Volume III

REGIONAL TRANSPORTATION PLAN FOR THE
NORTHEAST KINGDOM

Northeastern Vermont Development Association

Regional Transportation Plan for the Northeast Kingdom

Year 2005 Update

Prepared by

Wilbur Smith Associates

May 2005

Table of Contents

Figures

Tables

Section 1
Introduction

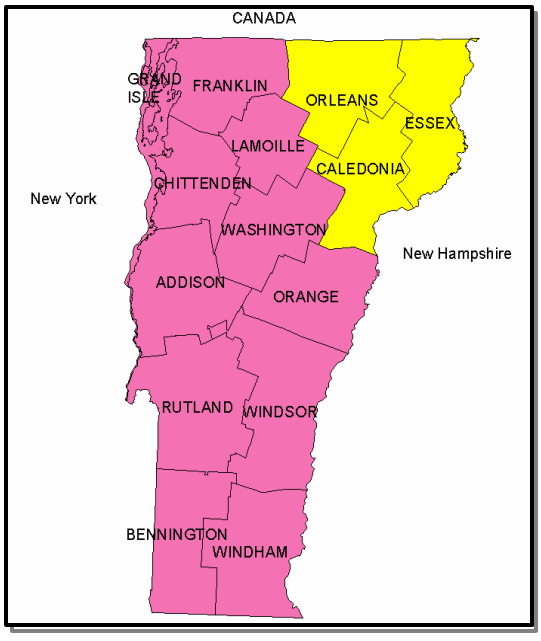
The Northeast Kingdom Regional Transportation Plan puts forth a 20-year guide for developing and improving the transportation system in the Region. This plan is an update of the previous plan prepared in 1996. The Northeastern Vermont Development Association (NVDA) has been responsible for the development of this and previous plans. It addresses the various means of transportation now in use in the Northeast Kingdom. The plan looked at the various modes of transportation to determine how they can play a decisive role in the future development of the region.

This plan has been prepared under the provisions and requirements of the Transportation Equity Act for the 21st Century (TEA-21). The Northeastern Vermont Development Association (NVDA) anticipates that it will update this plan again in five years, in accordance with current TEA-21 guidance. The plan was prepared with the assistance of the NVDA Transportation Advisory Committee (TAC), the local municipalities and the residents of the Northeast Kingdom. It will serve as the Transportation Element of the regional plan for the region.

The Plan has been prepared to respond to the special, unique characteristics of the Northeast Kingdom. It is also compatible with the State's Long Range Transportation Plan, which emphasizes maintenance, intermodal connections and links to land use.

The Region

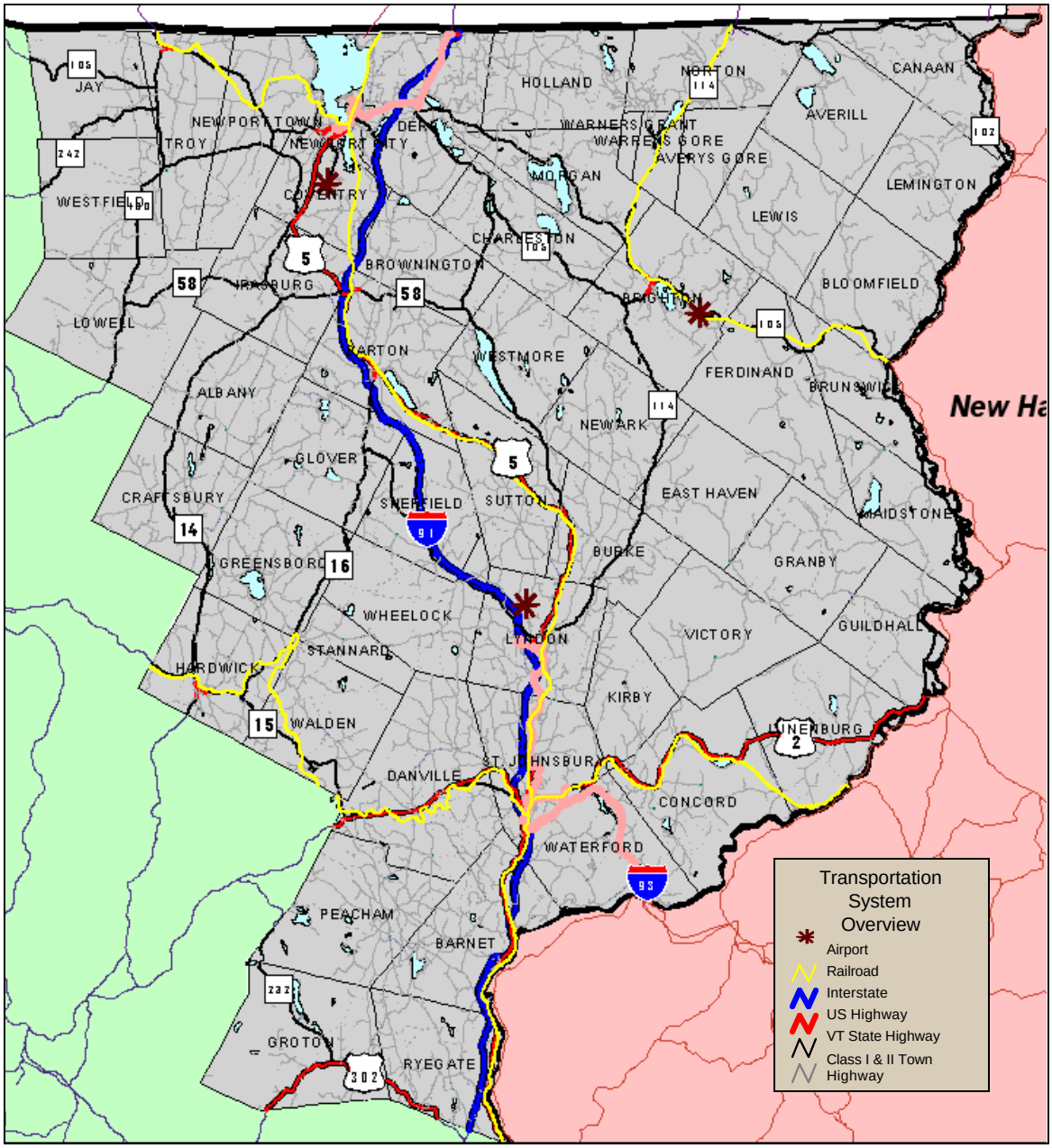
Figure 1.1: Geographic Relationship of Northeast Kingdom Region to the State of Vermont



The Northeast Kingdom encompasses 55 municipalities, grants and gores, situated in the northeastern most corner of Vermont, as shown in Figures 1.1 and 1.2. The region consists of three counties, Caledonia, Orleans and Essex. It is bordered on the east by the Connecticut River and New Hampshire; to the west by Franklin, Lamoille and Washington Counties; to the north by the Province of Quebec, Canada; and the south by Orange County. The Region's total land area is 2,027 square miles, encompassing about 21% of the State.

The Northeast Kingdom is the largest, most sparsely populated (10% of Vermont's population) and economically challenged of all the regions in the State. The region's population has been growing slowly over the last 20 years, but the rate is now increasing, as discussed later in this document.

Figure 1.2: Overview of Northeast Kingdom Regional Transportation System



Section 2
Vision and Goals

Vision for Transportation System Development and Improvement

The Northeast Kingdom is a special place. In this region, many traditions are preserved from generation to generation -- traditions of compact town and village centers surrounded by open, working farms and forests; of local and state road systems that are relatively congestion-free and pleasant to drive; and of a network of trails and paths providing access to a vast array of recreation opportunities. It is through respecting and valuing these and other long-held traditions that the Northeast Kingdom has been, and will continue to be, a special place.

Change, however, is inevitable. As the transportation infrastructure between neighboring states, Quebec and Ontario and the Northeast Kingdom has been continuously improved, the region is becoming increasingly desirable for second homes, businesses, and recreation for the 70 million people who live within a day's drive (500 miles). Additional transportation improvements, therefore, need to be carefully planned in concert with land use development.

Change can appear gradual -- one building, one driveway and one local road at a time. It has been easy to ignore single actions or development proposals, but the cumulative impact is beginning to be dramatic. Indeed, the very character and traditions of the Northeast Kingdom are at risk.

Even so, the community of the Northeast Kingdom still has a unique opportunity to "do it right:" to preserve our way of life, protect our villages and open spaces, and maintain our working farms and forests, yet still provide access for new businesses, residents and visitors. We have an opportunity, and a responsibility, to ensure that our transportation systems are used to maintain the long held Northeast Kingdom traditions while effectively addressing the inevitable change.

Goals and Objectives

Goals and objectives are the necessary cornerstones of any plan. They synthesize the region's vision and represent the general direction of transportation planning for the regional community. The goals and objectives of this regional transportation plan are consistent with the vision presented in the region's general plan and the goals presented in the State Transportation Plan. They are as follows:

NVDA Regional Transportation Plan

Goals and Objectives

Goals

Goal A: Maintain Adequate Road and Bridge Capacity and Mobility

Country roads developed from trails and village byways, or those that serpentine along rivers, streams, and mountains, are typical to Vermont. The charm of these roads helps give the region its character and attract visitors to the Northeast Kingdom. The physical maintenance and upgrade of these roads and bridges to accommodate increased traffic volumes is always challenging. Given the limit on funds for continued investment in the transportation networks, it is vitally important that the surface network be adequately maintained to accommodate future growth and continued accessibility. The transportation infrastructure serves as the veins and arteries through which the region's residents, goods and services are transported to various local, regional and national destinations. It must be maintained to ensure continued accessibility to city, town and village centers, as well as other principal, secondary, and recreation activity centers.

Goal B: Guarantee a Regional Transportation System that Facilitates Economic Development

Economic development is inextricably linked to the availability of transportation systems that provide adequate, sustainable levels of service and system capacity. Economic development is key to creating and stabilizing employment and for sustaining a good quality of life of our citizens. It is the foundation upon which the region's tax structure depends for financing the upkeep of the transportation infrastructure. In order to ensure an adequate source of funds for addressing the many deficiencies that afflict the primary and secondary modes of transportation, it is important that the tax base be strengthened through the creation of business and employment opportunities.

Goal C: Ensure Good Quality of Life

' "Quality of Life" implies different things to different people. In addition, the meaning of a "good" quality of life may change from time to time given evolving conditions or circumstances of a community. Generally, however, residents of the Northeast Kingdom today aspire to maintain a way of life consistent with those traditions discussed in the region's vision statement: wholesome living, efficient roadways, undeveloped rural and pastoral open lands, small town and village clusters that provide a sense of community and safety, an abundance of wildlife, readily available recreational activities, a variety of education options for human growth and development, and ample economic opportunities to enable residents to work and stay in the region.

Goal D: Ensure Availability of Alternative Transportation Modes to Address Residents' Needs

To rely solely on one mode of transportation is rarely the preferred course of action, nor is it the recommended solution for the distribution of goods and services and for general public mobility and commuting needs. The greater the multimodal options (e.g., rail, air, truck, bus, bicycle/pedestrian), the greater the opportunities will be for access and connectivity between activity centers within the region, and to those outside the Northeast Kingdom. The region will benefit from a more diverse transportation network with the ability to effectively address the growing needs of communities with readily available modes of travel.

Objectives

Objective 1: Develop Mechanisms for Effective Management and Maintenance of the Region's Transportation System

- Slow the deterioration of individual modes, and assist in reducing/averting costly repairs.
- Increase efficiency and structural longevity of system.
- Encourage more effective modal linkages.
- Protect and enhance the regions development investments.
- Maintain a consistent level of service and safety.

Objective 2: Integrate Transportation Planning with Local Land Use and Activity Center Development

- Facilitate a consistent and more effective planning process at the regional and local level.
- Insure that transportation concerns are addressed appropriately in light of land use impacts as well as community facility needs.
- Prevent waste of natural and financial resources.

Objective 3: Identify a Variety of Funding Mechanisms to Assist Towns in Maintaining Local Road Infrastructure

- Reduce the dependency on state Capital Program and Project Development.
- Encourage local participation by individual municipalities with respect to project development, design, and scheduling.
- Assist in reducing negative impacts on local town budgets for transportation maintenance and construction.

Objective 4: Enhance Economic Development and the Efficient Movement of Goods and Services While Reducing the Impact of Commercial Traffic on Local Communities

- Reduce time-in-transit for the driving public as well as commercial vehicles.
- Reduce energy consumption.
- Initiate projects that will increase the level of safety on local and state highways.
- Manage noise levels associated with transportation activities.
- Encourage and aid neighboring municipalities to work cooperatively on transportation projects of large scope, thus reducing the burden on any one municipality.

The transportation goals and objectives identified above direct the NVDA to establish an integrated transportation system for the Northeast Kingdom region. The system must meet the mobility needs of both individuals and commerce, while at the same time improving the environment through reduced reliance on the single occupant vehicle and more emphasis on providing alternate means of transportation. Special consideration must be given to addressing mobility needs of the transportation disadvantaged, to ensure the transportation system meets the diverse needs of people found in the region. Finally, the transportation system considered in the Regional Transportation Plan must be capable of being implemented, meaning that the impacts have been adequately identified and addressed, the financing is reasonably available and the community is able to maintain or improve the overall quality of life for its residents and visitors.

Section 3
Setting the Stage: Transportation Conditions, Trends and Issues

Introduction

This section provides information on existing transportation conditions in the Northeast Kingdom region, trends and projected future conditions, and themes and issues that the Regional Transportation Plan should address. An understanding of existing and future conditions helps put the transportation challenges facing the region into context. [1] Geography, population, employment and existing transportation networks are all inter-related. How these characteristics interact affects the manner in which mobility, access and overall regional vitality are created and ultimately addressed within the Plan. The following subjects are discussed in this section:

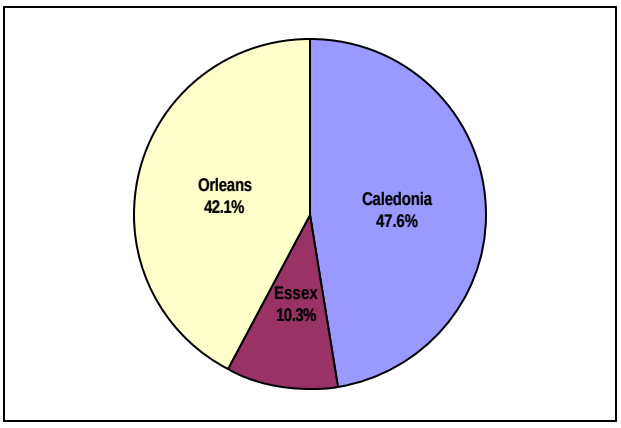
- Population and Demographics;
- Employment; and
- The Transportation Network.

Population

Introduction

The Northeast Kingdom region (NEK) is Vermont's most sparsely populated region, with a 2000 population of 62,438 across three counties. This is an increase of 7.1% over 1990 Census levels. The 2000 Census shows that Caledonia and Orleans Counties together account for almost 90% of the region's population (see Figure 3.1 below).

Figure 3.1: Regional Population Distribution, by County, 2000



Source: US Census, 2000.

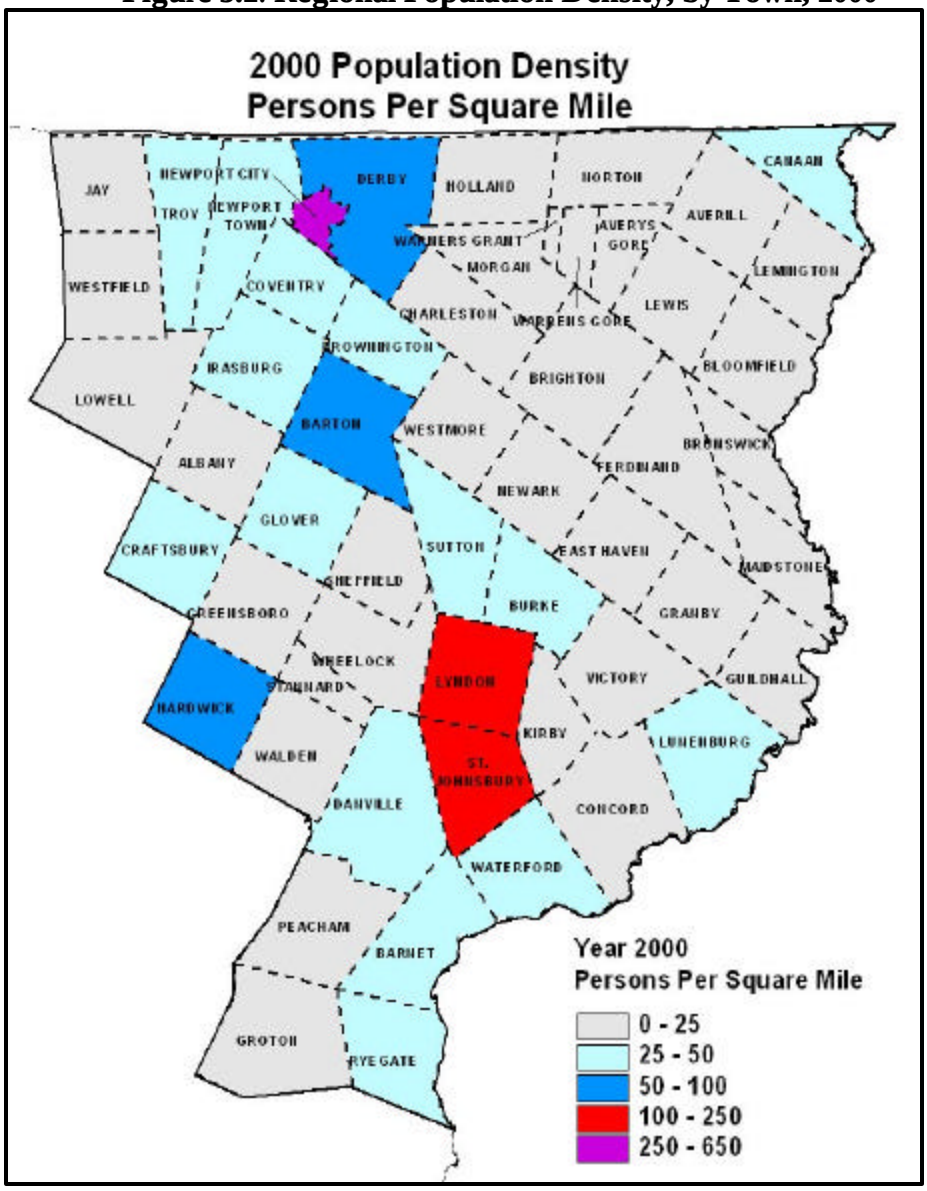
[1] This section presents a synthesis and assessment of the detailed information contained in the reports, *Existing Conditions* (September 2001) and *Future Conditions* (November 2002).

Table 3.1: Historical and Projected Regional Population, by Age Group, 1980-2020

	1980	2000	2020	% Change '80 to '00	Projected % Change '00 to '20
Total Regional Population	55,590	62,448	71,120	12%	14%
Population Age 15 and Younger	14,582	13,780	11,779	-5%	-15%
Population Age 16-64	34,072	39,459	41,914	16%	6%
Population Age 65 and Older	6,936	9,209	17,427	33%	89%

Source: Woods and Poole Economics, 2002.

Figure 3.2: Regional Population Density, by Town, 2000



Source: WSA analysis of Census 2000 Data.

The Region's population is projected to grow by an additional 14% by 2020 to 71,120. This represents a 0.65% annual growth rate, slightly higher than the 0.52% annual growth rate projected for all of New England.

Demographics

The median age of the region's residents ranges from 38.5 years in Caledonia County to 39.3 years in Orleans County, somewhat higher than the statewide median of 37.7 years. The largest group of residents in the NEK is in the 35-54 year old age range.

Figure 3.3: Historical and Projected Regional Population, by Age Group, 1980-2020

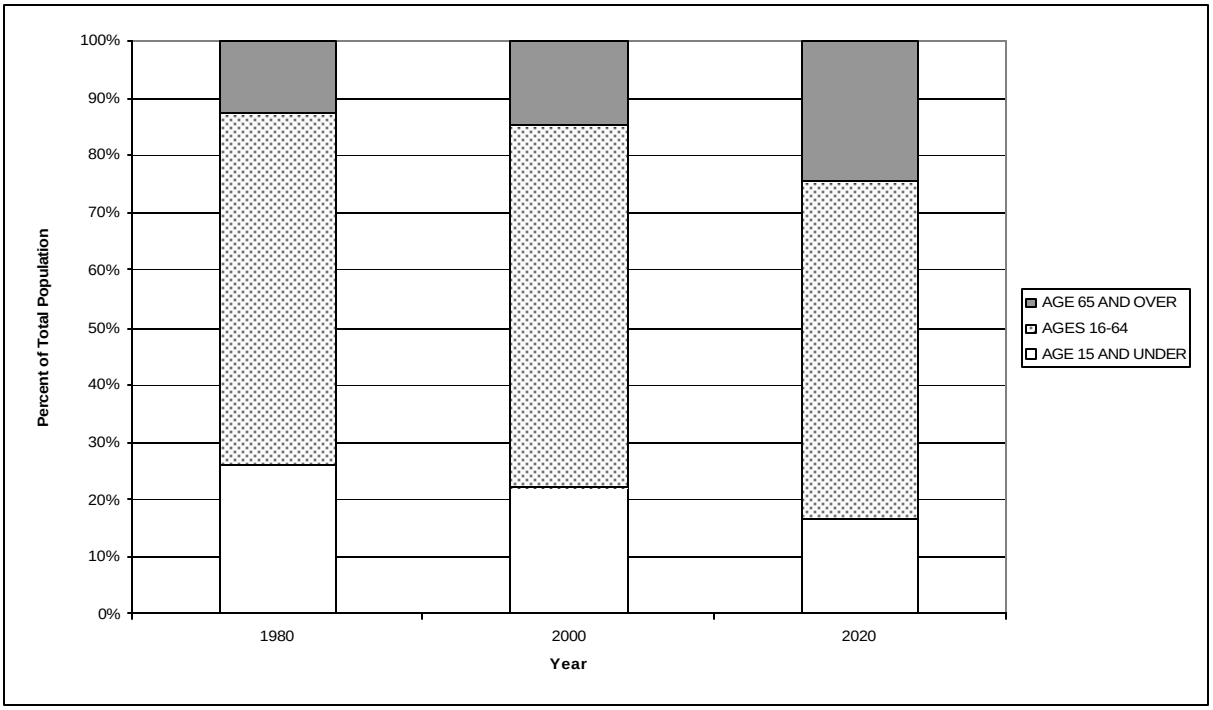
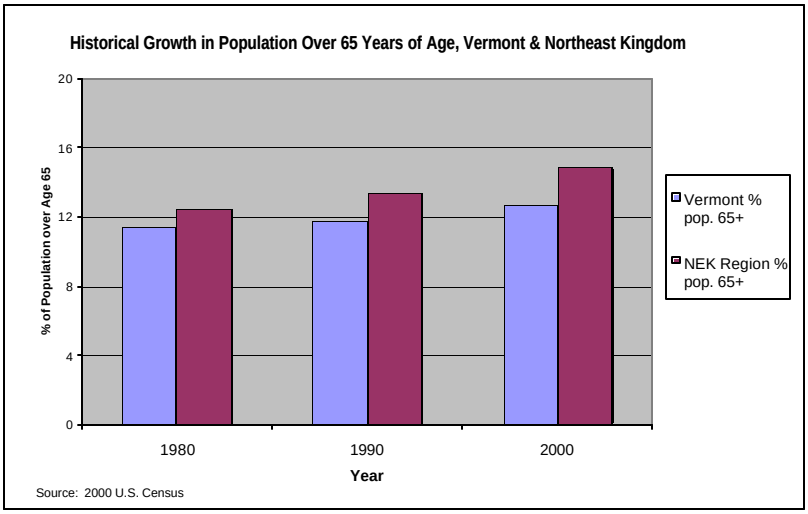


Figure 3.4: Historical Growth in Population over 65 Years of Age, Vermont & Northeast Kingdom, 1980-2000 Regional Population, by Age Group, 1980-2000



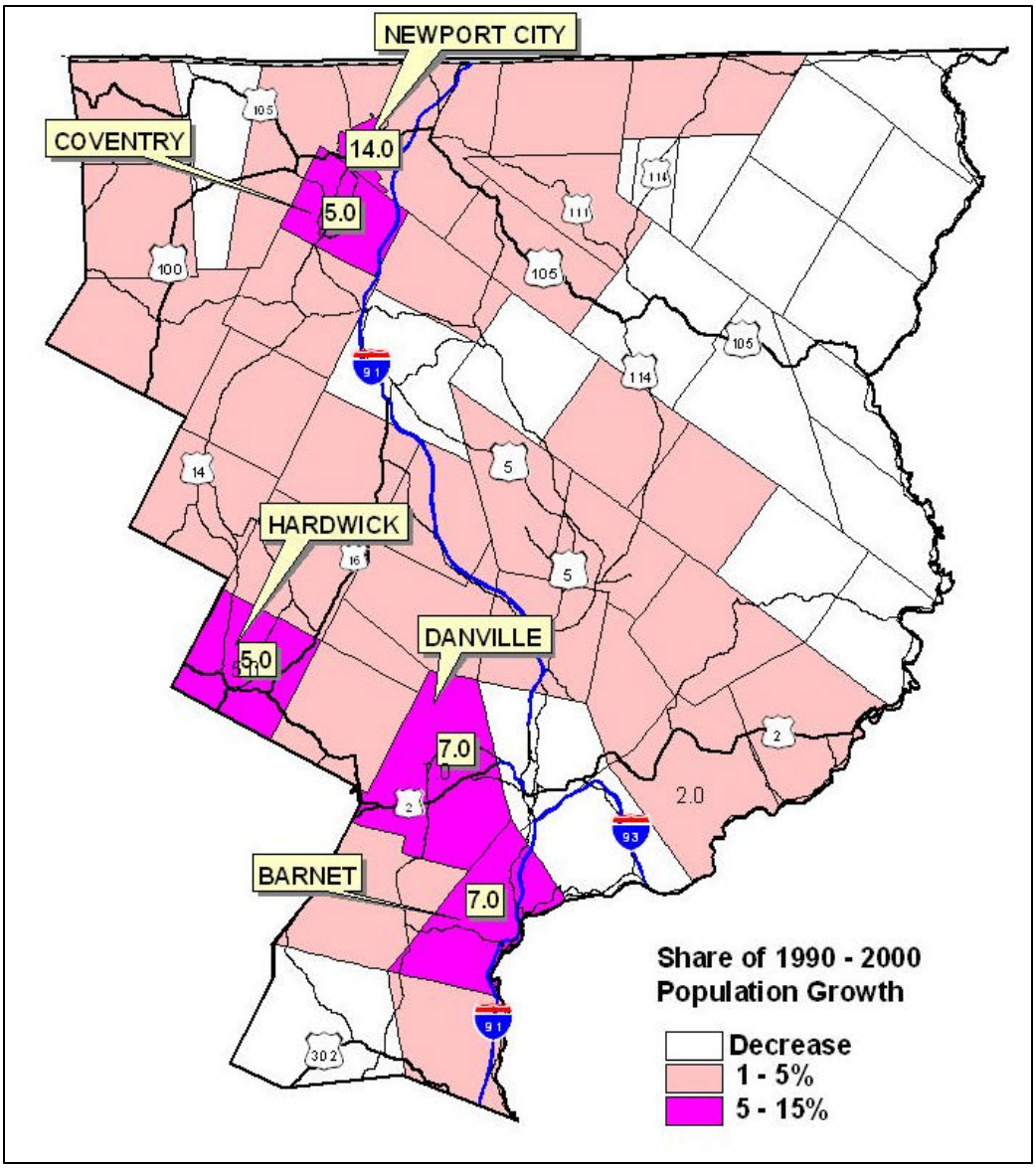
Senior citizens (aged 65 and older) comprise the fastest-growing age group in the region. As depicted in Figure 3.4, it is projected that 25% of the region's population will be in this group by the year 2020. Conversely, the share of the total population under 64 is projected to continue to decrease.

Geographic Distribution of Population

A key element of understanding the existing and future condition of the regional transportation system is to understand the geographic distribution of population in the region. The distribution and density of population has a direct relationship to the number of trips generated, the length of trips and the type of transportation network that can be used to serve them.

As shown in Figure 3.5, during the period 1990-2000, about 20% of the region's new population growth was in Newport and Coventry, and another 15% of the new population growth occurred in towns proximate to the region's largest municipality, St. Johnsbury. St. Johnsbury itself, however, experienced a slight population loss during this 10-year period.

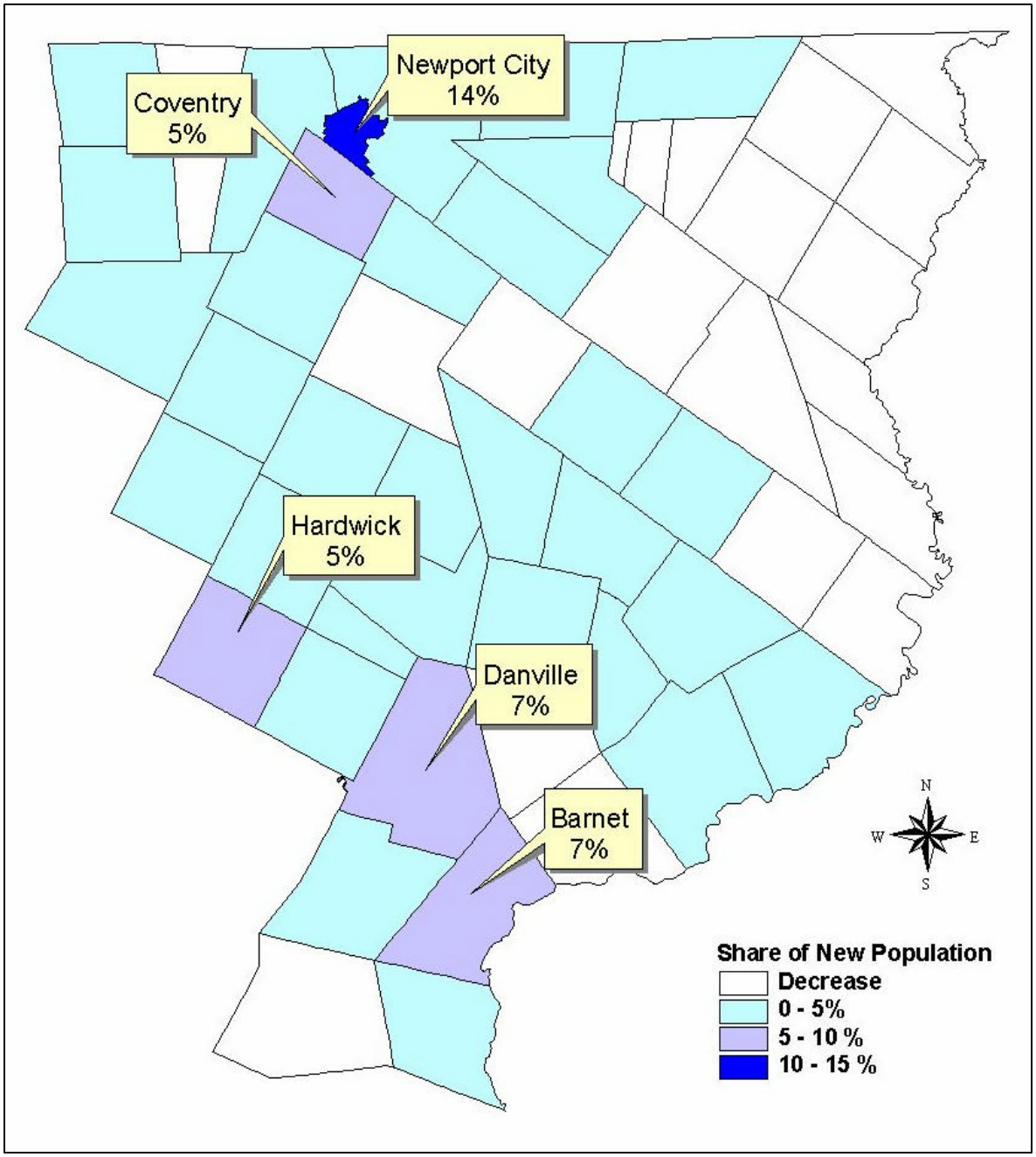
Figure 3.5: Geographic Distribution of Population Growth in NVDA Region, 1990-2000



Source: WSA Analysis of US Census 2000 Data.

As shown in Figure 3.6, based on Woods and Poole Economics data, it is projected that population growth in the NEK will continue to be concentrated inside the Newport/Derby Corridor and proximate to the Lyndonville/St. Johnsbury corridor over the next 20 years.

Figure 3.6: Projected Geographic Distribution of Population Growth, 2000-2020

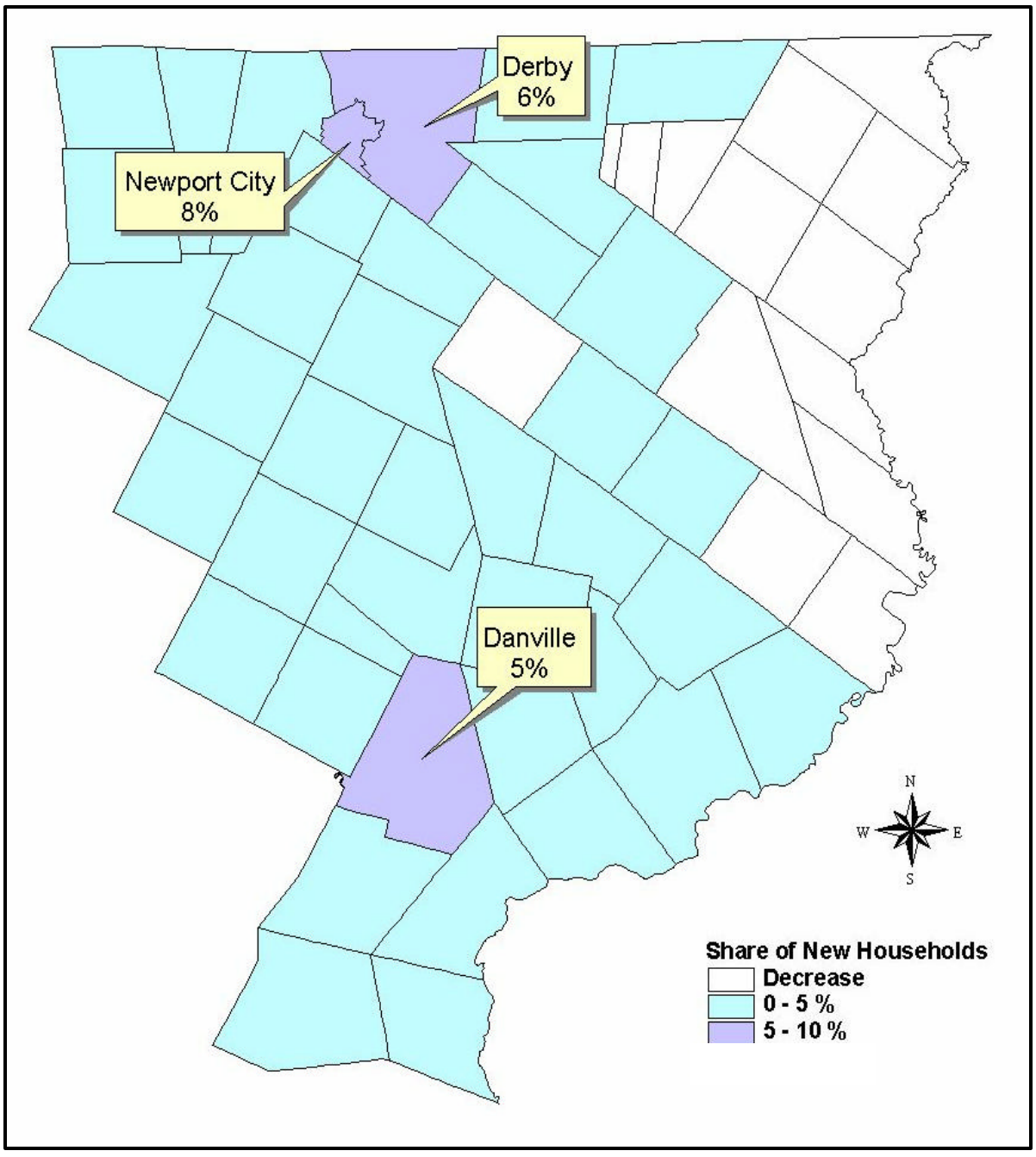


Source: WSA analysis of Woods & Pool Economics projections.

Households

As shown in Figure 3.7, based on based on Woods and Poole Economics projections for 2000-2020, growth in households will continue to be concentrated in the areas immediately adjacent to Newport and St. Johnsbury.

Figure 3.7: Projected Geographic Distribution of Growth in Households in Northeast Kingdom, 2000-2020



Source: WSA analysis of Woods & Pool Economics projections.

Summary

According to Woods and Poole Economics data, the NEK's population is projected to grow at a rate of about 0.65% annually through 2020, slightly higher than the overall New England annual growth rate of 0.52%. Within the NEK, people aged 65 or older comprise the fastest-growing population group. It is projected that 25% of the region's population will be 65 or older by 2020. At the same time, the proportion of the region's population under 65 is continuing to decrease.

During the past 10 years and for the foreseeable future, population growth in the NEK will continue to trend toward concentrating in the Newport/Derby sub-region and the Danville/Barnet area. The far northeastern corner of the NEK in Essex County will likely continue to lag the rest of the region in population growth.

Employment

Introduction

Employment is also an important component for understanding existing and future transportation system conditions in the region. Employment centers form the basis for where most trips are attracted, and therefore need to be adequately considered and accounted for the regional transportation planning process.

Employment Data

Between 1980 and 2000, the number of people employed in the NEK rose by 33%, from 25,347 to 33,667, or nearly five times the overall rate of population growth. Much of this job growth was concentrated in the Newport City/Derby and St. Johnsbury/Lyndon areas. As Table 3.2 describes, farm employment, as an employment sector, is projected to decline while service employment is projected to grow by 8%.

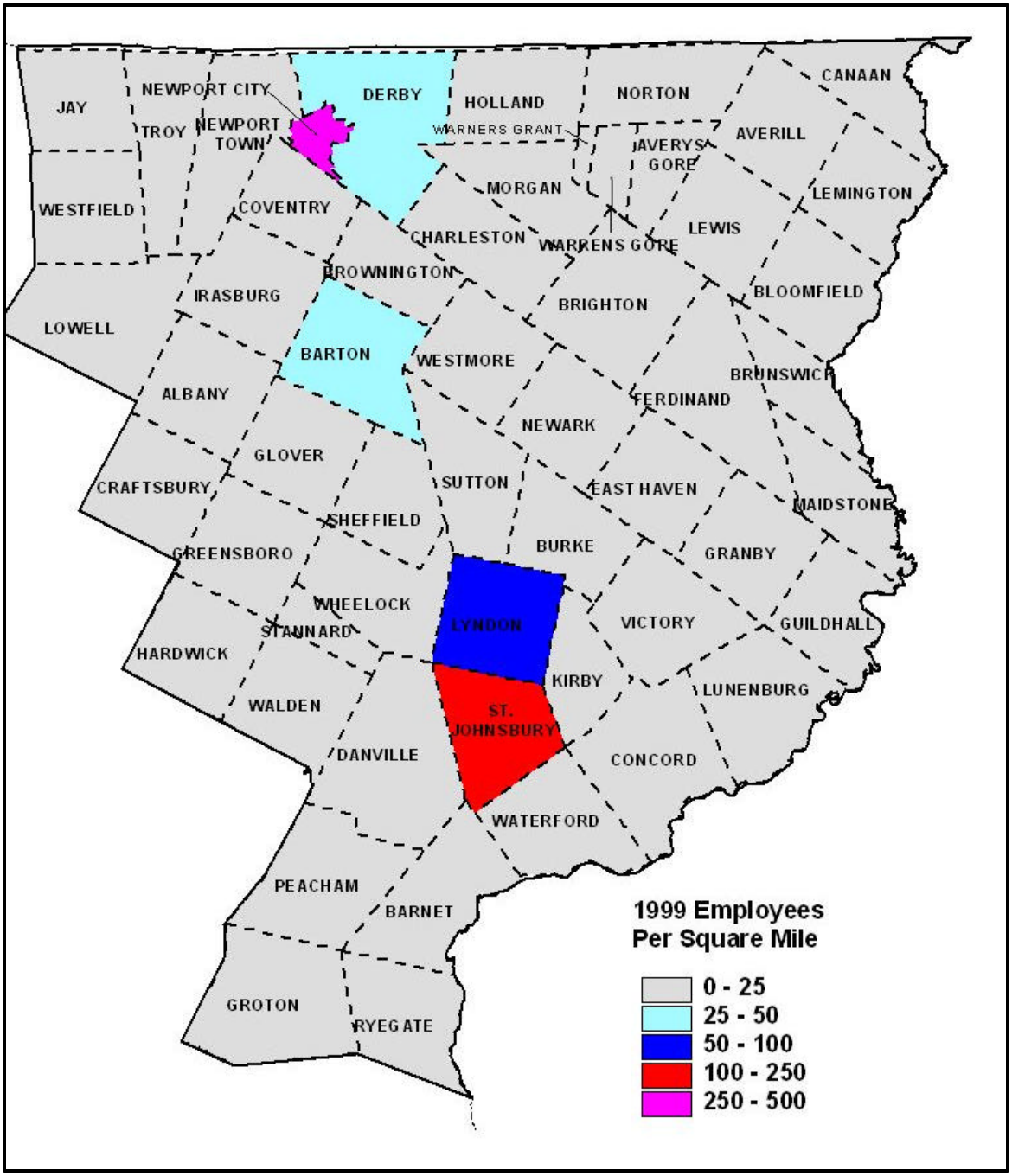
Table 3.2: Historical and Projected Employment in Northeast Kingdom, 1980-2020

Type of Employment	1980	1990	2000	2020	% of Total in '80	% of Total in '90	% of Total in '00	% of Total in '20
Farm Employment	2,696	1,844	1,697	1,624	11%	6%	5%	4%
Agricultural Services, Other	213	447	608	752	1%	2%	2%	2%
Mining	178	60	14	16	1%	0%	0%	0%
Construction	1,285	2,325	2,535	3,365	5%	8%	8%	8%
Manufacturing	6,386	5,152	6,046	6,242	25%	18%	18%	15%
Transport, Comm, Public Utilities	1,136	1,335	1,414	1,400	4%	5%	4%	3%
Wholesale Trade	822	742	787	895	3%	3%	2%	2%
Retail Trade	3,376	4,829	5,349	6,370	13%	17%	16%	16%
Finance, Ins, Real Estate	1,075	1,333	1,473	1,636	4%	5%	4%	4%
Services	4,833	7,103	9,153	12,446	19%	24%	27%	31%
Government Employment	3,347	4,056	4,591	6,030	13%	14%	14%	15%
TOTAL EMPLOYMENT	**25,347**	**29,226**	**33,667**	**40,776**	-	-	-	-

Source: US Census 2000; Woods and Poole Economics.

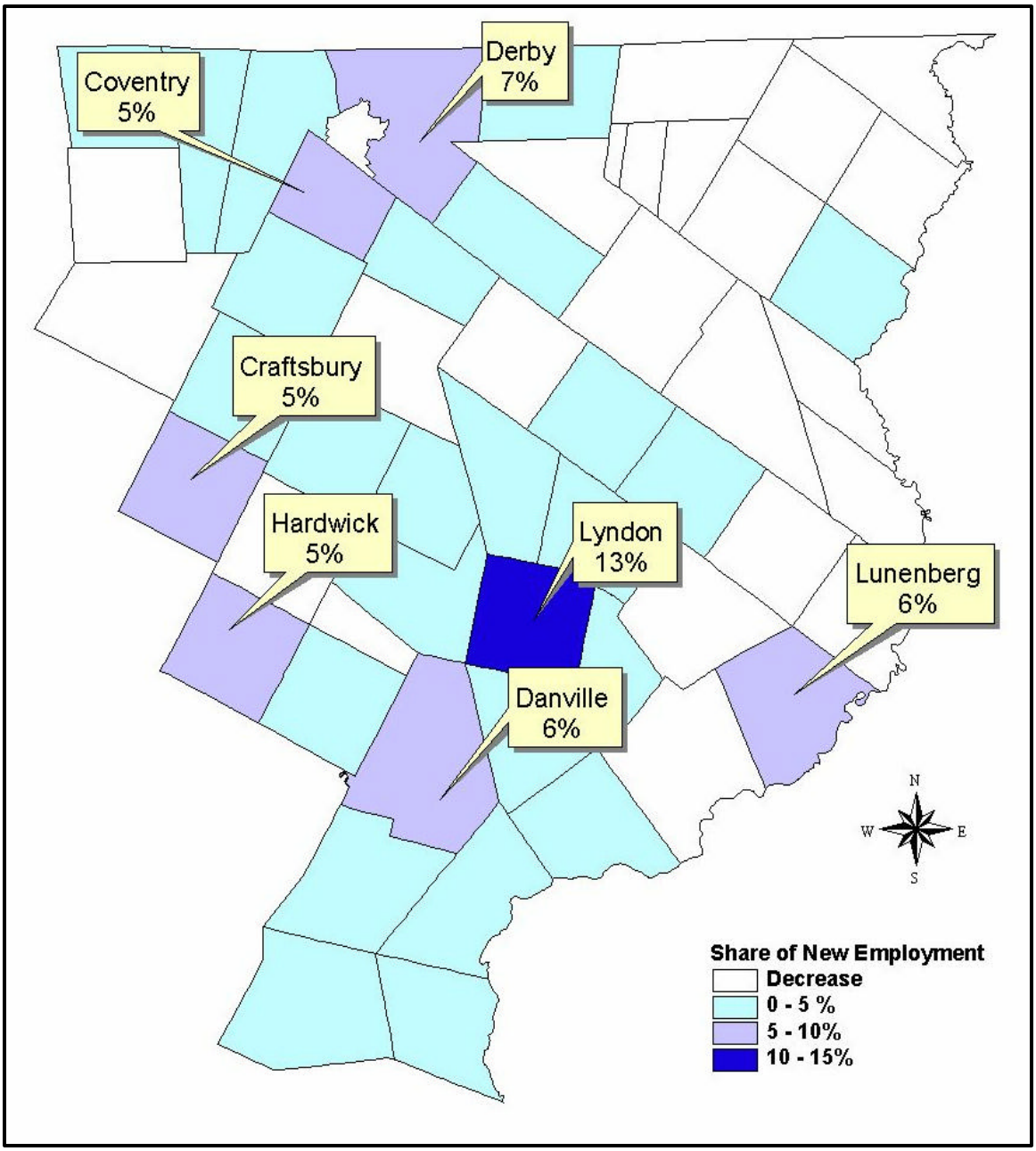
As shown in Figures 3.8 and 3.9, employment growth during the next 20 years is projected to parallel that which has occurred in recent years, focusing on the St. Johnsbury-Lyndon Corridor and the Newport area.

Figure 3.8: Geographic Concentrations of Employment in Northeast Kingdom, 1999



Source: WSA analysis of US Census 2000 data.

Figure 3.9: Projected Geographic Distribution of Employment Growth in Northeast Kingdom, 2000-2020



Source: WSA analysis of Woods and Poole Economics data.

Summary

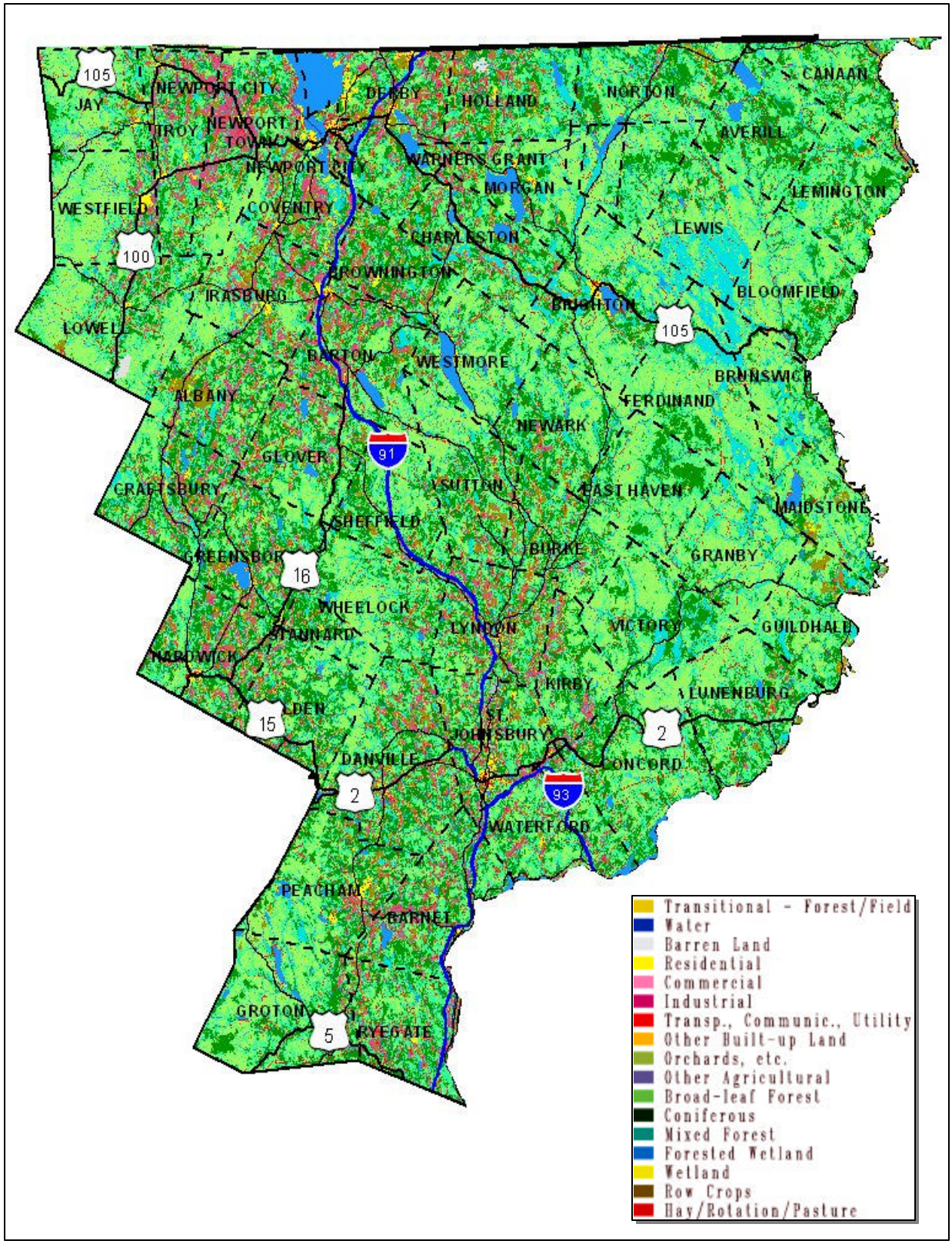
Overall employment in the NEK is projected to grow by nearly 20% between 2000 and 2020. The bulk of this growth will be in the service sector. At the same time, farm employment continues to decline, making up a projected 4% of regional employment by 2020. Manufacturing's share of employment is also declining slowly, although the actual amount of manufacturing employment was about the same in 2000 as in 1980. Much of the new employment in the NEK is projected to be focused on the I-91 corridor, with about 13% centered in Lyndon, 7% in Derby and 6% in Danville.

This corridor includes several key economic activity focal points, including the St. Johnsbury-Lyndonville Industrial Park.

Land Use and Development Patterns

In contrast with other parts of Vermont, the Northeast Kingdom has not seen significant changes in land markets and land use in the past few decades. Figure 3.10 depicts current land uses and land cover in the region. According to the *2001 Economic-Demographic Profile,* the Northeast Kingdom is by far the most economically challenged part of Vermont. The geographic isolation, which captures the unique rural beauty, is the very same feature that inhibits the economic growth of the region (p. 3). Nevertheless, numerous people have discovered nature's playground in Northeastern Vermont. Vacation homes are scattered all over the region. Approximately one out of every five houses (20 percent) is a vacation home (p. 6).

Figure 3.10: Existing Land Use and Land Cover in the Northeast Kingdom



Source: WSA analysis of VCGI data.

Transportation Network

Introduction

The regional transportation network is comprised of roadways (highways and major streets), bridges, transit service, aviation facilities, rail facilities, bicycle and pedestrian facilities, and intermodal facilities.

Roadways

The regional roadway network is comprised of a series of streets and highways that are owned and operated by local jurisdictions and the State of Vermont. Roadways are characterized by their function in a community as well as their function in the overall transportation system. Based on their function, roadways are designed and constructed to ensure the movement of people and goods in a manner that is both safe and efficient.

As shown in Figure 3.11, the Northeast Kingdom's highest function facilities (Interstates 91 and 93) provide very good access from the north and south through the heart of the region. US 5 also provides important north-south access through the region's economic and population core while VT 14 and VT 114 provide north-south access west and east, respectively, of the core. The next-highest function facilities (US 2, VT 58, VT 105, and portions of VT 15 and US 302) generally provide access from the east and west. Significant portions of the region, particularly in Essex County, lack any high level access north-south or east-west.

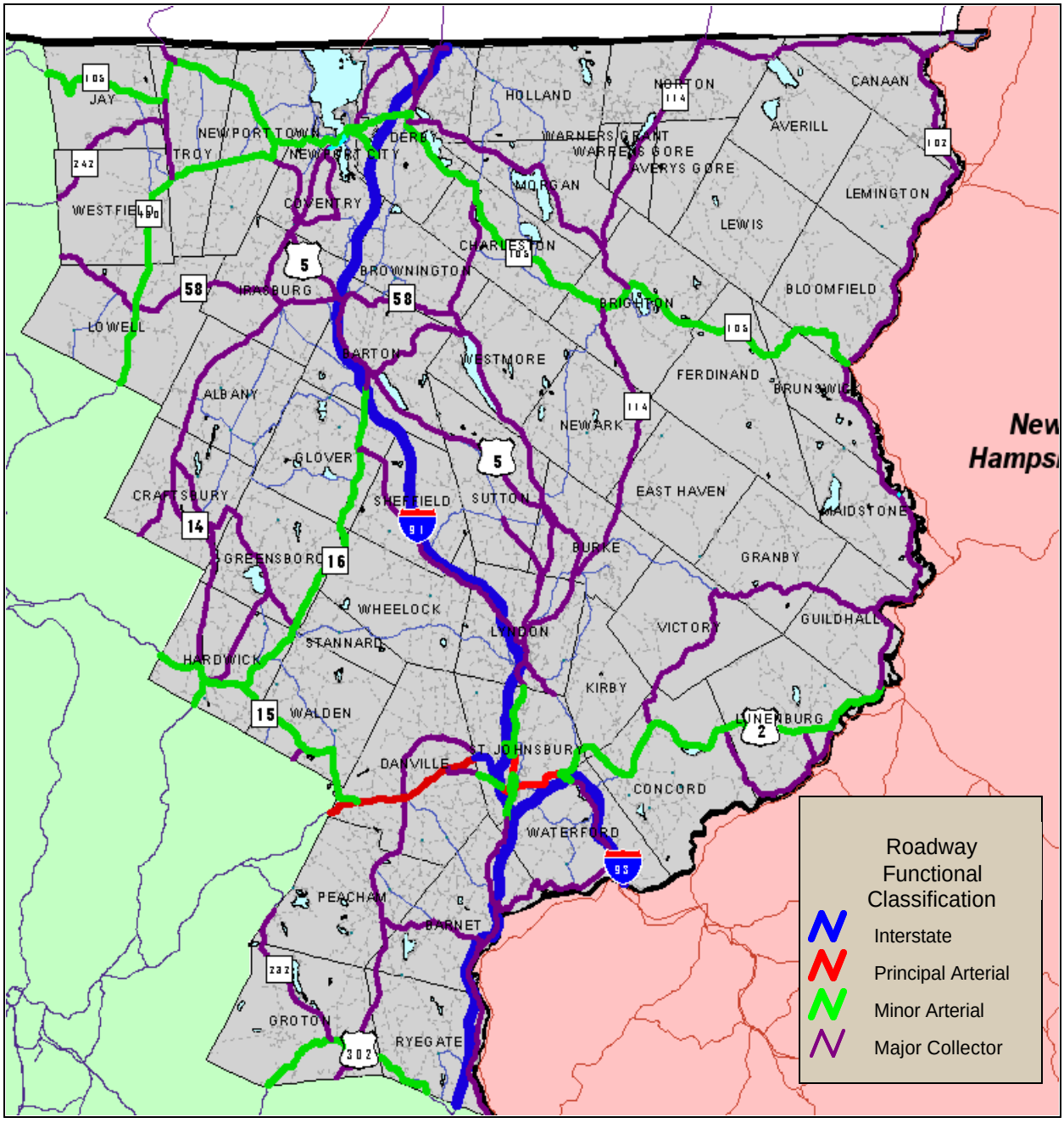
Table 3.3 shows the distribution of functionally classified roads in the NEK, as well as the relative volume of traffic carried by each class of highway. Although Interstate highways together make up only three percent of the region's highway miles, they carry more than 22 percent of the vehicle miles traveled in the Northeast Kingdom. Meanwhile, collector highways, making up about one quarter of the region's highway miles, carry about 29 percent of travel. In contrast, local highways, which make up roughly 64 percent of the region's highway miles, carry only 18 percent of the vehicle miles traveled. This pattern is fairly typical of highways across Vermont and the nation.

Table 3.3: Roadway Mileage and Use Levels, by Functional Class, 2000

Functional Class		Miles	Percent	AVMT (Annual)	Percent
Rural					
Interstate	1	71.9	2.8%	129,621,546	20.0%
Principal Arterial	2	31.3	1.2%	42,567,305	6.6%
Minor Arterial	6	133.6	5.3%	114,958,035	17.8%
Major Collector	7	440.8	17.3%	151,129,966	23.3%
Minor Collector	8	200.7	7.9%	31,074,613	4.8%
Local	9	1,553.5	61.1%	86,810,957	13.4%
Urban					
Interstate	11	5.7	0.2%	16,604,215	2.6%
Other Freeways	12	2.6	0.1%	4,398,875	0.7%
Principle Arterial	14	6.3	0.2%	14,554,598	2.2%
Minor Arterial	16	13.6	0.5%	22,513,904	3.5%
Collector	17	10.4	0.4%	5,815,782	0.9%
Local	19	71.5	2.8%	27,520,230	4.2%
Regional TOTALS		**2,542.0**		**647,570,026**	
State TOTALS		**14,275.6**		**6,553,996,077**	
Region as portion of state		**17.80%**		**9.90%**	

Source: WSA analysis of VTrans data.

Figure 3.11: Functional Classification of Roadways in the Northeast Kingdom



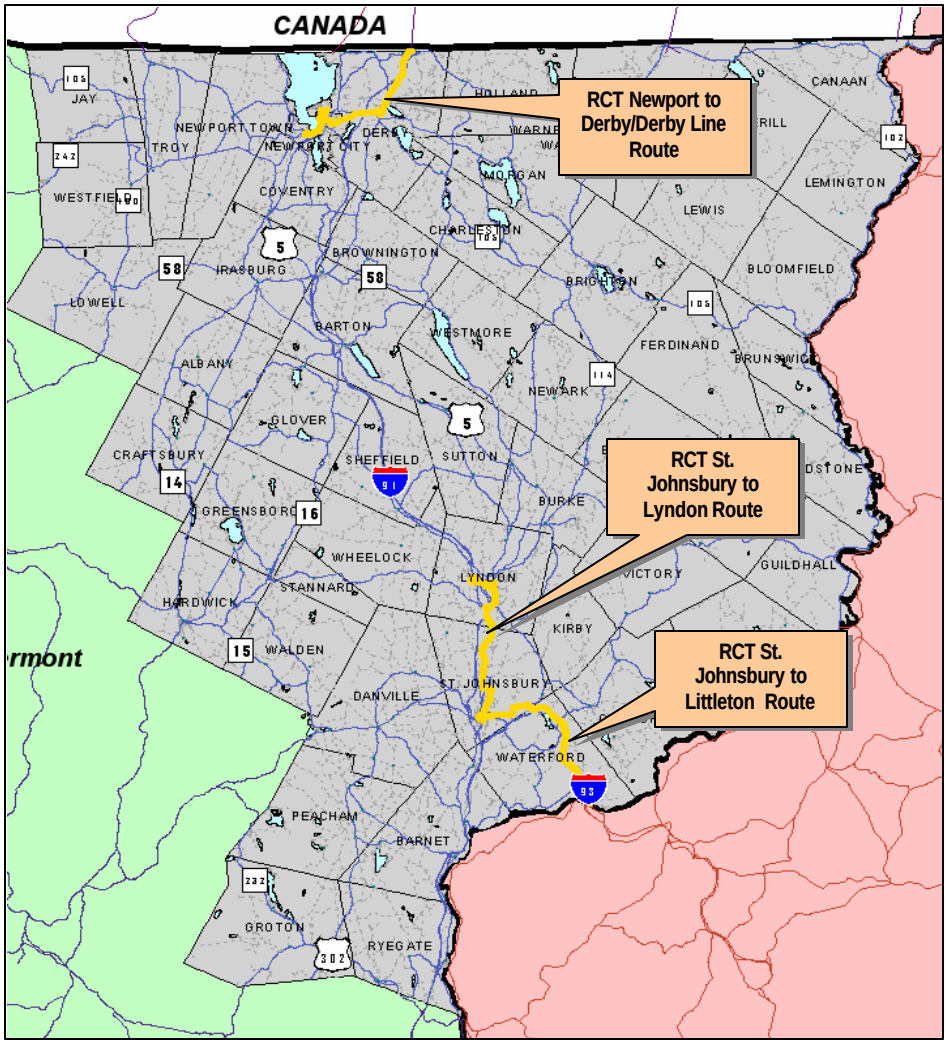
Public Transit System

Transit in Northeast Kingdom consists of service provided by public agencies and institutions. Augmenting these services are locally based taxi services operating in and around St. Johnsbury, Lyndon, and Newport.

Fixed Route Service

Rural Community Transportation, Inc. (RCT) is a private nonprofit organization, incorporated in November 1991 that provides transit services in the NEK. The service includes private vehicle travel on roadways and non-private vehicle transit. Several fixed routes are operated by RCT. Areas served by fixed route service are shown in Figure 3.12.

Figure 3.12: RCT Fixed-route Transit Services



Source: WSA map based on NVDA and RCT data.

Intercity Bus Service

There is currently no Intercity Bus Service available to residents of the Northeast Kingdom. RCT is currently proposing to operate a fixed-route line from Newport to Wells River that would connect to White River Junction via Stagecoach as a new start. The route runs along I-91, the central transportation "spine" of the region. About 50 percent of the region's population resides within one of the towns served by this route or in an adjoining town. This proposal has, as of this writing, not yet been funded for the 2005 FY.

Park and Ride Facilities

There are two official State of Vermont park-and-ride lots in the NEK: one in West Danville (at the junction of U.S. 2 and Vt. 15) and the other in St. Johnsbury (at the Junction of U.S. 2B and U.S. 2). The West Danville lot, which is paved, has 19 spaces, plus 2 handicapped spaces and 4 truck spaces. The West Danville lot was rated in a VTrans study as "poor" for accessibility and "good/average" for surface condition. According to NVDA, in late 2002, it had an observed usage rate of between 40 and 50 percent.

By contrast, the St. Johnsbury lot, with 30 spaces and a gravel surface, earned an "excellent" rating on accessibility and a "poor" for surface condition. According to NVDA, in late 2002, it had an observed usage rate of between 30 and 40 percent.

Given that 80 percent occupancy is generally considered full utilization of a park-and-ride lot, both major NEK facilities are well below capacity. In addition to these two "officially" designated lots, other park-and-ride facilities of regional significance are at the following locations:

- Barnet near US Route 5 at I-91 Exit 18;
- St. Johnsbury Center off 1-91;
- Town of Lyndon at US Route 5 and 1-91
- Newport City at VT Route 191 and 1-91
- Derby Line
- Hardwick on VT Route 15 and VT Route 14
- Barton at the Village of Barton on US Route 5 and 1-91 interchange; and
- The Village of Orleans in Barton, on Route 58 near 1-91 interchange.

These commuter parking lots provide parking accommodations for an average of 20 to 25 vehicles. They are generally unpaved, gravel surfaces on town owned property, and usually do not have any signage designating their use.

Bicycle and Pedestrian Facilities

In 1994, there were 37 miles of sidewalks in the Northeast Kingdom and one shared use path. Newport and St. Johnsbury have active sidewalk programs in which they repave, build, and maintain sidewalks on a yearly basis. Other communities are planning additional sidewalks or shared use paths for future implementation.

Goods Movement

A multimodal transportation network that facilitates the movement of goods and services is necessary to sustain the vitality of the NEK. As noted in the previous regional transportation plan, the region's air, rail and road facilities all have the capacity to handle the movement of freight to and from local industries within the tri-county area. However, while capacity does exist, the poor operational and physical quality of the surface and air infrastructure limits the effective movement of local freight and goods, and retards future growth in the local economy.

Table 3.4: Sidewalk Mileage in NEK Communities

Caledonia County		
Community	Subarea	Length
Burke	West Burke	0.14
Danville	Danville	0.39
Hardwick	East Hardwick	0.18
Hardwick	Hardwick	2.07
Lyndon	Near I-91	0.73
Lyndon	Lyndonville	1.64
Ryegate	East Ryegate	0.45
St. Johnsbury	Center	0.06
St. Johnsbury	Urban Compact	11.45
		17.11
Orleans County		
Community	Subarea	Length
Barton	Barton	2.20
Barton	Orleans	2.34
Derby	Derby Line	1.08
Glover	Glover	0.45
Greensboro	Greensboro	0.55
Newport City	Newport City	8.06
Troy	North Troy	2.61
		17.29
Essex County		
Community	Subarea	Length
Brighton	Island Pond	1.12
Canaan	Canaan	0.42
Canaan	Beecher Falls	0.36
Concord	East Concord	0.04
Guildhall	Guildhall	0.10
Lunenburg	Lunenburg	0.36
Lunenburg	Gilman	0.30
		2.70
	Total	37.10

Source: Existing Conditions Report, Dec. 2001.

Between September and November 1994, NVDA conducted a Goods Movement Survey among 34 retail and commercial firms and 45 independent and commercial truck operators. The survey helped the Commission in determining the impact of commercial truck traffic on the region's infrastructure, and regional shipping patterns. The survey's general observations revealed that a wide variety of goods and services originate or terminate within the region.

A more recent survey, conducted for the R.L. Banks and Associates' 2001 *Northeast Kingdom Railroad Assessment*, found that most of the products **shipped** from the Northeast Kingdom include lumber products (paper, fencing, dried lumber, veneer, wood chips, and furniture) and farm products (fertilizer, liquid feed, soy meal, distillers grain, corn and wheat). Most products **received** in the region are also farm and lumber products. This survey also found that steel, metal parts, building supplies and packaging material are frequently received in the region. Further detailed study will be necessary to make more definitive conclusions on the overall impact of goods throughout the region.

Trucking

Recent corridor and related planning studies conducted by or for the NVDA have identified roadways and areas around the region with significant truck traffic levels that may be incompatible with roadway configurations, designs, geometry and/or adjacent land uses, such as residences. Among the more prominent of these are:

- VT 105, between Derby and Bloomfield
- VT 111, between Morgan Center and Island Pond
- VT 114, between Morgan and Norton
- US 2, between St. Johnsbury and Guildhall
- US 302 in South Ryegate

For each of the above locations, truck traffic accounts for at least 10% of total daily traffic, on average, according to VTrans-generated traffic counts. Other significant truck "hotspots" are scattered throughout the region, most notably Caswell Avenue and Main Street in Derby Line.

Transborder Truck Movements

The NEK Region's proximity to Canada, combined with its location relative to major east coast markets in the U.S., results in it being a major area for throughput of Canada-U.S. truck movements. Since the advent of the North American Free Trade Agreement (NAFTA) in the mid-1990s, the region has experienced a significant increase in international truck traffic traveling the I-91 corridor between Quebec and southern New England.

According to the Bureau of Transportation Statistics (BTS), between 1997 and 2000, the border crossing at Derby Line experienced an increase of 37.6% in annual truck crossings into the U.S., rising from 101,000 to 139,000 annual crossings. In fact, the Derby Line port of entry is the 17th busiest on the Canada-U.S. border, handling 1.1% of all truck crossings from Canada into the U.S., an average of 380 trucks per day in 2000. The other major Vermont port of entry – Highgate Springs – is the 19th busiest, with about 364 U.S.-bound crossings per day in 2000. Highgate Springs has experienced somewhat slower growth in truck crossings than Derby Line, increasing 33.9% between 1997 and 2000.

Although Vermont ranked 22nd among the 50 states and the District of Columbia in the total value of NAFTA land trade (including truck, rail, pipeline and other modes), the state actually saw a 1.1% decline in the total value of such trade between 1995 and 2000. The total amount of Vermont's annual NAFTA land trade is about $6 billion, out of $575 billion nationwide.[2]

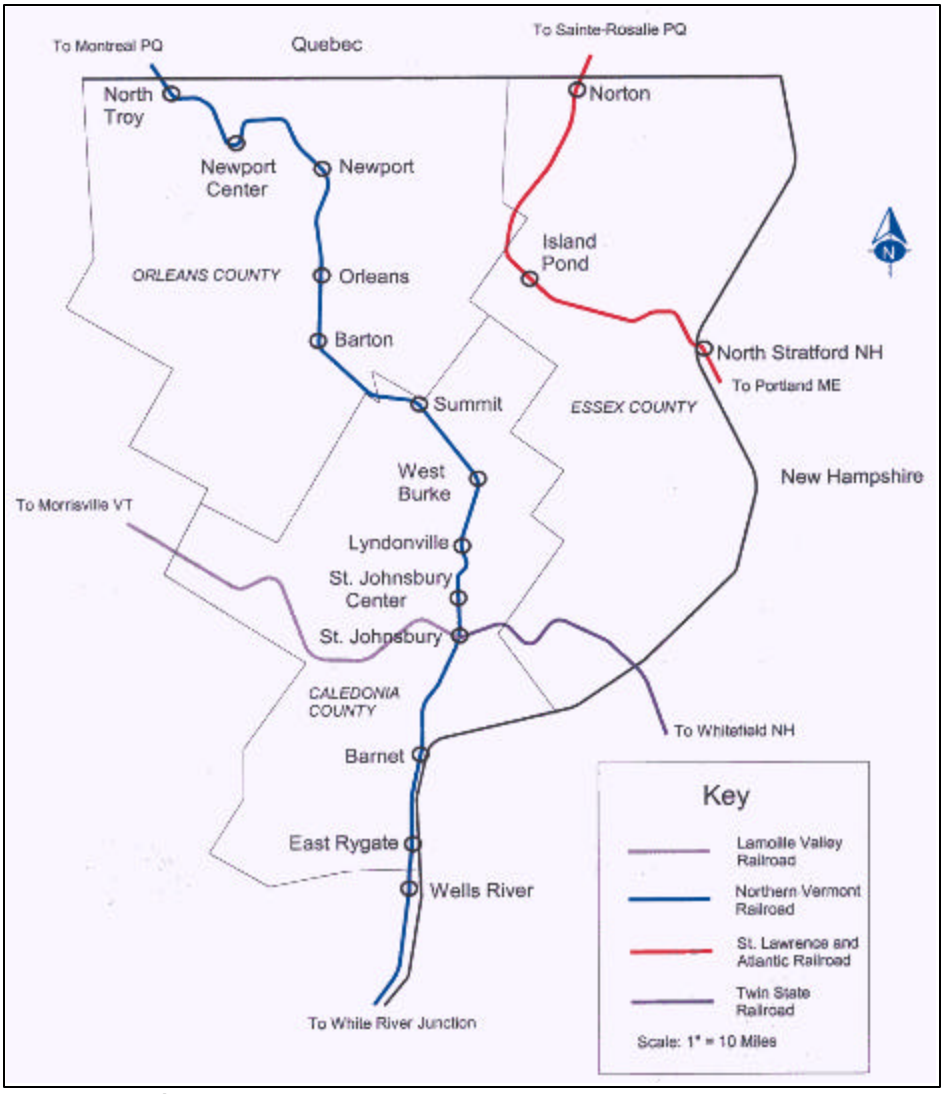
Freight Rail Service

The availability, frequency and level of freight rail service in the NEK has been declining for nearly two decades as key shippers have either left the area or shifted their business to trucks to satisfy time-sensitive delivery and just in time inventory requirements of customers. Four railroads traverse the region, occupying a total of about 135 miles of right of way:

- The Washington County Railroad[3]
- The St. Lawrence & Atlantic Railway[4]
- The Lamoille Railway (inactive)[5]
- The Twin State Railway (inactive)

[2] NAFTA Land Trade includes trade with both Canada and Mexico. It is reasonable to assume the vast majority of Vermont's NAFTA land trade is with Canada.
[3] Newport to Wells River Line now owned by State of Vermont and is operated by Washington County Railroad. Formerly operated by NVR.
[4] Now owned by Genesee & Wyoming, Inc. of Greenwich, CT, a railroad holding and operating company.
[5] The LVR's right of way is currently undergoing conversion into a recreational trail.

Figure 3.13: Railroads in the Northeast Kingdom Region



Source: RL Banks & Associates, 2001.

Air Transportation

There are three state-owned airports in the NEK, including the Caledonia State Airport, Newport State Airport, and John H. Boylan Airport (Island Pond). State-owned airports primarily serve the needs of general aviation. General aviation airports typically provide facilities for privately owned aircraft which are used for business activities and or private flying. Other uses for general aviation airports include flight instructions, aerial photography, crop dusting, and recreational flying. In addition, they provide facilities for local pilots, and provide charter air service to business and recreational travelers. Airports that support aviation related businesses provide the local economies with needed employment opportunities. Most importantly, these airports make up a system linking travelers in remote areas to the rest of Vermont and the greater New England region.

As there is no scheduled commercial air service available within the region, commercial air travelers must travel a minimum distance of 80 miles by road to Burlington International Airport. Other airports within the greater New England area that provide service to national and international destination points include: Lebanon, NH (60 miles), Montreal, QC (110 miles), Manchester, NH (125 miles), and Portland, ME (160 miles).

Summary of Existing Conditions

The NEK, as it exists today, is comprised of a wide range of topography, people, jobs and transportation systems that must interact successfully, if the regional transportation system is expected to fulfill its role of providing for the safe and efficient movement of people and goods into and through the region. The distribution of population throughout the geographic area reflects 50 years of post World War II growth and development resulting from increased mobility brought by the automobile.

The existing regional transportation system is ostensibly multi-modal, but dominated by the single-occupant vehicle. The roadway system experiences some spot congestion, which reduces its efficiency; however, they are not strained to the point of being gridlocked or dysfunctional. The transit system, however, suffers from discontinuous and inconsistent coverage patterns. It will require significant investment in order for it to become a significant contribution to the regional transportation system. The continual pull between maintenance and preservation, and the need to provide strategic transportation capacity to support the region's continued vitality and economic development means priorities and investment strategies over the long term will need to be clearly defined and implemented.

Trends and Themes

Introduction

Looking into the future requires assumptions to be prepared that establish a framework or canvas from which the future vision is built. The only fact we know for sure is that forecasts of the future will never be completely accurate. Population changes may not occur as fast or as slow as predicted; employment by sector will change due to technology or economic conditions; and some parts of the community will grow faster or slower than anticipated.

Population, employment and land use forecasts are used to form the basis for estimating travel demand. Each forecast is prepared in a unique way, often times by different people in the community. Demographers, will typically forecast population growth using techniques such as school enrollment, in-migration rates, outmigration rates, survival rates, and housing vacancy rates. Economists involved in employment programs as well as trade and economic development activities will typically look at market potential, historical performance of individual sectors, recruitment and retention activities, and trade partners to forecast employment growth for the region. In terms of land use development patterns, existing patterns, known location decision-making approaches, and emerging trends can be documented and projected outward; however, communities typically still have broad latitude on how they will ultimately define their land use design.

Population, employment, and land use forecasts are used to assess travel demand for the region. Where deficiencies are identified, options for the most appropriate means of addressing these problem areas are identified. The following section attempts to assess and characterize the key trends, themes and issues forming the framework for the NVDA Regional Transportation Plan Update.

Travel Demand

Vehicle Miles of Travel (VMT)

As shown in Table 3.4, the total daily vehicle miles of travel (VMT) in the Northeast Kingdom in 2000 was 1,327,607, an increase of 8.8% over 1990, slightly greater than the region's population growth of 7.1% during the same period. In other words, travel demand in the region is growing faster than the population. The majority of the increase in VMT has occurred within the greater I-91 corridor, where the region's primary economic activities are concentrated. It is reasonable to assume that VMT will continue to increase as the automobile remains the NEK's primary mode of transportation.

Table 3.5: Daily VMT in Northeast Kingdom, 1990-2000

Total Daily Vehicle Miles Traveled	
Year	**VMT**
1990	1,220,586
2000	1,327,607

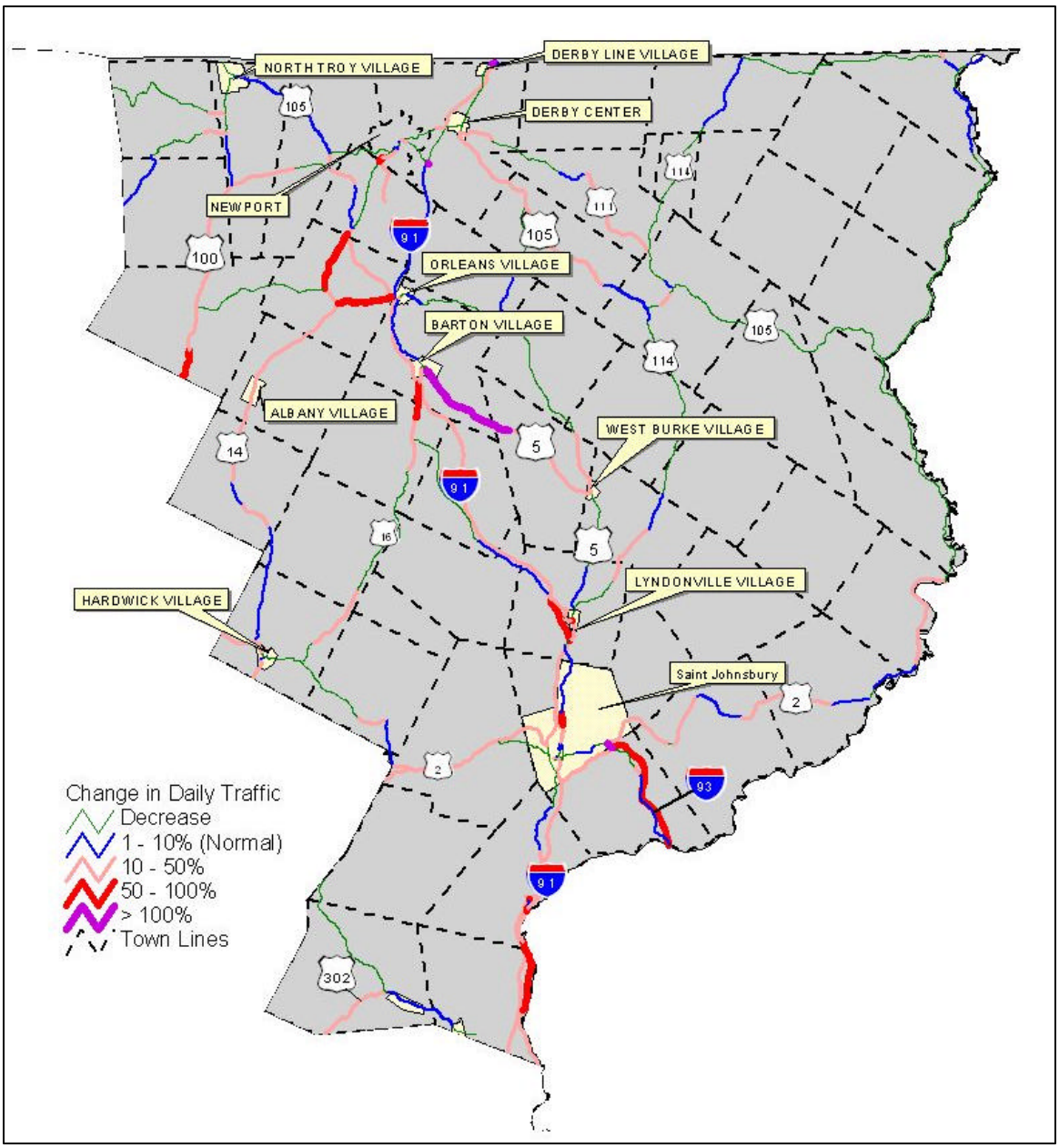
VMT Increase = 8.8%
Population Increase = 7.1%
Employment Increase = 15.2%

Average Annual Daily Traffic (AADT)

The growth in VMT has not been evenly distributed across the region. As Figure 3.14 shows, the majority of traffic growth over the last 10 years has occurred along the I-91 corridor. The arterials that connect to I-91 and serve the municipalities near interchanges have experienced some of the highest growth in the NEK. The average growth in VMT masks some of the faster growing traffic areas.

Continued growth along the arterial roadways may lead to congestion on those passing through municipal centers and at the arterial/I-91 ramp junctions. Additional arterial traffic passing through village, town and city centers could have a negative effect on safety, noise, and other quality of life issues unless measures are taken to address or prevent these projected increases from being so great.

Figure 3.14: Change in Daily Traffic Levels on Major Roadways in Northeast Kingdom, 1990-2000



Source: VTrans traffic counter records, 1990 and 2000.

Level of Service (LOS) for Selected Intersections

The level of service analysis (LOS) is a measure of the average delay time per vehicle at an intersection. LOS is rated by a lettering system from "A" to "F"; "A" being an intersection with minimal vehicular delay, and "F" being an intersection that is over capacity. LOS is calculated with factors such as the number of turning movements, the percentage of trucks, and the geometry of the intersection. LOS does not take into account pedestrian or bicycle conditions.

For this analysis, traffic volumes were used from the 30th busiest day of the year. The four intersections chosen as a sampling of intersections throughout the Northeast Kingdom are found in Table 3.6. They were chosen due to their close proximity to municipal centers, past history of congestion issues, and availability of data. In the year 2020, all four analyzed intersections have been projected to have a LOS F.

Table 3.6: Existing and Projected LOS for 4 Selected Major Intersections, 1996, 2000 & 2020

Town	Intersection Name	Worst Approach	1996 LOS	2000 LOS/Delay	2020 LOS/Delay
St. Johnsbury	US 2 (Eastern Ave) and Main Street (Alt.US 5)	Eastern Avenue	--	D: 26 sec	F: 360 sec
Derby	US 5 and VT 105	US 5 from Newport	E	D: 27 sec	F: 545 sec
Newport	W. Main Street, Third Street, and School Street	Third Street	B	C: 21 sec	F: 233 sec
Lyndon	VT 114, VT 122 (TH 3) and US 5	VT 114 from E.	F	F: * sec	F: * sec

Source: WSA analysis of VTrans traffic data and growth projections

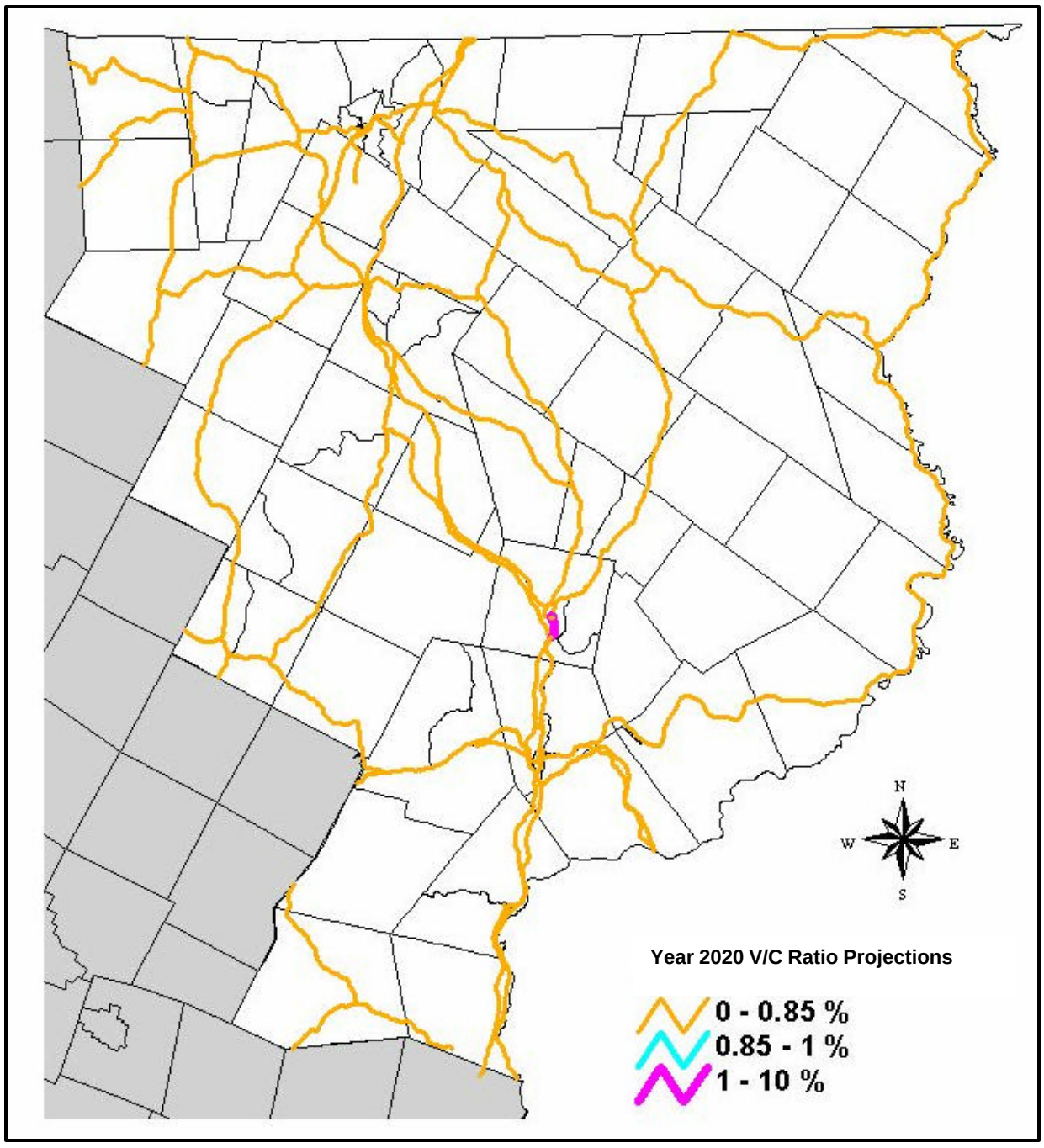
* intersection over capacity

Roadway Volume to Capacity Relationship

Based on an analysis of projected 2020 volume to capacity (V/C) ratios[6], there is only one segment of roadway in the region -- US 5 between I-91 and Alternate Route 122A in Lyndon -- that will increase much greater than the rest of the Region. It is therefore projected that the remainder of the current road system's capacity is adequate to accommodate traffic growth for the year 2020, as seen in Figure 3.15.

[6] "V/C ratio" is the ratio of the hourly volume of traffic on a roadway to the total hourly capacity of the roadway.

Figure 3.15: Projected Roadway Capacity Situation in the Northeast Kingdom, 2020

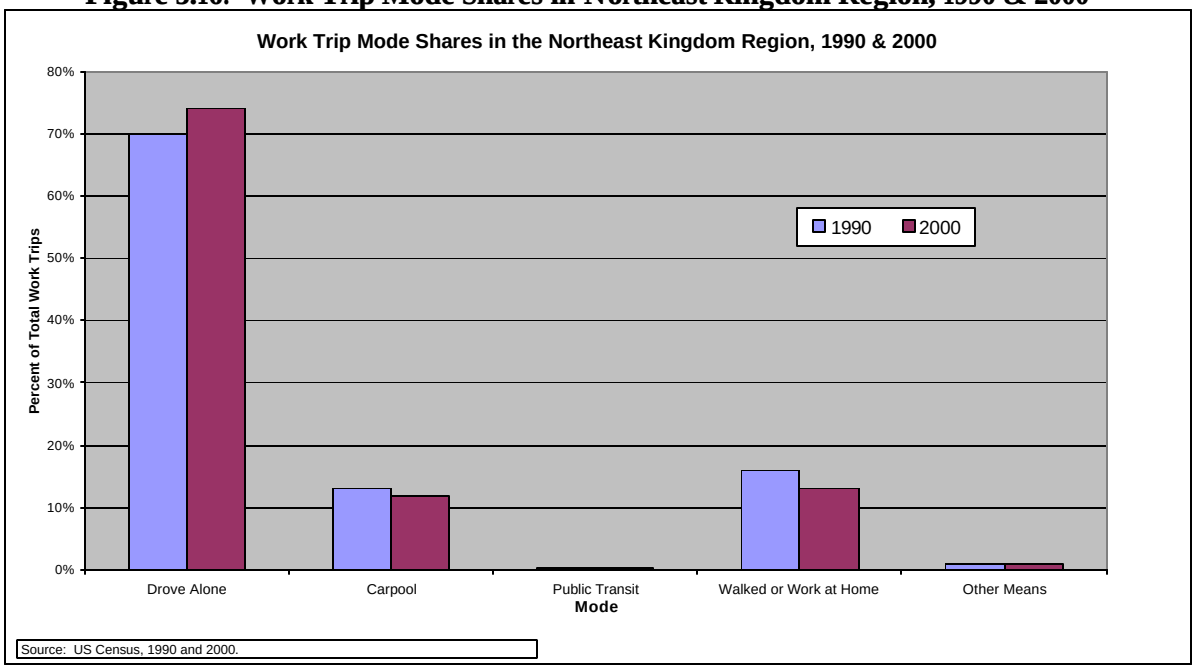


Source: WSA V/C projection based on Woods & Poole Economics data, 2002.

Mode Shares

As shown in Figure 3.16, the percentage of regional travelers using the automobile to travel to work increased from 83% in 1990 to 86% in 2000. Of this 86%, 12% carpooled to work. A large percentage of people (6%) walk to work, which is accounted for, in part, by the large number of people who walk to work in Newport City (8%) and St. Johnsbury (10%). Public transportation provided about 1% of work trips in the region by 2000.

Figure 3.16: Work Trip Mode Shares in Northeast Kingdom Region, 1990 & 2000

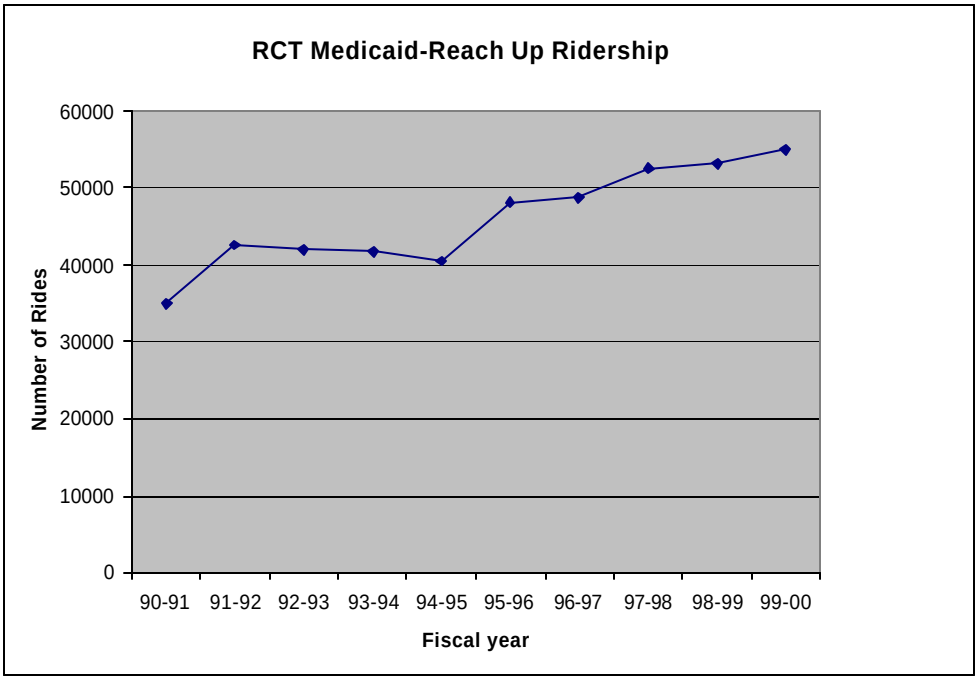


Results of the 1990 and 2000 Census show that, although most still drive to work alone, the NEK has a significant number of people that carpool to work. The 12% that carpooled in 2000 suggests the importance of park and ride lots and rideshare programs for the region. Today, walking is also a significant means of travel to work in Newport City (8%) and St. Johnsbury (10%) due to the compact, mixed use urban nature of these two municipalities and the presence of a good sidewalk system. As sidewalk mileage increases and more emphasis and opportunities exist for alternative transportation methods, it is possible that the method people choose to travel to work will shift slightly away from the automobile. The number of people walking also depends on the employment opportunities relative to where people live. The region is continuing to experience residential growth away from town and city centers. It is likely, therefore, that trip distances will increase and the automobile will remain the primary mode of transportation. This will also likely limit the attractiveness of public transit, in its current form, for most residents.

Use of available transit services in the Northeast Kingdom, including medical trips, rideshare and vanpool programs, fixed route bus services and the Rural Community Transportation (RCT) Senior Shopper, have been steadily increasing. The ridership on RCT's Medicaid-Reach up service has climbed steadily from 35,000 riders per year in 1990/1991 to 55,000 rides per year in 1999/2000.

The new Littleton service ridership has also shown significant if unsteady growth since commencing in July of 2000.

Figure 3.17: Ridership on RCT Medicaid-Reach Up Services, 1990-2000



Source: RCT, 2002.

It is projected that in the year 2020, 25% of the population in the NEK will be over the age of 65 and 17% of the population will be under the age of 15. This means that approximately 42% of the NEK population in 2020 will be unable or may choose not to operate a vehicle. It is this population group that forms a potentially significant base of demand for public transit options to meet daily travel needs.

According to data for the fiscal year 2001, roughly one-third of RCT system ridership were Medicaid recipients and another 25% were sponsored under the FTA 5310 program, the elderly and disabled transportation assistance program. Fifteen percent of rides were provided in the form of ride share-ride match and about 20% of rides were provided as part of a regional fixed route service to St. Johnsbury, Newport and Littleton.

Mobility and Access

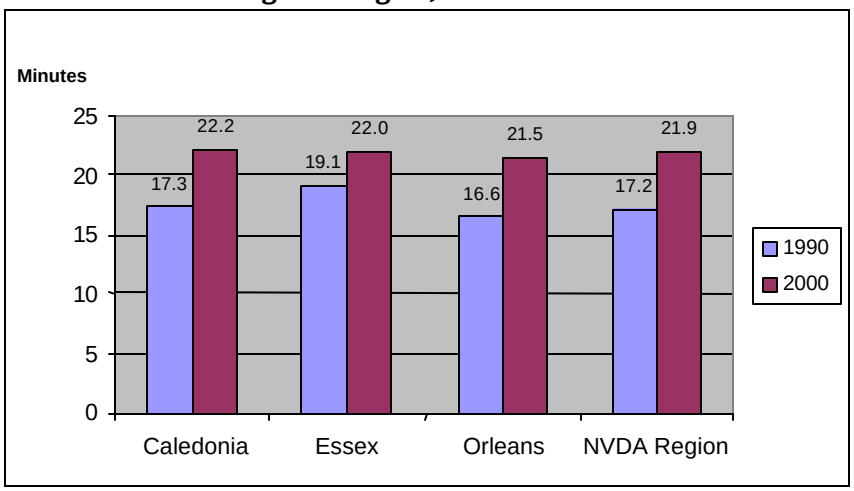
Work Trip Travel Time

As shown in Figure 3.18, the average regional travel time to work increased from 17.2 minutes in 1990 to 21.9 minutes in 2000, a 27% increase. This increase is probably reflective of the combined effects of increasingly dispersed land use patterns, growing congestion hotspots and, possibly, regional residents having to travel farther to jobs outside the region. Projecting current trends forward strongly suggests that work travel time will continue to increase in the region.

Safety

The number of recorded accidents in the Northeast Kingdom decreased between 1990 and 1997 from over 500 to fewer than 200, with similar drops in both injury- and fatal accidents. This decrease in accidents occurred even with an overall increase in VMT throughout the region. With the exception of 1993, the number of fatalities has remained below 10 per year. Continuation of state and local efforts to enhance roadway safety and educate drivers will undoubtedly help maintain this positive trend into the future.

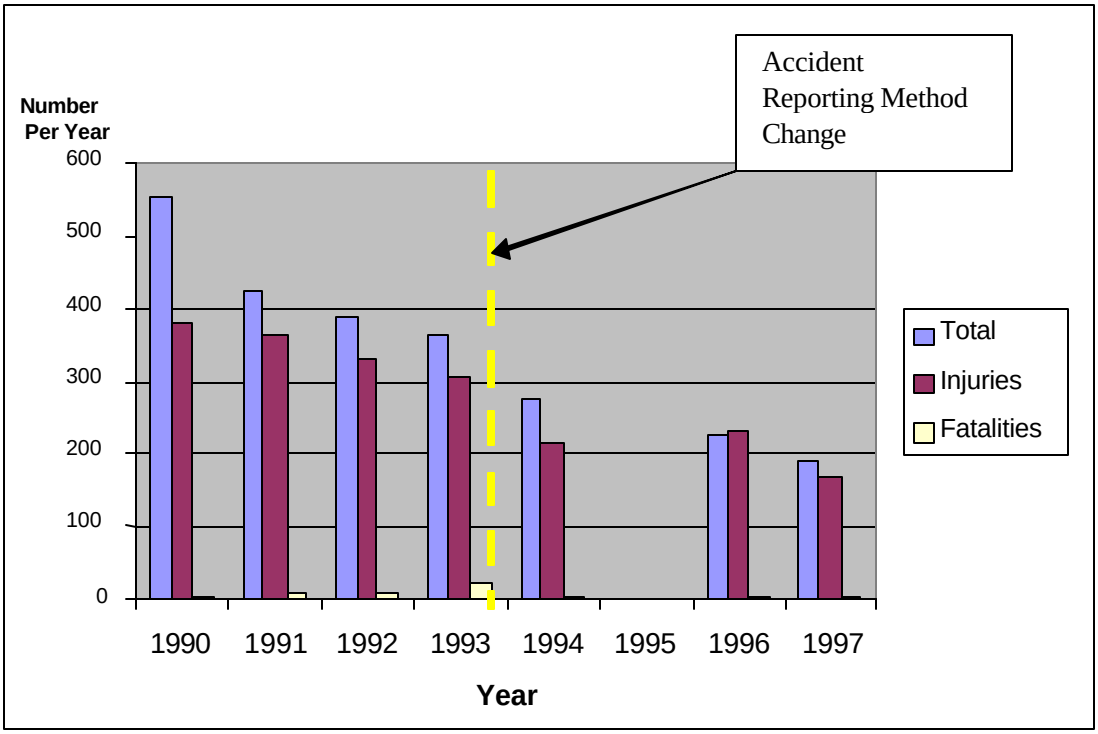
Figure 3.18: Average Work-trip Travel Time in Northeast Kingdom Region, 1990 & 2000



Source: US Census 1990 and 2000.

There are, however, looming issues that may adversely affect future transportation system safety in the region. These include overall increases in the number of vehicles on the road and associated congestion, changes in the mix of vehicle types, particularly large trucks, on roadways not designed for heavy truck operations, and the overall increase in the number of older drivers.

Figure 3.19: Recorded Highway Accidents in Northeast Kingdom Region, 1990-1997



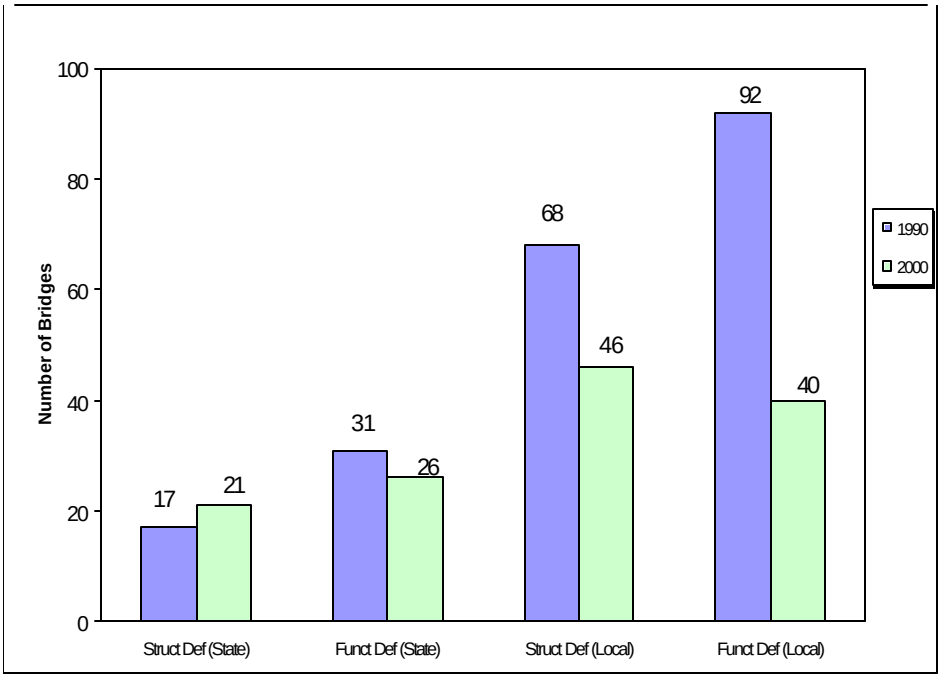
Source: VTrans Accident Database.

Roadway Physical Conditions

Highway Sufficiency Ratings

Road conditions in the NEK, as in the rest of the State, are routinely evaluated in terms of their physical condition, a rating called Highway Sufficiency Ratings. These ratings are measured based on three criteria: structural condition, safety and service on a score of 0-50, 0-20 being poor, 21-40 being acceptable, and 41-50 being good. Between 1991 and 1996, major collector roads increased from 62% to 80% in the acceptable category, the good category doubled to 4%, and the poor category decreased 21%. State highway conditions also improved, 18% in the acceptable category, 1% in the good category and decreased 19% in the poor category.

Figure 3.20: Bridge Deficiencies in Northeast Kingdom Region, by Number and Type, 1990 & 2000



Source: VTrans Bridge Database.

Bridge Sufficiency Ratings

There are 454 State and local bridges in the NEK that are rated on the VTrans 2000 Bridge Sufficiency Rating List. Since 1990, the number of structurally or functionally deficient bridges in the NEK has decreased overall, as Figure 3.20 shows, even though there has been a slight increase in the number of state structurally deficient bridges.

Public Transit

Public transit services in the NEK are currently expansive neither in geographic reach nor hours of service. According to "Working Paper C" of the ***Short-range Public Transportation Plan for***

RCT (KFH Group, November 2002), only some of the region's transportation needs can be met through existing fixed-route services, with limited hours posing a problem for many potential customers. The paper stated that services need (1) to be made more flexible in terms of scheduling and more available in terms of supply, (2) to have less volatility in pricing, (3) better town-to-town connections for employment purposes, and (4) better and more effective marketing to increase ridership.

Bicycle and Pedestrian Facilities

Every trip, whether it is by transit or automobile, begins and ends with a pedestrian movement. Additionally, many trips within the region's urban sub-areas can be solely accomplished by walking or bicycling within the community. Accommodating pedestrian and nonmotorized transportation movements in a safe and pleasant manner, integrated into the community, is an important factor in providing transportation services that are part of a true multi-modal transportation system.

In 1994, there were 37 miles of sidewalks in the Northeast Kingdom and one shared use path. Newport and St. Johnsbury have active sidewalk programs in which they repave, build, and maintain sidewalks on a yearly basis. According to NVDA, other towns in the region also have active programs. As shown in Table 3.7, other communities are planning additional sidewalks or shared use paths for future implementation.

Table 3.7: New Bicycle/Pedestrian Facilities Planned or Proposed in Northeast Kingdom, 2002

Name of Trail	Length
Newport bike/ped	1.5 miles
St. Johnsbury bike/ped: 3 Rivers Path	1.7
Pedestrian bridge over rail tracks in Island Pond	bridge
Derby pedestrian walkway	1
Potential: Lamoille Railbed, mixed use	40-50 miles
Canaan Rail Trail	-

Goods Movement/Intermodal

Trucking

Trucks and trucking are an integral – and essential -- part of the region's economy and transportation system. Over 85% of all of Vermont's freight is moved by truck, and it is likely this situation will continue for the foreseeable future. Time-sensitive delivery and freight movement services ("just-in-time", for example) are a growing part of the freight transportation and distribution and logistics industries. Even in a service-oriented economy, time-definite shipping services are essential for the types of low-weight, high-value goods typically used by business. For manufacturers, the concept of "inventory in motion" has become a reality with the advent of widely-available advanced telecommunications and inventory management systems. It is not uncommon for a manufacturing or final assembly facility to keep only one or two days' parts or supplies on-hand, relying on just-in-time delivery from suppliers to keep the operation up and running. In this type of business environment, reliable transportation system conditions are essential to shippers and receivers. This means the roadways used by trucks need to facilitate safe and reliable truck mobility by using design and operational features to accommodate both person and goods movement.

Transborder Truck Movement

Assuming NAFTA-related freight movement between Canada and the U.S. continues its spectacular growth into the future, the Derby Line port of entry will continue to experience significant increases in truck traffic. Further, as other ports of entry further west, such as Champlain, NY (I-87) and Buffalo, NY become more congested, shippers may be willing to use more circuitous but faster routes, including the I-91 corridor. Also, an impediment to truck crossing growth at the Highgate Springs port of entry is low-quality Canada-side roadway conditions, another factor that may push truck movements toward Derby Line and I-91.

With these factors in mind, it is imperative that the operational quality and physical condition of I-91 be preserved at the highest-possible levels. Although much of the truck traffic flowing through the port of entry and I-91 is bound for destinations outside the Northeast Kingdom, the region nevertheless is likely to see future opportunities for capturing NAFTA-related business location and expansion, particularly in the I-91 corridor (Derby, Newport, Lyndon, St. Johnsbury). I-91 is key to these opportunities, as ready and efficient access to and from this high-speed, high-capacity roadway will be a major facilitator of such opportunities. If congested and deteriorating operational conditions on US 5 in Lyndonville continue into the future, preserving I-91's capacity and functioning will be all the more essential.

Freight Rail Service

The availability, frequency and level of freight rail service in the NEK has been declining for nearly two decades as key shippers have either left the area or shifted their business to trucks to satisfy time-sensitive delivery and just in time inventory requirements of customers. According to the ***Northeast Kingdom Railroad Assessment Final Report*** (R.L. Banks & Associates, September 2001), the types of shippers and receivers best served by rail transportation -- large manufacturing or distribution facilities that move large volumes of freight over long distances, particularly between one or just a few origin/destination pairs – are not located in the Northeast Kingdom. Further, the top four commodity groups moving into, out of and through the region tend to be short-haul and widely dispersed, presenting more difficulties for rail to capture market share.

The RL Banks & Associates report concluded that

> While the SLR appears to be a growing railroad enterprise in the northeast corner of the [NEK], rail service elsewhere in the area is in jeopardy…The traffic density south of Newport on the NVR is [very] sparse. Although there are admittedly few customers, the ones that do patronize the [NVR] absolutely depend on it for their existence.

In November 2002, VTrans announced that the State of Vermont would purchase the NVR in order to keep the line alive and viable for a possible future private buyer. VTrans asked WACR to operate the NVR and the trackage to White River Junction and to become interim operator until a permanent operator could take over in mid-2003. WACR was selected to take over for NVR and currently operates one train per business day from White River Junction to Newport and back.[7]

[7] *Atlantic Northeast Rails & Ports*, 6 Dec. 2002, and supplemental information from NVDA 2004.

Table 3.8: Historical and Projected Aircraft Operations at Major NEK Airports, 1999-2019

		Forecast			
Airport	**1999**	**2004**	**2009**	**2019**	**Forecast % change 1999-2019**
Caledonia (Lyndonville)	6,000	6,400	6,900	7,900	31.7%
Newport (Coventry)	7,200	8,100	8,820	9,540	32.5%
Boylan (Island Pond)	600	600	700	800	33.3%
Regional Totals	13,800	15,100	16,420	18,240	32.2%

Source: Dufrense-Henry; Wilbur Smith Associates.

Air Transportation

As shown in Table 3.8, the total number of operations[8] at all three major airports in the region is expected to grow to 18,240 by 2019, an increase of about 32% over the 1999 level of 13,800.

According to a November 2002 draft of the VTrans technical report, *The Economic Impact of Vermont's Public-Use Airports*, these three airports have varying, but important, economic impacts on the region. Caledonia County Airport is estimated to generate a total local/regional economic impact of about $7 million, including payroll and business sales. Newport State Airport has an estimated total regional/local economic impact of about $445,000, including payroll and business sales, while Boylan Airport has an estimated total local/regional impact of about $60,000. Together, the three airports have an estimated annual economic impact on the region of over $7.5 million. Further, according to the VTrans report on airport economic impacts, both Caledonia and Newport Airports play important roles in serving the travel and shipping needs of national firms with operations in the Northeast Kingdom.

When one considers the projected increase in operations at all three airports in combination with their economic impact on the region, one can see an opportunity, and possibly a need, to enhance the landside transportation aspects of each facility. For Boylan Airport, this could be as simple as improved wayfinding signage directing airport users to and from the facility. For Newport and Caledonia, in addition to wayfinding improvements, enhancements to long-term and short-term parking and improved access from arterials to accommodate increased vehicle traffic may be warranted. Ensuring continued investment in these airports is also important to maintain access to the region for the national firms that operate in the region.

[8] An "operation" is one takeoff or one landing; a landing and takeoff of the same aircraft is therefore considered to be two operations.

Another long-term possibility is that either Caledonia or Newport Airports could attract commercial airline service with connections to hubs in Boston, New York, Albany or Montreal. Although the airline industry today is economically distressed and in somewhat of a contraction mode, it is not unreasonable to assume that once the industry has rationalized its route and service structures, there could be opportunities for scheduled, if limited, regular or seasonal airline service in the Northeast Kingdom. If such opportunity were to arise, the region would need to have an airport capable of accommodating the service, including passenger and baggage processing facilities, deicing facilities, concessions and the appropriate navigation system technologies.

Summary

Overall, despite some limited but noticeable travel problems in congested locations, the regional transportation system still enjoys a relatively high overall operating performance. This performance, however, may decline as growth and development continue to consume lots in areas outside the already-developed urban areas. By examining current trends and projections of future conditions, we can begin to understand and characterize emerging transportation needs and craft a regional transportation plan that strategically addresses those needs.

- Based on current trends, population growth is projected to be focused in the Newport City/Coventry area, the Danville/Barnet area and Hardwick. Most employment growth is projected to occur in the Lyndon/Danville area and in the areas immediately adjacent to Newport City. Hardwick, Craftsbury and Lunenburg are also projected to experience modest employment growth over time.
- Travel demand is expected to continue to increase at a rate faster than the rate of population growth. Paralleling the projected growth in population and employment is projected growth in traffic levels on arterials and the supportive roadway network in the Newport City/Derby and Lyndon/St. Johnsbury/Danville areas. This is a result of more trips, longer trip distances, and an overall increase in the number of trips per household.
- Projections show the Route 105/5 corridor between Newport City and Derby Center and the Route 5 Corridor between Lyndonville and the southern end of the St. Johnsbury urban area experiencing significant land use and traffic congestion growth during the next 20 years. The changes will challenge efforts to maintain mobility, access and quality of life in these areas and, by extension, the entire region.
- As the region continues to age, it is likely that more and more residents will become less able to drive themselves for their daily needs. Therefore, identifying options for and accelerating efforts to enhance transit services throughout the NEK will be critical in the not-so-distant future.
- The quality of the regional transportation system's physical condition remains at risk due to harsh climate conditions, often rugged topography and deferred maintenance situations. This is particularly true for bridges and roadways below the arterial level. It is imperative that strategies to preserve the physical quality of the regional system be pursued.
- The ability of freight and goods to move efficiently and safely around the region, particularly in the I-91 corridor, is essential to the region's economic vitality and future economic development. NAFTA-related truck traffic is growing dramatically, and facilitating this

traffic's ability to move quickly and access strategic points throughout the corridor could strengthen the region's economic future. Strategically targeted rail investments are also an important way to preserve overall freight movement capacity for the region.

The multi-modal transportation system in the region continues to gradually expand in coverage, service types and levels and use. Continued expansion of and investment in alternatives to the single-occupant vehicle will be increasingly important as traffic growth in key corridors and economic activity centers threatens to undermine the region's economic health and high quality of life. At the same time, this investment must be balanced with appropriate investment in preservation and enhanced efficiency of the mainly automobile-based existing transportation system, as the personal automobile will certainly remain the dominant mode of transportation in the region for many years to come.

Section 4
Recommended Regional Transportation Plan Update

The information provided to this point in this report lays the foundation for an updated long-range (20-year) transportation plan for the NVDA region. The preceding analysis of existing and project conditions and how they facilitate or undermine meeting the region's goals provides useful direction for identifying the nature of transportation improvements and investments that will best serve the region.

Several streams of input were used to develop the Plan:

- The 1995 NVDA Regional Transportation Plan;
- The assessment described in the preceding section; and
- Input of the stakeholders and residents of the Northeast Kingdom.[9]

Through this process, a "blueprint" for furthering the region's development of an integrated and multimodal transportation system has been developed. The recommended Plan is divided into two elements:

- ***Regionwide initiatives;*** and

- ***High-impact investments in major activity areas of the region.***

Regionwide initiatives include policy and strategic actions intended to maintain and enhance the existing levels of mobility and access throughout the region without major roadway capacity expansion. These types of investments include systematic roadway and bridge maintenance, repair and replacement programs, expanded public transportation coverage and service, expanded non-motorized facilities, preservation of access to recreational facilities and preservation and enhancement of freight and intermodal facilities.

High-impact investments are intended to support and facilitate economic activity in those areas already accommodating or designated to accommodate major growth. In the NEK region, these are the I-91/US 5 Corridor from St. Johnsbury to Lyndon and the VT 105 Corridor from Jay to Derby. It is in these two corridors that the most significant activity, commercial and industrial centers in the region are located. Investing in these corridors also facilitates opportunities to integrate town plans and zoning for planned development with corridor transportation improvements. High-impact investments include strategic roadway capacity enhancements, system efficiency improvements, intermodal access improvements and addressing of congestion hot spots.

It should be noted that it is impossible to list all the projects that will be used to ensure the mobility of people and goods into and through the NEK region. However, projects contained in the following recommendations provide the ability to substantially improve the regional transportation system in the coming years. Appendix A includes an inventory of all projects recommended

[9] See Appendix B for information on the public involvement process for this RTP Update.

through the various major corridor and modal studies conducted by the NVDA during the last 5-10 years.

Regionwide Initiatives

Maintenance and preservation of the facilities comprising the existing transportation system should continue to be the top priority for the NEK's decision-makers. With the region's diverse and often rugged topography and harsh climate, maintaining the system, including roadways, buses, bike paths and airport facilities, in an acceptable condition can be challenging. However, it is imperative that adequate resources be devoted on a continuing and systematic basis to the maintenance function in order to ensure the region's basic mobility and access needs are met.

With the continuing need for maintenance in mind, other key regionwide initiatives can be pursued. Each of these holds potential for enhancing the efficiency of the existing system and preserving mobility and access options for residents, travelers and freight transporters.

Recommended Regionwide Transportation Initiatives

Project	Description	Key Involved Parties	Initial Timeframe for Implementation
Regional Indicators Monitoring Report	Using a set of key indicators of transportation conditions, regularly assess conditions and publicly report on them	NVDA	1-2 Years
Freight/Goods Movement Access Improvement Program	Conduct Freight Audits of key freight movement corridors and access points throughout the region to develop schedules of prioritized freight-supportive system improvements, with particular focus on maintaining efficient and uncongested access to industrial parks and commercial centers. Initial priorities: • Port of Entry, Derby Line and vicinity • US 5, St. Johnsbury to Lyndon • US 2, St. Johnsbury to Guildhall • VT 105, Derby to Island Pond • I-91 Interchanges, Derby to Ryegate • VT 114, Lyndon/Morgan	NVDA, Municipalities, Vtrans, key shippers and receivers, freight movement companies, US Dept. of Homeland Security, USDOT	1-2 Years/Establish Regular Schedule
Bicycle Path Implementation Program	Review, re-prioritize as needed, and facilitate construction of all regional bikepath projects currently assigned a Vtrans project number	NVDA, Vtrans, municipalities, legislators	1-2 Years
High-accident Location (HAL) Reduction Program	Systematically review HAL locations and status and develop prioritized listing of HALs for remediation, revising/updating as needed; consider annual "safety audits" of key corridors in coordination with Vtrans' Safety Management System	NVDA, VTrans	1-2 Years/Continuous
Public Transit Improvement Program[10]	**(A)** Adopt regional guidelines for transit-oriented development (TOD) and/or transit-supportive land use and development planning	NVDA, municipalities	1-2 Years
	(B) Use recommendations of SRTP as basis for strategically improving transit service throughout region, including options for using advanced technologies to improve service efficiency and coverage	RCT, NVDA, Vtrans, municipalities	2-7 Years
WACR Revitalization Program	Work with VTrans, key rail shippers and receivers, municipalities and other concerned parties to facilitate needed investment in WACR infrastructure and stable rail operations by private owner or	NVDA, Vtrans, legislators, private concerns	1-2 Years

[10] This recommendation is subject to refinement based on the results of the Short-range Transit Plan process for RCT, currently being completed.

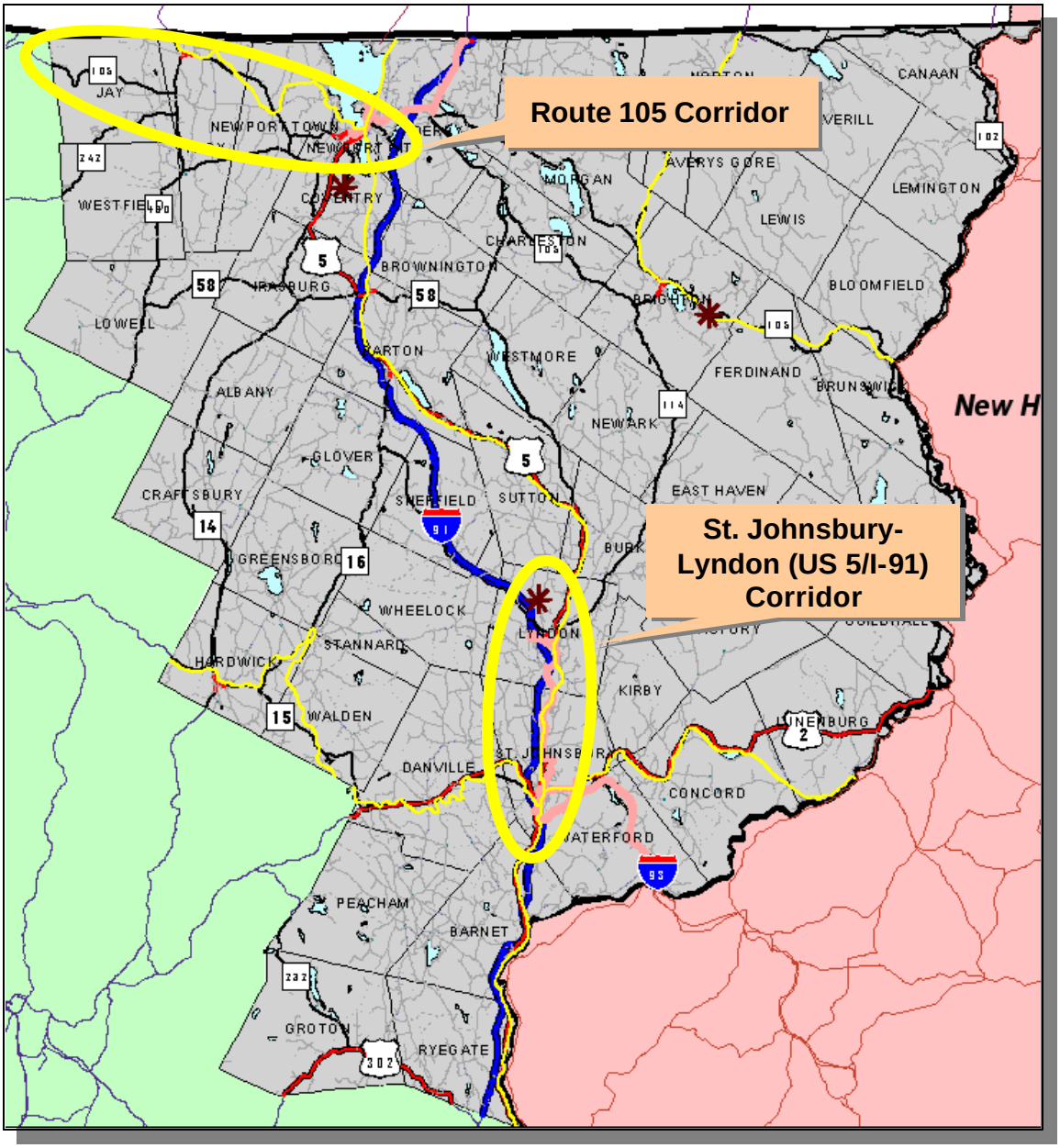
Project	Description	Key Involved Parties	Initial Timeframe for Implementation
	operator.		
Airport System Improvement Program	Regularly inventory state airport capital plan to identify, track and facilitate key airport improvement projects; also periodically review, assess and identify landside access needs.	NVDA, Airport Managers, Vtrans	1-2 Years
Intersection Improvement Program	Perform project definition (scoping) studies of lowest functioning intersections in region and prioritize/implement improvement projects for each: • Eastern Ave. @ Main St. (St. Johnsbury) • VT 114, VT122 (TH3) & US 5 (Lyndon) • W. Main St., 3rd St. and School St. (Newport) • US 5 @ VT 105 (Derby)	NVDA, Vtrans, Municipalities	1-3 Years for initial priorities
US 2 Corridor Improvement Program	Update study to look at the entire corridor, not just the villages. After these two documents are synchronized, prioritize and implement recommended projects from US 2 Corridor Access Management Plan, focusing on key projects in Danville, Lunenburg, St. Johnsbury and Guildhall	NVDA, Vtrans, municipalities, legislators	5-10 Years
Interregional Access Assessment	Monitor mobility conditions in the critical transportation corridors linking NEK with other regions in Vermont, New Hampshire (I-91, I-93/US 2) and Canada and identify and prioritize strategic investments plans as needed to maintain access to/from NEK region	NVDA, Vtrans,Municipalities	Continuous
Critical Roadway Access Protection	Access to minor arterial highways, principal arterial, interstate and National Highway System designated roads shall be carefully controlled so as to maximize capacity and safety and foster responsible land use	NVDA, municipalities, Vtrans	Continuous
Strategic Congestion Management	Perform on-going monitoring of congestion throughout the region. A minimum Level of Service (LOS) "C" shall be maintained in rural areas, LOS "D" in urban fringes and urban residential areas, and LOS "E" in central business districts.	NVDA, municipalities, Vtrans	Continuous
Transportation System Management	Design highway signalization, roadway signage, and operational	NVDA, municipalities, Vtrans	Continuous

Project	Description	Key Involved Parties	Initial Timeframe for Implementation
	capacities to optimize traffic flow and enhance the level of service throughout the regional roadway network		
Recreational Facility Access	**VT RT 242 Corridor Improvement Program** Initiate study to Address: • sight distance and geometry problems in Jay, Troy, Westfield • Widening roadway for shoulders to facilitate safe passing zones along the entire corridor. • Address needs associated with year round tourist activities.	NVDA, VTrans, Municipalities, Legislators	5-10 years
	Establish process to review and ensure access to key recreation centers is maintained at LOS "B" or better to sufficiently accommodate anticipated increases in recreational traffic.	NVDA, municipalities, Vtrans	Continuous
	Appropriately integrate snowmobiles into the Regional transportation system, including improving the interaction between the VAST trail system and the Region's roadway network.	VAST, municipalities, NVDA, Vtrans	Continuous
Maintain Existing Public Rights-of-Way	Encourage the continuance of public rights-of-way as legal trails for public purposes. The conversion of Class IV roads to legal trails for public purpose should be done so on a case-by-case basis at the discretion of each municipality.	Municipalities	Continuous
Regional TDM Program	Work with major employers and institutions to establish travel demand management (TDM) programs that facilitate more carpooling, transit use and alternative work arrangements as a means to mitigate peak hour congestion problems	NVDA, Vtrans, major employers, RCT	Continuous

High-Impact Investments: Corridor-focused

Two key transportation corridors provide critical support for the NEK Region's economic vitality and quality of life: the I-91/US 5 Corridor connecting St. Johnsbury and Lyndon, and the VT 105 Corridor connecting Newport/Derby with Jay and Lamoille and Franklin Counties. A set of high-impact investments is proposed for each corridor, with the objective of preserving their operational quality and facilitating enhanced mobility and access for both goods and people over the next 20 years.

Figure 4.1: High-Impact Investment Corridors in the Northeast Kingdom



I-91/US 5 Corridor, St. Johnsbury to Lyndon

The I-91/US 5 Corridor between St. Johnsbury and Lyndon is the focal point for much of the region's economic activity. Key existing or looming transportation problems include peak and non-peak hour congestion hotspots, limited truck mobility and access, limited public transit service, and lack of access controls on arterials.

Project	Description	Key Involved Parties	Initial Timeframe for Implementation
US 5 Access Management Program	Prioritize and implement access management recommendations of US 5 Corridor Study to facilitate improved mobility and safety in the corridor	NVDA, municipalities, Vtrans	1-2 Years
Corridor Signal Modernization and Optimization Initiative	Inventory existing signal system(s) in corridor and initiate program for upgrading control systems and optimizing signal coordination and timing to improve mobility and reduce congestion in corridor	NVDA, Vtrans, Municipalities	1-2 Years
Safety Improvement Program	Conduct "safety audit" of US 5 to identify and prioritize safety improvements for integration with Vtrans Safety Management System	NVDA, VTrans, Municipalities	1-2 Years
Wayfinding Improvements	Implement wayfinding system to assist cars and trucks to more efficiently and safely travel the corridor, with particular focus on directing trucks between I-91 and industrial parks, commercial centers and major shippers/receivers and away from congested areas.	NVDA, VTrans, Municipalities	1-2 Years
Public Transit Enhancement Initiative[11]	Implement strategic enhancements to St. Johnsbury-Lyndon bus service, including route diversion, peak hour service to major employment sites and guaranteed ride home program	RCT, NVDA, municipalities and Vtrans	3-5 Years
St. Johnsbury-Lyndon Bike Path	Implement route recommended in NEK Regional Bicycle Plan, including: • bike lanes and wide curb lanes connecting Lyndon SC & Center St. • bike lane between Lyndon Center and G.M. Mall • wide curb lanes between Mall and Hospital Drive • bicycle lanes between Hospital Drive and downtown St. Johnsbury.	Vtrans, municipalities, NVDA	5-10 Years

[11] This recommendation is subject to revision based on the results of the Short-range Transit Plan process for RCT, currently being completed.

VT 105 Corridor, Jay to Derby

The VT 105 Corridor is the "spine" of the NEK Region's secondary economic activity center, focused on the Newport/Newport City/Derby sub-area. Investments in key projects and initiatives in this corridor are critical for facilitating continued economic development, personal mobility and quality of life in the area.

Project	Description	Key Involved Parties	Initial Timeframe for Implementation
VT 105 Improvement Project	Implement major recommendations of Corridor Study, including: • Address sight distance and geometry problems in Jay, Troy, Coventry and Newport • Widen roadway for shoulders to facilitate safe passing zones in Troy • Conduct Newport Thoroughfare Plan Study, including analysis of additional bridge crossing	Vtrans, NVDA	3-5 Years
VT 105 Access Management Program	Prioritize and implement access management recommendations of VT 105 Access Management Study to facilitate improved mobility and safety in the corridor	NVDA, municipalities, Vtrans	3-5 Years
US 5 Improvement Project	• Reconstruct US 5 through Newport to widen shoulders and provide additional multimodal travel options for bikes, pedestrians and transit • Inventory existing signal system(s) in corridor and initiate program for upgrading control systems and optimizing signal coordination and timing to improve mobility and reduce congestion in corridor	Vtrans, municipalities, NVDA	5-10 years

Section 5
Implementation and Funding Framework

Introduction

The Regional Transportation Plan (RTP) is simply that – a plan – unless it is accompanied by a logical and feasible strategy for making the plan a reality. This section discusses a framework for monitoring and assessing transportation system performance on a continuous basis and options and approaches for implementing the recommendations of the Regional Transportation Plan, including institutional and funding approaches.

Performance Measure Framework

"Transportation performance measurement" is an approach to planning and programming that enables decision-makers and others to understand how well the transportation system is functioning in relation to established goals and objectives. A performance measurement system addresses at least four needs, including (1) achieving a snapshot view of how the overall system is functioning at a particular point in time; (2) gauging the system's performance against one or several benchmarks; (3) tracking the system's function over time to allow understanding of positive and negative trends; and (4) considering "what-if" scenarios pertaining to possible development and transportation system changes.

Table 5.1 displays suggested performance measures that could help the NVDA to both better understand regional needs and priorities and track the implementation and progress of the RTP. These performance measures include both quantitative and qualitative indicators. It is important to note that the benefits of using performance measures include the ability to monitor the performance of a system over time. Through this structure, NVDA can collect, manage, assess, and report on system performance over time and more effectively develop, refine, and implement policy and program actions to help meet the region's transportation goals.

Estimated Cost of RTP Implementation

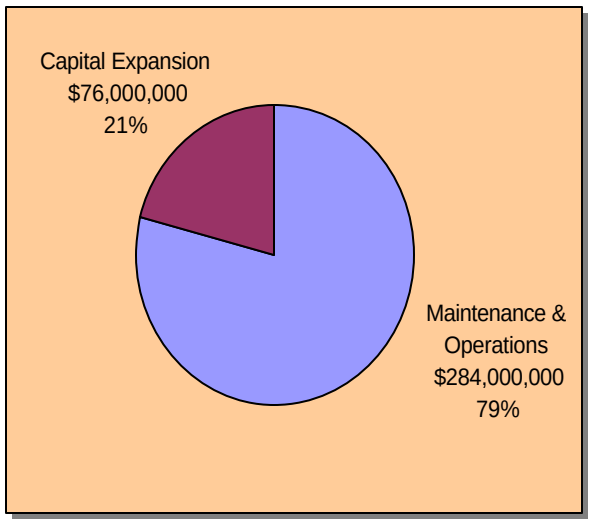
Estimated 20-year RTP capital implementation cost is $76 million, or $3.8 million annually.

The 20-year implementation cost of the recommended RTP capital element is estimated at about $76 million, in current dollars, or about $3.8 million annually. This figure is based on the implementation costs obtained from the various projects identified in the NVDA studies inventoried in Appendix A. Because some of the studies either did not clearly break out individual project costs or gave only "order of magnitude" figures, it is reasonable to consider the total figure to be a planning estimate only. Planning and engineering work on individual projects will result in refined cost information.

It should also be noted that the $3.8 million dollar annual capital figure does not account for basic ongoing maintenance, preservation and operations of the current regional transportation system. An approximate proxy for the annual cost of this basic upkeep is $14.2 million, which is the FY2002 state funding figure of $12.8 million plus an estimated 10 percent local match ($1.4 million).

Figure 5.1: Breakout of Estimated RTP Cost Allocations over 20 Years

In summary, the RTP has an estimated current dollar annual cost of $17.2 million for both capital expansion and basic maintenance and operations. Over the 20-year time horizon of RTP, this equates to $344 million in current dollars.



Source: WSA analysis of NVDA and VTrans fiscal information.

Implementation and Funding Framework

It is important to build a logical framework for implementation and funding of the RTP's priorities.

Vermont is currently in the midst of a statewide fiscal crisis, precipitated by the national economic slowdown. As of December 2002, the incoming administration has indicated that the transportation budget will not be immune from constraints in the coming fiscal years, and that there is limited funding available for anything beyond current "pipeline" projects. However, current economic conditions offer more reason, not less, to protect the economic vitality of the NEK. It is therefore important to build a logical framework for the planning, implementation and funding of the RTP's priorities.

During the period in which VTrans will be "clearing the pipeline," NVDA should focus on refining its transportation planning and project prioritization process to enable identification of high-priority strategic transportation investments and the building of strong regional consensus around those priorities. Once the VTrans candidate project queue re-opens for new proposals, the NEK would be in a good position to put forth a set of high-priority, high-impact transportation projects and initiatives that would have strong support in the region and, in all probability, high visibility in the statewide decision-making arena.

The following summary table and accompanying text suggest a phased framework for the NVDA to employ to move ahead on both meeting immediate transportation needs and addressing longer-term major regional needs.

Table 5.2: Proposed RTP Implementation & Funding Framework

Phase	Objectives	Suggested Focus Areas
Short-range (within 3 years)	A. Identify and pursue implementation of "early success" projects from the recommended RTP list that are achievable at a low cost and yield noticeable benefits for system users	▪ Freight Audits of key corridors ▪ HAL safety improvements ▪ Selected intersection improvements ▪ Safety audits of key corridors ▪ Wayfinding Improvements Traffic signal optimization
	B. Identify and prioritize regionally-significant projects requiring extensive project development activity and/or additional consensus-building	▪ US 2 Corridor Improvements ▪ US 5 Access Management ▪ VT 105 Corridor Improvements & Access Management ▪ Public Transit Enhancement Program ▪ Expansion of Regional Bike/Ped Facilities System ▪ NVR Revitalization
Mid-range (4-7 years)	A. Work with legislators, municipal officials and VTrans to establish a more proportionate and dependable amount of statewide funding resources for the NEK region	▪ Use regional performance measures monitoring to inform and educate public and policy-makers on funding needs and deficiencies ▪ Identify prioritized list of low-cost, high-impact projects annual budget process
	B. Use prioritization process to identify several high-impact investments for consideration for Congressional earmarks by Vermont's Congressional delegation	▪ Capacity and freight-supportive projects on NHS facilities ▪ Border crossing capacity and truck routing improvements ▪ Rail revitalization projects ▪ Intermodal facilities (people and freight)
	C. Seek partnerships between the public and private sectors in the region to develop transportation projects and initiatives	▪ Regional transit enhancements ▪ TDM programs ▪ Access management ▪ Intersection improvements
Continuous	A. Integrate transportation performance monitoring into short and long-range transportation planning	▪ Revise transportation data collection process to support performance measurement ▪ Produce periodic report on performance measures for policy-makers and public ▪ Use performance measure information as a foundation for RTP Updates

Near-Term (1-3 Years)

A. Identify and Pursue Implementation of "Early Success" Projects

"Early success" projects are intended to help NVDA and the region establish a track record of effectively pursuing projects that are low cost yet provide significant improvements at high profile locations. These initiatives and projects represent "low hanging fruit" in the sense that they yield noticeable benefits for transportation system users without the need for major capital expenditures. Examples of such projects include audits of freight movement impediments in key corridors, HAL safety improvements, key intersection improvements,

roadway safety audits, wayfinding (signage) improvements, and traffic signal optimization. Each of these efforts and/or projects could then yield a "laundry list" of small projects such as signal timing adjustments, directional and information signage installations, and intersection geometry improvements.

None of these are large-scale or big ticket efforts, but one can readily appreciate how transportation safety and efficiency in the NEK could be enhanced by systematically pursuing creation and implementation of "quick fix" projects. By following through on such a strategy and being results-oriented, the NVDA and its member communities can establish a foundation of credibility and visibility, thus enhancing future probability for funding of major projects.

B. Identify and Prioritize Regionally-significant Capital Projects

Some of the key projects in the recommended RTP require major investments of planning, design, engineering and capital resources. They also require time in order to define specific project elements for implementation and assembly of funding sources. The NVDA should determine the highest regional priorities from the recommended RTP and focus its efforts on advancing those few projects through the planning and definition phases to ensure they are "ready to go" when funding does become available through state or federal sources. By concentrating its efforts on just a few regionally-significant projects, the NVDA maximizes the chances of those projects being fully fleshed out and ready to move into the final design and construction phases.

Mid-Range (4-7 Years)

A. Seek a Dependable and Proportionate Amount Of Statewide Transportation Funding Resources For The NEK Region

The NEK is unique in Vermont in many ways. In the transportation arena, not only does the region face monumental basic system maintenance and preservation challenges, it is also unusually dependent on the quality of its transportation system to provide ready access to and from the region for residents, business and visitors. Ensuring this access remains in its highest possible form is critical for the region's ongoing economic vitality. To do so requires dependable funding from statewide resources in a proportionate manner.

Under current federal and state laws, a variety of funding sources are available for implementation of RTP priorities. At this time, local funding sources are generally restricted to local property taxes, developer impact fees and a handful of other special fees. Efforts by several groups are underway to change Vermont law to enable local and/or regional taxes to support needed transportation infrastructure improvements and transit operations and expansion. Because the outcome and timeframe for these efforts are uncertain, the NEK will likely need to rely on traditional funding sources – local, state and federal – for the immediate future. Appendix A includes descriptions of key existing federal and state transportation funding sources. The limited funding available, and the keen competition

among Vermont's different regions for that funding, makes effective planning and convincing project prioritization only more important in the process for securing funding in the state transportation capital budget.

Issue: Regional Funding Equity

In FY 2002, the NEK region fell below the State as a whole in terms of both transportation expenditures per capita ($206 vs. $250 statewide) and transportation expenditures per 1,000 VMT ($20 vs. $25 statewide) (see Tables 5.3 and 5.4). These figures are admittedly snapshots of one year, but as NEK's transportation system becomes increasingly strained in terms of maintenance needs and capacity enhancements, it will be important to work to ensure a more proportionate share of statewide resources is allocated to the region.

Table 5.3: FY 2002 Per Capita Transportation Expenditures in Vermont, by County

County	FY2002 Recommended	Per Capita	2000 Population
Addison	$2,606,333	$72.45	35,974
Bennington	$27,445,657	$741.89	36,994
Caledonia	$6,271,447	$211.15	29,702
Chittenden	$19,628,241	$133.92	146,571
Essex	$4,024,377	$623.07	6,459
Franklin	$16,092,602	$354.33	45,417
Grand Isle	$2,331,528	$337.85	6,901
Lamoille	$1,993,687	$85.81	23,233
Orange	$2,061,442	$73.03	28,226
Orleans	$2,555,278	$97.24	26,277
Rutland	$12,423,311	$195.95	63,400
Washington	$24,565,219	$423.25	58,039
Windham	$11,295,257	$255.46	44,216
Windsor	$18,514,226	$322.45	57,418
Northeast Kingdom	$12,851,102	**$205.82**	62,438
Vermont	$151,808,605	**$249.35**	608,827
NEK as percent of Statewide Totals	8.47%	**82.54%**	10.26%

Source: WSA analysis of Vermont state budget and Vtrans transportation data.

Table 5.4: FY 2002 Transportation Expenditures Per 1000 VMT in Vermont, by County

County	FY2002 Recommended	$ Per 1000VMT	Vehicle Miles of Travel (VMT) 2000	VMT Per Capita
Addison	$2,606,333	$7.76	335,884,267	9,337
Bennington	$27,445,657	$76.79	357,416,329	9,661
Caledonia	$6,271,447	$17.98	348,781,265	11,743
Chittenden	$19,628,241	$13.27	1,479,034,811	10,091
Essex	$4,024,377	$63.70	63,173,589	9,781
Franklin	$16,092,602	$45.67	352,385,812	7,759
Grand Isle	$2,331,528	$34.39	67,792,093	9,824
Lamoille	$1,993,687	$9.44	211,168,307	9,089
Orange	$2,061,442	$6.05	341,003,891	12,081
Orleans	$2,555,278	$11.49	222,409,725	8,464
Rutland	$12,423,311	$20.47	606,964,541	9,574
Washington	$24,565,219	$39.92	615,383,084	10,603
Windham	$11,295,257	$190.06	59,429,579	1,344
Windsor	$18,514,226	$23.07	802,619,045	13,979
Northeast Kingdom	$12,851,102	**$20.26**	634,364,579	**10,160**
Vermont	$151,808,605	**$25.89**	5,863,446,338	**9,631**
NEK as percent of Statewide Totals	8.47%	78.25%	10.82%	**105.49%**

Source: WSA analysis of Vermont state budget and Vtrans transportation data.

B. Identify High-Impact Investments for Congressional Earmarks

Although Vermont is a "minimum allocation" state in the federal transportation funding arena, meaning that we receive a disproportionately large share of federal formula funds for highways and transit, these funds are not nearly enough to satisfy all the demand for worthwhile projects throughout the state. Various parties in Vermont have therefore turned frequently to our Congressional delegation in order to secure "earmarks" of funds for specific projects and initiatives in federal appropriations and authorizing legislation. For some projects, these earmarks have yielded substantial infusions of capital funds that allowed the projects to advance beyond any point they might have otherwise. Recent examples include the Burlington Multimodal Center, the Bellows Falls Multimodal Center, the built segments of the Chittenden County Circumferential Highway and the regional passenger rail system in the Burlington region.

Among many projects that receive earmarks for capital funds is a common thread: they have moved through the planning process to the point of both receiving consensus support for key policy-makers and the public, and are ready to move into final design and/or construction. Therefore, building on the results of Step C in the near-term phase, NVDA could bring "ready-to-go" projects to the Congressional delegation for earmarking in pending appropriation and/or authorization bills. Strong candidates for earmarking in Congress could include truck capacity and routing improvements to the border crossing at Derby Line, capacity and safety improvements on key NHS facilities, and rail revitalization efforts.

C. Seek Partnerships between the Public and Private Sectors

As transportation needs have grown in recent years at a rate that has outpaced public funding availability, particularly at the local level, innovative approaches to paying for transportation projects have emerged. One such approach entails creative partnerships between the public and private sectors. In Vermont, these types of arrangements have typically involved roadway intersection and capacity improvements associated with commercial developments, such as in the Tafts Corner area of Williston. The common thread in any public-private partnership is that all involved parties receive some benefit from their resource contribution. While these partnerships may not fund 100 percent of a projects' implementation, they could represent an important piece of the overall funding framework. In light of continuing constraints on public funding sources, NVDA should consider such arrangements as a way to add another tool to the region's transportation funding "toolkit."[12]

[12] For in-depth information on public-private partnerships and other innovative transportation financing techniques, see *Innovative Finance Primer* (FHWA, April 2002, http://www.fhwa.dot.gov/innovativefinance/ifp/index.htm).

Appendix A
Information on Federal and State Transportation Funding Sources

Potential Funding Sources for Implementation of the RTP

The various funding sources that could possibly be used to help the region implement transportation projects include public funds, private funds, and a combination of both types. In the public funding category, sources include federal, state, regional, and local. The lists and information below focus on non-local sources, and are intended to provide guidance to the region, but should not be considered exhaustive, as funding source eligibility, restrictions, amounts, and requirements change from year to year. Some programs, such as the Enhancements Program and the Scenic Byways Programs, are under a new funding moratorium as of April 2003. *For additional detailed information, consult VTrans' Highways and Bridges Handbook for Local Officials (the "Orange Book"). For more information, contact your District Transportation Administrator, the NVDA or Vermont Local Roads (1-800-462-6555).*

Federal Sources

- **Surface Transportation Program (STP)** funds have the most flexible uses of any federal transportation funds. STP funds may be used for highway, transit, and non-motorized facility construction and improvements. Facilities must be classified by the state as eligible for federal-aid, although sidewalk projects on local roads that are not on the federal-aid system may also be eligible for STP funding. The non-federal state match requirement is 20 percent.

- **Enhancement Program** funds are another potential source of federal funds bikeway, pedestrian and other non-motorized transportation facilities. In Vermont, the final decisions on Enhancement funding are made by VTrans, although the regional planning commissions prioritize candidate Enhancement projects for their regions before VTrans will consider them for funding. Generally, Enhancement funding awards are made once per year through the competitive application process, although the state has, in recent years, made an additional round of awards after the end of the Legislative Session. The non-federal match requirement is 20 percent.

- The **"Transportation and Community and System Preservation" (TCSP)** pilot grant program is another potential source of funding. In 1998, under the new TEA-21 legislation, Congress established the TCSP competitive grant program to provide funding to states, regions, and localities for planning and implementing transportation projects that improve the efficiency of the transportation system, reduce environmental impacts of transportation, reduce the need for costly future public infrastructure investments, ensure efficient access to jobs, services and centers of trade, and examine development patterns and identify strategies to encourage compatible private sector development patterns. In Vermont, the City of Burlington has received a TCSP grant

for a corridor improvement project in the North Street area of the Old North End. Applications are accepted once per year, typically in late January, with awards made toward mid-year by the Federal Highway Administration (FHWA). It should be noted that for the last three years, virtually 100 percent of all TCSP grants across the country have been made through the Congressional earmarking process, despite the original stated intent that this be an open competitive process. Thus, the direct involvement of one or more members of Vermont's congressional delegation would be necessary for an application from the region to have a chance of success. Although matching funds are not required, priority is given to projects that leverage non-federal funds and take advantage of in-kind contributions, such as maintenance agreements, land donations, and volunteer time.

- **Federal Transit Administration (FTA)** funds are another potential source of federal funding for public transit initiatives in the region. FTA funds, through its "New Starts" program, have been a source of capital financing in Vermont for a variety of transit-supportive facilities, including the planned Burlington Multimodal Center and the proposed Essex Junction Intermodal Center. It should be noted that the New Starts funds for both of these facilities were secured in large part through the direct efforts of Vermont's Congressional delegation through the "earmarking" process during the annual federal appropriations cycle. The non-federal matching requirement varies depending on the precise source of funds, but typically averages at least 20 percent.

- The **Congestion Mitigation and Air Quality (CMAQ)** program is yet another possible federal source of funding. In general, federal law requires that CMAQ funds be targeted for addressing congestion problems and associated vehicle emissions that result in air quality problems, primarily in urban areas. In Vermont, because the entire state is currently considered to be "in attainment" of federal air quality standards, VTrans controls the distribution of CMAQ funds throughout the state. VTrans has mainly used CMAQ funds to support start-up of new transit services and park and ride lot construction. Because VTrans is currently developing a new statewide transit policy, it is uncertain how CMAQ funds may be used or distributed in the future. A 20 percent non-federal match is required.

State Funds

The state of Vermont, generally through VTrans, provides funds to the region. In most cases, federal funds comprise part of the grant, and a non-federal match would thus be required. Among the most applicable funding opportunities are:

- **Town Highway Grants**, which the General Assembly allocates annually based on the proportional mileage of Class 1, 2 and 3 roads in a town. These funds may be used for highway and bridge improvement, maintenance and/or construction. They may also be used for development of on-road bicycle routes. No local match is required.

- The **Town Highway Class 2 Paving Program** distributes grants to towns at the discretion of the VTrans District Transportation Administrator (DTA). These grants, which require a 33% local match, may be used for overlays, seals, reclaiming, pavement

markings, and drainage improvements; however, subsurface work is not eligible. All Class 2 Town Highways may be funded under this grant program, which has an annual March application deadline.

- The **Town Highway Class 2 Rehabilitation Program** distributes grants to towns at the statewide level for reconstruction of eligible roadways on existing alignments. A 33% local match is required. Eligible roadways include Class 2 Town Highways classified as rural collectors with an AADT exceeding 1,000 and a sufficiency rating under 50. The amount of funds available annually varies. The application deadline is March of each year.

- The **Town Highway Bridge and Culvert Program** distributes grants to towns at the discretion of the VTrans DTA for bridge or culvert repair, maintenance or replacement on structures longer than three feet on Class 1, 2 or 3 town highways. A local match of 10% is required. The application deadline is March of each year.

- The **Town Highway Bridge Maintenance Program** distributes grants to towns at the discretion of the VTrans DTA for bridge repair, maintenance or preservation on structures longer than six feet on Class 1, 2 or 3 town highways. A local match of 33% is required. The application deadline is January of each year.

- The **Town Highway Bridge Program** funds bridge rehabilitation or reconstruction on structures longer than 20 feet on Class 1, 2 or 3 town highways. Because federal funds may be involved, the local match requirement can range from 5 to 10%. VTrans has historically initiated these projects and established an agreement between the State and municipality on project management responsibilities.

- The **VTrans Bicycle and Pedestrian Facility Grant Program** provides competitive grants to municipalities and other entities for bicycle and pedestrian facilities. In order to apply for a grant under this program, the applicant must have completed a "Conceptual Alignment Analysis" (CAA) of the proposed facility. The annual application deadline is typically in May. The local match requirement is 10 percent.

- The **Local Transportation Facilities (LTF) Program** allows municipalities to manage historically state-managed transportation projects, thereby possibly expediting the project development process in high-priority situations. Generally, projects under the LTF program are on the local system, although it has sometimes been used for state system projects as well. A contract between the municipality and VTrans is executed for LTF projects. Depending on the mix of federal, state and local funds involved, an LTF project usually requires a 10 to 20% local match.

Appendix B
Information on Public Involvement During the Planning Process

Public involvement is a basic element of all planning processes, including the present one. To date, the emphasis of public involvement activities has been on clarifying the Plan's vision, goals and objectives and on building a foundation for consensus.

In support of the planning process, NVDA and the consultant have:

- obtained a summary of Current Town and Regional Issues from NVDA,
- conducted fifteen interviews with local contacts including local officials, business people, citizens, and legislators;
- reviewed reports that have influenced economic decision making;
- made presentations at meetings of interested individuals and organizations, and
- identified stakeholders with a role in influencing the land use development and transportation planning process.

WSA also helped NVDA conduct a group meeting. The purpose of the meeting was to begin the consensus building process and provide a forum for a dialogue among transportation stakeholders. A meeting summary (minutes) has been prepared for distribution participants, organizations, media, and others.

In summary, our contacts with residents and officials reveal a high level of concern about the condition and availability of transportation facilities and services—both current and future. Furthermore, a significant portion express fear that adequate funding might not be available to pay for long-desired improvements. A smaller portion worry that, due to the region's relatively low population, it might not be able to compete for scarce resources with other, fast-growing parts of the state. Finally, there appears to be a great appreciation of the Northeast Kingdom's natural assets and cultural heritage.

Appendix C
Inventory of Recommendations from Corridor and Modal Studies

Inventory of Recommendations from Corridor and Modal Studies

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
VT 114, Lyndon through Canaan	Lyndon, US 5, VT 114 & VT 122	change geometry & road width	247,500				
	Canaan Village,VT 114, VT 253, VT 102	change geometry & parking	165,000				
	Burke, Mountain Rd Intersection	change geometry, accommodate bike/ped	209,000				
	Lyndon, Bridges 2 & 8	replacement					
	Island Pond, VT 105 & VT 114	change geometry & road width	165,000				
	Morgan, Railroad underpass	signage & delineators	11,000	change geometry & clearances, shoulder width	550,000		
	Canaan, west of VT 141 intersection			major improvements incl. Alignment	5,500,000		
	East Burke Village Center			Study -accommodate non-motorized; traffic calming; channelization & speed reduction	165,000		
	East Burke Village Center			Improvements - "	495,000		
	East Haven, Bridge #18			replacement	275,000		
	Newark, Bridge #19			replacement	275,000		
	Brighton, road section south of VT 105			major improvements incl. Alignment	10,000,000		
	Warren's Gore Fishing access			signage	2,500		
	Wallace Pond Bike/Ped access			3 foot paved shoulder	50,000		
	Lyndon, Sight distance limitations at intersections					improve sight distance, improved signage	150,000
	Norton Village Center					Improvements to VT 114, Bike/Ped/ Traffic claming, reconfigure Vt 147 intersection	425,000
	Brighton, Sight limitations					Review each intersection; improve signage	150,000
	VTR 114 corridor					improve Bicycle Access, paved shoulders	2,000,000
	Morgan, sight distance					review each drive, improved signage	12,000
	Norton, sight distance intersection					review intersections, improved signage	350,000
VT 14/VT 100	Hardwick, Wolcott St.	Access Mgmt Plan	20,000			Implement Plan	60,000
	Albany, Albany Village	Construct traffic calming treatments				Plan & constructs sidewalks, parking definition	136,000
	Coventry	Define driveways	5,000				
	Coventry/Newport	Accelerated Pavement Mgmt (yearly)	150,000				
	Hardwick, Driveway definition	Median plantings	10,000				
	Hardwick Village, VT 14/15 Intersection					Construct "bump-outs", install ped crossing	53,000
	Hardwick					Multi-Modal Rail Trail	
	Corridor Wide/ VT 14					Scenic Byway Plan	75,000
	Corridor Wide/ VT 100					Scenic Byway Plan	80,000
	VT 14/VT 58 N, Irasburg, Insufficient Sight Distances					Study intersection/accidents	-
	VT 14 Southbound					Signage	500
	VT 14 Southbound					Realignment	
	VT 14 Southbound					Cut & fill VT 14 approach	10,000
	Irasburg, VT 14 bridge limited to one lane, "fair" condition					LT?/ Reconstruction	
	Lowell, VT 100, curve					Monitor accident rate, signage	
	Craftsbury, VT 247, aka No. Wolcott Rd., deficient sight distance					Monitor accident rate, possible reconfiguration	
VT 105 St. Albans to Bloomfield	Sheldon, VT 105, "No Passing" restrictions			Turnouts constructed	150,000		
	Jay, sight distance problem			improved signage, pavement markings & reflective delineators	20,000		
	Troy, sharp horizontal curve			modify geometry	350,000		
	Troy, VT 105, sight distance problems			advance warning signs, improved pavement markings, reflective delineators	17,500		
	Troy, VT 105, poor pavement condition, inadequate shoulders, no-passing restriction>2 mi.			resurface, widen for shoulder, turnout	2,500,000		
	Coventry, VT 105 at Bickford Rd, sight distance?			Sight distance analysis, geometry upgraded to meet standards or turn lane	250,000		
	Newport, VT 105 at Cross Rd & Vance Hill Rd., sight distance problems			1. Improve alignment; or 2. Provide warning signs, improved pavement markings and reflective delineators; clear adjacent foliage.	207500		

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
	Newport, VT 105 from Newport Town Line to Alderbrook Rd; Rt 105 from W. Main St. Memphromegog Views to West End Ave., sight distance problems			1. Improve roadway alignment; or 2. Advance warning signs, improved pavement marking and relfective delineators; clear adjacent foliage.	607500		
	Newport Thoroughfare Plan Study			Study additional bridge crossing	30,000		
	Derby, VT 105 from VT 111 to Brownington Rd; RT 105 mm 2.0 - 2.4; high accident location; sight distance problems.			advance warning signs, improved pavement markings, reflective delineators	7,500		
	Derby to Charlestown Town Line, poor shoulders			Widen to provide 3-4 feet of shoulder	1,700,000		
	Charlestown, sight distance problems			1. Improve alignment; or 2. Provide warning signs, improved pavement markings and reflective delineators; clear adjacent foliage.	425000		
	VT 105 Derby Town Line to VT 5A plus other locations, inadequate shoulders, limited passing opportunity			Widen to provide 3-4 feet of shoulder, resurface, passing land constructed mid point, turnouts	1500000		3500000
	Charleston, VT 105 at VT5A, VT 105 at TH 1, inadequate turning radius.			upgrade geometry of intersection.	100,000		
	Brighton, VT 105 at VT 114, sight distance problem.			1. Improve alignment; or 2. Provide warning signs, improved pavement markings and reflective delineators; clear adjacent foliage.	440000		
	Brighton - no passing restrictions cause delays			turnout constructed at mid-point.	150,000		
	Brighton, Village of Island Pond, intersection has inadequate turning radius			geometry upgraded, improve intersections.	50,000		
	Brunswick, sight distance problems.			Provide warning signs, improved pavement markings and reflective delineators; clear adjacent foliage.	7,500		
	Bloomfield, sight distance problems.			1. Improve alignment; or 2. Provide warning signs, improved pavement markings and reflective delineators; clear adjacent foliage.	207500		
VT 15 Hardwick through West Danville	Walden Center Village, improve bike/ped accommodations	Meetings and design to reach consensus.	10,000				
	Hardwick Village, VT 14S/15 Intersection access management			scoping, In-depth investigation	360,000		
	Lower Cabot Rd Intersection, accident history.			Improved signage and lighting	12,000		
	VT 16 Intersection, high accident location, shoulder width.			Change geometry and road width, additional shoulder width.	150,000		
	Improve bicycle access			additional paved shoulders along entire corridor; include 3-4 foot paved shoulder	600,000		
	US 2 Intersection in West Danville, improve safety.					Provide greater safety or parking accommodation.	800,000
	West Danville Village, enhance safety and mobility, reduce speeds, Bike/Ped accommodations.					Improve Vt 15, traffic calming measures, continue active enforcement measures.	600,000
	VT 15 west of Hardwick village, unsafe intersections					Review each intersection, increase sight distance, improve signage.	150,000
Northeast Kingdom Regional Bicycle Plan	"Beebe Spur" Newport City to Derby and Magog Quebec			multi-use pathway, 10' wide			
	St. Johnsbury/Lyndon Bicycle Path Proposed			bicycle lanes & wide curb lanes connecting Lyndon SC & Center St. in Lyndonville, lane along Route 5 between Lyndon Center and Green Mountain Mall in St. Johnsbury, wide curb lanes between Mall and Hospital Drive and bicycle lanes between Hospital Drive and north end of downtown St. Johnsbury.			
	St. Johnsbury to Ryegate/Newbury town line, high traffic, narrow shoulder widths.			paved shoulder needed.			
	Route 114, Burke; high volume of traffic, narrow bridges			paved shoulder needed at minimum.			
	Cross VT Trail in Ryegate & Groton proposed			gravel-surfaced trail following railroad bed.			
	Danville, West Danville bicycle lane			development of bicycle lane following Route 2B			
	Troy & Jay, high truck volume, steep grades			widened shoulder (at minimum)			

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
	Three Town Bicycle Route connecting Hardwick, Greensboro, & Craftsbury proposed route			paved shoulders on wider section of State highways and shared roadway on less-traveled town roads			
	Danville: connections between North Danville & South Danville (eventually to Peacham & Barnet)			series of paved shoulders			
	East St. Johnsbury, Concord, Lunenberg, Guildhall: high volume truck traffic.			St. J. - signage; Concord - paved shoulder; Lunenberg - bike lane; guildhall - paved shoulder. paved shoulder along Route 2			
	Route 102 between Canaan & Rt. 2 in Guildhall: log truck; shoulder width <3 feet.			not specified			
	Lunenberg & Concord: shoulders narrow or nonexistent; truck traffic.			not specified			
	Barton: proposed bicycle lanes connecting Crystal Lake and County Fairgrounds with downtown.			creation of bicycle lanes			
	Island Pond: multi-use path proposed			consider			
	CT River Scenic Byway: recommends creation of numerous local bike routs along corridor.			Establish and adhere to bicycle facility design guidelines; provide bicycle storage at destination end; revisit and amend NKRBP; develop safety programs in schools; improve education of motorists & bicyclists; develop and distribute a user's map; promote bicycling as travel alternative.			
US 2 & US 5, NEK	Derby: estimated growth in traffic; geometry poor for truck traffic; no public transportation system; pavement widths narrow; limited sidewalks & crosswalks at intersections in village centers; no easy access to CPR railroad facility.			New slip ramps to I-91 SB and from I-91 NB @ US 5. Re-evaluate weight restrictions on I-91. Alternative -widen existing roadway to 4 travel lanes; provide sufficient offset w/ 4-8 foot shoulders; sidewalks and crosswalks. Fixed-route transit service between Newport City and Derby Village center.			
	Newport City: estimated growth in traffic; geometry poor for truck traffic; Main Street only major link connecting east & western parts of City.			Good arterial corridor; conduct a Thoroughfare Study; 4 travel lanes w/ 8 foot shoulders; Alt: introduce TDM measures; more extensive fixed-route transit system; ride-sharing, car-pooling and flexible work hours. Signals @ Main St. & Mt. Vernon St. considered.			
	Lyndon: high accidents, poor roadway geometry w/insufficient pedestrian sidewalks and room for bicycles.			Lower speed limits & greater enforcement; better traffic safety devices, signage and pavement markings; refine existing alignments; improve turning radii; more sidewalks & crosswalks; thorough analysis of safety measures. Parallel road designated as bike route.			
	Ryegate: truck traffic; inadequate ped/bike facilities.			a.Interchange to I-91; b. utilize CPR RR; c. feasibility study of CT River as means to transport. US 5 & TH 1 upgraded w/pedestrian sidewalks & crosswalks.			
	St. J: pavement, bridges			re-surface pavement and rehabilitate bridges.			
	Barton: # accidents US5			Detailed study to identify safety hazards and proposed safety improvement measures.			
	US 2 Corridor: overall improvements			improve modes for: public transportation, bicycles & pedestrians.			
	US 2 Corridor: localized improvements			Localized improvements for remaining modes.			
	Danville: problems w/modes: truck traffic, public transportation, bike and pedestrian.			Develop Bikeway/Pedestrian Walkway corridor; possible widening roadway. Para-transit system in St. J. extended to Danville.			
	Lunenburg: nothing specific			better sidewalks & crosswalks in village center.			
	St. Johnsbury: delays			Us 5 & Portland Ave. signalization, lane configuration; US 5 & Eastern Ave. signalization; US 2 & Eastern Ave. study of accident data.			

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
VT 15 & VT 14, Hardwick to Danville	Hardwick	Modify o local conditions; zoning ordinance changes; public hearings; adopt Access Mgmt Plan.		Review & modify for changing conditions.		Review & modify for changing conditions.	
	Walden Center Village	Implement Town Plan, develop zoning ordinance		Hold public hearings Adopt AMP		Review & modify for changing conditions.	
	Danville	Review Corridor Plan, decide modifications on local conditions		Hold public hearings Adopt AMP		Review & modify for changing conditions.	
US Route 2 Corridor Multimodal Access Management Plan	West Danville Village: high traffic speed, poor intersection geometry, undefined roadway edge. No provision for truck parking; inadequate truck turning; informal park'n'ride, no bus stops; no bike access to Village; bike lane used for parking; no ped access to Village; long crossing distance between parking and store, no rail stop facilities,	Reconfigure Rt2/Rt 15 intersection; formalize parking; organize access; install traffic calming devices; construct sidewalks; install ped crosswalks w/shorter distances	503,000	Shift Rt2 to south, west of bridge; install traffic calming devices; provide 4' bicycle lane on both sides of Rt2 through village; extend bike/ped paths west; construct Joe's Pond overlooks.	658,500	Construct train platform and information kiosk.	150,000
	Danville Village: high traffic speeds; wide lanes; undefined roadway edge, vehicles park on green; poor intersection geometry; substandard land width on TH 2 approach; no provision for truck parking; inadequate truck turning radii; no provision for bus stopping; no bicycle facilities; uneven payment surface; poor sight distance for ped crossing; no sidewalks or deteriorated sidewalk, portions of existing sidewalks covered w/ asphalt and not handicapped accessible, no rail stop facilities; undefined parking spaces/lots, limited employee parking, topography limits sight distances.	Create back lot employee parking & service delivery; define parking areas; relocate TH 2 to intersect TR 3; designate road into green one-way.	433,600	Reconfigure Rt2,TH14 & other intersections w/improved sight lines & truck turning radii, install traffic calming devices; provide 4' bicycle lane; construct sidewalks, establish bus stop on newly designated one-way street.	613,000	Relocate Rt 2 to south, east of TR 3/Prarie Rd; reconfigure intersection; install traffic calming devices; install curbing & landscaping, construct train platform/ticket center.	1,850,000
	E. St. Johnsbury Village: high traffic speeds; narrow roadway; poor sight distances; on-street parking impedes truck mobility; no provision for bus stopping; narrow or nonexistent shoulders for bicycle travel; sidewalk facilities lacking; no rail stop facilities; do direct access to village commercial and retail businesses.	Install speed control signs; install no-parking signs on-street, install bicycle route signs.	4,400	Construct sidewalks throughout village; install flashing beacon at west approach to village; install street trees.	168,000	None	0
	Concord village: high traffic speeds; poor intersection geometry; undefined roadway edge; narrow parking lane inadequate for trucks; no provision for bus stopping; no designated bicycle facilities; interference by vehicles parking/unparking on wide shoulder; sidewalks missing; no rail stop facilities; informal parking at P.O.; conflicts between on-street parking and through traffic; multiple access points; curve, grade and retaining wall limit westbound driver's views.	Expand parking areas; enhance streetscape and define residential curb cuts.	262,000	Widen parking lane to 10'; define parking lane' install sidewalks; install traffic calming devices.	660,000	Construct train platform and information kiosk.	150,000
	Lunenburg Village: high traffic speeds; poor intersection geometry; limited exiting sight distances; no provision for truck parking; high speeds expected on downgrade; no provision for bus stopping; no bicycle facilities; sidewalks missing or deteriorated; pedestrian crosswalk at green not visible from the east; bridge lacks pedestrian provisions; 4 ft + corridor train accessing Rt 2 no warning sign; multiple access points onto Route 2.	Expand parking areas behind P.O.; define residential driveway curb cuts, tree lawn, sidewalks and bicycle shoulder; install warning sign for snowmobile crossing.	220,000	Define on-street 10' parking lane, provide minimum 5' shoulder for bicycle travel; install sidewalks and pedestrian crosswalks; define commercial access through curbing and landscaping.	374,000	None	0
	Guildhall (Route 2 at Route 102): high traffic speeds; high accident potential; limited sight distances; no bicycle facilities; no pedestrian facilities; undefined access for adjacent commercial uses.	None	0	Reconfigure intersection to prioritize traffic movements and improve sight lines; provide minimum 5' shoulder for bicycle travel; install sidewalks and pedestrian crosswalks; define commercial access through curbing and landscaping.	374,000	None	0

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
	Corridor Wide	Emergency vehicle access to I-91 in Sheffield; Pursue I-91 truck weight exemption; Develop Intermodal truck-rail facilities: Site truck-oriented land uses near I-91 access; Rideshare in Principal Activity Centers; Intra-Corridor bus service (Derby to Newport 7 St. J to Lyndonville); Continued inter-regional service w/stops in Newport, Orleans, Barton, Lyndon, St. J. and Barnet; Promote rail service: Encourage development of Intermodal facilities: Site industrial uses along rail sidings; Preserve rail rights-of-way; Signage to key destinations; Advisory & regulatory signage.		Reconstruct portions of Rt5; Address I-91 rutting; Bicyclists on widened roadway shoulders; separate bikepaths; Provide bike paths along rail corridors; Provide pedestrian access with sidewalks, pathways & crosswalks; Parking off-street in principal & secondary activity centers, controlled on-street parking in Villages and Hamlets.		Rural Design Standards:	
	Ryegate	East Ryegate: monitor safety; install curve warning signs; monitor safety at Power Station drive; encourage development of Intermodal truck-rail facilities.	800	New Full-access interchange with I-91		Realign Russell Road intersection; reduce grade on Russell Road approach; provide northbound right-turn lane.	110,000
	(a) McIndoe Falls	Fix sight distance for speed limit sign; separate speed limit sign and stop sign; advance warning signs for village center.		village Zone cross-section; provide pathway in village; consolidate driveways; limit # of access points; prohibit on-street parking.		None	
	(b) Barnet Village	Control access to retail parking; prohibit on-street parking; advance warning signs for village center		2-ft shoulders south of Village; replace Jersey barrier rail on bridge; channelize village intersection; provide parking for VT Transit; provide sidewalk/pathway in village center.		None	
	(c) Barnet Village to E. Barnet	None		None		Institute rural design standards.	
	(d) East Barnet Village	Pavement markings for side street; relocate advance warning signs.		Follow driveway access management standards; provide pathway in village.		None	
	(e) E. Barnet to Passumpsic Village	None		Follow driveway access management standards; provide pathway in village.		None	
	(f) Passumpsic Village	Advance warning signs for village center	103,000	Village Zone cross-section prohibit on-street parking.	1,440,000	None	2,100,000
	CONSTRUCTION						
	(g) Waterford	None	0	Driveway access mgmt stds		None	0
	(h) I-91 to Downtown St. J.	S. Main Street intersection; provide gateway; enforce posted speed; improve destination signage.		None		Install traffic signal at south Main St. intersection	
	(i) Downtown St. Johnsbury	Monitor congestion; install Stop/Yield sign at Eastern & Main; monitor safety at Western & Main; restrict trucks on RR St.; off-street loading areas; fixed-route bus service from St.J. to Lyndonville; Intermodal bus station for Vermont Transit; upgrade sidewalks north of Portland St.		Reconstruct RR St; new sidewalks; reduce/shift ped crossing demand at Western/Main; consolidate commercial driveways; limit # of driveways that access Rt. 5 directly; provide more off-street parking; reduce on-street parking.		None	
	(j) Downtown St.J. to St. J. Center	Bus service between St. J. & Lyndonville; sign snowmobile crossing; consolidate driveways		Provide separate bike/ped path along river.		Realign roadway.	
	(k) St. J. Center	Bus service between St. J. & Lyndonville; advance warning signs.		Resolve flooding problems, Village Zone design standards, preserve village sidewalks, provide parking at Post Office		None	
	(l) St. J. Center to Lyndon	Revise pavement markings at Mall; prune trees near Pierce Mill intersection, bus service between St.J. & Lyndonville	118,000	Consolidate driveways near town line.	4,230,000	None	3,750,000
	(m) Lyndon Corner	Institute Village design standards; improve pavement markings; bus service between St. J. & Lyndonville; discourage "wrong way" on-street parking, Remove east side parking on Rt. 5 curve		Separate bikepath; provide sidewalk.		Realign roadway (build bypass or straighten roadway)	
	(n) Lyndon	Bus service between St. J & Lyndonville; ensure rail operations do not contribute to traffic congestion; preserve snowmobile crossing.		3-land section with two-way left-turn land; provide sidewalks & crosswalks along Broad St.; driveway access: consolidate, provide interparcel connections, channelize drives, > driveway spacing.		None	

Corridor	Town/Location	1-5 Years	Estimated Cost	6-15 Years	Estimated Cost	16-20 Years	Estimated Cost
	(o) Downtown Lyndonville	Revise geometry at Broad & Depot intersection; bus service between St. J. & Lyndonville; Intemodal bus station for VT Transit; maintain control over driveway access to Rt.5; continue on-street angled parking; any new downtown parking should be off-street.	791,000	Provide pedestrian/bicyclist path to State College; investigate potential for passenger rail station.	1,760,000	None	1,200,000
	(p) Lyndonville to W. Burke	Monitor safety at 5/114 intersection		Institute rural Segment design standards		None	
	(q) West Burke	Re-mark pavement at 5/5A	5,000	Provide sidewalk	4,140,000	Implement Village Zone treatment	200,000
	W. Burke to Barton Village	Underpass Rd Height Restriction signage	400	None	0	None	0
	(r) Barton Village	Replace box culvert; provide VT Transit bus stop; advance warning signs		Fix Rt 5/Rt 16/Water St. intersection - close Water Street approach or make one-way w/right-turn only, - relocate Rt 5/16 intersection, provide continuous sidewalks on both sides; control driveways; consolidate drives; curbing; connect PO parking w/municipal parking; prohibit on-street parking on Rt 5.		Implement village zone treatment; consider passenger rail station at current Rt.16 crossing site; relocate at-grade Rt 16 crossing to reduce approach grade to Rt. 5.	
	(s) Barton Village to Orleans Village	Monitor safety at Lake Region High School Road intersection; improve signage to Industrial Park.		Fix Rt. 5 flooding problem.		Implement Rural Segment design standards.	
	(t) Orleans village	Continue Vermont Transit bus service	42,000	Evaluate alternative to safety problem at Rt 5/58 intersections; options include realignment	780,000	None	6,000,000
	Irasburg & Coventry	None	0	None	0	Implement Rural Segment design standards.	5,000,000
	Newport City	Reroute Rt.5 via Coventry St.; prohibit on-street parking; install warning signs; revise land designations; relocate fire hydrant; full-actuate signal; continue diversion of trucks; Intermodal bus station w/ VT Transit; bus service between Newport City & Derby; provide sidewalks on Pleasant St.; revise crosswalks at Rt/5/Western;restrict midday rail operations through downtown; provide access to new State Office complex; all new parking along Main St. should be off-street.	194,000	Realign Coventry St/Rt 5 intersection; consider roundabout or realignment of Rt5/Mt. Vernon St intersection; revise traffic signals at Rt 5/Western; consolidate drives, provide interparcel connections and improve sidewalks between Union & Western; limit number of access points along Rt5.	231,000	None	0
	Derby	Close eastbound rt-turn roadway at Shattuck Hill Rd; monitor safety/congestion at Coventry Rd; more pavement markings, curbing and relocate Stop sign at Rt 5/105, install advance warning signs on Rt 5 @ Derby Pond Rd; fixed-route bus service - Derby to Newport City; advance warning signs for village center.	67,000	Reconstruct Rt 5 as 3-lane cross-section west of I-91, institute Village Zone treatment in Derby Line; restrict trucks through Derby Line, improve sidewalks and parking demarcation in commercial district.	1,350,000	Improve merge areas from I-91 exchange to Rt 5; reconstruct Rt 5 at Rt 5/Derby Pond Rd.	200,000
Estimated Project Costs			**3,736,700**		**43,933,000**		**29,261,500**