Ludlow during fall foliage season.

Okemo Mountain Resort, with assistance from the State and the RPC, contracted with Rail Trac Associates to complete a Passenger Rail Study on the GMR line completed in 1999. The study included survey results and an engineering study to determine the feasibility of expanding passenger service on the GMR line. The survey consisted of skiers, travel agents, ski clubs and other recreational groups, and commuters in the greater New York City area. The skier survey showed that, of the 699 respondents, 73% would use train service if available. Of the 227 commuters surveyed in the New York City area, 64% said they would consider using a ski train. Travel agencies interviewed were generally in favor of the ski trains; ski clubs indicated they would be interested if the packages were attractive and the schedule was accommodating.

The engineering portion of the Passenger Rail Study indicated that extensive track improvements would have to be made in order to accommodate Amtrak trains at higher speeds (55mph). The study concluded that such improvements are feasible, but are very costly.

2. Freight Rail Service

Without freight rail service there would be no passenger rail service. Freight rail is an important mode for shipping commodities, and can offer greater economies of scale than

trucking for certain commodities.

a. New England Central Railroad

New England Central (NEC), a subsidiary of RailAmercia, operates the most heavily utilized rail line in the State, composed of three subdivisions. These are: the Palmer subdivision, extending from Palmer, MA to Windsor, VT; the Roxbury subdivision, from Windsor to St. Albans, VT; and the Winooski subdivision, from Essex Jct. to Burlington, VT. Two of these subdivisions, the Palmer and the Roxbury, directly impact the Region. Unlike the GMR, the NEC is a higher speed line.

Recent improvements to the clearance of the Bellows Falls tunnel increased the freight capacity of both the NEC and GMR lines.

b. Green Mountain Railroad

The Green Mountain Railroad (GMR) became affiliated with the Vermont Rail System in 1997. GMR provides freight service through a lease agreement with the State of Vermont. Its service area lies between North Clarendon, VT and Cold River, NH with stops in Chester and Ludlow. The Green Mountain Railroad links with the New England Central Railroad in Bellows Falls and VT Railway in Rutland. The primary regional user of freight service on GMR is Luzenac America, Inc., located in Ludlow. According to the Vermont State Rail and Policy Plan, portions of the rail line are identified for improvement in the near future to accommodate the demand for heavier weight carloads.

3. Transportation Implications

The Vermont Statewide Freight Study completed in 2001 concluded that while opportunities for expanded use of the GMR line for freight hauling are limited, there are some specific initiatives to focus on. Cavendish has a limited amount of land near the GMR near the intersection of Routes 103 and 131. Chester has portions of its industrial section that could allow for rail-oriented industrial development along the GMR line. Ludlow's Municipal Development Plan calls for the development of a rail site in its Dean Industrial Park.

The State freight study shows that there is limited opportunity for shipment by rail. With the current emphasis on "Just-on-time delivery" for certain commodities, railroads are limited to freight whose delivery is not time-sensitive. But there is opportunity to expand the use of rail for such freight as Liquefied Petroleum Gas (LPG), sand, gravel, which are very seldom carried by the GMR, and commodities that are a large portion of its freight, such as, talc from Luzenac, limestone slurry from OMYA, livestock feed, and logs and lumber, that are not time-sensitive for delivery. Two industries that would most likely use the line more are the LPG and logging industries. To a lesser extent there is an opportunity for the shipment of sand and gravel to and from the Rutland area. To facilitate this expansion, infrastructure would need to be developed along the line to encourage this type of use. The study agreed that upgrading the line to Federal Railroad Authority Class 2 or Class 3 standards would serve to entice more use of the line for freight hauling, although the increase in speeds as a result of the upgrades would benefit passenger service the most.

"Time-sensitive" goods are most often shipped by truck, which can more precisely schedule delivery. Overhead traffic (i.e. freight that does not originate or terminate in Vermont) makes up the majority of the carload traffic on the GMR. In 1998 overhead traffic consisted of 5,688 carloads, which was 64% of the carload traffic on the GMR, up from 1,882, which was 53% in 1996. Expansion of overhead traffic, in particular automobile carloads and double-stack carloads, is limited, not only by the condition of the track, but also by the tunnel at Bellows Falls, which is too small for these carloads. Recent upgrades to the Bellows Falls tunnel on the NEC line allow for automobile carloads and double-stack carloads, which will help to expand freight rail service.

The Town of Windsor, which is on the NEC, has passenger service with the Amtrak "Vermonter." Freight rail service is available in Windsor's downtown industrial area, and is a preferred alternative to local industrial trucking activity in the downtown.

Increased use of the GMR and the NEC tracks for both freight and passenger service has the potential to alleviate some of the traffic and safety problems on US Route 5 and VT Route 103.

B. Air Service

The Region is currently served by numerous commercial and general aviation airports. All but one airport is located outside of this Region. The large commercial airports are located in Manchester, NH; Hartford, CT; Boston, MA; and Burlington, VT. These airports provide service for domestic and international flights. In addition, Lebanon Municipal Airport and Rutland State Airport provide general aviation and limited commuter service within New England and the Northeast. For general aviation, the Region is served by Hartness State Airport in Springfield and Claremont Airport in Claremont, NH. See **Table 5.1** below for a summary of these airports.

1. Hartness State Airport

Hartness State Airport, located in Springfield and owned by the Vermont Agency of Transportation, has two runways. Hartness State Airport is the oldest in Vermont. According to the Vermont Airport System and Policy Plan, the airport is a fixed-base operation for general aviation service and has the second longest runway in the State, after Burlington (VTrans, 2007).

Federal Aviation Administration (FAA) funding generally pays for 90 percent of aviation projects. Vermont state policy is to use State funds to match FAA grants at state airports. FAA funding is provided through user taxes which are saved in a trust fund (VTrans, 2007).

At Hartness, Crown Point Aviation provides fixed based operator services, including aircraft maintenance, storage, fuel, charters, and flight instruction. It is one of only a few businesses offering flying lessons and aircraft rentals in the State. Hartness is a center for glider activity, with Celtic Air providing powered tows for gliders (VTrans, 2003).

In 2003 VTrans completed an analysis of the economic impact of airports and published the Economic Impact of Vermont's Public-Use Airports. According to that study, Hartness is

estimated to have over $1.2 million in economic impact in terms of business sales and public sector expenditures. Several local businesses, including Hancor and area machine tool parts companies, use the airport for company business. It is also used by Vermont Fish and Game Department, State Police, National Guard, Civil Air patrol (CAP) and by local hospitals for medical helicopter refueling. According to the study, the airport is also used for private aircraft services by a number of second home owners. The airport is also used for tourist related activities.

Table 5.1 - Regional Airport Summary

Airport	Type	Ownership	Runway Length	Est. Annual Commercial Enplanements	Est. Annual Tons of Cargo	Est. General Operations (Annual)
Claremont	GA	City of Claremont, NH	3,100' 1,600'	N/A	N/A	10,000
Hartness State	GA	State of Vermont	5,498' 3,000'	N/A	N/A	16,500
Lebanon Municipal	GA/CO	City of Lebanon, NH	5,496' 5,200'	N/A	N/A	47,000
Rutland State	GA/CO	State of Vermont	5,000' 3,170'	5,400	550	24,540
Burlington International	GA/CO	City of Burlington	8,320' 3,611'	525,000	9,000	129,945
Manchester	GA/CO	City of Manchester, NH	9,247' 6,850'	1,380,000	90,500	25,000

Sources: VTrans, NHDOT, UVLSRPC, SWCRPC

Notes: GA = General Aviation; CO = Commercial Aviation; All runways have asphalt surface unless otherwise noted.

2. Transportation Implications

All airports are important to maintain since building new air facilities is difficult and expensive. Hartness, Claremont and Lebanon airports provide important functions for general aviation, hospitals, National Guard and CAP operations, and are significant for economic development. Tourism is an important market for these airports. Hartness Airport is in close proximity to ski areas, golf courses and many other tourist destinations and/or special resources. Hartness State Airport is underutilized. Improvements, such as marketing and airplane-to-bus connections, might benefit tourism use of Hartness.

Burlington and Manchester airports are important to residents of this Region for domestic and limited international flights. The airports in Boston and Hartford, CT are important for domestic and international flights. Improved public transit connections to these airports may improve local access to these facilities.

C. Public Transportation

The primary functions of public transportation are to provide mobility for people with limited access to transportation, to offer transportation choice as part of a multi-modal

system, and to interconnect bus, rail and air transportation systems. Public transportation can provide an important community service to commuters, the elderly, the physically disabled, school-aged children, and those who do not have access to an automobile. It also serves an important economic development function by providing access to quality jobs, shopping and other services. The types of service include: fixed-route bus service and demand-responsive service (door-to-door phone-in service), such as Medicaid and human services-related transportation. Volunteers also play an important but less visible role in meeting unmet transportation needs.

1. State Transit Planning

As required by legislation passed in 1998, VTrans adopted a Public Transportation Policy Plan in 2007, an update to the first Plan adopted in 2000. In addition, a Public Transit Advisory Council (PTAC) was formed to implement the plan and other public transit issues. The three primary policies in the Public Transportation Policy Plan are:

1) The existing public transportation system in Vermont should be preserved and enhanced, provided that specific routes and services are well used by the traveling public.

2) Continuous performance monitoring by VTrans and the boards of directors of the transit providers will ensure that the maximum value is realized from available resources.

3) Additional public transportation funds should be used for services that support and promote the four goals stated in the 24 V.S.A., Chapter 126, §5083.

2. Regional Transit Planning

In 2001, the RPC, the Windham Regional Commission (WRC), and Town and Village Transportation Services (Town and Village Bus) surveyed travel practices and needs and published a Short Range Transit Plan for southern Windsor and Windham Counties. Recommendations from the 2001 Short Range Plan include the following:

- Increase public knowledge of public transit;
- Work with neighboring providers and RPCs to improve and expand the level of service for commuters to work and to vital services;
- Maximize efficiency and effectiveness of existing routes;
- Increase the number of people using public transit for the purpose of getting to work; and
- Promote better coordination between fixed route service and other forms of transportation.

Although Town and Village Bus ceased operations in 2003, Connecticut River Transit (CRT) was subsequently established in November 2003 to operate in the same geographic area in 2004. CRT will be discussed in further detail below.

In support of efficient public transportation, Milligan & Company, a transportation consulting firm, is developing a five-year Short Range Public Transportation Plan in 2008 specifically for CRT. The plan will identify areas of capital expenditures and list recommendations for service expansion.

As part of the RTP, the RPC conducted an analysis of 2000 Census data to estimate the potential need for transit services. The results indicate that approximately half the regional population exhibit transit dependent traits. See Chapter 2 for more details.

3. Existing Transit Services

A number of agencies are involved with providing public transit services in this Region, including senior centers, adult day care centers, hospitals and the Council on Aging for Southeastern Vermont. Intercity/interstate service is provided by Greyhound Lines. CRT offers service in southern Windsor and Windham Counties, including local service in Springfield. CRT also provides commuter services between Springfield and Brattleboro, Springfield and Dartmouth Hitchcock Medical Center (Lebanon, NH), and seasonal commuter service connecting Bellows Falls and Springfield to Okemo Mountain Resort in Ludlow. Starting in the fall of 2008, CRT is offering commuter service connecting Bellows Falls, Springfield, Ludlow and Rutland, in partnership with Marble Valley Regional Transit District (Marble), which provides bus service to the greater Rutland area. CRT also provides dial-a-ride services throughout the Region. Okemo Mountain Resort provides seasonal shuttle bus service for the ski resort within the town of Ludlow and surrounding areas. The Ludlow Municipal Transit System provides local service in the Ludlow area and brings students to the Black River High School in Springfield.

a. Greyhound Lines

Vermont Transit now operates as Greyhound Lines. Greyhound has a regional terminal in White River Junction. Many of Vermont Transit's previous services have been discontinued. Greyhound currently stops in five locations in Vermont, including White River Junction, Bellows Falls, Brattleboro, Burlington and Montpelier. . From the White River Junction terminal, non-stop and direct connections can be made to major cities throughout the USA and Canada.

b. Connecticut River Transit

CRT's mission is to meet the travel needs of area residents with flexible public transit routes, demand response, volunteer and carpool transportation services throughout 26 towns that are convenient, reliable and cost-effective. In its fifth year of operation, CRT has 31 employees, 23 transit vehicles, and an operating budget of $2.9 million for FY 2008. CRT receives revenues from towns, institutions, human service agencies, businesses, Medicaid and rider donations. CRT leverages this revenue to match federal and state transit grants through VTrans for general public, elderly and disabled transportation and medical transportation.

CRT is headquartered in Springfield, but is building a new facility in Bellows Falls in close proximity to I-91, Exit 6. CRT currently offers two in-town routes in Bellows Falls and Springfield, four commuter routes, and dial-a-ride service, including regularly scheduled shopping trips for residents of Chester and Windsor. CRT

ridership has grown rapidly with 58,481 rides provided in 2004, its first year of operation, and 189,718 in 2008.

Current services include:

Commuter/Access to Jobs – CRT currently operates four routes for long-distance access to jobs. These services benefit commuters looking for travel options and to reduce commuting costs. It also helps lower-income commuters access jobs outside of the towns in which they reside. Services provide connections between Springfield and the "Upper Valley," Springfield to Brattleboro, Bellows Falls to Ludlow (seasonally), and Bellows Falls to Rutland via Springfield and Ludlow. The "Upper Valley" includes White River Junction in Vermont, and Hanover and Lebanon in New Hampshire.

In-Town Services – In this Region, CRT offers local in-town service in Springfield.

Medical/Human Service-Related Services – CRT partners with human service agencies to provide a variety of curb-to-curb and door-to-door transportation services, which are described in more detail later in this Chapter. These services are primarily designed to serve the transportation needs of the elderly and persons with disabilities, for medical appointments and programs, and personal daily needs, such as shopping, appointments and access to social activities.

CRT is currently developing a Short Range Public Transportation Plan and revising its marketing strategy.

c. Ludlow Municipal Transit System

Ludlow provides a free public transit system serving the needs of town residents and visitors. Buses run on weekdays along six routes, each serving a different section of town with connections to the Springfield High School and various shopping centers. All of the routes operate on weekdays from approximately 6:45 am to 3:30 pm.

d. Okemo Mountain Shuttle

A private seasonal transportation service is operated by the Okemo Mountain Resort. The Okemo Mountain Shuttle is provided primarily for resort patrons and guests in order to mitigate ski traffic, but is also available to the public. Service is available during the ski season (December through March) on weekends and holiday periods. This system has four main routes. One serves the internal shuttle needs among the various condominium developments and the base lodge. The remaining three routes each make between 14 and 17 loops through town daily, connecting the base lodge with various inns, hotels and motels in and around Ludlow and Cavendish. All routes operate from approximately from 7:00 am to 6:30 pm.

e. Demand-Response Transit Services

Several human service agencies contract with CRT to provide on-demand transit services for medical appointments and various other personal needs. Volunteers in Action (ViA) in Windsor, provides a large number of rides to area elderly and disabled with the intent to keep people connected to their communities. Chester

Cares offers demand-response service for shopping, medical, personal and social trips where public transit is unable to meet the need. RSVP of Windsor County coordinates with CRT, who now provides trips for their clientele.

A major funding source for Human Service Providers (HSP) transportation is the Federal Elderly and Persons with Disabilities program (formerly "Section 5310") which provides funding for purchase of service, provision of service, and for capital improvements (mostly lift-equipped vans). HSP transportation focuses primarily on providing transportation services for seniors, low-income residents who have no access to private transportation, and persons with disabilities.

The RPC is responsible for gathering stakeholders (transit providers and human service agencies) together to determine needs and available service. It facilitates the development of a single application for Elderly and Persons with Disabilities funds that includes all service agencies of Windham County, southern Windsor County, and through Deerfield Valley Transit Authority and CRT.

f. Taxi Services

Taxi services provide important on-demand transportation services that often compliment services provided by human service agencies and public transit providers. Only a small number of taxi companies serve this Region. A listing of taxi cab companies serving the Region and descriptions of their service areas is found in **Table 5.2**.

Table 5.2 Taxi Cab Companies in the Region

Companies	Service Area
City Cab and Limo	Claremont, NH
Days In Town Taxi	Springfield, VT
Plaza Cab	Springfield, VT
P & P's Twin State Taxi	Upper Valley
Upper Valley Taxi	Upper Valley

Source: Yellow Pages, 2008

As suggested in Chapter 2 of this Plan, people exhibiting transit dependent traits could benefit from expanded taxi service since they are limited financially or physically from maintaining and operating a vehicle.

g. Connections Between Providers

Transit providers are working to coordinate services to provide connections offering greater geographic access for riders. Services for CRT, Okemo and Ludlow are reasonably coordinated, allowing for some connections between different bus systems, but improved coordination would benefit riders. Connections in Brattleboro are possible between CRT and Deerfield Valley Transit Authority (DVTA), with DVTA's route between Brattleboro and Wilmington. CRT riders can also connect in Brattleboro with the Beeline, which is operated by the municipality. CRT and Marble Valley Regional Transit District are providing fully-coordinated service between Bellows Falls and Rutland, with a transfer in Ludlow. Connections

can be made between CRT and Advance Transit at major service centers, including downtown Hanover, NH and Dartmouth Hitchcock Medical Center, in Lebanon, NH. Bi-state coordination is also important to address existing commuter workflows in the Connecticut River valley area, including connections to Claremont and Keene, as well as more services to the Upper Valley. The RPC will continue to explore ways to increase coordination and improve service connections, including identifying specific connections on route timetables and posting that information on transit providers' websites, along with links to the connecting schedules of the other providers.

D. Bicycle and Pedestrian Facilities

Over the past three decades, national bicycle and pedestrian activity has increased significantly. However, these popular leisure time pursuits, featuring health as well as recreational benefits, have yet to be fully utilized as a practical mode of transportation. With the advent of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and subsequent reauthorizations (TEA-21 and proposed SAFETEA), the emphasis has been placed on achieving a balanced intermodal transportation system that addresses alternative forms of transportation. One means of advancing this goal is the provision of bicycle and pedestrian facilities. The term bicycle and pedestrian facilities is used as a general term that denotes improvements and provisions made to accommodate or encourage bicycling and walking, including parking facilities, maps, bikeways and walkways, sidewalks, and shared roadways not specifically designated for bike or pedestrian use.

Many communities are examining bicycle and pedestrian facilities as a means of linking activity centers and creating a pedestrian-friendly environment, particularly in downtown and village centers. These efforts are often combined with a larger program to address issues such as parking, traffic congestion, economic development and the preservation of community character. Regulatory issues and public perception of these facilities has slowed or stopped the progress of a few projects in this Region.

The 2000 Census indicated that approximately 4.89% (599) of the Region's working population traveled by bicycle or walked to work, a slight increase since 1990 (4.4%). In comparison, nationally, bike and pedestrian commuters comprised 3.3% of the commuting population, a decrease since 1990 (4.3%).

1. Regional Bicycling and Walking Plan

In 2006, the RPC completed an update of the 1997 Regional Bicycling and Walking Plan (BWP). The BWP provides an inventory of the Region's popular bike touring routes and makes recommendations for addressing bicycle and pedestrian needs in the Region. It is the general policy of the RPC that bicycle and pedestrian needs should be considered in all transportation projects. The BWP provides a prioritized list of road and bridge improvements at twelve sites within the Region, which will improve bicycle and pedestrian conditions in the Region. The BWP references the Pedestrian and Bicycle Facility Planning and Design Manual (VTrans 2002) as design guidance for the Region.

2. Bicycling

Bicycling is one of the most energy efficient modes of transportation, but is limited in distance of travel for most cyclists. National statistics indicate that the average length of a typical bicycle trip is two miles. Bicycling can be combined with intermodal connections to transit buses with bike racks to increase travel distances. Alternative modes of travel, including bicycling, can be expected to increase as gas prices continue to remain high and/or increase.

Bicycle facilities designed for transportation, recreation or combined uses can provide a viable alternative to single-occupant vehicle travel. Well-designed facilities provide safe bicycle access and improve travel choices. In addition, they can encourage improved physical and emotional health, empower children with independent travel, and contribute to mitigating traffic congestion seasonally. These benefits also serve to making the Region more attractive for living, working and shopping.

a. Bicycle Facilities

Currently existing or planned bicycle facilities in the Region include:

- The Toonerville Trail is a shared-use path in Springfield along the Black River southeast of the downtown, and opened in the fall of 2000. VT Route 11 in the Town of Springfield is appropriately striped and signed as an on-road facility. The Toonerville path and the VT Route 11 on-road facility provide bicycle connections through downtown Springfield east to the Connecticut River.

The Town of Springfield was awarded 2008 Transportation Enhancement Program funding to design an extension of the existing Toonerville Trail, connecting to Bridge Street and the Southern Vermont Recreation Center. The Town anticipates beginning this design process in 2009, and will seek funds for construction within the next few years.

- The Calvin Coolidge Bicycle and Recreation Greenway is planned to run between the Black River and VT Route 103, from the Ludlow-Cavendish Town line to Black River Junior/Senior High School. Cavendish is also planning a shared-use path connecting the village of Proctorsville to the Calvin Coolidge Greenway. The intent of the two projects is to provide a safe bicycling alternative to VT Route 103 and to connect several recreational facilities to the villages.

The remainder of the regional bicycle network consists of the roads network on which bicyclists and motorized vehicles must coexist. These roads are seldom designed to accommodate bicycle traffic. Often the available road shoulder is narrow, resulting in the potential for increased conflict between motorized vehicles and bicycles. In addition, shoulder widths are frequently inconsistent due to abrupt changes in overall pavement width for bridge abutments, guard rails, and railroad crossings. Other obstacles such as certain types of drainage grates and roadside

debris create hazards for cyclists. These features force bicyclists into the traffic stream and increase the possibility of accidents.

Recreational bicyclists, including those participating in tour groups with outfits such as Bike Vermont, Vermont Bicycle Tours, and Backroads Bicycles, use all the major roadway corridors in the Region, including VT Routes 103, 106, 11, and 131. The bike tour groups are viewed by some residents as unwelcome obstacles on the Region's roadways. Others point out that bicycle tour groups provide a significant economic benefit to many area businesses, especially the five inns in southern Windsor County that provide them with accommodations.

b. Transportation Implications

A combination of factors limits bicycle use in the Region, including safety concerns such as the width and condition of the available shoulder; the speed and volume of traffic; steep terrain; weather conditions; distance to employment; availability of adequate bike storage facilities when the destination is reached; and public support and motorist tolerance of bikes on the roadways. Together these factors often create a difficult obstacle to even the most stalwart bicyclist. However, bicycling is popular on the Toonerville Trail and along many of the state highways in this Region. Small networks of in-town bicycle facilities would benefit communities by connecting residential areas with commercial and civic destinations.

3. Pedestrian Facilities

Pedestrian facilities encourage walking for transportation and recreational use, as well as benefit economic development in downtowns and villages. Safe and well-maintained pedestrian facilities also serve to support public transit operations. Walking is the most popular recreational activity with over 71 million or 28% of all Americans engaged in walking as a form of recreation. As part of the public debate on different aspects of transportation issues, the Surface Transportation Policy project conducted a study to measure American's attitudes towards walking. That survey found that Americans would like to walk more than they are currently, but they are held back by poorly designed communities that encourage speeding, and dangerous intersections whose design is inconvenient for walking. The recommendations in Chapter 3 for concentrating future growth in downtowns and village centers would help to address this issue. Other notable findings include:

- Over 50% of Americans say that their communities lack shops and restaurants within walking distance;
- About 30% see changing to less motor vehicle-necessary communities as the answer to traffic problems; and
- The survey found public support for better walking in communities, and specific policies such as designing streets for slower traffic speeds, using more federal dollars to make walking safer and creating walking-friendly routes to school for children.

Pedestrian facilities are vitally important for those who don't drive, especially children and the elderly. Based on anecdotal information, children are often inhibited from walking

because of legitimate parental concern over their safety on the roads. Providing safe pedestrian access to places frequented by the elderly and children can provide improved mobility and independence for non-drivers.

Pedestrian facilities are well suited for areas of concentrated development, such as Regional and Town Centers, connecting residential areas to businesses, civic buildings, schools and recreation areas. Additionally, in some locations parking constraints can make walking from place to place more appealing than returning to a vehicle and repeatedly seeking parking spaces. Encouraging walking in these areas can help to reduce vehicle turning movements and parking maneuvers. Unfortunately many people hesitate to walk for transportation due to the distances between origins and destinations, as well as for fear of the existing road conditions.

Recent land use developments that exhibit isolated and dispersed patterns discourage pedestrian travel. Auto-oriented, sprawl-type development also limits pedestrian access. Land use regulations that encourage compact and mixed use development encourage walking and other alternative modes of travel. Site designs can also encourage pedestrian access and incrementally contribute to a more efficient multi-modal transportation network.

a. Existing Pedestrian Facilities

Pedestrian facilities range from a dirt path through the woods to a paved shared-use path. In many parts of the Region, roadway shoulders provide pedestrian access, which are generally best suited for rural areas. The Toonerville shared-use path provides access for bicycles, in-line skaters, walkers and others. Sidewalks and trails are the most prevalent types of pedestrian facilities in this Region. Each is outlined below.

To varying degrees, communities throughout the Region maintain some form of sidewalk system. The complexity of local sidewalk systems is a function of the size, distribution and density of residential neighborhoods and employment centers. Communities with the largest network of sidewalks and crosswalks include Springfield (35 miles), Chester (4.4 miles), Ludlow (approx. 18 miles), and Windsor (approx. 18 miles). Regionally, towns are struggling to integrate existing noncontiguous segments of sidewalk, retrofit curb ramps to comply with the Americans with Disabilities Act, and overcome fiscal constraints to construct new sidewalks and maintain existing facilities.

Cavendish completed a "Town Green" project in Proctorsville that was funded under the Transportation Enhancements program. The Town also received funding in 1999 to upgrade and expand sidewalks in Proctorsville to provide improved access to the Green and to the Cavendish Elementary School.

Cavendish created a Bicycle and Pedestrian Master Plan to secure funding to upgrade sidewalks in the village of Cavendish. Contract plans were finalized in 2004, and the project is anticipated to go out to bid following the completion of right-of-way related work in 2008.

Weathersfield conducted a planning study to determine pedestrian related safety improvements along VT Route 106 in Perkinsville. In 2008, Weathersfield completed the Exit 8 Interstate Interchange Master Plan which calls for revitalization of the commercial strip development area along VT Route 131, including the provisions of pedestrian facilities and improving the safety of elementary and middle school students that walk along US Route 5 and VT Routes 12/131.

In 2008, Windsor completed construction of the Windsor Welcome Center (WWC) near the train depot. The WWC is a multi-modal visitors' center celebrating the intrinsic values of the Connecticut River. Windsor will also be constructing streetscape improvements and a riverwalk in the area surrounding the Armory Square Apartments at the intersection of US Route 5 (Main Street), Bridge Street and VT Route 44 (Union Street).

Though very successful in the past in securing funds to study and design pedestrian facilities in southern Windsor County villages, the RPC has discovered that new facilities can come under increased scrutiny by local residents opposed to either the cost, the maintenance responsibility, or the perceived impact to "historic" village settings. Future planning for sidewalks and related pedestrian upgrades will be closely reviewed in terms of public perception and support before advancing design and construction plans.

b. Transportation Implications

Pedestrians, similar to cyclists, often share the road with automobile traffic. Whether pathways are shared or separate from the travel lane, obstacles to pedestrian travel exist. Obstacles include: safety concerns; the distance to destinations (0.6 miles is the average distance for walking commuters); the physical condition and type of pedestrian facility; the desirability and aesthetic qualities of the route; and the continuity/connectivity of the route between origin and destination. The ideal scenario for encouraging walking is to provide a separate designated pathway that provides the user with a safe, accessible alternative to motorized vehicles.

4. Safe Routes to School

"Safe Routes to School" is a Federal initiative to getting children to walk or bike to school safely. Evidence suggests that children are becoming increasingly more reliant on motorized transportation to school. This stems from dispersed land use patterns, regional school systems requiring extensive transportation for expanded geographic service areas, parental safety concerns, traffic conditions, lack of sidewalk facilities and/or crossing guards, and bus safety. Many schools are now faced with increasing traffic congestion and parking problems. Safe Routes to School is a growing initiative developed to address some of these issues, and to improve the health of children. Windsor received a grant in 2006-2008 to support walking and bicycling initiatives at the State Street School. Windsor also received over $200,000 in Safe Routes top School Infrastructure funds to improve pedestrian safety in the area surrounding the State Street School (K-6).

5. Trails

An extensive network of hiking, horseback-riding, snowmobiling, cross country skiing, and other multi-purpose trails exists within the Region. The traditional use of multi-purpose trails is for recreation, although these trails also exhibit limited potential to serve a transportation function. The network consists of informal, loosely defined trails, usually traversing private land and often with one specific authorized user group, and formal, well identified trails on federal, state, and town public lands. The multi-purpose trail network is maintained by a number of organizations including the Vermont Department of Forests Parks and Recreation; the US Army Corps of Engineers (Corps); the Ascutney Trails Association; the Vermont Association of Snow Travelers (VAST); and local communities.

Vermont law allows people to hunt, fish and walk on private property without permission unless the land is legally posted. However, getting permission is generally recommended and permission is required for most motorized vehicle activities. According to Public Recreation on Private Land: A Landowner's Guide (VT Department of Forests, Parks and Recreation), an agreement between a recreational organization and landowners to develop or maintain trails on private lands helps ensure the work is done to landowner satisfaction. For example, VAST maintains approximately 5,000 miles of trails, 80 percent of which are on private lands and require landowner permission for snowmobiling access.

In many cases, the locations of many trails are not widely known beyond the local populace.

Trails on public lands include Class 4 Town Highways and Legal Trails as well as specific trails such as Paradise Park Trail in Windsor, and the Weathersfield, Windsor, and Brownsville Trails on Mt. Ascutney. The Corps has also developed a trail system on land managed by it next to the North Springfield Lake. Class 4 Town Highways are typically closed to vehicular traffic in the winter, although many are used for snowmobiling. Legal trails consist of public rights-of-way which, not being highways, the town has no responsibility to maintain.

E. Regional Issues

1. Intermodal Connections

Intermodalism provides seamless connections for travelers and shippers between different modes of transport. Bellows Falls is the site of a planned intermodal center, where passenger rail and bus connections will be facilitated in one central location. Three existing park-and-ride lots facilitate connections between transit buses and passenger cars and potentially also bicycles and pedestrians. The four park-and-ride lots in the area, including Springfield, Weathersfield, Ludlow and Hartland, support transit and carpooling activities. New freight connections between rail and trucking modes would benefit the distribution of certain commodities and should be explored further.

2. Tourism Travel Choices

Tourism is an important economic activity for this Region. Most tourism related travel in this Region today relies on personal automobiles. However, the potential to encourage airplane-to-bus or train-to-bus access to Okemo and Mt. Ascutney ski areas, for example, may prove to be effective. Maximizing such intermodal connections not only would provide

travel choices for visitors to this Region, but also would serve to mitigate traffic impacts on the highway infrastructure and communities.

A Ski Corridor Traffic Management Study was developed for the RPC together with Rutland Regional Planning Commission, Two Rivers-Ottauquechee Regional Commission and VTrans, to study ski resort (Okemo and Killington) related traffic along the I-91, VT Route 103, US Routes 5 and 4 corridors. This study noted that the local public transit systems in Ludlow have been effective in increasing ridership. This study identified transit bus service connections between ski resorts and intermodal centers as strategy. It did not specifically analyze the feasibility of airplane-to-bus or train-to-bus access to Okemo or Mt. Ascutney. Future studies should consider the viability of such services.

3. Park-and-Ride Facilities

Park-and-ride lots are effective in reducing single-occupant vehicle use when they are located along routes that are used by commuters where they have access to transit or ridesharing. According to past studies, ridesharing and the use of park-and-ride lots is most likely to be utilized when park-and-ride facilities are located close to where commuters live, commuters are traveling longer distances and the potential financial savings are greater. Therefore, external commuting patterns (those trips with work destinations outside the Region) are given the greatest weight in determining locations for effective park-and-ride facilities. In addition, park-and-ride lots, when combined with quality transit services, are heavily used compared to lots not served by transit.

The most common external commutes in this Region begin in Windsor, Springfield or Weathersfield. Approximately two-thirds of the outbound trips in the Region had the following destinations (in descending order): Lebanon, NH; Claremont, NH; Hartford, VT; Woodstock, VT; Rockingham, VT; Hanover, NH; and Brattleboro, VT. Since Hartford, Lebanon and Hanover are clustered together and comprise the Upper Valley employment center, this presents the most likely targeted area for investment in increased park-and-ride capacity and commuter transit services.

The RPC conducts regular surveys of the users of the Ascutney Park-and-Ride lot. The majority of the park-and-ride users arrive alone and leave with one other person. Sixty-one percent of respondents were bound for the Upper Valley area and just fewer than 44 percent began their trip from Weathersfield.

There are three (3) existing State-owned Park-and-Ride sites in the Region:

(1) Exit 7, Springfield – This lot was initially developed by the VTrans District Maintenance Office at the state garage site at the intersection of US Route 5 South and VT Route 11. It was typically at or beyond capacity, causing some users to park in undesignated areas, which created problems for maintenance operations. In January 2009, VTrans relocated this lot to the former Texaco gas station property across US Route 5. CRT's Upper Valley commuter service stops at this location;

(2) Exit 8, Ascutney – This lot is used on a daily basis and is often filled beyond its present capacity as defined by the existing paved area and needs expansion, which is planned for 2009. RPC surveys of this lot have indicated that over half of the cars parked in the lot are NH residents. (See Regional Transportation System Map); and

(3) Exit 9, Windsor/Hartland – Improvements have been made to this lot by VTrans, including signs, lighting, landscaping and pavement marking. This lot is also used on a daily basis and is often close to capacity. VTrans has plans to expand this lot to add more parking capacity.

These three lots are very important to the Region for access to employment opportunities. A recent survey conducted by Upper Valley Rideshare suggests that park-and-ride lots served by public transit are the heaviest used facilities. All existing park-and-ride lots are served by CRT for commuter services to the Upper Valley area. The CRT commuter route from Springfield to Hanover, NH stops at the park-and-ride lots at Exits 7, 8 and 9, with all lots close to or over capacity. Greater bi-state coordination is needed to address the lot capacity limitations and the growing Upper Valley commuting activity in the Connecticut River valley.

Under the State's Municipal Park-and-Ride Demonstration Grant Program, a forth park-and-ride lot was developed in Ludlow in 2004. This lot, located on VT Route 103 adjacent to the fire station, is owned and maintained by the Town of Ludlow. It is paved with approximately 20 parking spaces. It is currently lightly used. However, use will likely increase as it will serve the new public transportation service to Rutland.

4. Ridesharing and Carpooling

Ridesharing is a simple, low cost and effective Transportation Demand Management (TDM) technique to reduce single-occupant automobile use, improve access to jobs for certain people, as well as to contribute towards mitigating congestion and improving air quality. Not only is ridesharing an efficient way to move people, it also can save commuters money. According to the American Automobile Association, the average American commuter spent nearly $630 a month in 2001 to own and operate a vehicle. A family could save all or a portion of that money by reducing their need for owning and operating more than one vehicle or by reducing their vehicle use.

Projected traffic increases will likely result in deteriorating road conditions and needed investment in new highway infrastructure unless alternatives are not implemented. Ridesharing can contribute toward a more efficient regional transportation system, thus reducing the potential costs for maintaining and/or expanding this system.

Two rideshare programs serve this Region, including Upper Valley Rideshare and Vermont Rideshare. Upper Valley Rideshare offers a "guaranteed ride home" program might help to encourage increased carpooling activity.

5. Transportation Demand Management

As the number of cars and the miles traveled on the Region's roads continue to increase, air quality, bridge and roadway infrastructure, and quality of life are threatened. Rather than increase capacity to meet rising demand, Transportation Demand Management (TDM) seeks to address the demand side of transportation. TDM programs are designed to maximize the people-moving capability of the transportation system or decreasing the need to travel by automobile. Typical TDM alternatives include car and van pools, public and private bus and shuttle systems, and bicycling or walking.

TDM programs can also include "alternative work hours," such as compressed work weeks and flexible work schedules to allow commuters to shift their work start and end times to less congested times of the day. Another TDM strategy is telecommuting, which allows employees to work one or more days at home, thereby reducing trips to their primary work location. Other strategies include the use of incentives by the employer to encourage the use of these alternative modes, and marketing to remind employees of alternative commuting modes and to remove psychological impediments to their use.

TDM programs should be developed within an overall structure of land use planning. Towns should encourage planned unit developments, planned residential developments or other cluster development within or abutting village centers or other designated growth areas, which allow convenient pedestrian or cyclist access to shopping, services and work for its residents. Such developments would be more efficient for public transit to serve, resulting in not only achieving TDM objectives, but good conservation practices as well.

ALTERNATIVE MODES OF TRANSPORTATION GOALS

1. Promote alternative forms of transportation to lessen dependency on the automobile.

2. Increase the role of rail in the Region's and the State's economic development and multimodal transportation system.

3. Promote the use of air service as an alternative to over-the-road service for the movement of people and goods.

4. Encourage the most effective and efficient use of air service at the Hartness State Airport.

5. Maintain and preserve existing infrastructures and right-of-way for all alternative modes of transportation, including airports, rail corridors and multi-use paths.

6. Develop an intermodal transportation system that serves the transportation needs of the Region's residents in a manner that is compatible with characteristics of the natural, economic, and social resources.

7. Promote the expansion of park-and-ride facilities and public transit to lessen the number of single occupant vehicles.

ALTERNATIVE MODES OF TRANSPORTATION POLICIES

1. Promote the use of rail service as an alternative to over-the-road service for the movement of people and goods.

2. Support efforts to upgrade and improve the rail infrastructure of the Green Mountain Railroad, including tunnel and bridge overhead clearances.

3. Work with member towns to preserve existing rail infrastructure such as rail lines and spur track linkages to the larger rail network.

4. Encourage cooperative marketing and route scheduling between Amtrak and area resorts to increase ridership on Amtrak trains.

5. Encourage towns and operators to improve services available at passenger rail stations, including connections to other forms of transportation.

6. Foster public and private sector interest and participation in planning for full use and enhancement of services for pilots and their aircraft at Hartness Airport.

7. Support efforts to continually study, upgrade, and improve the infrastructure at Hartness Airport.

8. Encourage the use of landing fees and airport lease revenues to support the financial operations of state airports and to establish a baseline for airport activity.

9. Encourage towns to develop or expand public transportation services, rideshare, vanpool and carpool facilities, and programs among the business community.

10. Continue to develop a local, regional, and inter-regional transit system.

11. Encourage increased coordination among all the public transportation providers in the Region and neighboring Regions, for a "seamless" public transportation system.
12. Adopt the Regional Bicycling and Walking Plan as part of the Regional Transportation Plan.
13. Promote transportation in village centers, downtowns, and growth centers which feature bicycle, pedestrian, and other forms of non-motorized forms transportation.

14. Through the development review process, ensure new development incorporates pedestrian and bicycle circulation in site plans.

15. Support the use of rail and intermodal connections to rail as economic alternatives for the movement of goods. Consider the potential for tourist-related passenger rail service.

16. Encourage improvements to the Exit 7 park-and-ride facility to increase capacity.

17. Continue to support the upgrading of park-and-ride facilities at Exits 8 and 9.

ALTERNATIVE MODES OF TRANSPORTATION RECOMMENDATIONS

1. Develop a multi-modal transportation improvement program that is consistent with the goals and objectives of this plan.

2. Encourage local zoning that promotes the use of rail for industrial development in accordance with recommendations of the 1999 Freight study.

3. Advance the Goals and Policies outlined in the 2001 Vermont Rail Capital Investment Policy.

4. Work with Hartness Airport and the local economic development entities to increase the use of the airport.

5. Work with the abutting towns of Springfield and Weathersfield to recognize Hartness Airport in their town plans and zoning regulations.

6. Continue to work with Connecticut River Transit and participating agencies that use transportation funding dedicated for the elderly and persons with disabilities (formerly Section 5310 Program).

7. Include public transit infrastructure concerns in any transportation infrastructure projects in the Region.

8. Work with interested towns to investigate the feasibility of developing bicycle and pedestrian facilities.

9. Implement recommendations contained in the Regional Bicycling and Walking Plan.

10. Work with large traffic generators along the VT Route 103 corridor and other state highways to implement TDM options.

11. Ensure member towns give consideration to the TDM alternative, when increased road capacity is being considered.

12. Provide linkages between the various travel modes such as bicycles, automobiles and buses.

13. Expand existing service and funding to meet baseline mobility needs to ensure all residents have a similar access to transit.

14. Fund "New Starts" under a separate process: Create an incubator program which encourages systems to be innovative and creative in their approaches.

APPENDIX B: GLOSSARY

Average Annual Wage -
The average wage paid per year per employee within a given geographic area.

Average Daily Trip (ADT) -
An indicator of traffic volume. Measured by counting the number of vehicles that pass a certain point. Daily totals are averaged for a given period, usually one year. Often reported as AADT-annual average daily traffic. AADT is corrected f or seasonal variations.

Baby Boomers -
The generation born right after World War II. Their significance is in their size, creating large numbers of people within an age group.

Bicycle Facilities -
A general term denoting improvements and provisions made to accommodate or encourage bicycling and walking, including parking facilities, maps, bikeways, walkways, sidewalks, and shared roadways not specifically designated for bicycle use.

Bikeway -
Any road, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are shared with other modes of transportation or for exclusive use of bicyclists.

Consumer Price Index (CPI) -
An index developed by the U.S. Bureau of Labor Statistics to measure average change in prices over time to consumers. This index is used to evaluate the buying power of the dollar.

Double Stack Containers -
A type of rail transport that involves stacking trailers two high on top of one another while attached to a rail car.

Fixed Route -
Bus or rail service which follows an established route with scheduled stops.

General Aviation Services -
All aircraft, not including military and commercial airlines.

Goods Movement -
The transporting of consumer products that people use.

Human Service Agencies -
Those agencies which provide social services.

Infrastructure -
The underlying foundation or basic framework of a system.

Intermodal -
Providing seamless connections for travelers and shippers between different modes of transport.

Level of Service -
A measure of how traffic-free or traffic-congested a road segment or intersection is. Levels range from A (complete maneuverability) to F (gridlock).

Mean -
Average.

Median Family Income (MFI) -
The midpoint in the range of incomes - as many families earn above this point as below.

Median -
The midpoint in a range of values.

Mobility Limited -
Difficulty related to transportation based on inability to leave home without assistance because of mental or physical limitations.

Multimodal -
Using more than one mode of transportation.

National Highway System -
A federal highway funding initiative intended to insure that all areas of the country are served by highways meeting minimum design, construction, and performance standards.

Paratransit Service -
A sub-category of public transportation which provides service to the mobility-impaired on a regular basis. Para-transit services include demand-responsive transportation services such as shared-ride taxi.

Per Capita Income (PCI) -
The per person income in a given population.

Public Transportation -
Transit systems such as bus, rail, air, and taxi used to convey the general public.

Real Income -
Income adjusted for inflation using a base year "real" $1.00 per the CPI.

Road Classification -
A system for grouping roads into categories according to specified criteria. Useful in inventorying, describing, and discussing roads.

Seasonal Unit -
Vacation housing units used or intended for use only during certain seasons, for weekends, or for other occasional use throughout the year; includes time-shares or shared-ownership units.

Single Occupancy Vehicle (SOV) -
Private vehicle conveying one person.

Sufficiency Rating -
An evaluation of the adequacy of a bridge or road to perform its required functions, based on structural, safety, and service conditions.

Traffic Calming -
A series of techniques used to control traffic and reduce travel speeds that seeks to maximize mobility, while creating more livable surroundings by reducing the undesirable side effects of mobility.

Transit -
Passage; conveyance of persons or things from one place to another.

Transit Dependency-
The need to rely on other sources of transportation.

Transportation Disadvantaged -
Persons who, for reasons of health, age, lack of private vehicle, and/or low income may have a transportation need.

Vehicle-Miles Traveled (VMT's) -
Also known as Total Vehicle-Miles. An indicator of automobile usage over a given time period (usually on an annual basis). Equal to the total number of miles traveled by all vehicles. Estimated using surveys and traffic counts.

APPENDIX C: Funding Sources

The following summary of transportation funds available to Vermont municipalities was developed by Vermont Local Roads. This list has been modified based on recent changes to funding programs. For a more detailed description of programs administered by VTrans, including application forms, refer to the most recent edition of the VTrans *Highways and Bridges Handbook for Local Officials* (the "Orange Book"). For more information, contact your District Transportation Administrator, your regional planning commission or Vermont Local Roads (1-800-462-6555).

HIGHWAYS

1. Town Highway Grants ($23.5 million in FY 2000) (Distributed quarterly)

State annual allocation based on Class 1, 2, and 3 miles. For highway and bridge improvements, maintenance or construction. Funds may be used to maintain recreation paths.

2. Town Highway Class 2 Roadway Program (2/3 State – 1/3 Local)

Distributed by VTrans highway districts and allocated based generally on the number of class 2 miles in the district, although there is some discretion by the DTA. A reduced local match (20%) is available to communities who have satisfactory town highway codes and standards, and a highway infrastructure study. Check with DTA for application deadline which varies by district.

a. Project cap is $150,000.

3. Federal Aid Town Highway Program

State/Federal grants for reconstruction of class 1, 2, or 3 town highways which are on the federal –aid system. 10% local match required. Projects recommended by the regional planning commission's transportation plan and included in the VTrans State Development Program. Not FEMA eligible. These are large rehabilitation projects in the $250,000 to $300,000 range (Severance Hill Road, St. Johnsbury; Bethel Mountain Road, Rochester to Bethel; The Sharon – Strafford Road has been scoped). The State may undertake a project a year on an experimental basis.

4. Public Lands Highways

Funding for projects that are on, adjacent to or providing access to federal public lands such as Green Mountain National Forest or the Army Corps of Engineers. In Vermont PLH funding has been used for the West River Trail, protection of scenic properties along highways and visitor improvement at Quechee Gorge. January application request. First point of contact is the regional planning commission. Also call VTrans 802-828-3966.

5. Scenic Byways Program

For projects including acquisition, development and planning along designated scenic byways. January application request.

Contact VTrans at 802-828-0057.

Bridges and Culverts

6. Town Highway Structures Program (80% State – 20% Local)

Repair or replacement of bridges, culverts and retaining walls on Class 1, 2 or 3 town highways. $150,000 project cap. Check with DTA early January. A reduced local match (10%) is available to communities who have satisfactory town highway codes and standards, and a highway infrastructure study. Application deadline varies by district.

7. Town Highway Bridge Program ($13 million in FY 2000) (10% Local for replacement) (5% Local for rehabilitation)

For the repair, reconstruction or replacement of bridges twenty feet or longer on class 1, 2 or 3 town highways. A list of tentative new projects is drafted by VTrans based on statewide bridge data with recommendations form the DTA.

8. Historic Bridge Program

A program involving FHWA and four Vermont agencies to preserve historic metal, truss, covered, masonry arch and concrete arch bridges. Since municipalities own many, success is largely dependent on municipalities agreeing to the preservation alternatives.

Managed by Local Facilities Program (LTF, see below) at VTrans: 828-3966.

9. Adaptive Use Bridge Program (Metal Truss Bridges)

Part of VTrans Transportation Enhancement Program (Nos. 16 & 17 below) and Historic Bridge Program (# 9 above). Rehabilitation of historic metal truss bridges for adaptive re-use on other sites such as bicycle and pedestrian paths. 20% local match required for 80% federal dollars. No formal application process. Managed by the Local Facilities Program (LTF. P. 5 blow) at VTrans, 802-828-3966.

Erosion Control

10. Vermont Better Backroads Small Grants ($61,000 FY 2000) (1/3 Local Match)

Small grants up to $2,500 either for inventorying and assessing drainage/erosion problems on roads or for actual projects. Projects must impact or potentially impact a waterway. Apply to Northern Vermont Resource and Conservation District by May 1. Source of funds in FY 2000: VTrans: $48,000; VT Agency of Natural Resources: $18,000, EPA Section 319. Call No. VT RC & D 802-828-4595 or VT Local Roads 800-462-6555.

Emergency

11. Town Highway Emergency Fund

Class 1, 2 or 3 town highways damaged by a natural or man made event of such magnitude that financial aid to the municipality is both reasonable and necessary to preserve the public good. Grant amounts are for the cost involved to repair the damage less a deductible of 10% of a town's non-winter budget.

Contact DTA immediately after the disaster occurs to permit timely appraisal of the damage. Complete Damage Survey Report or estimate damage. Complete an application including eligibility justification statement. Submit with a copy of municipality's annual plan to DTA.

12. Hazard Mitigation (3/4 Federal – 1/4 Local)

Following a federally declared disaster, the Federal Emergency Management Agency (FEMA) establishes a fund equal to 15% of the federal dollars dispersed. Municipalities apply for a competitive grant to fund projects that prevent future natural disaster losses. Funds are available statewide even though a municipality is outside the declared disaster area. Funds vary. Application is determined following the federal declaration. Contact your DTA or Vermont Emergency Management 1-800-347-0488.

13. Emergency Funds for 1998 Ice Storm ($4 million from January, 1998 ice storm)

Applications for recovery money are being accepted. Call Ice Storm Recovery Coordinator 802-241-4453.

Local Transportation Facilities (LTF)

Communities which have an interest in managing the development and construction of their own transportation projects should contact the LTF office at 802-828-3966.

To be eligible a project must have a high degree of local focus, be a project under current development by the State and be recognized as a priority through the regional transportation planning process. More than 70 projects are underway: bridges, railroad crossings, many bicycle and pedestrian facilities.

LTF also manages the Historic Bridge Program (#10 above) and the Adaptive Bridge Program (#11 above).

14. Transportation Enhancement ($2.4 million in 2000) (1/5 local)

Competitive federal grants are available form the VAOT for such projects as:

- Pedestrian and bicycle facilities
- Acquisition of scenic easements or historic sites
- Scenic of historic highway programs including tourist and welcome centers
- Landscaping

- Historic preservation
- Preservation of abandoned railway corridors
- Control and removal of outdoor advertising
- Archeological planning and research
- Mitigation of water pollution due to highway runoff
- Traffic calming
- Transportation museums
- Safety and education activities for pedestrians and bicyclists

About 20 out of 60+ applications are funded yearly. Early September letter of intent and an early November deadline. (In January 2000, $2.4 million funded 23 projects)

Grants are not less than $5,000. Call: LTF: 808-828-3966 or

VTrans Policy & Planning: 802-828-3960

15. Bicycle and Pedestrian Program ($2 million FY 2000) (80% federal, 10% State, 10% local match)

Competitive grants for bicycle and pedestrian facilities. Four to six projects out of 15 to 20 applications are approved each year. May deadline. Call LTF: 802-282-3966.

16. Park and Ride

The Local Transportation Facilities at VTrans participates in the rehabilitation and development of park and ride facilities throughout Vermont. For information call LTF: 802-828-3966

Loan Programs

17. Equipment Loan Fund

State assistance for the purchase of municipal heavy equipment or vehicles, including fire trucks and buses. Cost of a piece of equipment must exceed $20,000. Municipality pays first 25% of cost. Loan cap is $60,000 and must be repaid within three years except in the case of a special hardship.

Interest rate is two percent; zero percent if purchase is for joint use by more than one community. Two application deadlines: April 15 and October 15. Work through DTA who sends application to VTrans Financial Services. VTrans contact: 802-828-6231.

18. State Infrastructure Bank

Loans for transportation projects that are eligible for federal funds. A 20% equity contribution is required. Interest rate is at or below applicable market rates. Contact the Vermont Economic Development Authority (VEDA), 802-828-5627.
Other Programs

19. Transportation and Community and System Preservation Program (TCSTP)

Communities can apply for federal help to fight local sprawl under the U.S.DOT TCSP growth strategies. Helps communities solve interrelated problems involving transportation, land development, environmental protection, public safety and economic development. Deadline: July 15, 1999.

This is a very competitive program. Much effort required for little chance of being funded. Small towns would be hard pressed to apply. Projects funded in 1998 were two large areas and heavily leveraged. In FY 1999, $13.1 million was awarded for 35 projects in 28 states.

20. Vermont Watershed Grants

Funded by the sale of Vermont's conservation license plates. Mini-grants of $200 to $1000 and larger grants of over $1000 are available for a wide range of water-related projects, including developing or enhancing recreational access and trails. November deadline. Contact Vermont Watershed Grants 802-241-3770.

Vermont Agency of Natural Resources, Water Quality Division, Building 10 North, 103 South Main Street, Waterbury, VT 05671-0408.

21. Vermont Recreational and Trails Grants ($500,000 in FY 2000) (80% State – 20% Local match)

Matching grants of $3,000 to $10,000 or more. $10,000 grants are typical. Mini-grants of $500 or less are available (no match requirements). Very competitive.

The Vermont Recreation Trail Fund provides funds to develop and maintain recreational trails and trail related facilities for both non-motorized and motorized recreational use. Grants are financed by the portion of state and federal gas tax attributable to off-highway vehicle use (snowmobiles, all terrain vehicles). Eligible projects include trail development, maintenance and restoration, development of trail-side and trail head facilities, creating accessible trails, acquisition of trail easements or fee acquisition of trail corridors, maps/publications, and purchase of trail-building hand tools.

Contact Vermont Trails & Greenways Council: 802-241-3690.

22. Vermont Youth Conservation Corps

VYCC, a non-profit organization, coordinates Vermont youth crews who work on conservation projects on lands, waters or buildings open for public use. VYCC leaders provide expertise and oversight for crews. Communities can either hire a trail crew through fee-for-service or apply for a greenways crew funded by VAOT and FHWA. January deadline.

Contact the VYCC at 1-800-639-8922 or 802-241-3699 FAX: 241-3909

92 South Main Street, Waterbury VT 05676 www.vycc.org.

23. National Scenic Byways Program

For projects including acquisitions, development and planning along designated scenic byways. January application. Contact VTrans, Policy and Planning: 802-282-3960 or your regional planning commission.

24. National Forest Lands Highways ($200,000 available in FY 2000)

Funds are to improve roads designates as a forest highway which give access to the national highway system. There are about twenty such roads in Vermont. Funds are obligated for the next three years due to flood damage and other emergencies.
Contact VTrans Planning Division: 802-828-5578.

25. Urban and Community Forest ($85,000 statewide) (50% state –50% local match)

Grants to communities for developing and implementing local urban and community forestry programs. $500 to $4000 grants for community planning / education, planting, maintenance. Mini grants from $25 to $200 for training, single tree purchase, Arbor Day activities and millennium 2000 tree planting (no match required). Application deadline: February 21, 2000.

Urban and Community Forestry Program, 103 South Main Street, Building 10 South, Waterbury, VT 05671-3678 802-241-3678.

Resources

Catalog of Federal Domestic Assistance web page: www.gsa.gov

The catalog is available at depository libraries nationwide or contact the Federal Domestic Assistance Catalog staff, General Services Administration, 300 7th Street SW, Washington, DC 20407. Telephone 1-800-669-833.

Federal Funding and Assistance for Rivers, Trails and Open Space Conservation

This guide is compiled periodically by the national Center for Recreation and Conservation of the National Park Service. Contact the National Center for Recreation and Conservation, National Park Service, Room 3606, 1849 C Street NW, Washington, DC 20240-0001/ Telephone 202-565-1200.

Acronyms

DTA District Transportation Administrator (DTA's manage the nine VTrans highway maintenance districts)

FEMA Federal Emergency Management Agency

LTF Local Transportation Facilities (VTrans)

RPC Regional Planning Commission

VEDA Vermont Economic Development Authority

VEM Vermont Emergency Management

VTrans Vermont Agency of Transportation

VYCC Vermont Youth Conservation Corps

Programs Identified by CTAA as Regularly Providing Funding for Transportation:

Agency: Department of Education;
Program: Vocational Rehabilitation Grants;
Description: Assists states in operating programs that provide vocational rehabilitation services for individuals with disabilities. Services include counseling, training, job placement, and other supportive services, including transportation.

Agency: Department of Health and Human Services;
Program: Grants for Supportive Services and Senior Centers;
Description: Assists states in developing a community-based system of services for older individuals. Services provided include nutrition services, caregiver support services, senior centers, and transportation services.

Program: Program for American Indian, Alaskan Native, and Native Hawaiian Elders;
Description: Assists tribal organizations in the delivery of supportive services to older Native Americans. Services provided include nutrition services, caregiver support services, senior centers, and transportation services.

Program: Head Start;
Description: Assists local grantees in providing a program of comprehensive health, educational, and other services to promote school readiness for low-income children. Transportation to and from program services is generally provided.

Program: Medicaid;
Description: Assists states in payments for medical assistance to populations that meet categorical eligibility (such as families with children or persons who are elderly or disabled) as well as income and resource requirements. States are required to assure transportation to medical services.

Program: Temporary Assistance for Needy Families;
Description: Provides grants to states or tribes to assist needy families with children. Grantees have the flexibility to use funds in any manner that meets the purposes of the program, which can include transportation to services.

Agency: Department of Labor;
Program: Senior Community Service Employment Program;
Description: Assists states and other grantees in providing work opportunities in community service activities for low-income individuals 55 years of age and older. Transportation to training and job placements can be provided.

Program: Workforce Investment Act Adult Services Program;
Description: Assists states in providing workforce investment activities. "Intensive" services provided to low-income participants include occupational and basic skills training, and transportation can be provided to access such services.

Program: Workforce Investment Act Dislocated Worker Program;
Description: Assists states in providing workforce investment activities. "Intensive" services provided to low-income participants include occupational and basic skills training, and transportation can be provided to access such services.

Program: Workforce Investment Act Youth Activities;
Description: Assists states in providing workforce investment activities that will help low-income youth acquire the skills, training, and support needed to achieve employment success. Transportation can be provided to access services.

Agency: Department of Transportation;
Program: Capital Investment Grants;
Description: Assists states in financing facilities for use in mass public transportation service. Projects can include those that are designed to meet the special needs of elderly or disabled individuals.

Program: Urbanized Area Formula Program;
Description: Assists urbanized areas in financing capital projects for use in mass transportation service. Ten percent of funds may be used to pay for ADA paratransit operating costs.

Program: Non-urbanized Area Formula Program;
Description: Assists non-urbanized areas with capital and operating expenses needed to provide public transportation service. Ten percent of funds may be used to pay for ADA paratransit operating costs.

Program: Job Access and Reverse Commute;
Description: Provides grants to develop transportation services to connect low-income persons to employment and support services. Funds can be used for capital and operating costs associated with new or expanded service.

Program: Capital and Training Assistance for Over-the-Road Bus Accessibility;
Description: Assists private operators of over-the-road buses with financing capital and training costs associated with making buses accessible to individuals with disabilities.

Program: Capital Assistance Program for Elderly Persons and Persons with Disabilities;
Description: Provides financial assistance to nonprofit organizations in meeting the transportation needs of elderly persons and persons with disabilities where public transportation services are unavailable, insufficient, or inappropriate. Funds may be used for eligible capital expenses, such as purchasing vehicles, or to contract for service.

Funding Programs Identified As Spending At Least $4 Million On Transportation For The Transportation-Disadvantaged In Fiscal Year 2001

Agency: Department of Agriculture;
Program: Food Stamp Employment and Training Program.

Agency: Department of Education;
Program: 21st-Century Community Learning Centers.

Agency: Department of Labor;
Program: Job Corps.

Agency: Department of Health and Human Services;
Program: Community Health Centers.
HIV Care Grants.
Social Services Block Grants.
State Children's Health Insurance Program.

Agency: Department of Housing and Urban Development;
Program: Community Development Block Grant.
Supportive Housing Program.

Agency: Department of Veterans Affairs;
Program: Automobiles and Adaptive Equipment for Certain Disabled Veterans.
Veterans Medical Care.

Under most of the federal programs providing transportation services, funding recipients typically purchase the services from existing sources, according to program officials. This includes contracting for services with private transportation providers or providing bus tokens, transit passes, taxi vouchers, mileage reimbursement to volunteers or program participants, or some combination of these methods. For example, recipients of funds from DOL's Workforce Investment Act Adult Services Program typically provide bus tokens or mileage reimbursement for participants to access training, while recipients of HHS's Grants for Supportive Services and Senior Centers most often contract with local transportation providers to provide client transportation. The funding recipients of several programs, however, typically purchase and operate vehicles, or modify existing vehicles for use by individuals with disabilities. These programs include Head Start and the Program for American Indian, Alaskan Native, and Hawaiian Elders in HHS; the Vocational Rehabilitation Grants Program in the Department of Education; and the six programs within DOT. Several of these programs have requirements for grantees to coordinate their services with other agencies providing similar services, which would include transportation, among other services. For example, Head Start grantees are required to make every reasonable effort to coordinate transportation services they provide with other human service transportation in their communities. Similarly, DOT's Capital Assistance Program for Elderly Persons and Persons with Disabilities, Job Access and Reverse Commute, and Non-

urbanized Area Formula Program have requirements for grantees to coordinate their transportation services. In addition, some programs have provisions designed to avoid duplication of effort and encourage the use of existing community resources. For example, Workforce Investment Act programs may use funds to support those who are participating in the program only if those individuals are unable to obtain services through other programs, according to program officials. Also, the Veterans' Workforce Investment Program requires grantees to provide information on the linkages this program will have with other providers of services to benefit veterans.

Appendix D - Highway Sufficiency Ratings 2001 - State Highways

Route Name	Section Number	Functional Class	BeginTown	EndTown	Begin Milepoint	End Milepoint	Section Length	2001 AADT	Crash Rate	Constructed Year1	Constructed Year2	Travel Width	Roadway Width	Condition Rating	Safety Rating	Service Rating	Corr	Basic Rating	Traffic Adjustment	Adjusted Rating
Rural Principal Arterial - Interstate																				
I 91	7	1	Springfield	Weathersfield	41.92	51.37	9.45	12,300.00	0.07	1965	1979	48.00	76.00	44.60	22.80	24.20	0.00	91.60	0.00	91.60
I 91	8	1	Weathersfield	Windsor	51.37	60.45	9.08	13,200.00	0.07	1965	1981	48.00	76.00	43.40	21.00	23.90	0.00	88.30	-0.20	88.20
I 91	6	1	Westminster	Springfield	27.64	41.92	14.28	13,000.00	0.12	1963	1977	48.00	76.00	44.90	19.30	21.80	0.00	86.00	-0.10	85.80
	Good						**32.81**													
Rural Principal Arterial																				
VT 103	11	2	Ludlow	Mt. Holly	4.06	1.10	2.82	5,400.00	0.15	1930	1985	26.20	45.20	25.50	21.80	23.40	0.00	70.70	-0.80	69.80
VT 12	1	2	Weathersfield	Weathersfield	0.00	0.39	0.39	8,100.00	0.00	1965	1969	48.50	56.90	45.40	18.90	7.30	0.00	71.70	-2.80	68.90
VT 103	8 A	2	Cavendish	Cavendish	2.93	3.72	0.79	7,900.00	0.00	1985	1985	24.00	40.00	28.70	25.00	14.80	0.00	68.50	-2.80	65.60
VT 103	6	2	Chester	Chester	7.24	9.88	2.64	5,300.00	0.12	1926	1962	27.00	45.80	26.70	19.10	20.30	0.00	66.10	-0.80	65.30
VT 103	8	2	Cavendish	Cavendish	1.94	2.93	0.99	4,800.00	0.66	1960	1960	24.00	44.00	26.50	15.40	23.20	0.00	65.10	-0.30	64.80
VT 103	10	2	Ludlow	Ludlow	2.86	4.06	1.20	8,100.00	0.89	1966	1985	24.20	41.00	29.40	20.80	17.40	0.00	67.60	-3.00	64.60
VT 103	5	2	Chester	Chester	4.42	7.24	2.82	4,700.00	0.25	1931	1942	24.00	30.00	27.80	18.70	17.80	0.00	64.20	-0.20	64.00
	Fair						**11.65**													
VT 103	7	2	Cavendish	Cavendish	0.00	1.94	1.94	5,200.00	0.00	1926	1960	30.10	36.90	13.00	23.60	22.70	0.00	59.30	-0.80	58.50
VT 103	4	2	Chester	Chester	1.50	2.60	1.10	6,900.00	0.07	1931	1999	24.00	34.60	28.20	12.50	9.10	0.00	49.80	-2.50	47.30
VT 103	9	2	Cavendish	Ludlow	3.72	1.29	1.31	7,900.00	1.00	1930	1930	22.60	26.10	20.50	9.70	13.90	0.00	44.10	-3.20	40.90
	Poor						**4.35**													
Rural Minor Arterial																				
VT 10	2	6	Chester	Chester	1.67	2.40	0.74	3,200.00	0.00	1976	1976	22.00	38.00	45.70	23.60	21.30	0.00	90.60	0.70	91.40
VT 11	21	6	Springfield	Springfield	6.35	8.18	1.83	7,900.00	0.60	1965	1966	52.00	68.00	45.10	16.70	20.60	0.00	82.40	-1.90	80.50
	Good						**2.57**													
US 5	31	6	Springfield	Springfield	2.26	2.54	0.28	5,390.00	0.38	1977	1977	48.00	72.00	46.90	20.30	12.20	0.00	79.40	-0.70	78.70
VT 106	2	6	Springfield	Springfield	0.37	0.94	0.58	10,200.00	0.85	1931	1957	28.30	43.00	29.00	23.70	21.30	0.00	73.90	0.00	73.90
VT 100	33	6	Ludlow	Ludlow	5.04	5.81	0.77	3,400.00	0.00	1933	1966	24.00	30.30	28.70	20.80	18.00	0.00	67.50	1.50	69.10
VT 100	35	6	Ludlow	Plymouth	8.33	0.29	0.43	2,300.00	1.16	1937	1954	22.70	28.00	27.00	20.10	17.70	0.00	64.80	3.70	68.50
VT 100	31	6	Ludlow	Ludlow	0.00	3.39	3.39	1,800.00	1.14	1961	1998	24.00	31.00	30.40	16.00	16.20	0.00	62.60	5.20	67.80
VT 100	30	6	Weston	Andover	3.68	0.21	4.93	1,900.00	0.06	1959	2000	22.10	30.50	28.40	17.80	15.50	0.00	61.70	4.90	66.60
VT 10	4	6	Springfield	Springfield	0.00	0.83	0.83	2,800.00	1.10	1958	1958	24.00	38.40	27.50	20.00	15.60	0.00	63.10	2.70	65.80
VT 100	34	6	Ludlow	Ludlow	5.81	8.33	2.52	2,600.00	0.64	1933	1937	22.80	28.00	29.20	16.60	14.70	0.00	60.50	3.20	63.60
VT 106	3	6	Springfield	Springfield	0.94	3.18	2.24	7,400.00	0.59	1931	1977	24.00	40.90	27.00	19.30	19.60	0.00	65.90	-2.60	63.30
VT 100	32	6	Ludlow	Ludlow	3.39	4.32	0.93	2,400.00	0.26	1941	1998	22.00	24.00	28.70	12.20	17.70	0.00	58.60	3.70	62.30
	Fair						**16.90**													
VT 11	15	6	Chester	Chester	4.00	4.37	0.37	3,700.00	0.00	1933	1933	22.00	26.00	10.60	20.80	20.00	0.00	51.40	1.20	52.60
VT 11	14	6	Andover	Chester	0.00	4.00	7.68	2,900.00	0.16	1933	1993	22.10	26.30	9.80	17.60	17.30	0.00	44.70	2.60	47.30
VT 10	3	6	Chester	Chester	2.40	3.54	1.14	2,700.00	0.00	UNK		22.20	26.50	9.50	10.60	18.30	0.00	38.50	2.90	41.40
VT 10	1	6	Chester	Chester	0.00	1.67	1.67	3,200.00	0.32	1962	1962	24.30	26.60	9.80	6.40	7.90	0.00	24.10	1.50	25.60
	Poor						**10.86**													
Rural Major Collector																				
VT 11	18	7	Chester	Springfield	5.87	2.45	4.83	4,500.00	0.19	1961	1993	24.00	40.60	46.40	23.30	21.30	0.00	91.00	-2.20	88.80
US 5	30	7	Springfield	Springfield	1.44	2.26	0.82	1,300.00	0.00	1940	1998	25.30	40.20	46.20	22.50	18.00	0.00	86.70	0.80	87.40
VT 11	20	7	Springfield	Springfield	3.31	3.53	0.22	4,600.00	0.43	1961	1961	24.00	40.00	45.20	24.50	17.80	0.00	87.50	-1.20	86.40
VT 11	19	7	Springfield	Springfield	2.45	3.31	0.86	5,100.00	0.76	1961	1961	24.00	40.00	45.70	22.30	18.50	0.00	86.50	-3.50	83.00
US 5	41	7	Weathersfield	Weathersfield	5.15	5.29	0.14	4,800.00	0.00	1927	1965	24.00	26.00	45.20	22.70	17.80	0.00	85.70	-3.50	82.10
VT 131	10	7	Weathersfield	Weathersfield	8.20	8.65	0.45	9,200.00	0.14	1965	1965	46.70	67.00	43.20	24.50	18.10	0.00	85.80	-5.60	80.20
	Good						**7.32**													
US 5	32	7	Springfield	Springfield	2.54	3.07	0.53	4,260.00	1.01	1965	1977	31.20	52.50	46.40	16.40	12.10	0.00	74.90	-4.80	70.10
VT 106	6	7	Weathersfield	Weathersfield	2.57	3.23	0.66	3,500.00	0.00	1937	1960	30.00	32.00	30.60	23.50	18.70	0.00	72.80	-4.00	68.90
VT 44	2	7	West Windsor	West Windsor	3.62	4.47	0.85	2,000.00	0.32	1941	1981	24.80	29.70	29.40	22.30	17.00	0.00	68.60	-1.10	67.50
US 5	36	7	Weathersfield	Weathersfield	0.38	0.94	0.56	900.00	0.00	1932	1932	23.30	27.30	13.40	25.00	23.90	0.00	62.30	3.90	66.20

Route Name	Section Number	Functional Class	BeginTown	EndTown	Begin Milepoint	End Milepoint	Section Length	2001 AADT	Crash Rate	Constructed Year1	Constructed Year2	Travel Width	Roadway Width	Condition Rating	Safety Rating	Service Rating	Corr	Basic Rating	Traffic Adjustment	Adjusted Rating
VT 106	7	7	Weathersfield	Weathersfield	3.23	4.31	1.07	3,500.00	0.00	1938	1983	22.00	26.00	29.70	21.70	18.50	0.00	69.90	-4.20	65.70
US 5	35	7	Springfield	Weathersfield	7.90	0.38	1.59	860.00	0.90	1932	1999	22.00	28.60	13.90	20.90	23.70	0.00	58.50	4.30	62.80
US 5	37	7	Weathersfield	Weathersfield	0.94	1.35	0.41	1,000.00	1.59	1932	1937	24.00	28.00	13.20	22.10	23.80	0.00	59.10	3.30	62.40
VT 131	3	7	Cavendish	Cavendish	1.82	2.45	0.63	3,200.00	0.31	UNK		24.00	30.30	26.80	22.60	15.40	0.00	64.70	-4.00	60.70
VT 131	6	7	Cavendish	Weathersfield	5.47	1.32	3.51	2,100.00	0.00	1952	1958	23.20	27.50	27.30	20.10	14.40	0.00	61.80	-1.50	60.40
US 5	38	7	Weathersfield	Weathersfield	1.35	3.73	2.38	1,600.00	0.00	1937	1937	24.00	28.00	14.20	25.00	20.60	0.00	59.80	0.20	60.00
	Fair						**12.19**													
VT 131	8	7	Weathersfield	Weathersfield	1.78	2.20	0.42	3,300.00	0.42	1955	1982	22.00	30.00	27.00	19.20	17.70	0.00	63.90	-4.30	59.60
VT 11	22	7	Springfield	Springfield	8.18	8.20	0.02	3,500.00	32.23	1929	1929	28.00	44.00	26.80	20.00	17.20	0.00	64.00	-4.60	59.40
VT 44A	2	7	Windsor	Windsor	0.12	0.54	0.42	1,200.00	0.00	1966	1966	20.10	27.90	13.40	25.00	17.90	0.00	56.30	2.20	58.50
US 5	33	7	Springfield	Springfield	3.07	6.59	3.53	800.00	0.39	1932	1938	22.00	26.00	13.40	19.60	20.40	0.00	53.40	4.90	58.30
VT 131	9	7	Weathersfield	Weathersfield	2.20	8.20	6.00	4,700.00	0.09	1950	1965	22.00	30.00	27.70	20.60	15.90	0.00	64.20	-6.50	57.80
US 5	42	7	Weathersfield	Weathersfield	5.29	6.39	1.10	4,670.00	0.00	1927	1927	24.00	26.00	20.50	22.70	20.80	0.00	63.90	-6.40	57.50
VT 131	1	7	Cavendish	Cavendish	0.00	0.94	0.94	3,300.00	0.20	1930	1979	22.00	26.00	26.60	19.90	14.90	0.00	61.40	-4.40	57.00
US 5	46	7	Windsor	Windsor	4.04	4.70	0.66	7,180.00	0.13	1955	1955	24.00	40.00	20.00	24.60	21.20	0.00	65.70	-8.90	56.80
VT 44	3	7	West Windsor	Windsor	4.47	1.61	2.18	2,200.00	0.24	1936	1946	22.00	24.00	27.80	13.10	17.40	0.00	58.30	-1.80	56.40
US 5	44	7	Windsor	Windsor	1.00	1.92	0.92	3,400.00	0.18	1926	1926	24.00	27.80	20.00	23.10	17.50	0.00	60.60	-4.60	56.00
VT 44A	3	7	Windsor	Windsor	0.54	2.49	1.95	1,100.00	0.26	UNK		21.50	25.50	13.20	21.60	18.40	0.00	53.20	2.80	56.00
VT 131	4	7	Cavendish	Cavendish	2.45	3.41	0.96	2,800.00	0.00	1940	1982	23.30	25.30	25.00	16.70	17.30	0.00	59.00	-3.40	55.60
US 5	48	7	Windsor	Windsor	5.83	6.35	0.52	3,700.00	0.23	1969	1975	24.00	36.00	32.60	18.40	9.20	0.00	60.10	-5.20	55.00
US 5	47	7	Windsor	Windsor	4.70	5.83	1.13	3,700.00	0.33	1927	1955	24.00	33.10	21.20	21.20	17.70	0.00	60.10	-5.20	54.90
VT 44	1	7	Reading	West Windsor	0.00	3.62	3.82	1,700.00	0.17	1947	1964	21.80	23.80	29.40	9.30	16.40	0.00	55.10	-0.20	54.90
US 5	43	7	Weathersfield	Windsor	6.39	1.00	1.40	3,400.00	0.00	1927	1927	22.00	30.00	19.30	22.90	16.90	0.00	59.10	-4.70	54.40
US 5	45	7	Windsor	Windsor	1.92	3.24	1.32	3,400.00	0.00	1924	1924	24.00	30.00	20.00	22.00	17.10	0.00	59.10	-4.70	54.40
VT 106	8	7	Weathersfield	Reading	4.31	0.35	3.70	1,600.00	0.00	1938	1983	24.00	26.10	14.40	20.30	18.90	0.00	53.70	0.20	53.90
VT 44A	1	7	Weathersfield	Windsor	0.00	0.12	0.62	1,200.00	0.00	UNK		20.40	24.40	13.40	19.90	17.90	0.00	51.20	2.20	53.40
VT 106	9	7	Reading	Reading	0.35	1.21	0.86	2,000.00	0.00	1939	1998	24.00	32.00	11.90	22.60	19.20	0.00	53.70	-1.20	52.40
VT 106	10	7	Reading	Reading	1.21	2.24	1.03	1,600.00	0.36	1939	1998	24.00	37.60	14.90	23.10	13.70	0.00	51.70	0.20	52.00
VT 131	5	7	Cavendish	Cavendish	3.41	5.47	2.06	2,200.00	0.42	1940	1948	22.00	24.00	22.80	15.10	15.70	0.00	53.50	-1.90	51.60
VT 131	2	7	Cavendish	Cavendish	0.94	1.82	0.88	3,300.00	0.00	1979	1979	22.50	26.00	26.80	14.10	15.00	0.00	55.90	-4.60	51.30
US 5	34	7	Springfield	Springfield	6.59	7.90	1.31	800.00	0.00	1932	1932	22.00	26.00	12.50	18.10	15.50	0.00	46.10	4.90	51.00
VT 11	17	7	Chester	Chester	5.64	5.87	0.23	4,400.00	0.00	1933	1933	20.00	22.00	29.70	8.00	18.90	0.00	56.60	-6.50	50.10
VT 106	5	7	Weathersfield	Weathersfield	1.32	2.57	1.25	2,900.00	0.00	1937	1940	23.30	27.00	11.40	23.80	17.90	0.00	53.10	-3.70	49.30
US 5	39	7	Weathersfield	Weathersfield	3.73	4.29	0.57	1,600.00	0.65	1932	1932	24.00	28.00	12.00	18.20	17.00	0.00	47.30	0.20	47.50
VT 131	7	7	Weathersfield	Weathersfield	1.32	1.78	0.46	3,400.00	0.00	1955	1982	22.00	30.00	29.20	13.00	9.20	0.00	51.40	-4.80	46.50
VT 11	16	7	Chester	Chester	5.11	5.64	0.52	4,500.00	1.10	1933	1933	20.00	22.00	26.50	10.80	15.60	0.00	52.90	-6.70	46.20
VT 44	4	7	Windsor	Windsor	2.00	2.58	0.58	1,700.00	1.19	1940	1997	22.00	26.00	16.90	11.70	17.40	0.00	45.90	-0.20	45.80
VT 106	11	7	Reading	Reading	2.24	7.28	5.04	1,200.00	0.08	1941	1998	24.00	25.70	12.60	19.80	10.50	0.00	43.00	2.10	45.10
VT 106	4	7	Springfield	Weathersfield	3.18	1.32	1.94	3,300.00	0.51	1937	1997	23.70	27.50	13.70	18.90	16.30	0.00	48.80	-4.60	44.20
US 5	40	7	Weathersfield	Weathersfield	4.29	5.15	0.86	1,600.00	0.00	1932	1980	23.30	24.50	11.30	12.40	18.50	0.00	42.20	0.20	42.40
	Poor						**49.20**													
US 5	49	7	Windsor	Hartland	6.35	1.37	1.87	4,170.00	0.15	1928	1930	22.90	30.00	19.40	10.60	11.90	0.00	42.00	-6.10	36.00
	Bad						**1.87**													
Urban Principal Arterial - Other																				
VT 106	1	14	Springfield	Springfield	0.06	0.37	0.31	10,200.00	0.00	1931	1957	40.00	40.00	28.50	25.00	10.50	0.00	64.00	0.00	64.00
	Fair						**0.31**													

Source: VTrans, 2008

This document is exempt from Discovery or admission under 23 U.S.C. 409.

Appendix E - Highway Sufficiency Ratings 2003 - Major Collector Town Highways

RouteName	Rt Number	Section	Func Class	Begin Town	End Town	Beginning MP	End MP	Length	2003 AADT	Crash Rate	Constructed First	Constructed Last	Travel Width	Roadway Width	Cond	Safety	Serv	Corr	Basic Rating	Traffic Adjust	Adjusted Rating
VT 35 / Grafton Road	FAS 125	8	7	Chester	Chester	0	2.33	2.33	820	0.3	1941	2001	22	25.6	32	15.8	14.2	0	62	4.5	**66.5**
VT 35 / Grafton Road	FAS 125	9	7	Chester	Chester	2.33	2.61	0.28	1,400	0	1938	1941	22	22	25.5	17.5	17.4	0	60.4	1.1	**61.5**
	Subtotal Miles							**2.61**													
Weston-Andover Road	FAS 132	1	7	Weston	Andover	0	3.82	5.19	680	0.31	1955	1965	22.8	24.5	27.6	19.9	18.6	0	66.1	5.4	**71.5**
Weston-Andover Road	FAS 132	2	7	Andover	Andover	3.82	4.36	0.54	870	0	1952	1952	22	24	27.3	17.1	17.3	0	61.7	4.2	**65.9**
Weston-Andover Road	FAS 132	3	7	Andover	Chester	4.36	1.48	1.95	970	0	1952	1980	23.5	28.6	29.8	24	18	0	71.8	3	**74.7**
	Subtotal Miles							**7.68**													
Weathersfield Center Road	FAS 135	1	7	Springfield	Springfield	0	1.6	1.6	1,640	0.16	1969	1969	20.7	23.5	27.3	17.8	19.6	0	64.7	0.1	**64.9**
Weathersfield Center Road	FAS 135	2	7	Springfield	Weathersfield	1.6	2.38	3.95	1,460	0.16	1960	1961	22.8	24.8	33.1	16.7	18.9	0	68.6	0.8	**69.4**
Weathersfield Center Road	FAS 135	3	7	Weathersfield	Weathersfield	2.38	3.07	0.69	1,500	0.52	1972	1975	22.8	25.5	46.9	16.2	18.2	0	81.3	0.4	**81.8**
Weathersfield Center Road	FAS 135	4	7	Weathersfield	Weathersfield	3.07	5.25	2.18	1,410	0.18	1960	1974	23.8	27.5	36.4	18.2	22.1	0	76.8	0.8	**77.6**
	Subtotal Miles							**8.42**													
VT 143 / Skitchewaug Trail	FAS 136	1	7	Springfield	Springfield	0	1.4	1.4	1,930	1.15	1957	1977	23.8	29.8	27.5	20	17.4	0	64.9	-0.9	**64**
VT 143 / Skitchewaug Trail	FAS 136	2	7	Springfield	Springfield	1.4	5.75	4.35	580	1.53	1949	1965	20	22	25.1	8.5	7.1	0	40.7	6.9	**47.6**
	Subtotal Miles							**5.75**													
Bridge Street	FAS 148	1	7	Windsor	Windsor	0	0.22	0.22	3,400	1.64	UNK	24	24	22	10.7	8	0	40.7	-4.6	36.1	
	Subtotal Miles							**0.22**													
County Road	FAS 152	1	7	Windsor	Windsor	0	0.72	0.72	3,270	0.7	1967	1967	30.1	30.1	21	21.1	20.3	0	62.4	-4.2	**58.2**
County Road	FAS 152	2	7	Windsor	Windsor	0.72	2.03	1.31	470	0	1966	1975	20.8	25.7	25.3	20.8	14.3	0	60.4	8.2	**68.5**
County Road	FAS 152	3	7	Windsor	Hartland	2.03	1.92	4.26	770	0	1960	1974	19.8	22.9	26.4	18.4	14.5	0	59.3	5	**64.3**
	Subtotal Miles							**6.29**													
Okemo Mountain Road	FAS 189	1	7	Ludlow	Ludlow	0	0.54	0.54	3,300	0	UNK	29.1	32.3	27.8	25	17.4		0	70.2	-3.8	**66.4**
	Subtotal Miles							**0.54**													
	Total Major Collector Miles							**31.51**													

Source: VTrans, 2005

This document is exempt from Discovery or admission under 23 U.S.C. 409.

Appendix F - Bridge Sufficiency Ratings (Long Bridges, Over 20 ft Span)

	Route Number	Road Name	Bridge Number	Features Intersected	Location	Bridge Type	Federal Sufficiency Rating	Deficiency Status of Structure
ANDOVER	C2002	East Hill Rd	00006	WILLIAMS RIVER	0.01 MI TO JCT W C3 TH12	ROLLED BEAM	66.7	ND
ANDOVER	C3023	Pettengill Rd	00025	ANDOVER BROOK	0.1 MI TO JCT W CL2 TH1	MULTI PLATE ARCH	93.9	ND
ANDOVER	C3025	Middletown Rd	00026	LYMAN BROOK	0.1 MI TO JCT W VT11	CONCRETE SLAB	100.0	ND
ANDOVER	C3029	Trombley Rd	00027	MID. BR WILLIAMS RIVER	0.08 MI TO JCT W VT11	ROLLED BEAM	44.2	ND
ANDOVER	C3036	Howard Hill Rd	00028	MID. BR WILLIAMS RIVER	0.08 MI TO JCT W VT11	ROLLED BEAM	59.2	SD
ANDOVER	FAS 0132	Weston-Andover Road	00007	ANDOVER BROOK	1.9 MI N JCT. VT.11	CONCRETE SLAB	90.3	ND
ANDOVER	FAS 0132	Weston-Andover Road	00008	ANDOVER BROOK	3.0 MI N JCT. VT.11	ROLLED BEAM	89.0	ND
ANDOVER	FAS 0132	Weston-Andover Road	00009	TROUT BROOK	3.8 MI N JCT. VT.11	ROLLED BEAM	79.9	ND
ANDOVER	VT11	VT11	00035	MID. BR WILLIAMS RIVER	2.0 MI E JCT VT 121	CONCRETE SLAB	87.5	ND
ANDOVER	VT11	VT11	00036	MID. BR WILLIAMS RIVER	2.2 MI E JCT VT 121	TBEAM WIDE W/ STL BM	82.8	ND
ANDOVER	VT11	VT11	00037	MID. BR WILLIAMS RIVER	2.4 MI E JCT VT 121	ROLLED BEAM	75.0	ND
ANDOVER	VT11	VT11	00038	MID. BR WILLIAMS RIVER	2.8 MI E JCT VT 121	TBEAM WIDE W/ STL BM	80.0	ND
ANDOVER	VT11	VT11	00039	MID. BR WILLIAMS RIVER	3.0 MI E JCT VT 121	ROLLED BEAM	70.8	ND
ANDOVER	VT11	VT11	00040	LYMAN BROOK	3.1 MI E JCT VT 121	TBEAM WIDE W/ STL BM	82.3	ND
ANDOVER	VT11	VT11	00041	MID. BR WILLIAMS RIVER	4.0 MI E JCT VT 121	TBEAM WIDE W/ STL BM	48.4	SD
CAVENDISH	C2001	Depot St	00058	BLACK RIVER	0.1 MI TO JCT W VT131	2 SPAN CONC. T-BEAM	69.9	SD
CAVENDISH	C2004	Mill St	00012	BLACK RIVER	0.1 MI TO JCT W VT131	STEEL PONY TRUSS	45.1	ND
CAVENDISH	C3006	Center Rd	00043	TWENTY MILE STREAM	0.4 MI TO JCT W VT131	ROLLED BEAM	46.8	SD
CAVENDISH	C3011	Heald Rd	00046	TWENTY MILE STREAM	0.28 MI TO JCT W CL2 TH3	CONCRETE SLAB	95.7	ND
CAVENDISH	C3021	Davis Rd	00037	TWENTY MILE STREAM	0.25 MI TO JCT W CL2 TH3	ROLLED BMW TIMBER DK	66.7	ND
CAVENDISH	C3029	Howard Hill Rd	00045	BLACK RIVER	0.02 MI TO JCT W VT131	GALV PONY TRUSS	77.2	ND
CAVENDISH	C3030	Carlton Rd	00044	BLACK RIVER	0.04 MI TO JCT W VT131	(2) SPAN ROLLED BEAM	74.5	ND
CAVENDISH	C3045	Winery Rd	00035	BLACK RIVER	0.02 MI TO JCT W VT103	ROLLED BEAM	67.6	ND
CAVENDISH	VT103	VT103	00021	BLACK RIVER	0.3 MI S JCT. VT.131	3 SPAN ROLLED BEAM	75.9	FD
CAVENDISH	VT103	VT103	0021A	INDUSTRIAL CANAL	0.1 MI S JCT. VT.131	ROLLED BEAM	88.6	ND
CAVENDISH	VT131	VT131	00001	TWENTY MILE STREAM	3.2 MI E JCT. VT.103	(2) SPAN ROLLED BEAM	65.8	ND
CAVENDISH	VT131	VT131	00003	ELM BROOK	4.0 MI E JCT. VT.103	ROLLED BEAM	67.2	ND
CAVENDISH	VT131	VT131	00004	BROOK	4.7 MI E JCT. VT.103	ROLLED BEAM	91.9	ND
CHESTER	C2005	Church St	00011	WILLIAMS RIVER	0.25 MI TO JCT W VT103	(2) SP CONT ROLL BM	80.8	ND
CHESTER	C2006	Missing Link Rd	00013	WILLIAMS RIVER	0.3 MI TO JCT W VT103	ROLLED THRU BEAM	68.0	ND
CHESTER	C2009	Flamstead Rd	00063	WILLIAMS RIVER	@ JCT OF CL2 TH9 & TH6	ROLLED BMW TIMBER DK	41.8	ND
CHESTER	C3009	Smokeshire Rd	00057	CHASE BROOK	@ JCT OF CL3 TH12 & TH9	CONCRETE SLAB	82.8	ND
CHESTER	C3009	Smokeshire Rd	00066	WILLIAMS RIVER	0.1 MI TO JCT W CL3 TH14	ROLLE BMW TIMBER DK	66.0	FD
CHESTER	C3009	Smokeshire Rd	00067	WILLIAMS RIVER	@ JCT OF CL3 TH14 & TH29	ROLLED BEAM	90.3	ND
CHESTER	C3009	Smokeshire Rd	00070	WILLIAMS RIVER	0.3 MI TO JCT W CL3 TH11	ROLLE BM W TIMBER DK	48.0	FD
CHESTER	C3009	Smokeshire Rd	00073	WILLIAMS RIVER	0.2 MI TO JCT W CL3 TH12	ROLLEDBM W TIMBER DK	75.4	FD
CHESTER	C3010	Popple Dungeon Rd	00052	SO BR OF WILLIAMS RIVER	0.25 MI TO JCT W C3 TH63	ROLLED BEAM	85.9	ND
CHESTER	C3010	Popple Dungeon Rd	00054	SO BR OF WILLIAMS RIVER	@ JCT W CL3 TH66	CONCRETE SLAB	95.7	ND
CHESTER	C3012	Chase Brook Rd	00043	CHASE BROOK	0.3 MI TO JCT W CL3 TH9	ROLLED BEAMTIMBER DK	53.5	ND
CHESTER	C3012	Chase Brook Rd	00050	CHASE BROOK	0.2 MI TO JCT W CL3 TH9	CONCRETE SLAB	76.3	FD
CHESTER	C3013	Pleines Rd	00056	CHASE BROOK	@ JCT OF CL3 TH12 & TH13	ROLLED BEAMTIMBER DK	75.0	ND
CHESTER	C3017	Goodrich Rd	00075	WILLIAMS RIVER	0.02 MI TO JCT W VT103	ROLLEDBM W TIMBER DK	75.4	ND
CHESTER	C3018	Thompson Rd	00062	WILLIAMS RIVER	0.01 MI TO JCT W VT103	ROLLED BEAMTIMBER DK	32.8	SD
CHESTER	C3019	Cavendish Rd	00051	WILLIAMS RIVER	0.1 MI TO JCT W VT103	ROLLED BEAM	37.6	SD
CHESTER	C3027	Gould Rd	00064	GREAT BROOK	0.07 MI TO JCT W VT10	CONCRETE SLAB	74.3	ND
CHESTER	C3038	Potash Brook Rd	00055	POTASH BROOK	0.55 MI TO JCT W CL2 TH7	PRESTRESS CONC. SLAB	90.6	ND
CHESTER	C3050	Colburn Rd	00068	WILLIAMS RIVER	0.01 MI TO JCT W VT103	ROLLEDBM W TIMBER DK	76.9	ND
CHESTER	C3056	Kingsbury Rd	00061	MID. BR WILLIAMS RIVER	0.07 MI TO JCT W VT11	ROLLED BEAMTIMBER DK	74.9	ND
CHESTER	C3057	Swett Rd	00069	MID. BR WILLIAMS RIVER	AT JCT VT 11 & TH 57	PRESTRESS CONC. SLAB	79.8	ND

	Route Number	Road Name	Bridge Number	Features Intersected	Location	Bridge Type	Federal Sufficiency Rating	Deficiency Status of Structure
CHESTER	C3057	Swett Rd	00074	MID. BR WILLIAMS RIVER	0.1 MI TO JCT W VT11	ROLLED BEAM	55.9	FD
CHESTER	C3063	Nudist Camp Rd	00049	SO BR OF WILLIAMS RIVER	0.05 MI N TO JCT W TH 10	ROLLED BM W/ WOOD DK	42.6	ND
CHESTER	C3077	Palmer Rd	00028	WILLIAMS RIVER	0.01 MI TO JCT W VT103	STEEL BEAM/FLBEAM	22.6	SD
CHESTER	C3078	Jewett Rd	00072	WILLIAMS RIVER	0.01 MI TO JCT W VT103	ROLLEDBM W TIMBER DK	25.7	SD
CHESTER	C3092	TH 92	00046	SO BR OF WILLIAMS RIVER	0.06 MI TO JCT W C3 TH10	ROLLED BEAMTIMBER DK	36.7	SD
CHESTER	C3104	Peck Rd	00059	HALL BROOK	0.07 MI TO JCT W CL2 TH6	CONCRETE T-BEAM	73.8	ND
CHESTER	C3118	Willard Rd	00053	WILLIAMS RIVER	0.01 MI TO JCT W VT103	ROLLED BEAM	37.8	ND
CHESTER	FAS 0125	VT 35 / Grafton Rd	00006	S. BR. WILLIAMS RIVER	0.6 MI S JCT. VT.11	ROLLED BEAM	61.3	ND
CHESTER	FAS 0125	VT 35 / Grafton Rd	00007	S. BR. WILLIAMS RIVER	0.5 MI S JCT. VT.11	ROLLED BEAM	72.6	ND
CHESTER	FAS 0125	VT 35 / Grafton Rd	00009	MID. BR WILLIAMS RIVER	0.2 MI S JCT. VT 11	ROLLED BEAM	78.3	ND
CHESTER	FAS 0125	VT 35 / Grafton Rd	00010	S. BR. WILLIAMS RIVER	1.5 MI S JCT. VT.11	ROLLED BEAM	42.8	SD
CHESTER	FAS 0132	Weston-Andover Road	00012	ANDOVER BROOK	1.5 MI N JCT. VT.11	ROLLED BEAM	93.7	ND
CHESTER	VT10	VT10	00002	GREAT BROOK	1.7 MI E JCT VT 103	CONCRETE SLAB	92.0	ND
CHESTER	VT10	VT10	00003	GREAT BROOK	2.4 MI E JCT VT 103	TBEAM WIDE W/ SLAB	64.8	SD
CHESTER	VT10	VT10	00004	GREAT BROOK	3.2 MI E JCT VT 103	ROLLED BEAM	63.2	SD
CHESTER	VT103	VT103	00008	S. BR. WILLIAMS RIVER	0.2 MI S JCT. VT.11 E	CONCRETE THRU GIRDER	56.7	SD
CHESTER	VT103	VT103	00009	MID. BR WILLIAMS RIVER	0.1 MI S JCT. VT.11 E	2 SPAN ROLLED BEAM	49.8	SD
CHESTER	VT103	VT103	00009	MID. BR WILLIAMS RIVER	0.1 MI S JCT. VT.11 E	2 SPAN ROLLED BEAM	49.8	SD
CHESTER	VT103	VT103	00012	WILLIAMS RIVER	0.8 MI N JCT. VT.11 W	CURVED WLD PLT GRDR	93.2	ND
CHESTER	VT103	VT103	00014	WILLIAMS R. & GMRR	0.7 MI N JCT. VT.10	4 SP ROLLED BEAM	38.0	SD
CHESTER	VT103	VT103	00016	WILLIAMS RIVER	1.7 MI N JCT. VT.10	3 SPAN ROLLED BEAM	55.7	SD
CHESTER	VT11	VT11	00043	MID. BR WILLIAMS RIVER	5.2 MI E JCT VT 121	TBEAM WIDE W/ STL BM	46.7	SD
CHESTER	VT11	VT11	00044	ANDOVER BROOK	3.6 MI W JCT. VT.103 N	TBEAM WIDE W/ STL BM	22.9	SD
CHESTER	VT11	VT11	00045	MID. BR WILLIAMS RIVER	3.3 MI W JCT. VT.103 N	WELDED GIRDER	93.0	ND
CHESTER	VT11	VT11	00046	MID. BR WILLIAMS RIVER	3.0 MI W JCT. VT.103 N	WELDED GIRDER	93.0	ND
CHESTER	VT11	VT11	00048	BROOK	0.1 MI E JCT. VT.103 S	CONCRETE T-BEAM	65.2	FD
CHESTER	VT11	VT11	00049	WILLIAMS RIVER	0.4 MI E JCT. VT.103 S	ROLLED BEAM	63.1	SD
LUDLOW	C2003	Dug Rd	00002	BLACK RIVER	@ JCT W VT100	ROLLED BEAM	87.9	ND
LUDLOW	C2004	East Lake Rd	00006	BLACK RIVER	0.01 MI TO JCT W VT100	PRESTRESS CONC. SLAB	76.5	ND
LUDLOW	C3008	Red Bridge Rd	00008	LAKE RESCUE	0.18 MI TO JCT W VT100	ROLLED BEAM	81.0	ND
LUDLOW	C3014	Rod & Gun Club Rd	00012	BRANCH BROOK	0.01 MI TO JCT W C3 TH53	STEEL I-BEAM	49.7	SD
LUDLOW	C3017	Fox Ln	00014	BLACK RIVER	0.08 MI TO JCT W VT103	ROLLED BEAM	88.0	ND
LUDLOW	C3026	Pleasant St Ext	00017	BLACK RIVER	0.01 MI TO JCT W VT103	2SP ROLLED BEAM	64.7	ND
LUDLOW	C3029	East Hill Rd	00020	BLACK RIVER	0.1 MI TO JCT W VT103	ROLLED BEAM	91.4	ND
LUDLOW	C3038	Lovejoy Brook Rd	00025	WILLIAMS RIVER	@ JCT OF CL3 TH33 & TH38	ROLLED BEAM	91.5	FD
LUDLOW	C3046	Clark Dr	00031	JEWELL BROOK	@ JCT W VT100	PRESTRESS CONC. SLAB	71.3	ND
LUDLOW	C3308	North Depot St	00056	BLACK RIVER	0.04 MI TO JCT N CL1 TH1	ROLLED BEAM	78.2	ND
LUDLOW	C3324	Mill St	00057	BLACK RIVER	@ JCT W CL3 TH324	STEEL PONY TRUSS	16.4	SD
LUDLOW	C3356	Pond St	00054	JEWELL BROOK	0.01 MI TO JCT W CL1 TH2	ROLLED BEAM	26.7	SD
LUDLOW	VT100	VT100	00099	BRANCH BROOK	0.1 MI N JCT. VT.103 N	ROLLED BEAM	82.5	ND
LUDLOW	VT100	VT100	0098I	JEWELL BROOK	0.4 MI S JCT. VT.103 S	CONCRETE SLAB	94.1	ND
LUDLOW	VT103	VT103	00025	BLACK RIVER	0.3 MI S JCT. VT.100 S	2 SPAN CONC T-BEAM	24.5	SD
LUDLOW	VT103	VT103	00026	JEWELL BROOK	0.1 MI N JCT. VT.100 S	ROLLED BEAM	70.9	ND
READING	C3008	Bailey's Mills Rd	00025	MILL BROOK	0.15 MI TO JCT W VT106	ROLLED BEAM	34.8	SD
READING	C3038	Archer Rd	00027	N. BR. BLACK RIVER	0.03 MI TO JCT W CL2 TH1	ROLLED BM TIMBER DK	40.0	SD
READING	C3051	Malagash Rd	00029	MILL BROOK	0.06 MI TO JCT W VT106	MULTI PLT PIPE ARCH	80.7	ND
READING	C3054	Town Farm Rd	00028	N. BR. BLACK RIVER	0.05 MI TO JCT W CL2 TH1	ROLLED BM TIMBER DK	34.8	SD
READING	VT106	VT106	00012	N. BR. BLACK RIVER	1.2 MI. S. JCT. VT.44	ROLLED BEAM	41.1	SD
READING	VT106	VT106	00013	MILL BROOK	0.4 MI N JCT. VT.44	ROLLED BEAM	78.6	ND
READING	VT44	VT44	00001	MILL BROOK	0.1 MI E JCT. VT.106	ROLLED BEAM	97.9	ND
SPRINGFIELD	BRIDGE STREET	Bridge St	00043	BLACK RIVER	BRIDGE STREET	WELDED PLATE GIRDER	98.0	ND

	Route Number	Road Name	Bridge Number	Features Intersected	Location	Bridge Type	Federal Sufficiency Rating	Deficiency Status of Structure
SPRINGFIELD	C2006	Main St (No. Spri.)	00056	GREAT BROOK	0.25 MI TO JCT W VT10	CONCRETE SLAB	19.7	SD
SPRINGFIELD	C2006	Main St (No. Spri.)	00057	GREAT BROOK	0.06 MI TO JCT C3 TH708	TWO SPAN ROLLED BEAM	22.2	SD
SPRINGFIELD	C2006	Main St (No. Spri.)	00058	BALTIMORE BROOK	0.04 MI TO JCT CL3 TH740	TBEAM WIDE W/ ROL BM	90.0	ND
SPRINGFIELD	C2010	Tarbell Rd	00045	SPOONERVILLE BROOK	0.3 MI TO JCT W CL3 TH5	CONC.ENCASEDROLLEDBM	78.0	FD
SPRINGFIELD	C2010	Spoonerville Rd	00046	SPOONERVILLE BROOK	0.1 MI TO JCT W C3 TH742	CONC.ENCASEDROLLEDBM	68.0	ND
SPRINGFIELD	C2010	Elm St	00047	GREAT BROOK	0.01 MI TO JCT W CL2 TH6	CONC.ENCASEDROLLEDBM	82.0	ND
SPRINGFIELD	C3066	Paddock Rd	00081	BLACK RIVER	0.04 MI TO JCT W VT11	STEEL THRU TRUSS	23.7	SD
SPRINGFIELD	C3122	Seavers Brook Rd	00044	SEAVERS BROOK	0.4 MI TO JCT W VT11	CONC.ENCASEDROLLEDBM	65.9	FD
SPRINGFIELD	C3712	South County Rd	00082	GREAT BROOK	0.02 MI TO JCT W CL2 TH6	MULTI PLATE PIPE ARC	72.9	SD
SPRINGFIELD	C3726	Church St	00041	SPOONERVILLE BROOK	0.01 MI TO JCT W C2 TH10	MULTI PLATE ARCH	97.0	ND
SPRINGFIELD	C3726	Church St	00048	GREAT BROOK	0.01 MI TO JCT W CL2 TH6	CONC.ENCASEDROLLEDBM	69.0	ND
SPRINGFIELD	C3738	Maple St South	00060	BALTIMORE BROOK	0.1 MI TO JCT W VT106	ROLLED BEAM	57.3	ND
SPRINGFIELD	FAS 0135	Weathersfield Center Rd	00009	VALLEY BROOK	VALLEY STREET	MULTI PLT PIPE ARCH	100.0	ND
SPRINGFIELD	I91	I-91	0025N	I 91 OVER US 5	0.8 MI S EXIT 7	3 SP CONT ROLLED BM	80.4	ND
SPRINGFIELD	I91	I-91	0025S	I 91 OVER US 5	0.8 MI S EXIT 7	3 SP CONT ROLLED BM	80.4	ND
SPRINGFIELD	I91	I-91	0026N	BLACK RIVER	0.4 MI S EXIT 7	3 SP CONT WLD GIRDER	65.0	ND
SPRINGFIELD	I91	I-91	0026S	BLACK RIVER	0.4 MI S EXIT 7	3 SP CONT WLD GIRDER	65.0	ND
SPRINGFIELD	I91	I-91	0027N	BIKE PATH	0.1 MI S EXIT 7	ROLLED BEAM	97.5	ND
SPRINGFIELD	I91	I-91	0027S	BIKE PATH	0.1 MI S EXIT 7	ROLLED BEAM	78.3	FD
SPRINGFIELD	I91	I-91	0028N	I 91 OVER US 5	I91 EXIT 7	4 SP CONT ROLLED BM	69.0	ND
SPRINGFIELD	I91	I-91	0028S	I 91 OVER US 5	I91 EXIT 7	4 SPN CONT ROLLED BM	81.0	ND
SPRINGFIELD	I91	I-91	0029N	I 91 OVER TH NO 3	3.3 MI N EXIT 7	3 SPN CONT ROLLED BM	96.5	ND
SPRINGFIELD	I91	I-91	0029S	I 91 OVER TH NO 3	3.3 MI N EXIT 7	3 SPN CONT ROLLED BM	68.3	SD
SPRINGFIELD	PARK STREET	Park St	00079	BLACK RIVER	PARK STREET	CONCRETE ARCH	70.0	SD
SPRINGFIELD	US5	US6	00044	BLACK RIVER	0.1 MI S JCT. VT.11 W	CONT. WELDED GIRDER	98.0	ND
SPRINGFIELD	VT106	VT106	00003	BLACK RIVER	0.9 MI S JCT. VT.10	3 SPAN ROLLED BEAM	55.0	SD
SPRINGFIELD	VT11	VT11	00055	BROOK	2.1 MI W JCT. VT.106	BURIED PRECAST BX BM	95.2	ND
SPRINGFIELD	VT11	VT11	00062	BLACK RIVER	0.1 MI W JCT. VT.106	(3)SPAN ROLLED BEAM	66.2	ND
SPRINGFIELD	VT11	VT11	00064	BLACK RIVER	0.8 MI E JCT. VT.106	ROLLED BEAM	43.9	SD
SPRINGFIELD	VT11	VT11	00065	SEAVER BROOK	2.0 MI W JCT US 5 S	TWIN CELL RC BOX	68.0	ND
SPRINGFIELD	VT11	VT11	00066	BLACK RIVER	0.3 MI WEST JCT U.S.5 S	WELDED GIRDER	69.1	ND
WEATHERSFIELD	C3006	Ascutney Basin Rd	00063	N. BR. BLACK RIVER	0.02 MI TO JCT W VT106	PRESTRESS CHANNEL BM	54.9	SD
WEATHERSFIELD	C3020	Upper Falls Rd	00066	BLACK RIVER	0.04 MI TO JCT W VT131	TOWN LATTICE COV BR	25.3	ND
WEATHERSFIELD	C3032	Tarbell Hill Rd	00024	CROWN POINT BROOK	0.8 MI JCT VT 106 & TH 32	CONCRETE SLAB	84.5	ND
WEATHERSFIELD	C3041	Hidden Glen Rd	00059	MILL BROOK	0.26 MI TO JCT W US5	ROLLEDBM W TIMBER DK	47.0	ND
WEATHERSFIELD	C3046	Goulden Ridge Rd	00058	MILL BROOK	0.03 MI TO JCT W VT131	MULTI PLATE PIPE ARC	99.9	ND
WEATHERSFIELD	C3065	Henry Gould Rd	00083	SHERMAN BROOK	0.15 MI TO JCT W VT131	MULTI KINGPST COV BR	25.0	SD
WEATHERSFIELD	I91	I-91	0030N	I 91 OVER VT 131	I91 EXIT 8	3 SPN CONT ROLLED BM	80.7	ND
WEATHERSFIELD	I91	I-91	0030S	I 91 OVER VT 131	I91 EXIT 8	3 SPN CONT ROLLED BM	80.7	ND
WEATHERSFIELD	I91	I-91	29-10	MILL BROOK	0.3 MI S EXIT 8	TWIN CELL RC BOX	73.6	ND
WEATHERSFIELD	TH37	Thrasher Rd	00D31	TH NO 37 OVER I 91	0.8 MI N EXIT 8	4 SPAN ROLLED BEAM	100.0	ND
WEATHERSFIELD	TH51	Bowen Hill Rd	0D294	TH NO 51 OVER I 91	3.4 MI S EXIT 8	5 SPN CONT ROLLED BM	87.0	ND
WEATHERSFIELD	VT106	VT106	00008	BLACK RIVER	2.8 MI N JCT. VT.10	STEEL GIRDER/FLBEAM	85.0	ND
WEATHERSFIELD	VT131	VT131	00010	N. BR. BLACK RIVER	0.7 MI E JCT. VT.106	ROLLED BEAM	77.8	ND
WEATHERSFIELD	VT131	VT131	00011	BROOK	1.1 MI E JCT. VT.106	TBEAM WIDE W/ STLBM	69.2	ND
WEST WINDSOR	C3006	Rush Meadow Rd	00032	WILLOW BROOK	0.3 MI TO JCT W VT44	CONCRETE SLAB	97.0	ND
WEST WINDSOR	C3030	Bible Hill Rd	00033	MILL BROOK	0.35 MI TO JCT W VT44	TIMBER THRU ARCH	29.3	SD
WEST WINDSOR	C3037	Churchill Rd	00034	MILL BROOK	0.06 MI TO JCT W VT44	TIMBER THRU ARCH	29.2	SD
WEST WINDSOR	VT44	VT44	00004	MILL BROOK	2.4 MI E JCT. VT.106	ROLLED BEAM	61.9	SD
WEST WINDSOR	VT44	VT44	00005	MILL BROOK	3.6 MI E JCT. VT.106	CONCRETE T-BEAM	81.1	ND
WEST WINDSOR	VT44	VT44	00006	BEAVER BROOK	4.1 MI E JCT. VT.106	CONCRETE SLAB	84.4	ND

	Route Number	Road Name	Bridge Number	Features Intersected	Location	Bridge Type	Federal Sufficiency Rating	Deficiency Status of Structure
WEST WINDSOR	VT44	VT44	00007	MILL BROOK	4.4 MI E JCT. VT.106	ROLLED BEAM	45.0	SD
WINDSOR	C3006	Brook Rd	00022	MILL BROOK	1.0 MI TO JCT W CL3 TH7	ROLLED BEAM	76.6	FD
WINDSOR	C3006	Brook Rd	00024	MILL BROOK	0.3 MI TO JCT W CL3 TH16	ROLLED BEAM	81.9	FD
WINDSOR	C3006	Brook Rd	00025	MILL BROOK	0.55 MI TO JCT W VT44	ROLLED BEAM	73.9	FD
WINDSOR	C3007	Hewett Rd	00023	MILL BROOK	@ JCT W CL3 TH6	ROLLED BEAM	58.6	FD
WINDSOR	C3022	Johnson Rd	00027	HUBBARD BROOK	@ JCT W CL2 TH3	ROLLED BM TIMBER DK	65.7	SD
WINDSOR	I91	I-91	0033N	I 91 OVER VT 44 MILLB	3.7 MI N EXIT 8	4SP 2 WELDED GIRDERS	69.1	ND
WINDSOR	I91	I-91	0033S	I 91 OVER VT 44 MILLB	3.7 MI N EXIT 8	4SP 2 WELDED GIRDERS	48.8	SD
WINDSOR	I91	I-91	0034N	I 91 OVER TH NO 5	3.0 MI S EXIT 9	3SP CONT ROLLED BEAM	50.7	SD
WINDSOR	I91	I-91	0034S	I 91 OVER TH NO 5	3.0 MI S EXIT 9	3SP CONT ROLLED BEAM	50.7	SD
WINDSOR	I91	I-91	0035N	I 91 OVER TH NO 3	2.1 MI S EXIT 9	GIRDER	97.4	ND
WINDSOR	I91	I-91	0035S	I 91 OVER TH NO 3	2.1 MI S EXIT 9	GIRDER	85.3	ND
WINDSOR	US5	US6	00055	MILL BROOK	0.1 MI S JCT. VT.44	CONC SPANDREL ARCH	43.0	SD
WINDSOR	VT44	VT44	00010	MILL BROOK	2.6 MI W JCT. U.S.5	2 SP CONC T BEAM	73.3	ND
WINDSOR	VT44	VT44	00012	MILL BROOK	0.3 MI W JCT. U.S.5	WELDED GIRDER	96.1	ND
WINDSOR	VT44	VT44	00013	MILL BROOK	0.1 MI W JCT. U.S.5	ROLLED BEAM	96.6	ND
WINDSOR	VT44A	VT44A	00001	I 91 UNDER VT 44A	0.9 MI WEST U.S.5	4SP ROLLED BEAM	80.8	ND

Source: VTrans, 2007

NOTES -

Federal Sufficiency Ratings:

80-100	Good / Not Eligible for Funding
50-80	Eligible for Rehabilitation
0-50	Eligible for Replacement

Deficiency Status of Structure:

ND	Not Deficient
FD	Functionally Deficient
SD	Structurally Deficient

APPENDIX G: 2008 Regional Transportation Survey Results

A Regional Transportation Survey was sent to all town officials in 2008. Thirty four surveys were completed. The following is a summary of the results:

1. Please rate each of the following aspects of the transportation system in your community as they exist today, on a scale of 0 to 4 with 4 being "excellent," 1 being "poor" and 0 being "no opinion."

Response Average	Category
2.26	State Highways
2.18	Overall transportation system
2.15	Trails & Paths
2.12	State Bridges
	Local Roads
	Local bridges
2.03	Public Transit Services
1.71	Sidewalks & crosswalks
1.35	Bicycle facilities & shoulders
1.03	Railroad tracks & bridges
0.97	Hartness State Airport

2. What roads or intersections need improvement in your area? (Please list your top 3 locations in order of need.)

Please see the New Project List

3. What bridges in your area need maintenance or repair? (Please list your top 3 locations in order of need.)

Please see the New Project List

4. Please look at the road and bridge issues below and rank them 1 through 5 with 1 being the most important.

Response Average	Category
2.00	Fix or replace bridges in poor condition
2.27	Rebuild Roads in very poor condition
2.85	Resurface roads in fair to poor condition
3.58	Road maintenance
3.73	Widen existing roads & shoulders

5.a Please look at the road safety and/or traffic operation issues below and rank them 1 through 7 with 1 being the most important.

Response Average	Category
2.44	Fix dangerous intersection
3.26	Slow traffic in villages, near schools, residential areas
3.36	Reduce sharp corners and blind spots on highways
4.12	Speed and/or aggressive driving enforcement

4.24	Improve unsafe driveways/access problems
4.55	Improve traffic signal operations
4.88	Add turning lanes at intersections

5.b Please add comments per specific locations in the COMMENTS box below.

Fix the intersections of route 44A.
Southern Windsor County is like the rest of the state as it is in need of many things all of which cost money.
I understand the rationale for this survey but I think that a scoring system versus ranking system would enable better, more sensitive analysis of perceived needs.
We should get rid of or not make more complicated intersections like at the Springfield Plaza. We should have a guarantee on road work from contractors. Rte 103 between Chester and Ludlow was extensively rebuilt last summer, and the surface paving is
A deminstration of wasted money is the "full depth road construction" with out drainage and under drain is the most important. The 103 project in Chester fixed the road bed but did not address water and ledge issue next to the river. The road is heaving a
Intersection of Rts. 44 & 44A is a significant problem.
5,6,7 are not neccessary Speed limits do not need to be lowered (if present limits were adhered to there would not be any problems). One of the present problems is that there is so much variety of limits that those in a hurry feel the need to ignore some
Our planning commission is working hard to make constructive changes in the Ascutney Village/Interstate interchange area as you well know and even though it is a long way away the beginning process is in the works and it will be great when done. Parking a
More agressive penalties for DUI offenses.
Other than the speed of drivers near the schools, especially on Union St., speed is not a top issue as the current "speed dips" and "speed bumps" seemed to slow us all down quite well. :(
Adequately fix existing conditions before expanding infrastructure base requiring repair and maintenance.
Speed/aggressive driving along Rt. 106 going to N. Springfield Add turning lane for Valley St. on to Main St. Springfield
Stop the money waste on studying Vt 131 at I-91 to US 5 Accelerate improvement of Ascutney park and ride Put planning of Vt 44 and Vt 44A Intersection in play

6. Please look at the public transportation issues below and rank them 1 through 4 with 1 being the most important.

Response Average	Category
2.26	Increase frequency of existing bus services
2.28	Expand capacity of park and ride lots
2.74	Increase hours of service (after 6 pm, weekends)
2.90	More trips for medical/social services

7. Please look at the bicycling and walking issues below and rank them 1 through 7 with 1 being the most important.

Response Average	Category
2.15	Improve existing sidewalks & crosswalks
2.91	Build new sidewalks & crosswalks
3.45	Provide bicycle lanes along existing roads
3.97	Provide more multi-use paths
4.21	Provide pedestrian amenities (shade trees, benches, etc)
5.06	Provide a buffer between sidewalk & road
5.30	Provide bicycle amenities

8. What are the primary challenges in addressing transportation infrastructure issues? (Please pick only three)

Response Percent	Category
85%	Lack of funds
77%	Project cost increases
74%	Deferred maintenance
27%	Regulations/Standards/Permitting
15%	Human behavior is hard to change
9%	Availability of materials (gravel, salt, etc)
3%	Lack of adequate staffing

9. Do you think current funding levels are sufficient to address our transportation needs?

Response Percent	Category
9%	Yes
85%	No
6%	No Opinion

10. If you answered no to question number 10, please rank top 4 funding options with 1 being the best.

Response Average	Category
2.18	Developer cost sharing (Capital budget, impact fees)
2.26	Additional federal or state gas tax
2.48	Additional state vehicle registration fees
2.95	Enable alternatives to the gas tax, such as road user fees
3.25	Enable local sales/income tax
3.50	Enable local vehicle registration fees
4.83	Additional local property tax

11. Do you know of any other funding options not mentioned above?

State tax on 4 wheel off-road vehicles and ATVs
Windsor should hire a grant writer as Im sure more funds are avaiable!
None of the above should be considered. Offer an "Adopt-A-Road" program to those wishing something special on a stretch of road. A tax deductable "Adoption Fee" that can be directed at a particular area for a particular use. Begin with those things alread
If additional funding were to be put in place the only way that it would work is for making sure that the designated monies raised get where they are supposed to go in the end and that rarely happens at the state level.
I think we need more Federal funding which could be passed down through the State and provided to Towns that are now or have been under funded in the past.
Since Vt. is considered a recreation state and the roads seem to have an increase in traffic mostly during the winter months. There should be toll booths set up on the interstates. Local traffic is not the problem. The increase in out of state traffic and
Tax all users or the transportation system
- Reallocate the funds for anti-terrorism to our transportation system. - tolls, though I hate them! - Please avoid anti-business type funding sources.
No
Re-appropriation of priorities at the Federal and State administration levels. Throughout history transportation has been subsidized to lesser or greater degrees. Sustainable projects are sufficient - consider life-cycle cost analysis and actual or
Admit it- fuel tax must up. Paving cost is up like 20x since tax set
None of the above revenue enhancing plans can be implemented currently without adverse effect on the fragile economy.

12. Please comment on other transportation issues you think are important:

Windsor is like many other Vermont towns but with a smaller tax base so taxes are at or near the max at this time. It would be nice to have the state step in and help the "Birthplace of Vermont" with some of the many problems it is facing with schools, roads, bridges and the tax base.
Wow, this is anonymous, well kinda, sorta, not really... (see 14 & 15 below)
Need to hire a Public Works person. Hire 2 more workers for Highway Dept
Are there ways we can encourage alternative fuel usage?

1)Traffic lights should be lower, or possibly put on opposite corners so that drivers sitting at a red light can see them easier. 2)Paints used on roads need to be more reflective so that they can be seen in bad weather, day and night. 3)reflectors were put up by drains so that the snowplows cleared them, but they are not working. something else has to be done about clearing the drains of snow in the winter.
Assistance to towns on traffic flow studies, rerouting of large trucks and mobile home transport to avoid downtown locations.
Some sections of our roads should have major reconstruction work done. However, our town is small and therefore this creates a problem in trying to raise sufficient funds through Local Property Taxes to accomplish this level of road work. We are looking into available grants as a way to fund these types of projects but this is not a source of funding that can be counted on for yearly planning by the town. It would be good if more money could be realized through state aid for this purpose. We do count on this money from the State.
The Conn. River Transit is great. It would be nice to see just one more bus leaving closer to 8:00am from the Exit 9 park & ride heading north. Windsor streets are in terrible shape as are many of Vermont's roads. The state and towns need to bite the bullet now and starting investing in their roads and transportation systems.
1. Narrowing of over-ambitious roadway projects to reduce initial costs and future maintenance. 2. De-accessioning of underutilized roads and infrastructure to private entities or mother nature. 3. Review possibility of Ct. River rail corridor commuter service at subsidized cost if necessary to achieve levels pegged below IRS mileage rate for travel by automobile of coequal distance. 4. Substantially improve Ct. River rail corridor bed and provide overhead electrical for

high-speed commuter line pegged at 2x IRS mileage rate. 5. Revive local rail support service systems, train stations, platforms, amenities, etc.
After the this last winter all roads are in need of repairs, that will put budgets to the limit.
Stop diverting funds to airports, railways, pathways, and the general fund

13. Survey Taker – I am a member of the:

26.5%	Select Board
26.5%	Planning Commission
0.0%	Road Foreman/PWD
5.9%	Police
5.9%	Fire
2.9%	Ambulance
5.9%	Conservation Commission
20.6%	DRB/ZBA
8.8%	Town Manager/Administrator
2.9%	State Agency
2.9%	Regional Agency
8.8%	Other

14. What municipality/agency do you represent?

Baltimore	1
Cavendish	1
Chester	2
Ludlow	3
Reading	2
Springfield	4
Weathersfield	2
West Windsor	6
Windsor	6
Village of Perkinsville	1
VTrans	1
Other	2

Map 1 of 6
2009 Regional Transportation Plan

Effective Date: July 21, 2009

Southern Windsor County Region of Vermont

Regional Transportation Network

DATA SOURCES: Vermont Center for Geographic Information (VCGI), Southern Windsor County Regional Planning Commission (SWCRPC), Vermont Agency of Natural Resources (VT ANR)
ROADS: VT Enhanced 911 Board. Last update September 2008.
TOWN BOUNDARIES: Extracted from BNDHASH. Last update December 2007. Most current and best available data.

- Class 1 TH
- Class 2 TH
- Class 3 TH
- Class 4 TH
- Trail
- Vermont State Highway
- US Highway
- Interstate
- Airport
- Park and Ride Lot
- Railroad
- Town Boundary

Miles
0 2.5 5

N

VT State Plane
Meters, NAD 83

For planning purposes only
Not for regulatory interpretation

GIS

For info & data - www.vcgi.org

Southern Windsor County
Regional Planning Commission

SWCRPC
SOUTHERN WINDSOR COUNTY
REGIONAL PLANNING COMMISSION

SWCRPC
PO BOX 320
Ascutney, VT 05030
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www.swcrpc.org

Map 2 of 6
2009 Regional Transportation Plan

Effective Date: July 21, 2009

Southern Windsor County Region of Vermont

Functional Road Classification

DATA SOURCES: Vermont Center for Geographic Information (VCGI), Southern Windsor County Regional Planning Commission (SWCRPC), Vermont Agency of Natural Resources (VT ANR)
ROADS: VT Enhanced 911 Board. Last update September 2008.
TOWN BOUNDARIES: Extracted from BNDHASH. Last update December 2007. FUNCTIONAL CLASSIFICATION: VT Agency of Transportation. Last update March 2003. Most current and best available data.

Miles
0 3 6

- Rural Principal Arterial - Interstate
- Rural Principal Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Town Boundary

N

VT State Plane
Meters, NAD 83

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Map 3 of 6
2009 Regional Transportation Plan
Effective Date: July 21, 2009

Southern Windsor County Region of Vermont

Scenic Byways and Highways

DATA SOURCES: Vermont Center for Geographic Information (VCGI), Southern Windsor County Regional Planning Commission (SWCRPC), Vermont Agency of Natural Resources (VT ANR)
ROADS: VT Enhanced 911 Board. Last update September 2008.
TOWN BOUNDARIES: Extracted from BNDHASH. Last update December 2007. Most current and best available data.

Miles
0 2.5 5

- Scenic Road
- Class I TH
- Vermont State Highway
- US Highway
- Interstate
- Town Boundary

N

VT State Plane
Meters, NAD 83

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Map 5 of 6
2009 Regional Transportation Plan

Effective Date: July 21, 2009

Southern Windsor County Region of Vermont

Average Annual Daily Traffic

DATA SOURCES: Vermont Center for Geographic Information (VCGI), Southern Windsor County Regional Planning Commission (SWCRPC), Vermont Agency of Natural Resources (VT ANR)
ROADS: VT Enhanced 911 Board. Last update September 2008.
TOWN BOUNDARIES: Extracted from BNDHASH. Last update December 2007. AADT: VT Agency of Transportation. Last update December 2004. Most current and best available data.

AADT

- Less than 1000
- 1000 - 2499
- 2500 - 4999
- 5000 - 9999
- 10000 or more
- Town Boundary

Miles
0 2.5 5

N

VT State Plane
Meters, NAD 83

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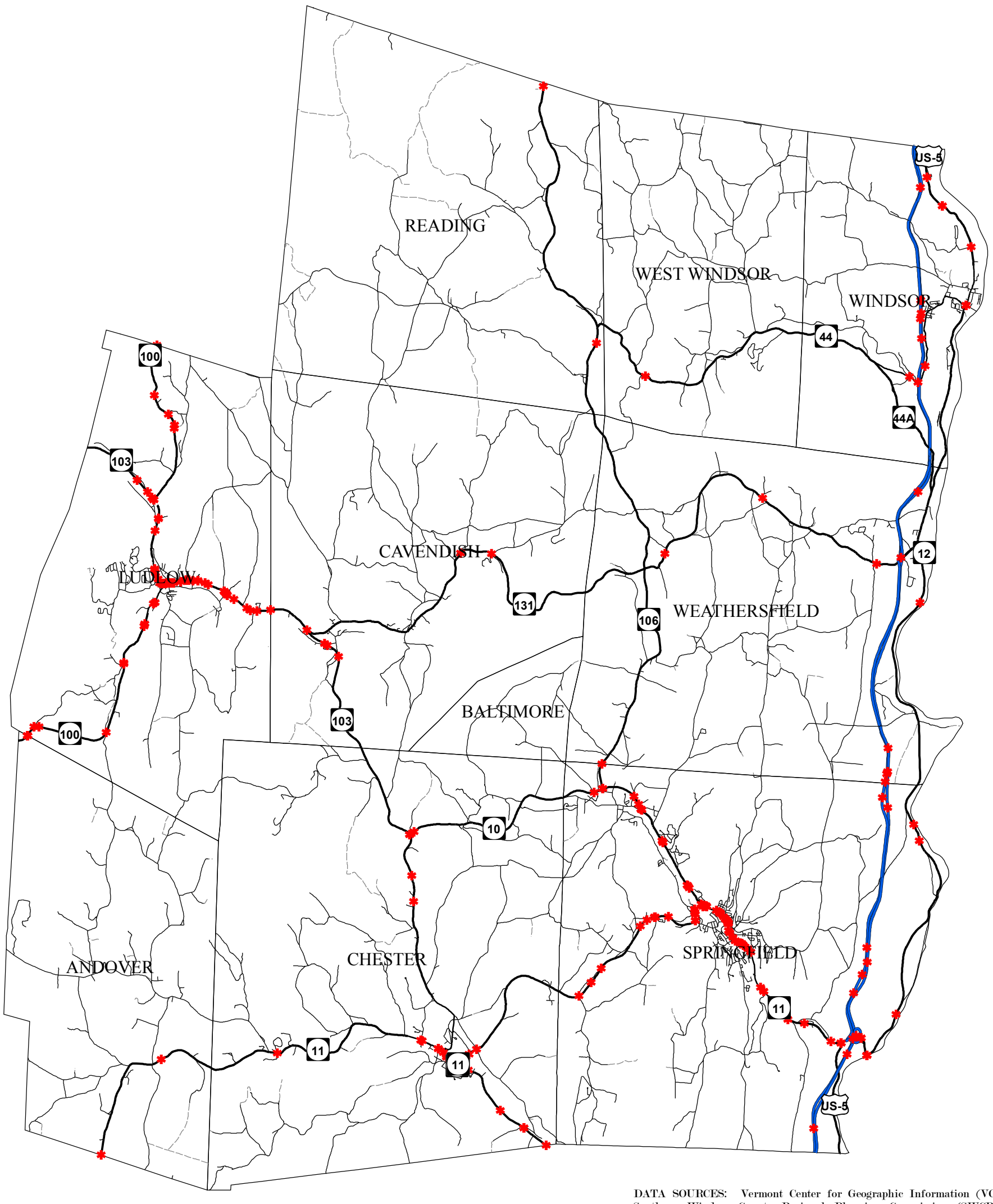
Map 6 of 6
2009 Regional Transportation Plan

Effective Date: July 21, 2009

Southern Windsor County Region of Vermont

High Crash Locations



DATA SOURCES: Vermont Center for Geographic Information (VCGI), Southern Windsor County Regional Planning Commission (SWCRPC), Vermont Agency of Natural Resources (VT ANR)
ROADS: VT Enhanced 911 Board. Last update September 2008.
TOWN BOUNDARIES: Extracted from BNDHASH. Last update December 2007. HIGH CRASH LOCATIONS: VT Agency of Transportation. Last update March 2003. Last update December 2007. Most current and best available data.

Miles
0 2.5 5

- High Crash Location
- Class I TH
- Class II TH
- Class III TH
- Class IV TH
- Vermont State Highway
- US Highway
- Interstate
- Town Boundary

N

VT State Plane
Meters, NAD 83

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