



Vermont Long Range Transportation Business Plan

EXECUTIVE SUMMARY

The 2009 Vermont Long Range Transportation Business Plan (LRTBP) is a comprehensive, 25-year plan for the state's multimodal network. The LRTBP complies with federal legislation enacted in 2005 titled, "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU). The 2009 plan is an update of two previous plans from 1995 and 2002.

The LRTBP builds on and guides statewide multimodal and modal/topic plans and regional and local transportation system plans. Although the LRTBP does not identify specific projects for development, it provides a framework for prioritizing future transportation improvements and developing funding alternatives. It also takes into account various alternative future scenarios that will guide the choice of strategy implementation.

Who Helped Develop This Plan?

The Vermont LRTBP reflects the work of numerous groups and individuals who participated throughout the plan development process, including:

- Advisory Committee of key stakeholders representing other state agencies, regional planning commissions and the Metropolitan Planning Organization (MPO), local governments, and business and environmental groups
- Vermont public opinion survey commissioned by the Vermont Agency of Transportation (VTTrans) in 2006 regarding transportation issues
- Interviews with VTTrans, national experts, and Vermont "Big Thinkers," as well as four focus groups
- Public meetings were held across the state during fall 2007 and 2008 to obtain comments on the draft LRTBP
- Vermont planning and transportation specialists who participated in a Scenario Planning Session

For more information, visit the VTTrans website at <http://www.aot.state.vt.us/>

[Click on the Long Range Transportation Business Plan link.](#)



Vermont's Multimodal Transportation System

Vermont has a large and varied transportation system. It includes aviation and rail facilities, bicycle and pedestrian paths and trails, public transit, roads and highways, and other associated facilities and services. The LRTBP is built in part upon the findings and recommendations of Vermont's modal policy plans. Recent plan updates focus on the development of and continuing refinements to a performance-based approach to programming, planning, and asset management.

AVIATION

Vermont has 17 public airports of varying sizes, 10 of which are state-owned. VTrans forecasts that commercial air operations will grow about 32% by 2025.



RAIL

Both rail passenger ridership and rail freight tonnage in Vermont are increasing, meaning VTrans and others will need to upgrade key rail bridges/tunnels to maintain the levels and quality of service.



BICYCLE & PEDESTRIAN

Vermont contains hundreds of miles of bike lanes and routes, shared-use paths and trails, and sidewalks. In the last year, about 40% of Vermonters used bike paths, trails, or shared use paths.



PUBLIC TRANSIT

Vermont has 12 regional public transit providers who serve many important community needs, providing fixed and flexible routes, as well as commuter services. Public transit use is growing, with a recent survey finding that Vermonters see it as one of the highest transportation funding priorities.



PARK & RIDE

VTrans operates 26 Park-and-Ride facilities across the state, with 23 more owned by municipalities. Use is increasing statewide, with some lots now over capacity.



HIGHWAY

Vermont contains more than 14,000 miles of public roads, of which the state owns 19%, or 2,704 miles, including 320 miles of Interstate, 2,370 bridges, more than 40,000 culverts, and 64,000 signs. As of 2003, about 1/3 of state highway pavement was in poor or worse condition and most bridges needed repairs.



INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

VTrans' ITS initiatives include the 511 Traveler Information service, variable message signs, the Tri-State Advanced Traveler Information System (TRIO), and "ConnectVermont," which will provide a comprehensive information portal for all travelers.



VTrans' Vision, Mission, and Goals

The current guiding principle for VTrans is “The Road to Affordability” with a focus on realigning priorities and rethinking areas of focus. Vermont must preserve its existing assets so that they do not deteriorate to the point that they require major reconstruction and become a financial drain on the entire system.

Vision

A safe, efficient, and fully integrated transportation system that promotes Vermont's quality of life and economic well being.

Mission

To provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.

Goals

Safety: Make safety a critical component in the development, implementation, and maintenance of the transportation system.

Excellence: Cultivate and continually pursue excellence in financial stewardship, performance accountability, and customer service.

Planning: Optimize the future movement of people and goods through corridor management, environmental stewardship, balanced modal alternatives, and sustainable financing.

Preservation: Protect the state's investment in its transportation system.



Vermont Transportation System Challenges and Opportunities

Vermont faces many challenges, yet also has several key opportunities as it moves forward to meet the transportation needs of the state. Over the next 25 years, there will be many changes on local, state, national, and global levels that affect our transportation system. Our ability to respond and address rising challenges will depend on how well we do the following things: efficiently manage the transportation system; integrate land use, transportation, and economic activities; fund a sustainable transportation system; and work together. It also depends on our ability to adapt to ever-changing economic and environmental impacts, turning challenges into opportunities.

CHALLENGES

- Aging Infrastructure
- Changing Demographics and Economy
- Land Use
- Funding
- Energy Constraints, Environmental Impacts, and Climate Change
- Freight Movement and Trade Globalization
- Security Needs and Issues

OPPORTUNITIES

- Leveraging The Road To Affordability Framework to Make Cost-Effective Transportation Investment Decisions
- Building a Sustainable Multimodal Transportation Network
- Building and Maintaining Vermont's Infrastructure to Be Compatible with Regional, National, and International Standards and Services
- Enhancing Environmental Quality, Facilitating Energy Conservation, and Addressing Climate Change
- Integrating Land Use and Transportation Planning
- Evolving to Corridor Management Planning

Possible Long Term Scenarios

Integral to the LRTBP process was a scenario planning process. This process included a full-day session engaging 75 participants from around the state in examining alternative future scenarios that could play out in Vermont regarding demographic, economic, and environmental changes. Participants at the event developed policies and actions to guide the State in the face of alternative futures to meet the plan's objectives. These objec-

tives were also used to develop the seven LRTBP goals and implementation strategies.

VTrans identified four possible long term scenarios based on input from national experts, Vermont "Big Thinkers," focus groups, and VTrans staff. Scenario planning session participants identified appropriate policies and strategies that VTrans could pursue to take the agency and state into the future.

Long Range Transportation Business Plan

To address the many challenges that Vermont's transportation system will face, the LRTBP is founded upon a series of policy-level goals and strategies for VTrans. These strategies, shown in Table 1, were developed with input from VTrans—including its goals and objectives and modal policy plans; and from the process of developing the LRTBP, including the scenario planning session,

public opinion survey, focus groups, a Study Advisory Committee, national and state experts, and the consultant team (see Figure 1).

The strategies will enable VTrans to be adaptable, innovative, sustainable, collaborative, and efficient managers of Vermont's transportation system as we move ahead.

Figure 1. LRTBP Inputs

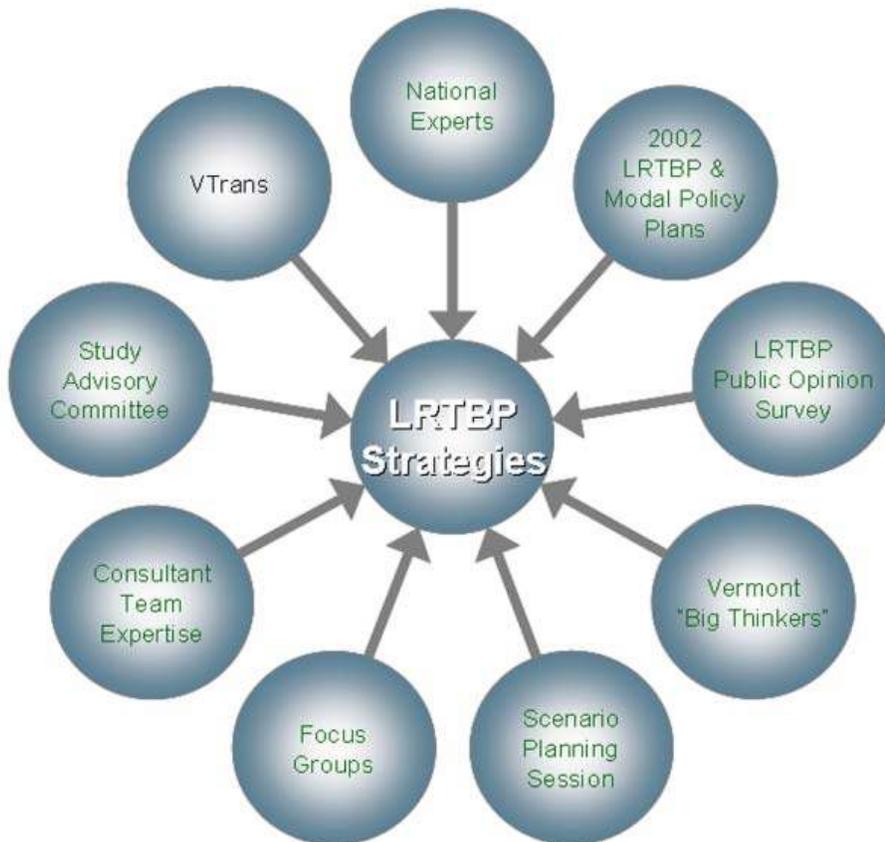


Table 1. VTrans’ Policy Goals and Strategies

POLICY GOAL	STRATEGIES
<p>1. Secure Sustainable Funding & Finance Sources</p>	<ul style="list-style-type: none"> ■ Pursue debt financing (bonding) as a cost-effective means of supplementing pay-as-you-go revenue for critical current needs. <i>(ST)</i> ■ Explore indexing the Motor Fuel Tax to keep pace with the rate of inflation. <i>(ST)</i> ■ Explore/assess the need to increase motor vehicle-related fees and sales taxes. <i>(ST)</i> ■ Consider concessions and tolls on Vermont’s highways. <i>(ST)</i> ■ Monitor studies at the national and state levels regarding various mileage-based tax options as an alternative to the gas tax. <i>(ST)</i> ■ Publicize existing federal tax incentives for employers to invest in employee transportation and consider similar state incentives. <i>(ST)</i> ■ Explore the potential for VTrans to use impact fees to pay for future transportation improvements and encourage increased use of impact fees at the local level. <i>(LT)</i> ■ Consider leasing of elements of all rights-of-way to appropriate lessees (e.g., fiber optic firms, automobile service/gas stations, data/communications firms, etc.). <i>(LT)</i> ■ Evaluate existing partnerships with other states that hold potential for developing projects or initiatives of sufficient financial scale that may attract public-private partnerships to Vermont and northern New England, New York, and Canada. <i>(ST)</i>
<p>2. Optimize Transportation System Management & Operations</p>	<ul style="list-style-type: none"> ■ Use the priority facilities and networks identified in modal policy plans to define a statewide, multimodal strategic transportation network as the principle focus of state funding. <i>(ST)</i> ■ Continue to work with Regional Planning Commissions on developing a value-added methodology for prioritization of projects. <i>(ST)</i> ■ Place emphasis on developing long-term multimodal corridor management plans and intergovernmental corridor management and development agreements in cooperation with local governments and regional planning agencies. <i>(ST)</i> ■ Expand intelligent transportation systems (ITS) to facilitate more efficient transportation operations, including variable message signs, real-time highway and transit information, etc. <i>(ST)</i> ■ Facilitate the ability of the transportation system to safely and efficiently accommodate both freight and person movement by collaborating with public and private entities to understand and address multimodal freight access needs for major destinations & economic hubs. <i>(LT)</i> ■ Consider consolidating the planning and operations of publicly assisted transit services throughout Vermont. <i>(ST)</i> ■ Continue funding and technical assistance for regional transportation planning and implementation through the Transportation Planning Initiative (TPI). <i>(ST)</i> ■ Continue to streamline and expedite the project development and permitting process through early consultation with resource agencies, greater reliance on consultant support services, and by exploring alternatives such as “design-build,” “design-build-maintain,” and comprehensive management service contracts for implementing a collection of projects. <i>(ST)</i> ■ Continue to emphasize long range modal and multimodal planning and the development of new strategies and policies. <i>(ST)</i>

ST = short term (0–5 years)
 LT = long term (>5 years)

Table continues on p. 6

POLICY GOAL**STRATEGIES****3. Provide a Safe & Secure Transportation System**

- Continue to implement, monitor, and report on progress of the Vermont Strategic Highway Safety Plan (SHSP). *(ST)*
- Develop and maintain safety plans for all modes of transportation in a manner relevant to each mode's safety issues. *(ST)*
- Assess the need to maintain security plans for all modes of transportation, including prevention, detection, and response across all entities. *(ST)*
- Broaden connections with Vermont Emergency Management, Department of Public Safety, and FHWA to improve the ability of the transportation system as a whole to handle disasters and emergency events of local, regional, and national scale. *(ST)*
- Ensure VTrans can handle emergency events and maintain provision of its services under the State Continuity of Operations Plan. *(ST)*

4. Preserve, Manage, & Operate the State's Existing Transportation System to Provide Capacity, Safety, Flexibility, and Reliability in the Most Effective and Efficient Manner

- Give priority to funding for maintenance and preservation of transportation infrastructure. *(ST)*
- Assess design and engineering standards necessary for transportation infrastructure to accommodate climate change impacts (e.g., extreme weather conditions) and evaluate inventory of facilities to determine vulnerabilities and adaptation priorities. *(LT)*
- Use lowest life-cycle cost methodology to determine the appropriate schedule and intervals for upkeep of transportation infrastructure. *(ST)*
- Review and modify where appropriate design standards and best practices to facilitate cost-effective maintenance. *(ST)*
- Expand the use of asset management systems for roadway pavement, bridges, right-of-way, public transportation facilities and equipment, safety features, and other infrastructure to prioritize expenditures. *(ST)*
- Consider development of a "strategic disinvestment" policy for transportation infrastructure and services whose maintenance, preservation, and/or operating costs significantly exceed the value of their economic and social benefits. *(ST)*

5. Improve & Connect All Modes of Vermont's Transportation System to Provide Vermonters with Options

- Emphasize and promote transportation system management (TSM), Intelligent Transportation Systems (ITS), and transportation demand management (TDM) strategies for addressing congestion and mobility. *(ST)*
- Plan and support intermodal transportation facilities to provide multimodal options that reduce personal vehicle use and reduce Vermont's reliance on fossil fuels for meeting transportation needs. *(LT)*
- Accommodate non-motorized transportation within the transportation system. *(ST)*
- Conduct ongoing assessments of non-single occupant vehicle (SOV) modes to determine their economy, efficiency, and effectiveness relative to other transit opportunities to ensure mobility and accessibility. *(ST)*

POLICY GOAL

STRATEGIES

6. Strengthen the Economy, Protect & Enhance the Quality of the Natural Environment, Promote Energy Conservation, & Improve Vermonters' Quality of Life

- Implement the June 2008 VTrans Climate Change Action Plan. *(ST)*
- Monitor and participate in, as appropriate, research on climate change impacts that identify changes or improvements necessary to maintain system operability and statewide mobility. *(ST)*
- Integrate transportation planning and investments with state and local economic development strategies and plans. *(LT)*
- Coordinate with Agency of Commerce and Community Development (ACCD) to evaluate the impacts of local planning and development decisions on the operations, physical condition, capacity, safety, and cost of state transportation facilities. *(ST)*
- Increase the use of, and support additional access to and development of, alternative fuels that could reduce Vermont's reliance on fossil fuels. *(ST)*
- Encourage the development and use of transportation construction and operations technologies that reduce emission of greenhouse gases (support work of UVM Transportation Research Center in this regard). *(ST)*
- Enhance coordination of policy development between the Agency of Natural Resources (ANR) and VTrans. *(ST)*
- Promote transit services as a tool to support tourism and economic development. *(ST)*
- Monitor and plan for the possibility of Vermont's designation as a non-attainment area for federal air quality standards, including training staff on policy, planning, and programming issues that would result from that designation. *(ST)*

7. Support & Reinforce Vermont's Historic Settlement Pattern of Compact Village and Urban Centers Separated by Rural Countryside

- Support transportation improvements and services assessed as critical to enhancing, stimulating, and connecting vital urban and village centers. *(ST)*
- Work with the Department of Buildings and General Services to encourage and support the siting of public-use state and local government facilities and services in multimodal access areas to the extent possible. *(LT)*
- Design, build, and maintain transportation facilities with consideration given to scenic, aesthetic, historic, and environmental resources, while respecting financial constraints and maintaining safety and mobility. *(ST)*

Implementing the LRTBP and Monitoring Progress

LRTBP implementation can build on the existing opportunities in Vermont's planning structure, planning organizations, partnerships, and public involvement practices. The critical foundations of successful implementation will include:

- Public involvement and consultation
- Legislative action
- Vermont's statewide multimodal planning and management of funds
- Cooperation between VTrans, RPCs, and the MPO
- Continue to develop VTrans asset management practices
- Federal, state, and local coordination and partnerships
- Public-private partnerships
- VTrans' role in multimodal connectivity

VTrans will also adopt different ways of doing business, including continuing its shift to Corridor Management for many planning and investment situations and embracing an Agency-wide Strategic Management approach.

- The Corridor Management approach offers the opportunity for state and regional agencies, municipalities, and communities to collectively plot a future strategy for a corridor, allowing a system-wide approach that considers multi-modal and intermodal connections.
- To ensure that the LRTBP goals and strategies can be effectively implemented over time, VTrans is adopting a strategic management approach, which will help VTrans ensure that it effectively links its day-to-day work to its overall goals and vision. Strategic management and planning identifies what is important for VTrans to be doing, in what priority, and by whom. A critical aspect of a strategic management process is for VTrans to continuously track progress and performance against goals and objectives and identify strategic changes on a regular basis. Performance measurement tells VTrans and its stakeholders what it is doing to address the state's transportation needs and how efficiently it is accomplishing its goals. Performance monitoring and reporting may be viewed as a hierarchical relationship among three categories: strategic, tactical, and operational (see Figure 2).

Figure 2. How Performance Measures Help VTrans Monitor LRTBP Implementation Progress



Financial Outlook

The greatest challenge to meeting Vermont’s transportation needs will be finding the money to pay for them. Vermont is facing the challenge of revenue not keeping pace with the demand to maintain and improve transportation infrastructure. Cumulative transportation revenue shortfalls for Vermont could be as high as \$8 billion over the next 20 years, depending on the rate of inflation (see Figure 3).

Figure 3. Estimated 2025 Funding Gap by Investment Scenario



NOTE: As with all long-range forecasts, the level of funding available for VTrans may vary significantly from the \$8.3 billion figure used in this Plan. Many factors, including changes to federal funding streams, will affect the actual funding level. (Source: VTLRTBP Working Paper 3, “Financial Analysis,” February 2007.)

Faced with the challenge of preserving its existing and deteriorating infrastructure, as well as funding strategic enhancements to the transportation system across the state, VTrans will need to determine the probability of current funding patterns continuing and the implications of future changes

to those patterns. New funding sources, including the American Recovery and Reinvestment Act and the next federal surface transportation act, could reduce Vermont’s future funding gap. By pursuing the LRTBP strategies in light of possible changing scenarios, long-term strategies can be implemented to increase the resources available in the transportation system and use available resources as cost-effectively as possible in the near term. In addition, as that return is realized in the form of a more efficient and cost-effective transportation system, Vermont can move toward making the large-scale transportation investments it will need in order to maintain the state’s economic vitality and quality of life in coming years.

For comments, questions, or copies of the full Plan, please contact:

Scott Bascom, Planning Coordinator
 Vermont Agency of Transportation
 Policy & Planning Division
 1 National Life Drive
 Montpelier, VT 05633-5001
 Email: Scott.Bascom@state.vt.us
 Tel: (802) 828-5748
 Fax: (802) 828-3983

To view the LRTBP, working papers, and other related information, visit the VTrans website at:

<http://www.aot.state.vt.us/>





Vermont Long Range Transportation Business Plan



March 2009



Table of Contents

1. Introduction and Purpose	1
A. Introduction	1
B. Evolution of Vermont's Transportation Planning	1
C. Responding to Federal Requirements	4
D. VTrans Organizational Change	5
E. Overview of LRTBP Development Process	6
F. LRTBP Working Papers	8
G. What's in the Plan?	10
2. Vermont's Transportation System	11
A. Overview of Modal Policy Plans	11
B. Modal Descriptions	17
C. Corridor Management Planning	27
3. Challenges and Opportunities	28
A. Vermont's Transportation Challenges.....	28
B. Vermont's Transportation Opportunities.....	39
4. Vermont Agency of Transportation Vision, Goals and Objectives	42
A. Guiding Principle – The Road to Affordability	42
B. Goals and Objectives.....	43
5. Alternative Long Range Transportation Business Plan Scenarios	46
A. Introduction	46
B. The Alternative Scenarios	48
C. Responding to the Scenarios.....	50
6. Long Range Transportation Business Plan Implementation	51
A. LRTBP Policy Goals and Strategies	51
B. LRTBP Implementation – The Scenario-Strategy Relationship	60
C. Foundations of LRTBP Implementation	61
D. Moving VTrans Forward through a Strategic Management Approach.....	62
E. Next Steps.....	66

7. Financial Outlook	67
A. Recent Transportation Funding History	67
B. System Performance Relationship to Investment Level.....	68
C. The Funding Gap.....	70
D. Addressing the Funding Challenges	72
Appendices	A-1
Appendix A: Summary of Transportation Plans and Studies	A-2
Appendix B: Vermont Long Range Transportation Business Plan Advisory Committee Members	A-8
Appendix C: Environmental Mitigation and Consultation Processes	A-9

List of Figures

Figure 1: Current VTrans Organizational Chart.....	5
Figure 2: LRTBP Development Process	7
Figure 3: Overview of Vermont’s Surface Transportation System	12
Figure 4: Location and Functional Class of Vermont Airports	16
Figure 5: Vermont’s Existing Rail System.....	18
Figure 6: Vermont’s Public Transportation Service Locations*	20
Figure 7: Vermont’s Park and Ride Facility Locations	23
Figure 8: Vermont’s State Highway System.....	24
Figure 9: Vermont’s Transportation Challenges	28
Figure 10: Project Change in Vermont’s Population & Age Distribution, 2005-2030	30
Figure 11: Producer Price Index (PPI) for Highway & Street Construction Activities in the U.S., 1998-2008	33
Figure 12: Projected GHG Emissions in Vermont, by Source, 1990-2030	35
Figure 13: Forecast of Freight Movements in Vermont through 2020, in Tons and by Value.....	37
Figure 14: Overview of the Scenario Planning Process.....	46
Figure 15: The Four LRTBP Alternative Scenarios.....	49
Figure 16: Inputs to LRTBP Implementation Strategies	52
Figure 17: The Hierarchy of Performance Measure Categories	63
Figure 18: Sources and Uses of VTrans Funds, Fiscal Year 2007	68
Figure 19: Estimated 2025 Funding Gap by Investment Scenario	71

List of Tables

Table 1: Vermont Long Range Transportation Plan Evolution – 1995-2008.....	2
Table 2: Summary of Recent Initiatives and Programs	3
Table 3: Policy Goal 1.....	53
Table 4: Policy Goal 2.....	54
Table 5: Policy Goal 3.....	55
Table 6: Policy Goal 4.....	56
Table 7: Policy Goal 5.....	57
Table 8: Policy Goal 6.....	58
Table 9: Policy Goal 7.....	59
Table 10: Example of Framework for Strategic, Tactical and Operational Performance Measures.....	64
Table 11: Proposed VTrans LRTBP Performance Monitoring Framework.....	65

Technical Appendix (Under Separate Cover)

Working Paper 1: State, Regional, and National Transportation Policy Review

Working Paper 2: State Agency Issue Review

Working Paper 3: Financial Analysis

Working Paper 4: Statewide and Regional Demographic and Employment Analysis

Working Paper 5: Visions, Goals, and Plan Objectives

Working Paper 6: Scenario Development

Working Paper 7: Summary of Scenario Planning Session

Voices of Vermonters: Vermont’s Transportation Future

Scenario Planning Participant Package

VT LRTBP 2006 Survey Update Final Report

Scenario Planning Participant Package

VT LRTBP 2006 Survey Update Final Report

This report was funded in part through a grant from the U.S. Department of Transportation. The views and opinions of the Vermont Agency of Transportation expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

Vermont Long Range Transportation Business Plan

March 2009

Prepared for:

Vermont Agency of Transportation



Prepared by:

Resource Systems Group, Inc.



In Partnership with:

Snelling Center for Government

Center for Rural Studies

Hubert H. Humphrey Institute of Public Affairs

TransManagement

Vermont Agency of Transportation Vision, Mission, and Goals

Vision: The Vermont Agency of Transportation's vision is a safe, efficient and fully integrated transportation system that promotes Vermont's quality of life and economic wellbeing.

Mission: VTrans' mission is to provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.

The four goals that support the vision and mission are:

- **Safety:** Ensure that safety is a critical component in the development, implementation and maintenance of all systems, programs and projects through staff awareness, best practices and collaboration
- **Excellence:** Cultivate and continually pursue excellence through financial stewardship, performance accountability, and customer service
- **Planning:** Optimize the movement of people and goods through corridor and natural resource management, balanced modal alternatives and sustainable financing
- **Preservation:** Safeguard assets through systematic condition assessment and prioritized resource allocation

1. Introduction and Purpose

A. Introduction

The Vermont Long Range Transportation Business Plan (LRTBP) is the state's overall multimodal transportation plan for bicycle and pedestrian facilities, highways and roadways, public transportation, railroads and airports. It is a comprehensive 25-year plan for the transportation system to provide economic efficiency, orderly economic development, safety and environmental quality. Required by federal law, the LRTBP guides development and investment in the transportation system through:

- Transportation goals and policies
- Transportation investment scenarios and an implementation framework
- Key initiatives to implement the vision and policies

The LRTBP both builds on and guides statewide multimodal and modal/topic plans and regional and local transportation system plans. Although the LRTBP does not identify specific projects for development, it provides a framework for prioritizing future transportation improvements and developing funding alternatives.

B. Evolution of Vermont's Transportation Planning

The Vermont Agency of Transportation (VTrans) developed its first modern-era Long Range Transportation Plan in 1995 in response to the federal government's reauthorization of the surface transportation act as 1991's Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA represented a major change to transportation planning and policy and established an intermodal approach to transportation funding. New requirements in ISTEA required states to conduct a statewide multimodal planning process that is coordinated with transportation planning activities carried out in coordination with metropolitan areas and in consultation with rural areas. The statewide transportation plan must cover a minimum 20-year forecast period.

In 2002, in response to both the National Highway System Act of 1995 and the 1998 reauthorization entitled Transportation Equity Act for the 21st Century (TEA-21), VTrans developed a major update of the Long Range Transportation Plan. The 2002 Plan built upon the basic foundation of the 1995 Plan and added considerations such as the designation of National Highway System (NHS) facilities in Vermont and the general policy of maintaining what infrastructure we have as a major focus of VTrans' activity. This latest Plan update incorporates, for the first time, a business perspective into VTrans' long range planning and policy.

Table 1 provides an overview of Vermont Long Range Transportation Plan evolution since 1995.

Table 1: Vermont Long Range Transportation Plan Evolution –1995-2008

Year of VTrans Plan	Guiding Federal Law	Overall Vermont Transportation Plan Goals
1995	ISTEA (1991)	<ul style="list-style-type: none"> ▪ Maintain existing transportation facilities ▪ Improve all modes of transportation to provide Vermonters with choices ▪ Strengthen the economy and improve Vermonters' quality of life
2002	NHS Act (1995) TEA-21 (1997)	<ul style="list-style-type: none"> ▪ Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner. ▪ Improve all modes of Vermont's transportation system to provide Vermonters with choices. ▪ Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life.
2008	SAFETEA-LU (2005)	<ul style="list-style-type: none"> ▪ SAFETY: Make safety a critical component in the development, implementation and maintenance of the transportation system. ▪ EXCELLENCE: Cultivate and continually pursue excellence in financial stewardship, performance accountability, and customer service. ▪ PLANNING: Optimize the future movement of people and goods through corridor management, environmental stewardship, balanced modal alternatives, and sustainable financing. ▪ PRESERVATION: Protect the state's investment in its transportation system.

Since the publication of the 2002 Long Range Plan, VTrans has also updated all of its modal policy plans and has completed other planning initiatives related to corridor planning, access management and safety. Regional Planning Commissions (RPC) and the Chittenden County Metropolitan Planning Organization (CCMPO) have completed regional-level plans and studies as well during this period.

VTrans' prevailing theme since 2002 is the development of and continuing refinements to a performance based approach to programming, planning, and asset management. To support this effort, all of the updated modal policy plans identify performance measures related to their stated goals and policies. Table 2 provides an overview of recent key initiatives and programs.

Table 2: Summary of Recent Initiatives and Programs

Year	Initiatives and Programs	Description and Goals
2000	<ul style="list-style-type: none"> Phase I of Safety Management System 	<ul style="list-style-type: none"> Developed mission statement, goals, and performance measures
2002	<ul style="list-style-type: none"> <i>VTrans Asset Management Vision and Work Plan</i> 	<ul style="list-style-type: none"> Documented the current state of practice within the Agency and noted that VTrans has many of the components necessary for a sound asset management program. Identified several opportunities to strengthen asset management capabilities and methods. Employs performance measures across all of VTrans' asset classes/investment categories, including highway, rail, bike/pedestrian, maintenance, buildings, Central Garage, public transportation and Department of Motor Vehicles (DMV).
2006	<ul style="list-style-type: none"> SAFETY: Draft Strategic Highway Safety Plan for Vermont 	<ul style="list-style-type: none"> To reduce the occurrence and severity of crashes through effective, education, enforcement, engineering, and emergency response initiative
	<ul style="list-style-type: none"> The Vermont Safe Routes to School Program (SR2S) 	<ul style="list-style-type: none"> To enable and encourage children, including those with disabilities, to walk and bicycle to school; to make walking and bicycling to school safe and more appealing; and to facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.
2007	<ul style="list-style-type: none"> The Road to Affordability 	<ul style="list-style-type: none"> Initiative that makes preservation and safety of existing transportation assets VTrans' highest priority so that these assets do not deteriorate to the point where they require major reconstruction at substantial cost. The Road to Affordability realigns VTrans' priorities to focus on a "back-to-basics" approach that limits project amenities, emphasizes safety and preservation, employs an asset and performance management approach and puts limited transportation funds where they can do the most good.

Appendix A contains a more detailed timeline displaying the specific plans and studies that VTrans completed since 1995 as well as those completed by regional planning commissions and the Chittenden County Metropolitan Planning Organization (CCMPO).

C. Responding to Federal Requirements

The LRTBP also responds to the federal **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy of Users (SAFETEA-LU)**, passed by Congress in 2005. Federal requirements include the development of a long-range statewide transportation plan that provides for the development and implementation of a multimodal transportation system. The statewide long-range transportation plan should include strategies and procedures to ensure the preservation and most efficient use of the existing transportation system, a safety element, a security element, and a discussion of potential environmental mitigation activities.

SAFETEA-LU also requires that state transportation agencies promote high levels of involvement in the transportation planning process. VTrans is carrying this out in part by engaging in consultation and mitigation activities. In developing the Vermont LRTBP, VTrans met federal regulations for consultation by collaborating with other state, regional, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation. VTrans also undergoes various types of environmental consultation activities for regional and state-wide planning processes. Appendix C contains more information on agency mitigation and consultation activities as well as its environmental stewardship ethics policy.

While SAFETEA-LU continues many of the planning requirements of its predecessors (ISTEA & TEA-21), it also emphasizes safety, security, freight, congestion management, financing and environmental stewardship. The eight specific planning factors that state long-range plans are required to address are shown in the textbox above. The federal government set a July 1, 2007 compliance deadline for these requirements. VTrans has fulfilled these requirements through the development of the seven LRTBP Working Papers on specific topics and through the strategies and recommendations contained in this Plan.

Required Planning Factors Under SAFETEA-LU

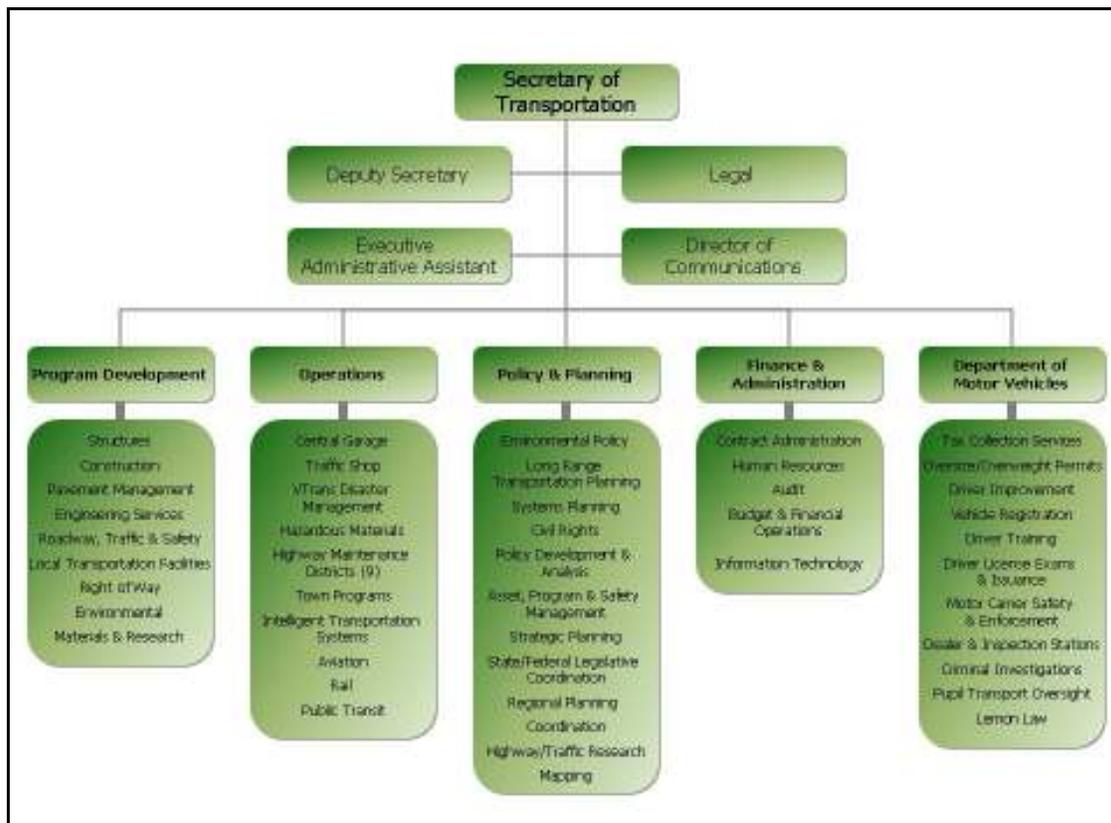
1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and nonmotorized users;
3. Increase the security of the transportation system for motorized and nonmotorized users;
4. Increase the accessibility and mobility of people and for freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation, and;
8. Emphasize the preservation of the existing transportation system.

D. VTrans Organizational Change

In addition to the numerous projects and plans that were completed since 2002, VTrans has also initiated various internal organizational changes. In 2002, the VTrans organization consisted of seven divisions: Project Development, Policy and Planning, Technical Services, Maintenance and Aviation, Rail, Finance and Administration, and the Department of Motor Vehicles. Since that time, VTrans has completed realignments to streamline and improve its operations. For example, the “Maintenance and Aviation Division” is now “Operations” and includes rail, public transit, aviation, maintenance operations and intelligent transportation systems. Rail and Technical Services have been dissolved as stand-alone divisions. Project Development and most of the Technical Services divisions have been consolidated into the Program Development Division. Figure 1 displays the current VTrans organizational structure.

VTrans has continued to implement and improve its project manager system. A project manager directs the scoping process, monitors project progress, responds to questions, and provides specific project details, and is a project’s single point of contact for citizens, local officials, and legislators. In addition, all members of the central office staff (except for Division of Motor Vehicles staff) are now consolidated at the National Life Building, thereby streamlining and improving the efficiency of the day-to-day operations of the Agency.

Figure 1: Current VTrans Organizational Chart

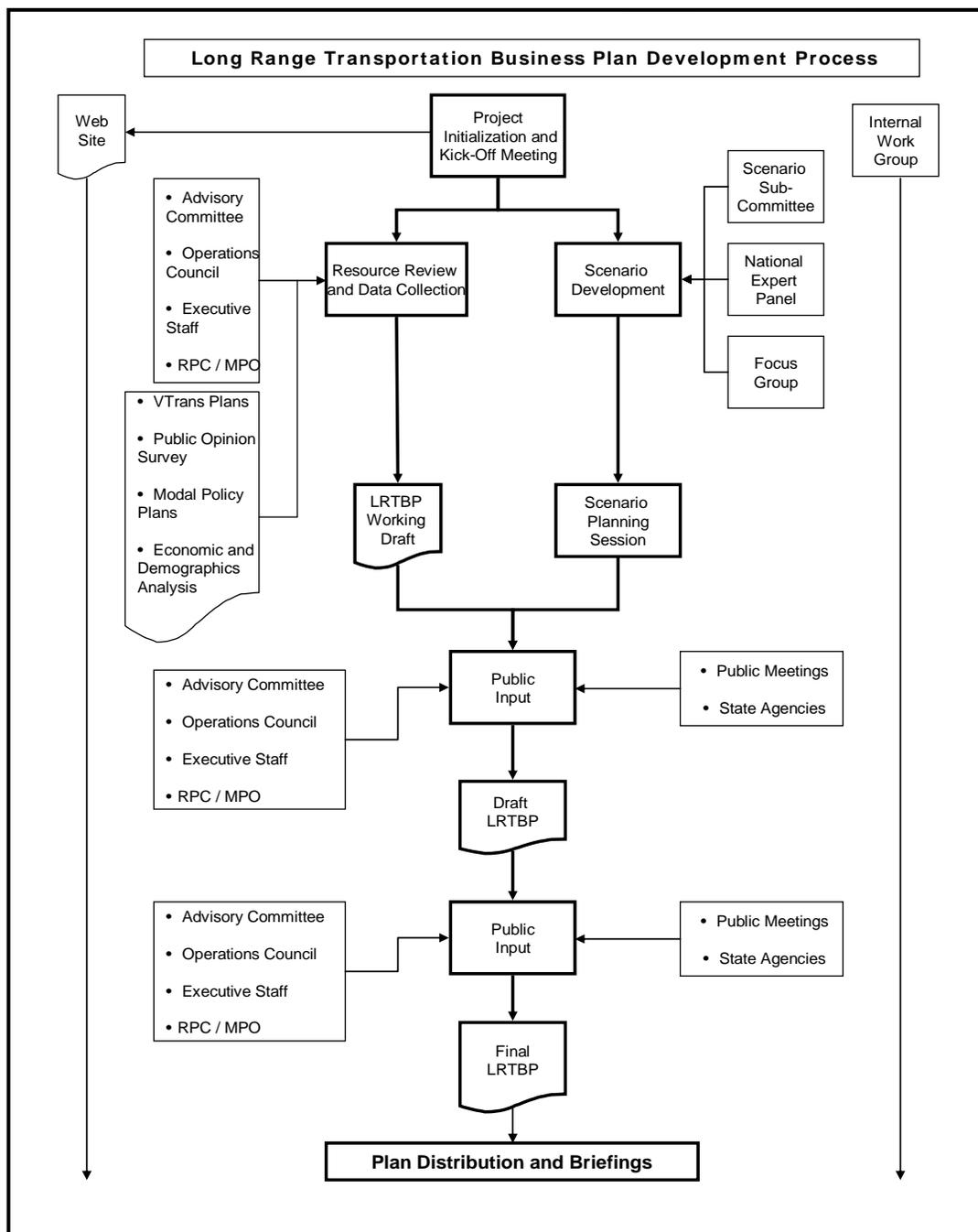


E. Overview of LRTBP Development Process

The Vermont LRTBP reflects the work of numerous groups and individuals who participated throughout the plan development process. In 2006, the beginning of the planning process, VTrans convened an Advisory Committee comprised of key stakeholders representing other state agencies, regional planning commissions and the Metropolitan Planning Organization, local governments, and business and environmental groups. In preparation for the 2008 Long Range Transportation Business Plan, VTrans commissioned a public opinion survey in 2006 of Vermont residents regarding transportation issues. VTrans designed the survey questions to better understand Vermonters' preferences and priorities for transportation programs, projects, and services. In many cases, responses are compared to results from a similar survey conducted in 2000 to help understand changing attitudes.

In combination with input from the survey and discussions with other state agencies, the Advisory Committee's ideas and issues provided the impetus for development of background papers and policies during the planning process. In addition, a VTrans Internal Working Group helped guide the day-to-day plan development process. With its members drawn from the Policy and Planning Division, the working group helped ensure the Plan developed with a multi-modal perspective. VTrans also convened an expanded group of officials from across all Agency divisions and stakeholders from across Vermont to help develop strategies for implementing the LRTBP and achieving its goals and objectives.

Figure 2: LRTBP Development Process



To support LRTBP development, VTrans staff and a consultant team made a statewide assessment of transportation issues and needs. This outreach effort included interviews with Vermont “Big Thinkers” and national experts who offered innovative ideas and knowledgeable insights about Vermont’s transportation system. With this foundation, an analysis was conducted of potential transportation futures, referred to as “scenario planning.” In the context of the LRTBP, scenarios involve state, national and global events that may create obstacles to achieving VTrans’ goals and defining policies that can help VTrans adapt to changing circumstances. This analysis involved consultation with key stakeholders from across the state and country. Figure 2 provides an overview of the overall Plan development process. Additional detail on the process may be found in the Appendix.

F. LRTBP Working Papers

To help assess and distill key issues facing VTrans and the transportation system, VTrans also developed a series of seven “working papers” to inform creation of the LRTBP. These working papers are summarized below.

Working Paper 1: State, Regional, and National Transportation Policy Review

- Working Paper 1 summarizes modal policy plans related to aviation, highways, rail, public transit, and pedestrians and cyclists. Policy and goals are discussed and major issues and recommendations are summarized. Key findings include an emphasis on: system preservation, performance measures and asset management, safety and security, economic vitality, energy and environment, and land use planning.

Working Paper 2: State Agency Issue Review

- This working paper includes a survey of Vermont state government agencies and departments for information regarding transportation plans and policies that should be taken into account in the update of the VTrans Long Range Transportation Business Plan. It identifies gaps between the policies and plans of VTrans and other state agencies.

Working Paper 3: Financial Analysis

- This paper provides an overview of transportation funding in Vermont, describes federal and state sources of revenue, explains how transportation funds are spent, compares the costs of needs to revenue from 2006 to 2030, and identifies different options for funding transportation. A projected major challenge facing Vermont is a cumulative funding gap from 2006-2030 of \$3 billion to \$8 billion (depending on assumptions about inflation). Unless a different tax collection mechanism is initiated, perhaps one based on vehicle miles traveled, the gap would be larger than projected. Another issue is a devolution of responsibility where “donee” states would begin to receive less (for every dollar in federal gas tax collected in Vermont, the state receives about \$1.90 in return). This could result in a significant loss of federal funding revenues to Vermont. Future funding options include indexing

motor fuel tax, local option sales tax, mileage based option tax, and rural funding strategies for federal funding.

Working Paper 4: Demographic and Employment Analysis and Projections

- This working paper documents historical trends in population and employment and provides projections for a twenty-year planning horizon (approximately 2030). Key findings indicate that there is slow to moderate population growth yet an aging of the population, the population is spreading out from traditional village centers yet employment is centralized, there is a shift to a service based economy yet there is a job growth split with high paying technical jobs and lower paying service jobs. The general economic outlook for Vermont through 2010 is positive.

Working Paper 5: Vision, Goals, and Plan Objectives

- This working paper recommends refinements to the objectives of the 2002 Long Range Transportation Plan. Revisions are suggested based on an updated Agency Vision and Mission Statement, results from a public opinion survey conducted in 2006, SAFETEA-LU planning factors, and goals presented in the aviation, bicycle/pedestrian, highway system, public transit, and rail modal policy plans. The objectives will provide the framework for developing specific policies, programs, and planning strategies that will form the basis for the 2008 Long Range Transportation Business Plan.

Working Paper 6: Scenario Development &

Working Paper 7: Summary of Scenario Planning Session

- The LRTBP is based on an assessment of several different but possible future year scenarios. A scenario consists of a combination of different assumptions about driving factors, external to the transportation system, such as the aging of the population, energy prices and shifts in type of energy, land use patterns, and economic changes (manufacturing/agricultural to service / tourism / information for example). The four scenarios are Business as Usual, Environmental Change, Energy Crunch, and Growth. Objectives and strategies have been developed with assistance from a broad range of stakeholders, to achieve the draft goals for each scenario. The scenarios were prepared by VTrans' consultants with input from the VTrans Internal Working Group based on findings presented in Working Papers 1-4, interviews with national and VT "Big Thinkers", and focus groups held throughout the state. These working papers summarize the relevant findings and driving factors identified through these efforts, and describes the scenarios.

G. What's in the Plan?

The rest of this document describes:

- The current status of Vermont's transportation system
- The transportation and global challenges facing Vermont and their implications for transportation investment and management
- VTrans goals and objectives
- The various scenarios that may unfold in the future that affect the way we must think about and invest in transportation
- A strategic plan and recommendations for moving ahead with implementation of the LRTBP
- Financial Outlook for Vermont's future transportation needs

2. Vermont's Transportation System

Vermont has a large and varied transportation system. It includes aviation facilities, rail facilities, bicycle and pedestrian paths and trails, public transportation services, roads and highways as well as other associated facilities and services. With oversight from the Vermont Legislature, VTrans manages the state highway system, supports airports, passenger rail, public transportation, bicycle and pedestrian facilities, park and ride lots and has overall responsibility for statewide transportation planning. Figure 3 provides an overview of the current Vermont surface transportation system.

There are also critical parts of the transportation system in Vermont for which local governments, transit agencies, airports, railroads and the private and non-profit sectors are responsible. In addition, Regional Planning Commissions (RPC) and, in the Burlington region, the Chittenden County Metropolitan Planning Organization (CCMPO), develop regional transportation plans and provide input to VTrans to assist in prioritizing transportation projects in their regions.

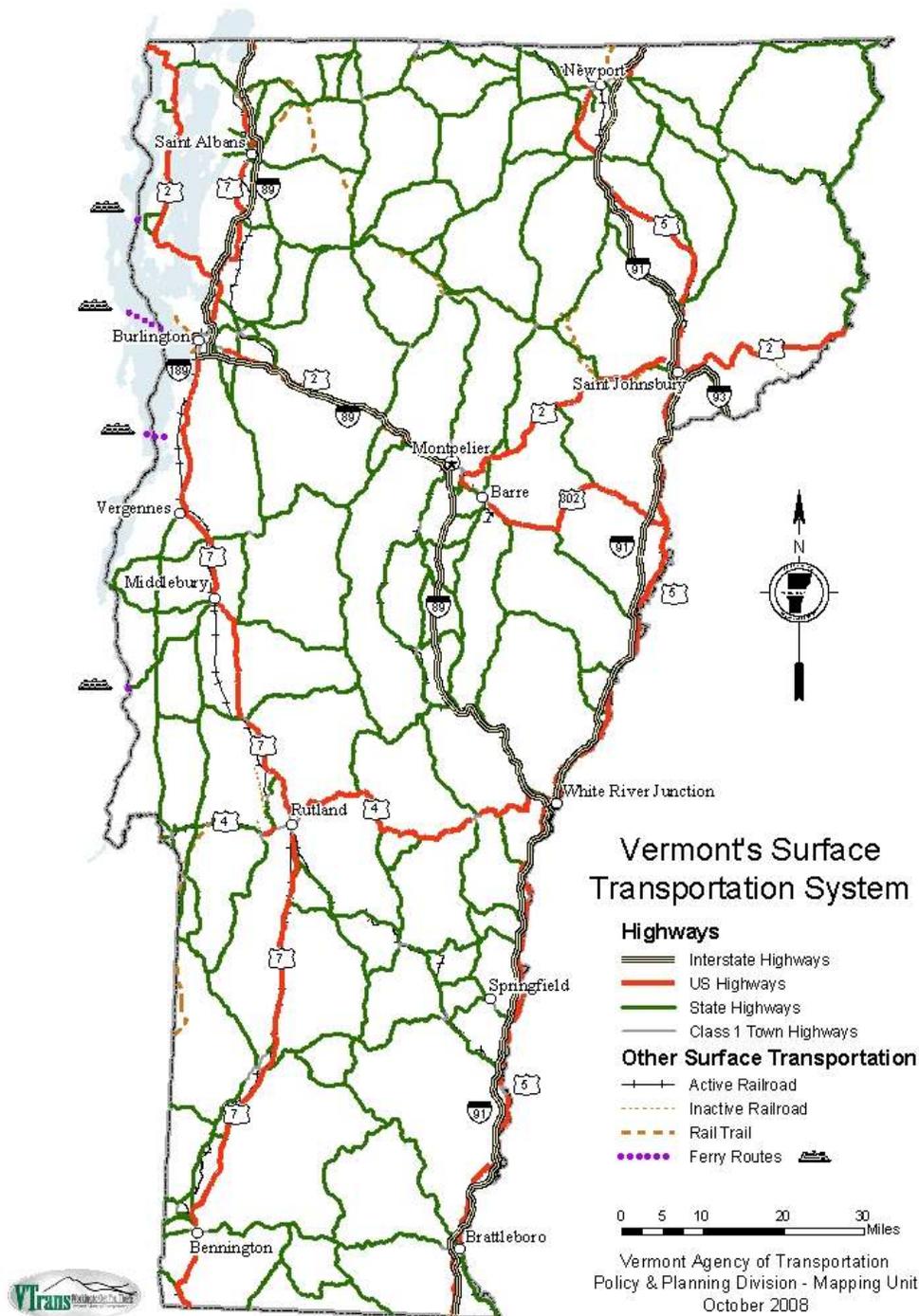
A. Overview of Modal Policy Plans

The LRTBP is built in part upon the findings and recommendations of Vermont's modal policy plans. Since the publication of the 2002 Plan, VTrans has updated all of its modal policy plans and has completed other planning initiatives related to corridor planning, access management, and safety. The overarching change since 2002 is the development and continuing refinements to a performance based approach to programming, planning, and asset management. To support this effort, all of the updated modal policy plans identify performance measures related to their stated goals and policies. The following summarizes each of the modal policy plans and their key findings.

Vermont Airport System and Policy Plan (2006)

Updated in 2006, the Vermont Airport System and Policy Plan includes an evaluation of the current statewide airport system, as well as goals and policy recommendations to help achieve the stated vision. The goals of the plan include preservation, safety and security, accessibility, use of new technologies, land use compatibility and the support of economic vitality. To achieve these goals, adequate and stable funding sources as well as timely and sound infrastructure investments are needed. The plan also identifies future needs for the airport system that include strategic runway extensions and accommodations for larger aircraft.

Figure 3: Overview of Vermont's Surface Transportation System



The plan's recommendations should be carried out continuously as needed throughout the 20-year planning period. The systemwide recommendations include updating and maintaining the following three existing VTrans studies and systems:

1. Airport Information Management System (AIMS)

- Airport IQ system (web-based platform) to monitor performance and update performance measures

2. Airport Pavement Management System (APMS)

- Maintain and monitor State-owned airports throughout and beyond 20-year planning period

3. Economic Impact Analysis

- Every 5 to 7 years, update the 2003 study that summarizes the significant economic value that aviation activity brings to the state

Vermont State Rail and Policy Plan (2006)

The State Rail and Policy Plan (SR&PP) consolidates the Rail Policy Plan and the State Rail Plan Update into a single document that identifies industry trends, provides a vision statement and supporting goals, and provides an overview of the state's rail system and its condition. The plan highlights the need to upgrade infrastructure on priority routes and outlines the changing demand for rail service in Vermont. The performance measures will be used to measure the success of projects. The SR&PP also includes a project prioritization screening process, identifies funding and financing options, and discusses implementation of the plan. The plan also included a funding prioritization screening tool to assist VTrans with the prioritization of projects as part of the annual budgeting process.

The SR&PP recommends performance measures and targets related to goals within three categories: system effectiveness, system condition and system initiatives.

Performance measures provide a basis for evaluating the success of the investments in the rail system and should be measured on a regular basis.

Vermont Bicycle and Pedestrian Policy Plan (2006)

The 2006 Bicycle and Pedestrian Policy Plan update seeks to enhance Vermont's bicycling and walking systems through education, planning, funding, proper maintenance and development of links with other transportation modes. The plan's policy statement includes the following three major elements:

- VTrans-funded projects should accommodate pedestrians and bicyclists wherever reasonably feasible

- New projects, road reconstruction projects, and capacity improvements will maintain or improve existing access and conditions for pedestrians and bicyclists
- Education and encouragement programs will incorporate pedestrian and bicycle issues, as appropriate

These policy statements are current actions carried out in those sections of VTrans that initiate and implement roadway design/operations projects and maintenance. They also will be carried out within the research program, data collection activities, the Department of Motor Vehicles, the Rail Section, Public Transit Section, regional maintenance activities, and other programs. The progress and effects of the systems are to be reviewed and assessed using performance categories such as usage, safety, facilities, training and assistance, education and encouragement, and economic benefits. Long term recommended actions in the plan also include the importance of coordination between VTrans, Regional Planning Commissions and the MPO to develop consistent methodologies for data collection and inventories. A major theme emphasized by the public in the development of the plan was the need to provide more and better paved shoulders on Vermont roads. The plan's long term actions element includes determining the value of using Bicycle Level of Service and other indices to gauge roadway bicycle suitability.

Public Transportation Policy Plan (2007 update)

Adopted in 2000 and updated in 2006, the Public Transportation Policy Plan provides policy guidance based on the following goals:

- Basic mobility for persons who are dependent on public transportation
- Access to employment
- Congestion mitigation to preserve air quality and the sustainability of the highway network
- Advancement of economic development activities including service for workers and visitors that support the travel and tourism

The updated plan recommends that continued funding of new services be evaluated relative to the above goals using performance measures. It recommends a series of performance measures based on 'boardings per hour' and 'cost per passenger' for each class of service. Other recommendations include:

- Protect current services and funding levels and yet recognize effective transit systems through the funding allocation process
- Expand services and funding levels to meet baseline mobility needs to ensure all residents have a similar access to transit
- Expand transit services as tool to support tourism and economic development throughout the state

- Coordination with rail, aviation, and intercity bus programs and focus on regional transit connections

Highway System Policy Plan (2004)

The 2004 Highway System Policy Plan (HSPP) examines Vermont's aging roadway infrastructure; limited funding resources for transportation; increased emphasis on highway operations and management; recognition of transportation/land use relationships; and balancing quality of life, mobility, environmental, and economic development concerns. While the plan identifies several items as part of an action plan, the major recommendations that cover the entire highway network include:

- Move towards a performance-based planning and programming process
- Support Corridor Management Planning
- Focus on highway system preservation and preventative maintenance

Figure 4: Location and Functional Class of Vermont Airports



B. Modal Descriptions

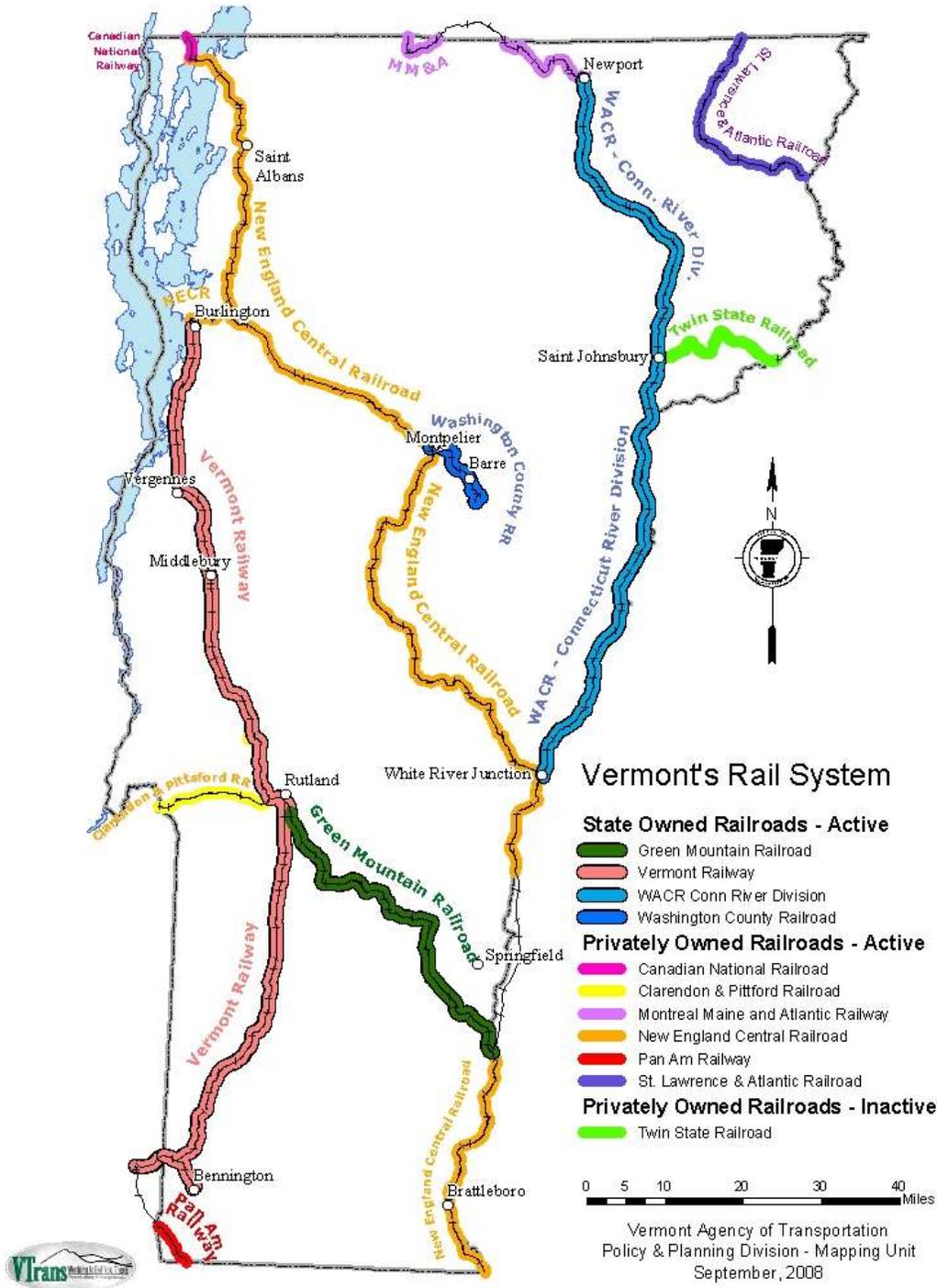
1. Aviation

Vermont's public use airport system, as shown in Figure 4, consists of 17 airports of varying sizes: 10 state-owned airports, five privately-owned airports, and two municipally-owned airports. Thirteen of the 17 airports are part of the FAA's National Plan of Integrated Airport Systems (NPIAS), which identifies airports that are significant to the national air transportation system. It should be noted that two airports, Burlington International Airport and Rutland State Airport, have commercial service and the rest are general aviation airports.

According to the 2007 Vermont Airport System and Policy Plan (VASPP), Vermont's airport system serves the State well overall, with 93% of the population within a 60-minute drive to a commercial service airport. However, only 44% of the population is within a 30-minute drive of an airport with a 5,000-foot long runway with precision instrument approach. Thus, improved accessibility is needed to better meet the business, recreational, safety and personal needs of Vermonters. Enabling key airports to safely accommodate larger aircraft through strategic runway extensions and improved approaches would provide for those needs and an opportunity for increased economic activity in Vermont.

The VASPP classified Vermont's airports based on their intended role in serving Vermont and Vermonters: National, Regional, Local and Specialty. Figure 4 includes classification information for each airport. VTrans forecasts that Vermont's airport activity will generally grow during the next 20 years. For general aviation, operations are expected to grow about 14% between 2005 and 2025. For commercial services, operations are expected to grow about 32% between 2005 and 2025.

Figure 5: Vermont's Existing Rail System



2. Rail

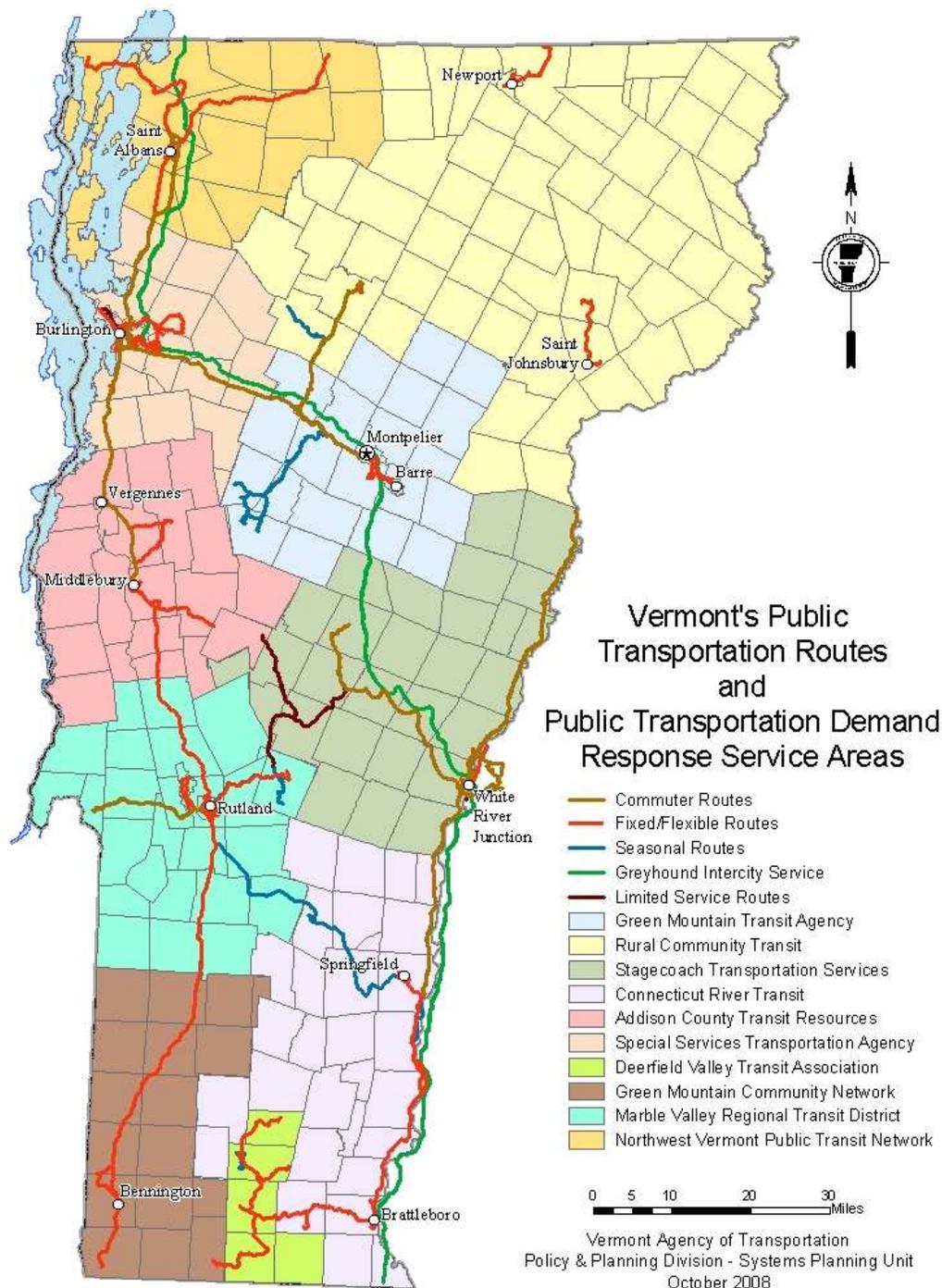
As shown in Figure 5, the 748-mile Vermont railroad system, of which 578 miles are active, is an integral part of the regional, national and international rail transportation networks. Of this total, about 427 miles are owned by the State. Most railroad activity in Vermont is freight traffic, although passenger service is an important component of rail operations. In 2006, 10 railroad companies operated or had trackage rights in Vermont, and all are privately owned and operated with the exception of Amtrak.

According to the Vermont State Rail Policy Plan (2006), the history of investment by VTrans and the state has demonstrated a commitment to supporting and encouraging the stability and growth of the freight and passenger rail services within Vermont. While the tonnage of rail freight service within the state declined by 21% between 1992 and 2002, rail freight tonnage that originated within Vermont increased by 78% during that same period, due mainly to the presence of freight hauling business generated by mineral processor Omya, Inc. in Rutland County. Furthermore, VTrans forecasts that rail freight tonnage will increase by 44-55% between 2006 and 2020. However, two key issues remain as challenges to increasing rail freight service in Vermont: the need to upgrade key rail bridges to the industry standard 286,000 pound capacity and the need to raise tunnel and other structure heights to allow for double-stack container train service between Montreal and major markets south of Vermont.

Regarding intercity passenger rail, which is operated by Amtrak through a contract with the State of Vermont, ridership has increased substantially in recent years. The State currently supports Amtrak-operated service on two passenger lines: the Ethan Allen Express that operates between Rutland and New York City and the Vermonter, which operates between St. Albans and Washington, DC. In 2007 the Ethan Allen Express ridership increased by a modest 2.8% year over year, while the Vermonter ridership increased by 16.6% over 2006. That trend continues into 2008 with increases of 5.8% and 14% YTD respectively. A demonstration project utilizing new innovative passenger rail equipment is currently under consideration to implemented on the Vermonter route which will reduce the train consist size and increase the frequency to two daily trains in each direction.

The Vermont State Rail Policy Plan recommended track upgrades, clearance improvements, and passenger rail enhancements prioritized by route. The Plan also includes an initiative to improve transload facilities that make it possible to transfer freight between trucks and rail at the Rutland, Burlington, and Saint Albans railyards. Specific improvements include upgrades to bridges and other track infrastructure that are likely to see 286,000-pound railcar traffic, and increases to overhead clearances (such as at the Bellows Falls tunnel). The Plan concludes that upgrades to infrastructure will lead to more economic opportunity, that an evaluation of benefits and costs should be performed to prioritize upgrade projects, and that the development of rail initiatives and prioritization should take place at a high level within VTrans.

Figure 6: Vermont's Public Transportation Service Locations*



*Note that various routes that appear to connect on this map may not connect. In addition, the map does not depict various demand response services are available throughout the state. Greyhound's Rutland-White River Jct. route has been discontinued as of 2008.

3. Public Transportation

Vermont has 12 regional public transportation providers who serve many important community needs, such as individual mobility (including Medicaid transportation), access to employment, and economic development—including tourism. According to the 2007 Vermont Public Transportation Policy Plan, the services each provider offers are unique, based on their location and demographics. Most providers offer demand response service and operate some form of fixed route service. Some, located near ski resorts, also run seasonal services that support the state's tourism industry. Due to the predominantly rural nature and low-density development of Vermont, a mixture of fixed and flexible routes and demand responsive services are needed to successfully serve local mobility needs.

Commuter bus service (town-to-town service during peak commuting hours) has grown significantly over the last several years in Vermont. Six public transportation providers operate 12 commuter bus services in Vermont. Between FY 2005 and FY 2008, the number of commuters on those routes doubled from 135,000 to 270,000. These figures do not include CCTA's Link Commuter Routes, which carry over 100,000 more commuters annually and have experienced a 20% increase in ridership since the beginning of 2008. With the increased cost of fuel early in 2008, many commuter routes saw increases of 30% in mid-2008 compared with the same period in mid-2007.

"Go-Vermont" is public transit's most recent initiative, proposed by Governor Douglas in January 2008, which is designed to address rising demand for alternative transportation, particularly for daily commuters who are facing higher fuel costs. Go-Vermont, through the provision of web-based public transit and alternative transportation information, on-line ride-matching service, car-pooling incentives and statewide and easy to join van-pool services, is intended to meet the travel and commuting needs of Vermont's rural, highly dispersed and car-dependent population. Go-Vermont aims to fill a gap in alternative transportation that bus routes simply cannot meet.

Greyhound Lines provides intercity bus service in Vermont. The company provides services that link Vermont to the major cities of New England as well as Montreal, New York City and the rest of Greyhound's North American network. Other daily services connect rural communities and colleges with larger cities within Maine, Massachusetts, New York, New Hampshire and Vermont. Greyhound Lines also provides connecting services with Canada.

According to the 2006 LRTBP public opinion survey, public transit captures only a small percentage of travel demand in the state. However, responses to the survey indicate that improvements to public transit service, both bus and rail, offer the greatest potential to reduce use of the personal automobile. Survey respondents felt that public transportation is the third highest priority for allocation of funds (tied with safety and security and following bridge maintenance and summer maintenance. Survey respondents reported that 12% had used public transit bus service, 11% had used passenger train service, 11% had used intercity bus lines (11%), and 4% had used special transportation services for senior citizens and the disabled.

The Public Transportation Policy Plan concludes that public transit needs long-term capital planning and new funding sources. The Plan also stresses the importance of public transit for human services and recommends the expansion of volunteer drivers and encouraging location of senior housing, continuing care communities, etc., where transit currently exists.

4. Bicycle and Pedestrian

VTrans is recognized as a national leader in bicycle and pedestrian planning. According to the Vermont Bicycle and Pedestrian Policy Plan (2008), Vermont contains over 50 miles of bike lanes, 350 miles of signed bicycle routes, over 100 miles of shared use paths and rail trails, 500 miles of hiking trails, hundreds of miles of sidewalks and an extensive network of mountain biking trails.

Vermont's scenic beauty fosters an environment where walking and bicycling are important activities. Results of the recent long range transportation plan survey revealed that Vermonters spend almost as much time walking as driving each day (61.9 minutes and 70.4 minutes per day, respectively). About 40% of Vermonters used bike paths, trails, or shared use paths in the last year. On average, Vermonters used bike paths, trails, and shared use paths 37.6 times in the last year. Bicycling and walking are also key parts of Vermont's tourism industry, with an estimated 11,000-plus people visiting the state to participate in bicycle touring activities, according to the Scenic Byways Program.

The 2006 Bicycle and Pedestrian Policy Plan update sought to enhance Vermont's bicycling and walking systems through education, planning, funding, proper maintenance and the development of links with other transportation modes. The Plan recommends that VTrans-funded projects should accommodate pedestrian and bicyclists wherever reasonably feasible; that new projects, road reconstruction projects, and capacity improvements maintain or improve existing access and conditions for pedestrians and bicyclists; and that education and encouragement programs will incorporate pedestrian and bicycle issues, as appropriate.

5. Park-and-Ride Facilities

VTrans operates 26 Park-and-Ride facilities across the state, as shown in the map in Figure 7. These lots are considered to be an effective method for reducing traffic congestion and decreasing the use of fossil fuels while minimizing air pollution emissions, providing connectivity between Park-and-Ride Facilities and inter-regional public transit routes and saving valuable urban land for more aesthetically appealing and productive uses. In addition, Park-and-Ride projects are a popular choice with Vermont's residents and businesses, and VTrans plans to continue developing facilities in cooperation with municipalities and regional organizations as funding and resources allow. According to the 2006 LRTBP public opinion survey, 22% of respondents used park and ride lots at least once in the last year, compared to 15% in 2000. VTrans has plans to improve several Park-and-Ride facilities during the fiscal year 2009.

Figure 7: Vermont's Park and Ride Facility Locations

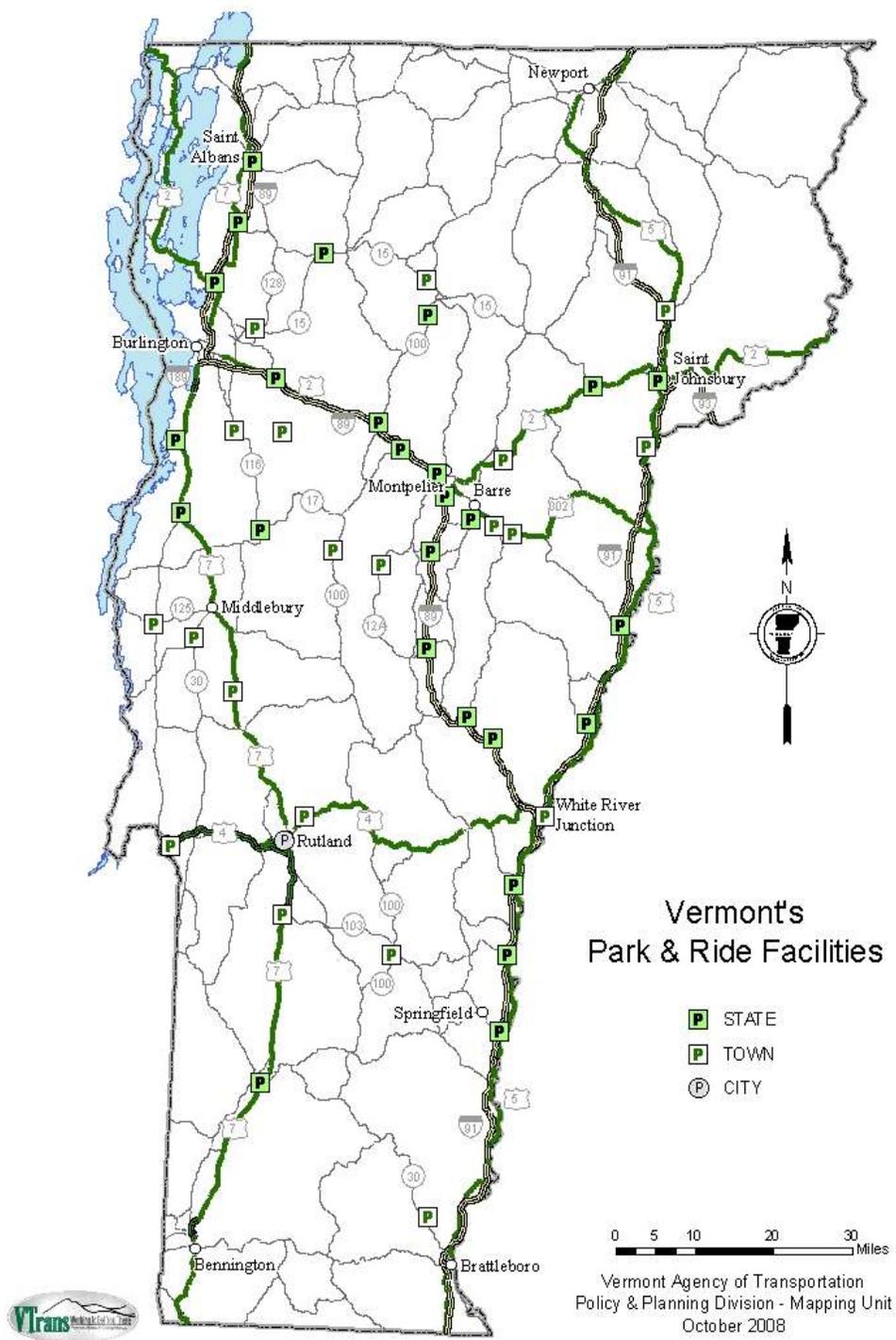
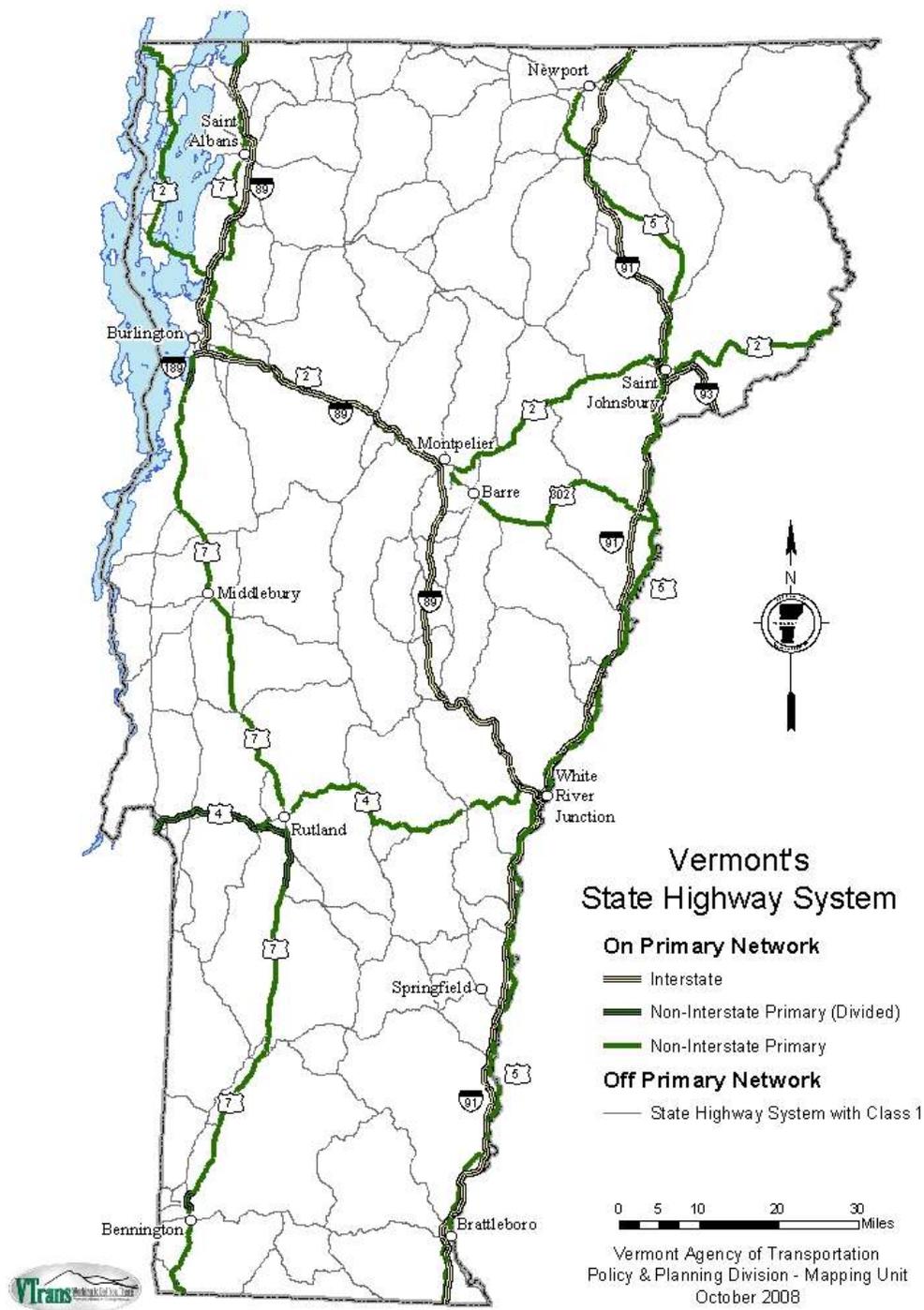


Figure 8: Vermont's State Highway System



6. Highway

Roads and highways form the basic circulation system for moving from home to business and other destinations. About 98% of Vermonters use private vehicles to meet daily transportation needs. In addition, trucking is Vermont's primary means of freight transportation. Thus, the highway system is a critical transportation mode in Vermont.

According to the 2004 Vermont Highway System Policy Plan (HSPP), the state contains over 14,000 miles of public roads, of which 19%, or 2,704 miles, belong to the state-owned highway system (SHS); the remainder of the highway system is owned by cities and towns. Figure 8 provides an overview of the SHS across the state.

The HSPP also found that:

- Approximately one-third of state highways have pavement that is in "very poor" or "poor" condition (as of 2003)
- The majority of bridges in the state highway system are at an age (over 50 years old) at which they require substantial maintenance, rehabilitation, or replacement
- The 2002 survey for the Long Range Transportation Plan indicated that the majority of Vermonters do not consider traffic to be a major problem, although 2020 projections show that congestion will be spreading beyond the Burlington area¹
- Vermont fatalities rates remain below the national average (Vermont's fatality rate per 100 million AMVT was 1.13 compared to the national rate of 1.41)

The HSPP recommends that major emphasis be placed on the safety and preservation of Vermont's roads and highways that include performance-based planning and programming processes.

Vermont's State Highway System (SHS)	
Total System Length - 2,704 Miles	
<u>Includes:</u>	
National Highway System – 703 miles (includes Interstates)	
Interstate – 320 miles	
Bridges – 2,370	
Culverts – 40,000+	
Signs – 64,000+	
Traffic Signals – 235	
Roadway Lights – 1,000+	
Guardrail – 1,000+ miles	

¹ In 2002, 43% of the Vermont adults surveyed reported that they had experienced traffic congestion while traveling in Vermont on the last six months. In the 2006 survey update, this proportion increased to 50%. Although congestion is still not a major problem across the state, the increase is noteworthy because it suggests that congestion is spreading.

7. Intelligent Transportation Systems



VTrans and other agencies are currently using Intelligent Transportation Systems (ITS), which apply the use of information technology to surface transportation needs, to improve the safety and efficiency of the transportation system. VTrans is one of the state DOTs across the country implementing the 511 service that allows travelers to access traffic and weather information through the internet and phone.

Vermont, along with New Hampshire and Maine, has undertaken a major regional ITS project - the Tri-State Advanced Traveler Information System - TRIO. VTrans uses mobile variable message signs (VMS) that are integrated with weather and road condition reporting systems to ensure the dissemination of timely and accurate information to motorists. The ConnectVermont project aims to continue to provide traveler information and travel itinerary planning via the Vermont Travel Planner on VacationVacation.com as well as continuing to improve the ITS infrastructure along Vermont highways. One project is incorporating Fiber Optic cabling in the rights-of-way as a delivery mechanism for the ITS functions and applications. The goal is to tie all of the ITS devices, such as road weather information stations, weight in motions stations, variable message signs, cameras, low power FM radio stations, and emergency communications, as well as new US DOT Vehicle Infrastructure Integration (vehicle to vehicle, road to vehicle, and town/city to vehicle communication) together on one Fiber Optic backbone. A secondary benefit will be to enhance broadband and cellular connectivity around the state. In response to increased speeds and crashes, VTrans is undertaking a project to implement an ITS corridor along I-89 from Sharon, VT to Colchester to highlight real-time severe weather and road conditions with variable message signs along the corridor to warn travelers and reduce speeds through affected areas. ConnectVermont is also undertaking a Kiosk Re-engineering Project that aims to redesign the state's electronic travel information kiosks by implementing a web-based traveler information portal that will allow kiosks statewide to be continually up-to-date and enable rapid deployment of new kiosks in an unprecedented number of locations. The project also involves presenting data feeds of travel alerts from Vermont's 511 System on both the kiosks and the Vermont Travel Planner.

The Chittenden County Metropolitan Planning Organization (CCMPO) has developed an architecture to provide a framework for coordinated ITS deployment and assure that local ITS projects are eligible for federal funding. Examples of current ITS projects in Chittenden County include demand-responsive public transportation services, the dissemination of information to travelers through the Internet/Vermont 511, signs, kiosks, radio, television, and telephone numbers, and traffic management such as signals, monitoring systems, and other technologies that are currently operated at the municipal level.

C. Corridor Management Planning

As recommended in the Highway System Policy Plan, VTrans has implemented its Corridor Management Planning Program. Corridor Management Planning is a collaborative, comprehensive and proactive approach to addressing transportation problems. There is growing realization that we can not build ourselves out of congestion. New facilities and major capacity improvements to our roadways are becoming increasingly difficult due to financial constraints, environmental and community challenges as well as jurisdictional issues that affect transportation problems and solutions. Due to these and other challenges, more creative and collaborative approaches to solving and preventing transportation problems are needed.

The Corridor Management approach offers the opportunity for state and regional agencies, municipalities and communities to collectively plot a future strategy for a corridor. This approach makes the best possible use of available resources, takes advantage of synergies to produce the best outcomes, and has a greater chance of becoming a reality – than would otherwise be the case if each community acted on its own. It also helps to alleviate adversarial situations with communities when projects move from the planning to implementation stage.

VTrans undertakes one to two Corridor Management Planning efforts each year, in collaboration with municipalities and Regional Planning Commissions. Communities are expected to contribute part of the funding for the Plans, as well as participate through their select boards and planning commissions. In addition, VTrans provides staff support to other corridor study initiatives.

In 2005, VTrans developed the *Vermont Corridor Management Handbook* to provide planners and consultants with resources (e.g., analysis methods and implementation mechanisms) and a multi-step process for developing Corridor Management Plans. Corridor planning efforts result in concrete goals and objectives as well as recommended land use and transportation strategies that comprehensively address present and future transportation needs.

3. Challenges and Opportunities

A. Vermont’s Transportation Challenges

Vermont’s transportation system will be different in 2030. Technology will likely improve the way that vehicles and people interact with the transportation system and each other. Nevertheless, the global economy, energy constraints and climate change will result in unpredictable changes and stresses on the transportation system. Our ability to meet these challenges, or at least respond as effectively as possible, depends on the way we work together to change the way we do things, manage the transportation system, better integrate land use, transportation and economic activities, and fund a sustainable transportation system.

There are at least seven key challenges facing Vermont’s transportation system:

Figure 9: Vermont’s Transportation Challenges



A.1. Aging Infrastructure

Vermont's transportation infrastructure is aging and steadily declining into a state of disrepair. The state built most of the transportation system in two concentrated periods of construction activity. The first was during the 1920 and 30s when the modern highway system was first constructed – and in Vermont particularly after the catastrophic floods of 1927 that resulted in the replacement of hundreds of bridges during the ensuing decade. The second was during the 1950s and 60s when the Interstate system was built and the state highway system was expanded to connect to it.

Challenges - Aging Infrastructure:

- Rapidly aging transportation infrastructure across the state requiring significant maintenance and rehabilitation
- Prioritizing preservation & maintenance projects while addressing new infrastructure needs

We are now 80 years after the first major construction period. The infrastructure built during that period is reaching the end of its useful life and, for the most part, needs replacement. At the same time, the infrastructure built in the 1950s and 60s is starting to require major rehabilitation work in order to extend and maximize its useful life. For example, according to the 2004 *Highway System Policy Plan* (HSPP):

- About one-third of state highways have pavement that is in “very poor” or “poor” condition (as of 2003)
- The majority of bridges in the state highway system are at an age (over 50 years old) at which they require substantial maintenance, rehabilitation, or replacement

To address these and related challenges, VTrans will need to continue and enhance the use of asset management principles to prioritize maintenance, rehabilitation and reconstruction projects across the state.

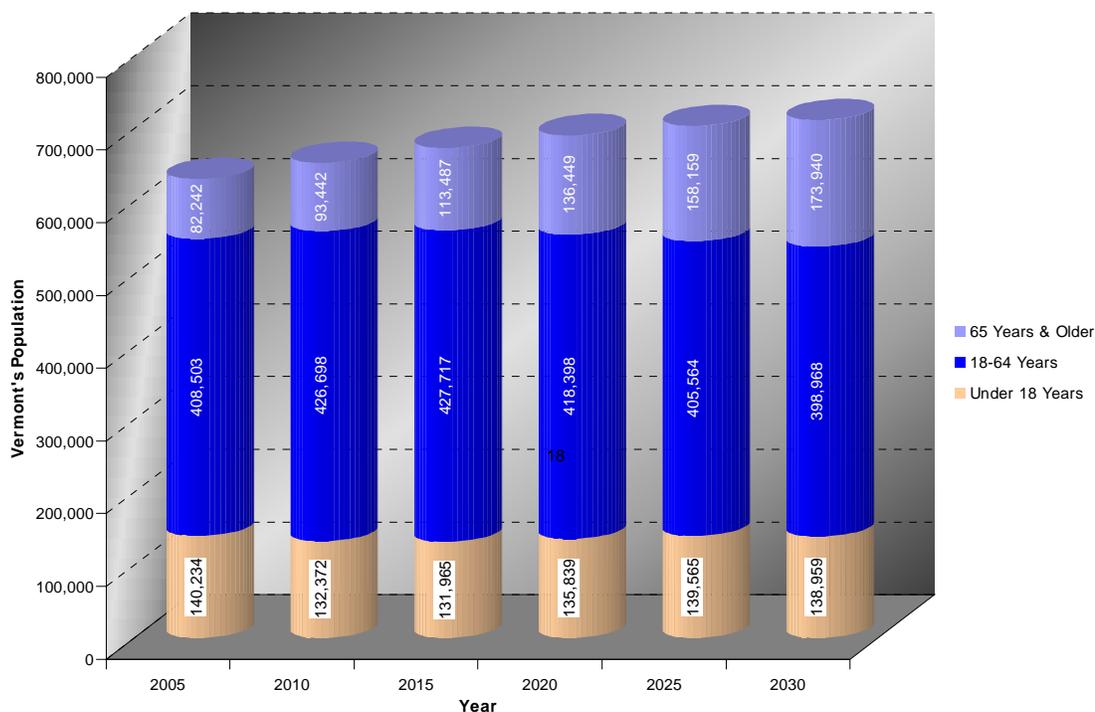
A.2. Changing Demographics and Economy

As in the rest of the country, Vermont is experiencing demographic shifts that have important implications for transportation investment and the state's economy. Vermont's population trend over time is best characterized as “slow and steady” growth when compared with the U.S. as a whole. Within the New England context, Vermont is growing at a relatively greater rate than other states. The counties in northwest Vermont are growing more quickly than other areas of the state. Population change in the state has been equally affected by natural factors (birth and death rates) and by migration. Assuming these factors continue to affect growth similarly to current trends, Vermont's population will increase by about 17% between 2000 and 2030 (or from approximately 608,000 to 712,000 people). Birth and death rates are likely to remain stable, but changes in national and global migration patterns could affect this forecast and should be considered in different planning scenarios.

Challenges - Changing Demographics and Economy:

- Doubling of elderly population by 2030
- Growth in special needs population that require assistance with daily living activities (6,000 in 2015)
- Continuing loss of manufacturing jobs and growth of the service economy

Figure 10: Project Change in Vermont’s Population & Age Distribution, 2005-2030



Source: Data derived from U.S. Census Bureau, “Interim Projections of the Population by Selected Age Groups for the United States

Another important demographic analysis features “dependents” in the population, namely the segment of the population that is composed of people who are either too young or too old to work in the traditional sense. If current trends continue, by 2030, almost 174,000 people in the state will be over the age of 65. This age group’s share of the total population will increase from 13% in 2000 to 24% in 2030. This trend has significant ramifications for health care services, transportation, and housing. The younger age cohort (under 18) will grow over time in absolute numbers, although it is currently decreasing slightly. This cohort’s proportion of the Vermont population is projected to decrease and plateau by 2030.

Another major trend is the steady loss of traditional manufacturing jobs and other changing economic factors. Information technology, along with major trade agreements, has encouraged outsourcing of many types of jobs, particularly manufacturing, to other countries. Between 1990 and 2008, Vermont’s manufacturing employment declined from 16.8% of the workforce to 11.8%, a drop of about 30%.² This shift in the economy

²Source: Current Employment Statistics (CES) program, produced by the Vermont Department of Labor, Labor Market Information, in cooperation with the U.S. Bureau of Labor Statistics, <http://www.vtلمي.info/CES.cfm>.

is affecting states and localities in differing ways, some of which become apparent in changing transportation patterns. As in most states, job growth in Vermont is in the service economy, including tourism, retail and information services.

A.3. Land Use

The state's largest growth centers exist in the Champlain Valley, the Connecticut River Valley, central Vermont, Rutland County, and southern Vermont on either side of the state (Brattleboro in the east and Bennington in the west). However, over the last 50 years, Vermont's population dispersed away from the traditional growth centers of 10,000 or more to smaller suburban and exurban communities.

As Vermont's population has become more geographically dispersed, commuting has increased between towns and counties. The vast majority (more than 75%) of Vermont towns experienced a net exporting of workers during the day in both 1990 and 2000. This suggests that, even though people are living in dispersed patterns, jobs remain more centrally located. Further, Vermonters are spending more time driving to and from work. The amount of time spent commuting to and from jobs in Vermont grew 20% between 1990 and 2000. Commuters in rural areas travel an average of 24 minutes to work, with their urban counterparts commuting an average of only 18 minutes.

Challenges - Land Use

- Increased commuting and time spent driving to/from work.
- People are more dispersed but jobs remain more centrally located.
- Planning and decision-making authority for land use and transportation planning is disjointed and poorly coordinated.

A.4. Funding

Vermont, like most states, is facing the challenge of revenue not keeping pace with the demand to maintain and improve transportation infrastructure. Current transportation user fees and taxing systems are not generating enough revenues to meet demands. Cumulative transportation revenue shortfalls for Vermont could be as high as \$8 billion over the next 20 years (depending on the rate of inflation).

Vermont is also faced with the challenge of preserving its existing and deteriorating infrastructure. VTrans' *Road to Affordability* initiative is intended to make expenditures for critical preservation and maintenance projects the state's highest transportation priorities, thereby helping extend the life and improve the performance of Vermont's existing transportation network. This initiative may require making trade-offs between these critical preservation investments and new transportation infrastructure in various parts of the state, at least until the state's overall transportation network is at an acceptable condition and level of performance.

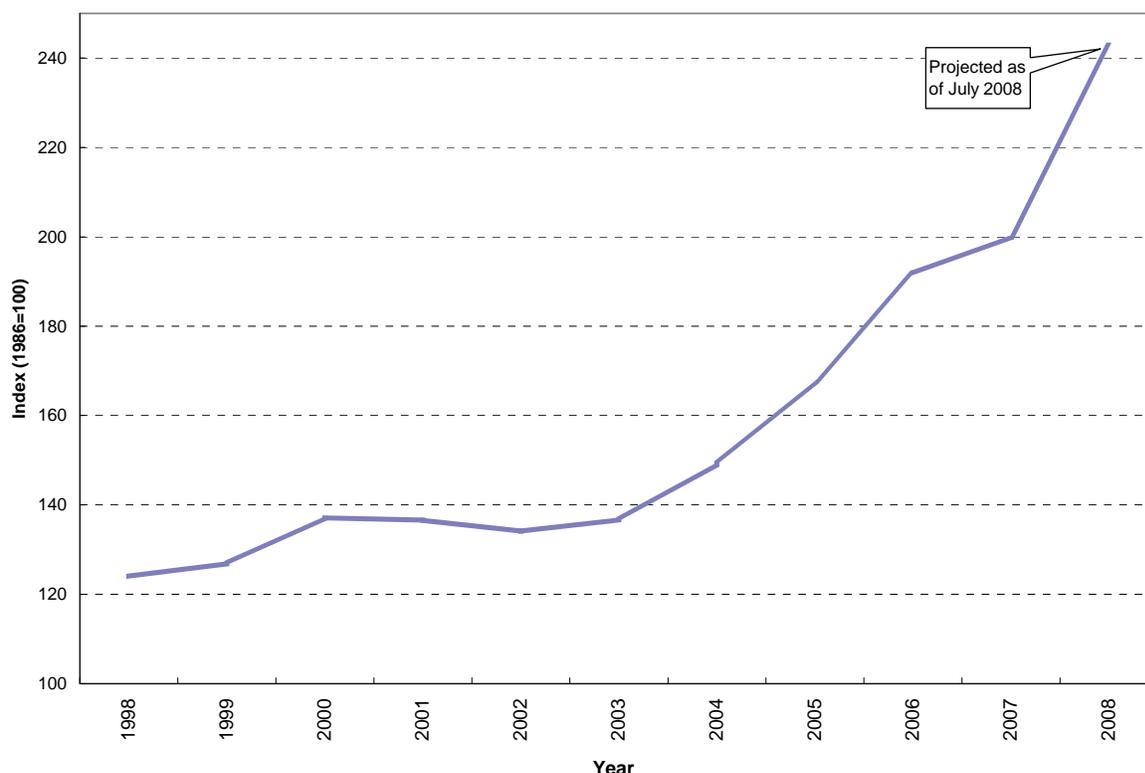
Challenges - Funding:

- Revenue not keeping pace with demand for transportation infrastructure improvements.
- Focus on funding preservation and maintenance only under *The Road to Affordability*
- Increasing per gallon charge on fuel tax, motor vehicle registration fees, and sales tax increasingly unpopular and difficult to implement.
- Federal earmarks likely to decline over time.
- Ability to leverage federally-enabled innovative financing mechanisms.

During state fiscal year (SFY) 2006, Vermont's transportation expenditures were \$321 million, or 7.5% of the state's total budget of about \$4.2 billion. Vermont's transportation infrastructure improvements depend largely on the continued availability of funds from both state and federal sources. The most recent federal transportation reauthorization legislation, SAFETEA-LU, authorized \$244.1 billion in funding for surface transportation projects nationally through 2009. However, there is a strong possibility that the federal government may face Highway Trust Fund (HTF) shortfalls in the near future, which could have significant impacts on the timing and content of the next federal surface transportation authorization bill (currently due in late 2009). Because of Vermont's significant dependence on federal transportation funding, VTrans should carefully monitor and track federal transportation revenue streams and issues.

Compounding this situation is the soaring costs of construction for transportation projects. Figure 11 shows the rise in the Produce Price Index (PPI) nationally for highway and street construction activities nationally since 1998. The steepest rises in overall costs have occurred since 2002, driven in large part by escalating material prices. Regular transfers of revenues from the transportation fund to the state's general fund for both transportation-related and unrelated purposes over the past two decades has exacerbated this situation.

Figure 11: Producer Price Index (PPI) for Highway & Street Construction Activities in the U.S., 1998-2008



Source: U.S. Department of Labor website, Producer Price Index page, <http://www.bls.gov/ppi/data.htm>, Sep. 2008.

In late 2007, it was estimated that to just maintain the state’s existing infrastructure in serviceable condition would require spending \$415 million a year for the next 30 years. However, the current level of spending on transportation infrastructure preservation is about \$211 million, meaning there is a spending “gap” of about \$203 million. Over the 20-year period from 2005 to 2025, it is estimated that the shortfall would total a cumulative \$4.2 billion if needs grow at 2% inflation rate, and \$8.7 billion if needs grow at 5% inflation rate.³

³ Based on VT LRTBP, Working Paper 3 – Financial Analysis (2007), Table 12.

A.5. Energy Constraints, Environmental Impacts and Climate Change

The impact of higher energy costs on the costs and means of transportation have been well chronicled in recent years. If higher fuel price levels are sustained, they are likely to lead to a variety of changes over time in transportation demand, but changes will vary region by region. A critical aspect of the higher petroleum costs is their contribution to the steep rise in the costs of building, maintaining and operating transportation systems. The cost of operating public transit vehicles, construction vehicles, and airplanes has all been substantially affected by fuel costs. Shortly before petroleum costs skyrocketed, the cost of steel and concrete also spiked, making new road and rail facilities much more costly. In addition, the cost of bituminous concrete, which is composed of petroleum and used almost exclusively in Vermont for roadway paving, has increased an average of 50% since mid-2005.

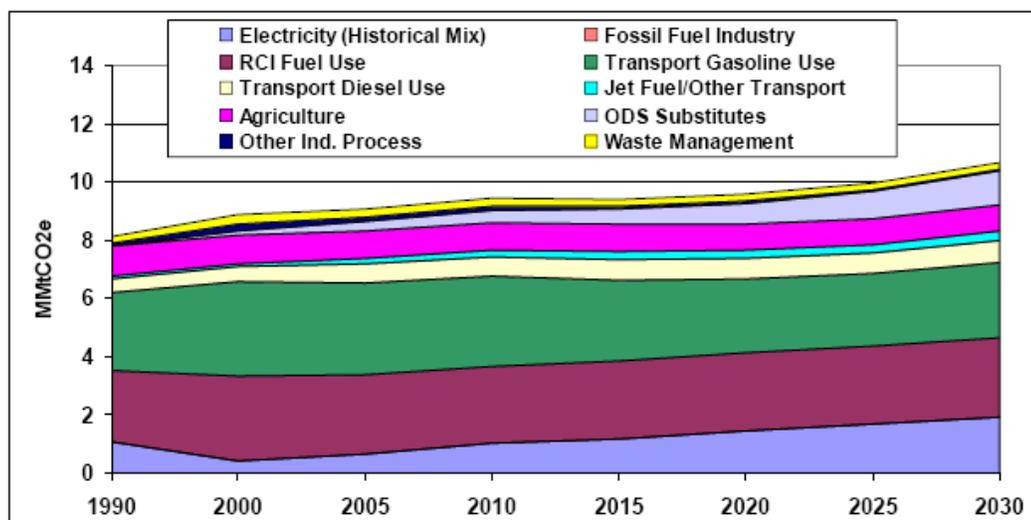
Challenges - Energy Constraints and Environmental Impacts of Transportation Systems

- Changing transportation demand due to increasing fuel prices.
- Rising costs of construction and maintenance of transportation systems due to higher fuel prices.
- Need to support environmental stewardship while seeking ways to streamline environmental permitting process.
- Need to adapt planning, investment and operational practices to address impacts of climate change over time.

Responses to the 2006 LRTBP Survey support the concept of protecting and enhancing the quality of the natural environment. Respondents were asked to rank eight issues generally considered important when thinking about the state's transportation system. Environmental protection is the second most important issue. As awareness and concern about energy constraints have come to the fore, a variety of related environmental quality concerns related to transportation system development and use have also grown in prominence among the public and decision-makers. VTrans recognizes that environmental quality - clean water and air, scenic beauty, ecological diversity and protection of the state's historic character - are what Vermonters desire and are considered integral parts of the state's economic well-being. VTrans has implemented an Agency-wide environmental stewardship ethic, which is guided by principles and practices that apply to all of the agency's business activities. Through its stewardship actions and policies, VTrans seeks to be a positive force in supporting the state's environmental quality and unique sense of place, and will strive to exceed state and federal environmental laws when practicable. The challenge for VTrans will be balancing an ongoing environmental stewardship perspective with its responsibility to make judgments and decisions based on numerous factors including cost, safety, and resource availability.

A critical environmental consideration in transportation planning is climate change. It is now generally accepted that every mode of transportation and every region in the United States will be affected as climate change poses new and often unfamiliar challenges to our transportation system. The past several decades of historical regional climate patterns commonly used by transportation planners to guide their operations and investments may no longer be a reliable guide for future plans. In particular, future climate will include new classes (in terms of magnitude and frequency) of weather and climate extremes, such as record rainfall and record heat waves, not experienced in modern times as human-induced changes are superimposed on the natural variability of the climate.

Figure 12: Projected GHG Emissions in Vermont, by Source, 1990-2030



RCI – Residential, Commercial and Industrial

ODS – Ozone Depleting Substances (which are also powerful greenhouse gases)

Source: The Final Report and Recommendations of the Governor's Commission on Climate Change, October 27, 2007, p.4-1

Vermont's current greenhouse gas (GHG) emission reduction goals are to reduce the state's GHG emissions by 25% from 1990 levels by 2012; 50% by 2028; and, if practical, 75% by 2050.⁴ As transportation makes up 44 percent of Vermont's GHG emissions, climate change is an issue requiring action by VTrans and other organizations and agencies that influence our transportation choices. Figure 12 depicts current projections of various sources contributions to total GHG emissions through 2030. Gasoline-powered transportation activities are projected to continue comprising a major share of GHG emissions in the state. The decisions that VTrans and other transportation organizations make today, particularly those related to the redesign and retrofitting of existing transportation infrastructure or the location and design of new infrastructure, will affect how well the system adapts to climate change far into the future.

A.6. Freight Movement & Trade Globalization

Vermont is well-positioned to continue making positive contributions to the regional, national, and international economies. These will depend, however, to a certain degree on the state's ability to maintain and improve the transportation infrastructure, thus facilitating the efficient movements of goods and services.

In 1997, about 23 million tons of freight moved on Vermont's transportation infrastructure. About 90 percent of this tonnage is moved by truck, while rail carried about seven percent. These two modes basically carry the freight into, out of, within,

⁴ Governor's Executive Order 07-05, December 5, 2005, and Vermont Legislature Act No. 168 (S.259), 2006

Challenges - Freight Movement & Trade Globalization

- Steady growth in amount and value of freight moving in Vermont
- Highway system will carry vast majority of freight over time
- Reliability and quality of transportation system critical for continued economic investment across the state

and through the state. Freight moving through Vermont from and to out of state locations represents 35 percent of all tons moved. This typically includes freight moving to/from Quebec, New Hampshire, and Massachusetts. In addition, Vermont receives significantly more freight than it ships (7.1 versus 2.9 million tons annually). Within Vermont, the freight flow patterns closely follow the economic and population centers. Chittenden County is by far the largest receiver of freight, while Chittenden and Rutland counties are the largest shippers of freight.

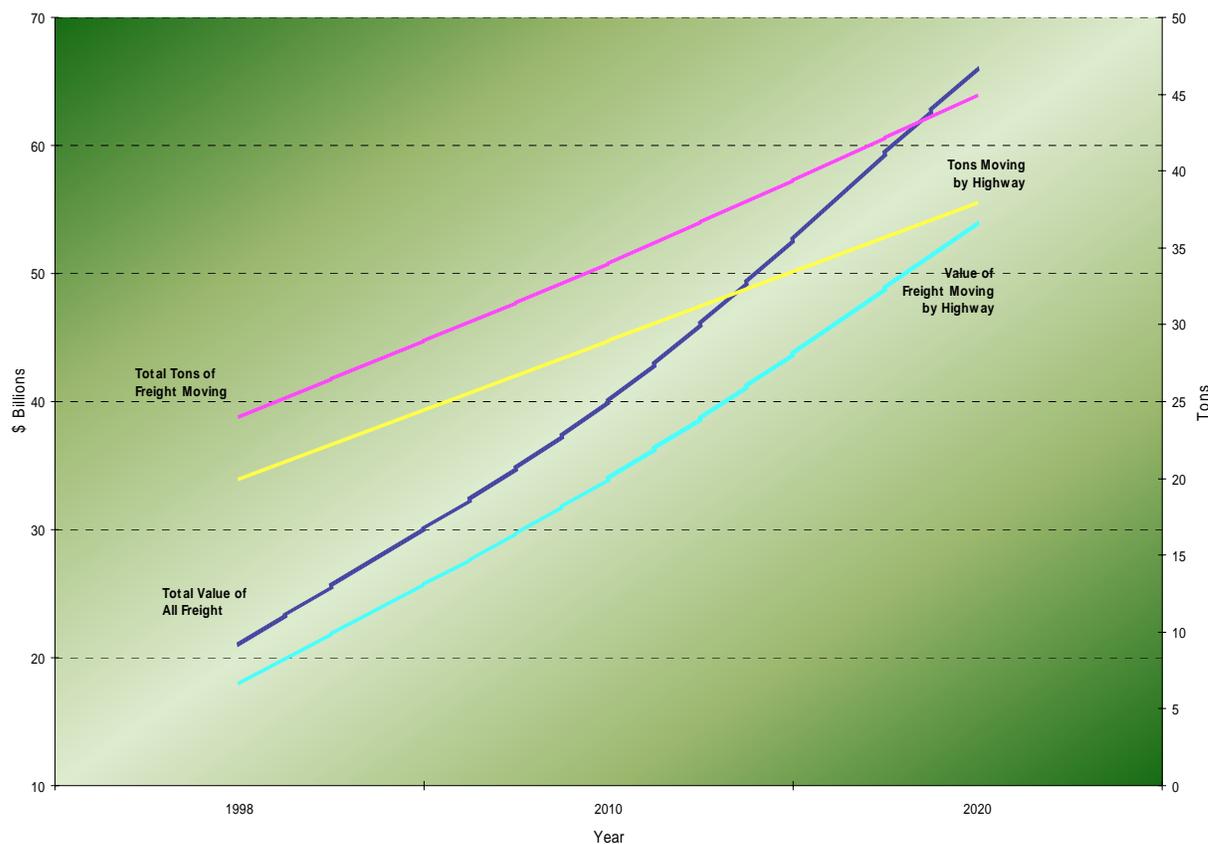
In the next two decades, as shown in Figure 13, Vermont is expected to experience a near doubling of tons of freight moved on its transportation system, from 24 million tons in the late 1990s to 45 million tons in 2020. The dollar value of these freight movements will more than triple from \$21 billion to \$66 billion. As Figure 13 shows, trucks (highway) will continue to carry the vast majority of this freight into the future. As a share of freight moving in Vermont, international trade-related freight is forecast to steadily increase in both tonnage and value during this period. By 2020, international trade is expected to account for more than half the value of all freight moved in the State.

At the same time, the evolution of a global, “just in time” economy has put pressure on the transportation industry to develop new equipment and operating procedures for moving freight as quickly and efficiently as possible, and on governments to provide the means for it to be moved freely.

The result has been many rapid advances in vehicles, rolling stock and other transportation technologies – a trend that is expected to continue. Truck trailers are getting longer, requiring turning radii not easily accommodated by much of the roadway system in Vermont. The national standards for rail are for taller, wider and heavier carloads than can be accommodated on much of the states’ system – a limiting factor to Vermont railroads for shipping, receiving and accepting interline traffic. In order to guarantee next-day delivery, courier companies require suitably designed, equipped and operated airports.

During the next 25 years, these transportation concepts will continue to develop and evolve into global “integrated supply chains,” which combine and merge formerly separate transportation functions and modes into one seamless intermodal system. Transportation partnerships, combining modes (highways, rail, air, and water), warehousing, transfer terminals, computer and telecommunications systems will become more common and many will expand services to other countries and continents. For Vermont to participate successfully in this global, “just in time” economy, these issues and needs will have to be considered and - where investment is compelling and makes economic sense - met.

Figure 13: Forecast of Freight Movements in Vermont through 2020, in Tons and by Value



Source: USDOT, Freight Analysis Framework, State Profile – Vermont, http://ops.fhwa.dot.gov/freight/freight_analysis/state_info/vermont/profile_vt.htm

A.7. Security Needs and Issues

The federal government now emphasizes “security” as a stand-alone transportation planning requirement under SAFETEA-LU. The concern for security was highlighted by making it a separate planning consideration for both state and metropolitan plans. Federal highway funds can be used to finance many planned activities, but grants from Homeland Security also are anticipated sources of support.

The Vermont Department of Public Safety (DPS) Homeland Security Unit is responsible for providing coordination and support to all local and state response organizations to ensure that the state is adequately prepared for any type of incident. Every year VTrans joins forces with DPS and other organizations to practice responses to security issues and potential disasters. VTrans is a member of the state government’s Emergency Operations team that employs two trained staff on-call 24/7 to respond to Vermont Emergency Management’s call to action. VTrans has addressed safety with the installation of fencing at various airports. The new Transportation Security

Administration (TSA) office at the Rutland Airport was renovated. DMV received an annual Border Enforcement grant from the Federal Motor Carrier Safety Administration. DMV's Commercial Vehicle Enforcement officers inspected nearly 1,800 commercial motor vehicles and 19 illegal foreign nationals were apprehended. DMV implemented provisions of the federal Patriot Act related to the licensing of commercial vehicle drivers transporting hazardous materials (Hazmat), requiring stricter security measures and background checks for over 1,900 Vermont licensed truck drivers. The DMV Investigations Unit, in coordination with the Department of Homeland Security and Immigration & Customs Enforcement, conducted 88 foreign applicant investigations in FY2006, identifying 10 people who were in the country illegally.

While VTrans continues to take measures to enhance the security of the state's transportation system, security is not a common theme in the VTrans policy plans or regional transportation plans, with the Airport Policy Plan as an exception. To enhance the security of the state's airports, highways, rail system and public transit services, VTrans will need to incorporate security planning into all future policy plans and other planning efforts.

B. Vermont's Transportation Opportunities

Although the challenges facing the transportation system are significant, Vermont is positioned to respond to them. Our basic transportation infrastructure is in place and in serviceable condition; we have a solid foundation for maintaining and enhancing the system. Under *The Road to Affordability* initiative, an asset management approach is being employed to facilitate the repair of bridges, pavements and culverts. Many of our urban and rural areas offer public transit services. We have the transportation infrastructure and the geographic position to connect to the international economy. Major highways, railroads and airports enable products from our businesses, farms and forests to be distributed worldwide. We also now have a National University Transportation Center at UVM, through which VTrans, regional planning bodies and the University collaborate to research critical transportation issues.

In the context of the LRTBP, six key opportunities present themselves:

- **Leveraging *The Road To Affordability* Framework to Make Cost-Effective Transportation Investment Decisions** - Vermont has an aging transportation infrastructure that demands greater and more costly attention than in the past. *The Road to Affordability* strategy puts VTrans on a path that will enable the use of key tools, primarily asset management, for preserving the state's existing transportation assets so that they do not deteriorate to the point that they require major reconstruction and become a financial drain on the entire system. By striving to obtain maximum efficiency from the existing transportation system, and making additional capacity investment in the infrastructure when warranted, VTrans moves toward achieving the highest degree of mobility and safety for all system users.
- **Building a Sustainable Multimodal Transportation Network** - As VTrans works to address the state's mobility needs, it does so in the face of various critical challenges – demographic change, energy constraints, environmental fragility and others. To manage and operate the transportation system effectively into the future, VTrans will need to invest strategically to develop a transportation network that is affordable (for both the state and individuals), efficiently operated, offers modal choices and linked to the state's economic well-being. At the same time, investments will need to support minimizing consumption of non-renewable resources, including fossil fuels and land, and protect our natural environment and resources.
- **Building and Maintaining Vermont's Infrastructure to be Compatible with Regional, National and International Standards and Services** - The world economy is being dominated by regions that intersect and span political boundaries as well as leverage cultural and political ties. Vermont, as part of the New England and North American economic spheres, has an opportunity to manage and invest in the transportation system to support sustainable economic growth and development. To do so will require harmonization of regulations, compatibility of infrastructure and integration of business relations across the New England states and eastern Canadian Provinces. Participating in

initiatives such as the Northeast CanAm Connections Trade Corridor Study is an important step toward seamless multimodal mobility options across the entire region.

- **Enhancing Environmental Quality, Facilitating Energy Conservation and Addressing Climate Change** – Transportation investment is not only a means of providing mobility and access. The types of strategies and projects VTrans pursues can facilitate protecting and improving the quality of our environment and conserving increasingly scarce energy resources. Opportunities available to VTrans include emphasizing roadway and vehicle operation improvements through better signal timing and removing congestion “hot spots” across the state. Also, continued investment in “intelligent transportation systems” (ITS) for traveler information and accident/incident management hold substantial promise for increased efficiency of operations. By managing transportation demand through investments in alternative modes for people and goods movement, telecommuting, pricing incentives, and integrated transportation-land use strategies, VTrans can further support environmental quality and energy conservation in Vermont. By working with other Vermont agencies, VTrans can play an integral role to improving and enforcing environmental standards. VTrans currently collaborates with the Agency of Natural Resources to facilitate the formation of wilderness corridors within their Wildlife Action Plan. VTrans also contributes to efforts to improve water quality through its storm water management process related to road design, construction, culvert engineering and permitting. In addition, VTrans and other transportation decision makers have an opportunity now to prepare for projected climate changes. It is important that climate change considerations are incorporated into transportation plans, facility designs, maintenance practices, operations and emergency response plans. In addition, climate change considerations will need to become a fundamental part of land use planning, since one of the most effective strategies for reducing the risks of climate change is to avoid placing people and infrastructure in vulnerable locations.
- **Integrating Land Use and Transportation Planning** – Increasing coordination of land use and transportation planning and investment presents many opportunities for Vermont, including economic vitality, environmental sustainability and improved mobility and accessibility. The ability to work more with local economic developers and planners may also provide an opportunity to facilitate transportation projects.

There are many challenges to integrating land use and transportation planning. In Vermont, as in most states, municipalities make land use planning, zoning and permitting decisions. These decisions frequently have important impacts on transportation infrastructure in or near the community. Although VTrans is often consulted only tangentially in these local planning and “decision” processes, the responsibility for addressing transportation infrastructure needs associated with these local decisions frequently fall to VTrans. The creation of a practical and successful nexus between local land use planning and decision-

making will be critical to successfully coordinate land use and transportation planning.

Also typical is that transportation problems – and solutions for those problems – are not considered until the accumulative effect of the land use decisions and multiple developments are very apparent in the form of serious safety and/or mobility problems. The second is moving transportation “needs” planning – at the local, regional and state level – like other utility needs analysis planning – from a typically “reactive basis” (analyzing problems and seeking solutions after the problem is already very apparent) to a “proactive basis” (anticipating and addressing problems before they occur). VTrans currently undertakes mitigation and consultation activities within land management that promotes environmental stewardship and helps to integrate land use and transportation planning decisions.

- **Evolving to Corridor Management Planning** – Corridor planning has become an area of focus in VTrans and is an executive-level priority. By using a corridor approach to management and planning, many benefits can occur. This comprehensive method can save money and resources through increased coordination between localities and agencies, more thorough planning efforts and better tracking of deficiencies. Corridor management also encourages the coordination of land use and transportation planning. Corridor management may also take advantage of ITS, which further improves the efficiency of the transportation network.

Through the experience gained in carefully evaluating possible future scenarios we may face as a state, we can also make the LRTBP strategies flexible enough to respond effectively to a variety of situations as they emerge. In this way, Vermont can seize the opportunity to be a leader in making cost-effective transportation investments. Our transportation system can be so effective and reliable that our economy and natural environment continue to provide a nationally-recognized quality of life for our people. We can lead in developing practices allowing us to respond to environmental degradation and lessen the impacts of climate change and energy constraints. The challenges are great, but we have started to meet them.

4. Vermont Agency of Transportation Vision, Goals and Objectives

To respond to the challenges and opportunities articulated in the LRTBP, VTrans developed a series of goals and objectives that support pursuit of the VTrans vision and mission. Underlying all of this is the Road to Affordability theme, which focuses VTrans on two broad operating principles: preserving Vermont's transportation assets and realigning transportation investment priorities.

This section summarizes the LRTBP Vision, Mission, Goals and Objectives. The specific strategies VTrans will pursue to implement the objectives and achieve the goals are described in Section 6.

A. Guiding Principle – The Road to Affordability

Vermont has an aging transportation infrastructure that demands greater and more costly attention than in the past. As a result, bridge, culvert and road repair are competing with new roadway construction projects for limited funds. Given this reality, Vermont must first step back and preserve its existing assets so that they do not deteriorate to the point that they require major reconstruction and become a financial drain on the entire system. The Road to Affordability thus encompasses a key set of strategic parameters, including:

1. Realignment of Priorities

- Primary investment will focus on traveler safety and the preservation of existing infrastructure.
- Optimize financial resources by focusing attention on a practical number of large projects, including the development of multimodal networks
- Set realistic timetables for large projects and new roadway segments, and balance funding within the Roadway Program to reflect a priority on system preservation.

2. Rethinking Project Focus

- Back to Basics – Where design status allows, develop project scopes that limit the addition of project amenities not related to preservation and environmental protection. (Example: under-grounding of utilities, streetscapes)
- Innovative Finance - Any proposed new roadway-segment project not presently in the Development & Evaluation portion of the Capital Program will require an innovative financing approach acceptable to the Agency prior to being considered for inclusion in the capital program. Also, employ innovative finance to fund multimodal projects.
- Just-in-time delivery of Design, Right of Way, & Permitting – VTrans will begin these processes only after project funding has been identified and a time line has been established so time, money and effort is not wasted.

Vermont Agency of Transportation

Vision & Mission

Vision

- **The Vermont Agency of Transportation's (VTrans) vision is a safe, efficient and fully integrated transportation system that promotes Vermont's quality of life and economic wellbeing.**

Mission

- **VTrans' mission is to provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.**

B. Goals and Objectives

To help VTrans carry out its mission and move toward achieving the vision, the Agency identified a set of broad goals. Within the context of the Road to Affordability theme, these goals address safety, excellence, planning and preservation. Each goal is supported by a set of more specific and measurable objectives. By using this framework, VTrans will be able to monitor and gauge its progress toward achieving its mission and determine the need for refining and changing implementation strategies over time.

Goal – *Safety*: Make safety a critical component in the development, implementation and maintenance of the transportation system.



Objectives:

1. Reduce employee first reports of accidents and injury from 208 to 175 by 2010.
2. Reduce the number of annual major highway crashes to 350 or fewer by 2010, and achieve a rate of fatalities occurring in vehicle crashes to a five-year average below 1.0 per 100 million vehicle miles traveled.
3. Enhance the safety and security of the state's airports, highways, rail system and public transit services.

Goal – *Excellence*: Cultivate and continually pursue excellence in financial stewardship, performance accountability, and customer service.



Objectives:

1. Deliver projects and services on time and on budget
2. Improve the Agency's cash flow and utilization of funds through timely authorizations, billings and payments.
3. Design a comprehensive workforce development plan for implementation during 2009.
4. Continue to improve the service level the Agency provides its customers.

Goal – *Planning*: Optimize the future movement of people and goods through corridor management, environmental stewardship, balanced modal alternatives, and sustainable financing.



Objectives:

1. Inventory and assess by 2010 the condition of all transportation assets.
2. For assets that are inventoried, align asset management target performance levels with the necessary financial resources described in the four-year Statewide Transportation Improvement Plan and develop by 2008 a five-year capital program.
3. Plan, design, construct and maintain all projects in compliance with federal and state environmental laws, adhere to the Agency's environmental stewardship policy, and collaborate with other Vermont agencies and entities to develop effective and efficient ways to protect or enhance the environment.

Goal – *Preservation*: Protect the state's investment in its transportation system.



Objectives:

1. Maintain the state transportation system to the highest practicable physical condition.
2. Annually develop strategy that preserves the safety of and the mobility within all transportation modes.
3. Increase utilization of alternative transportation modes such as aviation, rail, public transit and bike/pedestrian.

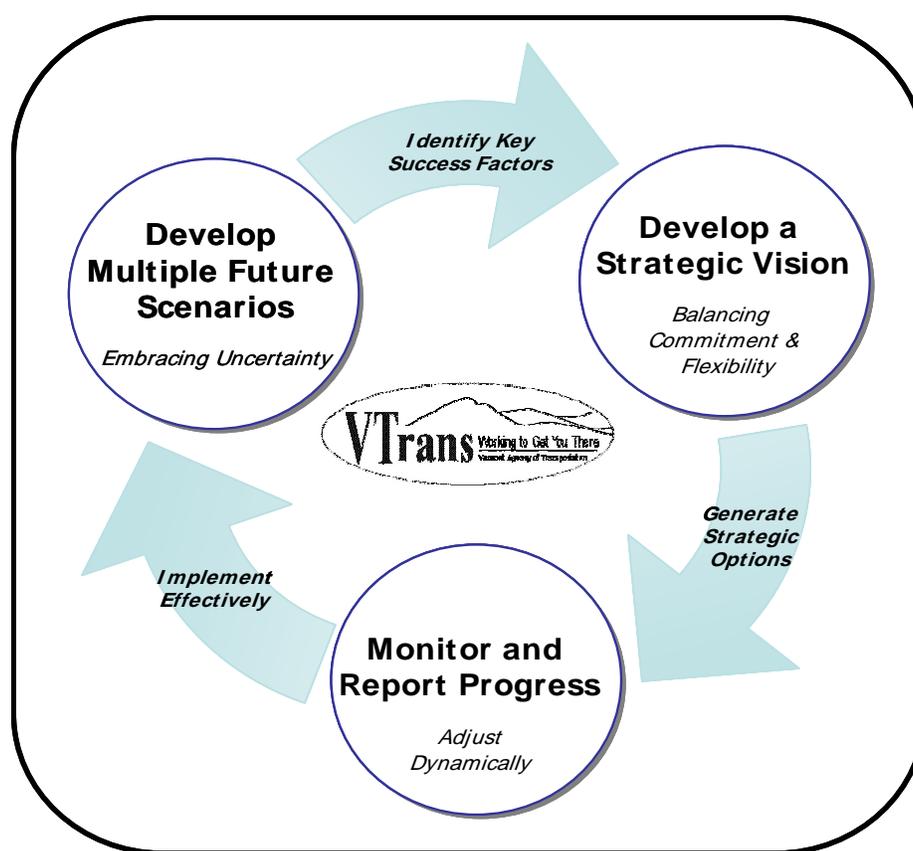
5. Alternative Long Range Transportation Business Plan Scenarios

A. Introduction

Our world is changing rapidly around us. Various issues such as climate change, energy constraints, and fiscal problems affect our ability to reliably predict future transportation needs and impacts. Based on current trends, it is evident that our future could take any number of turns. Agencies and institutions are best served by a long range plan that incorporates the flexibility to respond to a variety of future conditions (scenarios), any of which may come to pass but that cannot be predicted with certainty.

It is critical, therefore, that the LRTBP be crafted in a manner that allows for adjustments and “fine-tuning” to VTrans’ implementation strategies as different global scenarios play out over time. To address this need, the LRTBP development process used an approach known as “Scenario Planning” to help VTrans respond to the question of what might happen in the future and how it could adapt accordingly.

Figure 14: Overview of the Scenario Planning Process



As shown in Figure 14, Scenario Planning allows VTrans to develop the LRTBP in a way that embraces future uncertainties, balances commitment with flexibility and allows the Agency to adjust its strategies and operations dynamically to changing circumstances. In other words, by accepting that the future contains many unknowns and by anticipating the various ways in which those unknowns may affect our ability to meet VTrans' goals and objectives, Scenario Planning facilitates the Agency's ability to make "midcourse corrections" to its strategies and operations so that we remain on the path toward those goals and objectives.

A "scenario" consists of a combination of different assumptions about driving factors, external to the transportation system, such as the aging of the population, energy prices and shifts in type of energy, land use patterns, and economic changes (for example, from a manufacturing/agricultural economy to a service/tourism/information economy). In the context of Vermont's LRTBP, scenarios involve national and global events that may create obstacles to achieving VTrans' goals. This planning process is not about choosing a particular future or scenario. Rather, the process is about defining policies that can help VTrans adapt to changing circumstances.⁵

The Scenario Planning Session (SPS), convened in June 2007, engaged over 75 participants carefully selected by VTrans and the consultant team to represent a cross section of Vermont's transportation stakeholders. Prior to the SPS, participants were sent a description of the four scenarios and other related materials in preparation for the event. At the SPS event itself, participants were broken up into small facilitated groups to discuss each scenario and address the following general framework question: "What actions, plans, policies, or programs should VTrans pursue to achieve this objective (Objectives 1-5) given the future scenario that has been described?" The objectives used for the discussion framework were:

1. Provide a safe and secure transportation system.
2. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability in the most effective and efficient manner.
3. Improve and connect all modes of Vermont's transportation system to provide Vermonters with choices.
4. Strengthen the economy, protect and enhance the quality of the natural environment, promote energy conservation, and improve Vermonters' quality of life.
5. Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.

At the conclusion of the facilitated discussions, each group reported out to the assembled audience the two or three major themes that emerged from their groups

⁵ Details of the Scenario Planning process employed in the LRTBP process may be found in "Working Paper 7: Summary of Scenario Planning Session" (published August 2007), <http://www.rsginc.com/vtplan/vermontplan/reports.htm>.

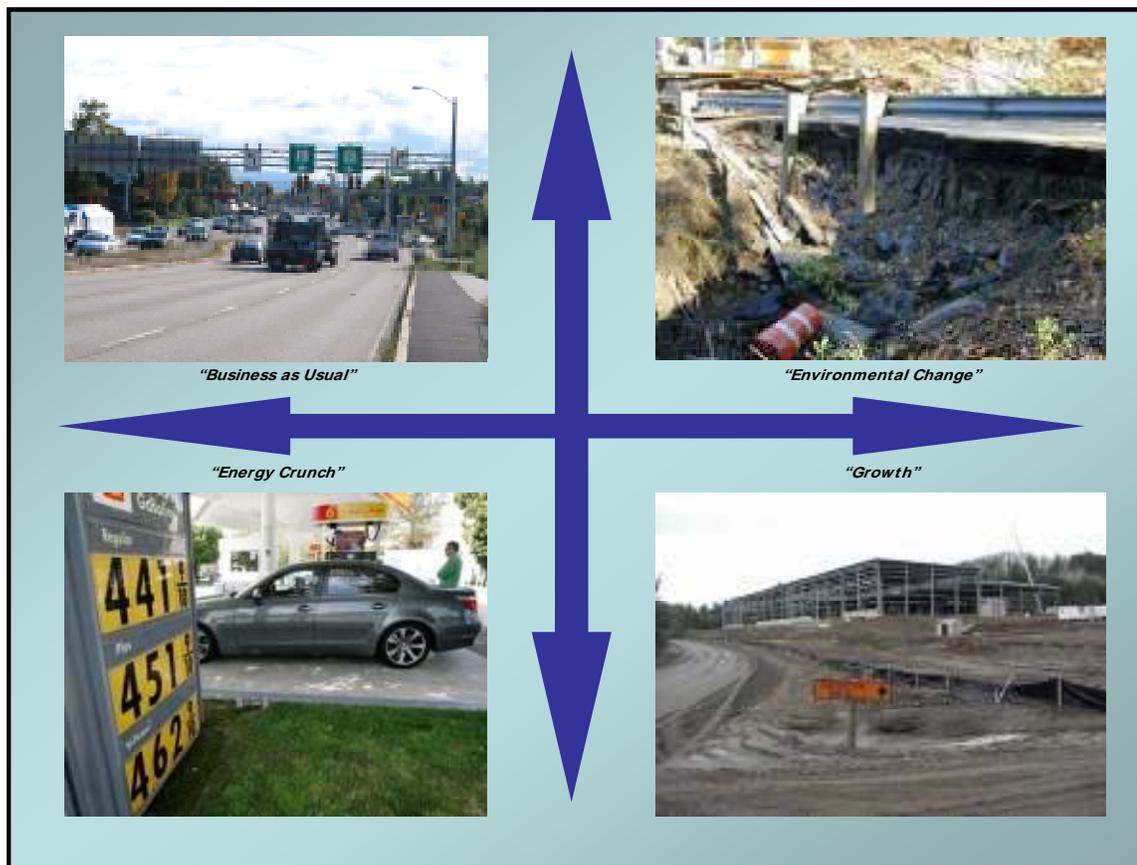
under each scenario. The enormous amount of qualitative data collected during the SPS session was organized using the five objectives as a framework.

B. The Alternative Scenarios

Based on input from national experts, Vermont “Big Thinkers,” focus groups and VTrans staff, the LRTBP considered four planning scenarios:

- ***Business As Usual*** – Existing trends continue through the 2030 planning horizon. The most significant characteristics are slow/moderate population growth, aging of the population, land use decentralization, shift to a service economy, and a projected gap between the costs of transportation needs and funding. The threat posed by devolution of federal user tax distributions is also included in the scenario. Additional trends a youth drain, energy vulnerability, and decline in higher education enrollment. All of these trends suggest slow or stagnant economic growth.
- ***Environmental Change*** – Air quality deteriorates and VT becomes a non-attainment area. In addition to negative impacts to our health and loss of Vermont’s clean environment “brand,” this unfortunate designation leads to regulatory requirements that affect project programming and selection. This scenario could also be characterized by additional measures designed to reduce green house gas emissions, which could be triggered by changes in national policies or implementation of state programs and policies (even if national policies are not implemented).
- ***Energy Crunch*** – The global supply of oil peaks or is interrupted for other reasons. There is a permanent and significant rise in the cost of fossil fuels. In addition, the Vermont Yankee nuclear power plant, which provides 30% of the state’s electricity, is decommissioned and a replacement source has not yet been secured. As a result, electricity is more expensive and not competitive as an energy source for electric or hybrid vehicles that use electricity from batteries charged over night. Higher cost oil/gas and electrical costs make Vermont less attractive to new businesses and existing businesses begin to leave for locations with lower cost, and more reliable energy.
- ***Growth Scenario*** – A new employer locates a major new manufacturing facility in one area of the state outside of Chittenden County (e.g., in Rutland or St. Johnsbury). There will be many jobs (by Vermont standards) available at the facility, which in turn spurs additional services and retail growth in the surrounding region. In addition, a major event occurs globally or nationally that causes a significant increase in in-migration. Migration currently accounts for about ½ of the projected population change in Vermont. As a result, Vermont’s population grows faster and is more diverse. The migration includes people with growing families that fuel population growth into the next generation.

Figure 15: The Four LRTBP Alternative Scenarios



While these scenarios are by no means considered exhaustive or encompassing of the complete range of future possibilities Vermont may face, they do provide a useful spectrum of the direction and magnitude of looming challenges to effective transportation planning and implementation.

C. Responding to the Scenarios

Based on this assessment, the people involved in the scenario planning process identified a variety of general and specific recommendations for application to the LRTBP. The following presents a high-level synopsis of these cross-cutting themes and suggested recommendations:

Section 6, “Long Range Transportation Plan Implementation,” provides a process by which VTrans may use the results of the scenario planning process to build significant flexibility into its approach for implementing the adopted strategies. By monitoring and considering the aspects of the various scenarios that may or may not become reality over time, VTrans can ensure it devotes its limited resources to the most beneficial strategies and maintains progress toward achieving the LRTBP objectives, goals and vision.

Scenario Planning Session Theme	Suggested VTrans Response
Enhance the role & profile of VTrans	Advocate, educate & facilitate LRTBP implementation
Improve multimodal alternatives	Include transit, bicycles, pedestrians and rail in investment planning
Emphasize land use planning	Endorse smart growth & access management
Develop dynamic design standards	Avoid “cookie cutter” approaches to projects
Prioritize energy and climate change	Anticipate & prepare for the crunch
Identify alternative financing	Consider new sources for funding transportation needs

6. Long Range Transportation Business Plan Implementation

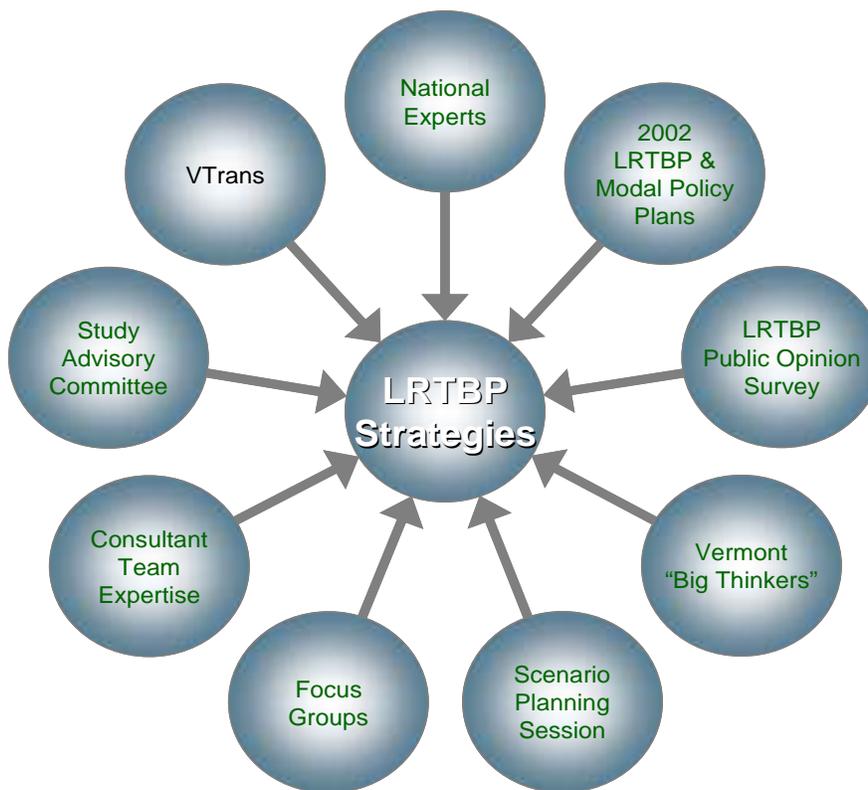
The results of the scenario planning process suggest that in order to move Vermont forward and maintain its quality of life and economic competitiveness, VTrans and its partners at the state, regional and local levels will need to make a variety of fundamental changes over time in the way we manage, build and invest in our transportation system. This section explains the processes used to develop the LRTBP strategies. Seven goals were developed using VTrans internal goals and the objectives identified in the scenario planning process. Each goal can be met through the implementation of the strategies. Additionally, the purpose of, accountability for, and implementation timeline is presented for each strategy.

A. LRTBP Policy Goals and Strategies

In order to address these challenges, a series of policy-level goals and strategies have been developed for VTrans to act upon over time. As illustrated in Figure 16, these strategies are derived from assessing the scenario planning results, the Agency's goals, and public input. As shown in the following implementation framework tables, while some strategies can be acted upon in the near-term, most will need to be implemented over the long-term in conjunction with other fundamental policy changes.

The strategies are intended to help make VTrans more nimble and adaptable to our changing world and respond to the suggestions of those involved in the Scenario Planning Process. Some are broader policy recommendations for the state as a whole, while others are aimed at VTrans management and operations internal policies. Implementing these recommendations will require close cooperation and coordination among all of Vermont's transportation planning and operating agencies, local governments, and the public.

Figure 16: Inputs to LRTBP Implementation Strategies



Tables 3 through 10 represent the seven policy goals and corresponding strategies. A purpose is provided for each strategy to explain the reason why the strategy is needed. There are several columns that indicate the key parties responsible for each strategy. The “Primary” VTrans accountability column lists the main division responsible for the implementation; whereas the “Support” column indicates the secondary VTrans division responsible for helping the “Primary” division to implement each strategy. Also listed are the external partners that can work with VTrans to ensure successful implementation of the strategies. The final column gives a time frame for implementation.

Table 3: Policy Goal 1

Policy Goal	Strategies	Purpose	Accountability			
			VTrans		External Partners	Implementation Target
			Primary	Support		
<p>1. Secure Sustainable Funding and Finance Sources</p> <p>The LRTBP relies on more efficient and cost-effective use of our traditional transportation funds. To achieve the LRTBP goals and objectives, however, will require moving beyond limited traditional sources and seeking revenues and financing from a more diverse and robust set of sustainable mechanisms that work in Vermont's small state environment.</p>	A. Pursue debt financing (bonding) as a cost-effective means of supplementing pay-as-you-go revenue for critical current needs.	To minimize impacts of infrastructure cost inflation on revenue needs	Finance & Administration	Policy & Planning	VT Legislative Transportation Committees	Immediate
	B. Explore indexing the Motor Fuel Tax to keep pace with the rate of inflation.	To increase the revenue capacity of the Motor Fuel Tax	Finance & Administration	Policy & Planning; Department of Motor Vehicle	VT Legislative Transportation Committees	Short Term (0-5 Years)
	C. Explore/assess the need to increase motor vehicle related fees and sales taxes.	To increase transportation revenues by allocating proportionate charges to system users	Finance & Administration	Department of Motor Vehicles; Policy & Planning	VT Legislative Transportation Committees	Short Term (0-5 Years)
	D. Consider concessions and tolls on Vermont's highways.	To increase transportation revenues by capturing untapped value of highway assets	Finance & Administration	Policy & Planning	VT Legislative Transportation Committees	Short Term (0-5 Years)
	E. Monitor studies at the national and state levels regarding various mileage-based tax options as an alternative to the gas tax.	To help ensure more stable and predictable streams of transportation revenue	Policy & Planning	Finance & Administration	VT Legislative Transportation Committees; UVM Transportation Research Center	Ongoing
	F. Publicize existing Federal tax incentives for employers to invest in employee transportation and consider similar State incentives.	To increase funding for public transit and travel demand management strategies	Operations	Finance & Administration; Policy & Planning	VLCT VPTA VAPDA	Short Term (0-5 Years)
	G. Explore the potential for VTrans to use impact fees to pay for future transportation improvements and encourage increased use of impact fees at the local level.	To provide funding for development-driven transportation projects and encourage better integration of transportation and development decisions	Policy & Planning	Finance & Administration	VT Legislative Transportation Committees; State, Regional, and Local Governments	Long Term (>5 Years)
	H. Consider leasing of elements of all rights-of-way to appropriate lessees (e.g., fiber optic firms, automobile service/gas stations, data/communications firms, etc.).	To increase transportation revenues by capturing untapped value of highway assets	Program Development	Legal	Private Sector	Long Term (>5 Years)
	I. Evaluate existing partnerships with other states that hold potential for developing projects or initiatives of sufficient financial scale that may attract public-private partnerships to Vermont and northern New England, New York and Canada.	To finance in-state elements of major regional transportation projects at the lowest possible cost to Vermont	Program Development	Policy & Planning	Other State DOTs Private sector; Canada	Short Term (0-5 Years)

Table 4: Policy Goal 2

Policy Goal	Strategies	Purpose	Accountability			
			VTrans		External Partners	Implementation Target
			Primary	Support		
<p>2. Optimize Transportation System Management & Operations</p> <p>It is important that Vermont make the best use of the facilities already in place. There are a wide range of emerging technologies and opportunities to increase the effectiveness of overall transportation system management. Getting the most out of our transportation investments requires monitoring the system's performance.</p>	A. Use the priority facilities and networks identified in modal policy plans to define a statewide, multimodal strategic transportation network as the principle focus of state funding.	To prioritize limited funding resources to programs with the highest return rate	Policy & Planning	Program Development; Operations	VT Legislature Regional Planning Commissions and Metropolitan Planning Organization	Short Term (0-5 Years)
	B. Continue to work with Regional Planning Commissions on developing a value-added methodology for prioritization of projects.	To maximize investments by prioritizing projects based on coordinated methodology	Policy & Planning	Program Development	Regional Planning Commissions and Metropolitan Planning Organization	Ongoing
	C. Place emphasis on developing long-term multimodal corridor management plans and intergovernmental corridor management and development agreements in cooperation with local governments and regional planning agencies.	To synchronize planning efforts to more effectively manage the transportation system & make more cost-effective investment decisions	Policy & Planning	Program Development; Operations	Regional transit agencies, State, Regional Planning Commissions, and Local Government	Ongoing
	D. Expand intelligent transportation systems (ITS) to facilitate more efficient transportation operations, including variable message signs, real-time highway and transit information, etc.	To improve highway traffic safety, decrease congestion, and maximize the efficiency of the system	Operations	Program Development	Transit Providers	Short Term (0-5 Years)
	E. Facilitate the ability of the transportation system to safely and efficiently accommodate both freight and person movement by collaborating with public and private entities to understand and address multimodal freight access needs for major destinations & economic hubs.	To support economic development and stability	Policy & Planning	Operations	Private sector, State Government	Long Term (>5 Years)
	F. Consider consolidating the planning and operations of publicly assisted transit services throughout Vermont.	To make public transit services as cost-effective, stable and extensive as possible	Operations	Policy & Planning	Transit providers VPTA VT Legislature	Short Term (0-5 Years)
	G. Continue funding and technical assistance for regional transportation planning and implementation through the Transportation Planning Initiative (TPI).	To facilitate improved transportation planning practices and policies at the regional and local levels	Policy & Planning	Finance & Administration	Regional and local planning commissions, CCMPO	Ongoing
	H. Continue to streamline and expedite the project development and permitting process through early consultation with resource agencies, greater reliance on consultant support services, and by exploring alternatives such as "design-build," "design-build-maintain" and comprehensive management service contracts for implementing a collection of projects.	To find more efficient and effective means of project delivery and the associated resource permitting.	Program Development	Operations, Policy & Planning, Finance & Administration	Federal & State Resource Agencies, USDOT Agencies	Ongoing
	I. Continue to emphasize long-range modal and multimodal planning and the development of new strategies and policies.	To better understand evolving modal and intermodal issues and conditions; to evaluate VTrans' strategic performance; and to fulfill federal and state planning requirements.	Policy & Planning	Operations, Program Development, Finance & Administration, Department of Motor Vehicles	Regional Planning Bodies, Federal and State Resource Agencies, USDOT Agencies, and the public.	Ongoing

Table 5: Policy Goal 3

Policy Goal	Strategies	Purpose	Accountability			
			VTrans		External Partners	Implementation Target
			Primary	Support		
<p>3. Provide a Safe and Secure Transportation System</p> <p>Vermont's transportation network should provide the safest possible experience for those traveling on it, whether by car, transit, train, foot, bike or rail. In addition, the system needs to be resilient and able to function adequately in the context of natural and manmade disasters and security incidents.</p>	<p>A. Continue to implement, monitor and report on progress of the Vermont Strategic Highway Safety Plan (SHSP).</p>	<p>To improve safety on Vermont's highways</p>	SHSP Core Group	<p>Program Development; Operations; Policy & Planning</p>	<p>Public Safety, Education, Health, and Labor Governor's Highway Safety Program</p>	Ongoing
	<p>B. Develop and maintain safety plans for all modes of transportation in a manner relevant to each mode's safety issues.</p>	<p>To improve safety within each transportation mode over which VTrans has jurisdiction</p>	Operations	Policy & Planning	<p>Transit Providers Vermont Railway System</p>	Short Term (0-5 Years)
	<p>C. Assess the need to maintain security plans for all modes of transportation, including prevention, detection and response across all entities.</p>	<p>To meet federal requirements for security planning and to improve security within each mode</p>	Operations	<p>Program Development; Policy & Planning</p>	<p>Transit Providers Vermont Railway System Burlington International Airport Greyhound Bus Lines</p>	Short Term (0-5 Years)
	<p>D. Broaden connections with Vermont Emergency Management, Department of Public Safety, and FHWA to improve the ability of the transportation system as a whole to handle disasters and emergency events of local, regional and national scale.</p>	<p>To ensure that the transportation system continues to operate during natural and manmade disasters/emergency events</p>	Operations	<p>Program Development; Policy & Planning</p>	<p>Vermont Emergency Management</p>	Short Term (0-5 Years)
	<p>E. Ensure VTrans can handle emergency events and maintain provision of its services under the State Continuity of Operations Plan.</p>	<p>To ensure continuity of state operations during natural and manmade emergency events</p>	Operations	<p>Program Development; Policy & Planning</p>	<p>State of Vermont</p>	Short Term (0-5 Years)

Table 6: Policy Goal 4

Policy Goal	Strategies	Purpose	Accountability			Implementation Target
			VTrans		External Partners	
			Primary	Support		
<p>4. Preserve, Manage, and Operate the State's Existing Transportation System to Provide Capacity, Safety, Flexibility, and Reliability in the Most Effective and Efficient Manner</p> <p>One of Vermont's top priorities is to preserve the condition of the state's existing transportation system across all modes, including highways, rail, transit, non-motorized and multimodal facilities</p>	A. Give priority to funding for maintenance and preservation of transportation infrastructure.	To ensure existing transportation facilities remain in safe and reliable operating condition	Policy & Planning	Program Development; Operations		Ongoing
	B. Assess design and engineering standards necessary for transportation infrastructure to accommodate climate change impacts (e.g., extreme weather conditions) and evaluate inventory of facilities to determine vulnerabilities and adaptation priorities.	To ensure that the transportation system will operate reliably regardless of climate change impacts	Program Development	Policy & Planning; Operations	UVM Transportation Research Center VT Local Roads	Long Term (>5 Years)
	C. Use lowest life-cycle cost methodology to determine the appropriate schedule and intervals for upkeep of transportation infrastructure.	To optimize the use of limited preservation and maintenance resources	Program Development	Policy & Planning Operations		Short Term (0-5 Years)
	D. Review and modify where appropriate design standards and best practices to facilitate cost-effective maintenance.	To optimize the use of limited preservation and maintenance resources	Program Development	Operations		Ongoing
	E. Expand the use of asset management systems for roadway pavement, bridges, right-of-way, public transportation facilities and equipment, safety features and other infrastructure to prioritize expenditures.	To optimize the use of limited preservation, maintenance and management resources	Policy & Planning	Program Development; Operations		Short Term (0-5 Years)
	F. Consider development of a "strategic disinvestment" policy for transportation infrastructure and services whose maintenance, preservation and/or operating costs significantly exceed the value of their economic and societal benefits.	To serve as a basis for VTrans management and decision-making that will help reassess the value of state ownership and/or operation of transportation infrastructure and services	Policy & Planning	Program Development; Operations; Finance & Administration	VT Legislature Regional Planning Commissions Metropolitan Planning Organization VLCT	Short Term (0-5 Years)

Table 7: Policy Goal 5

Policy Goal	Strategies	Purpose	Accountability			Implementation Target
			VTrans		External Partners	
			Primary	Support		
<p>5. Improve and Connect All Modes of Vermont's Transportation System to Provide Vermonters with Choices</p> <p>These recommendations are aimed at making the transportation system in Vermont more robust and providing more choices for people and freight.</p>	<p>A. Emphasize and promote transportation system management (TSM), Intelligent Transportation Systems (ITS), and transportation demand management (TDM) strategies for addressing congestion and mobility.</p>	<p>To improve mobility through efficient management of the transportation system</p>	Operations	Policy & Planning	Regional Planning Commissions and Metropolitan Planning Organization	Short Term (0-5 Years)
	<p>B. Plan and support intermodal transportation facilities to provide multimodal options that reduce personal vehicle use and reduce Vermont's reliance on fossil fuels for meeting transportation needs.</p>	<p>To increase mobility while reducing carbon and other emissions from the transportation sector</p>	Policy & Planning	Operations; Program Development	Regional Planning Commissions and Metropolitan Planning Organization	Long Term (>5 Years)
	<p>C. Accommodate non-motorized transportation within the transportation system.</p>	<p>To increase opportunities for non-motorized travel across the state</p>	Policy & Planning	Operations; Program Development	Regional Planning Commissions and Metropolitan Planning Organization	Short Term (0-5 Years)
	<p>D. Conduct ongoing assessments of non-single occupant vehicle (SOV) modes to determine their economy, efficiency and effectiveness relative to other transit opportunities to ensure mobility and accessibility.</p>	<p>To improve mobility and accessibility while decreasing SOV trips that burden the system</p>	Policy & Planning	Operations	VPTA RPCs & MPO	Ongoing

Table 8: Policy Goal 6

Policy Goal	Strategies	Purpose	Accountability			Implementation Target
			VTrans		External Partners	
			Primary	Support		
<p>6. Strengthen the Economy, Protect and Enhance the Quality of the Natural Environment, Promote Energy Conservation, and Improve Vermonters' Quality of Life</p> <p>To help preserve and enhance the state's economic vitality and Vermonters' quality of life, VTrans will work with other state agencies, the Vermont legislature, and the public to meet and address economic, environmental and energy-related challenges and opportunities.</p>	A. Implement the June 2008 VTrans Climate Change Action Plan.	To ensure VTrans can expeditiously and effectively respond to climate change impacts and requirements	Policy & Planning	Program Development; Operations;	ANR	Short Term (0-5 Years)
	B. Monitor and participate in, as appropriate, research on climate change impacts that identify changes or improvements necessary to maintain system operability and statewide mobility.	To use climate change research to optimize transportation investments	Policy & Planning	Operations; Program Development	UVM Transportation Research Center	Ongoing
	C. Integrate transportation planning and investments with state and local economic development strategies and plans.	To support economic development and better connect land use and transportation planning	Policy & Planning	Program Development; Operations	ACCD, local and regional planning and economic development organizations	Long Term (>5 Years)
	D. Coordinate with Agency of Commerce and Community Development (ACCD) to evaluate the impacts of local planning and development decisions on the operations, physical condition, capacity, safety and cost of state transportation facilities.	To ensure that local planning decisions do not conflict with VTrans planning and programming	Policy & Planning	Program Development; Operations	ACCD, local and regional planning and economic development organizations	Short Term (0-5 Years)
	E. Increase the use of, and support additional access to and development of, alternative fuels that could reduce Vermont's reliance on fossil fuels.	To improve transportation fuel options to maintain mobility and decrease pollution and GHG emissions	Operations	Policy & Planning; Program Development	Research organizations Private sector UVM Transportation Research Center	Ongoing
	F. Encourage the development and use of transportation construction and operations technologies that reduce emission of greenhouse gases (support work of UVM Transportation Research Center in this regard).	To reduce transportation sector's contribution to GHG emissions	Operations	Policy & Planning; Program Development	UVM Transportation Research Center	Short Term (0-5 Years)
	G. Enhance coordination of policy development between the Agency of Natural Resources (ANR) and VTrans.	To coordinate policy efforts to maximize policy efficacy	Policy & Planning	Program Development; Operations	ANR	Ongoing
	H. Promote transit services as a tool to support tourism and economic development.	To expand mobility options to increase tourism and business opportunities	Operations	Policy & Planning	Transit providers VPTA ACCD	Short Term (0-5 Years)
	I. Monitor and plan for the possibility of Vermont's designation as a non-attainment area for federal air quality standards, including training staff on policy, planning and programming issues that would result from that designation.	To prepare for policy changes that may effect future operations, management, and projects	Policy & Planning	Program Development; Operations	ANR	Short Term (0-5 Years)

Table 9: Policy Goal 7

Policy Goal	Strategies	Purpose	Accountability			Implementation Target
			VTrans		External Partners	
			Primary	Support		
7. Support and Reinforce Vermont's Historic Settlement Pattern of Compact Village and Urban Centers Separated by Rural Countryside Vermont will more effectively coordinate land use and transportation planning to improve mobility and livability, as well as to facilitate reducing growth in vehicle miles traveled and greenhouse gas emissions from transportation sources.	A. Support transportation improvements and services assessed as critical to enhancing, stimulating and connecting vital urban and village centers.	To promote smart growth and increase economic development/ access to jobs	Policy & Planning	Program Development	VAPDA VLCT RPCs & MPO ACCD	Short Term (0-5 Years)
	B. Work with the Department of Buildings and General Services to encourage and support the siting of public use state and local government facilities and services in multimodal access areas to the extent possible.	To make public facilities as accessible as possible through multiple transportation modes	Operations	Program Development	Buildings and General Services	Long Term (>5 Years)
	C. Design, build and maintain transportation facilities with consideration given to scenic, aesthetic, historic, and environmental resources, while respecting financial constraints and maintaining safety and mobility.	To preserve and protect Vermont's resources and heritage	Program Development	Operations; Policy & Planning	VT Local Roads	Ongoing

B. LRTBP Implementation – The Scenario-Strategy Relationship

Section 5 of the LRTBP discusses the results of the Scenario Planning process undertaken as part of this effort. While we cannot know with certainty which, if any, of the four possible future scenarios will come to pass, it is likely that elements of each will materialize. Therefore, it is important to consider how the implementation of this LRTBP and its strategies can be made flexible enough to allow VTrans to both react proactively to future changes and pursue strategies that facilitate the positive aspects of scenarios. While VTrans' goals and objectives address key aspects of the different scenarios, they are also intended to underscore the "Road to Affordability." Yet the four scenarios each contain elements that VTrans will have to strategically adapt to if any of them begin to emerge. The following scenarios are each associated with specific recommendations that VTrans will need to consider if trends move in the direction of the scenario.

Business as Usual Scenario:

- If Vermont's population continues to grow older (on average), VTrans will need to make changes to support the mobility of elders. This may mean shifting funding priorities toward making transit for rural elders more accessible, instituting reevaluations of driving skills for drivers license renewals, changing road signage and signals to be more visible, and longer pedestrian times to cross intersections.

Environmental Change Scenario:

- If Vermont or a geographic region within Vermont falls out of attainment with national air quality standards due to increased air pollution or more stringent federal standards, VTrans will have to adapt to changes in funding and priorities. For example, federal law will require that all the funds from the federal Congestion Mitigation and Air Quality Program (CMAQ), currently used across the state primarily for transit operating assistance, be allocated solely to the non-attainment areas for appropriate projects and actions. Similarly, if the federal government passes laws or adopts policies to aggressively address climate change impacts, the transportation sector and VTrans could be dramatically affected and will have to shift priorities accordingly.

Energy Crunch Scenario:

- If this scenario begins to unfold, there is real potential for the transportation sector to be radically transformed over the next 20-50 years. Considering that gasoline prices reached \$4.00 per gallon as of May 2008, it seems likely that this scenario is being realized in certain ways. To best prepare, VTrans needs to consider the impacts of an increased need for alternative fuels and alternative fueled vehicles, alternative transportation modes (e.g., public transit), and major price increases in non-renewable fuels. Part of properly addressing this scenario will be to identify alternative funding sources that do not rely on taxing petroleum. If the energy crunch decreases demand, a tax on vehicle miles may not be a high source of revenue.

Growth Scenario:

- If growth in Vermont were to take an unexpected upturn, the burden on the state's infrastructure and natural resources would grow as well. VTrans would have more

responsibility to maintain and preserve roads, bridges and other infrastructure. There would also be more traffic congestion to alleviate and it will be more difficult to meet air quality standards. A larger population base, however, may present revenue opportunities for VTrans to meet the transportation needs of the state. Accompanied by more concentrated land development, a larger population could also provide more opportunities for increased transit usage and expansion of transit services.

As noted in Section 5, by anticipating these potential changes in the planning landscape, VTrans will be in a position to expeditiously and cost-effectively make any needed “mid-course” corrections to the LRTBP strategies so that the VTrans goals and objectives may still be achieved. VTrans will need to monitor, report and assess strategies on a regular basis (annually, at a minimum) in order to track its progress and determine whether and how (a) it is achieving the LRTBP objectives and (b) the scenarios may be affecting implementation strategies, thus requiring adjustments to those strategies.

C. Foundations of LRTBP Implementation

LRTBP implementation can build on the existing opportunities in Vermont’s planning structure, planning organizations, partnerships and public involvement practices. Key implementation opportunities include the following:

- **Public involvement and consultation** - Vermont has a long history of effective public involvement in which citizens can discuss long-range issues and review priorities. Public involvement and consultation are particularly important since full implementation of the LRTBP hinges on public support.
- **Legislative action** - Implementation of several LRTBP policies and strategies rely on legislative leadership. Enacting new funding methods, greater investment in the public aspects of transportation and removing institutional barriers will require state and federal legislative changes.
- **Vermont’s statewide multimodal planning and management of funds** - VTrans’ planning program develops multimodal, modal and topic plans in order to implement the statewide multimodal priorities that are articulated in the LRTBP. The Agency’s roles in managing federal funds provide the opportunity to support and influence spending on aviation, highways, public transportation, park and ride facilities, bicycling, walking and rail. VTrans’ modal plans also define or refine the role of the state. The plans inventory existing conditions, identify minimum and desired levels of service and estimate costs to achieve the desired level of service.
- **Cooperation between VTrans, RPCs and the MPO** – Many key elements of Vermont’s overall transportation system are managed at the local and regional levels. Cooperative relationships between VTrans, RPC Transportation Advisory Committees (TAC) and the Chittenden County MPO enhance the opportunity to implement the Plan goals, policies, strategies and key initiatives in regional decision-making for all modes.
- **Federal, state and local coordination and partnerships** - The LRTBP advocates for increased planning coordination at the federal, state, regional and local levels and identifies specific actions that can build on existing relationships. As in the past,

Vermont can work with neighboring states to advocate for major regional corridor and mobility initiatives (e.g., the Boston-Montreal High Speed Rail Initiative, the CanAm Connections Corridor Initiative) that have benefits for both Vermont and Northern New England.

- **Public-private partnerships** - Innovative partnerships between public and private sector transportation providers may assist with transportation project financing and forward Vermont's interests in various transportation modes. For example, improving traffic flows and the interactions between modes requires better understanding of shipping issues and may involve consultations among air, rail, trucking and community interests. Similarly, creating more transportation-friendly communities may involve discussions among housing authorities, developers and transportation agencies.
- **VTrans' role in multimodal connectivity** - VTrans' current primary operational responsibility is the state highway system, but the Agency is also responsible for funding and managing certain bicycle/pedestrian, public transportation, aviation, park and ride, and rail facilities. These responsibilities provide opportunities for promoting connectivity of all modes including connectivity between local road systems, connectivity between modes and improved access to intermodal freight and passenger facilities.

Strategic management is adaptive and keeps an organization relevant. In these dynamic times, it is more likely to succeed than the traditional approach of "if it ain't broke, don't fix it."

D. Moving VTrans Forward through a Strategic Management Approach

To ensure the LRTBP goals and strategies can be effectively implemented over time, it is recommended that VTrans adopt the following *strategic management approach*, which is intended to help VTrans ensure it effectively links its day-to-day work to its overall goals and vision.

"Strategic Management" Defined

Strategic management is an 'umbrella' encompassing strategic planning, performance measurement and other tools. It draws an explicit link between an organization's strategic planning ("are we doing the right things?") and how that organization gauges or measures its performance ("are we doing things right?") by asking, "are we doing the right things right?" Strategic management and planning identifies what is important for the organization to be doing, in what priority, and by whom. It thus connects directly to measuring the performance of units and/or individuals. The key elements of the strategic management framework are organizational goals, organizational mission, and performance monitoring.

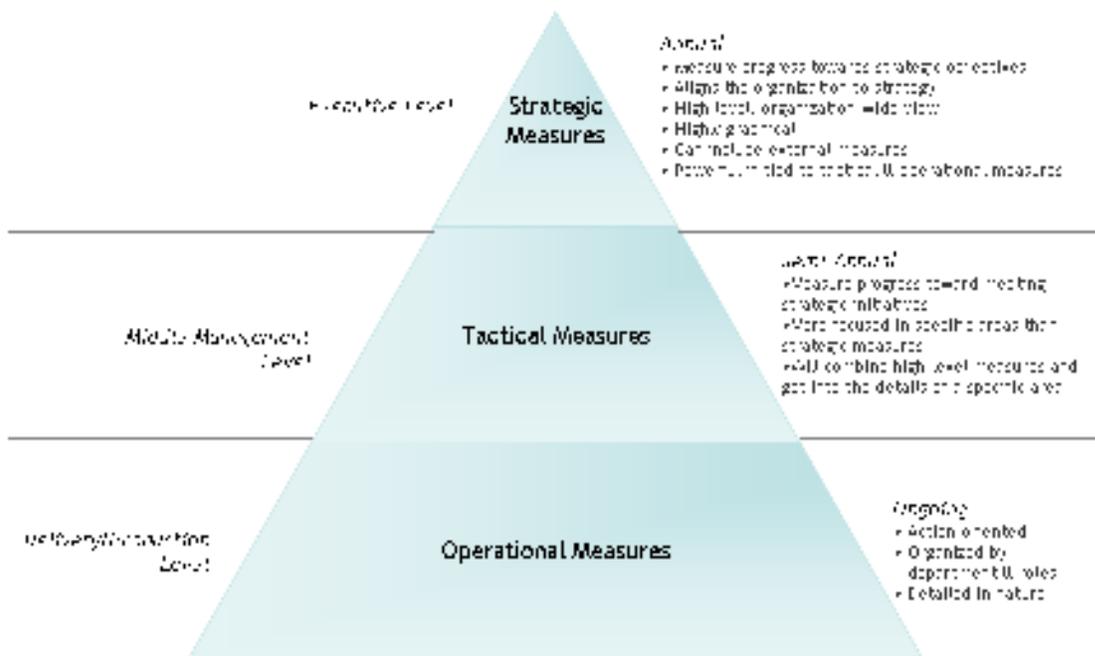
Performance Monitoring & Reporting

As described previously, VTrans has established a set of key goals and objectives. The LRTBP developed specific strategies for implementing these in the near-term and recommendations for policy changes to maintain progress over the long-term. A critical aspect of a strategic management process is for VTrans to continuously track progress and performance against these goals and objectives and identify strategic changes on a regular

basis. Why measure performance? Performance measurement tells VTrans and its stakeholders what it has done to address the state’s transportation needs and how efficiently it did its work.

In the LRTBP implementation framework, policy goals and strategies have been identified. The goals and objectives relate to outcomes – the degree to which VTrans’ output serves its ultimate mission or customer needs. Strategies refer to process – how we approach achievement of the goals. Progress indicators relate to outputs – the products or services being provided by the agency. The goals are long-term in nature, since they speak to the results VTrans wishes to achieve through its efforts over time. Therefore, it makes sense to evaluate progress toward the goals, but on a timeline that relates to their long-term nature. The strategies and performance targets associated with objectives are more finite and time-definite in nature, and can therefore be tracked and monitored in a more tangible and regular manner. These items can be essentially viewed as a “checklist” that is reviewed regularly to ensure the priority items are being addressed and completed.

Figure 17: The Hierarchy of Performance Measure Categories



As illustrated in Figure 17, performance monitoring and reporting may be viewed as a hierarchical relationship among three categories: strategic, tactical and operational:

- **Strategic measures** focus on overall agency progress toward the LRTBP objectives and policy goals. They are organization-wide in perspective and summary in nature. Often, strategic measures are reported in graphical form for executives and others to quickly and easily digest. They are usually updated on an annual or other relatively infrequent basis and can represent a “roll-up” of various tactical and operational measures. Strategic measures are quite powerful if they are used by executives to ensure the Agency’s structure and work program remains aligned to the LRTBP objectives, policy goals and strategies. Strategic measures will also help Executives **Tactical measures** relate to trends and progress towards meeting the LRTBP implementation strategies (and possibly other special projects). They are more focused in specific areas than the strategic measures. Tactical measures help the agency’s middle managers get a summary view of an initiative’s progress and then drill down into the root causes of issues and problems, including whether and how aspects of the different LRTBP scenarios may be influencing progress.
- **Operational measures** monitor the Agency’s business in near real-time with the aim of intervening quickly to fix problems or take advantage of opportunities. Typically, these measures are organized at the lowest logical organizational unit. They are detailed in nature, tied closely to specific organizational roles and output or production oriented.

Table 10 provides an example of how this framework may be applied to organize LRTBP performance monitoring and reporting, in this case for Pavement Management:

Table 10: Example of Framework for Strategic, Tactical and Operational Performance Measures

Executive Level	<ul style="list-style-type: none"> ▪ Report card showing percent of highway mileage meeting or exceeding pavement performance targets ▪ Map illustrating highway sections with improved, stable, and declining pavement condition
Middle Management Level	<ul style="list-style-type: none"> ▪ Percent highways in Good, Fair, or Poor condition based on pavement condition index ▪ Customer perceptions of pavement condition expressed through surveys
Technical Level	<ul style="list-style-type: none"> ▪ Specific measures of pavement cracking, roughness, rutting, faulting, etc. ▪ Pavement condition index as a function of above conditions

As important as performance monitoring and reporting is, it is also important to establish a system for monitoring that does not overwhelm agency resources. In other words, the benefits of performance monitoring should not be outweighed by the burden associated with that monitoring. Table 11, therefore, lays out a fairly straightforward framework for performance monitoring and reporting in the context of strategic, tactical and operational performance measures:

Table 11: Proposed VTrans LRTBP Performance Monitoring Framework

Monitoring Task	Frequency	Who
Track implementation tasks under each strategy (Operational)	Monthly or Quarterly (as appropriate)	Program Managers & Staff
Assess progress on each strategy (Tactical)	Semi-annual	Division Directors & Program Managers
Assess progress on each goal (Strategic)	Annual	Secretary & Division Directors
Review & revise goals, objectives and strategies (LRTBP Update)	Every 3-5 Years	Secretary/Entire Agency

One specific recommendation related to performance monitoring is for VTrans to revise its annual report to be more public-oriented and modern in both form and content. It should present high-level performance information on the LRTBP progress indicators in a succinct and easy-to-understand manner. In addition, the Annual Performance Report could include updates on whether and how the Alternative Future Scenarios have emerged and how VTrans is responding to them through mid-course corrections to its strategies. By publicizing this information in a publicly-accessible manner, the key task of gaining public buy-in to the fundamental changes necessary to achieve VTrans’ goals will be significantly easier.

E. Next Steps

In order to begin implementation of the LRTBP, address the preceding challenges and further the various initiatives already underway, VTrans will need to undertake several near-term (within one to three years) steps to ensure the Agency and state transportation system move smoothly onto the path toward meeting VTrans' goals and objectives:

- Adopt the LRTBP as the official transportation policy of the State of Vermont and as the state's priorities for legislative and regulatory action
- Review funding prioritization structures and refinements as needed to ensure alignment of VTrans funding priorities with LRTBP strategies
- In the annual budget proposal to the Legislature, report on the progress indicators described in the LRTBP for refining LRTBP strategies to ensure continued progress toward VTrans' goals
- Develop a biennial assessment of the emergence of aspects of alternative LRTBP scenarios and the extent to which LRTBP strategies may need to be adjusted to ensure continued progress toward VTrans' goals
- Continue building and refining VTrans' Asset Management System to provide a set of standard performance measures and information. This can be combined with the LRTBP progress indicators to provide a comprehensive picture of the state of the transportation system on a continuous basis
- Per VTrans' public involvement plans, revisit and update the LRTBP no later than every five years to account for changing circumstances, demands and resources. This will ensure VTrans' organization and resources are appropriately aligned with its vision and mission.

7. Financial Outlook

A significant hurdle to meeting transportation needs in Vermont will be finding the resources to pay for them. As discussed in Section 3, Vermont, like other states, is facing the challenge of revenue not keeping pace with the demand to maintain and improve transportation infrastructure. Cumulative transportation revenue shortfalls for Vermont are projected to be in the billions over the next 20 years (depending on the rate of inflation and other factors). Section 6 provides recommendations for securing financial resources. This section takes a closer look at projected funding gaps and what they may mean to VTrans' ability to meet the LRTBP goals and objectives over time.

A. Recent Transportation Funding History

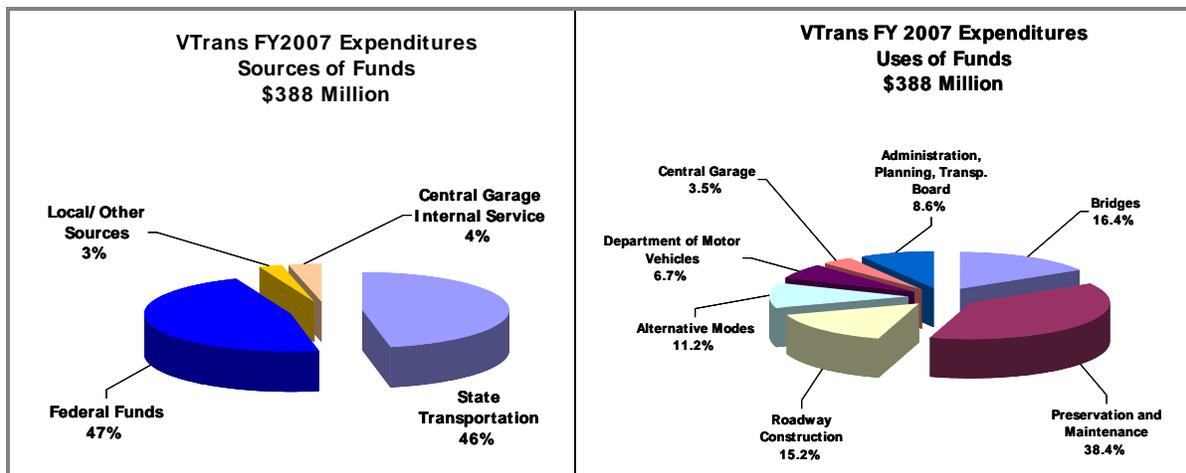
Between state fiscal years 2005 and 2008, Vermont's transportation spending rose from about \$356 million per year to about \$441 million. A key factor allowing this rise in spending was increased dollars from the federal government under SAFETEA-LU, which authorized \$244.1 billion⁶ in funding for surface transportation projects through 2009. Despite the increased federal assistance, Vermont still faces challenges in preserving its existing infrastructure that has deteriorated over the years. Vermont's 'Road to Affordability' program hopes to address this issue by reprioritizing projects that will enable it to free up money so that it could be used for preservation and maintenance.

Federal and state taxes and fees fund the bulk of Vermont's publicly-owned transportation system. Federal funds, collected primarily through the federal motor fuel tax, are apportioned to the states on a formula basis through the federal SAFETEA-LU law. Federal funds have been a crucial part of Vermont's transportation funds, contributing about 45% of transportation revenues in recent years, and have played a major role in supporting Vermont's transportation system. In addition to federal funds, state funds are generated primarily through taxes on the sale of motor fuels and by fees and taxes on the sale and use of motor vehicles. In 2007, Federal funds contributed about 47% of Vermont's transportation funding needs. State funds contributed 46%, with the remaining 7% coming from local and other sources and Central Garage Internal Service. Other revenue sources include Congressional earmarks for "high priority projects" in Vermont, totaling about \$138 million.

Figure 18 provides a snapshot of funding sources and uses for FY 2007, the latest year for which official VTrans figures are available.

⁶ SAFETEA-LU: http://www.fhwa.dot.gov/safetealu/safetea-lu_summary.pdf

Figure 18: Sources and Uses of VTrans Funds, Fiscal Year 2007



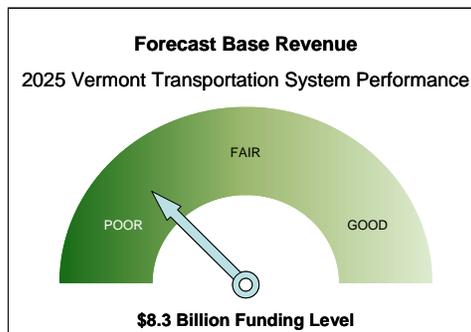
Source: Vermont Agency of Transportation, May 2008

B. System Performance Relationship to Investment Level

In the context of the LRTBP, there are two principal scenarios that we can consider related to transportation revenue levels over time: The “Forecast Revenue” Scenario and the “Sustain Current Performance” Scenario. The text below describes from a broad perspective how funding levels over time may affect the performance and reliability of Vermont’s transportation system. It should be noted that this text is based on analyses conducted in 2007 using assumptions considered valid at that time. Analyses conducted by and for VTrans since then, however, generally continue to support the finding that a substantial gap between forecast “current law” revenues and funding needed to maintain and operate the transportation system will exist and continue to grow in coming years.

“Forecast Revenue” Scenario

The base scenario, Forecast Revenue, represents the level of funding that the LRTBP process has projected to be available through 2025. It is estimated that \$8.3 billion will be available from all sources (federal and state) for preserving, managing and operating the state transportation system.⁷ With this scenario, it is likely that conditions on the state transportation system will deteriorate and that congestion and delay in key highway corridors would increase. Various bridges statewide will require load restrictions, increased maintenance or other special management measures to ensure safe conditions. It is also likely that it will be very difficult to expand public transit services.



“Sustain Current Performance” Scenario

The Sustain Current Performance Scenario represents the estimated funding needed to sustain the transportation system at the current performance levels, with no further deterioration of the system. The level of investment necessary to maintain today’s level of performance is estimated at between \$12.5 billion and \$16.9 billion, or from \$4.2 billion to \$8.7 billion beyond currently forecast revenues through 2025. In other words, simply to maintain today’s conditions on the Vermont transportation system will require an additional multi-billion dollar infusion of revenue over the next 20 years. Modernizing and improving the system to keep pace with economic opportunities and provide more mobility choices will require additional funding well above the level that simply sustains current performance.



⁷VTrans' consultant conducted the LRTBP financial analysis in 2007 using figures current at that time. It was assumed that the revenues available to Vermont for transportation purposes through 2025 would be comprised of federal funds, earmark revenues and State Transportation Fund revenues. Therefore, the consultant derived the revenue forecast from multiple sources of information: the Congressional Budget Office (CBO) 10-year forecast for Highway Trust Fund revenues; estimates of future Congressional earmarks; estimates of future Federal Transit Administration (FTA) funds for public transit; and projections of Vermont's State Transportation Fund revenues. In addition, for each category of revenue and each five-period between 2006 and 2025, the consultant applied a series of growth factors developed in collaboration with VTrans. The overall sum of figures for each period and category comprises the forecast of transportation revenues available to Vermont through 2025. (LRTBP Working Paper 3, "Financial Analysis," Feb. 2007, provides details of this analysis.)

C. The Funding Gap

The extensive effort that helped create the LRTBP makes clear that a range of strategies is needed to maintain, operate and improve Vermont's transportation system in order to support the state's economic growth and enhance residents' quality of life. However, under existing revenue and financing conditions, funding allocations will fall far short of being able to implement those strategies. Some of the key factors that have precipitated the relatively stagnant growth in Vermont's transportation revenue include:

- The cost of transportation projects increasing much higher than inflation in recent years
- Declining motor vehicle purchase and use taxes due to trend toward buying smaller cars that use less fuel, as a result of improved vehicle fuel efficiency, and also due to non-taxed propulsion systems.
- Fuel tax revenue not keep pace with inflation
- Transferring of transportation revenues to the state's general fund operations. From SFY 2002 to 2006, a total of \$250 million, or an average of \$50 million annually, has been transferred from the Transportation Fund to fund other state operations⁸

The Transportation Fund is also not growing fast enough to meet the increased costs of the transportation base needs - such as fuel, materials, salaries, and benefits, etc. - that together are growing at a rate of 5.6 percent annually.⁹ The base needs growth (5.6%) is substantially higher than the Transportation Fund growth (2%), resulting in less funds actually being available for projects.

Current estimates suggest that between now and 2025, an additional \$4.2 billion to \$8.7 billion will be necessary just to sustain existing transportation service levels in Vermont. If we wish to modernize and expand facilities and services in our transportation system, such as bridges, rail and public transit, the funding gap is likely to be much larger, creating additional pressure on state funds.

⁸ VTrans: SAFETEA-LU, <http://www.aot.state.vt.us/presentations/SAFETEALU/Slide18.htm>

⁹ VT LRTBP Working Paper 3, "Financial Analysis," Feb. 2007, pg. 17.

Figure 19: Estimated 2025 Funding Gap by Investment Scenario



Note: VTrans' consultant conducted the LRTBP financial analysis in 2007 using figures current at that time. It was assumed that the revenues available to Vermont for transportation purposes through 2025 would be comprised of federal funds, earmark revenues and State Transportation Fund revenues. Therefore, the consultant derived the revenue forecast from multiple sources of information: the Congressional Budget Office (CBO) 10-year forecast for Highway Trust Fund revenues; estimates of future Congressional earmarks; estimates of future Federal Transit Administration (FTA) funds for public transit; and projections of Vermont's State Transportation Fund revenues. In addition, for each category of revenue and each five-period between 2006 and 2025, the consultant applied a series of growth factors developed in collaboration with VTrans. The overall sum of figures for each period and category comprises the forecast of transportation revenues available to Vermont through 2025. (Source: LRTBP Working Paper 3, "Financial Analysis," Feb. 2007.)

As with all long-range forecasts, the level of funding available for VTrans may vary significantly from the \$8.3 billion figure used in this Plan. Many factors, including changes to federal funding streams, will affect the actual funding level. For example, the American Recovery and Reinvestment Act (ARRA) of 2009, passed by Congress in February 2009, allocated \$125 million in highway and bridge money and \$5.6 million in public transportation funding to Vermont. It is possible that additional federal funds may be directed to Vermont under this and/or other initiatives associated with federal economic stimulus efforts. In addition, some experts believe that Congress will significantly increase funding levels in the next federal surface transportation bill (due as early as 2009), which could reduce Vermont's future funding gap. Because it is extremely difficult to predict these and other future federal funding streams, all funding figures used in this Plan should be considered approximate and appropriate for planning purposes only.

D. Addressing the Funding Challenges

Faced with the challenge of preserving its existing and deteriorating infrastructure, as well as funding strategic enhancements to transportation system across the state, VTTrans will need to determine the probability of current funding patterns continuing and the implications of future changes to those patterns. This is where tough choices must be made. We know that transportation investments create economic benefits for residents and businesses in the state. We also know that thoughtful transportation investments can enhance our residents' quality of life and improve Vermont's economic competitiveness. The state's challenge is to now identify and implement long-term strategies to increase the resources available in the transportation system, and to use available resources as cost-effectively as possible in the near-term.

VTTrans has already recognized the emerging gap in funding availability and has begun to modify its activities, including pursuing "The Road to Affordability" initiative and implementing Asset Management techniques. Discussion between the administration and Legislature regarding raising significant additional revenue through bonding is anticipated to bear fruit as quickly as fiscal year 2010, and as much as \$130 million in federal economic recovery funds – better known as economic "stimulus funds" – are also expected in time for use in calendar year 2009 and 2010. Federal stimulus funding combined with local bonding is expected to give VTTrans an immediate jump start to bending the funding-deficit curve.

In addition to these efforts, pursuing the strategies outlined in this document will further set VTTrans on a course that allows its limited resources to be directed toward activities and investments with the greatest return on investment. As that return is realized in the form of a more efficient and cost-effective transportation system, Vermont can move toward making the long-term, large-scale transportation investments it will need to maintain the state's economic vitality and quality of life in coming years.

APPENDICES

Appendix A

Summary of Transportation Plans and Studies

Table A-1 identifies the plans and studies that VTrans completed in the last ten years as well as long range plans completed by regional planning commissions and the Chittenden County MPO (CCMPO). Since the publication of the 2002 plan, VTrans has updated all of its modal policy plans and has completed other planning initiatives related to corridor planning, access management, and safety.

TableA-1: Timeline of Recent Vermont Transportation Reports and Initiatives/Programs

Year	Statewide Plans	Regional Transportation Plans
1997	<ul style="list-style-type: none"> ▪ State Design Standards ▪ Project Development Process 	
1998	<ul style="list-style-type: none"> ▪ Vermont Statewide Intercity Bus Study ▪ Vermont Airport System Policy Plan (ASPP) ▪ Community Summer Outreach Forums 	
2000	<ul style="list-style-type: none"> ▪ Vermont Airport Capital Facilities Program (ACFP) ▪ Vermont Agency of Natural Resources Strategic Plan 2001-2005 	
2001	<ul style="list-style-type: none"> ▪ Transportation Planning Initiative Manual ▪ Vermont Freight Study ▪ East-West Highway Study ▪ Vermont Rail Capital Investment Policy Plan (RCIPP) ▪ Local Transportation Facilities Guidebook for Municipally Managed Projects 	<ul style="list-style-type: none"> ▪ Lamoille County Regional Plan 2002-2007
2002	<ul style="list-style-type: none"> ▪ Long-Range Transportation Plan Update ▪ Vermont Asset Management Vision and Work Plan ▪ Development of an Intelligent Transportation Systems (ITS) Strategic Plan for the State of Vermont ▪ Vermont Pedestrian and Bicycle Facility Planning and Design Manual 	<ul style="list-style-type: none"> ▪ Bennington County Regional Transportation Plan
2003	<ul style="list-style-type: none"> ▪ Traffic Calming Study and Approval Process for State Highways ▪ The Economic Impact of Vermont's Public-Use Airports ▪ Boston to Montreal High Speed Rail Feasibility Study Phase 1 ▪ Legislative Report: Asset Management at Agency of Transportation: Performance Measures (AM) 	<ul style="list-style-type: none"> ▪ Central Vermont Regional Transportation Plan ▪ Northwest Regional Long-Range Transportation Plan ▪ Two-Rivers Ottauquechee Regional Transportation Plan
2004	<ul style="list-style-type: none"> ▪ Vermont Access Management Public Outreach Workbook ▪ Highway System Policy Plan (HSPP) 	<ul style="list-style-type: none"> ▪ Plan for the Northwest Region
2005	<ul style="list-style-type: none"> ▪ Vermont Corridor Management Handbook ▪ State Rail Plan Update ▪ Vermont Twenty Year Electric Plan ▪ Vermont Statewide Intelligent Transportation Systems Plan Update 	<ul style="list-style-type: none"> ▪ Southern Windsor County Regional Transportation Plan ▪ Northeast Kingdom Regional Transportation Plan ▪ 2025 Chittenden County Metropolitan Transportation Plan
2006	<ul style="list-style-type: none"> ▪ Strategic Highway Safety Plan ▪ Vermont Rail Policy Plan (RPP) ▪ Vermont Public Transportation Policy Plan (PTPP) ▪ Vermont Byways Program 	<ul style="list-style-type: none"> ▪ Addison County Long Range Regional Transportation Plan (update in progress) ▪ Lamoille County Regional Transportation Plan ▪ Rutland Regional Transportation Plan ▪ Windham Regional Transportation Plan
2007	<ul style="list-style-type: none"> ▪ Vermont Airport System Policy Plan (APP) 	
2008	<ul style="list-style-type: none"> ▪ Vermont Climate Change Action Plan ▪ Vermont Bicycle and Pedestrian Policy Plan (BPP) 	<ul style="list-style-type: none"> ▪ CCMPO Regional Bicycle-Pedestrian Plan Update

A variety of initiatives and programs have also been implemented since the 1995 and 2002 Long Range Transportation Plans. Table A-2 presents a timeline of those initiatives and programs.

Table A-2 Summary of Recent Initiatives and Programs

Year	Initiatives and Programs	Description and Goals
2000	<ul style="list-style-type: none"> ▪ Phase I of Safety Management System 	<ul style="list-style-type: none"> ▪ Developed mission statement, goals, and performance measures
2002	<ul style="list-style-type: none"> ▪ <i>VTrans Asset Management Vision and Work Plan</i> 	<ul style="list-style-type: none"> ▪ Documented the current state of practice within the Agency and noted that VTrans has many of the components necessary for a sound asset management program. Identified several opportunities to strengthen asset management capabilities and methods.
2006	<ul style="list-style-type: none"> ▪ SAFETY: Draft Strategic Highway Safety Plan for Vermont¹⁰ ▪ The Vermont Safe Routes to School Program (SR2S) 	<ul style="list-style-type: none"> ▪ To reduce the occurrence and severity of crashes through effective, education, enforcement, engineering, and emergency response initiative ▪ To enable and encourage children, including those with disabilities, to walk and bicycle to school; to make walking and bicycling to school safe and more appealing; and to facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.¹¹

¹⁰ "Strategic Highway Safety Plan for Vermont, Draft Version 1"; not dated. See <http://highwaysafety.vermont.gov/Draftplan.htm>

¹¹ Fact Sheet on Highway Provisions Safe Routes to School Program, Federal Highway Administration, <http://www.fhwa.dot.gov/safetealu/factsheets/saferoutes.htm>

In addition to initiatives and programs above, VTTrans has implemented other initiatives and programs implemented in the areas of environmental stewardship, smart growth, and wildlife corridors:

- Environmental Stewardship
 - Watershed planning – numerous basin specific watershed plans and TMDLs¹²
 - Municipal Separate Storm Sewer Systems (MS4)
 - Lake Champlain Basin Program – Opportunities for Action
 - Clean and Clear Initiative
 - Stormwater and Erosion Control Program and Regulation
 - River Management Program and Planning
 - The Vermont Wetlands Program
 - The Governor’s Commission on Climate Change - evaluating options for reduction of green house gases (www.vtclimate.us). Vermont’s largest source of green house gases is vehicle exhaust, which bears on transportation fuel consumption and vehicle miles traveled.
 - The Air Pollution Control Division - manages the state’s adoption of the California Low Emission Vehicle program which impacts on transportation policy through requiring vehicles to reduce green house gas emissions.
 - Vermont’s Comprehensive Energy Plan - updated by the Department of Public Service (DPS) with a target completion date of October 2007. The Plan will recommend strategies and policies that bear on transportation fuel consumption. Greenhouse Gas Emissions and the role of transportation in Vermont as a contributor will be a portion of the plan.
 - Initiatives to promote alternative fuels in vehicles such as the bio-diesel project in coordination with the Vermont Sustainable Jobs Fund, and the Clean Cities program – supported by the DPS
 - *Comprehensive Environmental and Resource Management Program (CERMP)* – defines the environmental footprint of Vermont state government and was created by the Department of Buildings and General Services on 28 April 2004.
 - The Climate Neutral Working Group (CNWG Executive Order 14-03) - to direct state government agencies and departments to reduce greenhouse gas emissions from state government buildings and operations by

¹² A TMDL or Total Maximum Daily Load is the calculation of the maximum amount of a pollutant that a water body can receive and still meet Vermont Water Quality Standards. In a broader sense, a TMDL is a plan that identifies the pollutant reductions a water body needs to meet Vermont’s Water Quality Standards and develops a means to implement those reductions. See <http://www.anr.state.vt.us/dec/waterq/planning/htm/pl%5Ftmdl.htm> for more information.

purchasing fuel efficient vehicles and develop programs to encourage state employees to use transportation alternatives through the use of incentives.

- Smart Growth
 - The Downtown Development Act – reflects the principles and policies of Smart Growth and is supported by Governor Douglas.
 - “Downtown Transportation and Related Capital Improvements” funding application guidelines – provided by the Department of Housing and Community Development
 - Guidelines for development of and around new interstate highway interchanges – provided by the Department of Housing and Community Development
 - The Vermont Department of Health physical activity plan - released in April 2006 promoting community efforts to increase physical activity (biking and walking) through changes to the built environment and conducted a survey of the availability of sidewalks and other pedestrian amenities in Vermont’s towns and villages.
- Transit for Human Services
 - The Elders and Persons with Disabilities Transportation Program - VTrans is charged with administering the plan
 - A Public Policy Plan for Human Service Transportation (Draft) – VTrans currently drafting
- Wildlife Corridors
 - The Department of Fish and Wildlife has produced several documents stressing the importance of properly designed culverts for fish and road crossings for land wildlife.
- Other Information
 - On August 22, 2006, 350 Vermonters gathered for a summit on energy and transportation issues at a conference convened by the Vermont Council on Rural Development. Two of the working groups at this conference called for the creation of a transportation efficiency utility that would mirror the work of Efficiency Vermont in the transportation field and invest in mechanisms to reduce vehicles miles traveled (Local Power: Energy & Economic Development in Rural Vermont, Final Report).
 - The new University Transportation Center at UVM has opened with \$16 million in funding and a mission to promote sustainable transportation systems and advanced technologies for northern rural climates. The UTC recently requested proposals for signature projects and received 35 by the deadline of September 31. Several of the proposals will directly look at technologies and policies that research, test and demonstrate sustainable

transportation policies, programs and models in Vermont and nationally (www.uvm.edu/~transctr).

- The Vermont AARP has been coordinating an in-depth look at quality of life measures including transportation for seniors in Burlington, Vermont. The project is part of a nation-wide livable communities demonstration and research effort by the AARP.

Appendix B
Vermont Long Range Transportation Business Plan
Advisory Committee Members

Faith Ingulsrud
Vermont Department of Housing & Community Affairs

Peter Gregory, Executive Director
Two Rivers-Ottawaquechee Regional Commission

Scott Johnstone, Executive Director
Chittenden County Metropolitan Planning Organization

Chris Jolly, Planning & Programming Engineer
Federal Highway Administration

Dennis E. Malloy, Chief of Policy and Planning
Vermont Agency of Natural Resources

Trevor Lashua
Vermont League of Cities and Towns

Barbara Farr
Vermont Department of Public Safety

Bonnie L. Rutledge, Commissioner
Department of Motor Vehicles

Joan Stewart, Management & Fiscal Analyst
Vermont Agency of Transportation

Trini Brassard, Special Projects Manager – Operations
Vermont Agency of Transportation

Jim Bush, Program Development
Vermont Agency of Transportation

Bruce Hyde
Vermont Department of Tourism & Marketing

Appendix C

Environmental Mitigation and Consultation Processes

VTrans has conducted environmental mitigation and consultation since the inception of federal and state environmental and resource regulatory laws. The concept of integrated cooperation is long established at VTrans. Environmental mitigation and consultation occur at both the planning and project level. SAFETEA-LU environmental mitigation and consultation federal requirements have been fulfilled in the development of the LRTBP. Appendix C demonstrates how resource agencies play a key role in helping shape transportation plans, programs and decisions. VTrans works together with these agencies to effectively integrate environmental considerations at all stages of transportation decision making.

Planning Level

While all of VTrans' state-level planning projects involve consultative components, these activities are especially important in the development of the Long Range Transportation Business Plan, which was developed in consultation, as appropriate, with State and Local agencies that are responsible for environmental protection, conservation, historic preservation, natural resources, and land use management. These activities range from individual meetings and communications with resource agencies and experts to broad outreach activities through Regional Planning Commissions/MPO, as well as participation in the study advisory committee and specific planning events. In addition, while developing this plan, VTrans consulted with State and Federal regulatory agencies responsible for wildlife and land management regarding the Agency's environmental mitigation activities in the planning and project development process. The following list documents the primary specific consultative activities that were conducted to address the consultative requirements outlined in SAFETEA-LU.

List of primary correspondence and consultations associated with the SAFETEA-LU Consultation and Environmental Mitigation requirements for the development of the LRTBP

<u>Date</u>	<u>Description</u>
12/8/05	In anticipation of developing the SOW and content of the LRTBP, interested State agencies were invited to a meeting with VTrans to discuss what state level plans they have that should be reviewed and considered in developing the LRTBP, as well as what would be the best means to coordinate with them during the development of the plan. The answer to the second question was to include an Agency representative on a Study Advisory

Committee. Participants at the meeting included: Peg Elmer, Housing and Community Development; Thomas Murray, Department of Economic Development; Bruce Hyde, Tourism and Marketing; Riley Allen, Department of Public Service; John Sayles and Dennis Malloy, Agency of Natural Resources.

9/21/06 VTrans presented the plan overview and requested input on driving factors affecting transportation at the monthly Transportation Planning Initiative (TPI) meeting of the RPC/MPO transportation planners.

October/06 VTrans Planning Coordinators presented the Plan overview and requested input on driving factors affecting transportation to the RPC/MPO Transportation Advisory Committee (TAC) meetings throughout the state.

11/6/06 LRTBP Project Managers held the first of many coordination meetings with VTrans' Environmental Services Engineer and its Environmental Policy Manager to discuss how to meet the consultation and environmental mitigation requirements.

12/8/06 Working Paper 2 was completed. It summarized how Vermont state government agencies and departments were surveyed for information regarding transportation plans and policies that should be taken into account in the update of the VTrans Long Range Transportation Business Plan. State agencies and departments were requested to identify major policy areas, in their jurisdictions, that need to be taken into account in the planning leading up to the LRTBP. Specifically, they were asked for reports, written policies and policy statements that address issues of which VTrans needs to be mindful in its planning work for the LRTBP. This work was reviewed by an internal working group as well as VTrans' Environmental Services Engineer and its Environmental Policy Manager.

12/20/06 LRTBP Project Managers met with the Interagency Wildlife Crossing Steering Committee. Chris Jolly, FHWA, was invited to discuss SAFETEA-LU and how it applies to Wildlife Crossings. Mr. Jolly briefly discussed in requirements of SAFETEA-LU regarding consultation with resource agencies and environmental mitigation. The result of the meeting was a discussion of how this group, Fish and Wildlife and other initiatives this Interagency Committee is involved with should be involved in the Long Range Plan development.

2/21/07 LRTBP Project Managers, along with FHWA's Planning and Programming Engineer and VTrans' Environmental Policy Manager attended the bi-monthly Environmental Coordination Meeting with the Army Corps of Engineers to inform them of the LRTBP process and consultation and environmental mitigation requirements and to

inquire about any plans the ACOE may have that we could review. They explained that they had no plans and just reviewed projects.

1/12/07 Consultation began between the CCMPO and LRTBP Project Managers on how both entities were to address the consultation and environmental mitigation component of their plans.

1/17/07 Received guidance memos from Vermont's FHWA office on how to address this component of the plan.

3/21/07 LRTBP Project Managers and other program managers from VTrans held the first of a series of communications and meetings to coordinate the development of Vermont Department of Public Service's Comprehensive Energy Plan including its Policies Concerning "Increasing the Efficiency of Vermont's Transportation Networks." This coordination also served to enlighten how that plans development could help in the development of the LRTBP. Forwarded VTrans' modal system plans to Public Service Department's planners.

4/26/07 Vermont Department of Public Service forwarded their hazard mitigation plan extracts to VTrans.

6/5/07 The LRTBP held the Scenario Planning Session discussed throughout the LRTBP document and in Working Paper # 7 of the technical appendix.

11/6/07 About 25 select and limited number of professional participated in developing implementation strategies for the LRTBP in a half day Scenario Planning Session.

12/17&18/07 Representatives from VTrans, ANR, Commerce and Community Affairs, the RPCs, and other VT planning and conservation-related organizations met, along with their counterparts from Maine and NH, at the Northeast Summit on Transportation and Conservation Planning in Concord, NH. The summit's overall purpose was to better understand how planning for transportation, land use, and conservation occurs at the state regional and local levels, and begin to identify how planners can work together to everyone's benefit. The event was sponsored by the Henry P. Kendall Foundation and organized by Defenders of Wildlife's Habitat and Highways Campaign.

11/13/08 LRTBP Project Manager presented an overview of the draft LRTBP to the Vermont Aviation Advisory Council for review and comment.

5/1/08 VTrans received EPA, ACOE, Fish & Wildlife, and the Forrest Service contact information from the Vermont FHWA office as well as guidance from FHWA that they had sent to those federal resource agencies regarding the SAFETEA-LU consultation and environmental mitigation requirements.

9/3/08 The first draft of the consultation and environmental mitigation section of the LRTBP was forwarded to the VTrans Environmental Section for review; initial comments received three weeks later.

10/9/08 A draft of the LRTBP consultation and environmental mitigation section that documents VTrans' environmental mitigation and environmental procedures for VTrans' project development process was forwarded to the US EPA, ACOE, Fish & Wildlife, and the Forrest Service as well as to the Vermont Agency of Natural Resources for their review and requested comments. Replies and comments/edits were received from the USACOE (on 10/9/07) and the EPA on 11/10/08.

Environmental Mitigation Activities in the Planning and Project Development Process

The following information describes VTrans' Project Development process, focusing on policies, practices and strategies that VTrans employs to restore and maintain environmental functions. This section of the LRTBP as well as VTrans' Project Development process itself was developed in consultation with Federal and State wildlife and regulatory agencies. Additional information on this subject can be found in Working Paper 2: State Agency Policy Review in the Technical Appendix.

Assessments of a project's potential to impact natural and cultural resources and efforts to avoid, minimize and mitigate such impacts, are conducted for all Agency projects including highways, railroads, airports and associated infrastructure and operations. Environmental coordination is conducted at the earliest stages of a project's identification and definition, and avoidance, minimization and environmental mitigation are standard practices in the project development process as described below.

The vast majority of VTrans projects processed under the National Environmental Policy Act (NEPA) qualify as Categorical Exclusion (CE) actions. Very few projects require processing of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The typical project development process is graphically depicted at: <http://www.aot.state.vt.us/progdev/images/projdev.gif>. The process complies with the Federal Highway Administration Technical Advisory T6640.8A "Guidance for Preparing and Processing Environmental and Section 4(f) Documents" (1987) and includes identification of natural and cultural resources, early consultation with resource regulatory agencies, and evaluation of alternatives and design options that attempt to avoid, minimize and mitigate resource impacts.

VTrans standard practices involve concerted effort to consult with and gather input from interested parties throughout the project development process. Consultation ranges from involved property owners to local town officials, regional planning organizations and state and federal agencies. VTrans and the Vermont Center for Geographic Information maintain GIS databases of known natural and cultural resources which are updated with information gathered from each project's resource data gathering activities.

In 2004, VTrans established an Environmental Stewardship Ethic Policy documenting its commitment to environmental principles and practices for protection of the state's natural and cultural character. A copy of the policy follows:

FFECTIVE DATE: 10/07/2004

APPROVED BY: Patricia A. McDonald, Secretary of Transportation

PURPOSE/COMMENT: To establish the Environmental Stewardship Ethic Policy for VTrans

VTrans Environmental Policy: VTrans recognizes that environmental quality - clean water and air, scenic beauty, ecological diversity and protection of the state's historic character - are what Vermonters desire and are considered integral parts of the state's economic well-being. VTrans will fulfill its environmental responsibility through an Agency-wide *environmental stewardship ethic*. This ethic will be guided by *principles* and *practices* that will apply to all of the agency's business activities. An annual work plan will be developed each year and a yearly report will outline the success of specific agency environmental initiatives. The Agency will aim to be a positive force in supporting the state's environmental quality and unique sense of place, and will strive to exceed state and federal environmental laws when practicable, while subject to the Agency's responsibility to make judgments and decisions based on numerous factors including cost, safety, and resource availability.

VTrans Environmental Principles: VTrans and its employees, consultants, and contractors should when practicable consider these basic environmental principles:

- Protect and/or improve water and air quality
- Protect and/or enhance wildlife habitat
- Preserve and/or enhance cultural and scenic resources
- Support healthy communities and sustainable growth
- Encourage design that compliments the visual quality of the surrounding environment including the historic and scenic character
- Increase transportation choices including non-motorized options
- Minimize agency-generated waste by reducing, reusing, or recycling materials and find substitutes for hazardous materials whenever possible
- Reduce the use of non-renewable energy resources by promoting building and vehicle energy efficiency, and considering the use of alternative fuels in Agency operations

VTrans Environmental Practices: The following practices are on-going and help define how employees will execute the Agency's environmental stewardship ethic and follow its environmental principles:

1. Plan, design, construct and maintain VTrans-sponsored projects in compliance with federal and state environmental laws.
2. Work collaboratively with national, regional and local stakeholders including, federal and state regulatory agencies, regional planning entities, municipal officials, interest groups, and the general public.
3. Encourage the agency environmental stewardship ethic through continual VTrans staff education and training regarding state and federal environmental law and policy, as well as environmental research and technical advances.
4. Provide opportunities for continual staff feedback and input regarding how to best implement an agency environmental stewardship ethic.
5. Consider the initial costs of transportation investment alternatives as well as future costs over life of the investment.
6. Encourage the development of all transportation modes and an integrated seamless transportation system.

Conduct public outreach and education, including local governments and agency consulting engineers and contractors, regarding VTrans' environmental policy and initiatives

The following ten sections demonstrate how environmental mitigation and consultation activities are fully integrated into Vtrans' project development process and constitute the Agency's way of conducting business.

1. **Consultation and Environmental Mitigation:**

The purpose of this section is to present the vast amount of activities, consultations and communications that are continuously and routinely undertaken by the Vermont Agency of Transportation (VTrans) in the course of doing business as well as part of its project development process. These are not special activities, but ones fully integrated into the Agency's way of life. The State of Vermont's specific resource requirements in the form of law, rule or regulation are also listed to demonstrate the extensive array of requirements, above and beyond the Federal requirements that must be met during the development of a project.

2. **Ongoing Consultation Activities:**

VTrans continually conducts routine consultation with federal, state and local resource agencies and other parties in the planning, scoping and implementation of projects. There are also regular ongoing meetings with resource agencies in the form of working groups and committees/task forces to establish better communications and agree on solutions to environmental issues, rules, regulations and laws. In addition there are individual assessments, agreements and system wide agreements to address resource impacts on an ad hoc basis as needed.

3. **A List of regular coordination meetings and agreements:**

- ☐ ANR/VTrans Wildlife and Transportation Steering Committee

- ☐ Interagency Wildlife Crossing Steering Committee
- ☐ US COE Resource Coordination Meeting – Bi-monthly meeting for the US COE to coordinate with ANR, EPA, Fish & Wildlife, and others as appropriate regarding new projects.
- ☐ ANR/VTrans Transportation and Air Quality Memorandum of Understanding
- ☐ Air Quality and Transportation Working Group and Work Plan – Clean Air Act planning and compliance; diesel initiatives; DMV air quality inspection program
- ☐ Low Emission Vehicle Program (LEV)
- ☐ E-Vermont
- ☐ Governor’s Commission on Climate Change and Climate Change Action Plan
- ☐ New England Governors and Eastern Canadian Premiers Climate Action Plan
- ☐ Climate Neutral Working Group and Bi-annual Report
- ☐ VT’s Comprehensive Energy Plan
- ☐ Vermont Clean Cities Program
- ☐ Watershed Planning -numerous basin specific watershed plans and TMDLs[ja2]
- ☐ MS4 Water Quality Planning [ja3]
- ☐ Lake Champlain Basin Program – Opportunities for Action
- ☐ Clean and Clear Initiative
- ☐ Stormwater and Erosion Control Program and Regulation[ja4]
- ☐ River Management Program and Planning [ja5]
- ☐ The Vermont Wetlands Program

4. **A List of agreements established for consultation or environmental mitigation:**

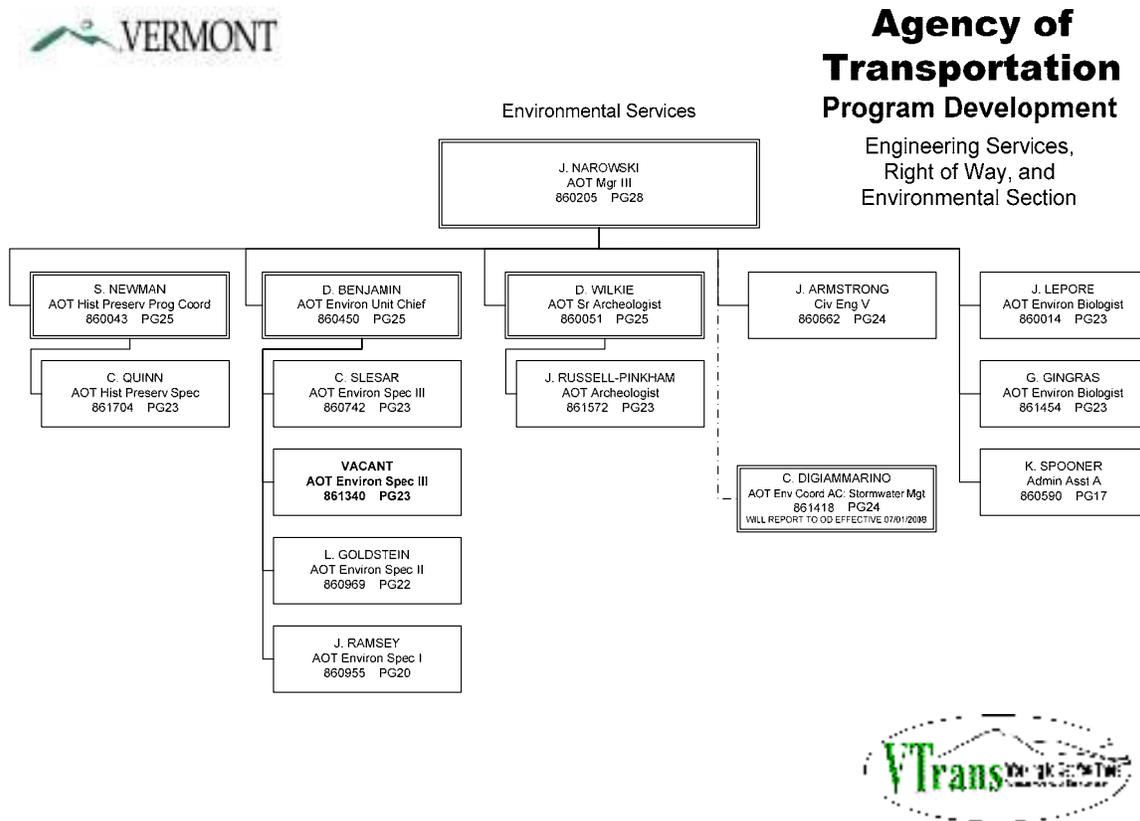
- ☐ State Hazard Mitigation Plan
- ☐ Aquatic Organism Passage Guidance
- ☐ Environmental Implications of Increasing Chloride Levels in Lake Champlain and Other Vermont Waters
- ☐ Wildlife Linkage Area Assessment
- ☐ The Vermont Outdoor Recreation Plan for 2005 thru 2009
- ☐ 2002 Vermont Stormwater Management Manual
- ☐ Draft Airport Tree Removal Policy
- ☐ VTrans Project Post-Construction (Operational) Stormwater Protocol

5. **A List of Ad Hoc meetings /consultation:**

- ☐ Transportation and Conservation Planning Summit – November, 2007
- ☐ Coordination Meeting - FAA-WS-State Agency (Wildlife/Transportation)
- ☐ Gov's Blue Ribbon Commission Climate Change Technical Working Group
- ☐ The Vermont Archaeological Sensitivity Model (VTASM)

6. **Specialized VTrans personnel to assist in consultation and environmental mitigation:**

The Environmental Section of VTrans Program Development Division employs natural and cultural resource professionals and specialists that provide expertise, in-house technical assistance, and liaison with State and Federal resource agencies in the project development process regarding resources, regulations and permitting. The organization chart below illustrates the number and type of positions in this section.



In addition to the Environmental Section the Construction Section employs a Construction Environmental Engineer and Assistant CEE who work with construction contractors, VTrans resident engineers and VTrans Maintenance District forces to ensure compliance with state and federal resource regulations and permit requirements.

7. **Environmental Resource Coordination during Project Development:**

The Project Development Process incorporates consultation and coordination with all potentially involved resource regulatory agencies. Other interested parties are consulted as appropriate. All potential resource impacts are identified and strategies to avoid, minimize or mitigate impacts are developed. Specific resource consultation and environmental mitigation related activities conducted by this section during the Project Development Process are identified in the following section, "Project Development and Environmental Resource Coordination." This section has been adapted from Chapter 2 of the Environmental Operations Manual that can be found at the following link:

<http://www.aot.state.vt.us/TechServices/Documents/EnviroOpsManual/FullEnviroOpsManual.pdf>

Project Development and Environmental Resource Coordination

This section describes VTrans' environmental resource review and regulatory coordination procedures that are a required element of the project development process. All of the major steps in project development are addressed, from project selection through construction, to give the reader a basic understanding of the entire process. The Project Development Process Flow Chart (attached separately) shows the overall process for VTrans projects. For more information on project development, refer to the *Project Development Process* manual published by VTrans in 1998. Tables 2-4 through 2-8, at the end of this chapter, summarize the environmental steps in project development.

Project development includes five major phases:

- Project Selection: This is the phase when a concept becomes an official project and is added to the Capitol Program.
- Authorization to Proceed: During this phase, a project on the capitol Program is approved for development.
- Project Definition: This is the critical stage of development, when the Purpose and Need Statement is prepared, alternatives are developed, and alternative is selected, conceptual plans are prepared, and NEPA documentation is prepared.
- Project Design: Project Design is when detailed design work takes place, including preliminary, semi-final, and final plans. Most permit applications are obtained during this phase.
- Construction: This phase includes actual construction and related alternatives.

It is important to note that this chapter describes the project development process and environmental procedures that a project *may* have to go through. Some projects are more straightforward and may skip some of the design steps, while others may be more complicated or controversial and involve more steps than indicated here. Early coordination with regulatory agencies and other interested parties is the key to determining appropriate procedures for a given project. The principles will remain the same on most projects.

1.1 PROJECT SELECTION

Selection procedures depend on the type of project under consideration. State system, Town Highway bridge, maintenance, enhancement, interstate bridge, paving, rail, airport, public transit, rail crossing, and bicycle/pedestrian categories each have their own procedures for selecting and prioritizing projects. Typically there is an evaluation of need and input from local and regional interests and VTrans districts. Selected projects are added to the Capital Program and the State Transportation Improvement Program (STIP). The Chittenden County Metropolitan Planning Organization selects its own projects and develops a Transportation Improvement Program (TIP), which is incorporated into the VTrans list.

1.2 AUTHORIZATION TO PROCEED

Authorization procedures also depend on the type of project. State system projects are submitted to the Director of Project Development for assignment to a Program Manager. If funding is available and the project is part of the approved STIP or TIP, the Programming Section contacts FHWA to request authorization. For other kinds of projects, the Program Manager typically notifies the Programming Section to request authorization from FHWA to proceed.

1.3 PROJECT DEFINITION

The Project Definition Phase is when the purpose and need are defined, an alternative is selected, conceptual design is prepared, and NEPA documentation is prepared. The major tasks and environmental sub-tasks in this phase are described below.

1.3.1 Purpose and Need

The purpose and need for a project must be clearly demonstrated before a project may go forward. The documentation takes the form of a Purpose and Need Statement (P&N), which is the basis for the Project Definition Phase. The intention of the P&N is to state, define and justify the problem; in other words, it is a problem statement. FHWA has a seven-page memorandum on the subject of purpose and need for NEPA environmental documents. VTrans Scoping Reports are not true NEPA documents, but there are similarities. The FHWA memorandum emphasizes the following:

"Without a well-defined... purpose and need, it will be difficult to determine which alternatives are reasonable, prudent and practicable, and it may be impossible to dismiss the no-build alternative."

Development of the P&N involves collecting existing transportation and environmental resource data, conducting a site visit, holding a Local Concerns Meeting, and preparing the actual Purpose and Need Statement. The environmental procedures required during these tasks are described below and are listed in Table 2-4 at the end of this chapter.

1.3.1.1 Collect Existing Data

VTrans environmental specialists normally get involved when the Project Manager contacts the Technical Services Division Environmental Section and requests existing resource data. It is important to begin collecting environmental and cultural resource information as early in the project development process as possible. Examples of maps and data that may be available and provide useful information in a preliminary evaluation of resource constraints include:

- Video logs
- Air photos
- Floodplain maps
- USGS quadrangle sheets
- National Wetlands Inventory/Vermont Significant Wetlands Inventory maps
- Historical resource maps and records
- Rare species maps and listings
- Public lands maps
- Land use plans
- Soils maps
- GIS data layers

Sources for obtaining these maps and data are listed in Chapter 3.

1.3.1.2 Site Visit

The site visit is a formal step in project development wherein the Project Manager invites local representatives and technical specialists to view and discuss the site. The site visit allows all involved to collect site data, ensure logical endpoints, note areas for off-alignment consideration, and gain an understanding of the physical context of the project area. Individuals that might be involved in the site visit include representatives of the Town or Municipality, the Agency's environmental resource specialists and appropriate district administrator(s), and an individual representing the interests of the project's main function, e.g., structures, congestion, maintenance, etc. This can be an opportunity for environmental and cultural resource specialists to get a preliminary, "windshield" overview of the site and alert others to some of the key issues. It is not mandatory that the resource review begin at this point or that resource specialists participate in the site visit, although it is important that resource specialists begin their resource review, visit the site, and notify others of the key environmental issues as early in the process as possible.

Environmental resources and sensitive sites to note during a site visit include, but are not necessarily limited to:

- Historic structures
- Archeologically sensitive land

- Wetlands
- Water bodies
- Agricultural lands
- Streams posted as spawning waters
- Deer yards or potential deer yards
- Wildlife habitats
- Parks or other Section 4(f) or 6(f) properties

1.3.1.3 Resource Identification

This step involves formal resource identification and mapping, either by resource specialists in the Environmental Section or by consultants. The timing of the resource team review is flexible, and depends on factors such as seasonal constraints, cost, the importance of the resources, or the likelihood of impacts. It is helpful if the resource identification and mapping is completed before the Local Concerns Meeting, so that resources may be shown on presentation plans and discussed at that meeting, especially if there are sensitive resources in the area. However, this step can also occur after the Purpose and Need Statement is finalized, at the beginning of project scoping.

Formal resource mapping usually does not commence until a survey of the project area has been performed and the Project Manager sends a request to plot resources to the Environmental Section. A CADD base resource file will be created by the Environmental Section that includes survey information, project name and number, names of rivers, direction of flow, north arrow, scale bar, and resource check-off box. Areas of sensitivity to be identified and plotted on the base map may include some or all of the resources listed in Table 2-1.

The Transportation Biologist or consultant will conduct research and make a site visit of the project area (typically to the limits of the survey on the base map) for critical habitats, endangered and threatened species, floodplains, floodways, groundwater resources, surface waters, high water indicators, important farmland soils, or the presence of wetlands. Wetlands will be either formally flagged and surveyed, or sketched onto the base resource plan. Wetlands may be sketched if wetland boundaries are well defined (such as the edge of an abrupt fill slope) and easily transferred to base mapping. The biologist prepares a written wetland report that gives a brief description of the locations, characteristics, ANR classifications, and functions of the wetlands. The report may include photographs, Army Corps transect forms, and other documentation. The wetland report is included in the appendix of the scoping report. (Information on other environmental resources is usually documented in the Resource Information section of the Scoping Report, rather than in a separate report.) See Chapter 3 for more detail on resource identification procedures.

Table 2-1. Resource Identification Checklist

Wetlands
 Water bodies
 Water quality
 Groundwater resources
 Historic sites and districts

- Archeologically sensitive areas
- Section 4(f) properties
- Section 6(f) properties (Land and Water Conservation Fund)
- Agricultural lands or soils
- Fish and wildlife habitats
- Endangered and threatened species or habitats
- Floodplains and floodways
- Hazardous waste sites
- Community character/aesthetic/scenic resources
- Social features and demographic data
- Economic growth and development potential
- Town and regional plans

The Transportation Archeology Officer/Specialist or consultant will conduct an initial background search to determine if the project area is sensitive for archeological resources. The background search will include investigating the database at the Division for Historic Preservation for areas of archeological significance. Using this information, the archeologist will complete a predictive model concerning the archeological sensitivity of the project area. The archeologist will conduct a site visit, preferably including soil probes, to obtain site-specific information and to facilitate determining whether additional study is needed. An "Archeological Initial Resource Identification Report" will be prepared describing the scope of the investigation, methods used, and findings, including locations of sensitive areas drawn on base plans. Areas that are archeologically sensitive will then be digitized and depicted on the base resource file. All work must be conducted in accordance with the Agency's current guidelines and policies. The Project Manager will obtain as-built plans for existing bridges or roadways, if possible, to help establish areas of prior construction activity.

The Transportation Historic Preservation Officer/Specialist or consultant will review the database in the Division for Historic Preservation for all buildings, structures, sites, or districts that are or may be eligible for the National or State Register of Historic Places. In addition, the historian performs field reconnaissance to gather site-specific information necessary to address issues related to Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act of 1966. In some cases, archival research is required. The Project Manager will obtain this information in memo form. Buildings, structures, sites, historic districts, and Section 4(f) property shall be identified on the base resource file.

All environmental resource information is incorporated into the base resource map and a CADD resource reference file is generated. The format must follow standard VTrans line styles and labels, as shown on the sample plan in Figure 2-1. Alternatives can now be developed that attempt to avoid or minimize impacts to resources to the greatest extent possible.

Community character, scenic resources, and the potential for visual and aesthetic impacts must be considered. Social features are the attributes of the general population served by the transportation facility. Demographic data includes population and growth projections. Neighborhoods and other sensitive areas need to be identified. Church, school, and

emergency service facility locations shall be determined and their relationship with the transportation facility or service discussed. These concerns must be considered in project development.

Economic growth and development are often dependent upon transportation facilities. The local economy (i.e., tourism, farms, manufacturing, retail, etc.) must be considered, as well as tax revenues, employment opportunities, accessibility, and public expenditures. Impacts on existing highway-related businesses and established business districts must be considered.

Town and Regional plans shall be reviewed for economic information and to determine how the project fits in with their transportation plan. These plans are usually available from the regional planning commission (see Appendix A) or the town. The Project Manager may have to coordinate with the Agency of Housing & Community Affairs to obtain the plans. The regional planning coordinator of VTrans Planning Division should be consulted on issues related to local and regional planning.

All information gathered above will be documented and summarized in the Categorical Exclusion.

1.3.1.4 Early Resource Agency Coordination

Coordination with resource agencies, such as the Agency of Natural Resources (ANR), Division for Historic Preservation (DHP), Department of Agriculture (DA), and the Corps of Engineers (COE) is an important part of the development of a Purpose and Need Statement. The number and timing of resource coordination meetings depends on the importance of the resources and the magnitude of the expected impacts. Some projects have essentially no resource impacts, and little or no agency coordination may be necessary. Other projects may have substantial impacts, and it may be necessary to meet or correspond with agencies numerous times during project development. If there are resource impacts, it is imperative that agencies have an opportunity for input before the preferred alternative is selected.

Figure 2-1, Sample Resource Identification Plan, is in a separate file and may be viewed in the main document on the following URL:

<http://www.aot.state.vt.us/TechServices/Documents/EnviroOpsManual/FullEnviroOpsManual.pdf>

As soon as the information is available, the Project Manager provides these agencies with a general description of the project site and purpose and need, as well as information about known resources, local and regional concerns, site contextual (regional, landscape, visual, etc.) information, and potential impacts. The Project Manager also requests their comments regarding the project and potential resource concerns and solutions.

Formal resource delineations or assessments, such as wetland delineations, completed by the resource team or consultants are distributed to the agencies for their review and approval. These resource assessments are typically distributed, if they have been completed, with plans sent out for the Site Visit, Local Concerns Meeting, COE coordination meeting, or other meeting, rather than a separate mailing.

Resource agencies are also invited to the Local Concerns Meeting and asked to present, either in writing before the meeting, or in person at the meeting, the agency's preliminary comments regarding whether resources are present in the problem area and their extent and potential significance. The resource agencies shall also be given the minimum three-week notification. It is anticipated that these agencies will only attend meetings when important resources are known to occur at the site.

If there are known to be important resource issues associated with the project, it is advisable to hold a pre-design meeting with the resource agencies. This may be either at the site or at the bimonthly COE coordination meetings at VTrans. Representatives from ANR, COE, EPA, USFWS, DHP, or other agencies may be invited, depending on resource issues.

Resource agencies are also asked to comment on the draft Purpose and Need Statement. It is the Project Manager's responsibility to coordinate the distribution of the Purpose and Need Statement and comments subsequently received.

1.3.1.5 Local Concerns Meeting

The purpose of the Local Concerns Meeting is to introduce local and regional officials and affected parties to the transportation problem, initiate a dialogue with them, gather information and concerns, and solicit input from the RPC, municipal officials, regulatory/resource agencies, and special interest groups, including abutting property owners. The resource agencies shall be given the minimum three-week notification. This meeting is not intended to develop solutions; specific proposals are not discussed at this meeting. Input is gathered from State and Federal agencies, including the District Transportation Administrator (DTA) and VTrans Planning Coordinator.

As noted above, it is helpful if the resource identification and mapping is completed before this meeting, so that resources may be shown on presentation plans and discussed at that meeting, especially if there are sensitive resources in the area.

Resource agencies shall be invited to the Local Concerns Meeting and asked to present, either in writing before the meeting, or in person at the meeting, the agency's preliminary comments regarding whether resources are present in the problem area and their extent and potential significance.

At the meeting, environmental issues are identified, if known, and public response sought as appropriate. However, formal inter-agency discussion and resolution of regulatory issues occurs at other steps in the Project Development Process.

1.3.1.6 Prepare Purpose and Need Statement

From information obtained at the Local Concerns Meeting, the Project Manager writes a "Purpose and Need Statement" that is consistent with the requirements of the state and local community. The P&N should be written to state the problems of the transportation facility (need) and the goal for that facility (purpose). A Purpose and Need Statement does not describe the author's recommended solution. The reader should be presented with sufficient material to understand the needs and purpose of the project and then logically reach the same conclusion as reached during the Project Definition Phase.

The P&N is very important to justifying and defining a project. The statement needs to be able to be proven by facts, statistics, or even by photographs. If all aspects of the statement cannot be proven, either the statement is poorly written and thus weak, or the project is not needed, at least in the form originally thought. A P&N must conclusively illustrate that corrective effort is justifiable and worth the expenditure of public funds. The assumption for this is that there is proof of local and regional support for something to be done to correct deficiencies.

The Purpose and Need Statement is sent to the VTrans Director of Project Development, FHWA, the RPC, and the municipality for a two-week review period. The Project Manager also sends a copy of the Purpose and Need Statement to resource agencies and the VTrans Planning Coordinator for concurrence. If the parties do not concur, the Project Manager will need to determine if the Purpose and Need Statement requires modification. If the Purpose and Need Statement is rewritten, it will be resubmitted for review and concurrence.

For more information on the P&N, and a sample P&N, see Appendix D of the VTrans Project Development Process manual.

1.3.2 Project Scoping

Project scoping is the process of developing and evaluating alternatives and selecting an alternative for conceptual design. The environmental procedures required during this phase are listed in Table 2-5 at the end of this chapter.

1.3.2.1 Resource Team Review

Resource identification is described above under Purpose and Need. If the VTrans resource team review is not completed during that phase, it must be completed during the scoping process.

1.3.2.2 Impact Assessment and Evaluation Matrix

The feasible and practicable alternatives are investigated and considered, including a "no-build" option. Alternatives may include preservation (maintenance) and rehabilitation. All reasonable alternatives are developed to comparable levels and presented in an evaluation matrix. The purpose of the evaluation matrix is to present information about the alternatives in a manner that facilitates comparison and helps ensure that the impacts of each alternative are considered consistently.

The evaluation matrix lists the resource impacts and permitting requirements of each alternative. The level of detail provided in the matrix should be commensurate with the importance of the resources and the scope of the project. The matrix should detail the temporary, permanent and indirect impacts of each alternative on each resource. For example, an alignment may involve filling in a certain amount of wetland to construct a temporary bridge, restoring those wetlands after removal of the bridge, and filling additional wetland for the permanent structure, while another alternative may permanently fragment wetland habitat. All of these impacts should be individually noted in the evaluation matrix. See the example (Table 2-2) on the following page.

In some cases a simple evaluation matrix may suffice, with impacts listed as “yes” or “no”, for example, rather than quantified. This may be appropriate for feasibility studies or planning studies; when the resource data is not mapped in detail; when the project is only developed to a schematic level; or when the differences in resource impacts are clear-cut. An example of such a matrix, based on the sample provided in *VTrans’ Project Development Process Manual*, is provided in Table 2-3.

1.3.2.3 Resource Agency Coordination

Resource agencies should be familiar with the project from prior correspondence and meetings regarding the Purpose and Need Statement, Local Concerns Meeting, pre-design meeting, resource assessments, or other activities. Any formal resource delineations or assessments which have not previously been provided to the resource agencies should be reviewed at this time.

Comments from resource agencies regarding their views on the various alternatives are required at this time. The agencies are invited to the Alternatives Presentation Meeting (described below) and are sent plans for review showing alternatives, resource constraints, an evaluation matrix, and any other useful information (such as wetland descriptions). Written comments should be requested of the resource agencies in the event they will be unable to attend the Alternatives Presentation Meeting.

The agencies are often given further opportunities to comment, such as COE coordination meetings. Representatives from ANR, COE, EPA, USFWS, DHP, and other agencies are invited to these meetings. If impacts are substantial or the project is controversial, it is helpful to hold meetings at the site, so all parties can review the alternatives and site constraints first-hand. It may not be necessary to meet with agencies if resource impacts are negligible.

If resources under their jurisdiction will be affected, regulatory agencies will be notified when other meetings are scheduled, such as 502 Public Hearings, or Act 250 Hearings (discussed below). It may be necessary at times for resource agency staff to participate in these proceedings, to enable the public to understand why a particular solution to a problem may not be permitted.

In addition to these meeting opportunities for regulatory agencies, project correspondence related to environmental issues should be distributed to any other concerned agencies. It is imperative that agencies be well informed of any project changes that take place during the "Project Design" phase of the development process.

1.3.2.4 Alternatives Presentation Meeting

The Project Manager will set up a meeting with local officials, the RPC, FHWA, and environmental resource agencies to present the alternatives. Alternatives presentation plans should show all resource constraints. The evaluation matrix and other useful resource information, such as wetland descriptions, will be handed out at the meeting so that the participants will have information regarding the type and amount of impacts for each alternative. The Project Manager generally gives at least three weeks written notice of the meeting. Comments from resource agencies regarding the various alternatives are required at this time, as described above.

Minutes of the Alternatives Presentation Meeting must be recorded and distributed to involved agencies. This is necessary to ensure that there are no misunderstandings concerning acceptance of a selected alternative. The minutes should be sent to all attendees, local officials, the RPC, and resource agencies that have project jurisdiction or interest. The recipients of the minutes have two weeks from the postmarked date to correct any errors or contest any findings. The minutes will also be included in the Scoping Report.

1.3.2.5 Preferred Alternative and LEDPA

Ideally there will be agreement among VTrans, the public, and the resource agencies as to the preferred alternative. If there is no consensus on a preferred alternative, the Project Manager must attempt to resolve underlying conflicts. Failing this, the Project Manager must develop new alternatives and an evaluation matrix, and schedule new resource agency and Alternatives Presentation Meetings. This process will continue until consensus on an alternative is achieved or the project is terminated.

Table 2-3

Sample Detailed Evaluation Matrix, is in a separate Microsoft Excel file and may be viewed in the main document on the following URL:

<http://www.aot.state.vt.us/TechServices/Documents/EnviroOpsManual/FullEnviroOpsManual.pdf>

Table 2-3 Sample Simplified Evaluation Matrix

		<u>Alternative A</u> DO NOTHING	<u>Alternative B</u> REHAB.	<u>Alternative C</u> OFF ALIGNMENT
COST	Roadway	\$0.00	\$177,000	\$353,000
	Structure	\$0.00	\$0.00	\$0.00
	Temporary Structure	\$0.00	\$0.00	\$0.00
	Traffic & Safety	\$0.00	\$15,000	\$31,000
	TOTAL (\$)	\$0.00	\$192,000	\$384,000
ENGINEERING	Typical Section (meters)	.5 - 3.5 - 3.5 - .5	1 - 4 - 4 - 1	1 - 4 - 4 - 1
	Alignment Change	No	No	Yes
	Bicycle Access	No Change	Enhanced	Enhanced
	Hydraulic	No Change	Improved	Improved
	Utility	No Change	N/A	N/A

IMPACTS	Agricultural	No	No	Yes. (0.25 ha)
	Archaeological	No	No	Yes (College Field)
	Historic Structures, Sites & Districts	No	No	Yes (College Gate)
	Hazardous Materials	No	No	No
	Floodplain	No	No	No
	Fish & Wildlife	No	No	No
	Rare, Threatened & Endangered Species	No	No	No
	Public Lands - Sec 4(f)	No	No	No
	LWCF - Section 6(f)	No	No	No
	Noise	No Change	No Change	No Change
	Wetlands	No	No	No
LOCAL & REGIONAL ISSUES	Concerns	Not Met	Satisfied	Satisfied
	Community Character	No Change	Enhanced	Lessened
	Economic Impacts	Unknown	Unknown	Unknown
	Conformance to Regional Transportation Plan	No	Yes	Partially
	Satisfies Purpose & Need Statement	No	Yes	Yes
PERMITS	ACT 250	No	No	No
	401 Water Quality	No	No	No
	404 COE Permit	No	No	No
	Stream Alteration	No	No	No
	Conditional Use Determination	No	No	No
	Stormwater Discharge	No	Yes	Yes
	Lakes & Ponds	No	No	No
	T & E Species	No	No	No
	SHPO	No	Yes	Yes
OTHER	Road Closure			

If a Section 404 permit is needed, the COE must select the Least Environmentally Damaging Practicable Alternative (LEDPA). The LEDPA selection involves determining first, which alternatives are practicable (in terms of logistics, technical aspects, and cost); and second, which are environmentally less damaging. The full range of NEPA alternatives and impacts are considered, and the determination is made with consideration of input from the public, FHWA, and other resource agencies.

1.3.2.6 Scoping Report

The Scoping Report can be completed and made ready for review following public, local, regional, and resource agency acceptance of an alternative. The Scoping Report documents the existing conditions, Purpose and Need of the project, resources identified, alternatives considered, resource impacts, public involvement outcome, and the solution finally recommended.

Existing resource constraints are usually identified in a separate chapter or section titled "Resource Information". The resources considered are those identified above in "Resource Identification". The methods used in identification and the key characteristics and importance of the resources are briefly described. Implications for project design may be noted, but there is no discussion of impacts in this section. Reference is made to any separate resource identification reports prepared for the project, usually included in the appendix. There are typically separate reports for wetlands, archeologically sensitive land, historical resources, and occasionally other resources.

Resource impacts of each alternative are described in the Alternatives section and are summarized in the evaluation matrix. The description usually includes a brief summary of the quantity (acreage or volume) and quality (functions or importance of resources) of each impact, as previously illustrated.

The first review of the Scoping Report is done by the Program Manager. Following this "in-house" review, corrections are made and comments are addressed.

The Project Definition Team (PDT) is a VTrans committee of division representatives. The PDT reviews projects that have estimated construction costs of over \$1,500,000 or that have shown a "significant cost increase" in the latest construction estimate, or that the Project Manager chooses to bring before the PDT.

For projects requiring PDT action, the Project Manager shall notify the PDT chair, who has the responsibility of scheduling a meeting of the PDT to discuss the Scoping Report. If the PDT recommends approval of the Scoping Report, it will be forwarded to the Project Development Division Director and the Secretary of Transportation. If the Scoping Report is voted down by the PDT, or is disapproved by the Secretary of Transportation, the Project Manager needs to investigate further alternatives and go through the Alternatives Presentation Meeting portion again.

If PDT review is not required, the Project Manager may, at his/her own discretion, distribute the Scoping Report to VTrans staff, local and regional officials, resource agencies, or others for a two-week review. The Scoping Report must be approved by the Project

Development Division Director and the Secretary of Transportation, who has ultimate approval authority.

1.3.3 NEPA Classification

Following approval of the Scoping Report, the level of NEPA documentation necessary for the project is determined. If impacts are not likely to be “significant” under NEPA, documentation for a Categorical Exclusion will be prepared. If the magnitude of impacts is uncertain, an Environmental Assessment (EA) will be prepared. If the impacts are likely to be significant, an Environmental Impact Statement (EIS) will be required. The NEPA process is summarized in Chapter 4. Detailed guidance for preparing CEs, EAs, and EISs may be found in FHWA’s Technical Advisory T6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (1987).

Federal regulations in 23 CFR Part 771 include the criteria for the classification of projects under NEPA. Most VTrans projects have modest impacts and meet the criteria for Categorical Exclusions CE’s per 23 CFR 771.117 and are documented in accordance with the Programmatic Agreement for preparing Categorical Exclusions described under NEPA in Chapter 4. If there is any question as to the level of NEPA documentation required, the FHWA makes the determination. The processes described in the remainder of this chapter are typical for projects involving Categorical Exclusion.

1.3.4 Conceptual Design

When an alternative has been approved, work can begin on developing Conceptual plans. Conceptual design development is the first design effort and last stage of the Project Definition phase. This stage includes developing typical sections, calculating rough earthwork, making a field review (when appropriate), adjusting line and grade, and obtaining approval of the line and grade. Conceptual design is needed for projects which will require acquisition of lands or rights to construct the project. Maintenance projects, interstate improvements (bridge or roadway), paving projects, rail/highway crossing projects, and the like usually do not need to go through this phase of project development. However, the Project Manager may have reason to develop a conceptual design for any project. The environmental procedures required during conceptual design are summarized in Table 2-6 at the end of this chapter.

1.3.4.1 Resource Mitigation Design

After the approximate extent of resource impacts has been determined, coordination with resource agencies is needed to determine whether mitigation will be required. At this stage, mitigation design is usually confined to developing a proposed concept for mitigation, finding a suitable location, coordinating with resource agencies regarding the appropriate level of mitigation, and drawing up schematic plans. Most mitigation design occurs during the Project Design phase described below.

Wetland mitigation design should be consistent with the requirements of the ANR and COE. The *Cooperative Memorandum between the Vermont Agency of Transportation and the*

Agency of Natural Resources Regarding Wetland Mitigation... (see Appendix C) has guidelines for planning wetland mitigation and an appendix listing submittal requirements for each design stage. The COE has published a *Checklist for Review of Mitigation Plan*, available at <http://www.nae.usace.army.mil/reg/index.htm> or 978-318-8335. This document lists all of the elements the COE expects in a mitigation plan, invasive species control, monitoring requirements, and assessment guidelines. Mitigation for impacts on historic resources could be in the form of adaptive reuse of structures. Other types of mitigation may be considered based on project needs.

1.3.4.2 Resource Team Plan Review

The resource team (Technical Services Division environmental and cultural resource specialists or consultants) will review the conceptual plans, prior to the formal submittal, to ensure that the resources have been adequately identified and considered in the project design.

1.3.4.3 Act 250 Jurisdiction

The project construction area that is considered disturbed land under Act 250 is calculated after the construction limits are determined (during or after the Conceptual plan stage). If the total affected area exceeds 10 acres (4.0 hectares), an Act 250 permit may be required. (See Chapter 4 for more information on jurisdiction of transportation projects.) The total affected area is the area that is actually expected to be disturbed by construction. This includes the land within the plotted construction limits (toe of slope) plus whatever additional ground may be temporarily disturbed during construction. The *Project Development Process* manual specifies a ten-foot wide construction zone outside the plotted construction limits, and for most circumstances this is a reasonable estimate. However, the actual disturbed ground may vary depending on the context. For example, where construction is adjacent to mature landscaping or a sensitive resource area, the contractor may be limited to disturbing to the toe of slope. Disturbed ground usually does not include all land within the ROW. If there is any question as to whether the project is subject to Act 250, a formal Jurisdictional Opinion should be requested from the District Environmental Commission. If the project is subject to Act 250, the Environmental Section should be notified as soon as possible to begin preparing the application. Ideally, the application will be submitted as soon as possible after impacts are determined.

1.3.4.4 Resource Agency Review of Impacts

The resources within the project area should have been identified and mapped earlier in the Purpose and Need or Project Scoping phases. The impacts of the various alternatives were estimated during the Project Scoping phase. The Conceptual plans show an accurate determination of the impacts of the preferred alternative. If resource agencies have not reviewed and commented on project impacts, the Conceptual plans should be sent to the various resource agencies for their review and comment. The preferred alternative should be familiar to them in light of their participation in the alternatives analysis phase of project development.

1.3.5 502/Informational Hearing

Under 19 V.S.A. § 502, a public hearing shall be held for the purpose of receiving suggestions and recommendations from the public prior to the Agency's initiating proceedings for the acquisition of any lands or rights. A Public Informational Hearing may be held on projects which do not require acquisition of lands or rights, and for off-system projects such as Town Highway bridge projects.

Depending on review comments received, revisions to the plans may be necessary before going to a hearing. If substantial revisions are made, such as revisions to the project footprint, all concerned parties, including the resource team, should review the project before scheduling a hearing.

If a hearing results in recommendations which will involve plan revisions, the Project Manager should identify any additional impact(s) these changes may have on environmental resources within the project area and notify the Environmental Section of said impacts. Any resulting changes in impacts must be quantified for use in appropriate permit applications.

1.3.6 NEPA Documentation (CE) Approval

The Categorical Exclusion (CE) forms and supporting documentation are sent with a cover letter to the FHWA for approval. The CE serves as an umbrella addressing other executive orders, laws, and regulations in addition to NEPA. The CE process, including the Programmatic Agreement CE (PACE), is described in more detail in Chapter 4.

1.3.6.1 CE Documentation

The draft CE or PACE is prepared by the Environmental Section or consultants and is submitted to the Environmental Specialist Supervisor and the Project Manager for review. After the review is complete and the final document is prepared, VTrans submits the CE or PACE to FHWA. The submission includes the following elements:

- Cover letter to FHWA
- "Programmatic Categorical Exclusion Criteria" (checklist, for programmatic only)
- Environmental Analysis Sheet
- Wetlands Findings (report or memo usually)
- Section 106 documents (see below)
- Relevant correspondence regarding rare species occurrence or other issues

The first three of these items must follow the standard format included with the CE or PACE in Appendix C.

1.3.6.2 Section 106

If Section 106 resources (historic properties or districts that are on or eligible for the National Register of Historic Places, or archeologically sensitive sites) are within the project area, a determination of effect on those resources needs to be done. Under the

Programmatic Agreement among the Federal Highway Administration, the Vermont Agency of Transportation, the Advisory Council on Historic Preservation, and the Vermont State Historic Preservation Officer Regarding Implementation of the Federal-Aid Highway Program in Vermont, VTrans staff are responsible for making those determinations. If there is any question regarding a determination, a request for concurrence is sent to the Division for Historic Preservation. Three determinations are possible:

- **No Effect** (or “No Historic Properties Affected” under the Agreement) means there are no Section 106 resources present, or the project will not affect them. VTrans staff may consult with SHPO regarding application of the criteria. VTrans will also notify FHWA and any interested party of the finding and will forward copies of supporting documentation to SHPO for inspection by the public. No further review under Section 106 is required for this finding of No Historic Properties Affected.
- **No Adverse Effect** means there will be an effect but it will not be adverse. The VTrans Historic Preservation Coordinator will specify conditions, if necessary, that must be imposed to secure that finding. VTrans shall notify FHWA and any interested party that this finding of no adverse effect has been made and shall forward copies of supporting documentation to SHPO for inspection by the public. No further review under Section 106 is required for a finding of no adverse effect.
- **Adverse Effect** means the resource will be adversely affected and mitigation will be necessary. Prior to any finding of adverse effect, VTrans may consult with SHPO regarding application of the criteria and appropriateness of mitigation. The Agreement allows “Standard Mitigation Measures” under certain circumstances. Those measures are incorporated into a formal written finding of adverse effect. VTrans shall notify FHWA, SHPO, consulting agencies and interested parties that this finding of adverse effect has been made and shall forward copies of supporting documentation to SHPO. No further review under Section 106 is required. If VTrans determines that the Standard Mitigation Measures are not applicable, VTrans will consult with SHPO, FHWA, and consulting agencies on the special provisions adopted to avoid, minimize, or mitigate the adverse effect, and draft a Memorandum of Agreements (MOA) to reflect the agreement. This MOA and supporting documentation will be forwarded to SHPO, FHWA, and the federal Advisory Council on Historic Preservation (ACHP).

See Chapter 4 for more information on Section 106 procedures.

1.3.6.3 Section 4(f)

Section 4(f) of the Department of Transportation Act states that, “It is hereby declared to be the national policy that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites” (see Chapter 4). Section 4(f) applies to *all* historic sites but only to *publicly owned* parks, recreational areas, and wildlife and waterfowl refuges. In addition, Section 4(f) applies only to Department of Transportation actions and only if the land or historic site is considered “significant”. Section 4(f) does not apply to restoration, rehabilitation, or

maintenance projects if there is not an adverse effect determination under Section 106 (see Chapter 4).

If any Section 4(f) resources are to be used or acquired for project purposes, the Project Manager will ask the Environmental Section to prepare a Section 4(f) document, which may take the form of an individual, programmatic, or nationwide evaluation.

An individual Section 4(f) evaluation should address the following: project description, project purpose and need, description of proposed actions, 4(f) resource, alternatives, impacts, mitigation measures, and coordination activities.

There are three types of involvement with 4(f) resources which are covered by programmatic or nationwide 4(f) evaluations, and one by a negative declaration:

1. *Programmatic Section 4(f) Evaluation and Approval for FHWA Projects that Necessitate the Use of Historic Bridges (7/5/1983)*
2. *Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway projects with Minor Involvements with Public Parks, Recreation Lands, and Wildlife and Waterfowl Refuges (12/23/86)*
3. *Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway projects with Minor Involvements with Historic Sites (12/23/86)*
4. *Negative Declaration/Section 4(f) Statement for Independent Bikeway or Walkway Construction Projects (5/23/77)*

See Chapter 4 for more detail on Section 4(f) evaluations.

1.3.7 Act 250 Application Submittal (Part 1)

If the project is subject to Act 250 jurisdiction, (see the *Act 250 Jurisdiction* section above or Chapter 4) an application must be prepared and submitted, along with Conceptual plans, to the appropriate District Environmental Commission. Information required for the permit application is discussed in Chapter 4. The Commission may set up a hearing to gather testimony from interested parties, including Agency personnel. One or more hearings may be required. The Commission may issue a permit or a Draft Permit and Findings of Fact. These documents should be reviewed by the Technical Services Division Environmental Section and the Project Manager to determine if any changes to the plans are in order (such as to satisfy the conditions of the permit). Part 2 of the Act 250 application process is the submittal of Semi-Final Plans to the District Environmental Commission (see Section 2.4.2.1 below).

1.4 PROJECT DESIGN

The Project Design phase normally follows receipt of NEPA approval from FHWA (or from VTrans, if the NEPA document is a programmatic CE), and FHWA's authorization to proceed with "preliminary engineering for contract plan preparation." Project Design includes most permit applications, Part 2 of the Act 250 submittal, and a CE re-evaluation, if needed. The environmental procedures required during this phase are summarized in Table 2-7 at the end of this chapter.

1.4.1 Preliminary Plan Development

During development of Preliminary Plans, the Project Manager will supervise design of such features as width and depth transitions, curbs, guard rails, cut-to-fill transitions, drives, intersecting highway approaches, drainage and erosion control, traffic signs, pavement markings, street lighting, signalization, and detours. Cross sections will be templated, construction limits and notes will be placed on the layouts, and quantities will be computed for all anticipated construction items. Most permit applications are prepared during or soon after preliminary design plans are completed and approved.

1.4.1.1 Contaminated Soils

Geotechnical investigations should be requested within all excavation areas where potential contaminated soils were identified during the Project Definition Phase. The Project Manager submits a geotechnical investigation request to the Materials and Research Section. If the boring logs indicate the presence of contaminated soils, the Project Manager shall provide this information to the Agency's Hazardous Materials and Waste Coordinator to determine what, if any, action is necessary. The Project Manager shall also provide this information to the Right-of-Way Section as soon as possible. The most common kinds of involvement with hazardous materials are addressed in VTrans' standard specification Section 215, *Excavation and Disposal of Contaminated Soils*, and ANR's *Agency Guidelines for Procedures Contaminated Soil and Debris* (1996).

1.4.1.2 Permit Applications

The most common permits or sign-offs that are obtained during the development of Preliminary Plans are listed below. See Chapter 4 for more information on these and other programs. The various permitting agencies will have been exposed to the project during the Project Definition phase and will have given their informal concurrence that the proposed project is permissible. However, most of these agencies need to review Preliminary Plans before issuing a permit or signing off on the project.

- Conditional Use Determination (CUD)
- Stream Alteration Permit (SAP) (Title 19 (coordination))
- Section 401 Water Quality Certificate (WQC)
- Endangered and Threatened Species Permit
- Stormwater Discharge Permit
- Shoreland Encroachment/Lakes & Ponds Permit
- Section 404 (COE) Permit

1.4.2 Semi-Final Plan Development

Semi-Final Plans are developed for any project that requires the acquisition of land and/or rights. Semi-Final Design activities include incorporating any changes in design details as a result of meeting with property owners or in response to comments received from permitting agencies. Part 2 of the Act 250 submittal and the CE Re-evaluation may occur during this stage, if necessary.

1.4.2.1 Act 250 Submittal (Part 2)

If the project involves an Act 250 application, a set of plans must be submitted to the District Environmental Commission to obtain the land use permit. The cover letter and the attached plans should address any outstanding issues, design changes, or preliminary findings of fact made by the Commission.

1.4.2.2 Act 250 Permit Issuance

Once the District Environmental Commission issues the land use permit, the Technical Services Division shall forward one copy of this permit to the Project Manager and one copy to the Contract Administration Section. The Environmental Section permit specialist and the Project Manager shall review the conditions of this permit. If necessary, the Project Manager shall request that the Technical Services Division file a motion to alter or an appeal. If the conditions of the permit are acceptable, the Project Manager shall make any necessary changes to the plans and shall discuss these changes with any affected Agency sections and property owners. Any changes to the plans which would affect a property owner must be authorized by the Chief of Right of Way.

1.4.2.3 Re-evaluation of the CE

Prior to requesting authorization to acquire right-of-way, the Technical Services Division shall establish whether or not the CE designation remains valid. If either of the following conditions is met, the Project Manager shall request that the Technical Services Division submit a written CE Re-evaluation to the FHWA:

- Time: More than three (3) years has elapsed since the original CE determination.
- Design Changes: The project scope, construction limits, impacts, or proposed mitigation have changed.

The re-evaluation request is a letter to FHWA describing changes in the project, assessing the significance of the changes in terms of impacts, and requesting FHWA concurrence.

1.4.3 Final Plan Development

The Final Design phase includes development of most of the structural design, traffic signal, and landscaping details; acquisition of land and/or rights; development of utility or railroad agreements; and special provisions. This phase of design culminates in the completion of the contract plans, specifications and estimate and the advertisement of the project for receipt of bids.

Prior to requesting authorization to advertise the project for the receipt of bids, the Project Manager, in consultation with the Technical Services Division, shall establish whether or not the CE designation remains valid. Further details regarding the reevaluation criteria may be found in Chapter 4. If more than three (3) years has elapsed since the original CE determination, or the project scope, construction limits, impacts, or proposed mitigation

have changed substantially, then the Project Manager shall request that the Technical Services Division submit a written CE Re-evaluation to the FHWA.

1.5 CONSTRUCTION

The environmental procedures required during and after construction are summarized in Table 2-8 at the end of this chapter.

1.5.1 Material Supply and Disposal

In 1991, VTrans and the Environmental Board signed the *State of Vermont Environmental Board and Agency of Transportation Material Supply and Disposal Area Memorandum of Understanding*. This MOU provides guidelines for VTrans waste and borrow activities during construction in accordance with Act 250 requirements. VTrans also has general material supply and disposal guidelines in Section 105.25 of VTrans's 2001 *Standard Specifications*. This specification requires that the contractor give written notice to the DHP of all material supply and disposal areas at least three weeks prior to utilization of the areas; note that notice should go to the Archeology Officer rather than DHP. The Environmental Section's procedures for VTrans material supply and disposal activities are defined in two documents prepared by VTrans in 2001: *Archaeological & Natural Resource Review of Waste, Borrow & Staging Area(s)* and *Waste, Borrow, and/or Staging Area(s) for Archaeology Only*. These documents and the MOU are included in Appendix C.

1.5.2 General Permit 3-9001 for Stormwater Runoff from Construction Sites

Most projects will require a "General Permit 3-9001 for Stormwater Runoff from Construction Sites." This permit is for EPA's National Pollutant Discharge Elimination System (NPDES), which is administered by the Vermont ANR. The purpose of the permit is erosion control during construction. This permit is required for any project which will disturb an area over five acres. The permit is obtained by Construction and acknowledges that an erosion control plan has been developed and will be implemented. See Chapter 4 for more information. The turnaround time from application to issuance is typically ten days. Plans are not required to be submitted with this permit. Municipal projects are exempt from this permit.

1.5.3 Mitigation

Many projects receive permits from resource agencies contingent upon a certain amount of work to be performed as mitigation for a loss of existing resources required to construct the project. Mitigation work will be shown in the Contract Plans and other Contract documents. The Project Manager will develop a listing of specific mitigation and permit requirements and provide this listing to the Resident Engineer. The Resident Engineer must be fully knowledgeable relative to the concerns of the resource agencies and to what areas of the proposed construction are included as mitigation. The Project Manager is the key person to inform the Resident Engineer relative to these matters. Occasionally construction items used to perform mitigation are modified from the standard specifications due to concerns in allowing the contractor to work in environmentally sensitive areas.

For large, complicated, or controversial mitigation projects, technical specialists may be consulted to provide input. The technical specialists may be from Environmental Section, the consulting firm, or appropriate resource agencies, such as the Army Corps (Ruth Ladd is currently the regional mitigation specialist), ANR, or Natural Resources Conservation Service. This ensures that the best technical expertise is focused on the project. It also helps gain consensus on key project decisions.

1.5.3.1 Pre-Construction Conference

Required mitigation should be discussed at a pre-construction conference to ensure the contractor is fully aware of all environmental mitigation issues. This conference is attended by the contractor, Project Manager, resident engineer, and a representative from Technical Services or the consultant. The contractor's sequence of construction, type of equipment for performing various tasks, and methods of construction are presented. The pre-construction conference also gives interested parties the opportunity to express their concerns relative to their specific interests. Many contractors are somewhat flexible to reasonable modifications to their proposed sequence or construction methods.

1.5.3.2 Project Inspections During Construction

Representatives from resource agencies quite often visit the project site during construction to inspect the progress of the work. Generally, these visits are satisfactory and many of the representatives do not choose to attend the final inspection.

Any resource agency that has a concern relative to any aspect of the construction on a project can have an on-site meeting be required as part of the permit, and that requirement can be incorporated into the project Special Provisions. This is quite common when construction is required close to or in sensitive wetlands, archeological, or historic resources. It is critical that the requested resource agency specialist be available for scheduled meetings along with the Agency's resource specialist so that decisions can be made at this meeting, limiting the contractor's basis for claims of project delays.

1.5.3.3 Final Inspection

After notice from the Contractor of presumed completion of the mitigation site, the Construction Section, in coordination with the Project Manager and Technical Services, will schedule a date for a final inspection of the project. If the inspection finds all work completed, the Contractor will be informed in writing of the acceptance of work, as of the final inspection date. If the work is not complete, or unsatisfactory, the Contractor will be given instructions for corrective action. The corrective action must be completed to the satisfaction of the Resident Engineer and the Project Manager before the project will be accepted. Resource agencies or other interested parties may be invited to the final inspection.

1.5.3.4 Post-Construction Monitoring

After the mitigation work has been constructed, a schedule of post-construction monitoring may be undertaken. This typically lasts for two to five years following construction, and

involves at least annual visits to the site to monitor progress and identify problems. Monitoring may involve formal data collection such as vegetation plots, photographs at photo stations, water measurements, or other methods. Typically, a brief report is prepared and distributed to resource agencies following annual monitoring. The monitoring schedule, methods, and reporting procedures should be determined earlier in project development, as part of mitigation planning.

1.6 SUMMARY OF ENVIRONMENTAL PROCEDURES IN PROJECT DEVELOPMENT

The key environmental steps in project development are summarized in Tables 2-4 through 2-8 on the following pages. This list may not be comprehensive, but is intended to include the major steps that typical projects follow. It may be used as reference to ensure that a project is meeting all of the required procedures. Of course, not all projects follow exactly the same procedures, and all project development procedures are subject to change.

Table 2-4 Environmental Procedures During the Purpose and Need Phase

Collect Existing Data and Maps

Site Visit – Overview of Site

Resource Team Review and Mapping

- Formal Resource Identification (Optional at This Phase)
- Biologist
- Archeologist
- Historian
- Other Resource Data
- Socio-Economic Data
- Local and Regional Plans

Resource Agency Coordination

- Send Resource Identification Plans, Project Information
- Pre-Design Site Meeting (Optional)
- Invite to Local Concerns, Other Meetings
- Request Purpose and Need Comments

Local Concerns Meeting

- Include Resource Identification if Available
- Invite Resource Agencies and Environmental Section
- Request Agency Comments Before or at Meeting

Purpose and Need Statement

- Submit to Agencies for Comment

Table 2-5 Environmental Procedures During Project Scoping

Resource Team Review (If Not Previously Completed)

Impact Assessment (Direct and Indirect Impacts)

Evaluation Matrix

Resource Agency Coordination

- Invite to Alternatives Presentation Meeting
- Send Plans and Matrix
- Request Comments
- COE Coordination Meeting or Site Meeting
- Notify of Alternatives Acceptance, 502 Hearing, Act 250 Hearing

Alternatives Presentation Meeting

- Invite Agencies
- Show Resources on Plans
- Hand Out Evaluation Matrix, Other Materials as Appropriate

Preferred Alternative/LEDPA Selection

Scoping Report

- Resource Information Section
- Alternatives Section (Impact Information)

- Evaluation Matrix
- Append Resource Reports
- Send Review Draft to Agencies

PDT Meeting (if necessary)

Following Scoping:

NEPA Classification: CE, EA, or EIS

Table 2-6 Environmental Procedures During and After Conceptual Design

Conceptual Design

- Resource Team Plan Review
- Act 250 Jurisdiction Determination
- Resource Team Review of Impacts

502/Informational Hearing (After Conceptual Design)

NEPA Documentation (Begin Preparing During Conceptual Design)

CE Procedures:

- FHWA Cover Letter
- Programmatic Checklist (if Applicable)
- Environmental Analysis Sheet
- Section 106 Documentation
- Section 4(f) Documentation, if necessary
- Wetlands Findings
- Rare Species Documentation
- Other Documentation

Act 250 Submittal (Part 1) (Begin Preparing During Conceptual Design)

- Submittal
- Hearings
- Review Draft Permit and Findings of Fact

Table 2-7 Environmental Procedures During Project Design (Preliminary through Final Plans)

Preliminary Plans

- Resolve Hazardous Waste Issues, if Any

Permit Applications

- Conditional Use Determination
- Stream Alteration Permit (Title 19 coordination)
- Section 401
- Endangered and Threatened Species Permit
- Stormwater Discharge Permit
- Shoreland Encroachment/Lakes & Ponds
- Section 404

Semi-Final Plans

- Act 250 (Part 2 – Plan Submittal)
- Review Act 250 Permit in Light of Design Changes
- CE Re-evaluation (Over 3 Years since Approval or Design Changes)

Final Plans

- CE Re-evaluation (Over 3 Years since Approval or Design Changes)

Table 2-8 Environmental Procedures During and After Construction

Material Supply and Disposal Area Review

General Permit 3-9001 For Stormwater Runoff From Construction Sites

Mitigation

- Pre-Construction Conference
- Project Inspections during Construction
- Final Inspection
- Post-Construction Monitoring

Appendix D

Public Involvement Process

Transportation is important for creating economic vitality, quality of life, and sustainable communities in Vermont. To develop an inclusive, well thought out plan, the Vermont Agency of Transportation reached out to a broad range of Vermonters, other State agencies, and various organizations through a variety of engagement processes during the development of the Long Range Transportation Business Plan (LRTBP).

The LRTBP process included many activities to engage the public and other interested parties and to gather input to guide the development of the plan. The public involvement process included two rounds of public meetings and an open public comment period. All public meetings are listed at the end of Appendix D. For the duration of the planning process, a public website was maintained, containing links to Plan documents, working papers, and updates, as well as information on how to get involved (<http://vtplan.rsginc.com/>). A public opinion survey was conducted in the early planning process to help develop the Plan. Focus groups and interviews were conducted to gather opinions about transportation and to assist in the development of the goals and strategies. A unique component to the LRTBP process was the scenario planning session that included over 75 participants.

VTrans reached out to Vermonters during the initial phases of LRTBP development. In anticipation of developing the Scope of Work and content of the LRTBP, interested State agencies were invited to a meeting with VTrans in December 2005 to discuss what state level plans they had that should be reviewed and considered by VTrans in developing the LRTBP, as well as what would be the best means of coordination during the development of the Plan. The answer to the second question was to include agency representatives on a Study Advisory Committee. Participants at the meeting included: Peg Elmer, Housing and Community Development; Thomas Murray, Department of Economic Development; Bruce Hyde, Tourism and Marketing; Riley Allen, Department of Public Service; John Sayles and Dennis Malloy, Agency of Natural Resources.

In September 2006, VTrans presented a LRTBP overview and requested input on important factors affecting transportation to the Transportation Planning Initiative (TPI) consisting of RPC/MPO transportation planners. The following month, in October, VTrans presented the LRTBP overview and requested input on important factors affecting transportation to the RPC/MPO TAC meetings throughout the state. In April 2007, VTrans planning coordinators Scott Bascom and Aimee Pope delivered a PowerPoint presentation to the TPI to discuss what had been done to date on the LRTBP and what the next steps were to be.

VTrans conducted the statewide public opinion survey in the early planning stages of the LRTBP. The purpose of the survey was to gauge how Vermonter's travel habits are changing and to provide current information about their attitudes, perspectives, and priorities for the future of transportation spending and infrastructure planning. Survey results were obtained through a random telephone survey of 1,243 Vermont residents over the age of 18. Individuals were selected to participate in the survey using a list of randomly generated phone numbers purchased from a supplier of samples for telephone surveys.

Interviews and focus groups were conducted between January and March 2007. Fifty-two Vermonters participated in the interviews and focus groups that took place in several regions across the state. These interviews were transcribed and coded for themes using a qualitative software program. VTrans' consultant wrote a report entitled, "Voices of Vermonters: Vermont's Transportation Future,," based on the results. These findings helped develop the scenarios and objectives for the Scenario Planning Session.

In June 2007, a group of over 75 people, carefully selected to represent a cross-section of state transportation stakeholders, gathered at the Capital Plaza Hotel in Montpelier to participate in an all-day Scenario Planning Session. Working Paper 7 provides a summary and analysis of the discussions and results of the Session. Four possible future scenarios were extensively developed throughout the workshop. The session also set the foundation for the goals and strategies identified in the LRTBP.

VTrans held a series of public meetings across the state during Fall 2007 to present and obtain comments on the Working Papers and draft LRTBP. In October and November 2008, five public meetings were held around the state to present the draft plan. Public presentations were also made at this time to the Central Vermont Regional Planning Commission (CVRCC) and Chittenden County Metropolitan Planning Organization (CCMPO) TAC, the CCMPO Board, a CVRCC committee meeting, and the Vermont Aviation Advisory Council.

VTrans provided an executive summary of the Plan at public meetings. A PowerPoint presentation with visualization techniques to describe the LRTBP was given and discussions were facilitated. Notes were carefully taken at these sessions and compiled with the written comments received through email and mail. These comments are presented and addressed in the next section. Overall, many positive comments about the plan were made by the public and other stakeholders. These comments were often given "off the record" following public meetings and presentations.

The final version of the LRTBP will be available for download on the VTrans website (<http://www.aot.state.vt.us/>). It will also be available in CD or hardcopy by contacting the agency, or through any of the Regional Planning Commissions or the Chittenden County Metropolitan Planning Organization.

Compiled Public Comment on the
Draft Vermont Long Range Transportation Business Plan

Bicycle & Pedestrian Transportation

Comments:

- Explicitly reference that Ped/Bike plan as part of your intentions for Chittenden County and as an objective for broader adoption throughout the state.
- More dedicated bike lanes designed into known commuter arterial routes, and/or dedicated off-road bike paths that serve as connectors between arterial routes. I bike-commute to Burlington 2x week in the three hospitable seasons, and I personally think using and improving the existing road system with dedicated bike lanes much more practical than trying to cut new off-road bike paths where no ROW currently exists (but short strategic linkages made by off-road paths can be an important part of bike routes)
- Wider roads when re-paving is done, with dedicated painted shoulder lines. Nine-foot wide painted lanes on Town roads to give cyclists those precious extra inches and slow down traffic by "virtual" necking down road width, which benefits walkers as well.
- Do we have a plan or are we moving in a direction to make improvements to VT road network to better accommodate bicycling?
- How where does bike/ped fit into the LRTBP?
- National standards recommend 4 feet minimum passing distance for biking on roads; if only 1.2% of roads have bike lanes then 98% of roads can not accommodate bicyclists.

- Do we have a measurable way to gauge progress toward accommodation for bicyclists?

How these comments are addressed:

The LRTBP is a strategic planning and management level document and the details of specific projects are included. For the comments that are at the program or project level, please refer to the appropriate modal policy plan (e.g. the Vermont Pedestrian and Bicycle Policy Plan). The modal plans have information on standards and regulations, as does the Bicycle & Pedestrian Facilities Design Manual. These pedestrian and Bicycle comments will be forwarded to the program manager.

In Section 6 of the LRTBP, Goal 5 refers to improving and connecting all modes of Vermont's transportation system. A main strategy under this goal is to "Accommodate non-motorized transportation within the transportation system." Although there are no specific performance measures for non-motorized transport in the LRTBP, there are both short term (0-5 years) and long term (more than 5 year) implementation targets for improving and accommodating non-motorized transportation and supporting intermodal transportation facilities. Primary accountability for these strategies is VTrans' Department of Policy and Planning. Internal support will come from both Operations and Program Development, and external-agency support will be provided by the state's regional planning commissions and the metropolitan planning organization.

The September 2008 Chittenden County MPO Regional Bicycle-Pedestrian Plan Update has been listed in Table A-1 in Appendix A.

Transit, Rail, and Commuter Options

Comments:

- The State has to do more to address issues around commuting in all parts of the state, to give commuters real alternatives to single-occupant vehicle travel.
- More transit options and better, smarter networks of bus routes to reach more riders!

- Introduce an "outer loop" circulator bus to Burlington so people can get around and across, not just into and out of the city and introduce a "satellite loop" that circulates in both directions around the towns surrounding Burlington

- Introduce commuter routes using smaller sized, fuel efficient busses (they could even be 10-15 seat vans!) that originate at satellite collector P&R lots on known congested commuter routes provide satellite parking facilities at limits of urbanized areas, to limit car travel into cities

- Look at smaller scaled examples (Caribbean Islands come to mind) with similar population size, geographic challenges, and land area to cover and see how they do it. Many rural and town busses are large Club Vans, privately owned and operated, with known, predictable schedules, somehow organized and very efficiently run! We have a private bus service for DOGS in Chittenden County (Gulliver's Doggie Daycare shuttle); why can we have several for people??

- Make rail travel a goal (Chicago, Florida, etc.). If that plan is going to improve connectivity, then the state should insist that Amtrak provide same day connections to major cities. There is no way to go beyond DC from VT by train and not stay overnight somewhere.

How these comments are addressed:

Public transit is addressed several times in the LRTBP at a strategic level. The Public Transportation Policy Plan is discussed in Section 2.A.4. The Public Transportation Policy Plan's goals include providing mobility for transit dependent populations and access to employment through public transit. Recommendations in this plan include the expansion of services and funding, the coordination of rail, aviation, and intercity bus programs, and a focus on regional transit connections. In section 2.B.4, a description of Vermont's current public transportation service is described and the results of the 2006 LRTBP public opinion survey regarding public transit are summarized.

In Section 6 of the LRTBP, there are several strategies and goals that address public transit. For Goal 2, strategies include consolidating the planning and operations of publically assisted transit services. For Goal 5, strategies include planning and supporting intermodal transportation facilities to provide multimodal options and conducting assessments of single occupancy vehicle (SOV) modes that burden the system more than transit modes. In Goal 6 of the LRTBP, there is also a strategy aimed at promoting public transit.

Project or operating suggestions will be referred to the transit or rail program managers. For the suggestions specific to Chittenden County, these comments will be referred to the Chittenden County Transportation Authority.

Freight Travel

Comments:

- The Plan needs to recommend how to reduce the amount of freight truck travel.
- Plan needs to recommend how to get additional freight tons onto rail and barge and out of trucks
- Did we address allowing heavier trucks on our roads as New Hampshire has?
- Reference to CanAm Connections Trade Corridor Study needs to be clarified or eliminated. It is slipped in without public knowledge of the plan. Clarify that this is an example of coordination of transportation issues on a regional basis.

How these comments are addressed:

Improving rail freight travel is an important component of the LRTBP. Under Goal 2, Strategy E is to help accommodate freight movement by collaborating with public and private entities to address multimodal freight access needs. Under Goal 2, there is also a strategy focused on helping develop multimodal corridor management plans. The multimodal corridor approach includes rail and freight travel. The Vermont State Rail and Policy Plan (2006), which includes improvements to rail networks within Vermont, is briefly summarized in Section 2 of the Plan. In addition, VTrans has recently announced that it will undertake the development of a major freight policy plan over the next few years.

Section 3.A.6 of the LRTBP discusses the challenges posed by freight movement in the state. Part of this challenge will be to maintain and improve the transportation infrastructure, thus facilitating the efficient movements of goods and services. Transportation partnerships, combining modes (highways, rail, air, and water), warehousing, transfer terminals, computer and telecommunications systems will need to become more common.

In Section 3.B, one of the opportunities for Vermont will be to build and maintain infrastructure to be compatible with regional, national, and international service standards. The Northeast CanAm Connections Trade Corridor Study is cited as an example of a future initiative that could help develop seamless multimodal mobility options across the entire region.

These rail and freight comments will be forwarded to VTtrans management.

Goals & Strategies

Comments:

- Restructure Goals with SAFETEA-LU goals
- Stronger Verbs in strategies and goals—too vague
- Performance measures and goals aren't sufficiently detailed to measure progress; how can you measure progress with weak goals?
- Where are performance measures and accountability?
- Are the strategies in priority order?
- What guarantee do we have that this won't just sit on a shelf?
- Did we consider strategic abandonment of transportation facilities?
- Does the legislature have to approve the strategies?
- Policy Goal 2, Strategy F, page 58 – I hope that all stakeholders – including bus riders, regional E&D transportation groups, transit boards of directors, town officials – will be fully consulted with regarding the potential to consolidate public transportation services statewide.
- Consider new strategies under Policy Goal 7, page 63: The Transportation Enhancement program is vitally important since beautification, streetscaping and other improvements are a key component of local economic development efforts to revitalize villages and

downtowns. State transportation planning efforts and funding decisions shall be made in accordance with state policies in 19 V.S.A. § 10b(b) and the State Planning Goals in 24 V.S.A. § 4302.

How these comments are addressed:

The goals were developed from the entire LRTBP process, including the scenario planning sessions. The SAFETEA-LU required planning factors (Section 1.C) are fully addressed within the LRTBP and are also imbedded within each of the seven LRTBP goals.

The wording of the goals and strategies is not meant to be specific and rigid, as this is a long range strategic plan and not a short term or project plan. Although the strategies are numbered for identification purposes, they have no prioritization order. Each strategy has a division assigned to it that is accountable for implementing that specific strategy. The table of goals, strategies, purpose, accountability, and implementation target dates is meant to provide guidance to all aspects of agency work. This plan will be used by all levels of agency management—executive, program, and operational—to guide agency decision-making processes.

VTrans develops plans at corridor levels and uses the VTrans-developed Corridor Management Handbook to help do this. As important corridors emerge, there may be some consideration in the planning process to strategic abandonment of facilities. A new strategy has been added to Goal 4 of the LRTBP regarding the strategic abandonment of transportation facilities. Goal 4, Strategy F is to “Consider development of a “strategic disinvestment” policy for transportation infrastructure and services whose maintenance, preservation and/or operating costs significantly exceed the value of their economic and societal benefits.”

The Vermont legislature does not approve these strategies. Legislatures will be offered an opportunity to review and comment on the plan. The Legislature has the power to authorize legislation to implement some of the strategies, such as financing options.

Transportation Enhancement Program is a federal program that VTrans partakes in. This comment will be passed on the appropriate program manager.

Funding Issues

Comments:

- Does the gap include accommodations for new practices?
- Is the funding chart assuming a good condition of our infrastructure?
- Are the projections to maintain the infrastructure in “current performance” levels?
- Figure 3, Funding Gap, should be on the front page because it is the most important thing in the plan.
- Do we anticipate new funding at 100% federal from a stimulus from Washington?
- There are worries that VTrans is not ready to benefit from a potential new economic stimulus bill under consideration in Congress.
- If a gas tax is considered it should go to construction costs for bridges and roads only and not for other costs.
- More money is needed for transportation and the plan should acknowledge this.
- Policy Goal 1, Strategy G - I like the idea of a state or regional impact fee since the towns in our region are too small for impact fees to work.
- Policy Goal 1, Strategy B - I fully support indexing the gas tax to inflation.
- Consider adding a strategy under Policy Goal 1: Dollars allocated to the T-Fund should stay in the Fund.

How these comments are addressed:

Section 7 (Financial Outlook) Figure 19 contains the estimated funding gap between 2007 and 2025. This is the same exhibit as Figure 3 in the Executive Summary. These estimates were developed for Working Paper 3, “Financial Analysis.” This gap does not account for new practices; it merely plans for maintaining the current system that we already have. Essentially, we maintain the system that we have in place currently and meet our asset management targets (condition of infrastructure) through asset management processes. This table is at the end of the Executive Summary and in the final section of the LRTBP to demonstrate that with no changes to the way VTrans has conducted its business in the past

the funding gap between needs and resources will continue to exist and most likely continue to grow.

At the federal funding level, there is no decision yet on funding for the next reauthorization bill. We can not predict what will come out of national legislation. We can assume that we will continue to receive federal funding but the specifics of what those levels of funding will be are undetermined. Although some people expressed concern that Vermont would lose federal funds since some of these are not being matched by the state, this most likely will not occur. Some earmarked project funds are slow to be obligated but Vermont is not going to lose federal funding. VTrans is in consultation with the Congressional delegation and anticipates that any stimulus funding from Congress, if approved, will not require a non-federal match. VTrans is working with Vermont's Congressional delegation as well as Regional Planning commissions and towns to prepare for the federal stimulus package.

The LRTBP strategies consider several funding options including a raise or indexed adjustments in the gas tax. While more state and local revenue will need to be raised, it is uncertain what these additional funds will be used for. The main thrust of the financial analysis is that there will be funding shortages and additional revenue will be needed and the way the Agency conducts its business will have to become more cost efficient.

While there has been discussion throughout the state to cease the transfer of transportation revenue into the General Fund and other state funds, this is a complex issue that requires more than VTrans' approval. This is ultimately a Legislative decision. VTrans can provide opinion on funding issues to the Governor, who puts forth the Governor's Recommendation Budget to legislature each year.

Business/Economic Development/Streamlining Efforts

Comments

- The state is slow to react to the transportation needs of existing major employers making it difficult to believe they could assist major new ones.
- The focus on business should be stronger in the plan
- Growth scenario – AOT can't respond to support developers because it takes 10 years to do a bridge (they can't respond in the same timeframe that business does.) The AOT couldn't/didn't help IBM, Omya, or others.
- What about considerations for design build as a strategy?

- Can we streamline the project planning, design, and permitting processes to help expedite projects?
- Is VTrans considering design/build options to move projects quicker?

How these comments are addressed:

An element of Goal 6 in the LRTBP is the strengthen Vermont's economy. Strategies to help meet this goal include integrating transportation investments with state and local economic development strategies and plans and to coordinate with the Agency of Commerce and Community Development.

Goal 4 Strategy D states that VTrans needs to review and modify design standards to facilitate cost-effective maintenance.

VTrans is continuing to work with the Agency of Natural Resources and the American Association of State Highway and Transportation Officials (AASHTO) to streamline regulations and interagency agreements, including elimination of duplication of permitting. A new strategy has been added to Goal 2. This new strategy is: Continue to pursue design-build, operation, maintenance, finance, and other strategies to streamline the project development and permitting process.

Land Use

- Why doesn't land use and transportation occur already?
- Challenges, page 3, Executive Summary – Land use is listed as a challenge. I believe this would be more appropriately listed as sprawl or strip development with uncoordinated access management as a challenge, not simply "land use" in and of itself.
- How is progress measured against goal 7?

The connections between land use and transportation planning are increasing being made. The issue is complex because land use decisions are mostly made at a local level; the state

has little authority in most land use decisions. Land use and transportation is increasingly being coordinated, although there are many barriers and challenges to this. In the LRTBP, land use is presented as a challenge. Yet land use can be considered an opportunity if land use and transportation planning become better coordinated.

For Goal 7, regarding land use and transportation coordination, progress is measured by the level of coordinated planning between transportation and land use. These strategies include continuing current efforts such as working with Vermont Local Roads to preserve aesthetic and historic resources. In the next 5 years, this goal will also be supported through VTrans planning efforts to promote smart growth by working with several external partners including the Vermont Association of Planning and Development Agencies, the Vermont League of Cities and Towns, and the Agency of Commerce and Community Development.

Other Issues

Comments (Note: These comments are addressed individually)

- How will we tax electric cars?

Although the Plan mentions supporting the development and use of alternative fueled vehicles, it does not discuss specifics such as how these vehicles will be taxed.

- “Big Thinkers” has negative connotations

The term “Big Thinkers” is not intended to have negative connotations. A wide net was cast throughout the state to diversify these interviews and focus groups. Interview and focus group participants were chosen from many sectors: human services, business, tourism, transportation, and environment. These participants were from university, non-profit, for-profit, and governmental organizations. There were also focus groups held around the state by region; these regional participants were also comprised of a diverse stakeholder background.

- End state involvement of airports (due to lack of support for airports in scenario planning)

Although the public ownership of airports may not have been supported by some participants at the scenario planning session, there was general support of state-run

airports throughout the LRTBP process and it is state policy to keep all 10 State-owned airports open and safe.

- Transportation decision-making is paralyzed, too complicated, and everyone's given a project veto

Although transportation decision-making is multi-faceted, there are processes in place to help managers make the best decisions. These processes include asset management, life-cycle analysis, cost-benefit analysis, collaborative decision making through consultation processes, and prioritization processes. Other tools to assist decision-makers include performance measures and indicators developed with various data.

- Maintenance of the existing system is not the only near or long-term focus that's needed for the transportation system. Other facility needs should be addressed. There seems to be disconnection between near term realities and the long-range plan.

The LRTBP lists a time implementation plan for each strategy. The differences between near term realities and long-range planning strategies were discussed throughout the entire long range planning process. The result was the development of an immediate, ongoing, short-term and long-term implementation time frame.

- Does the plan assume that SOVs will be the most prevalent mode of transportation in 25 years?

The LRTBP has four different scenarios that guided goal and strategy development. Certain scenarios suggest that energy and environmental changes may alter the transportation system and reduce the number of single occupancy vehicle (SOV) trips in the future. The strategies to address these scenarios can be found in many goals within the Plan.

FOR IMMEDIATE RELEASE:
October 3, 2008

Contact Scott Bascom
802-828-5748

**VTRANS TO HOLD PUBLIC MEETINGS ON THE DRAFT
VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN**

MONTPELIER – The Vermont Agency of Transportation (VTrans) will hold a series of public meetings in October and November to discuss and gather public feedback on the Agency’s Draft Long Range Transportation Business Plan (LRTBP).

The comprehensive, 25-year transportation plan lays out strategies that will provide increased mobility, economic efficiency, orderly economic development, safety, and environmental quality for all transportation modes including bicycle and pedestrian facilities, highways and roadways, public transportation, railroads, and airports.

“The Long Range Transportation Business Plan provides VTrans with a ‘roadmap’ for investing the state’s limited resources and managing our transportation system in a highly cost-effective way over time,” said VTrans Secretary David Dill. “In addition, the scenario-based planning process that was used to develop this plan provides Vermont with an important tool for expeditiously adapting both its transportation funding and system management strategies to address the needs of an ever changing world.”

The Plan is built upon VTrans guiding principle, “*The Road to Affordability*,” which places the preservation of Vermont’s existing transportation system as a first priority. The LRTBP planning process included the input of a wide variety of stakeholders, including:

- An Advisory Committee comprised of key stakeholders representing various state agencies, regional planning commissions and the Metropolitan Planning Organization, local governments, and business and environmental groups.
- A public opinion survey commissioned by VTrans in 2006 that gathered input from Vermont residents about transportation issues.
- A Scenario planning session was held where participants developed policies and actions in response to four possible scenarios that may play out in the next 25 years.
- The plan’s consultant team gathered input from VTrans, national experts, Vermont “Big Thinkers,” the public opinion survey, and focus groups.

The Plan uses both current VTrans goals and policy goals recently developed through the LRTBP planning process to develop a set of strategies to meet the state’s current and future transportation needs. The Plan also includes a financial analysis of Vermont’s transportation system.

An executive summary, as well as the full draft Plan, are available for public review on the LRTBP website: <http://vtplan.rsginc.com/>.

VTrans will hold five public meetings, including one conducted through Vermont Interactive Television, to take comments on the draft Plan. The meetings are the second round of public meetings conducted as part of the preparation of the Plan.

The dates and locations for the meetings are:

- **Thursday, October 23, 2008 at 7pm in Rutland, VT**

Rutland Regional Medical Center, Conference Room 4

160 Allen Street, Rutland, VT, 05701

Additional information: To coincide with the Rutland Regional Transportation Advisory Committee. Parking is in front and behind the hospital. If you enter on the far east side of the building, near the gift shop, the conference room is right off the main hallway.

- **Tuesday, October 28, 2008 at 6pm in Lyndon, VT**

Lyndon Industrial Park - Charles E. Carter Business Resource Center

Industrial Parkway – off of US 5, South of Lyndonville

- **Thursday, November 20, 2008 from 3 pm—5:30 pm in Norwich, VT**

Tracey Hall, Downstairs multi-purpose conference room

Corner of US 5 and Main Street

Additional Information: Sponsored meeting of the Upper Valley Transportation Management Association Along with; Southern Windsor County Regional Planning Commission and Two Rivers-Ottawaquechee Regional Commission. Located across from the town green. On-street parking and parking spaces located on either side of the building.

- **Tuesday, November 18, 2008 from 5 pm—6:45 pm on Vermont Interactive Television (VIT)**

Several sites around the state will host this interactive television presentation. Please call (802) 728-1455 or go to www.vitlink.org for location information.

- **Wednesday, November 19, 2008 from 5 pm—6:30 pm in South Burlington, VT**

Chittenden County Metropolitan Planning Organization, Main Conference Room

30 Kimball Avenue, Suite 206, South Burlington, Vermont

Additional Information: Office is located at 30 Kimball Ave - about 3 buildings down on the left side. The building is a grey rectangular shaped structure. Parking is available in front and behind the building. There is a rear entrance on the lower level to the main conference room.

Individuals requiring special accommodation should contact Karen Akins at (802) 793-1481 or karenakins@onebox.com a minimum of two weeks in advance.

Written or email comment on the Plan will also be accepted until November, 30 2008 and can be sent to either of the following contacts:

Scott Bascom, Planning Coordinator
Policy and Planning Division
Vermont Agency of Transportation
Policy & Planning Division
1 National Life Drive
Montpelier, VT 05633-5001
Email: Scott.Bascom@state.vt.us
Tel: (802) 828-5748

Erica Campbell
Resource Systems Group, Inc.
60 Lake Street, Suite 1E
Burlington, VT 05401
Email: Ecampbell@rsginc.com



Vermont Long Range Transportation Business Plan: Technical Appendix

March 2009

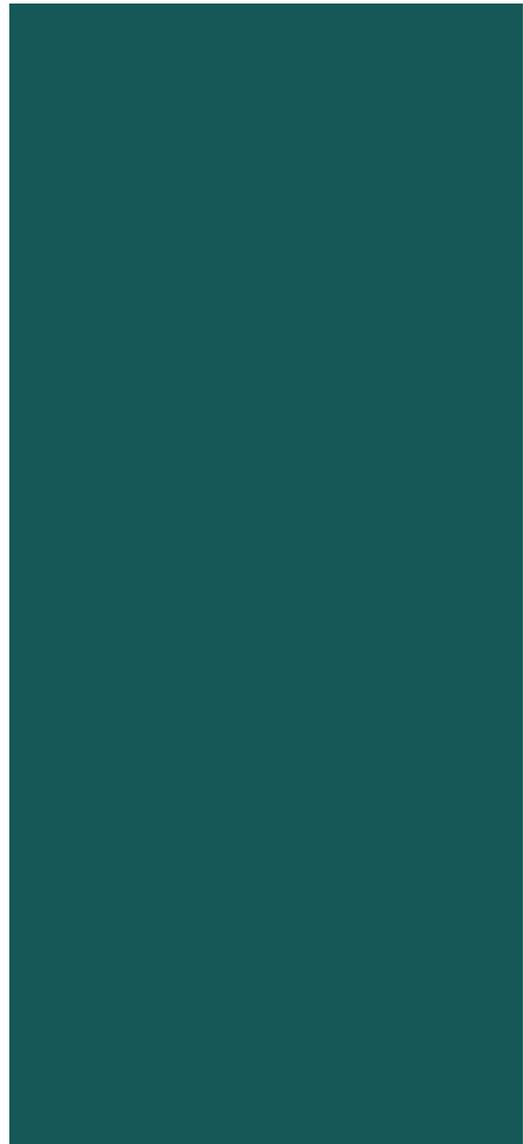


TABLE OF CONTENTS

Working Paper 1: State, Regional, and National Transportation Policy Review

Working Paper 2: State Agency Issue Review

Working Paper 3: Financial Analysis

Working Paper 4: Statewide and Regional Demographic and Employment Analysis

Working Paper 5: Visions, Goals, and Plan Objectives

Working Paper 6: Scenario Development

Working Paper 7: Summary of Scenario Planning Session

Voices of Vermonters: Vermont's Transportation Future

Scenario Planning Participant Package

VT LRTBP 2006 Survey Update Final Report



■ Documentation for:
**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 1: State, Regional, and National
Transportation Policy Review

■ Prepared for:
Vermont Agency of Transportation

8 December 2006

Draft

■ In Partnership with:
Snelling Center for Government
TransManagement
Center for Rural Studies
Hubert H. Humphrey Institute of Public Affairs

VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 1: State, Regional, and National Transportation Policy Review

TABLE OF CONTENTS

INTRODUCTION..... 1

1.0 VTRANS ACTIVITIES SINCE 2002 1

 1.1 STATEWIDE SYSTEM MODAL POLICY PLANS 3

 1.2 MODAL CAPITAL INVESTMENT POLICY PLANS..... 9

 1.3 OTHER STATEWIDE STUDIES AND PLANNING INITIATIVES 10

 1.4 SAFETY INITIATIVES..... 13

 1.5 ASSET MANAGEMENT AND PERFORMANCE MEASURES..... 15

 1.6 VTRANS ORGANIZATIONAL CHANGES..... 18

 1.7 REGIONAL TRANSPORTATION PLANS 20

2.0 NATIONAL ISSUES IN TRANSPORTATION 23

 2.1 FINANCING SURFACE TRANSPORTATION..... 24

 2.2 THE GROWING ROLE OF FREIGHT 28

 2.3 SAFETY AND SECURITY 30

 2.4 DEMOGRAPHICS AND ECONOMIC FORCES..... 30

 2.5 CONCERN FOR ENERGY COSTS AND ENVIRONMENTAL IMPACTS OF TRANSPORTATION SYSTEMS 32

 2.6 CONGESTION MANAGEMENT..... 34

 2.7 INTERCITY PASSENGER TRAVEL 35

 2.8 PLANNING AND DELIVERING PROJECTS..... 37

3.0 SUMMARY 37

LIST OF FIGURES

Figure 1: VTrans Organizational Chart.....19

Figure 2: VT Regional Planning Commissions20

Figure 3: Import Growth.....28

Figure 4: Street and Highway Construction Costs32

LIST OF TABLES

Table 1: Timeline of Recent Vermont Transportation Reports2

Table 2: Strategic Performance Measures as of October 2006.....16

Table 3: Performance Measures Established in VTrans Policy Plans Since 2002 Relative to Long Range
Plan Goals17

Table 4: Forecastable Performance Measures18

Table 5: Summary of Goals and Objectives in RPC and CCMPO Transportation Plans22

Table 6: Transportation Funding Methods used by States27

Table 7: Annual Costs of Congestion.....35

INTRODUCTION

The Vermont Agency of Transportation (VTTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach. It refined the three major objectives of the 1995 Long Range Plan, and emphasizes system management¹.

This working paper, one of many to be prepared in support of the plan², includes two major sections that provide background information that will be used to update the plan. Section 1.0 summarizes modal policy plans completed by VTTrans since 2002 related to aviation, highways, rail, public transit, and pedestrians and cyclists. Policy and goals are discussed and major issues and recommendations are summarized. Brief summaries are also provided for other recent statewide transportation planning initiatives.

The LRTBP must satisfy the requirements of SAFETEA-LU³. This federal legislation emphasizes the significance of safety and security by providing specific planning factors for each and also requires that long range plans promote consistency between transportation improvements and state and local planned growth and economic development patterns. This working paper includes specific sections on VTTrans activities related to safety and highlights the major policies contained in regional transportation plans.

Section 2.0 presents a discussion on national trends in the transportation industry and how they relate to Vermont. The most significant issues include inadequacy of traditional funding sources and global changes in the delivery of freight. This section also discusses the affect on travel patterns related to changing demographics and the shift to a service economy, challenges to funding non-road modes of travel, and increasing congestion. The various requirements of SAFETEA-LU are woven through the discussion and new federal policies for planning, financing, and delivering projects are summarized.

1.0 VTRANS ACTIVITIES SINCE 2002

The timeline provided in Table 1 identifies the plans and studies completed in the last ten years by VTTrans, and long range plans completed by regional planning commissions and the Chittenden County MPO (CCMPO). Since the publication of the 2002 plan, VTTrans has updated all of its modal

¹ 2002 objectives (paraphrased): Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility; Improve all modes to provide Vermonters with choices; Strengthen the economy, protect and enhance the natural environment, and improve Vermonters' quality of life.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

³ Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy of Users was passed in July 2005.

policy plans and has completed other planning initiatives related to corridor planning, access management, and safety. The overarching change since 2002 is the development and continuing refinements to a performance based approach to programming, planning, and asset management. To support this effort, all of the updated modal policy plans identify performance measures related to their stated goals and policies.

This section of the working paper summarizes the modal policy plans and other planning initiatives completed since 2002, documents the status of the current asset management process at the agency, and provides an overview of goals and policies contained in the most recent regional transportation plans.

Table 1: Timeline of Recent Vermont Transportation Reports

Statewide Plans	Year	Regional Transportation Plans
<ul style="list-style-type: none"> State Design Standards Project Development Process 	1997	
<ul style="list-style-type: none"> Vermont Statewide Intercity Bus Study Vermont Airport System Policy Plan (ASPP) Community Summer Outreach Forums 	1998	
<ul style="list-style-type: none"> Vermont Airport Capital Facilities Program (ACFP) Vermont Agency of Natural Resources Strategic Plan 2001-2005 	2000	
<ul style="list-style-type: none"> Transportation Planning Initiative Manual Vermont Freight Study East-West Highway Study Vermont Rail Capital Investment Policy Plan (RCIPP) Local Transportation Facilities Guidebook for Municipally Managed Projects 	2001	<ul style="list-style-type: none"> Lamoille County Regional Plan 2002-2007
<ul style="list-style-type: none"> Long-Range Transportation Plan Update Vermont Asset Management Vision and Work Plan Development of an Intelligent Transportation Systems (ITS) Strategic Plan for the State of Vermont Vermont Pedestrian and Bicycle Facility Planning and Design Manual 	2002	<ul style="list-style-type: none"> Bennington County Regional Transportation Plan
<ul style="list-style-type: none"> Traffic Calming Study and Approval Process for State Highways The Economic Impact of Vermont's Public-Use Airports Boston to Montreal High Speed Rail Feasibility Study Phase 1 Legislative Report: Asset Management at Agency of Transportation: Performance Measures (AM) 	2003	<ul style="list-style-type: none"> Central Vermont Regional Transportation Plan Northwest Regional Long-Range Transportation Plan Two-Rivers Ottauquechee Regional Transportation Plan
<ul style="list-style-type: none"> Vermont Access Management Public Outreach Workbook Highway System Policy Plan (HSPP) 	2004	<ul style="list-style-type: none"> Plan for the Northwest Region
<ul style="list-style-type: none"> Vermont Corridor Management Handbook State Rail Plan Update Vermont Twenty Year Electric Plan Vermont Statewide Intelligent Transportation Systems Plan Update 	2005	<ul style="list-style-type: none"> Southern Windsor County Regional Transportation Plan Northeast Kingdom Regional Transportation Plan 2025 Chittenden County Metropolitan Transportation Plan
<ul style="list-style-type: none"> Strategic Highway Safety Plan Vermont Rail Policy Plan (RPP) Vermont Public Transportation Policy Plan (PTPP) Vermont Airport System Policy Plan (APP) Vermont Bicycle and Pedestrian Policy Plan (BPP) Vermont Byways Program 	2006	<ul style="list-style-type: none"> Addison County Long Range Regional Transportation Plan (update in progress) Lamoille County Regional Transportation Plan Rutland Regional Transportation Plan Windham Regional Transportation Plan

1.1 STATEWIDE SYSTEM MODAL POLICY PLANS

Since the publication of the last Long Range Transportation Plan in 2002, the policy plans have been updated by VTTrans to address the individual modes of the Vermont transportation system and to establish performance measures. The plans typically include goals, objectives, and policies, a profile of the existing system, issue identification, performance measures, recommendations and actions, and an implementation plan. The major goals, issues, and recommendations from each modal policy plan are provided below. The complete policy plans are available on the VTTrans web site at <http://www.aot.state.vt.us/planning/studies.htm>.

1.1.1 Aviation

***Vermont Airport System Policy Plan (2006)*¹**

The *Vermont Airport System and Policy Plan* was updated in 2006. It includes a system plan that inventories and evaluates the entire statewide airport system, identifies needs, and assesses the system's ability to adequately serve the entire state. It also includes a policy plan that identifies the role of aviation in Vermont, and presents a mission statement and goals for VTTrans to help achieve the stated vision of Vermont's airport system.

The plan includes the following goals:

- Be accessible and integrated with local, regional, and national transportation systems;
- Preserve and enhance existing airport infrastructure;
- Be safe and secure;
- Support economic activity;
- Use new technology to prepare for future transportation needs; and
- Promote compatible land uses.

To achieve these goals, the plan notes the need for adequate and stable funding sources, and timely and sound infrastructure investments.

Future systems needs include:

- Additional coverage to provide Vermont's businesses and recreational interests with access to airports that can accommodate their demand for larger aircraft; and
- Strategic runway extensions and improved approaches at key airports to increase accessibility throughout Vermont.

¹ "Executive Summary Vermont Airport System and Policy Plan"; Wilbur Smith Associates; September 2006.

The plan identifies performance measures in the categories of accessibility, development (airport infrastructure), safety and security, funding and economics, and maintenance.

1.1.2 Rail

***Vermont State Rail and Policy Plan (2006)*¹**

The State Rail and Policy Plan (SR&PP) consolidates the Rail Policy Plan and the State Rail Plan Update (completed in 2005 and summarized below) into a single document that identifies industry trends, provides a vision statement and supporting goals, and provides an overview of the state's rail system and its condition.

The following rail industry trends will impact the railroad industry in Vermont:

- Growth of Short Lines and Regional Railroads – Vermont's active railroads are short lines and regional railroads. These types of railroads can easily adapt to changing conditions but do not always have the financial resources to invest in improvements.
- 286,000 Pound Rail Cars – The standard railcar weight has increased from 263,000-pound to 286,000-pound. The track and bridges in Vermont, as in other areas with short line and regional railroads, are not designed for this new weight standard. Upgrading the state's rail system to accommodate the increased weight is a priority, but the short line and regional railroads are least able to afford the cost of improvements.
- Growth of Rail Intermodal – Intermodal freight traffic involves trailers and often double stack containers on rail cars that require bridges and tunnels with adequate vertical clearance. Improvements are needed on the entire state system and are expected to have a strong positive impact on the state's railroads.

Demand for rail service is changing as follows:

- The amount of freight moved on railroads between origins and destinations within Vermont decreased between 1992 and 2002 by 21%, while the amount of freight shipped out of the state on rail almost doubled. It is projected that rail freight from, to, and within VT will increase by approximately 2.4% per year (44-55% by 2020).
- Intercity passenger rail ridership has been decreasing in recent years. The Amtrak strategic plan identifies the Vermonter and Ethan Allen Express as segments at risk. In response,

¹ "State and Rail Policy Plan, 2006 Executive Summary, Draft"; Parsons Brinkerhoff; October 25, 2006.

VTrans is exploring the possibility of acquiring diesel multiple units (DMU), which can provide more flexible and lower cost service for the Vermonter¹.

The initiatives recommended in the SR&PP include track upgrades, clearance improvements, and passenger rail enhancements prioritized by route. An initiative is also included to improve transload facilities that make it possible to transfer freight between trucks and rail at the Rutland, Burlington, and Saint Albans rail yards.

The SR&PP recommends performance measures and targets related to goals within the categories of system effectiveness, system condition, and system initiatives. The performance measures will be used to measure success of projects. The SR&PP also includes a project prioritization screening process, identifies funding and financing options, and discusses implementation of the plan.

***State Rail Plan Update (2005)*²**

The original *State Rail Plan* was created in 1986. Since that time, significant changes in the railroad industry have occurred, including efficiency improvements, common use of heavier cars and large loading configurations (e.g. double-stack containers), growth in rail traffic, and elimination of federal funding for local freight railroads. It is noted that “Vermont’s freight railroads are turning down business because bridges, tunnels and track infrastructure designed and constructed a century ago cannot accommodate modern railcar weights and sizes.”

The update clearly states the condition of the railroad industry in Vermont: “the state’s rail network may go out of business if action is not taken to upgrade infrastructure on priority routes.” Specific improvements include upgrades to bridges and other track infrastructure which are likely to see 286,000-pound railcar traffic, and increases to clearances (such as at the Bellows Falls tunnel). The update concludes that upgrades to infrastructure will lead to more economic opportunity, that an evaluation of benefits and costs should be performed to prioritize upgrade projects, and that the development of rail initiatives and prioritization should take place at a high level within VTrans.

1.1.3 Bicycle and Pedestrian

***Vermont Bicycle and Pedestrian Policy Plan (2006)*³**

The 2006 *Bicycle and Pedestrian Policy Plan* update seeks to enhance Vermont’s bicycling and walking systems through education, planning, funding, proper maintenance, and the development of links

¹ A DMU has a diesel engine under each passenger carriage. This feature allows the supply of cars to be better matched with actual demand. As few as one car can be provided in rural areas where demand is low.

² “Vermont State Rail Plan Update 2005 Final Report”; R.L. Banks and Associates; November 15, 2005.

³ “Vermont Bicycle and Pedestrian Policy Plan, Draft #1”; Wilbur Smith Associates; September 22, 2006

with other transportation modes. The plan's policy statement includes the following three major elements:

- VTrans-funded projects should accommodate pedestrians and bicyclists wherever reasonably feasible;
- New projects, road reconstruction projects, and capacity improvements will maintain or improve existing access and conditions for pedestrians and bicyclists; and
- Education and encouragement programs will incorporate pedestrian and bicycle issues, as appropriate.

The progress and effects of the systems are to be reviewed and assessed using performance categories such as usage, safety, facilities, training and assistance, education and encouragement, and economic benefits.

1.1.4 Public Transportation

Public Transportation Policy Plan (2006 update in progress)

In January 2000, the state of Vermont adopted a *Public Transportation Policy Plan* (PTPP) to guide transit service providers under a comprehensive yet flexible plan. VTrans has been updating the PTPP and is holding public meetings on draft findings and recommendations (October – November 2006). The updated plan¹ maintains the overarching policy guidance for transit which is based on the following goals:

- Basic mobility for persons who are dependent on public transportation;
- Access to employment;
- Congestion mitigation to preserve air quality and the sustainability of the highway network; and
- Advancement of economic development activities including service for workers and visitors that support the travel and tourism.

The Draft 2006 PTPP recommends that continued funding of new services be evaluated relative to the above goals using performance measures. It recommends a series of performance measures based on boardings per hour and cost per passenger for each class of service².

Issues and recommendations are identified relative to:

¹ As presented in a PowerPoint "Vermont's Public Transportation Policy Plan Draft Findings", October 11, 2006 by VTrans and TranSystems.

² Transit service classes are urban, small town, rural, commuter, demand response, volunteer driver, and tourism.

- Funding – Lack of adequate funding is a widely recognized issue. Recommendations include replacement of funding formulas with three New Starts screening criteria, long-term capital planning, and looking for new funding sources.
- Demographics – The population is aging “in place”. This trend will create dispersed demand for new services. Recommendations include expansion of volunteer drivers and encouraging location of senior housing, continuing care communities, etc. where transit currently exists.
- Human Service Coordination - Improve coordination with human services to better serve growing demand.
- Transit Oriented Development – Supporting concentrated, mixed use development patterns is consistent with Vermont’s traditional settlement pattern and supports access to transit service.
- Environment – Supporting public transit is inherently good for the environment. Recommendations include coordination between park and ride lots and commuter transit service, using low emission technologies, and including energy conservation and climate change considerations in state and regional transportation plans.
- Intercity Bus Service – Support intercity travel with attractive and accessible park and ride facilities and bus shelters. Coordinate between private and public carriers.
- Regional Connections – Provide easily accessible and reliable information about routes and services.

1.1.5 Roadway System

Highway System Policy Plan (2004)¹

The 2004 *Highway System Policy Plan* (HSPP) examines Vermont’s aging roadway infrastructure; limited funding resources for transportation; increased emphasis on highway operations and management; recognition of transportation/land use relationships; and balancing quality of life, mobility, environmental, and economic development concerns. The HSPP found that:

- Approximately one-third of state highways have pavement that is in “very poor” or “poor” condition (as of 2003).
- The majority of bridges in the state highway system are at an age (over 50 years old) at which they require substantial maintenance, rehabilitation, or replacement.

¹ “Vermont’s Highway System Policy Plan, Final Report”; Cambridge Systematics, Inc.; June 2004.

- The 2002 survey for the Long Range Transportation Plan indicated that the majority of Vermonters do not consider traffic to be a major problem, although 2020 projections show that congestion will be spreading beyond the Burlington area¹.
- Crash rates in Vermont have been declining steadily over the past decade, and are significantly lower than the national average (52.8 crashes per 100 million VMT in Vermont versus 232 for the United States as a whole).

The HSPP establishes the following policies:

- A. Investment Priorities – Place the highest priorities on safety, physical integrity, enhancing operations, and fostering economic development. Focus on the Interstate and Non-Interstate Primary Networks.
- B. Keeping highway safe – Identify and implement cost effective actions to reduce the number of serious crashes and fatalities on the state highway system.
- C. Maintain network connectivity - Keep all bridges along the primary network (NHS routes and the Commercial Vehicle Network) free from load restrictions.
- D. Preserve the existing system – Cost effective investments to keep the State Highway System infrastructure safe and in structurally sound condition. Determine least life cycle-cost preservation strategies.
- E. Improve the system – Use the following hierarchy when selecting improvements: (1) Address capacity and safety issues through access management and coordinated land use planning, (2) improve traffic operations and demand management strategies, (3) minor efficiency or capacity improvements, (4) major improvements such as new general purpose lanes or re-alignments, and last (5) new facilities such as new interchanges or bypasses.
- F. Manage access – Implement the state’s access management guidelines to preserve capacity and improve safety.

Performance measures identified by the plan assess preservation of pavements and structures, safety, mobility, and environment/quality of life. The plan concludes by identifying ten items as part of an action plan:

1. Increase highway preservation funding.
2. Increase emphasis on preventive maintenance.
3. Use a performance-based planning and programming process.

¹ In 2002, 43% of the Vermont adults surveyed reported that they had experienced traffic congestion while traveling in Vermont on the last six months. In the 2006 survey update, this proportion increased to 50%. Although congestion is still not a major problem across the state, the increase is noteworthy because it suggests that congestion is spreading.

4. Prepare corridor planning guidelines and develop plans that address transportation and land use in a coordinated fashion.
5. Coordinate highway needs and projects scheduling.
6. Strengthen and reinforce the Access Management Program.
7. Update design standards and Project Development Process description.
8. Periodically review functional classification and facility ownership.
9. Integrate Asset Management Systems.
10. Enhance pavement and bridge performance models.

1.2 MODAL CAPITAL INVESTMENT POLICY PLANS

To provide specific information regarding transportation investment, VTrans has prepared Capital Investment Policy Plans for aviation and rail. The intent of these plans is to provide a repeatable mechanism to identify, prioritize and fund transportation projects. These plans help guide VTrans and the Legislature in the decision-making process.

1.2.1 Airport Capital Facility Plan (2000)

The recommendations of the 1998 *Airport System Policy Plan* prompted the need for the *Airport Capital Facility Plan*, which examines the ten-year capital facility needs of the airports; develops a prioritization system to rank the needed projects, prioritizes them based on airport activity (for example, number of annual operations, number of based aircraft, FAA priority points, projects which upgrade the airport to minimum standards) and develops a financial plan for each; develops an airport classification system and a set of appropriate development standards for each classification; and develops a computerized project identification and prioritization program. The 2006 *Airport System and Policy Plan* incorporates the findings from this capital plan.

1.2.2 Rail Capital Investment Policy Plan (2001)¹

The 2001 *Rail Capital Policy Plan* notes that “approximately 50 percent of the active railroad track system in the state is used for both freight and passenger service with the balance being used only for freight service” and that “the well-being of the rail freight industry is of prime importance to the rail system as a whole.” Proposed policies include: rail line classification, rail facility standards, rail network classification, state rail plan, project partnering, funding categories, and funding availability. The plan also establishes performances measures and criteria for capital investment evaluation

¹ “Vermont Rail Capital Investment Policy Plan Executive Summary”; Parsons Brinkerhoff Quage & Douglas, Inc.; October 2001.

(selected measures are shown in Table 2, page 16). VTTrans found that the prioritization was cumbersome and impractical and therefore it was not implemented. An updated set of performance measures as recommended in the October 2006 State Rail and Policy Plan.

1.2.3 Short-Range Transit Plans

VTTrans has prepared “short-range transit plans” for each of the transit providers. These plans have a three-to-five year timeframe, and collectively recommend improvements and identify a capital plan for transit investment.

Member associations of the Vermont Public Transportation Association include:

- Addison County Transit Resources
- Advance Transit, Inc.
- Chittenden County Transportation Authority (CCTA)
- Connecticut River Transit
- Deerfield Valley Transportation Association
- Green Mountain – American Red Cross
- Green Mountain Transit Agency
- Marble Valley Regional Transit District
- Stagecoach Transportation Services, Inc.
- Rural Community Transit, Inc.

1.3 OTHER STATEWIDE STUDIES AND PLANNING INITIATIVES

1.3.1 Vermont Freight Study (2001)¹

The *Freight Study* examines where Vermont stands in the context of the national freight system.

Among the findings of the study are that:

- Existing east-west corridors (US 2, US 4, and VT 9) through the state need to be improved;
- The north-south corridor along the western side of the state (US 7 and VT 22A) also needs to be improved;

¹ “Vermont Satewide Freight Study”; Cambridge Systematics, Inc.; January 2001.

- Expansion of the Commercial Vehicle network in 2000 was a very positive move for freight, because it allowed large trucks up to 72 feet long to travel through most of the state without permits and opened new highway segments to trucks;
- Expanding the rail network and its facilities to give clearance to larger trains (i.e., double-stack) may create economic opportunities for Vermont railroads;
- Freight by air is typically used for courier services such as Federal Express, and represents a market segment for lightweight goods that need to be transported in a short amount of time; and
- Approximately 90 percent of the 23 million tons of freight that moves into, out of, within and through Vermont is carried by truck.

1.3.2 Development of an Intelligent Transportation Systems (ITS) Strategic Plan for the State of Vermont (2002)¹

The process of developing an ITS Plan for the State began with screening the existing national packages and developing a regional system architecture (or “blueprint for the deployment of ITS technologies in a particular region”). Three project areas were identified:

- 1) Advanced Traffic Management Systems (this includes the establishment of a statewide Transportation Management and Information Center (TMIC));
- 2) Advanced Traveler Information Systems (to disseminate information from the TMIC);
- 3) Safety-related projects (namely, a downhill truck speed warning system and establishment of a portable traffic management system, which would assist with event traffic and work zones.

Recommended actions for continuing development of the ITS program include:

- Develop a Statewide ITS Steering Committee
- Conduct a comprehensive communications study
- Maintain the statewide and regional architecture
- Develop guidance for ITS project design, operations and maintenance
- Develop a statewide ITS element
- Initiate steps to incorporate ITS into the metropolitan planning process

The 2005 *Vermont Statewide Intelligent Transportation Systems Plan* update provides a deployment plan for ITS to be included as a regular piece of the VTtrans planning and design process. The ITS framework

¹ “Development of an Intelligent Transportation Systems (ITS) Strategic Plan for the State of Vermont; Final Report”; University of Vermont Department of Civil Engineering; Adopted May 2002.

is expected to assist in the maintenance and operations of the transportation network while being deployed in a consistent manner and complying with federal requirements.

1.3.3 Traffic Calming Study and Approval Process for State Highway (2003)¹

This document provides information about the process for planning, evaluating, and implementing traffic calming projects on state highways in Vermont. Municipalities, Regional Planning Commissions and the CCMPO are required to follow the process when considering traffic calming projects on state highways and when using federal or state funds for such projects. In general, the manual can be used to determine whether traffic calming is appropriate, where it may be appropriately used, and how to implement a project. It describes the planning, public outreach, implementation, and evaluation processes. Municipal officials considering traffic calming on local roads without the use of federal or state funds may find it useful to adapt this process to their needs.

1.3.4 Vermont Access Management Public Outreach Workbook (2004)²

Many of the activities and decisions leading to good access management are made at the local level through the development review process. Development of this workbook reflects a policy to emphasize education rather than regulation to encourage sound access management practices. Therefore, the focus of the workbook is on education, not regulation, and it explains that access management seeks to create a balance between safe and efficient mobility and accessibility to businesses and properties. Case studies and best practices are presented, sample regulations are provided, and the relationship between local development review and the VTTrans access permitting processes is described.

1.3.5 Vermont Corridor Management Handbook (2005)³

As recommended in the *Highway System Policy Plan*, VTTrans will plan for transportation needs on a corridor-wide basis. This handbook provides planners and consultants with resources (such as analysis methods, implementation mechanisms) and a six-step process for the development of a corridor management plan. Corridor planning is gaining importance because it takes into account the larger context of each project rather than considering isolated sites.

¹ “Traffic Calming Study and Approval Process for State Highways”; Prepared by Buckhurst Fish & Jacquemart, Inc.; for VTTrans and the Windham Regional Commission; September 2003.

² “Vermont Access Management”; Prepared by Resource Systems Group, Inc.; June 2004.

³ “Vermont Corridor Management Handbook”; Cambridge Systematics, Inc.; July 2005.

1.3.6 Vermont Byways Program Manual (2006)¹

This manual describes how a roadway can be nominated for and designated as a Vermont Byway. A Vermont Byway is a roadway, or a broader corridor centered on a roadway, with at least one of six intrinsic qualities related to archeological, cultural, historic, natural, recreational, or scenic resources that should be preserved or enhanced. A management plan, which includes transportation recommendations to provide for the safety and accessibility of daily travelers, commercial vehicles, and visitors to a Vermont Byway, must be completed as part of the nomination and designation process. The Program Manual describes how to develop a management plan, the public outreach process, and the other steps to follow for state byway designation.

1.4 SAFETY INITIATIVES

1.4.1 2006 Draft Strategic Highway Safety Plan for Vermont²

SAFETEA-LU includes the Highway System Improvement Program (HSIP), a new core funding program with the goal of significantly reducing traffic fatalities and serious injuries on all public roads. A strategic highway safety plan must be in place by October 2007³ in order to use HSIP funds for new eligible activities⁴. Governor Douglas kicked off Vermont's strategic highway safety plan in December 2005 with a meeting of over 100 local and state engineers, emergency responders, educators, and enforcement professionals. The draft plan acknowledges that no single organization in Vermont is solely responsible for highway safety and is organized around the following seven critical emphasis areas:

- Keeping vehicles on the roadway and minimizing the consequences of leaving the road;
- Improving young driver safety;
- Improving the design and operation of highway intersections;
- Increasing seat belt use;
- Reducing impaired driving;

¹ "The Vermont Byways Program, Program Manual"; Vermont Scenery Preservation Council; February 13, 2006.

² "Strategic Highway Safety Plan for Vermont, Draft Version 1"; not dated. See <http://highwaysafety.vermont.gov/Draftplan.htm>

³ Fact Sheet on Highway Provisions, Highway System Improvement Program, Federal Highway Administration, <http://www.fhwa.dot.gov/safetealu/factsheets/hsip.htm>

⁴ If a State does not have a plan in place by October 1, 2007, subsequent HSIP apportionments are frozen at the 2007 level and may only be used to fund projects eligible under sections 130 and 152 (railway-highway crossings, and hazard elimination) as in effect prior to enactment of SAFETEA-LU. States without SHSPs will be ineligible to use up to 10 percent of their HSIP funds for other safety projects under 23 USC (including education, enforcement, and emergency medical services).

- Curbing speeding and aggressive driving; and
- Keeping drivers alert.

The mission of the plan is to reduce the occurrence and severity of crashes through effective education, enforcement, engineering, and emergency response initiatives. Its goal is to reduce the number of major crashes from 350 per year or fewer by 2010 (from 437 in 2004) resulting in 40 fewer fatalities and 26 fewer incapacitating injuries per year. Specific strategies are identified for each emphasis area. Overall performance measures are identified for each emphasis area and measures of implementation and success are identified for each strategy.

1.4.2 Vermont Safe Routes to School Program

The Vermont Safe Routes to School Program (SR2S) was launched in 2006. The SR2S program is directed at children in primary and middle schools (K-8). Its purpose is to enable and encourage children, including those with disabilities, to walk and bicycle to school; to make walking and bicycling to school safe and more appealing; and to facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic, fuel consumption, and air pollution in the vicinity of schools¹. The program funds non-infrastructure activities such as public awareness campaigns, student sessions on walking and bicycling safety, and data gathering and surveys necessary to develop effective plans. It also funds infrastructure projects such as sidewalks, traffic calming, pedestrian and bicycle roadway crossing improvements, and shared use paths².

1.4.3 Safety Management System

The 1991 ISTEA legislation required that state department of transportations develop several management systems, including one for safety. Management systems were made optional in TEA-21 and remain optional under SAFETEA-LU. In 2000 VTtrans completed Phase I of its Safety Management System which developed a mission statement, goals, and performance measures. Several of the goals identified in Phase I have been addressed through the Strategic Highway Safety Plan including: minimizing the consequences of leaving the road, making intersections safer, and improving driver performance. VTtrans continues to work on the other goals developed in Phase I including its safety data system, development of a work zone safety program, and improved roadway crossings for pedestrians by developing guidelines for the installations of cross walks.

¹ Fact Sheet on Highway Provisions Safe Routes to School Program, Federal Highway Administration, <http://www.fhwa.dot.gov/safetealu/factsheets/saferoutes.htm>

² Vermont Safe Routes to School Program Brochure

1.5 ASSET MANAGEMENT AND PERFORMANCE MEASURES

Building off its established pavement, bridge, and safety management systems, VTrans has been expanding and refining its approach to asset management and associated performance measures. In 2002, the *VTrans Asset Management Vision and Work Plan* documented the current state of practice within the Agency. It noted that VTrans has many of the components necessary for a sound asset management program and identified several opportunities to strengthen asset management capabilities and methods.

In 2002, the General Assembly instructed the Agency to begin implementing the recommendations of the *Asset Management Vision and Work Plan* which include: establishing an asset management working group, coordinating with efforts to use performance measures in planning and programming, and selecting a balanced set of asset management performance measures that incorporate customer survey information, that can be tracked, forecasted, and reported by management system.

VTrans established an asset management working group in 2002 which coordinates with the performance measures committee, and has continued to develop and refine the list of asset management performance measures. Initial lists were long and organized around Agency departments and programs. The long lists were difficult to manage and VTrans is now using a focused number of strategic measures organized by the following assets: Highway, Aviation, Public Transit, Rail, Maintenance, Buildings, Central Garage, and Department of Motor Vehicles.

Table 2 on the following page presents a list of strategic asset management performance measures for each mode, other supporting infrastructure managed by the Agency, and the Department of Motor Vehicles Performance measures have been identified for all asset categories. Specific targets have been established for many of the measures.

The list in Table 2 was prepared in October 2006. VTrans will continue to revise and refine the list based on experience using the measures and as policy plans are updated. Changes may also be recommended based on the outcome of the VT LRTBP.

Table 2: Strategic Performance Measures as of October 2006

Asset / Investment Categories	Strategic Performance Measures	Target
Highway	Pavement condition index based on vehicle miles traveled	"Good" 70-85 on a scale of 0 - 100
	Percent of miles of pavements rated in "very poor" condition	< 25
	Percent of VMT on Fair or Good Pavement	To be Determined
	Number of structurally deficient bridges (bridges longer than 20 feet)	Fewer than: <ul style="list-style-type: none"> • 21 Interstate SD bridges • 122 state SD bridges • 255 town SD bridges
	Number of fatal plus incapacitating crashes per year	Reduce by 4% per year
	Percent of high-priority safety needs addressed	100% on state system
Park & Ride facility condition	Improve Facility Condition Index each year	
Signs: Provide readable, relevant, and compliant signs throughout the state	Reduce average age of signs to 7.5 years	
Aviation	Generate appropriate airport revenue utilizing a business oriented approach.	Establish Aiprot Business Plan; 3% increase per year in revenue
Public Transportation	Percent of routes at or below the acceptable level for cost per passenger (Goal 100%)	To be Determined
	Percent of routes at or above the acceptable level for passengers per hour (Goal 100%)	To be Determined
Rail	Increase ton-miles of freight	3% increase per year
	Increase Vermont origin or destination carloads	To be Determined
	Annual passenger rail ridership	3% increase per year
Bike / Pedestrian	Reported motor vehicle crashes involving bicyclists & pedestrians	Hold or reduce number of crashes
	Mileage of bicycle and pedestrian facilities developed	Develop 4 miles per year
Maintenance	Percent of bridges cleaned and washed annually	50% or more
	Percent of State highway centerlines renewed annually	100%
	Mow at least two swaths on all major state roads and arteries annually.	100%
	Patch 100% of post winter potholes on state roads by June 1	100%
	Complete spring litter clean up on 100% of state roads by the end of May	100%
	Paint structural steel each calendar year	780 tons of structural steel
Time to clear highways after a storm per the Winter Snow & Ice Control Plan	To be Determined	
Transportation Buildings	Improve average building condition as measured by the building condition index.	To be Determined
Central Garage	Percentage of vehicles within their cost-effective service lives	85% or more
	Percentage of vehicles available for service	To be Determined
Department of Motor Vehicles	Service walk-in customers at DMV offices with within 30 minutes	90% or better
	Turnaround time for DMV mail transactions	7 days or less
	Electronic transactions as a percent of the total transactions (Web, IVR, and Kiosk)	Reach 8% or more in three years
	Percent Transactions delivered near customer location	75% or more
Compliance rate of commercial vehicle equipment and drivers	Reduce % of Out-of-service violations	
Organizational Excellence	Contracts completed on-budget	95% on-budget (proposed)

This list is subject to change based on on-going planning work and experience.

In addition to supporting asset management, performance measures can also be used for planning efforts such as the Long Range Transportation Business Plan and the Agency's corridor plans. Ideally, performance measures can be forecasted based on a variety of assumptions about future conditions and can also be monitored by measuring actual conditions. The ability to forecast performance measures is useful for planning purposes. However, not all performance measures can be forecasted. Table 3 presents a count of the performance measures identified in the most recent modal policy plan updates for each mode according to the associated goal from the 2002 Long Range Transportation Plan. Forecastable performance measures have been identified for highway and rail modes under each goal. Forecastable measures have not been identified for bike/ped, transit, and aviation modes.

Table 3: Performance Measures Established in VTrans Policy Plans Since 2002 Relative to Long Range Plan Goals

Asset	Type of Measure	2002 LRTBP GOAL 1 Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner	2002 LRTBP GOAL 2 Improve all modes of Vermont's transportation system to provide Vermonter's with choices	2002 LRTBP GOAL 3 Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonter's quality of life
Highway	Monitoring	9	0	1
	Forecastable	3	4	1
Rail	Monitoring	10	2	6
	Forecastable	4	1	2
Bike/ Ped	Monitoring	4	5	1
	Forecastable	0	0	0
Transit	Monitoring	0	0	0
	Forecastable	0	1	0
Aviation	Monitoring	13	3	3
	Forecastable	0	3	0

While all of the performance measures are used primarily to monitor progress, the ones identified in Table 4 on the following page can be forecasted using a variety of methodologies. It may be appropriate to utilize some of these forecastable performance measures in the scenario planning process. Additional information on how scenario planning will be used in the LRTBP is available on the plan's web site at <http://www.rsginc.com/vtplan/vermontplan/about.htm>.

Table 3 and Table 4 also illustrate the fundamental concept that performance measures should ultimately relate to broader goals that cut across all modes of travel. The goals presented in these two tables are taken from the 2002 Vermont Long Range Transportation Plan. These goals will be reviewed, and verified or revised as part of this 2008 update. Changes to the goals may also lead to changes in the types of performance measures.

Table 4: Forecastable Performance Measures

Mode	2002 LRTP GOAL 1 <i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner</i>	2002 LRTP GOAL 2 <i>Improve all modes of Vermont's transportation system to provide Vermonter's with choices</i>	2002 LRTP GOAL 3 <i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonter's quality of life</i>
Highway	<ul style="list-style-type: none"> • Percent of pavement in "good" condition (AM) • Pavement-average condition index of vehicle miles traveled (HSPP) • Percent lane miles with "very poor" condition rating (HSPP) 	<ul style="list-style-type: none"> • Average travel time between major cities (HSPP) • Maximum V/C ratio on state highways (HSPP) • Percent of employment within 10 minutes of the Primary Network (HSPP) • Percent of employees living within 10 minutes of the Primary Network (HSPP) 	<ul style="list-style-type: none"> • Air quality attainment status (HSPP)
Rail	<ul style="list-style-type: none"> • Freight rail volumes in VT (RPP) • Passenger rail trips in VT (RPP) • Railroad operations-freight: measured in number of ton miles or number of car miles (RCIPP) • Railroad operations-passenger: measured in number of revenue miles or number of passenger miles (RCIPP) 	<ul style="list-style-type: none"> • Annual ridership (AM) 	<ul style="list-style-type: none"> • Number of carloads shipped (AM) • Vermont-based activity: measured by carload's origin/termination in Vermont, overhead carloads, passenger boardings/alightings in Vermont, and rail jobs in Vermont (RCIPP)
Bike/ Ped	None	None	None
Transit	<ul style="list-style-type: none"> • Boardings per Hour (draft Public Transit Policy Plan) • Cost per passenger (draft Public Transit Policy Plan) 	<ul style="list-style-type: none"> • Number of Park & Ride spaces available (AM) 	
Aviation	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Percent of Vermont's population and land area within 60 minutes of an airport with commercial service (APP) • Percent of Vermont's population and land area within 30 minutes of a 5,000 foot runway (APP) • Percent of population and land area exclusively served (within 30 minutes) by a privately-owned public use airport (APP) 	<ul style="list-style-type: none"> • None

(Note: Plan that identifies performance measure appears in parentheses.)

1.6 VTRANS ORGANIZATIONAL CHANGES

In addition to the numerous projects and plans that were completed since 2002, there were also some organizational changes within VTrans. These realignments were completed to provide better operations within the Agency. The current VTrans organizational structure is provided in Figure 1. In 2002, the VTrans organization consisted of seven divisions: Project Development, Policy and Planning, Technical Services, Maintenance and Aviation, Rail, Finance and Administration, and the Department of Motor Vehicles.

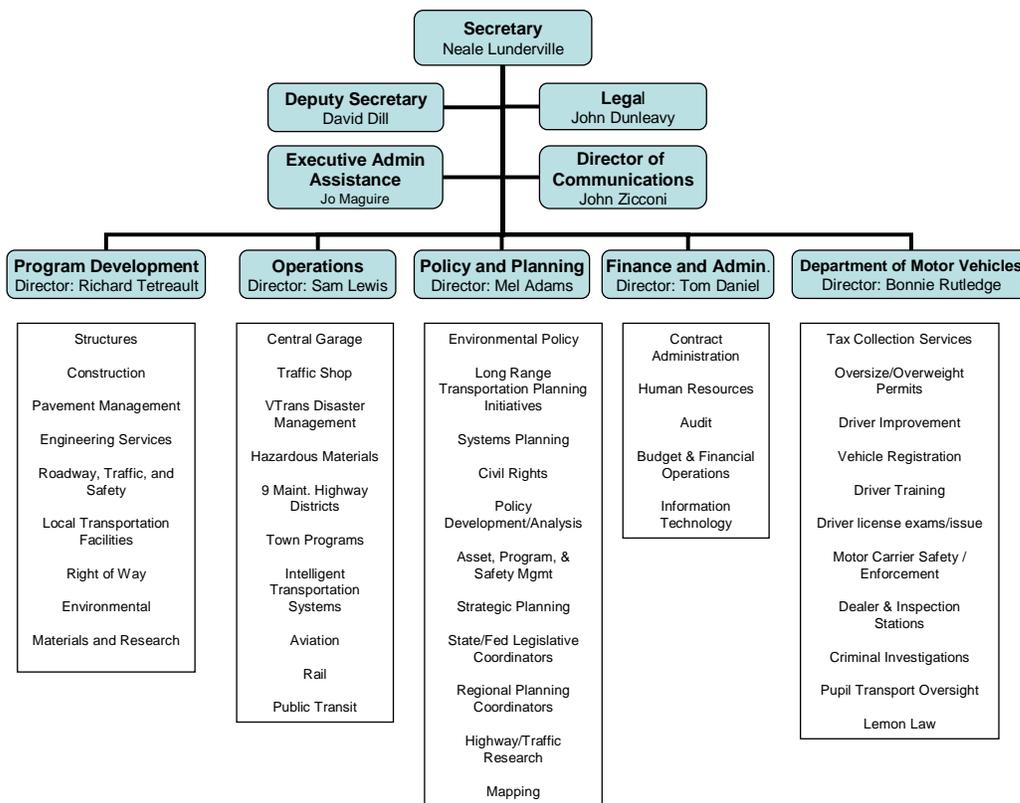
The "Maintenance and Aviation Division" is now "Operations" and includes rail, public transit, and intelligent transportation systems. Rail and Technical Services have been dissolved as stand alone

divisions. Project Development and most of the Technical Services divisions have been consolidated into the Program Development Division.

VTrans has continued to implement and improve its project manager system. A project manager can direct the scoping process, monitor project progress, respond to questions, and provide specific project details, and is the single point of contact for citizens, local officials, and legislators.

All members of the central office staff are consolidated at the National Life Building streamlining and improving the efficiency of the day-to-day operations of the Agency. The Department of Motor Vehicles, which is part of VTrans, remains at 120 State Street.

Figure 1: VTrans Organizational Chart



1.7 REGIONAL TRANSPORTATION PLANS

Through the Transportation Planning Initiative (TPI), VTtrans collaborates with the regional planning commissions and the CCMPO to carry out transportation planning at the regional level. Figure 2 identifies the locations of the RPC and the CCMPO. As part of the data collection effort for this update, the most recent transportation plans of each of the 10 RPCs and the CCMPO have been reviewed.

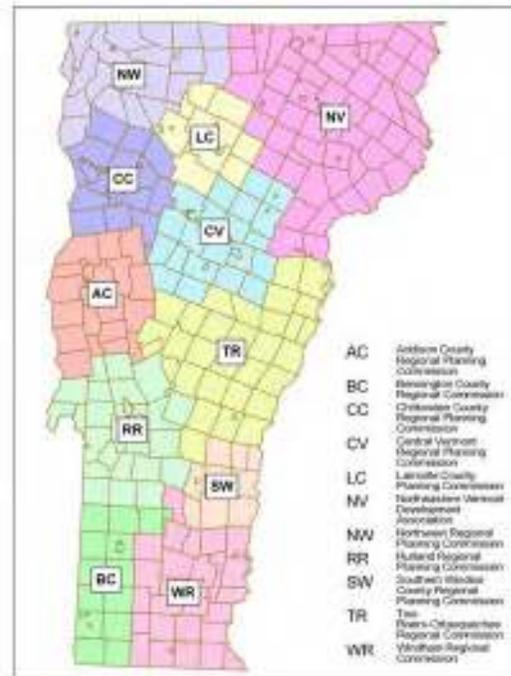
Each region and the CCMPO prepare and update long range transportation plans that include detailed inventories of their transportation systems, identification of existing and future needs, general recommendations, specific project recommendations, and typically include a vision statement with supporting goals, objectives, or policies.

Table 5 documents the broad principles included in the vision statements, goals, objectives, and policies of the regional long range transportation plans. All of the principles listed in Table 5 can be found in some fashion within all plans. Table 5 shows which principles the regions have chosen to emphasize within their policy statements.

The most common principles emphasized include:

- Using transportation to support economic diversity, vitality, and development;
- Preserving and maintaining the existing transportation system. All plans are very clear about the importance of system preservation. Several regions state that system preservation is their highest priority;
- Supporting the use of alternative modes. All plans support walking, cycling, public transit by bus and rail, rail for freight, and the importance of aviation. Many plans include specific goals related to the expansion of public transportation;
- Connecting transportation and land use. All plans include language that supports effective coordination between transportation and land use. In some cases, the language specifies that transportation should support the traditional Vermont settlement pattern of compact, mixed use, urban centers and villages separated by a rural and working landscape. In other cases,

Figure 2: VT Regional Planning Commissions



the plans are less specific and call for better integration between the transportation and land use planning. Many plans emphasize the role of access management in the relationship;

- Improving safety for all modes of travel.
- Protecting and enhancing the environment.

The following principles are emphasized less frequently within regional transportation plans:

- Providing intermodal connections. After ISTEA was passed, intermodalism was a common theme in transportation planning. In Vermont, where over 90% of person trips are made in passenger vehicles, the emphasis has been on expanding multi-modal options. The concept of a seamless transportation system may be less prevalent in planning documents. In practice, however, there are many examples of intermodalism in Vermont including: completion (or funding) for major multi-modal centers in Brattleboro, Rutland, Bellows Falls and Montpelier; improvements to park and ride facilities throughout the state; transit stopping at park and ride facilities; and bike racks on transit vehicles;
- Energy efficiency and alternatives;
- Managing demand and improving system efficiency; and
- Reducing congestion. Of all the principles, congestion is mentioned the least.

All of the plans stress the importance of public participation and discuss funding challenges. Some plans also emphasize the responsibility to provide for special transportation needs, educating the public on transportation choices, managing freight, and facilitating cooperation between neighboring municipalities.

Table 5: Summary of Goals and Objectives in RPC and CCMP Transportation Plans

Principle	Regional Transportation Plans (Date)										
	ACRPC (1995) ¹	BCRC (2002)	CVRPC (2003)	CCMPO (2005) ¹	LCRPC (2006) ²	NVDA (2005)	NWRPC (2003)	RRPR (2006)	SWRPC (2005)	TRORPC (2003)	WRC (2006)
Support economic vitality		√	√	√	√	√	√	√	√		√
Preserve and Maintain the Existing System	√	√	√	√	√	√	√	√	√	√	√
Improve/ develop intermodal connections	√		√			√		√	√	√	√
Increase availability/ encourage use of transportation alternatives	√	√	√	√	√	√	√	√	√	√	√
Manage Travel Demand & Improve System Efficiency		√	√	√			√		√		
Transportation and Land Use	√	√	√	√	√	√	√	√	√	√	√
Protect / enhance the environment	√	√	√	√	√	√	√	√	√	√	√
Promote Alternate Energy Sources and Efficiency	√	√		√		√			√	√	√
Promote/ protect quality of life		√	√	√	√	√			√	√	
Address Safety	√	√	√	√	√	√	√		√	√	
Reduce Congestion	√										

¹ Update in process

² Draft Plan

³ Chapter 20 of Rutland Regional Plan

2.0 NATIONAL ISSUES IN TRANSPORTATION

Across the United States the transportation industry is undergoing fundamental change in the way facilities are planned, financed, built and operated. Two areas stand out:

1. the inadequacy of traditional transportation revenues to support the federal highway trust fund (HTF) that, in turn, funds the highway and transit programs; and
2. the increasing importance of freight in the development and operation of the transportation system.

At the top of almost everyone's list of critical issues is the realization that the highway trust fund (HTF) can no longer meet core transportation needs with the traditional revenue sources of fuel and motor vehicle-related taxes and fees. Anticipated shortfalls in the HTF are occurring at the same time that transportation costs and the cost of providing transportation facilities have increased rapidly, and the Interstate highway system is aging. For more than a decade, leaders in the transportation field have been looking for more reliable sources of funding. This long-anticipated crisis in transportation finance has many implications for VTrans' programs and services.

The second area is goods movement. The productivity of the US freight system has been the envy of other developed countries since WWII. Today, rapidly expanding international trade is overwhelming ports on the east and west coasts. Many states and cities are faced with almost impossible tasks of accommodating the growing volumes on the connecting roads and rails that serve them. The major north-south NAFTA corridors have experienced steadily growing truck traffic over the last 12 years and are congested even in many rural sections. The rail industry, which has been downsizing capacity for more than 30 years, is now looking to increase capacity on key lines, especially the fast growing intermodal traffic. Railroads also are increasing car weights and using other strategies to stretch line capacity. The change in manufacturing and retail to just-in-time freight delivery reduces the need for warehousing, but increases the service demands on truck and rail carriers. This new way of doing business has put a premium on tight management of the supply chain of goods, often referred to as logistics. While Vermont roads and rails have not yet been as impacted as in other states such as Virginia or New York, there are important cost and service issues for shippers as well as quality of life impacts for towns developed along highways that need consideration in VTrans investment decisions. As port capacity becomes more precious as predicted, shifts to put more traffic in ports such as the deepwater port of Halifax would directly impact Vermont rail and the state needs to plan and understand these implications for the infrastructure.

In addition to these issues is the general concern for safety, particularly the persistently high number of road and highway crashes, and this concern is reflected in the latest federal transportation bill - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Some of the other trends in the industry and outside forces that should figure in the development of scenarios for Vermont's transportation needs of the future include:

- changing demographics and economics such as aging population and the continuing move to a service and information economy,
- growing awareness of energy and environmental impacts of transportation systems,
- continuing policy dilemmas of aviation and of funding non-road modes such as Amtrak and intercity bus,
- growing congestion from greater dependence on travel by auto and truck, and
- new federal policies for planning and delivering projects and for security of the system.

These issues and the possible implications for transportation in Vermont are discussed in the remainder of this paper.

2.1 FINANCING SURFACE TRANSPORTATION

The declining ability of the HTF to support core surface transportation needs has stimulated a lively debate in recent years within the industry and with Congress and legislatures over what takes its place. For 50 years, the HTF has supported a strong public role in the development of roads and, for last 25 years, in support of public transit. Most states have relied on a pay-as-you-go approach for roads and special local taxes for transit, as well as fares, in addition to federal funds for both modes.

During this time the federal share of surface transportation financing has been declining from as much as 34% in the 1970s to about 25% of total expenditures today. Depending on the state and the mode, state and local governments have been stepping up their share of the transportation bill. In 2006, Cambridge Systematics estimates that states contribute 40 percent of the total surface transportation bill and local governments 35 percent. When it comes to transit in many states, however, the responsibility shifts so that, on average, local governments are paying 61 percent of the total cost including operations.

Despite the decline in the relative levels of federal funding, federal dollars remain an important part of the total program. For the transit capital program, the American Public Transportation Association reports that the federal share in 2004 was 40 percent. For small states such as Vermont, the federal funds account for a much larger proportion than the national average. In Vermont, federal funds represent almost 60% annually of the total state transportation expenditures including rail, aviation, and DMV. For transit, federal funds in 2007 are expected to contribute 66 percent of the total Vermont tab¹. Vermont is one of about 20 states (numbers vary by year) that receives more

¹ We were unable to disaggregate the surface transportation funding from the HTF from some of the other categories such as rail and DMV, to get a clear comparison with the national average. It is instructive, however, that the HTF represents 38% of proposed funding in 2007 for all transportation activities in Vermont.

funds from the HTF than it contributes through gas taxes and other fees and taxes. This fact makes the current federal financial picture especially critical to the state.

The continuing viability of federal financing of surface transportation has been a concern in the industry for at least the last 15 years. What comes next, then, should not be so difficult a question. Each of the three major reauthorizations of the federal surface transportation legislation has recognized this trend through provisions that show:

- A strong interest in private partnerships and increased use of tolls and other road pricing;
- A variety of new debt instruments and revolving funds that have been liberalized in each bill, including: Grant Anticipation Revenue Vehicle (GARVEES), State Infrastructure Banks (SIB), Transportation Infrastructure Finance Innovation Act (TIFIA), and in SAFETEA-LU, the eligibility of transportation projects for private activity bonds; and
- Streamlining of procedures and contracting arrangements, such as design-build, to reduce project development time and increase attractiveness to private sector partners.

However, despite the attention, there are no obvious solutions. Recently, more attention has been given to strategies that minimize political exposure on raising revenues, including taxes. One way to do that is to index the gas tax to some measure such as cost of living. This method exposes legislators only once to voting for a tax increase and, theoretically, the tax could actually decline in a recession. Several states adopted such a measure within the last decade. Not surprisingly, some of these states have higher gas and diesel taxes, such as Maine, with 26 cents per gallon for gasoline and 27 cents for diesel, as compared to a national mean average of 20.3 cents and 20.46 cents, respectively. According to the same report, FHWA's Financial Statistics for 2005, Vermont's tax rate is 20 cents per gallon for gasoline and 26 center for diesel and the state has not raised the gas tax since 1997 or diesel tax since 2000.

Private partnerships are stressed in SAFETEA-LU and in the policy work of the FHWA as an additional source of revenue for states and localities. Recent experience with the traditional form of public-private partnerships – toll roads - have not shown substantial new revenue generation, but appear likely to be good tools to reduce public expenditures for particular road facilities. There also are a growing number of private partnerships around transit. These arrangements usually rely on tolls, the revenues of which have proven to be over-estimated the first 6 – 10 years of the facility and underestimated in later years, according to a report by The Bond Buyer¹. This may be one reason for growing interest in tolling existing facilities where demand is more certain. The industry also is seeking to structure the debt differently to avoid creditworthiness problems. Land redevelopment in conjunction with a highway or transit corridor is another innovative private approach, but these require more dense corridors than are generally present in Vermont.

¹ The Bond Buyer, Fitch: *Better Forecasts, More Flexibility Will Stabilize Toll Roads*, April 19, 2006

The current state of the debate over finances can be seen in recent expert testimony to a Congressionally chartered commission, the National Surface Transportation Policy and Revenue Commission (authorized in SAFETEA-LU). According to testimony by consultant Gary Maring, federal, state and local governments will need to roughly double the \$168 billion they are spending now to maintain and improve roads and transit. The current set of federal taxes is expected to remain viable for maintaining the road system for about another 15 years, but overall program needs will outstrip the HTF revenues within the next three years. How transit funding will fare with the declining fortunes of the HTF is an open question.

The recommendations presented to the Commission for the near term include: indexing the gas tax to inflation, tolling more highways and increasing the involvement of the private sector. Long-term solutions suggested included states and/or localities charging drivers for each mile driven, known as a VMT based fee. Another recommendation was charging variable road fees, so drivers would incur higher costs on congested roads at peak periods.

Clearly, despite the interest and growing attention, there is no consensus for federal action. No silver bullet. Moreover, many of the solutions imply state and local actions, rather than federal. And, many of the fiscal remedies are appropriate only for highly urban and “captive” traffic. For a state with a small population and with relatively few congested areas, other solutions are needed. Among the mechanisms suggested, the most likely are indexing or raising the gas and other motor vehicle taxes, and moving to a VMT based fee for residents. Forgoing those, the state has to consider the usual range of non-user fees such as property and sales taxes and development fees. Table 6 shows how states are currently or considering raising funds. This information also was presented to the Commission at its June meeting.

Table 6: Transportation Funding Methods used by States

Specific Tool	Scope		Potential Yield	Locations Used
	Program	Project		
Fuel Taxes				
Motor fuel excise (per gallon) tax	X		H	All states, Federal
Indexing of the motor fuel tax	X		H	FL, KY, ME, NE, NY, NC, PA, WV, WI
Sales tax on motor fuel	X		H	CA, GA, HI, IL, IN, MI, NY
Other petroleum related taxes	X		H	NY, PA
Registration and Vehicle Fees				
Registration or related fees	X		H	All states
Excise tax on vehicle sales	X		H	KS, NC, NE, MN, MO, OK, SD
Tolling and Pricing, and Other User Fees				
Tolling new or existing roads and bridges		X	M	About 1/3 of States (e.g. TX, FL, VA)
HOT lanes, express toll lanes, truck toll lanes		X	M	CA, CO, GA, MN, TX
VMT fees	X		H	OR testing, 15 state pooled fund study
Transit fees (fares, park-and-ride fees, other)	X		H	All transit agencies
Local Option and Beneficiary Charges				
Beneficiary charges/value capture (special assessment impact fees, and tax increment financing)		X	L	Multiple (e.g. CA, FL)
Permitting local option taxes for highway and transit improvements	X	X	M	46 states have legislation
General Revenue Sources	X		H	Most states and localities

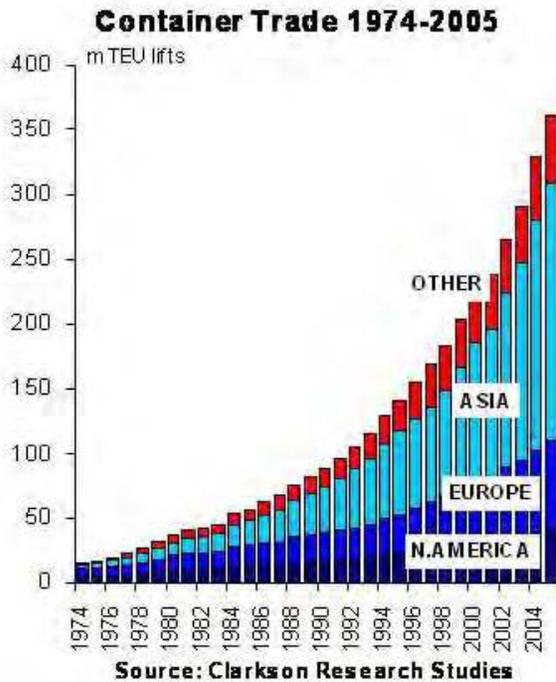
Source: NCHRP Finance Study, presented to Commission by Cambridge Systematics on June 25, 2006.

The continuing appetite in Congress for earmarked funds is another trend in federal transportation financing, which also may prove problematic for a small state that receives more from the HTF than it pays in. Experts generally are in agreement that the growth in the number and dollar value of these earmarks is eroding formula programs. Despite considerable negative publicity, there is no evidence from the FY 2005, 2006 or 2007 Appropriations processes that this trend is leveling off. It is worth noting that there were only 10 such earmark projects in the 1982 highway bill with a total cost or value of \$368 million. By the 1998 bill, the practice had grown to almost 1500 valued at \$9 billion, and by SAFETEA-LU the number was 5092 valued at almost \$24 billion. Donee states will be disproportionately disadvantaged by continued emphasis on earmarks unless they are very strategic in identifying worthy projects and highly successful in getting them.

2.2 THE GROWING ROLE OF FREIGHT

The extraordinary growth in imported goods to the US in the last 15 years is showing up in ports and on highways across the country. In the late 1990s and early 2000s, west coast ports and on north/south corridors affected by NAFTA such as I-95, I-81, I-35 and I-5, were the focus. By 2003, east coast ports were experiencing much higher shipments including cargo from China. According to US DOT, the trend will only be accelerating. As shown in Figure 3, imports are expected to rise more than three fold between 2003 and 2006, while exports will decline modestly. Much of this is due to a shift in product sourcing by US companies increasingly to China and India. What ever the impetus, the net effect is forecast to be a 60 to 70 percent increase in domestic freight shipments and a corresponding, or higher, increase in empty loads.

Figure 3: Import Growth



From Presentation by Jeffrey Shane, USDOT, Under Secretary for Policy, June 26, 2006

Faced with these facts, the Administration and Congress have appeared to give the freight issue much more attention recently. The obvious need for more capacity is, however, not easily met. Two possible sources are domestic railroads and inland waterways, but in these cases thirty years of disinvestment and deferred maintenance stand as major barriers. The costs to overcome these bottlenecks is too high for the profit potential to private operators, according to Shane, so public-

private partnerships are essential to addressing the freight congestion problem. For the railroads, corporate culture also has led to resistance to be involved, but the new realities of freight and the growing opportunity for intermodal business have led to a softening of that stance in the last five years at least at some of the Class I railroads. In a recent speech, outgoing Norfolk Southern Corp CEO, David Goode, pointed out his company's changing posture on "public-benefit" rail projects and cited the potential of improvements to the Heartland rail corridor from the Port of Virginia to Columbus Ohio's inland port, saying it could remove 1000 trucks per day from the Interstate. (The Heartland corridor received several high priority project earmarks in SAFETEA-LU.)

The private sector is finding ways to add to capacity through improved logistics – better management and control of freight shipments and the use of transportation systems – largely through new information technology and management systems. These systems direct shipments from one carrier to the next (rail, road, air, water) tailored to the shipment's cost and time sensitivity to reach the final destination. The field of logistics represents a greatly expanded profession with many new tools as compared to a decade ago. As a means to increase efficiency of the system, logistics does have its limits, however. The basic infrastructure and efficient physical connections between modes are the backbone of the freight system and the "just-in-time delivery" approach managed by the logistics professionals and on which manufacturers and retailers have come to depend. This places new challenges on states and localities to provide and maintain the infrastructure.

With the economic stakes in better freight systems becoming clearer, the Administration proposed a number of intermodal and motor vehicle freight programs for SAFETEA-LU. These expectations were not entirely met and funding was not extended for some important intermodal projects funded under the previous law, Transportation Equity Act for the 21st Century (TEA-21), such as the Freight Action Strategy for the Everett-Seattle-Tacoma Corridor (FAST Corridor) a coordinated program of rail and truck improvement projects with state, local and private funding in the Seattle area. Nevertheless, the freight issue was advanced by several provisions of the bill, primarily found in the Sections authorizing some 6000 special projects known as earmarks, including the Transportation Improvement program (Sections 1301 -1306) and the High Priority Projects program (Sections 1701 and 1702).

According to FHWA's summary of SAFETEA-LU, the new law provides funding totaling over \$2.8 billion to improve transportation at international borders, ports of entry, and in trade corridors. (<http://www.fhwa.dot.gov/safetealu/summary.htm>) All but \$ 30 million of these funds will go to a variety of improvements for motor vehicles, emphasizing freight capacity particularly in high trade corridors and on the US borders with Canada and Mexico. Substantial grants to intermodal projects are included in Section 1301, which totals \$1.8 billion in special project earmarks. Included are the Chicago Region Environmental and Transportation Efficiency program (CREATE) project to unscramble the rail yards and rail lines exchanging freight in Chicago, which had strong national support given the importance of the Chicago connections. The \$ 100 million earmark, however, is much smaller than the Administration request and half the commitment of the major railroads,

known as Class I railroads. Other small and large intermodal projects are included in the Section 1702 project authorizations.

2.3 SAFETY AND SECURITY

Congress and the Administration sought to make improved safety a higher priority in more than just the bill's name. This issue resonates with the public and was highly publicized in conjunction with the passage of SAFETEA-LU. Among the changes was the consolidation of previous safety programs into one core program, the Highway Safety Improvement Program (HSIP), which provides \$5.1 billion over five years. There are several strings to tie the funding to the development and implementation of a highway safety plan and to require reporting, but these are not substantially different than prior reporting requirements. The HSIP includes the highway grade crossing program as an independent element.

New safety programs include the much publicized, Safe Routes to School, from which Vermont will receive about \$1 million annually. A number of states had already established their own programs and the federal legislation supports that movement. The need to improve work zone safety also was recognized through new requirements and a separate funding category for training. Requirements affecting commercial vehicles and support for better safety data were included in the Motor Carrier and Highway Safety sections of the bill. A number of safety studies were authorized in the Research section of the law.

The concern for security was highlighted by making it a separate planning consideration for both state and metropolitan plans. Federal highway funds can be used to finance many planned activities, but grants from Homeland Security also are anticipated sources of support.

2.4 DEMOGRAPHICS AND ECONOMIC FORCES

Transportation planners have their eyes on three National demographic and economic trends that have significant implications for transportation needs in the future:

1. the aging of the American population;
2. growth of tourism-based economies; and
3. service and information as the growth sectors for jobs and the economy

The aging issue has gained currency in the transportation research field as one requiring more attention to meet mid-term needs. Both the "aging in place" movement and the growth of senior communities in many states imply differing transportation patterns. Advocates for seniors lobbied Congress along side interest groups promoting transit and non-motorized transportation provisions. At the same time, the traditional household of a couple and two kids is declining with implications for new housing choices and locations that need to be better understood by transportation decision-makers.

The growing number of senior Americans with more leisure time is one of several factors also contributing to the increased interest of states and their DOTs in supporting leisure travel. In states as diverse as Virginia and Montana, tourism is becoming a bigger part of the economy. In response, support has increased for federal programs geared to improving the traveling experience, such as Transportation Enhancements and Scenic Byways. Programs to improve transportation in National Parks and other public lands were increased 29 percent in SAFETEA-LU.

This interest in the quality of the trip sometimes collides with the desire for greater road capacity and with design standards for such safety features as jersey barriers. As a means of sorting this conflict out, the US DOT has promoted Context Sensitive Solutions (CSS) as a professional ethic. There have been numerous conferences attracting a growing audience of transportation planners and designers. In the most recent Context Sensitive Solutions competition sponsored by American Association of State Highway and Transportation Officers (AASHTO), 33 states submitted projects reflecting more attention to design quality and to the environment in which the project is built.

Another major trend is the steady loss of manufacturing jobs and other changing economic factors. Information technology, along with major trade agreements, has encouraged outsourcing of many types of jobs, particularly manufacturing, to other countries. This shift in the economy is impacting states and localities in differing ways, some of which become apparent in changing transportation patterns. In state after state, job growth is in the service economy, which includes tourism, and/or in information services.

Advances in information technology have enabled workers to do many jobs without going to a traditional worksite because of technology. This trend has encouraged researchers to predict significant telecommuting. The proportion of workers who do so on a regular basis, however, has remained small nationwide – 2 to 4 percent¹. Even in urban communities with notorious commutes and strong public programs, such as in New Jersey and Connecticut, the percentage is low. The technology has had other positive effects, such as improved transportation options by reducing the uncertainty of transit and carpool matching, among other things. The real impact of information technology on transportation is only just being seen.

These trends will affect each state and community in different ways, but they are likely to mean that the public will need a balanced transportation system offering a variety of transportation services – the same general prescription that has been suggested by US DOT policy reports since the first one in 1975.

¹ Bureau of the Census, American Community Survey 2005 shows the national percentage of “work at home” as 3.6 percent. While this number includes many who would not be considered “teleworkers”, it is the best proxy for this group available from a national data source. Using this variable, Burlington Vermont has a relatively high proportion of 4.4 percent, while NYC is only 3.4 percent.

2.5 CONCERN FOR ENERGY COSTS AND ENVIRONMENTAL IMPACTS OF TRANSPORTATION SYSTEMS

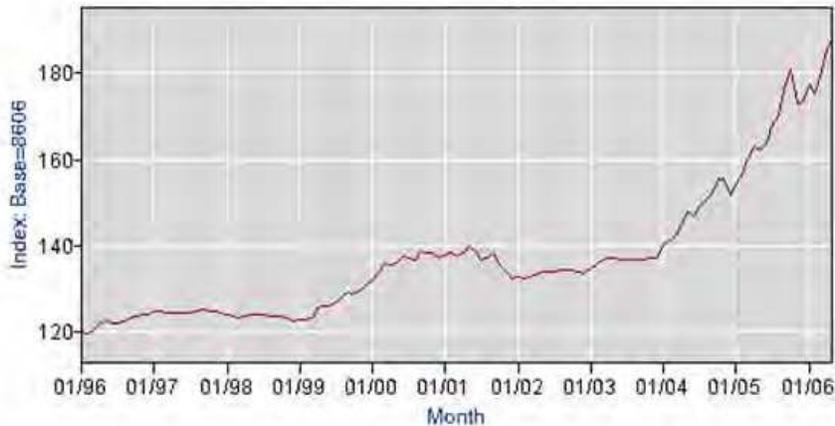
2.5.1 Energy

The impact of higher **energy costs** on the costs and means of transportation have been well chronicled in the last year. Shifts in automobile purchases towards higher fuel economy vehicles began being noted in many regions in the summer of 2006 and gasoline tax receipts declined in some states as early as mid 2005, indicating modest shifts in consumer behavior. If higher fuel price levels are sustained, they are likely to lead to a number of changes over time in transportation demand, but changes will vary region by region.

One aspect of the higher petroleum costs that has not been well publicized is the contribution to the steep rise in the costs of building, maintaining and operating transportation systems. The cost of operating public transit vehicles, construction vehicles, airplanes - all have been substantially impacted by fuel costs. Shortly before petroleum costs skyrocketed, the cost of steel and concrete also jumped up making new road and rail facilities much more costly. The following chart reveals the cumulative impact of all three, with fuel showing up especially in 2006.

Figure 4: Street and Highway Construction Costs

Street and Highway Construction Costs Up Dramatically



From Cambridge Systematics presentation to National Surface Transportation Revenue and Policy Commission, June 2006, based on BLS Producer Price Index

2.5.2 Streamlining the environmental process

Interest in environmental streamlining has been a focus of state DOTs at least since the mid-1990s, particularly for road projects. SAFTEA-LU reflects that concern in important ways and these changes have implications both for the Vermont Long Range Business Plan and for on-going practices and procedures. Here are the highlights:

- SAFTEA-LU made the first change to Section 4(f) of the DOT Act in its 40 year history. Section 4(f) provides strict limits on building or expanding federally funded projects in public parks, wildlife refuges, or recreation areas and historic sites. SAFTEA-LU allows the DOT flexibility in applying the standard if a project will have a “de minimis impact” on the area and there is concurrence to that effect by the State Historic Preservation Officer (SHPO);
- Responding to concerns about lengthy environmental reviews, several changes were made to the process. These include:
 - giving US DOT more of a role in imposing shorter timelines and clarifying the roles of various participating agencies
 - requiring publication in the Federal Register of environmental decision documents
 - limiting lawsuits directed toward federal agency approvals to 180 days from the decision; and
- For highway projects, Congress: allowed state DOTs to assume more of the US DOT role for categorical exclusions; authorized pilots in five states (Alaska, Ohio, Oklahoma, Texas, and California) to apply to US DOT to assume all environmental responsibilities under NEPA and some related laws; and authorized a pilot of 5 states (not specified) to handle all environmental requirements for Recreational Trails and Enhancement projects.

To reduce the harmful emissions of motor vehicles, transportation demand management programs have been adopted over the last 20 years by many states and metropolitan areas. Recent commitments by major cities to reduce greenhouse gases are likely to stimulate these activities as are the higher fuel prices.

2.5.3 Stewardship

Since the early 2000s, environmental stewardship practices for both maintenance and capital programs also have been promoted within the profession and by the Administration through conferences, research, and new federal guidelines. SAFTEA-LU supported these activities in several ways:

- Established the Surface Transportation-Environmental Cooperative Research Program (STEP) at \$16.9 million annually;
- The state’s long range transportation plans are to address possible environmental mitigation, especially “activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan”; and

- Eligible activities for the core National Highway System (NHS) and Surface Transportation Program (STP) programs now include the ability to fund environmental restoration and pollution abatement and control of invasive species. There is, however, a 20 percent cap on the amount of a rehabilitation, reconstruction, resurfacing or restoration project that can be spent on such activities.

2.6 CONGESTION MANAGEMENT

Congestion relief has been a rallying cry for surface transportation reauthorization since the late 1980s. Today, despite programs and some advances due to information technology, the problem is growing. FHWA officials call traffic congestion one of the biggest challenges facing the transportation profession today. The chief economist for the US DOT reports that the problem is spreading to smaller cities and rural communities. Citing a recent study by Texas Transportation Institute (TTI), Jack Wells, told the Congressional Policy and Revenue Commission this summer that traffic congestion grew 56 percent in small cities between 1997 and 2003, more than twice the rate of large metropolitan areas. Wells quoted departmental figures that show rural interstate congestion between 1998 and 2002 grew 35 percent, while urban interstate traffic grew 21 percent. His estimate of the annual cost of congestion nationwide expands on the TTI estimate of \$63 billion by adding such factors as: other cities not in the TTI study; truck delay; productivity; and safety and environmental costs, which bring the total to \$168 billion.

SAFETEA-LU adds to the congestion tool arsenal by adopting provisions to encourage road pricing, improved High Occupancy Vehicle (HOV), and by directing US DOT to provide all states with effective programs to monitor real-time traffic, weather and incidents to develop better response capabilities.

Table 7: Annual Costs of Congestion

	Billions of dollars
TTI estimates of delay and fuel waste	63.1
Cities not included in TTI estimates	12.8
Productivity losses	38.0
Unreliability losses	38.0
Truck cargo delays	3.8
Safety and environmental costs	12.6
Total highway congestion costs	168.3

Source: Jack Wells presentation to Congressional Policy and Revenue Commission, Summer 2006

2.7 INTERCITY PASSENGER TRAVEL

Since September 11, 2001, the state of the American **airlines**, especially the legacy carriers (Delta, United, American, Northwest, US Airways) has been highly publicized. Despite the perceived glamour, airlines have not been profitable ventures for much of their history. At the time of 9/11, several airlines were already in bankruptcy. The dramatic drop off in passenger travel and increased security helped push several carriers over the edge.

According to a report last year by Reconnecting America¹, 20 airlines filed for Chapter 11 bankruptcy between 2000 and 2005. Using 2001 – 2004 airline data on passengers and aircraft, the report charts the shift of the industry to smaller regional jets with the dual effects of fewer seats and lower airport revenues. In earlier reports, the group documented the loss of air carrier service to a growing number of small and mid-sized airports, as well as substantial loss of flights in major markets such as Boston. With passengers finally returning to air service in 2004, the loss of capacity from the shift to smaller jets has resulted in congestion and higher passenger costs in a number of markets. The run-up in jet fuel costs since then has hit the airlines particularly hard and the full impact is not yet clear.

Another trend in air service is the growing number of corporate jets, fractional ownership and charter jet services, which has made substantial in-roads in the airlines profitable business market. *Air Charter Guide*, a publisher of air charter directories, reports that the air charter business is up more

¹ *Missed Connections III*, September 2005 can be found at <http://www.reconnectingamerica.org/html/RATN/index.htm>

than 50 percent since 2001. “The operators are drawing customers in part because of the Transportation Security Administration's heightened - and time-consuming - inspections on commercial flights.”¹

Another issue that continues to grab the national spotlight is the ups and downs of **Amtrak**, the National Passenger Railroad Corporation. For much of its history, Amtrak has been supported by strong segments of Congress and reviled by others. Administrations have been negative or neutral. Annual federal funding for intercity passenger rail is solely for Amtrak, and many of the categorical transit and highway programs are prohibited from funding this type of project or service. Vermont has a special history with Amtrak and has had a partnership to continue rail service to the state since 1995.

Recently, a new corporate board appointed a long-time railroad manager to be President. Public statements of board members indicate that the board wants a new structure and that states should be paying more of the costs. It is not at all clear, what this might mean for the Vermont service or for plans to create new east-west service. A 2003 study showed that the state could not provide the current service for less. It is also worth noting that increasingly states are strengthening their partnerships with Amtrak, regardless of the uncertainty. Last year, Illinois doubled their financial commitment to enable an increased number of trains on two state-subsidized routes and North Carolina finished track improvements that cut the in-state transit time by one hour. North Carolina recorded substantial passenger gains in the last twelve months of 17 to 25 percent, depending on the line.²

Intercity bus service also was hard hit by the decline in travel after 9/11. A recent American Bus Association study shows that beginning in 2004, patronage began to increase again and is close to pre 9/11 levels. However, as with the airlines, the impact of 9/11 caused restructuring for scheduled intercity carriers like Greyhound and impacted new services underway at the time. These new offerings included luxury bus services beginning to be introduced around the country, an example of which is NE Maine to Portland and to Boston.

Generally, states have few resources to encourage intercity bus travel. The Federal Transit Administration (FTA) does support a rural transportation program, Section 5311(f), includes to subsidies for rural transportation to communities less than \$50,000. In fact states are obligated to spend 15% of the 5311 funds for intercity bus transportation unless they certify that needs are being met. The national program is only \$450,000,000 annually, with Vermont receiving some \$ 1.5 million annually.

¹ Nashville Business Journal, *Young Air Charter Firm on Steep Ascent*, October 13, 2006

² **Charlotte Business Journal**, *Amtrak Posts Gains for Piedmont Service*, October 13, 2005

2.8 PLANNING AND DELIVERING PROJECTS

Multimodal planning has been emphasized in the highway and transit programs since ISTEA revamped all planning requirements and unified the requirements of the two modes as well as encouraged consideration of all other transportation means, including aviation, bicycle, pedestrian, and rail. Since that time, planners have learned to use new technology to improve planning practices and information and outreach to the community. A significant advance has been the use of new visualization techniques. Planning professionals also have promoted the combining of the planning processes with environmental issues and even the NEPA process to reduce duplication and time involved.

SAFETEA-LU recognizes these changes by emphasizing outreach, expanding coordination requirements, and by requiring the use of visualization in planning. Congress showed its interest in better metropolitan planning¹ by increasing the percentage of Federal highway funds to be set aside for that purpose to 1.25 percent of core programs and setting standards for prompt payment of these funds by the state DOTs to MPOs. Congress also chose to expand the planning scope by adding a separate security factor (safety and security are each required planning factors now), by requiring more consideration of economic development plans, and by increasing the environmental considerations. State planning requirements, for example, now specify that potential environmental mitigation activities are to be considered.

In addition to the several environmental changes, SAFETEA-LU included provisions to make a greater number of projects eligible for design build contracting and certain changes to Clean Air requirements to clarify the analysis process.

3.0 SUMMARY

The following list synthesizes some key findings from the review of VTrans plans and policies, regional transportation plan goals, and the review of national issues in transportation:

- Need for more and stable funding sources. This need will become even more important, and challenging to address, in the context of the anticipated shortfalls facing the highway trust fund. A financial analysis and identification of existing and innovative funding sources will be addressed in subsequent tasks of the plan update.
- Emphasis on System Preservation. Although important for all modes, system preservation is most critical for the highway and rail infrastructure and is supported in VTrans' last long range transportation plan, its policy plans, and the regional planning commission's transportation plans. The highway system is by far the largest component of the state's transportation system and in many cases the oldest. Its geographic extent, level of use, and

¹ Transportation and related planning for urbanized areas (as defined by the U.S. Census Bureau) as having 50,000 population or greater.

age make system preservation a priority. Although not as extensive, the state's rail system is arguably older than the highway system and it faces physical challenges that are threatening its long term viability in Vermont. Both modes are essential to the delivery of freight, which is increasing and changing due to global trade.

- Emphasis on Performance Measures and Asset management. All of the modal policy plans define performance measures tied to their goals and policies. The policies and goals were generally consistent with the three objectives in the current long range transportation plan (manage the system, improve all modes, and strengthen the economy and protect quality of life and environment). Future policy plan updates should clearly show how their specific recommendations, policies and associated performance measures relate to the objectives of the Long Range Transportation Business Plan.
- Safety. All of the modal policy plans, and many of the regions, include goals, and sometimes specific performance measures related to safety. On-going planning and operations work at VTTrans currently recognize the significance of safety. The Agency has demonstrated its commitment to safety through preparation of the Strategic Highway Safety Plan, initiation of the Vermont Safe Routes to School program, work zone safety initiatives, and the FAA 5010 Airport Safety Inspection Program.
- Security. Security is now emphasized as a stand alone planning factor in SAFETEA-LU. With the exception of the Airport Policy Plan, security is not a common theme of the VTTrans policy plans or regional transportation plans. Even within the Airport Policy Plan, security is a moving target due to evolving requirements at the federal level. Security will need to be addressed as the LRTBP moves forward.
- Economic Vitality. All VTTrans policy plans and the regional plans recognize the role transportation plays in supporting the state and regional economies. National trends point towards a shift to an information, service, and tourism based economy. National trends also point to significant funding challenges for intercity passenger travel by air, bus, and rail. These modes, in addition to the highway system, are important for tourism. The LRTBP should consider policies that recognize this shift.
- Energy and the Environment. While the environment is supported through policy statements, goals, and objectives in state and regional transportation plans, energy has not been a major emphasis. Energy affects the cost of travel, mode of travel, and the cost of transportation projects and is a critical issue that should be considered in the LRTBP.
- Transportation and Land Use. Connecting land use and transportation is a common theme in all of the regional transportation plans. The relationship is emphasized in the state's bike/ped, highway, and transit policy plans, but somewhat tangential in the rail and aviation plans.

- Congestion: Responses to the statewide public opinion survey and the lack of emphasis in regional transportation plans indicates that congestion is not currently a significant statewide issue. National trends show congestion growing faster in small cities and rural areas than in large metropolitan areas. If this trend continues, congestion will become more important on a statewide level and could create demand for projects and services beyond simply maintaining the existing system.



■ Documentation for:

VT LONG RANGE TRANSPORTATION BUSINESS PLAN

Working Paper 2: State Agency Issue
Review

■ Prepared for:

Vermont Agency of Transportation

8 December 2006

Draft

■ In Partnership with:

Snelling Center for Government

TransManagement

Center for Rural Studies

Hubert H. Humphrey Institute of Public Affairs

VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 2: State Agency Issue Review

TABLE OF CONTENTS

INTRODUCTION..... 1

WATER QUALITY INITIATIVES..... 2

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE..... 2

SMART GROWTH 4

TRANSIT FOR HUMAN SERVICES..... 4

COMMUNICATIONS CORRIDORS..... 5

WILDLIFE CORRIDORS 5

OTHER INFORMATION 5

APPENDIX A: STATE POLICY AND PLAN INVENTORY..... 7

This page left intentionally blank.



INTRODUCTION

The Vermont Agency of Transportation (VTTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach. It refined the three major objectives of the 1995 Long Range Plan, and emphasizes system management¹.

This working paper, one of many to be prepared in support of the plan², was prepared by the Snelling Center which surveyed Vermont state government agencies and departments for information regarding transportation plans and policies that should be taken into account in the update of the VTTrans Long Range Transportation Business Plan. State agencies and departments were requested to identify major policy areas, in their jurisdictions, that need to be taken into account in the planning leading up to the LRTBP. Specifically, they were asked for reports, written policies and policy statements that address issues of which VTTrans needs to be mindful in its planning work for the LRTBP.

Six agencies and departments responded; Agency of Natural Resources, Agency of Human Services, Agency of Commerce and Community Development, Agency of Administration and the Department of Public Service and Department of Public Safety.

Generally, six areas emerged, for which there is fairly clear report documentation since the last long range transportation plan update. In this memorandum we describe the six areas and some of the policy statements and plans. A complete list of policy statements and plans and contacts at the agencies and departments is attached. The six areas are grouped as follows.

- Water Quality
- Greenhouse gas emissions/internal combustion engine issues
- Smart Growth
- Public Transportation
- Communications corridors

¹ 2002 objectives (paraphrased): Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility; Improve all modes to provide Vermonters with choices; Strengthen the economy, protect and enhance the natural environment, and improve Vermonters' quality of life.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

- Wildlife corridors

WATER QUALITY INITIATIVES

The Agency of Natural Resources has several policies and planning initiatives related to water quality protection including:

- Watershed planning – numerous basin specific watershed plans and TMDLs¹
- Municipal Separate Storm Sewer Systems (MS4);
- Lake Champlain Basin Program – Opportunities for Action;
- Clean and Clear Initiative;
- Stormwater and Erosion Control Program and Regulation;
- River Management Program and Planning; and
- the Vermont Wetlands Program.

Issue and Gaps: Storm water management and riparian buffers are points of connection with VTtrans that are specifically reflected in ANR reports. Storm water management with respect to highways extends to road design, construction, culvert engineering, permitting, etc. Based on reports and policy statements, there is emphasis on “Better Back Roads” as a stream bank erosion control issue. The Clean and Clear program is a governor’s initiative led by a volunteer committee and supported by the Agency of Natural Resources. The program has a primary but not exclusive focus on the Lake Champlain watershed.

De-icing is presumably a water quality issue, although we saw no current reports on the subject.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

The Governor’s Commission on Climate Change is the primary forum for evaluating options for reduction of green house gases (www.vtclimate.us). Vermont’s largest source of green house gases is vehicle exhaust, which bears on transportation fuel consumption and vehicle miles traveled. The

¹ A TMDL or Total Maximum Daily Load is the calculation of the maximum amount of a pollutant that a water body can receive and still meet [Vermont Water Quality Standards](#). In a broader sense, a TMDL is a plan that identifies the pollutant reductions a water body needs to meet Vermont's Water Quality Standards and develops a means to implement those reductions. See <http://www.anr.state.vt.us/dec/waterq/planning/htm/pl%5Ftmdl.htm> for more information.



ANR web-page for the Air Pollution Control Division includes numerous publications and citations about greenhouse gases. The Air Pollution Control Division is also managing the state's adoption of the California Low Emission Vehicle program which impacts on transportation policy through requiring vehicles to reduce green house gas emissions.

In addition, the Department of Public Service is responsible for updating Vermont's Comprehensive Energy Plan, with a target completion date of October 2007. The Comprehensive Energy Plan will recommend strategies and policies that bear on transportation fuel consumption. Greenhouse Gas Emissions and the role of transportation in Vermont as a contributor will be a portion of the plan. The DPS has also been actively supporting a number of initiatives to promote alternative fuels in vehicles, such as the bio-diesel project in coordination with the Vermont Sustainable Jobs Fund, and the Clean Cities program.

The Department of Buildings and General Services created a comprehensive program with accompanying documentation entitled, Comprehensive Environmental and Resource Management Program (CERMP), dated April 28, 2004. The program defines the environmental footprint of Vermont state government. CERMP is divided into the following sections:

Building Infrastructure, Transportation (Fleet Management, Transportation Demand Management) and Statewide Purchasing Management

At the same time, Executive Order 14-03, created the Climate Neutral Working Group (CNWG) to direct state government agencies and departments to reduce greenhouse gas emissions from state government buildings and operations. The CNWG is just completing its first biennial report. Pertinent to the VT LRTBP, the biennial report requires all state government agencies, offices, and departments to:

- Purchase vehicles that have the highest available fuel efficiency in each respective vehicle class (e.g., passenger cars, light duty trucks, etc.), pursuant to performance specifications approved by the Climate Neutral Working Group. In setting these performance specifications, the Working Group shall consider vehicles that not only meet high fuel economy standards but that also provide lower total overall emissions of greenhouse gases, criteria pollutants, and hazardous air contaminants. To this end alternative transportation fuels have been investigated, including: Biodiesel VTans Highway truck pilot project in Central Vermont); Electric (Electric car pilot project)
- Develop programs to encourage state employees, through the use of incentives, to use transportation alternatives to a single person in a single motor vehicle for commuting and business travel, including incentives as may be bargained with the collective bargaining units. Cost modeling has started for an intercomplex Central Vermont Shuttle Service. A complementary "No-Idling" Campaign is in development

Section 44 of No. 121, Acts of 2004 amended 3 V.S.A. section 217 (c) to read:



At least 50 percent of the vehicles purchased annually by the commissioner shall be low emission passenger vehicles. Exceeding this mandate, all of the 100 new Fleet program acquisitions meet the low emissions standards while 25 of those 100 new vehicles are super low emission hybrids.

Issues and Gaps: Both the Commission on Climate Change and the DPS update of Vermont's Comprehensive Energy Plan referenced above are just getting underway, with reports due in 2007. The Comprehensive Energy Plan will have a Transportation section.

LRTBP Advisory Committee members also raised the impact of climate change on existing state transportation infrastructure (November 2, 2006). Emergency management procedures and impact analysis may have to be updated based on climate change scenarios. No state plans exist on this subject at this time.

SMART GROWTH

The principles and policies of "Smart Growth" are reflected in the Downtown Development Act and supported by Governor Douglas. Pursuant to the principles of the Downtown Development Act, the Department of Housing and Community Development has provided funding application guidelines for "Downtown Transportation and Related Capital Improvements," and guidelines for development of and around new interstate highway interchanges.

The Vermont Department of Health released a plan in April 2006 promoting community efforts to increase physical activity (biking and walking) through changes to the built environment and conducted a survey of the availability of sidewalks and other pedestrian amenities in Vermont's towns and villages.

Issues and Gaps: Less clearly stated, but of importance to ANR, DHCA and the Department of Health, are reports and policies promoting pedestrian and bicycle infrastructure and public transportation. (A Growth Center Planning Manual will be issued in January, 2007).

TRANSIT FOR HUMAN SERVICES

VTrans is charged with the responsibility for administering the Elders and Persons with Disabilities Transportation Program. Until July 1, 2004, that responsibility was delegated to the Department of Disabilities, Aging and Independent Living. The memorandum between the Agency of Human Services and VTrans reflects the deep concerns at that time that, with VTrans taking back control of the program, the service levels would drop.

In a December 2005 evaluation report, the Agency of Human Services reviewed the performance of the public transportation providers, and several other contractors, which provide "on-demand" transportation services to low income Vermonters who need a ride to work.



In a 2006 “Analysis of Impediments to Fair Housing”, by the Vermont Human Rights Commission, lack of public transportation is cited as one of nine impediments to fair housing.

At the present time, VTrans is drafting a “Public Policy Plan for Human Service Transportation”, which will be completed and released following a period of public comment. This plan should take into account the documents referenced above.

Issues and Gaps: The challenges of providing comprehensive public transportation in a rural state are obvious and well known. There is clearly a funding gap.

COMMUNICATIONS CORRIDORS

There is tremendous interest, coming from many directions, in the use of transportation corridors for fiber optic cable and other communications infrastructure. The commentary comes from the:

- Department of Public Service which wrote the 2004 Vermont Telecommunications Plan;
- Department of Innovation and Information which leads on Connect Vermont project for cell and wireless coverage;
- Department of Public Safety which leads on the Vermont Communications (VCOMM) project for law enforcement communications;
- Division of Tourism and Marketing which expressed interest in the 511 communications, the Intelligent Transportation System project and broadband access;
- Department of Economic Development which produced the “Strategic Vision and Business Plan for Job Creation and Economic Advancement” in January 2004, which presents the Governor’s goals for broadband and wireless coverage and access.

Issues and Gaps: There are no obvious gaps although VTrans might review its policies with respect to using rights of way for this purpose and determine whether it is being as supportive as possible in the development of communications infrastructure.

WILDLIFE CORRIDORS

The Department of Fish and Wildlife has produced several documents stressing the importance of properly designed culverts for fish and road crossings for land wildlife.

Issues and Gaps: There are no obvious gaps.

OTHER INFORMATION

LRTBP Advisory Committee members identified the lack of written plans connecting economic development issues with transportation infrastructure at a meeting with VTrans staff and the consultant team on November 2, 2006.



The Snelling Center is also aware of several other transportation planning initiatives that may provide information to inform the development of the Long Range Transportation Business Plan.

On August 22, 2006, 350 Vermonters gathered for a summit on energy and transportation issues at a conference convened by the Vermont Council on Rural Development. Two of the working groups at this conference called for the creation of a transportation efficiency utility that would mirror the work of Efficiency Vermont in the transportation field and invest in mechanisms to reduce vehicles miles traveled (Local Power: Energy & Economic Development in Rural Vermont, Final Report).

The new University Transportation Center at UVM has opened with \$16 million in funding and a mission to promote sustainable transportation systems and advanced technologies for northern rural climates. The UTC recently requested proposals for signature projects and received 35 by the deadline of September 31. Several of the proposals will directly look at technologies and policies that research, test and demonstrate sustainable transportation policies, programs and models in Vermont and nationally (www.uvm.edu/~transctr).

The Vermont AARP has been coordinating an in-depth look at quality of life measures including transportation for seniors in Burlington, Vermont. The project is part of a nation-wide livable communities demonstration and research effort by the AARP.



APPENDIX A: STATE POLICY AND PLAN INVENTORYAgency of Natural Resources

Contact: Dennis Malloy, Chief of Policy and Planning
802 241-3614 dennis.malloy@state.vt.us

1. Report of: The Governor's Funders Summit, Making Commitments to the Lake Champlain Phosphorous TMDL, December 2, 2003
With respect to transportation, this report stresses "Better Back Roads".
2. Governor's Clean and Clear Action Plan, current web-site;
The solutions indicated in the action plan make specific reference to "Better Back Roads" as an important factor in storm water run-off and erosion control.
3. Catalog of States' Green House Gas Reduction Policy Options, September 7, 2006; prepared for the Governor's Commission on Climate Change
4. Air Pollution Control Division; many web-site references to automobile emissions as a source of pollutants and green house gases. Seeking updates on Vermont Air Quality Improvement Plan.
5. Vermont's Wildlife Action Plan, September 2005;
Department of Fish and Wildlife
This plan stresses the importance of better road crossings and culverts, maintenance and restoration of aquatic and riparian habitat connectivity, and the provision of access to critical habitats for fish and 'other Species of Greatest conservation Need'.
6. Vermont Wildlife Linkage Habitat Analysis, May 16, 2006
A GIS Based, Landscape-level Identification of Potentially Significant Wildlife Linkage Habitats Associated with State of Vermont Roadways
7. Riparian Buffers and Corridors, 2005
Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers, December 9, 2005



These publications provide guidance for projects, including road construction, that fall under the jurisdiction of Act 250.

8. Climate Neutral Working Group (CNWG) First Biennial Report, April 2005.

Provides a clear summary of the ongoing energy consumption and greenhouse gas (GHG) emissions inventory of Vermont State Government operations. In addition, the report includes potential emission reduction strategies, energy consumption case studies, and other relevant work conducted by the CNWG since the signing of the Executive Order regarding Climate Change.

9. Stormwater Impaired Waters

Stormwater-Impaired Watershed Remediation Plan Development.

Stormwater Advisory Group – Milestone Meeting August 29, 2005.

The VTDEC Stormwater Management Section presented a comprehensive overview of the process to develop remediation plans for the 17 stormwater-impaired receiving waters that are listed on Vermont's 303(d) list. The purpose of the meeting was to present and discuss a complete 'straw-man' example of how the VTDEC proposes to develop both watershed targets and the subsequent watershed-wide permits for the stormwater impaired watersheds.

Agency of Human Services

Contact: Cathy Voyer, Director of Housing and Transportation

802 241-4624 cathyv@ahs.state.vt.us

1. Vermont Elders and Persons with Disabilities, Transportation Program Review, March 2004; prepared for the Vermont Department of Aging and Independent Living
2. SFY 2005 Memorandum of Understanding, August 31, 2004
Agency of Human Services and Agency of Transportation
3. ESD Program Evaluation Services: Reach Up Teen Parent Education, On-Demand Transportation and Independence Place programs, December 2005; prepared for Vermont Agency of Human Services, Economic Services Division



4. Human Services Transportation Coordination, Draft Plan, August 22, 2006

Agency of Commerce and Community Development

Contact: Denise Diehl, Office of the Secretary

802 828-3211

Denise.Diehl@state.vt.us

1. Downtown Development Act, 24 VSA 2794(a)(1)

This statute indicates that downtowns are to receive “priority consideration by any agency of the state administering any state or federal assistance program providing funding or other aid to a municipal downtown area.”

2. Application Guidelines for the Downtown Transportation and Related Capital Improvement Fund for FY 2007, prepared July 2006 by the Vermont Downtown Program, Department of Housing and Community Affairs.
3. Vermont Interstate Interchange Planning Project, August 12, 2003; and

Interstate Interchanges Planning and Development Design Guidelines, 2004;

Vermont Department of Housing and Community Affairs

4. Analysis of Impediments to Fair Housing Choice in Vermont, 2006; Department of Housing and community Affairs and Vermont Human Rights Commission

“Lack of Public Transportation Options” is one of nine impediments to fair housing identified in the report. Remedial actions are suggested.

5. Department of Tourism and Marketing

Issues are cited, although not apparently documented in reports:

- Issues pertaining to road signage
- The 511 information system
- Intelligent Transportation System (ITS) initiatives
- Initiatives and tools that help to identify and map recreational, cultural and heritage assets
- Broadband access for the Vermont travel Planner

6. Division of Historic Preservation

Many reports and other documents pertinent to transportation are cited. No dates are indicated as when the reports or other documents were issued.

- AOT Programmatic Agreement (among FHA, VTrans, and Historic Preservation)
- Historic Bridge Programmatic Agreement



- Historic Covered Bridge Preservation Plan
 - Vermont Historic Metal Truss Bridge Study
 - Criteria for Evaluating the Effect of Telecommunications facilities on Historic Resources
 - Locating Telecommunications Towers in Historic Buildings
7. Strategic Vision and Business Plan for Job Creation and Economic Advancement, January 2004; Department of Economic Development

This plan makes specific reference to goals for broadband and wireless voice communication access and coverage in Vermont including on major travel corridors such as the interstate system and routes 2, 4, 7 and 9.

Agency of Administration, Department of Innovation and Information

Contact: Tom Murray, Commissioner

Connect Vermont Project

This is a collaboration of various departments, led by the Department of Information and Innovation, with the purpose of achieving the Governor's goals for broadband and wireless access and coverage.

Department of Public Service

Contact: Walter Poor, Policy and Program Analyst

802 828-0544 Walter.Poor@state.vt.us

1. Vermont Telecommunications Plan, September 2004; prepared by the Vermont Department of Public Service.
2. Vermont Comprehensive Energy Plan; in process; target completion: Q4 2007

This project is directed by statute (30 VSA 202b). It updates the current plan which is dated July 1998. The plan covers a minimum of a 20 year period and includes, "A comprehensive analysis and projections regarding the use, cost, supply and environmental effects of all forms of energy resources used within Vermont." Transportation is a major section of the Vermont Comprehensive Energy Plan.

Department of Public Safety

Contact: Captain Chris Reinfurt

Director, Vermont Homeland Security Unit

802 241-5357 creinfurt@dps.state.vt.us



1. Vermont Communications (VCOMM); officially recognized under an Executive Order by Governor James H. Douglas, June 5, 2006

The goal is to replace and modernize the mobile data and two-way voice communications system for law enforcement and public safety functions in Vermont. VCOMM will leverage and integrate with the work of other agencies of state government including the use of fiber optic cable being placed in transportation corridors.

2. Operation Safe Commerce (Classified): This is a Homeland Security project, driven by the U.S. Department of Transportation, focused on commercial vehicle security and cross-border transportation issues.

Department of Health

Contact: Susan Coburn

1. The Vermont Department of Health released a plan in April 2006 promoting community efforts to increase physical activity (biking and walking) through changes to the built environment (Fit and Health Vermonters, Preventing Obesity in Vermont, April 2006). The DOH recommends improving sidewalks and street crossing safety, encouraging mixed use development and housing located in downtowns.
2. DOH contracted with CRS to conduct a survey of community assets that promote physical activity like bike paths, sidewalks and playgrounds. CRS found that less than 50 percent of Vermont communities have sidewalks, 8 percent have speed bumps to slow traffic and less than 40 percent have cross-walks. The survey results were based on responses from 93 percent of Vermont's 246 municipalities (CRS Report: Inventory of Public Resources Related to Health for Cities and Towns in Vermont, April, 2006).





■ Documentation for:

**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 3: Financial Analysis

■ Prepared for:

Vermont Agency of Transportation

26 February 2007

Draft

■ Prepared by:

Hubert H. Humphrey Institute of Public Affairs

In Partnership with:

Resource Systems Group, Inc.
Snelling Center for Government
TransManagement
Center for Rural Studies

VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 3: Financial Analysis

TABLE OF CONTENTS

INTRODUCTION..... 1

OVERVIEW OF TRANSPORTATION FUNDING 1

 TRANSPORTATION'S SHARE OF STATE BUDGET 1

 TRANSPORTATION EXPENDITURES..... 14

NEEDS VS. REVENUES 17

 NEEDS 17

 REVENUES 21

 GAP ANALYSIS..... 24

VERMONT TRANSPORTATION COMPARED TO OTHER STATES 26

FUTURE REVENUE CHALLENGES..... 32

 EARMARKS 32

 DEVOLUTION 32

 CHANGING DEMOGRAPHICS 33

FINANCING OPTIONS 34

 TRADITIONAL TOOLS..... 34

 INNOVATIVE TOOLS..... 39

CONCLUSIONS AND RECOMMENDATIONS..... 47

 CONCLUSIONS 47

 RECOMMENDATIONS 48

REFERENCES..... 51

INTRODUCTION

The Vermont Agency of Transportation (VTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach. It refined the three major objectives of the 1995 Long Range Plan, and emphasizes system management¹.

This working paper, one of many to be prepared in support of the plan², was prepared by the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs, which specializes in innovative financing, including the use of public/private partnerships. It provides an overview of transportation funding in Vermont, describes federal and state sources of revenue, explains how transportation funds are spent, compares need to revenue, and identifies different options for funding transportation. It should be noted that the report is a long-range plan and therefore it is likely that current assumptions and projections used in the report could change over a period of time due to many external factors.

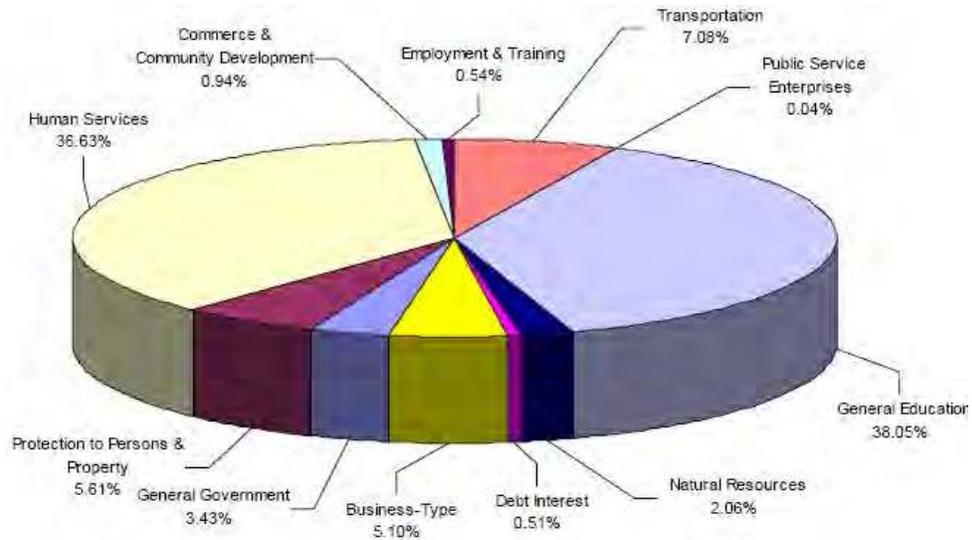
OVERVIEW OF TRANSPORTATION FUNDING

TRANSPORTATION'S SHARE OF STATE BUDGET

During state fiscal year (SFY) 2005, Vermont's transportation costs were 7.08 percent of the state's total expenditures of about \$3.83 billion. Figure-1 shows the relationship of transportation to components of the state's budget.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

Figure-1
Vermont Government Expenditures
Fiscal Year 2005



Source: Vermont Agency of Administration - Finance & Management, Budget summary for 2005,
http://finance.state.vt.us/Fin%20Publications/2005_cafr.pdf

For fiscal year (SFY) 2006, transportation appropriations amounted to about \$354 million or 8.35 percent of a total state budget of \$4.23 billion.

Vermont’s transportation infrastructure improvements depend largely on the continued availability of funds from both state as well as federal sources. Though the federal transportation reauthorization legislation - Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users



(SAFETEA-LU) - authorized \$244.1 billion¹ in funding for surface transportation projects through 2009, there is a high possibility that the Federal government may not be able to fully fund it due to anticipated Federal Highway Trust Fund (HTF) shortfalls as early as 2009. As a consequence, Vermont's transportation revenue stream could be significantly impacted. Vermont is also faced with the challenge of preserving its existing infrastructure which has deteriorated over the years. Vermont's 'Road to Affordability' program hopes to address this issue by reprioritizing projects that will enable it to free up money so that it could be used for preservation and maintenance. However, this could mean that new projects - new road segments - such as the Bennington Bypass and Chittenden County Circumferential Highway could get delayed.

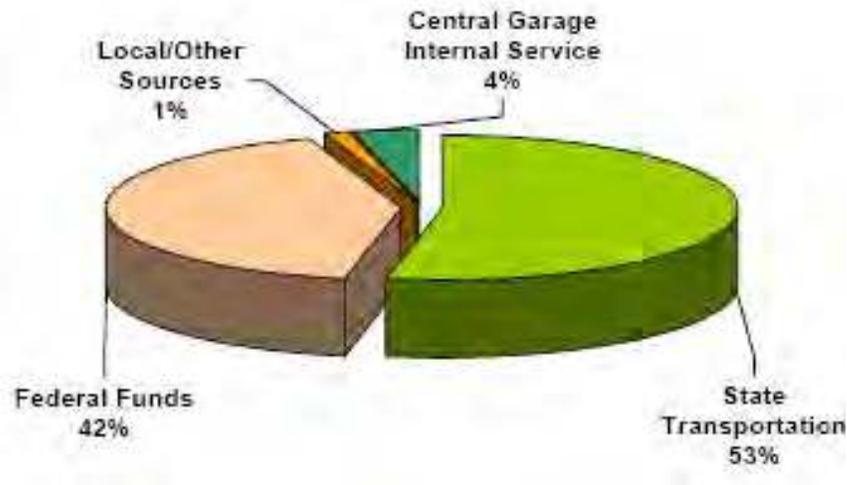
Transportation Revenues

Vermont's transportation system is mainly funded through federal and state taxes and fees. Federal funds, collected primarily through the federal motor fuel tax, are apportioned to the states on a formula basis through SAFETEA-LU. Federal funds have been a crucial part of Vermont's transportation funds, contributing about 40-45 percent of transportation revenues in recent years, and have played a major role in supporting Vermont's transportation system. In addition to federal funds, state funds are generated primarily through taxes on the sale of motor fuels and by fees and taxes on the sale and use of motor vehicles. In 2005, Federal funds contributed about 42 percent of Vermont's transportation funding needs, while state funds have contributed 53 percent, and the balance 5 percent coming from local and other sources and Central Garage Internal Service. Figure-2 shows the contributions from federal and state sources to Vermont's transportation funding.

¹ SAFETEA-LU: http://www.fhwa.dot.gov/safetealu/safetea-lu_summary.pdf



Figure-2
Vermont Transportation Funding Sources
Fiscal Year 2005



Source: VTrans 2005 Performance Report,

www.aot.state.vt.us/Documents/05PrfRpt.pdf

Federal Funds

SAFETEA-LU Authorization

With the passage of SAFETEA-LU in 2005, Vermont expects to receive about \$1 billion in transportation funding through the life of the bill which runs through 2009. Though Vermont has been authorized \$1 billion, federal appropriations processes will result in less dollars actually being appropriated. The appropriated amounts, or Obligation Limitation, are the real amounts that will be available for transportation uses. Historically, the obligation limitation has been about 90 percent of the authorized amount, and if this trend continues, Vermont can expect to get about \$900 million through 2009. (In FFY 2005 federal obligation authority was capped at 85.5 percent and in 2006 federal obligation

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



authority was capped at 87.1 percent. This has meant a reduction in anticipated federal fund to all states; however, part of that reduction has been offset by federal redistribution of obligation authority in FFY 2005 of \$7.13 million and in FFY 2006 of \$11.53 million to the State of Vermont.) If the amount made available would remain at the 90 percent level, the estimated FHWA funds, including earmarks, available to Vermont over the five year life of SAFETEA-LU will average about \$188 million/year. This is an increase of about \$61 million/year over previous allocations.

Earmarks

An earmark is a requirement that all or a portion of a source of revenue be devoted towards spending on specific programs or projects. Congress designates these funds to be spent on specific named projects, which differs from the appropriations process where lump sum grants are provided to an agency to allocate according to its internal budgeting process. Earmarks come to the state due to the efforts of Congress. Vermont's high levels of earmarks is mostly due to Sen. Jeffords seniority position as a Senate member, however, the same level of earmarks cannot be expected in the future. Earmarks are over and above what the state would otherwise expect to receive under normal authorizations. A portion of the obligation limitation is reserved for allocation to special program categories: high priority, transportation improvements, bridge discretionary and annual formula. The first three categories represent the earmark categories, while the annual formula is discretionary and can be allocated to construction, reconstruction, rehabilitation, paving, bridges, safety, enhancement and other eligible programs. Under SAFETEA-LU Vermont is the 2nd largest recipient state for earmarks on a per capita basis, behind only Alaska.

The SAFETEA-LU earmarks for high priority projects in Vermont total \$137.8 million to be spent on 30 projects over five years. If an obligation limitation of 90 percent is made available, \$24.8 million/year would be available through the life of the bill. In 2005, Vermont received \$27.5 million for high priority projects. Some of the high priority projects include: various interstate projects, Bennington Bypass, Brandon-Pittsford, Connect VT, US-2 in Danville, Burlington Church Street & Waterfront, and Lamoille Valley Rail Trail. The bill also includes earmarks from the Federal Transit Administration (FTA).

Transportation Improvement earmarks for Vermont constitutes \$120 million over 5 years with the following allocations: 10 percent in 2005, 20 percent in 2006, 25 percent in 2007, 25 percent in 2008, and 20 percent in 2009. Considering an obligation limitation of 90 percent, \$21.6 million will be available on



average each year through the life of the bill. Some of the transportation projects included are improvements to VT interstates, western corridor rail improvements, Bennington welcome center, Hartford rest areas, VT small bridges, and VT covered bridges.

Bridge Discretionary will contribute \$50 million from 2006-09, with an average of \$11.25 million/year assuming a 90 percent obligation limitation. Projects that are to be funded are: \$18 million for Missisquoi Bay Bridge and \$32 million for nine state maintained bridges (includes several Town Highway bridges).²

Federal Highway Administration Funds (Highways)

The Federal Highway Administration (FHWA) administers the Federal Highway Trust Fund (HTF), which derives funds from user-fees on motor fuels, tires, and heavy trucks. In FFY 2005, Vermont had contributed about \$74 million into the highway account; with motor fuels contributing \$66.58 million, and the balance \$7.62 million from federal use tax, taxes on trucks and trailers, and tires. Vermont was apportioned \$133.32 million for FFY 2005 and \$136.68 million for FFY 2006. The obligation limitation was \$110.79 million in FFY 2005 and \$115.67 million in FFY 2006.³

The FHWA administers various programs including: Interstate Maintenance, National Highway System, Surface Transportation Program, Bridge, Congestion Mitigation and Air Quality Improvement, Recreation Trails, Safe Routes to School, Highway Safety Improvement Program, and Rail Highway Crossing Program. Table-1 identifies apportionments of federal funds administered by FHWA by program category in FFY2005 and FFY 2006.

² VTrans: SAFETEA-LU

³ SAFETEA-LU: <http://www.fhwa.dot.gov/legsregs/directives/notices/n4520184a1.htm>

<http://www.fhwa.dot.gov/legsregs/directives/notices/n4520188a1.htm>



Table-1 FHWA Apportionment by Program Category, Vermont FFY2005 & FFY2006

Program	FFY2005	FFY2006
	(Millions)	(Millions)
Interstate (Maintenance)	\$15.65	\$16.02
National Highway System	\$31.89	\$35.47
Surface Transportation Program	\$32.34	\$29.83
Bridge	\$34.50	\$31.86
Congestion Mitigation and Air Quality	\$7.89	\$8.08
Recreational Trails	\$0.71	\$0.81
Metropolitan Planning	\$1.47	\$1.43
Coordinated Border Infrastructure	\$5.17	\$6.07
Safe Routes to School	\$1.00	\$0.99
Highway Safety Improvement Program	3.17*	\$5.03
	(* Includes Rail Highway Crossing Program)	
Rail Highway Crossing Program	-	\$1.09
Total FHWA Fund Apportionment	\$133.79	\$136.68

Source: <http://www.fhwa.dot.gov/safetealu/fundtables.htm>

Federal Transit Administration Funds (Transit)

The Federal Transit Authority (FTA) provides funding for Vermont's transit systems through numerous programs under authorization of SAFETEA-LU. In FFY2005 and FFY2006 those programs included:

- Metropolitan & Statewide Transportation Planning Program (Section 5303 & 5304)

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



- Large Urban Cities program (Section 5307)
- Bus and Bus Facilities Allocation Program (Section 5309)
- Transportation for Elderly Persons and Persons with Disabilities (Section 5310)
- Rural and Small Urban Areas (Section 5311 & 5340)
- Rural Transit Assistance Program (RTAP) (Section 5311 ((b)(3)))
- Job Access and Reverse Commute Program (JARC) (Section 5316)
- New Freedom Program (Section 5317)

SAFETEA-LU authorizes specific grant amounts annually for each program, which are provided through legislative formulas or discretionary authority. While FTA provides 80 percent of the funds, the 20 percent balance is matched with state and local funds for these transit programs. However, since the state does not have a dedicated fund source, generating revenues to support public transit is a challenge since transit competes for funds provided from the General Fund. Vermont was apportioned nearly \$8 million in FFY2005 and nearly \$10 million in FFY2006. Table-2 identifies the respective FTA grants for FFY 2005-06.



Table-2 FTA Grants to Vermont FFY 2005-2006

FTA Program Category	Location/Facility	FY 2005 (\$Millions)	FY 2006 (\$Millions)
Metropolitan Planning (Section 5303)	Statewide	\$0.25	\$0.31
Metropolitan Transportation Improvement Program (Section 5304)	Statewide		\$0.08
Large Urban Cities program (Section 5307)	Burlington	\$1.09	\$1.35
Bus and Bus Facilities Allocation Program (Section 5309)	Bellows Falls multi-modal facility and statewide bus facilities;	\$3.89	\$3.12
	Brattleboro Intermodal Center;		\$0.59
	Burlington Transit Facilities;		\$0.99
	Chittenden County Transportation Authority (CCTA) Bus, facilities and equipment;		\$0.30
	State of Vermont buses, facilities & equipment		\$0.25
Transportation for Elderly Persons and Persons with Disabilities (Section 5310)	Statewide	\$0.30	\$0.33
Rural and Small Urban Areas (Section 5311 & 5340)	Statewide	\$1.40	\$2.19
Rural Transit Assistance Program (RTAP) (Section 5311 ((b)(3)))	Statewide	\$0.07	\$0.08
Job Access and Reverse Commute Program (JARC) (Section 5316)		\$0.91	\$0.19
New Freedom Program (Section 5317)	Statewide		\$0.12
State Planning and Research (Section 5313)	Statewide	\$0.06	
Total FTA Grants		\$7.97	\$9.90

Source: http://www.fta.dot.gov/documents/apportionments_by_state_2005.pdf

<http://www.fta.dot.gov/documents/06-961.pdf>

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



Federal Aviation Administration Funds (Aviation)

The Federal Aviation Administration (FAA) provides funding for commercial and general aviation airports in Vermont through the Airport & Airway Trust Fund. The fund receives revenues from aviation excise taxes on airline tickets and other taxes paid by airport and airway users. Appropriations are authorized from this fund to meet the obligations for the airport improvement grants, facilities and equipment, engineering and development, research, and a portion of operations. Funding is made available through the Aviation Investment and Reform Act for the 21st Century (AIR-21) legislation. The National Plan of Integrated Airport Systems (NPIAS) identifies the development needs of general aviation airports for a five year period and AIR-21 provides the entitlement grants.

Capital improvements for state-owned airports in Vermont are funded by FAA Airport Improvement Program (AIP) State Apportionment Funds and FAA AIP Discretionary funds. Vermont receives approximately \$750,000 annually through AIP State Apportionments for large projects such as runway reconstruction or new taxiway systems. However, since these projects usually cost above \$750,000, the state must combine consecutive apportionments over a period of time until sufficient funds are available for construction. In addition, Vermont can also pursue discretionary funds from FAA through the same program. Though funds are not set aside for Vermont for discretionary projects, FAA may provide a discretionary grant above and beyond the state apportionment if a project meets certain criteria, typically safety reasons. FAA grants require matching funds; FAA provides 90 percent of an approved project's total cost while state match is to be provided for the remaining 10 percent. To be eligible for FAA funding, the projects must be on a federally approved Airport Layout Plan (ALP). The ALP is a detailed drawing of the airport and its surrounding environs and depicting proposed developments. FAA provides grants on a case-by-case basis with priority given to safety enhancement projects. These funds can be expended only on the approved project and cannot be transferred.

Burlington International Airport (BIA) receives the bulk of FAA capital aid provided to Vermont. Capital improvements for BIA are funded by FAA AIP Entitlement Funds, FAA AIP Discretionary Funds, State Appropriation Funds (6 percent of FAA grant), local funding (4 percent of FAA grant), and Passenger Facility Charges (PFC's). The AIP grant program is identical for both the State-Owned Airports and BIA, in addition, Burlington has specific set-aside entitlement funds based on its designation as a commercial service airport. BIA receives approximately \$2.2 million annually as entitlement appropriations.



Federal Railroad Administration Funds (Railways)

Unlike other programs, rail does not have a dedicated funding source; rather all funds provided are discretionary. The state does not have a dedicated funding source for rail and funds for transit are made available by transferring funds from the State Transportation Fund. Also, Vermont owns almost 50 percent of the railroads in the state, which is very unique, and generating funds to meet the needs for rail is a big challenge for the state. State governments have limited flexibility to use federal funds from SAFETEA-LU for rail projects. Typically federal funds for rail have been provided through Congestion Mitigation and Air Quality Improvement (CMAQ), Transportation Enhancements, High Speed Rail Development, Rail-Highway Crossing Program (Section 130), and other programs. The Transportation Improvement Program and the High Priority Programs are earmarks that provide dedicated funding for specific projects identified in SAFETEA-LU. Though one additional rail program – Capital Grants for Rail Line Relocation Projects – was added to SAFETEA-LU, it did not bring about any major change to the funding pattern.

Congestion Mitigation and Air Quality Improvement (CMAQ) funding may be used for freight and passenger rail projects that meet CMAQ goals. Transportation Enhancement funds are made available from the state STP funds, normally 10 percent is set aside, which are used for a broad range of environmentally-related activities including rehabilitation and operation of historic transportation buildings, structures or facilities and preservation of abandoned railway corridors. Under High-Speed Rail Corridor Development, SAFETEA-LU reauthorized the Swift Act and expanded eligible expenses from planning to development of high-speed rail corridors. The Rail-Highway Crossing Program, known as Section 130 program, provides funding for improving safety at public railroad crossings. High-Speed Rail Crossing Improvement Program funds are provided to eliminate hazards at highway-rail grade crossings in designated high speed corridors.

High Priority Programs provide designated funding for specific programs identified in SAFETEA-LU. Vermont receives earmarks for the following projects:

- St. Lawrence and Atlantic Railroad Upgrades in Northeastern Vermont \$5 million



- Lamoille Valley Rail Trail for the Vermont Association of Snow Travelers \$5.8 million
- Transportation Improvements to Bellows Falls Tunnel \$2 million

Transportation Improvement Programs are also earmarks, providing funding for specific projects.

Vermont receives funding for the following projects:

- Western Corridor Rail Improvements \$30 million
- Improvements to East Alburg Railroad Trestle Swing Span \$5 million
- Improvement to Green Mountain Rail Line between Rutland and-
Bellows Falls \$2.5 million

Capital Grants for Rail Line Relocation Projects provides financial assistance for rail line relocation or grade separation of track that is interfering with a community's motor vehicle traffic flow, its quality of life, or its economic development. Vermont's rail system also received specialized benefit through the Gateway Rural Improvement Pilot Program (GRIPP) in establishing a pilot program to demonstrate the benefits to rural rail corridors from a freight transportation gateway program. In addition, SAFETEA-LU also authorizes two credit assistance programs – Rail Rehabilitation and Improvement Financing (RRIF) and Transportation Infrastructure Finance and Innovation Act (TIFIA). New Starts Program funds are provided by FTA which supports transit 'guideway' capital investments.

State Funds

Vermont has a dedicated State Transportation (STP) Fund to provide for transportation appropriations. Receipts from the Motor Fuel Tax, and the purchase, use and registration of motor vehicles are deposited in the Transportation Fund. Figure-3 shows the proportion of Vermont's transportation revenue sources.



Figure-3
State Transportation Revenue Sources
Fiscal Year 2005



Source: VTrans 2005 Performance Report,

www.aot.state.vt.us/Documents/05PrfRpt.pdf

In SFY 2005, the transportation fund received \$210 million in revenues after all out-transfers made to general fund operations. The 19 cents per gallon gasoline tax and the 25 cents per gallon diesel fuel tax contributed 38 percent of the total revenue for the Transportation Fund. Of the 38 percent, gasoline tax contributed 31 percent and diesel tax contributed 7 percent. The six percent tax on the purchase and use of motor vehicles contributed 27 percent to the Transportation Fund. The motor vehicle fees; which includes operator license, registration fee for cars and the registration fee for trucks, raised 27 percent of the revenue while other taxes and fees raised 8 percent.



TRANSPORTATION EXPENDITURES

Transportation Fund Appropriations

In 2006, of a total VTTrans budget of \$354 million, federal funds made up \$164 million, state transportation fund appropriations (after all transfers) were \$173 million, and the balance from local and other sources. The VTTrans budget in 2007 as passed by the legislature is for \$454 million, an increase of \$100 million over SFY2006 appropriations.⁴ Vermont is to get an increase of \$80.7 million in federal funds in 2007 over 2006. The 2007 allocation is higher since the obligated 2005 earmarked funds were not available for expending in 2005, allowing some of the funds to be allocated for 2007.

Transportation Expenditures 2005

Of the \$327 million expended by the state on transportation in 2005, preservation and maintenance constituted 39 percent, roadway construction constituted 17 percent, bridges constituted 14 percent, alternative modes and administration and transportation board constituted 10 percent respectively. The Department of Motor Vehicles constituted 6 percent, and the balance 4 percent was expended on the Central Garage. Figure-4 illustrates the relationship and proportion of the 2005 state transportation expenditures in Vermont.

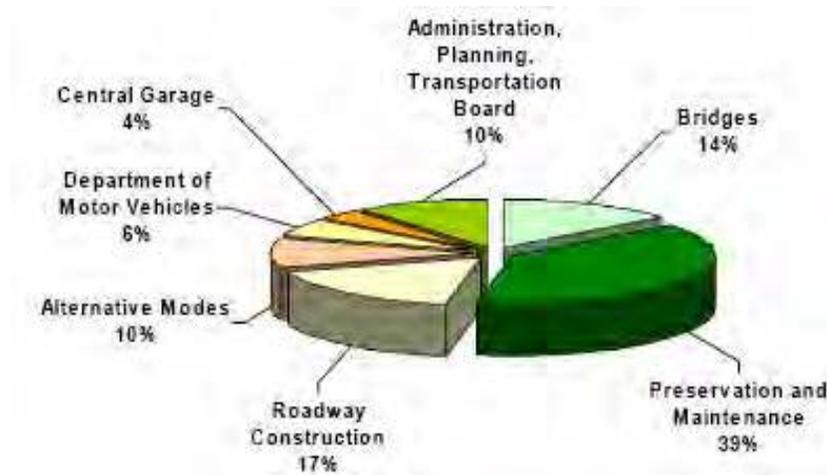
⁴ Vermont Agency of Transportation – Appropriation History FY2006 & FY2007



Figure-4

Vermont Total Transportation Expenditures

Fiscal Year 2005



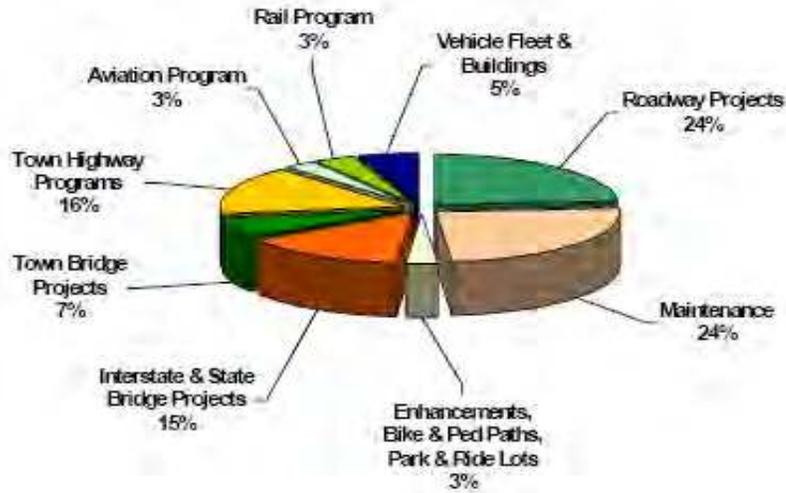
Source: VTrans 2005 Performance Report,

www.aot.state.vt.us/Documents/05PrfRpt.pdf**Capital (Infrastructure) Expenditure**

In 2005, a total of \$217.9 million of state transportation funds was spent on infrastructure with the largest portion being spent on maintenance and roadway projects. Of the total infrastructure expenditures, 24 percent was spent on maintenance and roadway projects respectively, 16 percent spent on Town Highway programs, 15 percent spent on Interstate and State Bridge projects, 7 percent on Town Bridge projects, 5 percent on vehicle fleet and buildings, and 3 percent on rail program, aviation program, and enhancements, bike & pedestrian paths, park & ride lots respectively.⁵ Figure-5 shows the relative percentage of expenditures on transportation infrastructure.



Figure-5
Vermont Transportation Infrastructure Expenditure
Fiscal Year 2005



Source: VTrans 2005 Performance Report,

www.aot.state.vt.us/Documents/05PrfRpt.pdf

⁵ VTrans FY2005 Budget



NEEDS VS. REVENUES

NEEDS

Federal Match Funds

A significant challenge facing Vermont in the short term is the ability to match the new federal transportation funding that will become available. It is estimated that \$12.3 million of state funds will be needed to match federal funds in 2007; \$14.6 million in 2008; \$14.4 million in 2009; and \$11.5 million in 2010, assuming that all new federal dollars are matched.⁶ The total state funds needed to match federal funds over the next four years is \$52.8 million. A state match on federal projects is typically 20 percent, 10 percent, or 0 percent depending on the category. The amount of state funds estimated to be available for fiscal years 2007 to 2010 is \$ 28.6 million. Therefore, the state needed to identify new revenue sources to come up with \$24.2 million in additional funding to provide for federal match.

State Transportation Fund

Existing and projected State revenues pose serious challenges for Vermont's Transportation Fund, which has been growing at an average rate of 2 percent per year since 2000. Following are the main reasons for the Transportation Fund not meeting expectations:

1. Motor fuel tax revenues are down because people are driving less;
2. Motor vehicle fees have only recently begun generating more funds, after recent fee increases; and,
3. Motor vehicle purchase and use taxes are down as a result of people buying smaller cars that use less fuel, as a result of improved vehicle fuel efficiency, and also due to non-taxed propulsion systems.
4. Fixed tax rates - fuel tax revenues have not been indexed to accommodate inflation as a result, inflation of roadway construction costs have frequently exceeded general inflation over the years.



In addition to these challenges, Transportation revenues in Vermont have been transferred from the Transportation Fund to fund the state's general fund operations. From SFY 2002 to 2006, a total of \$250 million, or \$50 million annually, has been transferred from the Transportation Fund to fund other state operations, as shown in Table-3.

Table-3 'Non Transportation' Appropriations from the Transportation Fund (in Millions)

General Description	Specific Area	2002	2003	2004	2005	2006
General Government	Building & General Services, Use Tax Reimbursement Fund, Legislature, Human Resources, Finance & Management etc.	11.3	9.5	10.1	9.3	10.0
Protection to People and Property	Public Safety, Judiciary, Defender General, Sheriffs, State Attorneys etc.	30.3	27.8	29.0	27.7	28.0
Human Services	Correction Services, Aging & Disabilities – Advocacy etc.	2.0	2.0	2.0	1.6	1.6
Education	Property Tax Assistance and Education Department	4.2	4.5	5.0	4.0	2.9
Natural Resources	Forests, Parks & Recreation, Environmental Conservation, Fish & Wildlife etc.	1.1	1.1	1.1	1.3	1.2
Debt Service	Principal	2.9	2.8	2.5	2.4	2.1
Miscellaneous		-	6.2	0.1	1.4	1.3
Total		51.8	53.9	49.8	47.7	47.2

Source: <http://www.leg.state.vt.us/jfo/Fiscal%20Facts%20&%20Fiscal%20Focus/2006%20Fiscal%20Facts.pdf>

Historically, Vermonters have had a willingness to collect and spend tax dollars when needed. This is evidenced today as Vermont is ranked among the highest taxed states in the U.S. With this ranking, further increases in taxes or fees in the near future are likely to meet with serious resistance, which could result in continued decline in revenues. In addition to declining revenues, Vermont, like many states, is

⁶ VTrans: Vermont Transportation Funding and SAFETEA-LU



also facing significant cost pressures and an aging infrastructure. Among the most significant driving forces affecting transportation funding decisions in Vermont are the impacts of:

- Inflation on construction costs;
- Large and expensive projects expected in the next 7-10 years; and,
- Deferred maintenance of the existing network adding to the costs of construction in the coming years.

Base Needs

The Transportation Fund is also not growing fast enough to meet the increased costs of the transportation base needs - such as fuel, materials, salaries, and benefits, etc. - which together are growing at a rate of 5.6 percent annually.¹ The base needs growth (5.6 percent) is substantially higher than the Transportation Fund growth (2 percent), which would result in less funds actually being available for projects. The growths in the transportation fund and the base needs can be calculated by applying the transportation fund growth percentage and the base needs growth percentage to SFY 2006 appropriation amount of \$220 million. Table-4 shows the expected shortfall of funds between the estimated growths in the Transportation Fund in comparison to the base needs growth over a 20-year period.

Table-4 State Transportation Fund Growth, Base Needs, and Projected Shortfall

Year	Transportation Fund Growth	Base Needs Growth	Projected Shortfall
(\$Millions)			
2006 - 2010	\$24.6	\$68.9	\$44.3
2011 - 2015	\$32.3	\$90.5	\$58.2
2016 - 2020	\$42.4	\$118.8	\$76.4
2021 - 2025	\$55.7	\$156.0	\$100.3
		Total	\$279.2

¹ VTTrans: SAFETEA-LU, <http://www.aot.state.vt.us/presentations/SAFETEALU/Slide18.htm>



Projected Needs

The current needs as of 2006 were estimated at \$513 million. This figure was arrived at by making adjustments to internal working documents of VTrans.¹ A needs analysis can be calculated for a 20-year period by applying a projected inflation rate factor of 5 percent, which is the most likely to be experienced and relevant, to the current needs. However, since the inflation rate is likely to fluctuate over time, it would be appropriate to apply a series of inflation rates to show the estimated needs. As shown in Table-5, the projected needs for Vermont over a 20-year period would be: \$12.4 billion with a 2 percent inflation rate, \$13.7 billion with a 3 percent inflation rate, \$15.2 billion with a 4 percent inflation rate, \$16.9 billion with a 5 percent inflation rate, and \$18.8 billion with a 6 percent inflation rate.

Table-5 Projected Transportation Needs Under Various Inflation Assumptions

Year	2%	3%	4%	5%	6%
(\$ Millions)					
2006 - 2010	\$2,670	\$2,724	\$2,779	\$2,835	\$2,892
2011 - 2015	\$2,948	\$3,157	\$3,381	\$3,618	\$3,870
2016 - 2020	\$3,254	\$3,660	\$4,113	\$4,617	\$5,179
2021 - 2025	\$3,593	\$4,243	\$5,004	\$5,893	\$6,930
Total	\$12,465	\$13,785	\$15,276	\$16,963	\$18,871

Under these projections and in spite of the large increase in federal funding, there may be many unmet needs across most programs including paving, bridges, rail and public transit that would not be addressed. Unmet needs create additional pressure on state funds that will be required to close the funding gap.

¹ VTrans Funding Projection



REVENUES

Forecast of Federal Highway Funds

The Congressional Budget Office (CBO) generates a 10-year forecast for the HTF revenues, with the most current update done in 2005. The CBO growth estimate for 2006 is 4.7 percent – largely due to the legislation that affects the tax treatment of kerosene and hence receipts from the tax on diesel – and 2.8 percent from 2007-09, and 2.1 percent from 2010-16.⁸

The expected Federal Highway Funds, excluding earmarks that would be available over the next 20 years can be calculated by applying the respective HTF growth percentages to the FFY 2006 federal appropriation amount of \$115.6 million. Since the HTF growth is estimated only up to 2016, while calculating values beyond 2016, the same HTF growth estimate of 2.1 percent has been applied. As shown in Table-6, the amount available to Vermont over a 20-year period is expected to be \$2.9 billion.

Table-6 Anticipated Federal Funds 2006-2025

Years	Funding (\$Millions)
2006 - 2010	\$620
2011 - 2015	\$700
2016 - 2020	\$777
2021 - 2025	\$862
Total	\$2,959

National Transportation Funding: SAFETEA-LU created two commissions: the National Surface Transportation Policy and Revenue Commission (section 1909) was created to study and report on current conditions and future needs of the surface transportation system, and potential funding to meet such needs; the National Surface Transportation Infrastructure Financing Commission (Section 1142)

⁸ <http://www.cbo.gov/ftpdocs/71xx/doc7123/04-04-HighwayRevenues.pdf>



was created to study the Highway Trust Fund revenues and the impacts of these revenues on future highway and transit needs.

Forecast of Earmarks

Vermont's earmarks from SAFETEA-LU authorization average about \$57.7 million/year through the life of the bill. The expected earmarks over the next 20 years can be calculated by using the SAFETEA-LU earmarks for 2006-10, and applying a projected inflation rate of 5 percent to an estimated earmark average of \$20 million, for 2011-2025. A constant earmark value has been applied considering that earmarks would not remain the same as in previous years and also that a decrease or absence of future earmarks would likely be offset by an increase in federal appropriations. As shown in Table-7, the projected earmark revenues for Vermont over a 20-year period would be: \$721 million.

Table-7 Projected Earmark Revenues 2006-2025

Year	Total Earmarks
	(\$Millions)
2006 - 2010	\$289
2011 - 2015	\$111
2016 - 2020	\$141
2021 - 2025	\$180
Total	\$721



Forecast of Federal Transit Administration Funds

The expected FTA Funds over the next 20 years can be calculated by applying the same HTF growth estimates, 4.7 percent in 2006, 2.8 percent from 2007-09, and 2.1 percent from 2010-25, since 80 percent of FTA funds come from the Mass Transit account of the Highway Trust Fund. FFY 2006 allocations have been taken as base value for the respective sections. As shown in Table-8, Vermont can expect to receive \$99.0 million from the FTA fund over a 20-year period.

Table-8 Anticipated FTA Funding 2006-2025

Year	S.5307 Urban	S.5310 Elderly and Disabilities	S.5311 Rural	Total
(\$Millions)				
2006 - 2010	\$7.2	\$1.7	\$11.8	\$20.7
2011 - 2015	\$8.2	\$2.0	\$13.3	\$23.5
2016 - 2020	\$9.1	\$2.2	\$14.7	\$26.0
2021 - 2025	\$10.1	\$2.4	\$16.3	\$28.8
Total	\$34.6	\$8.5	\$56.1	\$99.0

Forecast of State Transportation Funds

The State Transportation Fund, excluding federal sources, has been growing at an average rate of 2 percent from SFY 2000. The revenues that would be available from the transportation fund over the next 20-years can be forecast by applying the State Transportation Fund growth rate to the SFY 2005 Transportation Fund revenue of \$225 million. However, since revenues from the Transportation Fund are expected to continue to decline, it is appropriate to forecast future revenues by applying a series of growth rates to the SFY 2005 base revenue. As shown in Table-9, Vermont can expect to receive the following revenues over a 20-year period: \$5.2 billion if the Transportation Fund's growth rate declines to 1.5 percent, \$5.3 billion if the Transportation Fund growth rate declines to 1.75 percent and \$5.4 billion if the Transportation Fund continues growing at the current rate.



Table-9 State Transportation Fund Forecast 2006-2025

Years	1.5%	1.75%	2.0%
		(\$ Millions)	
2006 - 2010	\$1,159	\$1,165	\$1,171
2011 - 2015	\$1,249	\$1,271	\$1,293
2016 - 2020	\$1,345	\$1,386	\$1,427
2021 - 2025	\$1,449	\$1,511	\$1,576
Total	\$5,203	\$5,333	\$5,467

The revenues that would be available to Vermont for transportation purposes through 2025 would be the total of federal funds, earmark revenues, FTA funds, and State Transportation Fund revenues. Table-10 shows the total revenues that would be available from 2006-2025. Together all sources would generate \$9.2 billion in revenue provided all revenues are allocated for transportation. However, if the current trend of transferring transportation funds for non-transportation purposes continues, and considering that the current average of \$50 million is transferred annually to the general fund then, only \$8.2 billion would be available through 2025.

Table-10 Available Transportation Revenues 2006-2025

Sources	Before Out-Transfers	After Out-Transfers
	(\$ Millions)	
Federal Funds, Earmarks, FTA Funds and STP Fund	\$9,246	\$8,246



GAP ANALYSIS

The table below shows the revenue shortfall relative to the estimated overall needs over a 20 year period. The most relevant value that is likely to be experienced for the needs is the 5 percent inflation rate values from Table-5 (Projected Transportation Needs Under Various Inflation Assumptions). However, for calculation purposes, the 2 percent inflation rate and the 5 percent inflation rate from the needs in Table-5 is compared to show the shortfall in each scenario. Revenues have been calculated using values from Table-6, 7, 8 and the 2 percent values from Table-9. As shown in Table-11, over a 20 year period, Vermont's transportation revenue shortfall is estimated to be \$3.2 billion if the needs grow at 2 percent inflation rate, and \$7.7 billion if needs grow at 5 percent inflation rate. The revenues shown in the table are before any out-transfers, however, if out-transfers are made, it would increase the shortfalls proportionately.

Table-11 Vermont's Transportation Revenue Shortfall Analysis 2006-2025 (Before Out-Transfers)

Years	Needs		Revenues	Shortfall	
	2%	5%		2%	5%
(\$ Millions)					
2006 - 2010	\$2,670	\$2,835	\$2,101	\$569	\$734
2011 - 2015	\$2,948	\$3,618	\$2,127	\$821	\$1,491
2016 - 2020	\$3,254	\$4,617	\$2,371	\$883	\$2,246
2021 - 2025	\$3,593	\$5,893	\$2,647	\$946	\$3,246
Total	\$12,465	\$16,963	\$9,246	\$3,219	\$7,717



Table-12 shows Vermont's transportation revenue shortfall over a 20 year period after out-transfers. It is estimated that the shortfall would be \$4.2 billion if the needs grow at 2 percent inflation rate, and \$8.7 billion if needs grow at 5 percent inflation rate.

Table-12 Vermont's Transportation Revenue Shortfall Analysis 2006-2025 (After Out-Transfers)

Years	Needs		Revenues	Shortfall	
	2%	5%		2%	5%
(\$ Millions)					
2006 - 2010	\$2,670	\$2,835	\$1,851	\$819	\$984
2011 - 2015	\$2,948	\$3,618	\$1,877	\$1,071	\$1,741
2016 - 2020	\$3,254	\$4,617	\$2,121	\$1,133	\$2,496
2021 - 2025	\$3,593	\$5,893	\$2,397	\$1,196	\$3,496
Total	\$12,465	\$16,963	\$8,246	\$4,219	\$8,717

VERMONT TRANSPORTATION COMPARED TO OTHER STATES

Four states – Idaho, Montana, New Hampshire, and North Dakota, that have similar demographic characteristics as that of Vermont were selected for comparison. Various transportation criteria, as shown in Table-13 and 14, were analyzed and compared against Vermont's transportation.

State Gross Domestic Product

Table-13 shows the GDP comparison among the selected states. Vermont has the lowest GDP, \$23,065 million, while New Hampshire with \$55,061 million has the highest GDP. The contribution of transportation to GDP is also the lowest in Vermont, with \$484 million, but the contribution of

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



transportation as a percentage to total state GDP, at 2.1 percent, is higher than New Hampshire's 1.6 percent. However, Vermont's transportation is not contributing as much to GDP. Also Vermont and New Hampshire are in the lower percentile because transportation related spending is less and therefore resulting in lower change.

Table-13 Gross Domestic Product and Growth Comparison Among Selected States

State	Total GDP – FY2005 (in millions)	Contribution of Transportation to GDP (in millions)	Transportation GDP as a percentage of total GDP	Average Annual GDP Growth rates in percentage (FY 1997-2004)	Percentage GDP Change (2004-2005)	Contribution to percentage change from transportation (2004-05)
<i>Vermont</i>	\$23,065	\$484	2.1	4.1	2.7	0.03
<i>Idaho</i>	\$47,189	\$1,336	2.8	5.0	7.4	0.16
<i>Montana</i>	\$29,885	\$1,333	4.5	2.7	5.2	0.26
<i>New Hampshire</i>	\$55,061	\$885	1.6	4.1	3.2	0.01
<i>North Dakota</i>	\$24,397	\$992	4.1	2.3	5.3	0.20

Source: <http://bea.gov/bea/newsrel/gspnewsrelease.htm>

Table-14 shows the comparison of transportation budget and other sources among the selected states. In 2005, Vermont received \$111 million in SAFETEA-LU appropriations (excluding earmarks), as compared to a high of \$246 million for Montana and \$195 for Idaho. Just as in Vermont, the comparison states also generate state transportation revenues through motor fuel taxes and motor vehicle taxes. While Vermont generated \$225 million, in 2005, from the state transportation fund, New Hampshire generated \$374 million. The proportion of transportation to state budget for all states is between 8-10 percent. Though Vermont received the least federal appropriation, the federal transportation revenue per capita, at \$178 is higher than New Hampshire's \$98 and Idaho's \$136. However, Vermont's state



transportation revenue per capita, at \$361, is the highest among all the states. Vermont also has the highest revenue per capita, when federal and state transportation revenues are combined, at \$539, which is higher than New Hampshire's \$383. While Montana receives the highest federal funds, at 60 percent, Vermont receives 42 percent.

Vermont's contribution to the HTF is almost twice as less compared to other states; however, it receives more than twice the allocation from the fund. While Vermont contributed \$74 million to the HTF in 2004, it received \$171 million. Comparatively, North Dakota and Montana receive higher allocations. Vermont's state GDP per capita is \$37,000 which is higher than the GDP's of Idaho and Montana. In 2005, Vermont was the highest taxed state in the country. Vermont's state tax revenue per capita is \$3600 compared to New Hampshire's \$1544 and a national average of \$2189. Vermont also stands first in personal income tax per capita with \$803 as compared to New Hampshire's \$52 and a national average of \$744.

While Vermont generates \$86 million through motor fuel taxes, it is still the lowest among comparison states, but revenues from motor vehicle and motor-carrier taxes, \$125 million, are almost on par with New Hampshire's \$126 million, and higher than North Dakota's \$67 million and Montana's \$115 million. Vermont's gas tax rate of 20 cents is one of the lowest, only marginally higher than New Hampshire's 19.6 cents, compared to Montana's 27 cents, Idaho's 25 cents, and North Dakota's 23 cents. Vermont's highway use of gasoline is 343 million, which is slightly higher than North Dakota's 300 million and almost twice as less than what Idaho, Montana, and New Hampshire consume. Vermont's highway vehicle miles traveled (VMT) is 7.8 million compared to Idaho's 14.7 million, New Hampshire's 13.2 million, Montana's 11.2 million, and North Dakota's 7.6 million, but Vermont's VMT at 12,641 is the highest among all other states.

All states however, face a similar challenge; the need to generate additional transportation revenues to meet their growing transportation needs. It has become critical for each state to take some steps to address these burgeoning transportation needs.



Table-14 Transportation Budget and Source Comparison

	Vermont	Idaho	Montana	New Hampshire	North Dakota
<i>SAFETEA-LU appropriations (2005)ⁱ excluding Earmarks</i>	\$111 million	\$195 million	\$246 million	\$128 million	\$154 million
<i>State revenue sources</i>	State Transportation Fund -Motor Fuel Tax, and the purchase, use and registration of motor vehicles.	Highway Distribution Account (HDA) - motor fuel tax, vehicle registration, truck registrations, and miscellaneous fees – property tax, local funds, federal aid, National forest reserve, user funds, and others	Highways State Special Revenue Account - motor fuel tax, Gross Vehicle Weight (GVW) fees, and other revenues. The Department of Transportation receives about 80% allocations from the Highways State Special Revenue Account for transportation related expenditures.	State Highway Trust Fund – gas tax and vehicle fees - and Turnpike Funds.	Highway Tax Distribution Fund - motor fuel tax and motor vehicle registration
<i>State Transportation Fund revenues</i>	FY2005: \$225 million	FY2006: \$296 million ⁱⁱ	FY2006: \$211 million ⁱⁱⁱ	FY2005: \$374 million (\$255 from State Highway Trust Fund, \$88 million from Turnpike funds, and \$31 million from other sources) ^{iv}	FY2005-07: \$335 million ^v
<i>Proportion of Transportation share to state budget</i>	8.35 percent of a total budget of \$4.2 billion (FY2006) \$354 million	10 percent of total state revenues (FY 2006) ^{vi}		9 percent of total state budget of \$4.7 billion (FY2005) \$423 million	16.6 percent of the total budget appropriation of \$5.75 billion (FY2005-07) \$954 million
<i>Federal Transportation revenue per capita</i>	\$178	\$136	\$262	\$98	\$241
<i>State Transportation revenue per capita</i>	\$361	\$207	\$219	\$285	\$525 (biennium)

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



	Vermont	Idaho	Montana	New Hampshire	North Dakota
<i>Transportation revenue per capita (Federal & State)</i>	\$539	\$343	\$481	\$383	\$504* <small>* State transportation revenue per capita calculated on annual basis</small>
<i>Proportion of Federal funds to state transportation budget</i>	42%	58%	60%	44%	34%
<i>HTF account receipts ^{vii} (FY2004)</i>					
- Payments into fund	\$74 million	\$174 million	\$148 million	\$146 million	\$103 million
- Percent of total	0.22	0.53	0.45	0.44	0.31
-Apportionments and allocations from fund	\$171 million	\$274 million	\$360 million	\$173 million	\$266 million
-Percent of total	0.45	0.73	0.95	0.46	0.70
<i>State GDP per capita</i>	\$37,000	\$33,000	\$32,000	\$42,000	\$38,000
<i>State tax revenue per capita ^{viii} (FY2005 - National tax per capita: \$2189)</i>	\$3,600	\$2,053	\$2,003	\$1,544	\$2,202
<i>Rank among all states</i>	1st	30 th	33rd	48 th	21 st
<i>Personal income tax per capita (FY2005: National personal income tax per capita: \$744)</i>	\$803	\$728	\$762	\$52	\$380



	Vermont	Idaho	Montana	New Hampshire	North Dakota
<i>Highway-user revenue^{ix} (FY2005)</i>					
-Motor fuel tax	\$86 million	\$215 million	\$171 million	\$155 million	\$108 million
-Motor vehicle and motor-carrier tax	\$125 million	\$134 million	\$115 million	\$126 million	\$67 million
<i>Gas tax rate (per gallon)</i>	20 cents	25 cents	27 cents	19.6 cents	23 cents
<i>Highway use of motor fuel^x (2004) gallons</i>					
-Gasoline	343 million	604 million	466 million	698 million	300 million
-Special fuels	62 million	239 million	223 million	112 million	157 million
-Percentage of total national use	0.23	0.48	0.40	0.46	0.28
<i>Highway vehicle miles traveled(VMT)</i>	7.8 million	14.7 million	11.2 million	13.2 million	7.6 million
<i>VMT per capita (2004)</i>	12,641	10,572	12,091	10,170	11,971
<i>State ranking in size and population</i>					
-Size	45 th	14 th	4 th	46 th	19 th
-Population (2005)	49 th (623,000)	39 th (1,429,000)	44 th (936,000)	41 st (1,310,000)	47 th (637,000)



FUTURE REVENUE CHALLENGES

EARMARKS

Earmarking of transportation projects by Congress during the authorization of Federal-aid highway acts has increased significantly during the last two decades. In 1982 only 11 projects worth \$700 million were earmarked which represented 1.4 percent of the total amount authorized. The number of projects increased to 152 in 1987, 539 in 1991, 1850 in 1998 and ballooned to 5700 in 2005 in the reauthorization named SAFETEA-LU. The percentage also increased to 1.6 in 1987, 6.0 in 1991, 6.3 in 1998 and eventually 10.6 percent in 2005.

Earmarks have become the subject of significant controversy in recent years. The earmarked money is allocated to the states by Congress rather than using the normal formula. Vermont has performed well in recent years by receiving a substantial amount of earmarked funds due to the favorable placement of its congressional representatives. Vermont was the recipient of the second highest per capita amount of earmarked dollars authorized under SAFETEA-LU. Though revenue projections in this report have taken earmarks into consideration, the same levels as authorized under SAFETEA-LU are not expected to be available to Vermont in future reauthorizations.

DEVOLUTION

The current federal transportation financing system was developed in the 1950s with a major mission of constructing the interstate system. The fund distribution to states was mostly based on the need to construct that infrastructure. Now that the mission is complete, it is evident that revenues are not keeping up with the demand to maintain the built infrastructure. In addition, ever increasing congestion in the urban areas is causing severe problems for motorists and business. The words “donor” and “donee” states and regions have become common as some states complain that they are not getting their fair share of the transportation fund. They feel that their share of the fund should be related to the amount of monies they collect and contribute to the Highway Trust Fund. TEA-21 and SAFETEA-LU attempted to respond to the concerns of the donor states by establishing increasing minimum percentage that every state will receive. Because Vermont is a “donee” state, devolution will impact the state adversely.



CHANGING DEMOGRAPHICS

The following table portrays a snapshot of population trends in Vermont since the 1990 census. It is clear that Vermont's population is growing much more slowly than the US population and also it is aging faster than the nation in general. Most of these trends can be attributed to the fact that Vermont is not the destination of immigrants to this country. The majority of the population increase in the US can be attributed to the higher birth rates among immigrant population, who are usually younger in age.

The U.S. Census Bureau projects that over 20 percent of the national population will be age 65 or over by 2030. Considering other factors, it is safe to say that the Vermont percentage will be higher than 20 percent. This aging population poses a serious challenge for Vermont. Access to transportation is essential to individuals as they age, as it allows them to stay independent and allows them access to goods and services. It also allows them to keep strong social contact which is important for quality of life. As the population continues to age, a higher number of people stop driving. This can increase isolation unless mobility assistance is provided to these seniors. Providing this mobility is challenging in Vermont due to its lower population density and the resulting high cost of addressing this need. A more detailed discussion of demographic changes is available in Working Paper - 4.

Table-15 Demographic Comparisons: Vermont and the U.S.

	Vermont	USA
Population, 2005 estimate	623,050	296,410,404
Population, percent change, 2000 to 2005	2.3%	5.3%
Population, percent change, 1990 to 2000	8.2%	13.1%
Persons under 18 years old, percent, 2004	21.7%	25.0%
Persons 65 years old and over, percent, 2004	13.0%	12.4%
White persons, not Hispanic, percent, 2004	96.0%	67.4%
Foreign born persons, percent, 2000	3.8%	11.1%
Persons per square mile, 2000	65.8	79.6

Source: U.S. Census Bureau

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



FINANCING OPTIONS

TRADITIONAL TOOLS

State governments have generally funded their transportation needs through revenues from motor fuel taxes, vehicle registration taxes, license and other fees. However, the costs of infrastructure construction and maintenance have increased compared disproportionately to revenues due to inflation. The traditional sources of revenues to fund transportation have not been sufficient to meet increased costs, forcing governments to resort to innovative financing mechanisms to generate the required revenues.

Motor Fuel Tax

This is the most commonly used tax to support transportation projects. It is a tax on motor fuel, charged per gallon of usage. The revenue from this tax is usually dedicated to transportation. Historically, governments have been relying on this tax to support transportation projects, but in recent years, revenues from this source alone have not been sufficient to meet the costs of projects. Federal and state fuel tax revenues have been rising slower than vehicle miles of travel (VMT) and transportation costs, and fuel taxes have not been raised to match inflation and increases in fuel efficiency, resulting in declining revenue per vehicle mile. All states use revenues from motor fuel tax to support transportation.

The purchasing power of the gas tax, both federal and state, when equated against the Consumer Price Index (CPI) has been steadily decreasing over the years. Figure-6 and 7 show the federal and state gas tax purchasing power decline respectively, with '82 as the base year. As shown in both graphs, increases in the gas tax purchasing power have been noticed whenever the gas tax rates were increased.



Figure-6: Federal Gas Tax Purchasing Power

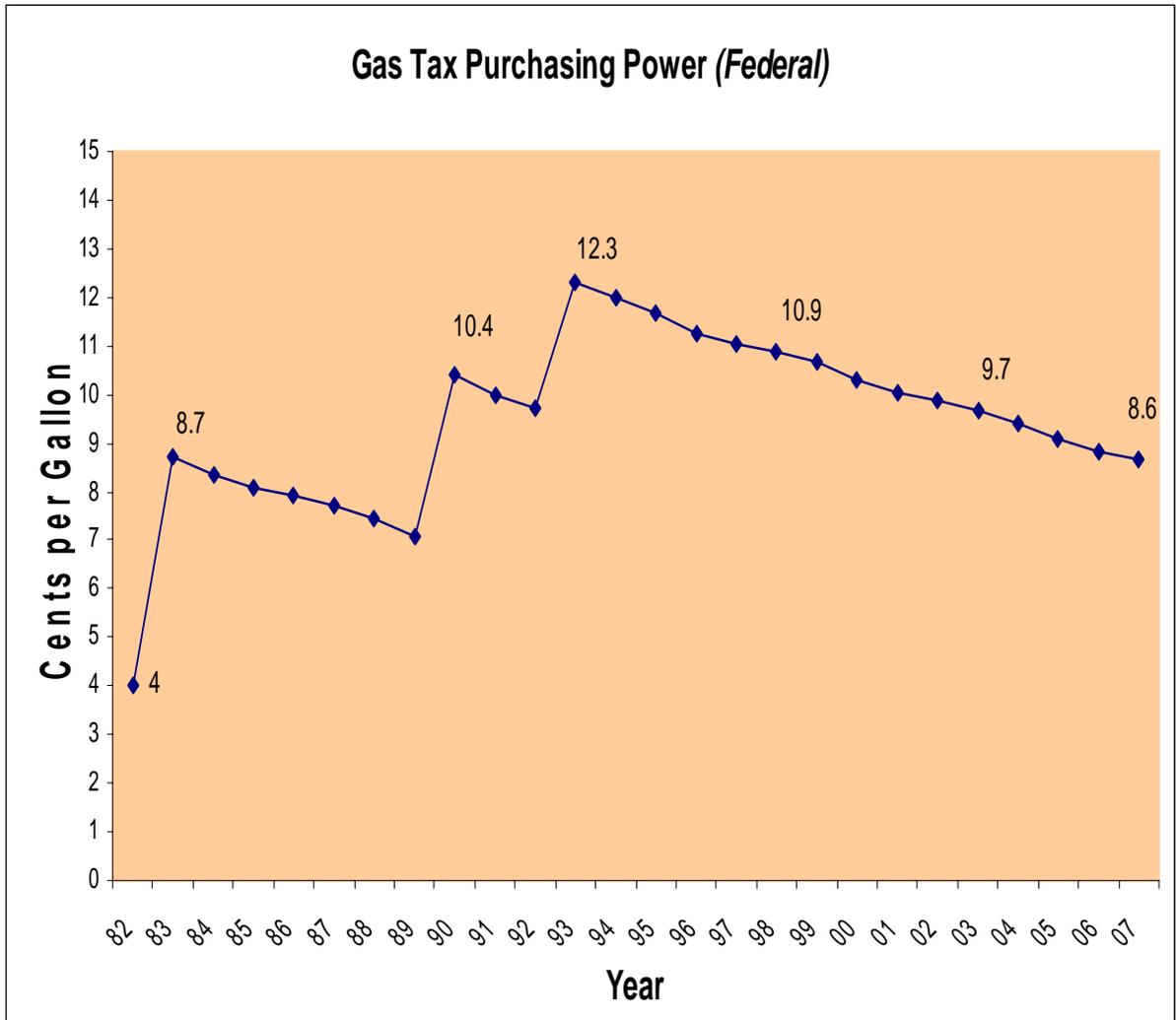
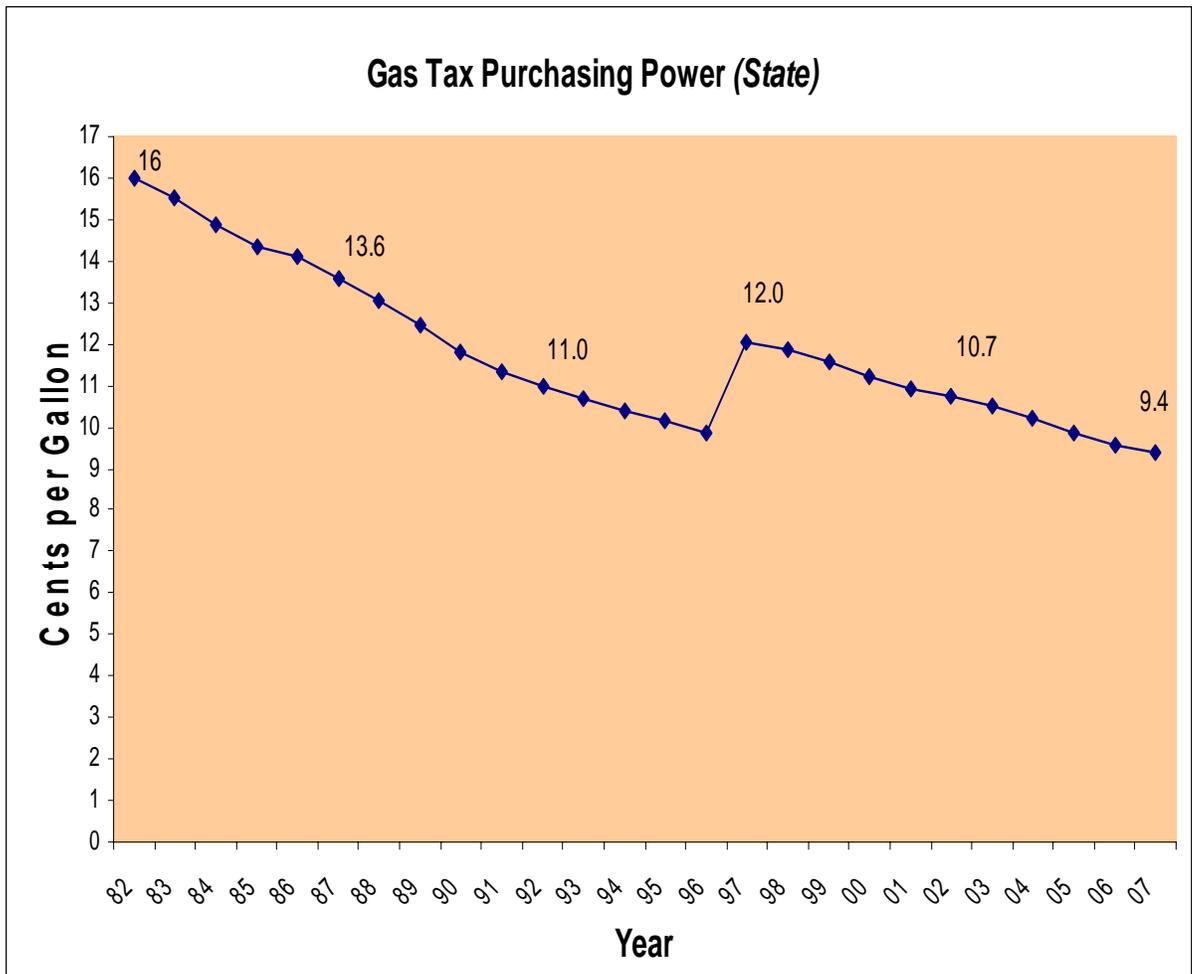


Figure-7: State Gas Tax Purchasing Power



Most of Vermont’s travel takes place on roads where vehicle miles traveled (VMT) has increased significantly over the years. Nationally, VMT has been increasing twice that of population increase and Vermont follows this same trend. Since the fuel tax has not been adjusted for inflation, additional fuel

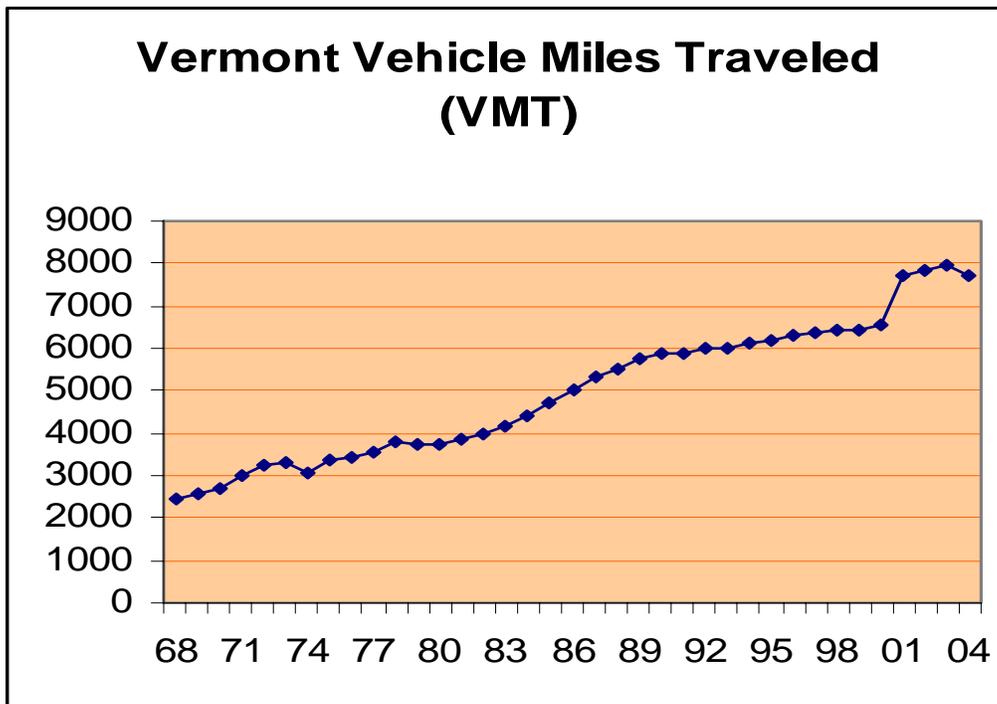


consumption due to higher VMT does not result in a comparable growth in revenues for the state. As a result, the fuel tax is not sufficient to meet the increased transportation costs incurred by the state.

Figure-8 shows Vermont’s annual VMT increase over the years.

Figure-8

Annual VMT in Millions of Miles



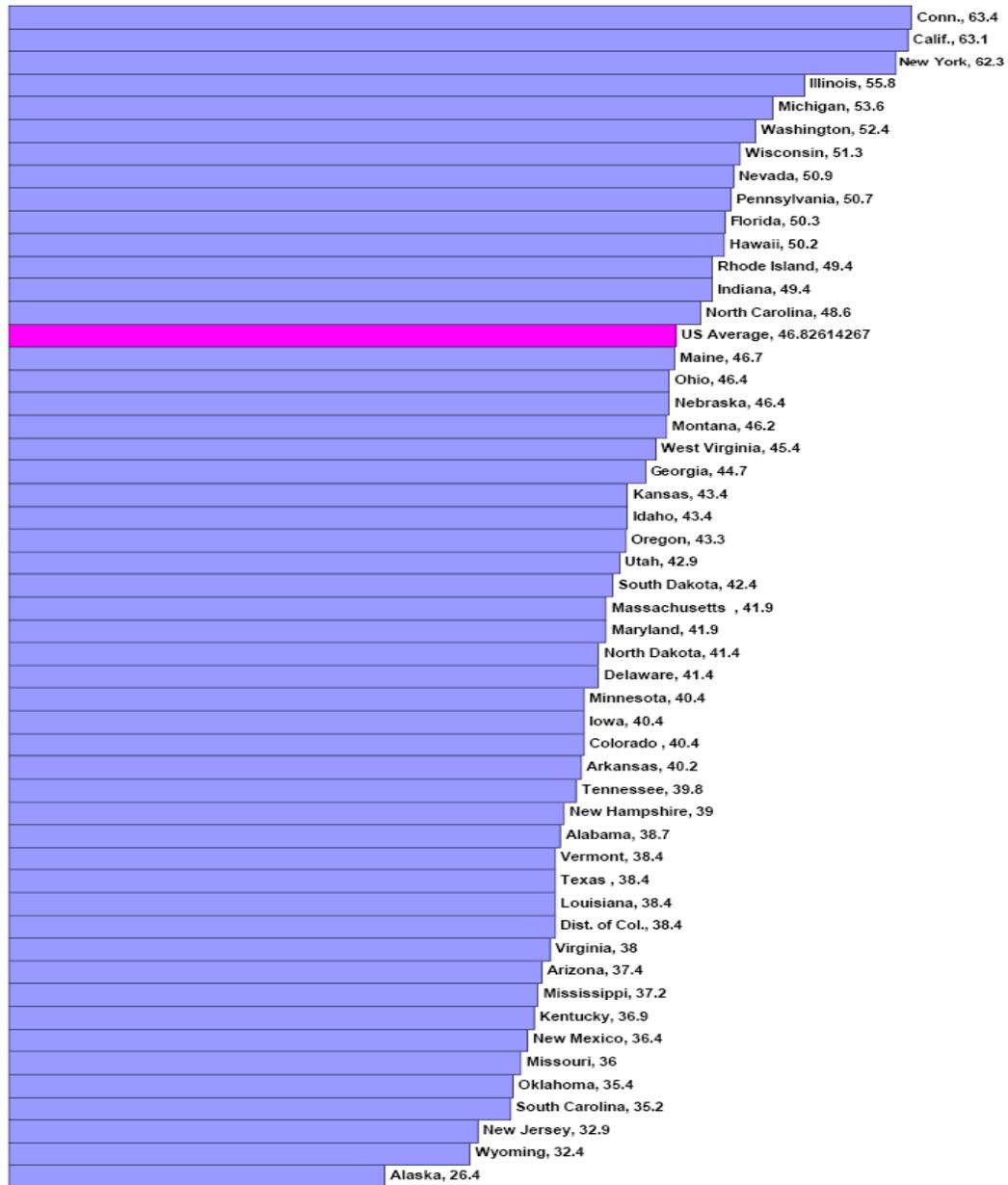
Source: <http://www.aot.state.vt.us/planning/documents/highresearch/publications/avmthist.pdf>

The motor fuel tax is a potential source for generating additional revenues for the state. The current tax of 19 cents (excluding the 1cent dedicated to Petroleum Cleanup) per gallon is expected to generate \$67 million in 2007. At current consumption levels, a penny increase in the motor fuel tax can generate an additional \$3.6 million annually for Vermont.

Figure-9 compares the combined federal and state gas tax rates of all fifty states in the nation. The gas rates shown include the 18.4 cents federal tax. While the national average is 46.8 cents per gallon, Vermont’s rate is 38.4 cents per gallon, which places it 37th among all states.



Figure-9: Federal and State Gasoline Taxes as of July 2006 (cents per gallon)



Source: http://www.api.org/statistics/fueltaxes/upload/Motor_Gasoline_Taxes_1918_2006.pdf

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



Motor Vehicle Tax

Some governments use motor vehicle or registration taxes to fund transportation. This tax is charged in such ways as registration fees, insurance fees, annual taxes, license fees, sales or use fees, age-based fees or rental vehicle taxes.

Vermont's current motor vehicle purchase and use tax of 6 percent is expected to generate \$86.3 million in 2007, and an increase of 1 percent would generate an additional \$14.4 million.

INNOVATIVE TOOLS

Some of the innovative financing mechanisms that are in use include: indexing of motor fuel taxes; local option sales taxes; property taxes; impact fees; highway and general fund bonding; metro area sales taxes and local option sales tax, motor vehicle violation surcharges, transportation utility fees, metro payroll taxes, and state lotteries. Transportation financing innovations are also occurring in the development of toll facilities, high occupancy toll lanes and optional express lanes, sometimes through public-private partnerships. A vehicle miles of travel (VMT) tax is widely being considered as a replacement or supplement to the motor fuel tax. And while it is being tested in Oregon and Washington State, it has not yet been adopted by any jurisdictions in the U.S. Among states using innovative financing, some are using a single type of tax or a combination of taxes to fund transportation while other states earmark taxes exclusively to fund transportation projects. Transportation funding trends, on a national level, have shown a shift towards innovative financing initiatives to solve local transportation problems.

Sales Tax Rate

This form of tax has been a more recent phenomenon and is being increasingly adopted by governments. Legislative action is necessary to make local option taxes available as a funding source. In many instances sales tax has been favorably accepted instead of property taxes. Some local governments levy sales taxes that are used to fund specific transportation projects and are called Special Purpose Local Option Sales Tax (SPLOST). Localities with a large retail base or with high travel and tourism flow benefit from this form of tax, as non-residents also share the tax burden. Local residents prefer this form of tax to property or other forms of taxes as it is spread across the population and is less of a burden since it is



paid in small increments. Generally, local option sales taxes are passed by the local government commission and require voter approval before implementation. Some of the states that have implemented this tax are Arizona, Colorado, Florida, Georgia, and South Carolina.

Local Option Sales Tax (LOST) is also permitted in Vermont under certain situations. Some communities such as Burlington and Williston currently raise revenues with LOST, although the funds are not used for transportation. The sales and use tax is also a potential revenue generator. The current general sales and use tax of 6 percent in Vermont is expected to generate \$341 million in 2007. An increase of 1 percent of the sales tax can generate an addition \$56.9 million.

Property Tax

State governments use property taxes to fund transportation projects, especially transit. This form of tax however, funds only a portion of transportation costs, and residents generally do not favor increases in property taxes to fund transportation. Florida and Illinois have used revenues from property taxes to fund transportation. The property tax burden in Vermont is significant. Most local and state officials today are looking for ways to reduce, not add to, property taxes. Therefore, it is an unlikely source of transportation revenues.

Impact Fee

This has been a more recent development and some state governments, such as Florida and Illinois, levy impact fees in new development areas. Since these developments increase the demand for public services, governments levy a development impact fee on developers of the area. Developers also pay for transportation improvements related to a specific development project. Revenue from impact fees is generally used to fund roads serving these new development areas, but in some cases have been used to fund larger projects. A key step to increased emphasis on Impact Fee is local and regional planning to determine impacts and proportionate shares. It is an important issue since many communities in Vermont do not have the planning capability.



Highway Bonds

This financing option allows the department of transportation to transfer money from the general fund to the highway fund, or authorize spending from the highway fund, up to the amount of the anticipated receipts from the sale of bonds. When bond proceeds are received they are required to be returned to the general fund or replaced in the highway fund.

General Fund Bonds

Some states use general obligation bonds as an innovative financing initiative to fund transportation projects.

Metro Sales Tax

This innovative financing option is a sales tax that is levied in metro areas to fund specific, local transportation projects.

Sales Tax on Gasoline Sale

Gasoline is currently exempt from sales tax. Imposing sales tax on gasoline has the potential of generating significant revenue.

Vehicle Trade-in Exemption

Elimination of exemption of trade-in value from sales tax is another source of income.

Motor Vehicle Violation Surcharge

This is an innovative financing mechanism wherein a surcharge is levied on various traffic offenses, such as drunk driving and speeding. Funds collected from this source can be used as an additional revenue source to support transportation.

Transportation Utility Fee

This is a fee similar to a water or sewer fee that is collected on a monthly basis from residential and businesses within a city's corporate limits. Funds from this source have traditionally been used for transportation maintenance and operations.



Metro Payroll Tax

Some states use payroll tax to support transportation, mainly transit. This form of tax is charged directly on the employer. Usually salaries, commissions, fees, etc. paid to employees within the tax jurisdiction are taxed.

State Lottery

State lottery funds have been used to support transportation projects or to provide additional revenues to state government transportation funds.

Vehicle Miles of Travel (VMT) Tax

This innovative financing option is a mileage-based fee. Under this system a per-mile charge is collected for every mile driven within specified areas. A GPS unit in the vehicle measures the miles traveled and a charge is levied based on each mile of travel. Although this form of tax has been gaining interest with transportation authorities as a possible future replacement or supplement for the motor fuel tax, the system technology and architecture is still under development. However, Oregon is undertaking a pilot program that allows volunteer drivers to pay a flat fee for in-state miles traveled instead of the gas tax. Washington State has also recently tested a similar program. In 2005, Germany successfully implemented a nationwide mileage-based tax on foreign and domestic trucks using the federal motorway. The tax charged is based on number of axles and vehicle emission levels.

A New Approach to Assessing Road User Charges

Minnesota initiated a pooled fund study which was funded by FHWA and 15 states from all regions of the country. This study resulted in a number of reports including “A New Approach to Assessing Road User Charges” in 2002. One of the driving forces for the study was the realization that the present fuel tax system provides a weak relationship to the relative costs of specific trips: some vehicle operators pay charges that are higher than the costs they impose on the system, while others pay much less than their cost. This leads to inefficient use of the transportation infrastructure. Sponsors were also concerned with the long term viability of the fuel tax system. The study resulted in a proposal calling for a road user charge system that could be implemented nationally but is also flexible enough to allow each state or community to develop its own fee structure.



SAFETEA-LU (Section 1919 and 1934) provided 16.5 million dollars for the field trial of the technical proposal of the New Approach to Assessing Road User Charges. The following are the main elements:

1. Each vehicle will have an onboard computer with a data file containing boundaries of taxing authorities (federal, state and local) and tax rate. This computer will coordinate this information with a GPS receiver and the vehicle odometer.
2. In its simplest implementation form, there would be a flat fee schedule for miles traveled in each jurisdiction.
3. The vehicle will be able to communicate periodically with a collection center through wireless connection so that fees can be calculated.

It is expected that this system will be able to support a more complex system in the future. Such a system could, for example, charge fees based on the time-of-day travel, type of vehicle and type of road. The field trial is expected to last three years.

An important consideration for this project is that for some time there will be a transition period during which there will be two parallel fee collection systems. This is necessary because for some period not all vehicles will be equipped with technology to implement a new road user charging system.

Oregon Road User Fee Task Force

In 2001, the Oregon Legislature created a Road User Fee Task Force with the charge to design a revenue collection strategy that can effectively replace the fuel tax in order to provide a long term, stable source of funding for maintenance and improvement of Oregon's road system. The need to search for a fuel tax replacement stems from two causes. First, there is a growing sense that fuel taxes have little to do with road use, and is therefore, "just another tax." Second, the fuel economy of new vehicles is soon expected to dramatically improve. This will cause fuel tax revenue, along with road program funding, to plummet. The Task force was charged to find a solution for these concerns before the problem becomes an emergency.

After examining a number of ideas for replacing the fuel taxes, the Task Force and the Oregon Department of Transportation (ODOT) decided to pilot-test one potential concept for implementing a distance-based fee, which includes a distance-based congestion pricing component. The Task Force



stated that the only broad-based revenue source which could ultimately replace the fuel tax is a mileage fee. In the opinion of the Task Force, the other revenue sources would address specific problems related to road revenue and are designed for certain geographical areas, certain road projects, or certain road users.

One of the requirements of the pilot-test was to safeguard the privacy of the vehicle user. They proposed that only the minimum summary data required to compute the charges would be transmitted outside the vehicle; this information would be insufficient to allow reconstruction of the routes and times of travel of the vehicle. The pilot test is scheduled to run for about one year ending in 2007.

Tolling

Highway tolling has been used as an innovative financing option by some states to fund transportation projects. Revenues generated through tolling have also been used for maintenance and repair of the toll highway system.

Congestion Pricing

Congestion pricing is used either within city limits or on highways to prevent traffic build-up during peak hours. Commuters traveling in designated areas or on specified highways during peak travel hours, pay a variable fee for using the roads. To manage congestion, the highest prices are set during the peak hours. The variable fee reduces congestion by encouraging some travel to occur outside of the peak periods or to use other modes. Washington and New Jersey are among several states that are studying the possibility of implementing this form of user fees

High Occupancy Toll Lanes

High occupancy vehicle (HOV) lanes are specially marked lanes for use by motorists who carry multiple – generally two or more - passengers in their vehicles. Transportation authorities around the country have considered ways to better use excess HOV capacity during peak periods when adjacent general purpose lanes were congested. A tool that has been successfully used in several locations around the country is to convert HOV lanes to High Occupancy Toll (HOT) lanes which allow solo drivers the opportunity to buy into those lanes for a fee. Tolls are varied based on the time of day, with the highest



charges occurring in the peak periods. The variable tolling feature ensures that the lane is managed for free flow. California, Texas, Florida, Minnesota and Colorado have successfully implemented this optional tolling system.

Privatization and Public-Private Partnerships

In recent years, this innovative method has been gaining support from some governments as a result of increased transportation funding needs and the increasing recognition that the capital value of these assets cannot be captured without this shift. Responsibility for highway operations is transferred to private enterprises under long-term contracts.

One of the first private toll roads in the United States in more than half a century was SR -91 which was built in early 90s in California. This road was eventually acquired by the public sector in 2003. However, recently there has been a rash of proposals and actions to privatize public roads. It started dramatically when the City of Chicago in 2005 leased the Chicago Skyway toll road for 99 years and received \$1.8 billion dollars from private vendors. In the spring of 2006, Indiana followed suit and leased its 157-mile toll road for 75 years. Indiana received \$3.8 billion dollars. The success of these transactions has many other states looking at the possibilities of leasing their toll roads to private enterprises.

Privatization is not limited to existing toll roads. California SR-15, which is already open for traffic, and the Texas SH 130 proposal are examples of private “Greenfield” roads. Proponents of these initiatives point out that private concessionaire are able to fund roads at a much higher level than public sector toll authorities. In the case of SH 130, TxDOT reports that through a conventional public toll road model they could raise around \$600 million dollars for 40 miles of SH 130. A private enterprise however offered to come up with not only 1.3 billion dollars of the cost of the road, but also offered to pay TxDOT about \$245 million dollars over the 50-year term of the concession. Considering Vermont roads have a lower volume and rate of growth, the potential for generating significant private investment is low.

Grant Anticipation Revenue Vehicles (GARVEE)

A GARVEE is a designation applied to a debt-financing instrument that has a pledge of future Federal-aid for debt service and is authorized for Federal reimbursement of debt service and related financing



costs. This financing mechanism generates up-front capital for major highway projects that the state may be unable to construct in the near term using traditional pay-as-you-go funding approaches.

Transit agencies are using similar mechanisms to borrow against future Federal-aid funding. While transit financings are quite similar to the GARVEE type instruments, the transit debt mechanisms are known as Grant Anticipation Notes (GANs).

Transportation Infrastructure Finance and Innovation Act (TIFIA)

The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA), enacted as part of the Transportation Equity Act for the 21st Century (TEA-21), established a new Federal program under which the U.S. Department of Transportation (USDOT) provides credit assistance to major surface transportation projects of national or regional significance.

SAFETEA-LU continues the TIFIA credit program established under TEA-21. However, it made it more user-friendly by lowering the threshold so that projects with costs as low as \$50 million dollars are eligible. Intelligent Transportation project thresholds were reduced to \$15 million.

State Infrastructure Bank (SIB)

SIB is a revolving loan and credit enhancement program consisting of a federal-funded SIB account and a state-funded SIB account. The federal-funded SIB is capitalized with federal money matched with state money as authorized under Section 1511 of TEA-21, while the state-funded SIB is capitalized with state money only. SIB can leverage funds through loans and credit enhancement assistance to improve project feasibility.

GARVEE, TIFIA and SIB financing do not generate new revenue for the states. These are debt-financing tools which allow earlier completion of larger expensive projects which can take many years to build under normal pay-as-you-go approach of financing. Supporters of these tools point out that by completing projects sooner, instead of waiting to accumulate funds, the public starts benefiting more quickly and, better yet, by building projects quicker, delays and disruption of traffic for longer periods of time are avoided.



CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Vermont, like nearly all other states, is facing the challenge of revenue not keeping up with the demand to maintain and improve transportation infrastructure. Motorists continue to demand better, safer, and less congested roads. Vermont is also confronted with the need to maintain and improve transportation infrastructure in other transportation modes as well. Current transportation user fees and taxing systems, however, are not generating enough revenues to meet such demands and taxpayers are increasingly reluctant to take on additional taxes. Cumulative transportation revenue shortfalls for Vermont could be as high as \$8 billion over the next 20 years (depending on the rate of inflation).

Raising the per-gallon charge on the motor fuel tax, which has long been the “workhorse” for transportation, is increasingly unpopular all over the country. The problem is further exacerbated by the fact that neither the state nor federal motor fuel taxes are indexed for inflation, which means that the “buying power” of this tax is reduced each year by the amount that inflation increases. Although increasing VMT (which has meant increasing consumption of motor fuels and hence more tax collection) has tended to make-up for that loss, it has not, and will not in the future meet revenue needs for the state. This is largely the result of improvement in vehicle efficiencies, which will increase even more in the future, as will the introduction of alternative fuel and propulsion systems.

Motor vehicle registrations fees and sales tax are also important components of Vermont’s transportation revenue. The potential exists to increase these taxes as well, but nationally this has also proven difficult in recent years.

Although the current taxing system has served the state and nation well in the past, many experts believe that it will soon require a major overhaul. This overhaul is going to take time and the transition will be challenging. SAFETEA-LU recognized this trend, and established and funded a number of commissions and tests to explore, develop, and recommend new taxing mechanisms. The National Surface Transportation Policy and Revenue Commission (section 1909) was created to study and report on current conditions and future needs of the surface transportation system, and potential funding to meet such needs; the National Surface Transportation Infrastructure Financing Commission (Section 1142) was created to study the Highway Trust Fund revenues and the impacts of the these revenues on future



highway and transit needs. Most experts believe new system is likely to resemble some form of a mileage-based tax – in all probability weighted by vehicle type and the relative cost imposed on the system - described in this report. A mileage-based tax has the advantage of being able to charge users in a manner more closely related to road usage and the costs they impose on the system. By some estimates, it will take one or two or more reauthorizations before a new taxing system will be in place. In other words, it will take at least another three to eight years before a credible new system could come to fruition. It will likely be longer.

There are a wide variety of taxes, tolls, fees and partnerships described in this analysis that could assist the state closing the transportation funding gap. Many of these tools are best suited for specialized application rather than general transportation revenue. Analysis of such transportation financing tools as bonding, GARVEE, TIFIA and SIBs, show that, while potentially important in their application, do not generate new revenues for the state.

RECOMMENDATIONS

Vermont today must deal with existing short-mid-and long-term funding shortfalls. The following are options and recommendations for the short-term, three to eight years, and for the long-term, beyond eight years. These time frames relate to the federal re-authorization periods.

Short Term Options (3 to 8 years)

- **Increasing the Motor Fuel Tax:** An increase in the motor fuel tax could be used as a short-term fix for revenue shortfalls. However, increasing the gas tax has been difficult in recent years for reasons explained earlier.
- **Indexing the Motor Fuel Tax:** The motor fuel tax could be indexed to some cost and automatically adjusted on a periodic basis. Most common indexes are Cost of living or Cost of Construction. However, indexing the motor fuel tax has been even more difficult than increasing the motor fuel tax.



- **Vehicle Tax Increase:** A vehicle tax increase can take the form of sales tax, registration and wheelage tax.
- **Impact Fees:** Traditionally, impact fees have been used by local governments but they can also be used by the state. This fee has the tendency to suppress demand for highway improvements as it requires local beneficiaries to contribute to the cost of improvements.
- **Local Option Sales Tax:** Normally this tax is used by local jurisdictions but it can also be used to raise revenue for regional improvements.
- **Sales Tax Increase:** This tax is not normally used for transportation funding but under certain circumstance may be an appropriate funding tool.

Long Term Options (9-20 years)

- **Mileage-Based Tax Options:** Every indication is that the nation is poised to move toward a mileage-based tax in the long term. With that in mind, Vermont needs to continue to monitor what is going on around the country, and explore the possibility of joining other states in the study and test of various mileage-based options. Vermont should also consider education and outreach to the public so that there is a better understanding of the taxing options.
- **Rural State Funding Strategies:** Nationally, there is much discussion, research, demonstrations, and special programs addressing transportation, but nearly all of these opportunities are happening in the context of urban areas and congestion. Smaller and rural areas are being generally ignored. Rural states and areas have their own serious financing challenges. These challenges are especially serious for those areas that have a great numbers of bridges and culverts, as these require expensive repairs, maintenance and replacements. It is imperative that these states devise strategies so that their concerns are fully voiced and heard.



- National Transportation Funding: SAFETEA-LU created two commissions: the National Surface Transportation Policy and Revenue Commission (section 1909) was created to study and report on current conditions and future needs of the surface transportation system, and potential funding to meet such needs; the National Surface Transportation Infrastructure Financing Commission (Section 1142) was created to study the Highway Trust Fund revenues and the impacts of these revenues on future highway and transit needs. It is important that Vermont closely follow the proceedings of these commissions and try to make sure that these commissions fully take into account the interest of smaller and more rural states.



REFERENCES

-
- i SAFETEA-LU: <http://www.fhwa.dot.gov/legsregs/directives/notices/n4520184a1.htm>
- ii <http://www.legislature.idaho.gov/Budget/publications/PDFs/FiscalFacts/FY2007/FFFrame.htm>
- iii http://leg.mt.gov/content/publications/fiscal/fr_2005/fr_a/dot.pdf
http://leg.mt.gov/content/publications/fiscal/leg_reference/montana_highway_funding.pdf
- iv http://www.nhtranplan.com/library/060906_NHLRTBP%20CACFinalReport.pdf
- v <http://www.nd.gov/fiscal/docs/appropbook2005-07.pdf>
- vi <http://www.legislature.idaho.gov/Budget/publications/PDFs/FiscalFacts/FY2006/FFFrame.htm>
<http://www.legislature.idaho.gov/Budget/publications/PDFs/FiscalFacts/FY2007/FFFrame.htm>
- vii Comparison of Federal HTF Account Receipts Attributable to The States and Federal-Aid Apportionments and Allocations from the Highway Account – FY2004 (Table FE-221)
- viii <http://www.census.gov/govs/www/statetax.html>
- ix State Motor-fuel Taxes and Related Receipts – 2005 (Table MF-1)
State Motor-Vehicle and Motor-Carrier Tax Receipts – 2005 (Table MV-2)
- x Highway Use of Motor Fuel – 2004 (Table MF-27)



APPENDIX

List of Identified/Planned projects

a) *State*

VTrans priority is on maintenance and effective operation of the highway system since most travel in Vermont takes place on roads. The three emphasis areas are: paving, bridge, and roadway. In 2007, the proposed funding for the three areas is: \$55.3 million for paving; \$70.7 million for bridge; and \$73.3 million for roadway.

For further information please refer to:

<http://www.aot.state.vt.us/CapProg/documents/02-AgencySummary.pdf>

<http://www.aot.state.vt.us/CapProg/documents/FY07%20Capital%20Program.pdf>

b) *Local (CCMPO and Regional Planning Commissions)*

1. Chittenden County Metropolitan Planning Organization: www.ccmppo.org/MTP/
2. The Northwest Regional Planning Commission: www.nrpcvt.com/nrpcvt/mission.html
3. Two Rivers-Ottauquechee Regional Commission: www.trorc.org/trans_proj.html
4. Chittenden County Regional Planning Commission:
www.ccrpcvt.org/index.asp?Type=B_PRGSRV&SEC={7BC065B1-CB8A-4C16-81CE-EF7DC68387AE}&DE={70E87908-35E8-4EFD-A0C6-ECCEAF9D240B}
5. Lamoille County Planning Commission:
www.lcpcvt.org/index.asp?Type=B_BASIC&SEC={344D4CC9-7315-49B2-9714-D574C1A85A2D}
5. Windham Regional Commission: www.rpc.windham.vt.us/trans/index.htm
6. Northeastern Vermont Development Association: www.nvda.net/transportation/index.html
7. Central Vermont Regional Planning Commission: www.centralvtplanning.com/Trans.html

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



8. So. Windsor County Regional Planning Commission:

www.swcrpc.org/subpage.php?file=content/transportation.htm

9. Addison County Regional Planning Commission:

www.acrpc.org/pages/activities/transportation/transportation.htm

10. Rutland Regional Planning Commission: www.rutlandrpc.org/RRTCWebsite/missionprofile.htm

11. Bennington County Planning Commission: www.rpc.bennington.vt.us/





■ Documentation for:

**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 4: Statewide and Regional
Demographic and Employment Analysis

■ Prepared for:

Vermont Agency of Transportation

17 April 2007

■ In Partnership with:

Snelling Center for Government
TransManagement
Center for Rural Studies
Hubert H. Humphrey Institute of Public Affairs

VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 4: Statewide and Regional Demographic and Employment Analysis

TABLE OF CONTENTS

INTRODUCTION.....	1
VERMONT DEMOGRAPHICS.....	1
POPULATION CHARACTERISTICS.....	1
PERSONS PER HOUSEHOLD	3
POPULATION DENSITY AND URBAN CENTERS.....	4
COMPONENTS OF POPULATION CHANGE.....	7
AGE COMPOSITION.....	9
VERMONT POPULATION DISPERSION.....	12
EMPLOYMENT, INCOME & ECONOMIC TRENDS.....	17
EMPLOYMENT.....	17
INCOME	19
ECONOMIC TRENDS	22
COMMUTING PATTERNS, HOUSEHOLDS WITHOUT VEHICLES, AND COMMUNITY PLANNING	23
JOURNEY TO WORK	23
HOUSEHOLDS WITH AND WITHOUT VEHICLES.....	29
COMMUNITY LEVEL PLANNING	35
REPORT SUMMARY AND KEY FINDINGS.....	37
APPENDIX I: REFERENCES	40
APPENDIX II: SAMPLE COMMUTER DATA BY COUNTY.....	42

INTRODUCTION

The Vermont Agency of Transportation (VTTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach. It refined the three major objectives of the 1995 Long Range Plan, and emphasizes system management¹.

This working paper, one of many to be prepared in support of the plan², was prepared by the Center for Rural Studies at the University of Vermont. It documents historical trends in population and employment and provides projections for a twenty-year planning horizon (approximately 2030). This planning process is different because it will identify policy options for several possible future scenarios. This analysis helps to define the "trend" scenario. In other words, if the trends of the last twenty to thirty years continue, how many people will live in Vermont, how will the population be divided into different age groups, and how will Vermonters earn a living.

VERMONT DEMOGRAPHICS

According to the U.S. Census decennial census reports, Vermont has experienced sustained population growth for the past 200 years. In recent years, Vermont's population has increased at a greater rate than most of our neighbors in the northeast United States and New England. Our population is aging, especially when compared to the national average. The population segment that is expanding most quickly in Vermont – both today and in the future – is the 65 and over age cohort. The portion of Vermont's population in young age cohorts has tabled off or decreased during the past decade but is expected to expand again beginning in 2010.

POPULATION CHARACTERISTICS

According to projections for the year 2030 produced by the U.S. Census, Vermont's population is projected to increase by approximately 0.6% per year for the next 25 years (Table 1).

¹ 2002 objectives (paraphrased): Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility; Improve all modes to provide Vermonters with choices; Strengthen the economy, protect and enhance the natural environment, and improve Vermonters' quality of life.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

Vermont's population is projected to grow at about the same rate as New England overall, but much slower than the United States as a whole.

Between 1990 and 2000, Vermont's population grew more (8.2% total increase) than both New England and the Northeast states. In New England, New Hampshire was the only state that grew more, with an increase of 11.4%. Connecticut's population grew the least at 3.6%.

Table 1: Population Trends for Vermont, New England, Northeast, and U.S.

	Population 1990 and 2000			Population 2030 Forecast		
	1990	2000	% Change 1990-2000	2030 Population	% Change 2000-2030	% Average Annual Growth 2000 to 2030
Vermont	562,758	608,827	0.8%	711,867	16.9	0.6%
New England	13,206,943	13,922,517	0.5%	15,623,050	12.2	0.5%
Northeast States ¹	50,809,229	53,594,378	0.5%	57,671,068	7.6	0.3%
United States	248,709,873	281,421,906	1.2%	363,584,435	29.2	1.0%

Source: U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.

¹The U.S. Census Bureau includes the states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New Jersey, New York, and Pennsylvania in its Northeast States region.

Because the U.S. Census Bureau currently produces projections at the state level, additional population projections were purchased from a private vendor. As with any set of population projections, assumptions about birth and death rates, migration patterns, and other factors may vary. Therefore, the population for years 2010 through 2030 varies in Table 1 and Table 2.

From 1950 to 2000, many counties in Vermont grew substantially. Counties in the Northeast Kingdom -- Caledonia, Essex, and Orleans -- experienced the least amount of growth (Table 2). Several counties more than doubled during this fifty-year span; these counties were concentrated in northwest and central Vermont -- Chittenden, Grand Isle, and Lamoille.

Not surprisingly, Chittenden County is dominant in population and in absolute increase between 1990 and 2000. Although it is one of the smallest counties in Vermont, Grand Isle County was the fastest growing county in the state (29.8% total increase). Lamoille County (17.7%) and Franklin County (13.6%) also experienced strong increases. Chittenden County came in fourth with a total population increase of 11.2%. The slowest growing county was Essex at 0.8%. Essex is also the smallest county in total population. Rutland County is the second largest county in the state, but it had the second lowest population increase at 2.0%.

Despite its distinction as the largest county, Chittenden County grew at a modest rate. The counties in northwestern Vermont surrounding Chittenden County led the state in population growth, including Addison, Grand Isle, and Franklin counties. This regional expansion accounted for more than half of Vermont's 8.2% population increase since 1990. This pattern appears linked to job growth in Chittenden County and an expensive residential real estate market which helped drive population growth into surrounding counties. Rutland, Bennington



and Essex counties all experienced only slight population growth. Southern Vermont counties had moderate growth.

Table 2: Vermont Population Change, 1950-2030

County	1950	1970	1990	2000	2010	2030	% Annual
							Change 2000
Addison	19,442	24,266	32,953	35,974	40,210	53,890	1.4%
Bennington	24,115	29,282	35,854	36,994	38,770	46,430	0.8%
Caledonia	24,049	22,789	27,846	29,702	31,820	37,860	0.8%
Chittenden	62,570	99,131	131,761	146,571	158,050	194,330	0.9%
Essex	6,257	5,416	6,405	6,459	6,600	6,700	0.1%
Franklin	29,894	31,281	39,980	45,417	50,370	60,970	1.2%
Grand Isle	3,406	3,574	5,318	6,901	8,520	11,930	2.2%
Lamoille	11,388	13,309	19,735	23,233	26,420	34,590	1.6%
Orange	17,027	17,676	26,149	28,226	30,740	37,000	1.1%
Orleans	21,190	20,153	24,053	26,277	28,770	33,730	1.0%
Rutland	45,905	52,637	62,142	63,400	65,010	70,990	0.5%
Washington	42,870	47,659	54,928	58,039	60,650	66,190	0.5%
Windham	28,749	33,476	41,588	44,216	45,840	53,330	0.8%
Windsor	40,885	44,082	54,055	57,418	60,810	72,890	1.0%
Vermont	377,747	444,731	562,767	608,827	780,000	820,000	1.2%

Sources: U.S. Census Bureau for 1950 to 2000; Woods & Poole Economics for 2010 and 2030

PERSONS PER HOUSEHOLD

Examining the numbers of persons per household over time provides an indication of household formation – separate from simply looking at relative shifts in population alone (Table 3). Like the U.S. as a whole and the New England region, Vermont has experienced a steady decline in the persons per household since 1980. This trend is likely to continue until household sizes gain a consistent number of persons per household in 2020. In Vermont, the pattern of small household sizes is more pronounced than in New England or the U.S. as a whole. The relatively small household size has direct impacts on the need for additional housing units and transportation infrastructure activities.



Table 3: Persons Per Household Trends For Vermont, New England, and U.S.

	Persons Per Household - 1980, 1990, 2000			Persons Per Household - 2010, 2020, 2030		
	1980	1990	2000	2010	2020	2030
Vermont	2.75	2.57	2.44	2.36	2.32	2.33
New England	2.73	2.58	2.50	2.41	2.37	2.38
United States	2.74	2.63	2.59	2.52	2.49	2.52

Sources: U.S. Census Bureau for 1980, 1990, 2000; Woods & Poole Economics for 2010, 2020, 2030

POPULATION DENSITY AND URBAN CENTERS

As Vermont's population expands, population density is also expected to increase. With few exceptions, the measure of people per square mile within Vermont and its 14 counties has increased over the past several decades (Table 4). Chittenden, Grand Isle, and Lamoille Counties have more than doubled in population density since 1950, while Essex County has stayed relatively stable and maintained a very low density. While total population and population distribution trends at the county level do provide an overall picture, only a town-by-town analysis can indicate detailed patterns about the dynamic changes that are occurring.

Table 4: Population Density, Persons per Square Mile, 1950-2000

	1950	1960	1970	1980	1990	2000	% Change 1950-2000	% Change 1990-2000
Addison	25.2	26.1	31.5	38.2	42.8	46.7	85%	9%
Bennington	35.7	37.1	43.3	49.3	53	54.7	53%	3%
Caledonia	37	35	35	39.7	42.8	45.7	24%	7%
Chittenden	116.1	138.1	183.9	214.3	244.4	271.9	134%	11%
Essex	9.4	9.1	8.1	9.5	9.6	9.7	3%	1%
Franklin	46.9	46.3	49.1	54.6	62.8	71.3	52%	14%
Grand Isle	41.2	35.4	43.3	55.8	64.4	83.5	103%	30%
Lamoille	24.7	23.9	28.9	36.4	42.8	50.4	104%	18%
Orange	24.7	23.3	25.7	33	38	41	66%	8%
Orleans	30.4	28.9	28.9	33.6	34.5	37.7	24%	9%
Rutland	49.2	50.1	56.4	62.6	66.6	68	38%	2%
Washington	62.2	62.2	69.2	76	79.7	84.2	35%	6%
Windham	36.5	37.8	42.4	46.8	52.7	56.1	54%	6%
Windsor	42.1	43.8	45.4	52.6	55.7	59.1	40%	6%
Vermont	40.8	42.2	48.1	55.3	60.8	65.8	61%	8%

Source: U.S. Census Bureau Decennial Census for 1950 through 2000



One measurement tool for analyzing population density distributions is through the “urban/rural” designation. The Census Bureau assigns “urban” status to core Census blocks and block groups with a population density of at least 1,000 people per square mile and adds surrounding census blocks and block groups with an overall density of at least 500 people per square mile (Figure 1). The balance of an area is then defined as “rural”.

Vermont is considered one of the most rural states in the U.S., however, the proportion of Vermont’s population living in urban areas is larger than one might expect (Table 5). For instance, about 62% of Vermont’s population lived in rural areas in 2000. Chittenden County is, by far, Vermont’s most urban county. In 2000, 72% of the county’s population (146,571) resided in urban areas. On the other hand, half of Vermont counties remained highly rural in 2000. In Addison, Caledonia, Essex, Grand Isle, Lamoille, Orange, Orleans and Windsor counties, at least 75% of populations lived in rural areas. Part of the reason why the total proportion of residents in urban areas in Vermont tops 30% is because the state population centers represent a disproportionate share of the total population.

Comparisons with 1990 data are not possible because the U.S. Census Bureau used a different methodology for calculating urban and rural populations for the 1990 Census. It was a much more coarse method that did not analyze below the town level of geography. The Census 1990 urban/rural analysis showed 68% of the Vermont population living in rural areas – 6% more than the more focused Census 2000 definition.



Figure 1: Urban Areas in Vermont

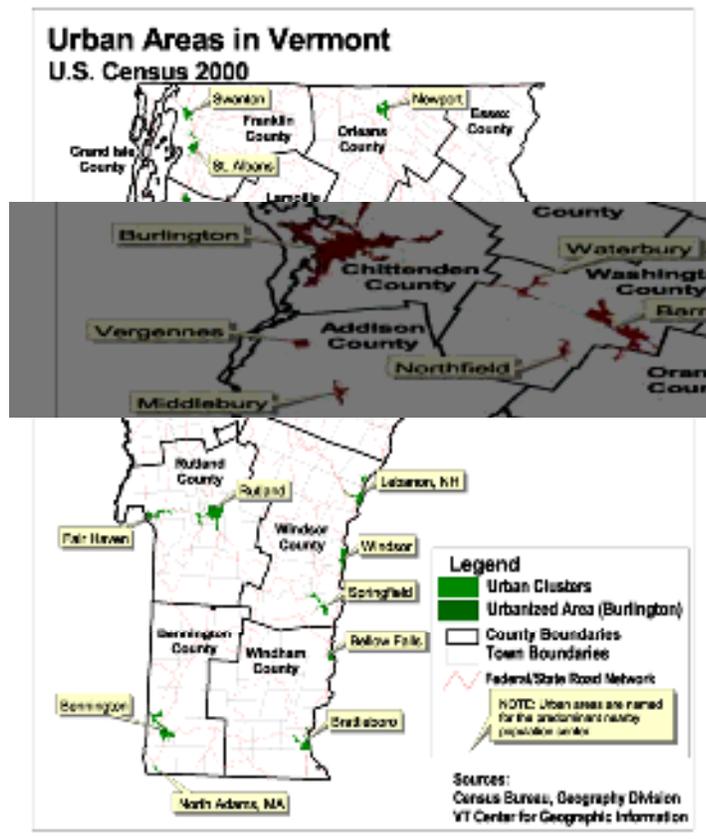


Table 5: Vermont Rural and Urban Populations in 2000

	Total Population	Rural Population	Urban Population	Percent Urban
Addison	35,974	28,432	7,542	21%
Bennington	36,994	23,274	13,720	37%
Caledonia	29,702	22,243	7,459	25%
Chittenden	146,571	41,206	105,365	72%
Essex	6,459	6,459	0	0%
Franklin	45,417	32,211	13,206	29%
Grand Isle	6,901	6,901	0	0%
Lamoille	23,233	23,233	0	0%
Orange	28,226	27,624	602	2%
Orleans	26,277	21,431	4,846	18%
Rutland	63,400	38,967	24,433	39%
Washington	58,039	29,729	28,310	49%
Windham	44,216	31,712	12,504	28%
Windsor	57,418	42,957	14,461	25%
Vermont	608,827	376,379	232,448	38.2

Source: U.S. Census Bureau, 2000 Census of Population and Housing

COMPONENTS OF POPULATION CHANGE

Population change is the result of differences between natural change (birth and death rates) and migration in and out of an area. These factors affect population change in different ways. The natural change rates can be affected by pregnancy rates, public health issues (such as good quality pre-natal and infant care, the level of smoking in the population, etc.), traffic safety, and the median age (older residents are at risk for illness and disease). Net migration represents the ratio of persons moving in and out of the state and may be related to local or regional economic conditions, quality of life factors, cost of living, etc. Of the two, migration is arguably more difficult to predict and will be influenced by national and even global events. A change in migration patterns could affect both total change in Vermont's population, age distribution, and other demographic characteristics such as race. On the other hand, birth and death rates are constantly fluctuating and reflect demographic trends related to race and ethnicity, age, etc.



In general, natural population increases and net migration are important contributors to Vermont's population change. Data from 2000 to 2005 (Table 6) indicate that birth/death rates and migration account for nearly equal shares of the state's population growth.

The net migration trend for counties indicates that, with few exceptions, more persons are moving into a county than moving out. Only Chittenden County and Windham County had negative migration activities between 2000 and 2005. Interestingly, those two counties have regional medical centers and are home to colleges and universities.

Between 1990 and 2000 (Figure 2) both Chittenden and Windham Counties experienced significant positive migration. This comparison demonstrates that migration patterns, which are driven by economic conditions, quality of life, cost of life factors, are much more susceptible to change than natural causes (other than catastrophic events).

Table 6: Vermont Population Change: Natural Increase and Net Migration, 2000-2005

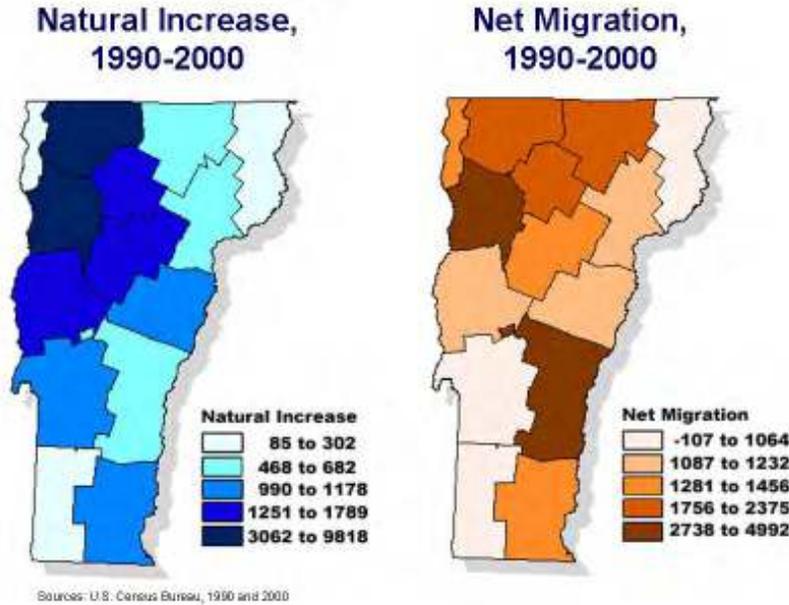
County	2000-2005 Total Population Change*	Natural Increases			Net Migration		
		Births	Deaths	Total	Net International Migration	Net Non-Foreign Migration (in/out of area)	Total
Addison	991	1,879	1,385	494	285	257	542
Bennington	5	1,877	1,968	-91	182	-35	147
Caledonia	733	1,681	1,465	216	150	410	560
Chittenden	3,042	8,548	5,066	3,482	2,486	-2,724	-238
Essex	143	292	319	-27	14	167	181
Franklin	2,497	3,074	2,011	1,063	146	1,357	1,503
Grand Isle	802	356	262	94	8	707	715
Lamoille	1,271	1,377	896	481	125	699	824
Orange	1,061	1,440	1,226	214	43	836	879
Orleans	1,359	1,454	1,360	94	68	1,232	1,300
Rutland	343	3,271	3,210	61	82	270	352
Washington	1,439	3,206	2,537	669	437	400	837
Windham	-73	2,333	2,041	292	145	-442	-297
Windsor	610	2,818	2,712	106	188	396	584
Vermont	14,223	33,606	26,458	7,148	4,359	3,530	7,889

Source: U.S. Census Bureau – Population Estimates Division

* Total population change represents the natural increase or decrease plus the net migration.



Figure 2: Vermont Population Change: Natural Increase and Net Migration, 1990 to 2000



AGE COMPOSITION

One of the most prominent Vermont demographic trends during the next twenty-five years is the projected increase in the number and percentage of people 65 and over, including those older than 85 (Figure 3, Figure 4) (Table 7). If current trends continue, by 2030, more than 170,000 people in the state will be over the age of 65. This age group's share of the total population will increase from 13% in 2000 to 24% in 2030. This trend corresponds to the aging of the "Baby Boom" population. This general "aging" phenomenon is occurring across the U.S., however, the impact of the "aging" cohorts in Vermont is expected to be much greater than the national average.

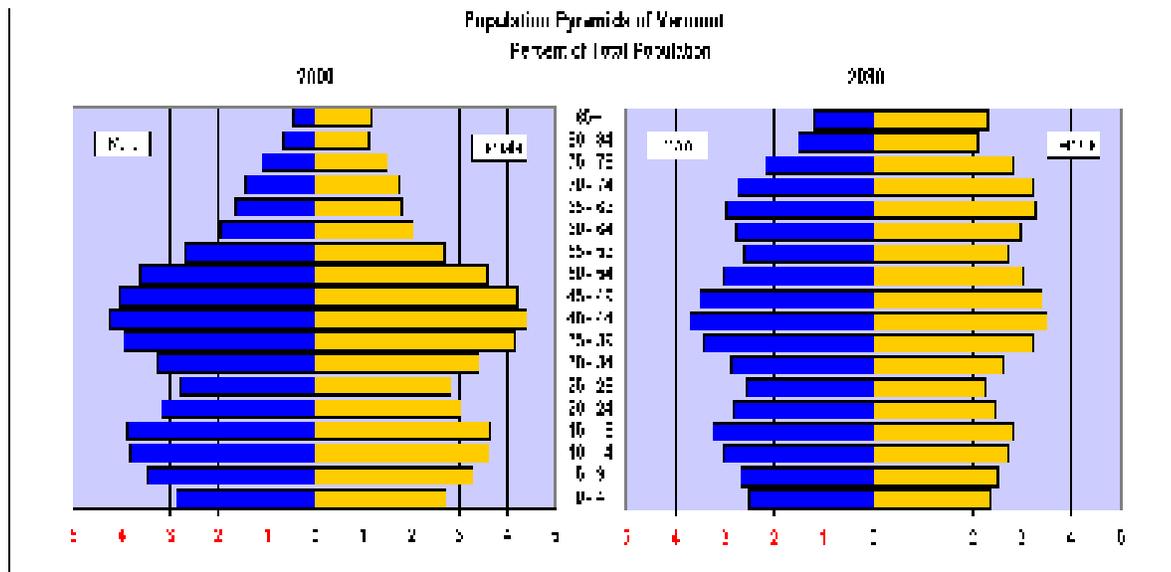
Part of the reason for Vermont's disproportionate share of older residents may be related to the fact that the fastest-growing segments of the population tend to be associated with non-white races and ethnicity which have correspondingly higher birth rates. According to the U.S. Census, in the year 2025, the average age of whites will be 43 years, 37 years for blacks, 35 years for Asians, and 30 years for Hispanics. Since Vermont is (and will remain) predominantly white, the population growth will be at a slower pace.



It should be noted that population projections reflect assumptions about birth and death rates, migration trends, and other factors. The projections used in this report were produced by the U.S. Census Bureau and by Woods & Poole Economics. Other projections have been released recently that show slightly different trends. For instance, *Shaping the Future of Long-Term Care and Independent Living*, which was updated in 2006 by the Vermont Department of Disabilities, Aging, and Independent Living (DAIL), projects an even larger number and proportion of older age cohorts in Vermont. Privately produced projections also differ in the exact numbers of persons in each age cohort. However, one trend is clear no matter what set of projections is used – namely that age cohorts for persons age 65 and over (and especially age 85 and over) will grow significantly in the state. This strongly suggests that careful planning will be needed to develop and deliver appropriate multi-modal types of transportation for older Vermonters in the coming years.

The number of school-age children (ages 5-17) is projected to decrease slightly between 2000 and 2010 (as many local school boards have learned) but that number is expected to begin rebounding again between 2010 and 2030. It is expected that school transportation service expansions will be needed by that time.

Figure 3: Age and Sex Pyramids for Vermont, 2000-2030



Sources: U.S. Census Bureau, 2000 Decennial Census and 2030 Population Projections

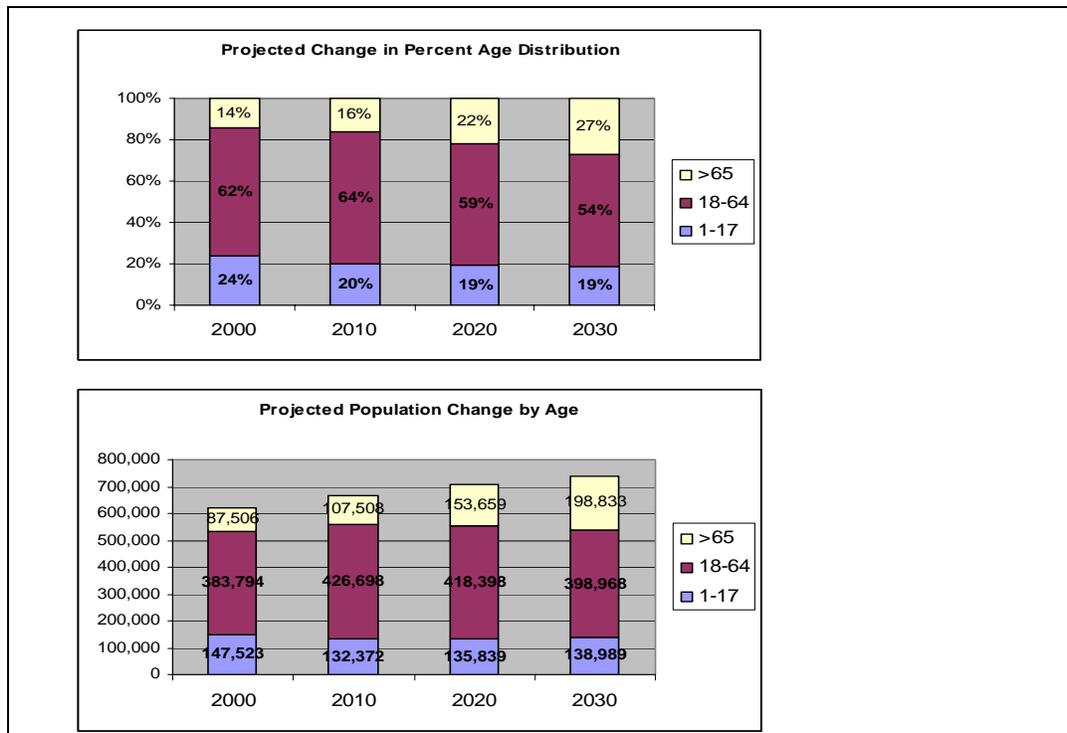


Table 7: Vermont Current and Future Population Age Cohorts, 2000 to 2030

Age Group Categories	2000	2010	2020	2030
Under 5 years	33,989	34,303	36,982	34,667
5 to 13 years	77,428	63,339	68,904	69,659
14 to 17 years	36,106	34,730	29,953	34,663
18 to 24 years	56,586	65,961	53,495	54,981
25 to 44 years	176,456	165,793	184,482	172,734
45 to 64 years	150,752	194,944	180,421	171,253
65 years and over	77,510	93,442	136,449	173,940
85 years and over	9,996	14,066	17,210	24,893
Vermont Total Population	608,827	652,512	690,686	711,867
Vermont Median Age	37.7	40.6	41.5	43.9
U.S. Median Age	35.3	37	38	39

Source: U.S. Census Bureau, Population Projections Division

Figure 4: Vermont Population Projected Age Distribution, 2000 to 2030



Sources: U.S. Census Bureau Decennial Census for 2000; U.S. Census Bureau Population Projections for 2010-2030



Because county-level population projections contain relatively higher levels of statistical error, no county-level population or age cohort projection trends are included in this report. However, the “dependency” population distributions for counties in 2000 are very instructive for understanding current patterns (Table 8). The “dependency” population ratio indicates the portion of the population that is below age 18 or over age 65 – in other words, not part of the workforce and therefore, “dependent” on the workforce. In 2000, Bennington, Caledonia, Essex, and Orleans had the largest “dependency” ratio, with at least 40% of the population fitting that definition. As expected, Chittenden County, with a strong college-age population, had the lowest level.

Table 8: Vermont Dependency Population by County, 2000

	Under Age 18	Over Age 65	Total Dependent *	Total Population	% Dependent Population *
Addison	8,949	4,065	13,014	35,974	36%
Bennington	8,758	6,167	14,925	36,994	40%
Caledonia	7,509	4,272	11,781	29,702	40%
Chittenden	34,513	13,780	48,293	146,571	33%
Essex	1,653	981	2,634	6,459	41%
Franklin	12,759	5,004	17,763	45,417	39%
Grand Isle	1,712	850	2,562	6,901	37%
Lamoille	5,645	2,638	8,283	23,233	36%
Orange	7,229	3,612	10,841	28,226	38%
Orleans	6,608	3,952	10,560	26,277	40%
Rutland	14,739	9,480	24,219	63,400	38%
Washington	13,636	7,463	21,099	58,039	36%
Windham	10,412	6,173	16,585	44,216	38%
Windsor	13,401	9,073	22,474	57,418	39%
Vermont	147,523	77,510	225,033	608,827	37%

* Denotes segment of the population that is under age 18 or over age 65 (not in workforce)

Source: US Census Bureau, 2000 Census of Population and Housing

VERMONT POPULATION DISPERSION

Vermont’s 246 contiguous civil units form the backbone of local government in the state. The vast majority of these civil units actively engage in planning, including transportation planning, routinely in five year cycles. These local plans rely on understanding state, regional, and local population, housing, transportation, economic development, and school enrollment trends.



The following tables and figures explore changes in Vermont towns of *different sizes* with respect to their number and their proportion of Vermont's total population between 1960 and 2000. The specific town size categories are constructed to represent equal quartiles in 1960 and are held constant over the period in order to reveal relative shifts in the numbers of towns and persons associated with a given category (Table 9).

For instance, the "Tiny" category in 1960 contained approximately one quarter of all places in the state representing 350 or fewer persons in population.

The share of "tiny" or "small" Vermont towns has decreased dramatically between 1960 and 2000. In 1960, approximately 50% of towns fell within those categories. By 2000, "tiny" and "small" towns represented 22% of communities in Vermont.

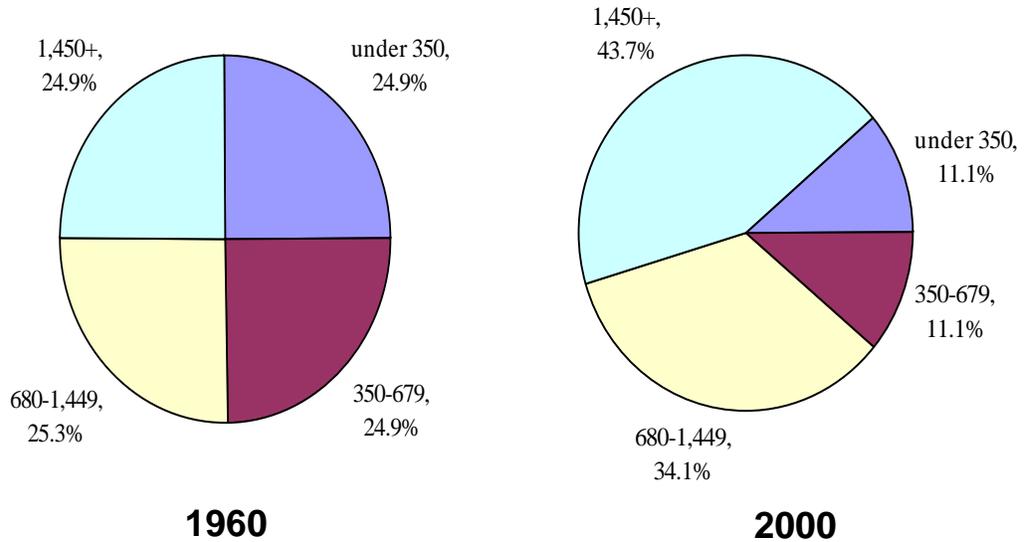
Table 9: Changes in Vermont Communities by Population, 1960 to 2000

General Size Categories	Sub-Categories	Percent of Towns in Category				
		1960	1970	1980	1990	2000
Tiny (< 350)	under 100	5%	4%	4%	4%	4%
	100-349	20%	17%	11%	9%	8%
	subtotal	25%	21%	15%	13%	11%
Small (350-679)	350-500	11%	8%	9%	7%	6%
	500-679	14%	18%	9%	7%	6%
	subtotal	25%	26%	18%	14%	11%
Medium (680-1,449)	680-999	13%	13%	19%	17%	15%
	1,000-1,449	12%	10%	13%	17%	19%
	subtotal	25%	23%	32%	34%	34%
Large (1,450+)	1,450-2,499	13%	15%	15%	14%	15%
	2,500-4,999	6%	8%	12%	17%	18%
	5,000-9,999	4%	4%	5%	6%	8%
	10,000+	2%	3%	3%	3%	3%
	subtotal	25%	30%	36%	39%	44%
Total # Communities		249	250	251	252	252

Sources: U.S. Census Bureau for 1960 to 2000 and analysis by UVM Center for Rural Studies



Figure 5: Distribution of Vermont Communities by Population Size Category, 1960 to 2000



Sources: U.S. Census Bureau, Decennial Census for 1960 and 2000 and analysis by UVM Center for Rural Studies

A primary trend witnessed between 1960 and 2000 is the continuing dispersion of Vermont’s population from the traditional growth centers of 10,000 or more to communities of between 2,500 and 9,999 people. In general, Vermonters travel further distances for work, although the patterns of importing and exporting workers varies substantially. This report’s “Commuting Patterns, Households without Vehicles, and Community Planning” section provides detailed discussion about commuting and journey to work patterns.

The share of *Vermont’s population* within each town size category and sub-category also changed from 1960 to 2000 (Table 10). Logically, the smaller categories hold a smaller proportion of the population. The 1,450+ category’s population share increased between 1960 and 2000, but the most interesting analysis lies within the sub-categories. In the past, Vermont’s cities with 10,000+ in population have been the state’s primary population centers and possessed the largest share of the population (22.8% in 1960). During the course of the four decades, that population share peaked in 1970 at 28.3% and then decreased below the plurality. Upon the release of the 2000 Census data, the town sub-category of 2,500-4,999 held more than a quarter of the state’s population. This is regardless of the fact that the sub-categories are not of equal size and some have proportionally larger increments than the 2,500-4,999 size groups. Over the past two decades, the state’s traditional growth centers have relinquished the largest share of Vermont’s population to towns that are between 2,500 and 5,000 people in size.



Table 10: Percent of Vermont Population by Town Size Categories, 1960-2000

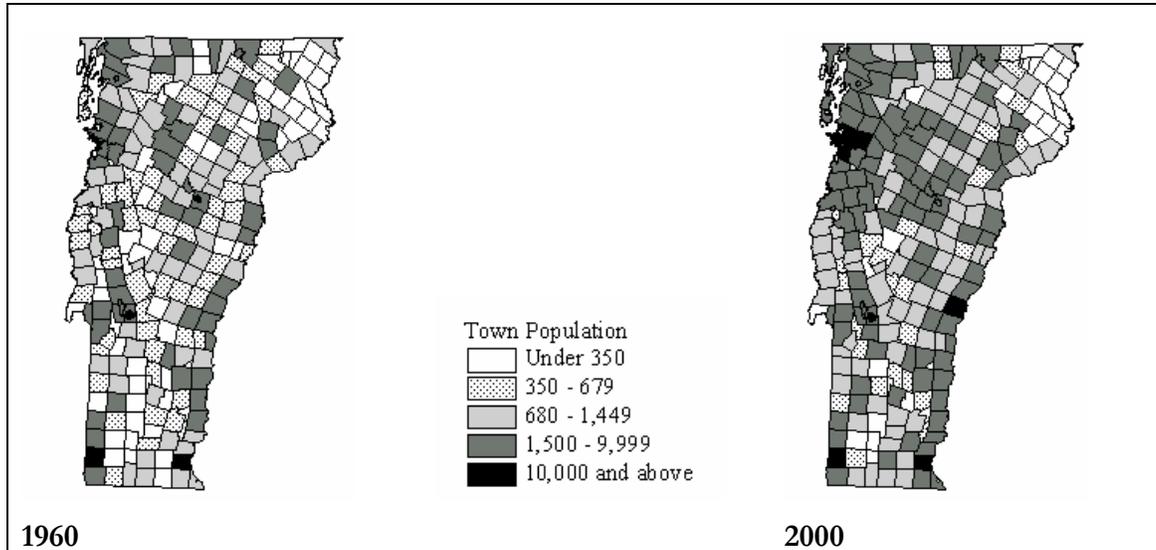
General Size Categories	Sub-Categories	Percent of Population within Each Category				
		1960	1970	1980	1990	2000
Tiny (< 350)	under 100	0.2%	0.1%	0.1%	0.1%	0.1%
	100-349	2.9%	2.2%	1.3%	1.0%	0.7%
	subtotal	3.1%	2.3%	1.3%	1.0%	0.8%
Small (350-679)	350-500	3.1%	1.8%	1.8%	1.4%	1.0%
	500-679	5.2%	6.0%	2.8%	1.9%	1.4%
	subtotal	8.3%	7.8%	4.6%	3.3%	2.4%
Medium (680-1,449)	680-999	7.0%	5.9%	7.9%	6.5%	5.3%
	1,000-1,449	9.5%	7.2%	7.5%	8.9%	9.4%
	subtotal	16.5%	13.1%	15.4%	15.5%	14.6%
Large (1,450+)	1,450-2,499	15.6%	16.5%	14.5%	11.7%	11.6%
	2,500-4,999	13.2%	17.1%	20.7%	25.8%	25.2%
	5,000-9,999	20.6%	14.9%	17.6%	19.6%	21.5%
	10,000+	22.8%	28.3%	25.8%	23.1%	23.9%
	subtotal	72.2%	76.8%	78.7%	80.2%	82.2%
Total Vermont Population		389,881	444,731	511,456	562,758	608,827

Sources: U.S. Census Bureau for 1960 to 2000 and analysis by UVM Center for Rural Studies

This trend can be seen across the state when viewing maps of towns with respect to general population distributions and larger population distributions only (Figure 6 and Figure 7). The number of towns in the 1,500 – 9,999 persons category has increased most dramatically, illustrating the dispersion of population outside traditional growth centers of 10,000 people or more. Overall, population growth is occurring throughout Vermont, although some regional variation exists with respect to particular concentrations. The state's largest growth centers exist in the Champlain Valley, the Connecticut River Valley, central Vermont, Rutland County, and southern Vermont on either side of the state (Brattleboro in the east and Bennington in the west).

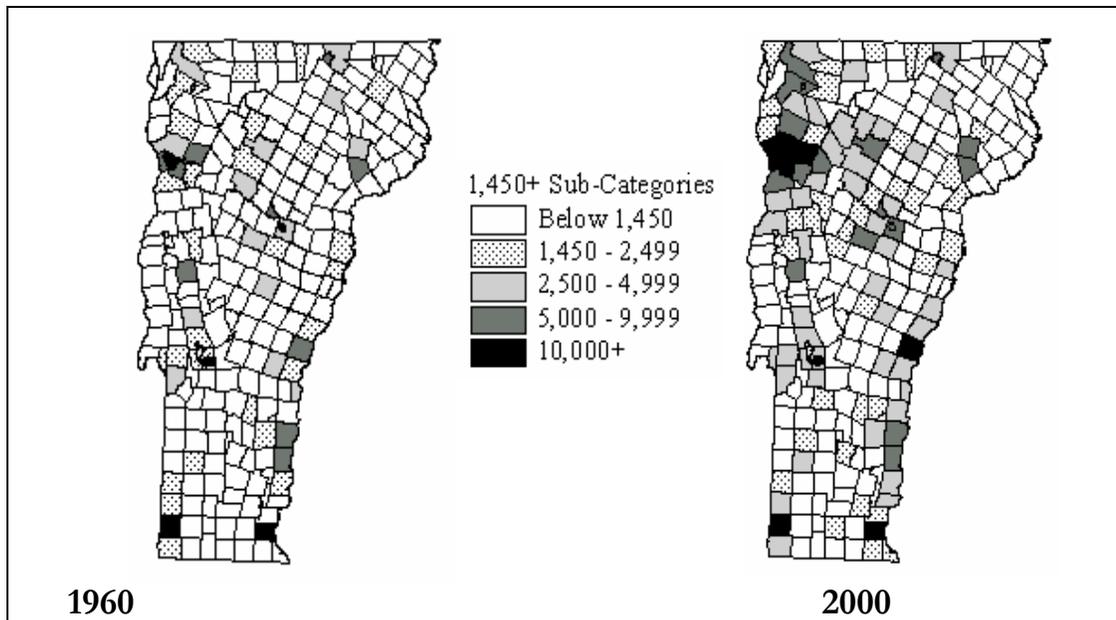


Figure 6: Vermont Towns by Size Category, 1960 and 2000



Sources: U.S. Census Bureau, Decennial Censuses for 1960 and 2000

Figure 7: Vermont Towns by Sub-Category, within 1,450+ Size Category, 1960 and 2000



Sources: U.S. Census Bureau, Decennial Census for 1960 and 2000



EMPLOYMENT, INCOME & ECONOMIC TRENDS

The previous section provides information about how Vermont's population is changing in terms of size and age distribution, where people live with respect to locations to urban areas, and an overall trend toward regional dispersion. This section examines trends in employment and income, commuter flows and journey to work patterns within and between counties, and how people travel to and from work, in particular persons without access to a vehicle.

EMPLOYMENT

The total number of employees in Vermont in 2000 was about 404,000 and is expected to expand to more than 557,000 by 2030 (Table 11). The percent of employed persons when compared with the total population has grown for the past two decades and is expected to continue to do so. For instance, 52% of the population was employed in 1980; by 2000, that portion increased to 66% and is expected to represent 78% by 2030. [Note: Table 1 and Table 11 were used to calculate these percentages.] Reasons for this may be related to 1) more women participating in the workforce, 2) a larger segment of the population represented within the workforce age cohorts, and/or 3) the economic necessity for more members of the household to cover the costs of housing, transportation, and other living expenses. AARP and other organizations point to a burgeoning future trend where older persons "begin a second career" or work well beyond traditional retirement years, whether by choice or economic necessity. Vermonters may also be holding more than one job.

The largest employment sector in Vermont is services-related, with 136,000 in 2000. It is expected to increase to 239,000 employees in 2030. The portion of Vermont's population within the service sector has climbed very steadily since 1980, when it represented 24% of the workforce. By 2030, it will likely represent 43% of the total workforce. It should be noted that the services sector includes establishments for individuals, businesses, governments, and other organizations. These include: personal services; advertising, employment agencies, education and health services. Leisure and hospitality (including food service, accommodations and entertainment) and many other services (including repair, maintenance, and personal) are also included.

The second leading employment sector is retail trade, with approximately 65,000 employed in 2000 and 78,000 expected to be employed in that sector in 2030. Manufacturing jobs in Vermont are expected to continue declining. Farm employment will drop only slightly, probably due to the growth of the agricultural specialty products. Retail trade is expected to grow at a modest pace, which may reflect the current and expected slow expansion in the tourism industry.



Table 11: Vermont Employment by Sector, 2000 to 2030

TOTAL EMPLOYMENT (in thousands)					% Change
	2000	2010	2020	2030	2000-2030
FARM EMPLOYMENT	9.50	9.33	9.05	8.78	-7.7%
AGRICULTURAL SERVICES, OTHER	6.82	8.71	10.33	11.94	75.0%
MINING	0.93	0.76	0.74	0.73	-21.0%
CONSTRUCTION	26.28	28.66	32.41	36.19	37.7%
MANUFACTURING	53.35	43.29	42.84	42.56	-20.2%
TRANSPORT, COMM. & PUBLIC UTIL.	15.08	15.34	16.80	18.26	21.1%
WHOLESALE TRADE	14.27	15.00	15.82	16.70	17.0%
RETAIL TRADE	65.84	69.67	74.04	78.49	19.2%
FINANCE, INS. & REAL ESTATE	23.14	25.75	28.21	30.67	32.5%
SERVICES	136.51	172.77	205.86	239.60	75.5%
FEDERAL CIVILIAN GOVT	6.04	6.05	5.97	5.91	-2.1%
FEDERAL MILITARY GOVT	4.58	4.48	4.51	4.53	-1.0%
STATE AND LOCAL GOVT	42.14	49.17	56.23	63.34	50.3%
Total Employment (In Thousands)	404.46	448.98	502.81	557.69	37.9%

Source: Woods & Poole Economics, 2006

Projections for the fastest-growing occupations are made by the U.S. Bureau of Labor Statistics. At this time, the projections for 2014 indicate that the fastest-growing occupations being created in Vermont fall into very distinct categories: highly technical, good paying jobs versus lower-end, entry-level service or health care oriented positions (Table 12). The list of the top fifteen fastest growing occupations demonstrates this trend. The largest numbers of workers are expected to be home health aids and human/social services assistants. These jobs tend to be lower-paying jobs that make it difficult for individuals to meet the basic costs of living, including housing and transportation. On the other hand, high paying jobs for computer engineers, network systems and data communications specialists, and other high technology jobs are also likely to be created.



Table 12: Fastest Growing Occupations in Vermont, 2004 to 2014

Rank	Occupational Title	Employment		Annual Percent Change
		2004	2014	
1	Personal and Home Care Aides	1,378	2,058	4.10%
2	Network Systems and Data Communications Analysts	318	462	3.80%
3	Medical Assistants	460	664	3.70%
4	Physician Assistants	244	350	3.70%
5	Community and Social Service Specialists, All Other	98	136	3.30%
6	Computer Software Engineers, Applications	1,082	1,501	3.30%
7	Home Health Aides	3,372	4,635	3.20%
8	Healthcare Practitioners and Technical Workers, All Other	176	239	3.10%
9	Dental Hygienists	520	699	3.00%
10	Social and Human Service Assistants	2,707	3,636	3.00%
11	Network and Computer Systems Administrators	671	901	3.00%
12	Hazardous Materials Removal Workers	108	145	3.00%
13	Dental Assistants	579	775	3.00%
14	Preschool Teachers, except Special Education	583	773	2.90%
15	Medical Scientists, Except Epidemiologists	86	113	2.80%

Source: U.S Bureau of Labor Statistics

INCOME

Vermonters' incomes on a per capita basis have generally lagged incomes in New England and the U.S. as a whole, both in current dollars and in constant (1996) dollars (Table 13). However, Vermont's per capita income is steadily rising when compared with either the New England or U.S. figures, in the past thirty decades and looking forward to 2030.

Table 13: Per Capita Income Trends for Vermont, New England, and U.S.

	Per Capita Income (Current \$)			Per Capita Income (1996 \$)		
	1970	2000	2030	1970	2000	2030
Vermont	\$3,615	\$27,680	\$95,099	\$12,785	\$25,894	\$35,835
New England	\$4,446	\$36,118	\$97,628	\$15,725	\$33,788	\$43,862
United States	\$4,081	\$29,845	\$100,410	\$14,434	\$27,919	\$37,837

Source: Woods & Poole Economics, 2006



According to the *2005 Vermont Housing Needs Assessment*, it can be seen that Vermont household incomes at the higher ranges are rising very quickly between 2000 and 2010 (Table 14). The fastest-growing categories are in the income brackets over \$100,000, especially the \$250,000+ groups. It should be noted that almost 50% of Vermont households are earning incomes of less than \$50,000.

Table 14: Vermont Households by Income Categories for 2000, 2005, and 2010

Income Categories	2000	2005 (estimated)	2010 (projected)	% Change (2000 – 2010)	% of All Households (2010)
<\$15,000	34,792	32,455	28,848	-1.9%	11%
\$15,000-24,999	33,768	30,021	26,379	-2.4%	10%
\$25,000-34,999	33,422	32,908	28,907	-1.4%	11%
\$35,000-49,999	44,871	41,723	42,809	-0.5%	16%
\$50,000-74,999	49,824	53,076	53,648	0.7%	21%
\$75,000-99,999	23,051	29,047	32,965	3.6%	13%
\$100,000-149,999	13,775	20,335	30,841	8.4%	12%
\$150,000-249,999	5,458	7,688	10,777	7.0%	4%
\$250,000-499,999	1,338	2,168	3,288	9.4%	1%
\$500,000+	445	799	1,354	11.8%	1%
Total	240,744	250,220	259,816	0.8%	100%

Source: 2005 Vermont Housing Needs Assessment (Vermont Dept. of Housing & Community Affairs)

In addition to analyzing general income trends for Vermont, it is important to assess the income parameters for Vermonters who require assistance with activities of daily living. These individuals are more likely to need special transportation services (elderly and persons with disabilities). In its *Shaping the Future of Long-Term Care and Independent Living* report, the Vermont Department of Disabilities, Aging, and Independent Living assess the poverty levels of persons requiring assistance with activities of daily living. The DAIL 2006 report shows that almost 1,800 individuals who need assistance live below 175% of the federal poverty level (Table 15). By 2015, that number is likely to grow to more than 2,500 persons. In addition, about 3,500 persons above 175% of the federal poverty level will need assistance with activities of daily living. The need among very elderly (over age 85) is particularly compelling. Clearly, transportation planning will be needed to prepare for the transportation needs for persons needing assistance with activities of daily living because, even if some are able to drive independently, the sheer numbers of persons will strain the public transit system, at current operating capacities.

In response to the projected rising demand for long-term care associated with an aging population facing chronic illness and disability, new models for organizing and delivering health-



related and supportive services are being explored. Prepared for the U.S. Department of Health and Human Services and the U.S. Department of Housing and Urban Development, the American Association of Homes and Services for the Aging has recently assessed Assisted Living Facilities and “affordable housing plus services” which integrate access to health-related and supportive services to residents. These models may actually streamline and reduce the need for transportation services for residents. As noted in Table 12, the fastest growing occupations in Vermont are related to personal and home care aides, which appears to correspond to the need for workers within nursing homes, assisted living facilities and affordable housing plus services residential care model.

Table 15: Number of Persons in Vermont Needing Long Term Care, by Poverty Level

	2005	2010	2015	% Change (2005 - 2010)	% Change (2005 - 2015)
Nursing Facility^{2,3}	3,168	3,039	2,956	-0.8%	-0.7%
Community, Low Income ($<175\%$FPL)⁴	1,830	2,139	2,504	3.2%	3.2%
<18	34	33	37	-0.6%	0.8%
18-64	637	683	770	1.4%	1.9%
65-74	289	362	476	4.6%	5.1%
75-84	320	346	377	1.6%	1.7%
85+	549	715	845	5.4%	4.4%
Community, 175%+ FPL⁵	2,658	3,085	3,578	3.0%	3.0%
<18	48	47	52	-0.4%	0.8%
18-64	642	688	776	1.4%	1.9%
65-74	436	544	708	4.5%	5.0%
75-84	831	897	971	1.5%	1.6%
85+	701	910	1,071	5.4%	4.3%
Total Community	4,488	5,224	6,082	3.1%	3.1%

¹ LTC Needs defined as requiring the help of another person to perform two or more Activities of Daily Living (ADLs), *excluding* individuals with mental retardation/developmental disabilities.

² Represents average daily number of nursing facility residents in fiscal year, based on quarterly MDS data (includes Wake Robin but excludes Arbors and Mertens). Nursing facility residents not broken out by income or disability level because data are unavailable.

³ Nursing facility "need" assumes that all individuals in nursing facilities in 2004 "needed" nursing facility care. Trend in nursing facility need over time is based on use trend assumption entered on ASSUMPTIONS sheet. All individuals in nursing homes are assumed to have 2+ ADLs.

⁴ Community residents include individuals residing in non-institutional settings. This includes people living in their homes, as well as people living in residential care and congregate housing with supportive services.

Sources: Shaping the Future of Long Term Care and Independent Living, Vermont Department of Aging and Independent Living (2006).



ECONOMIC TRENDS

According to the New England Economic Partnership report for November 2006, the economic outlook for Vermont through 2010 is positive, with overall macroeconomic benchmarks expected to post respectable gains during the period. However, output, job and income growth are forecast to be below both the U.S. and New England averages as the state moves through a housing market correction. Having said this, Vermont's unemployment rate is expected to remain well below the national and New England regional rates, although the rate is expected to tick upwards during the next four years.

The report notes numerous economic trends that reflect the tourism industry patterns and may impact Vermont's transportation infrastructure.

Numerous niche manufacturers have recently announced expansion plans and new jobs around the state, including Autumn Harp, Ethan Allen, Green Mountain Coffee Roasters, Hubbardton Forge, Lake Champlain Chocolates, Peerless Clothing, Vermont Soy and Via Cheese have great on-site employment activity and a direct impact on Vermont's transportation infrastructure since many of these companies export products outside Vermont.

Another sign of the economic growth in this arena is the Vermont Economic Development Authority (VEDA) approval of financings totaling \$113.4 million to support 235 commercial, agricultural, and small business development projects in Fiscal Year 2006. This was an increase over the prior year when \$49 million was approved to support 240 projects.

A 2003 "Travel and Tourism" report by the Vermont Department of Tourism and Marketing showed that the top attractions for visitors include: sightseeing, followed by shopping, then winter recreational sports, outdoor recreational activities, and historic sites. Many traditional sports activities have seen a decrease in visitors (downhill skiing, cross country skiing, fishing and hunting) while new sports are drawing an equal number of new enthusiasts (snowboarding, mountain biking, snowshoeing, and kayaking). A study conducted by Economic & Policy Resources Inc. showed that, in 2003, visitor spending resulted in 36,470 jobs for workers and proprietors in Vermont.

Vermont's three welcome centers -- located in Guilford, Fair Haven, and Highgate -- had increased visits in recent years. (Visits have increased from 450,497 in 2000 to 1,065,646 visits in 2005.) The Guilford Welcome Center, located on the Massachusetts Border off US Highway Route 91, receives the largest number of visits per year; in 2005 there were 897,376 visits that accounted for 84% of the total visits between the three welcome centers. The Vermont Department of Tourism and Marketing also reported that, according to the Travel Industry of America report, visitors in 2003 to the state included people who were here for shorter time periods, based on more spontaneous travel decisions as well as the traditional longer-range planner. The welcome centers are designed to provide helpful information that suits both groups. The New England Economic Project report also noted that areas around the state's



major ski resorts are witnessing development and expansion, at least on the drafting board. Nearly all of the state's resort areas have expansion and/or upgrade plans. Hundreds of second homes are planned for the areas around resorts. Despite the generally positive tone to the above developments in the manufacturing sector, the job change data show that the state's factory sector remains largely in a holding pattern, with only occasional positive bumps which often times is off-set by other job reduction announcements.

Meanwhile, as Jeffrey Carr pointed out in the NEEP report, Vermont is at the forefront of sustainable business practices. From the small, diversified farmer who sells produce at local farmers market to “green” cleaning supply manufacturing companies that sell nationwide, sustainable business is a growing trend.

According to its web site, the Vermont Businesses for Social Responsibility (VBSR) has about 650 members representing over 30,000 employees and more than \$4.5 billion in annual sales. It is the largest business trade organization of its kind in the United States.

Anecdotal information points to a growing interest in food security and to local food education work that is translating into increasing numbers of land- and food-based businesses. “Buy Local” campaigns are encouraging the development of cottage industries. The trend toward ecologically sensitive, socially responsible and economically sustainable business practices is not unique to Vermont, but seems to have found its home in the Green Mountain State.

COMMUTING PATTERNS, HOUSEHOLDS WITHOUT VEHICLES, AND COMMUNITY PLANNING

Among the most useful transportation planning data collected by the U.S. Census Bureau are the indicators showing the relationships between residence, place of work, modes of transportation and travel times.

JOURNEY TO WORK

This section of the report summarizes journey to work data representing the most recent source of county and sub-county commuter flows. They provide insight into travel patterns within and between counties and describe the modes by which Vermonters travel to work.

Commuting Patterns

According to the 2000 Census, the majority of Vermont’s workforce commuted outside the town of residence, sometimes within the county of residence although often between counties (Table 16). A small minority of 5.7% of Vermonters avoided a commute by working at home, and no county strayed from that number by more than 2.2 percentage points. Inter-county and



even inter-state commuting patterns seem to relate to one's county of residence. In some regions, a large segment of the workforce commuted, not only beyond town lines, but also across county lines, and many worked in other states. A majority of the resident workforce in both Grand Isle (68.2%) and Essex (58.7%) counties commuted across county lines. Several counties on state borders had a larger number of residents who worked outside Vermont; Windsor County had a total of 7,508 residents (26%) cross the state border for work. Conversely, only 7% of Chittenden County residents crossed county lines during their commutes, illustrating that county's role as a major employment area.

Table 16: Place of Work by County in Vermont, 2000

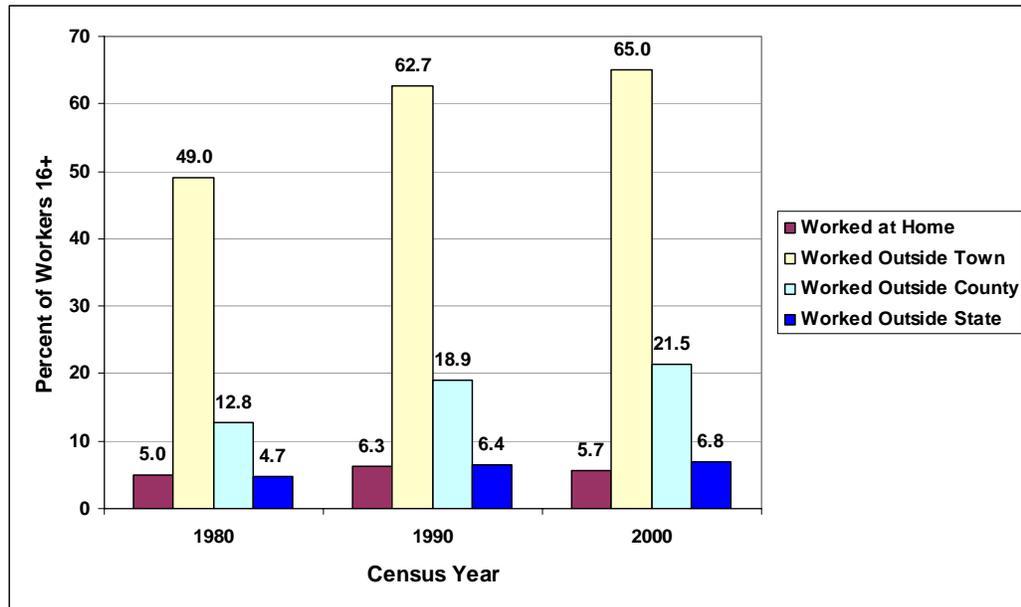
County	Total Workers 16+	Percent Worked at Home	Percent Worked Outside Town	Percent Worked Outside County	Percent Worked Outside State
Addison County	18,503	7.9	64.5	29.4	1.5
Bennington County	18,320	5.4	49.0	17.4	12.5
Caledonia County	14,262	6.6	64.5	25.2	8.7
Chittenden County	79,670	4.2	67.2	7.0	1.0
Essex County	2,909	4.5	66.1	58.7	34.0
Franklin County	22,578	5.6	72.9	36.1	1.0
Grand Isle County	3,466	5.9	76.6	68.2	6.3
Lamoille County	12,141	6.9	64.8	28.6	2.6
Orange County	14,424	7.1	70.5	53.3	19.6
Orleans County	11,845	7.4	61.0	15.5	1.7
Rutland County	31,048	4.8	63.0	13.6	3.7
Washington County	30,881	5.9	69.0	17.9	2.1
Windham County	22,895	6.8	58.9	17.7	11.7
Windsor County	28,897	6.1	63.7	34.8	26.0
Vermont Total	311,839	5.7	65.0	21.5	6.8

Source: U.S. Census Bureau, 2000 Census of Population and Housing

Between 1980 and 2000, there have been changes in the place of work patterns (Figure 8). All trends have increased, the least of which being the percentage of workers who work at home. This trend experienced a brief spike and settled for a 0.7 percentage point increase for the 3 decade period. The trend of working outside one's town increased the most by 16 percentage points. The minority-to-majority transition of those working outside their town between 1980 (49%) and 2000 (65%) is of special note.



Figure 8: Journey to Work Trends in Vermont - 1980 to 2000



Between 1990 and 2000, the patterns of vehicle use across Vermont show that more people are driving cars, whether alone in their cars or within car pools (Table 17). In every county and the state as a whole, the numbers of persons driving alone in their cars has increased. The use of car pools expanded in almost every county (with the exception of Rutland and Windham). The use of public transportation has grown very little during the ten-year period, with the greatest improvement in Bennington, Rutland, Windham, and Windsor counties. On the other hand, public transportation use has decreased in Franklin, Orange, and Washington counties. The mean travel time has increased dramatically in every part of Vermont. Whether because of the high cost of housing, difficulties finding local employment, or personal lifestyle preferences affecting where people choose to live, the amount of time people spend getting to and from their jobs is substantial.



Table 17: Selected Means of Transportation to Work, 2000

	Drive Car Alone-2000 (persons)	Drive Car Alone-1990 (persons)	Car Pool 2000 (persons)	Car Pool 1990 (persons)	Public Transit 2000 (persons)	Public Transit 1990 (persons)	Mean Travel Time 2000 (minutes)	Mean Travel Time 1990 (minutes)
Addison	13,192	11,466	2,005	1,727	41	48	23.2	17.3
Bennington	13,922	12,257	2,151	2,050	130	98	19.1	14.5
Caledonia	10,794	9,001	1,734	1,635	26	29	22.2	15.7
Chittenden	60,619	52,078	8,581	8,802	1,186	1,186	19.7	17.6
Essex	2,206	1,699	369	350	8	6	22	17.5
Franklin	16,544	12,459	3,728	3,244	43	113	25.6	19.6
Grand Isle	2,559	1,739	571	436	8	5	33.4	24.9
Lamoille	9,078	6,703	1,332	1,228	48	33	25.7	17.6
Orange	10,752	9,144	1,903	1,515	43	77	25.3	19.3
Orleans	8,616	6,885	1,423	1,395	64	60	21.5	14.4
Rutland	24,181	21,612	3,463	4,384	183	124	20.6	15.8
Washington	22,885	19,597	3,872	3,304	124	151	21.8	16.3
Windham	16,951	14,958	2,603	2,602	161	59	20.5	15.4
Windsor	22,089	20,210	3,456	3,059	143	85	21.3	16
Vermont	234,388	199,808	37,191	35,731	2,208	2,033	21.6	16.5

Sources: U.S. Census Bureau, 1990 and 2000 Censuses of Population and

Importing and Exporting Workers at the Town Level

An analysis of the degrees to which Vermont towns “import” and “export” workers reveal some of the dynamics related to regional employment centers that determine much of the daily traffic on the surrounding transportation system, especially during rush hours. Using Census 1990 and 2000 data, the extent to which a town imports workers is calculated by subtracting the number of residents who work in town from the total number of workers in town during the day. The exporting variable is calculated by subtracting the residents who work in town from the total resident workforce. The net effect is then calculated by subtracting a town’s export number from its import number.

The 1990 and 2000 Census data revealed that the vast majority (more than 75%) of Vermont towns experienced net exporting of workers during the day (Table 18). The pattern was fairly consistent for both points in time.



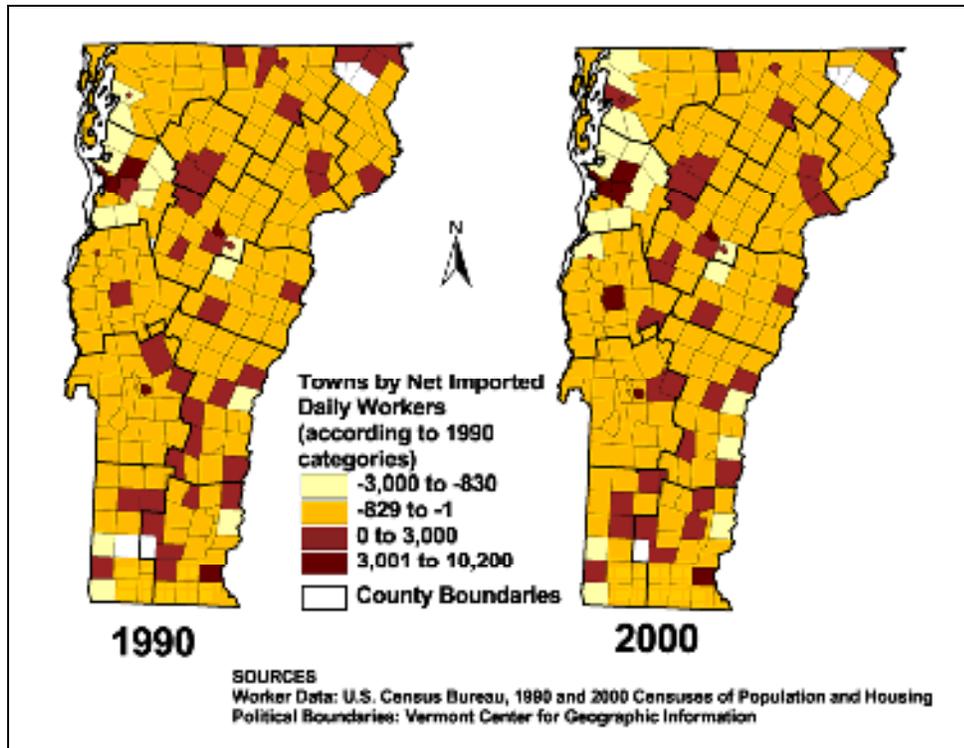
Table 18: Worker Import-Export Categories for Vermont Towns, 1990-2000

Net Workers Imported	1990		2000	
	Number	%	Number	%
-3,000 to -830	15	6.0	20	8.0
-829 to -1	189	76.2	187	74.8
0 to 3,000	38	15.3	35	14.0
3,001 to 10,200	6	2.4	8	3.2

Sources: U.S. Census Bureau, 1990 and 2000 Censuses of Population and Housing

The pattern for net imported daily workers in both 1990 and 2000 shows that the traditional town or city employment centers typically imported workers, while many other towns exported workers (Figure 9). One example of a shift in 2000 occurred with the addition of St. Albans Town to the importing towns, which may reflect a shift in Franklin County. On the other hand, Newport in Orleans County shifted to the exporting town category.

Figure 9: Vermont Towns by Net Imported Daily Workers - 1990 and 2000



In looking at the degree to which Vermont towns import or export workers, there was very modest change between 1990 and 2000, with some towns increasing the *relative* number of workers that they exported between 1990 and 2000 (Figure 10 and Figure 11). This trend may reflect the residential growth in some towns being driven by regional employment centers. This can be seen most easily in the Chittenden, Franklin, Grand Isle, and Lamoille County towns that surround the greater Burlington area. It is also interesting to note that those towns with the highest levels of importing workers also seemed to export the most workers. This is logical, and the implications of this daily exchange of workers for the local and regional transportation system should be studied further for transportation planning.

Figure 10: Vermont Towns by Total Imported Daily Workers - 1990 and 2000

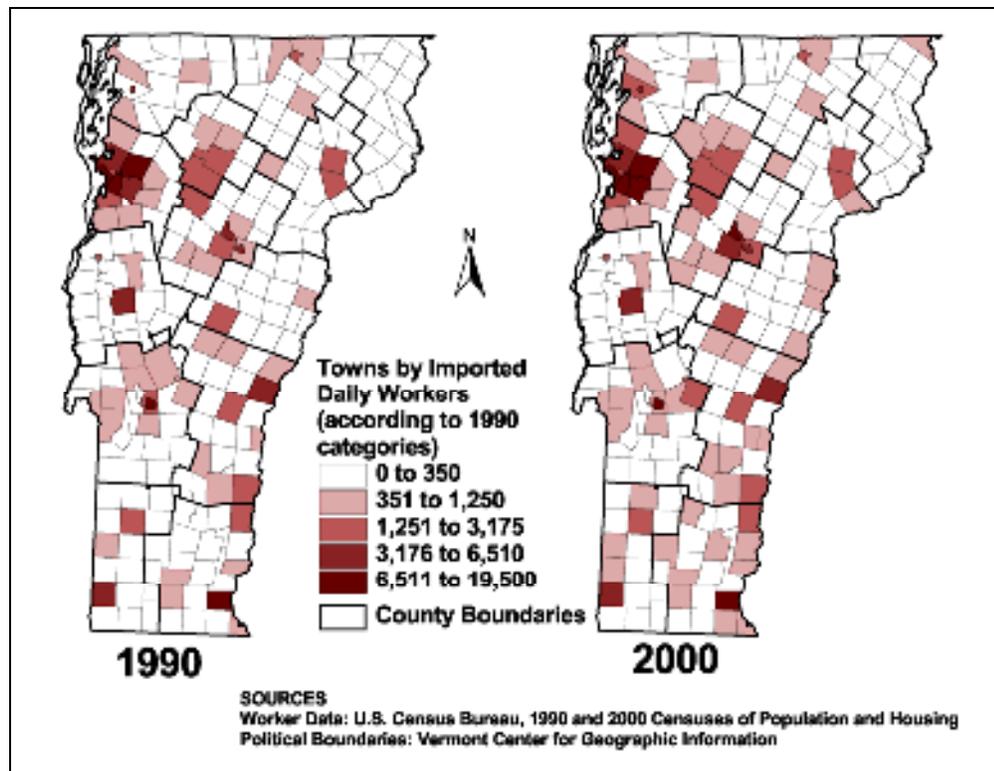
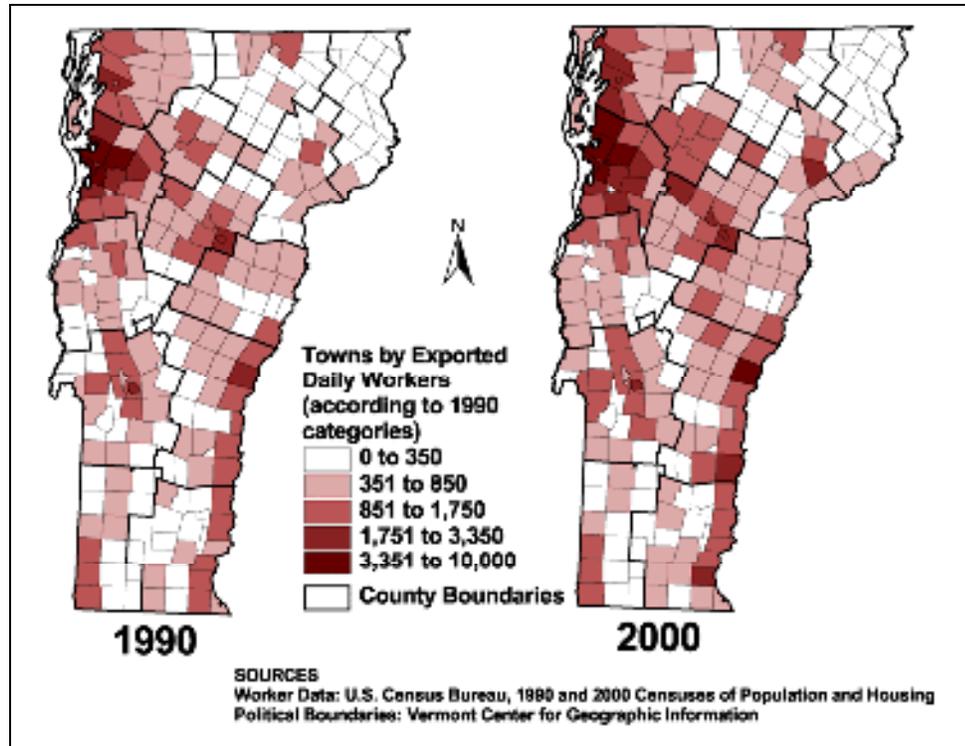


Figure 11: Vermont Towns by Total Exported Daily Workers - 1990 and 2000



HOUSEHOLDS WITH AND WITHOUT VEHICLES

When gathering data on households, the Census Bureau counts the number of available vehicles in households that are not restricted to business purposes only. This definition captures more than just the vehicles that may be wholly owned or leased by household members.

The average number of vehicles per household in Vermont has been about 1.7 for the past two decennial Censuses (Table 19). Homeowners have had a higher average (1.9 vehicles) than rental households (1.3 vehicles). With respect to county trends, Grand Isle, Addison, and Orange counties contained the highest levels of vehicles per person overall.

In addition to the decennial censuses, the U.S. Census Bureau captures the average vehicles per household in the 2005 American Community Survey. In Vermont during 2005, the average



number of vehicles per household was 2.0 for owner households, 1.3 vehicles for renter households, and 1.8 total vehicles per household.

Table 19: Average Number of Vehicles Per Household - 1990 and 2000

County	Total Households		Homeowner Households		Renter Households	
	1990	2000	1990	2000	1990	2000
Addison County	1.86	1.88	2.02	2.00	1.39	1.51
Bennington County	1.67	1.72	1.88	1.93	1.17	1.22
Caledonia County	1.66	1.74	1.87	1.93	1.14	1.23
Chittenden County	1.73	1.74	1.94	1.95	1.34	1.32
Essex County	1.66	1.75	1.76	1.84	1.28	1.39
Franklin County	1.74	1.84	1.94	1.99	1.22	1.38
Grand Isle County	1.89	1.92	2.02	2.02	1.45	1.51
Lamoille County	1.75	1.80	1.94	1.97	1.32	1.39
Orange County	1.85	1.88	1.99	2.00	1.36	1.46
Orleans County	1.67	1.73	1.84	1.90	1.19	1.23
Rutland County	1.65	1.69	1.85	1.89	1.19	1.22
Washington County	1.63	1.68	1.86	1.90	1.14	1.21
Windham County	1.69	1.72	1.93	1.94	1.28	1.25
Windsor County	1.74	1.77	1.92	1.94	1.33	1.34
Vermont Total	1.71	1.75	1.91	1.94	1.27	1.30

Sources: U.S. Census Bureau, 1990 and 2000 Censuses of Population and Housing

Households without Vehicles

A special analysis of households in Vermont without vehicles available is valuable for long-term transportation planning. The percentage of households without vehicles seemed to have declined between the 1980 and 2000, a trend echoed largely in all counties (Table 20). For the state as a whole, the proportion declined from 10.3% to 6.8%. The largest drop at a county level took place in Caledonia County, which dropped from 12.1% to 8.3%, however, Caledonia County still retained the largest share of any county in 2000. Addison County possessed the lowest percentage of households without vehicles at 4.3% in 2000.

According to the Census Bureau's American Community Survey in 2005, Vermont's percentage of households without vehicles available remained around 6.8%.



Table 20: Percent of Vermont Households with No Vehicles Available – 1980 to 2000

County	1980	1990	2000
Addison County	8.4	5.3	4.3
Bennington County	9.9	9.6	7.9
Caledonia County	12.1	8.6	8.3
Chittenden County	10.7	8.4	7.1
Essex County	9.8	8.1	5.3
Franklin County	11.4	8.3	6.3
Grand Isle County	5.7	5.1	4.5
Lamoille County	9.8	6.7	5.2
Orange County	7.4	4.8	4.9
Orleans County	10.4	8.0	6.6
Rutland County	10.0	8.6	7.9
Washington County	11.2	9.3	8.1
Windham County	12.0	8.3	7.8
Windsor County	8.7	7.0	5.7
Vermont Total	10.3	8.0	6.8

Sources: U.S. Census Bureau, 1980, 1990, and 2000 Decennial Censuses

The fact that there has been a decrease in households without vehicles available does not mean that underlying issues do not exist. The possibility of an economic or demographic divide in Vermont may be at play. Therefore, we examined households without vehicles by household income and the age of the householder (head of household) in comparison with trends for total households. The majority of Vermont households without vehicles earned \$15,000 or less in 2000 (Table 21). This was in stark contrast to the pattern for total households: the majority of total households earned at least \$25,000 or more. This income disparity should be examined for future social and transportation program planning purposes.

Heads of household in Vermont without vehicles available tend to be older than the trend for total households (Table 22: Vermont Total Households and Households without Vehicles by Age of Householder, 2000 and 2005). In fact, 32% of households without vehicles had a householder of 75 years or older in 2000, versus 10% for total households. The 2005 American Community Survey found that about 35% of households with an older household head did not have any vehicles. However, this should not be seen as a downward trend until comparability issues between the 2000 Census Bureau decennial census and the American Community Survey can be isolated and explained.



Table 21: Vermont Total Households and Households without Vehicles by Income, 2000

Household Income	Total Households	Households with No Vehicles
No Income	0.6	1.2
\$1 to \$15,000	13.9	55.8
\$15,000 to \$24,999	14.0	20.1
\$25,000 to \$49,999	32.5	15.2
\$50,000 to \$74,999	20.7	4.5
\$75,000 to \$99,999	9.6	1.6
\$100,000 to \$199,999	7.3	1.1
\$200,000 or more	1.5	0.4

Source: U.S. Census Bureau, 2000 Census of Population and Housing

Table 22: Vermont Total Households and Households without Vehicles by Age of Householder, 2000 and 2005

Age of Householder	Census 2000		ACS 2005	
	Total Households	Households with No Vehicles	Total Households	Households with No Vehicles
Total	240,634	16,461	248,825	16,939
15 to 34 years (%)	19.4	15.5	18.6	23.1
35 to 64 years (%)	59.6	37.6	61.2	41.6
65+ years (%)	20.9	46.9	20.2	35.3
75+ years (%)	10.0	32.4		

Sources: U.S. Census Bureau, 2000 Census of Population and Housing

U.S. Census Bureau, 2005 American Community Survey

Differences in transportation modes for getting to work were found between Vermont workers with and without vehicles available (Table 23). As expected, workers with vehicles were more likely to drive alone to work in 2005. Counter-intuitively perhaps, 32% of those without vehicles available in the household also were recorded as driving alone to work. This can be explained by the fact that the Census Bureau records a worker as “driving alone to work” if they are given a ride by someone who is not driving to the same destination. Carpooling is only attributed when the workplace is the destination for both or all passengers in the vehicle.

The pattern for workers walking to work is clear - about 36% of workers without vehicles compared to 5% who had access to a vehicle. From a policy perspective, however, it is not



known whether some workers do not own a vehicle because they can walk to work while others walk to work because they do not own a vehicle.

Table 23: Vermont Total Workers and Workers without Vehicles, 2005

Means of Transportation to Work	Total Workers	Workers with No Vehicles
Total	315,580	5,722
Drove Alone (%)	75.8	32.1
Carpooled (%)	11.0	14.7
Public Transportation (%)	0.9	5.7
Walked (%)	5.2	35.9
Taxicab or other means (%)	1.5	9.5
Worked at Home (%)	5.5	2.1

Source: U.S. Census Bureau, 2005 American Community Survey

Most Vermont towns with both high percentages and absolute numbers of households without vehicles available in 2000 were also the state's traditional employment centers, where jobs opportunities are typically in close proximity to residential areas (Figure 12 and Figure 13). These are also the towns most likely to have regular bus and taxi service, which were used more often by workers without vehicles in 2005, as shown above.

In addition, the maps show that there are numerous highly rural towns with a high proportion of households without vehicles available. For those workers, securing transportation to jobs may be a critical problem. Additional research on this public policy issue is warranted. Unfortunately, a town-level analysis of this data from the American Community Survey will not be available until 2010 at the earliest.



Figure 12: Vermont Towns by Percent of Households with No Vehicles Available, 2000

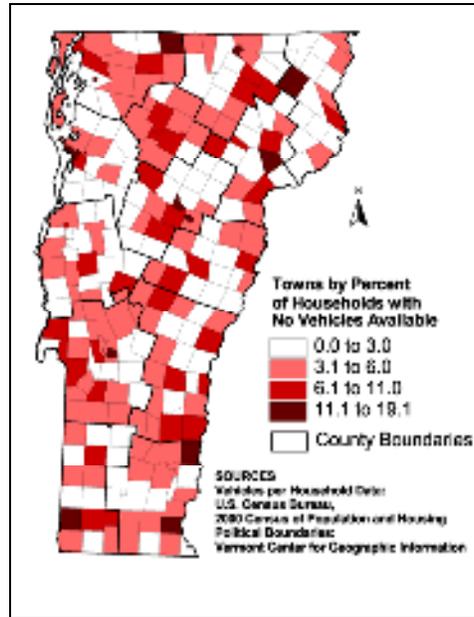
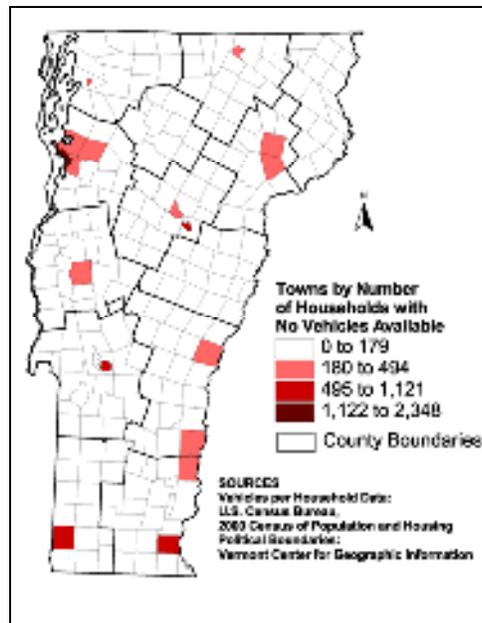


Figure 13: Vermont Towns by Numbers of Households with No Vehicles Available, 2000



COMMUNITY LEVEL PLANNING

The previous sections of this report look at general trends at the state, county, or town levels. For transportation planning purposes, analysis of detailed commuting information at the town level yields valuable information about county-to-county and town-to-town patterns which can explain the relationships between where people live and work. This type of analysis may be applicable to town and regional planning, zoning decisions, and other local government functions. Appendix II contains county-to-county commuting data and a list of towns where the top 75% of the resident workforce is employed. Highlights from Appendix II include:

- Nearly half of Grand Isle's resident workforce (49.5%) commuted to Chittenden County in 2000, presumably along Route 2 to Route 7 and Interstate 89. Franklin County also sent a sizeable proportion of its workforce (32.3%) to Chittenden County, most likely along Interstate 89 and Route 7, and perhaps accounting for traffic along Route 128 between Fairfax and Essex as well. Chittenden County also attracted 21.5% of the Addison County workforce.
- The three Chittenden County municipalities of Burlington, South Burlington and Essex all appear within the list of places that employed the top 75% of the resident workforce of Addison, Franklin, and Grand Isle Counties. Williston and Colchester also appear in the lists of at least two of the sending counties. Those five towns also employed the top 75% of the Chittenden County workforce. The influence of this 5-town block in their home county and surrounding counties is a testament to the pressures that must be felt by the local and regional transportation infrastructure supporting the area.
- In terms of absolute numbers, Chittenden County did send (and continues to send) sizable amounts of commuters "against the flow" and into surrounding counties. While accounting for only a fraction of the resident workforce, 1,852 Chittenden County workers commuted into Washington County in 2000, followed by 1,126 to Franklin County and 935 to Addison County. This likely had an effect on Routes 2 and 7 and Interstate 89 in both directions.
- Another commuting linkage of note plays along the Connecticut River. The five Vermont counties along that river corridor each lost a measurable proportion of resident workforce to New Hampshire during the course of a typical work day in 2000. Nearly 33% of Essex County workers commuted to New Hampshire. Windsor County also shared a strong link, with 23.5% crossing the Connecticut River. Counties with less linkage were Orange (18.1%), Caledonia (7.1%) and Windham (6.0%).
- New Hampshire towns figuring prominently in this linkage were Lebanon, Hanover, Littleton, and Haverhill. Many state roads likely supported this linkage, notably Routes 2, 4, 5, 25, 105, and 302, and Interstates 91 and 93.



- The sub-county data tell a slightly different story for every county. For this analysis, a list of towns employing the top 75% of every county's resident workforce was created. Highly self-reliant counties like Chittenden, Rutland and Windham included towns from no other counties on their top 75% lists. Other counties that shared strong links to within-county towns also revealed more removed job centers within their own boundaries. Good examples are Enosburg and Richford in Franklin County and Bridport and Shoreham in Addison County. This brief analysis shows that each county's situation needs to be considered separately in order to tease out possible commuting pressures brought to bear upon the transportation infrastructure within and upon the connections to other counties.



REPORT SUMMARY AND KEY FINDINGS

Working Paper 4: Demographic and Economic Trends documents a range of demographic, economic, and transportation data pertaining to historical trends in population and employment and projections for a twenty-year planning horizon. Key findings in this report include:

- Vermont's population trend over time is best characterized as "slow and steady" growth when compared with the U.S. as a whole, and is growing at a relatively swifter rate than other New England states. The counties in northwest Vermont are growing more quickly than other areas of the state. Population change in the state has been equally affected by natural factors (birth and death rates) and by migration. Assuming these factors continue to affect growth similarly to current trends, Vermont's population will increase by about 17% between 2000 and 2030 (or from approximately 608,000 to 712,000 people). Birth and death rates are likely to remain stable, but changes in national and global migration patterns could affect this forecast and should be considered in different planning scenarios.
- The average household size in Vermont has fallen steadily over the past three decades and will continue to decrease until about 2020, when it will level off at about 2.3 persons per household. Vermont's pattern of small household sizes is more pronounced than in New England or the U.S. as a whole. The relatively small household size has direct impacts on the need for additional housing units and transportation infrastructure activities.
- Another important demographic analysis features "dependents" in the population, namely the segment of the population which is composed of people who are either too young or too old to work. If current trends continue, by 2030, almost 174,000 people in the state will be over the age of 65. This age group's share of the total population will increase from 13% in 2000 to 24% in 2030. This trend has significant ramifications for health care services, transportation, and housing. The younger age cohort (under 18) will grow over time in absolute numbers, although it is currently decreasing slightly. This cohort's proportion of the Vermont population is projected to decrease and plateau by 2030.
- Between 1960 and 2000, Vermont's population dispersed away from the traditional growth centers of 10,000 or more to communities of between 2,500 and 9,999 people. However, some regional variation still exists with respect to population concentrations. The state's largest growth centers exist in the Champlain Valley, the Connecticut River Valley, central Vermont, Rutland County, and southern Vermont on either side of the state (Brattleboro in the east and Bennington in the west).



- As Vermont's population became more dispersed geographically, commuting has increased between towns and counties. Vermonters are spending more time driving to and from work. The amount of time spent commuting to and from jobs in Vermont grew 20% between 1990 and 2000. Commuters in rural areas travel an average of 24 minutes to work, with their urban counterparts commuting 18 minutes, on average.
- The total number of employees is projected to increase from 404,000 in 2000 to 557,000 by 2030. The ratio of jobs to population will increase from 66% in 2000 to 78% in 2030. This increase suggests that people will hold multiple jobs and that more people over the age of 65 will continue to work.
- Since 1980, the service sector represented 24% of the workforce and, by 2030, will likely represent 43% of the total workforce. The second leading employment sector is retail trade. Manufacturing jobs in Vermont are expected to continue declining. Farm employment will drop only slightly, probably due to the growth of the agricultural specialty products.
- The fastest-growing occupations being created in Vermont fall into very distinct categories: highly technical, good paying jobs versus lower-end, entry-level service or health care oriented positions. The largest numbers of new workers are expected to be home health aids and human/social services assistants. These jobs tend to be lower-paying jobs that make it difficult for individuals to meet the basic costs of living, including housing and transportation. On the other hand, high paying jobs for computer engineers, network systems and data communications specialists, and other high technology jobs are also likely to be created.
- Although Vermont's income levels generally lag behind the U.S. or New England average, incomes are steadily rising. The fastest income segments are for household incomes at or above \$100,000. However, about one-half of households earn incomes of \$35,000 or less.
- Almost 1,800 individuals with special needs (who need assistance with one or more activities of daily living) live below 175% of the federal poverty level. By 2015, that number is likely to grow to more than 2,500 persons. In addition, about 3,500 persons above 175% of the federal poverty level will need assistance with activities of daily living. The need among very elderly (over age 85) is particularly compelling. Planning is needed to meet the transportation needs for these persons.
- The general economic outlook for Vermont through 2010 is positive, with overall macroeconomic benchmarks expected to post moderate gains during the period. However, the housing market deterioration may affect other components in the economy.



- The vast majority (more than 75%) of Vermont towns experienced net exporting of workers during the day in both 1990 and 2000. This suggests that, even though people are living in dispersed patterns, jobs remain more centrally located.
- The average number of vehicles per household in Vermont has been about 1.7 for the past two decades. Homeowners have had a higher average (1.9 vehicles) than rental households (1.3 vehicles). With respect to county trends, Grand Isle, Addison, and Orange counties contained the highest levels of vehicles per person overall.
- About 7% of Vermont households are without any vehicle. The majority of Vermont households without vehicles earned \$15,000 or less in 2000, in stark contrast to the pattern for total households: the majority of total households earned at least \$25,000 or more. This income disparity has serious implications for effective planning for social and transportation programs.
- The heads of households in Vermont without available vehicles tend to be older than household heads in general. In fact, 32% of households without vehicles had a householder of 75 years or older in 2000, versus 10% for total households.
- Households without access to vehicles are located in both rural and urban areas. In urban areas, workers can walk to work, however, that is typically much more difficult for workers in rural communities without access to a vehicle.



APPENDIX I: REFERENCES

Carr, Jeffrey

2006 "The State of the Economy and the Proposed Staff Consensus Forecast: Update for Fiscal 2007 and 2008," Prepared for the Vermont Emergency Board, July 18, 2006.

Center for Rural Studies

2006 Website Access - <http://crs.uvm.edu/>

Economic & Policy Resources

2005 "The Travel and Tourism Industry in Vermont: 2003", for the Vermont Department of Tourism and Marketing.

Friedman, Pamela

2004 "Transportation Needs in Rural Communities, Rural Assistance Center, An Issue Note, March, 2004. www.raconline.org/info_guides/transportation/issuenote.html

Huffman, Benjamin L.

1974 Getting Around Vermont, UVM Environmental Program, Burlington, Vermont, December, 1974.

American Association of Homes and Services for the Aging -- Institute for the Future of Aging Services

2006 "Inventory of Affordable Housing Plus Services Initiatives for Low- and Modest-Income Seniors", Office of Disability, Aging and Long-Term Care Policy.

New England Economic Partnership

2006 November, 2006 Vermont Economic Outlook. Economic & Policy Resources, Inc. Williston, VT 05495

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies;
Hubert H. Humphrey Institute



Steahr, Thomas E. and A. E. Luloff

1985 The Structure and Impact of Population Redistribution in New England, Northeast Regional Center for Rural Development, Pennsylvania State University, University Park, Pennsylvania

Vermont Businesses for Social Responsibility

2006 Website Access - <http://www.vbsr.org/>

Vermont Department of Housing and Community Affairs

2005 "Vermont Housing Needs Assessment," Agency of Commerce, June 2006.

Vermont Department of Disabilities, Aging, and Independent Living

2006 "Shaping the Future of Long Term Care and Independent Living," Vermont Department of Disabilities, Aging and Independent Living, Agency of Human Services, May, 2006.

Vermont Economic Development

2006 web site - <http://www.veda.org/>

Vermont Department of Tourism and Marketing

2004 TIA report - www.vermontvacation.com



APPENDIX II: SAMPLE COMMUTER DATA BY COUNTY

Addison County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Addison Co.	13,070	70.6
Chittenden Co.	3,969	21.5
Rutland Co.	777	4.2
Out of State	270	1.5
Washington Co.	204	1.1
Windsor Co.	124	0.7
Orange Co.	28	0.2
Franklin Co.	26	0.1
Lamoille Co.	14	0.1
Bennington Co.	8	0.0
Windham Co.	7	0.0
Orleans Co.	4	0.0
Caledonia Co.	2	0.0
Essex Co.	0	0.0
Grand Isle Co.	0	0.0
Total	18,503	100.0
<i>Commute Outside County</i>	<i>5,433</i>	<i>29.4</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Middlebury town Addison Co.	6518	35.2	35.2
Vergennes city Addison Co.	1499	8.1	43.3
Burlington city Chittenden Co.	1115	6.0	49.4
Bristol town Addison Co.	1008	5.4	54.8
South Burlington city Chittenden Co.	817	4.4	59.2
Williston town Chittenden Co.	533	2.9	62.1
Ferrisburg town Addison Co.	507	2.7	64.8
Essex town Chittenden Co.	464	2.5	67.3
New Haven town Addison Co.	445	2.4	69.8
Bridport town Addison Co.	343	1.9	71.6
Shoreham town Addison Co.	331	1.8	73.4
Shelburne town Chittenden Co.	324	1.8	75.1

Source: U.S. Census Bureau, 2000 Census of Population and Housing

Bennington County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Bennington	15,125	82.6
Out of State	2,296	12.5
Windham	521	2.8
Rutland	260	1.4
Windsor	51	0.3
Orange	39	0.2
Washington	21	0.1
Chittenden	7	0.0
Addison	0	0.0
Caledonia	0	0.0
Essex	0	0.0
Franklin	0	0.0
Grand Isle	0	0.0
Lamoille	0	0.0
Orleans	0	0.0
Total	18,320	100.0
<i>Commute Outside County</i>	<i>3,195</i>	<i>17.4</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Bennington town Bennington Co.	8,568	46.8	46.8
Manchester town Bennington Co.	3,163	17.3	64.0
Arlington town Bennington Co.	849	4.6	68.7
Dorset town Bennington Co.	565	3.1	71.8
Shaftsbury town Bennington Co.	531	2.9	74.7
Williamstown town Berkshire Co. MA	467	2.5	77.2

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Caledonia County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Caledonia Co.	10,671	74.8
Out of State	1,237	8.7
Washington Co.	794	5.6
Lamoille Co.	461	3.2
Orange Co.	335	2.3
Orleans Co.	319	2.2
Chittenden Co.	187	1.3
Essex Co.	182	1.3
Windsor Co.	48	0.3
Franklin Co.	17	0.1
Windham Co.	4	0.0
Rutland Co.	3	0.0
Addison Co.	2	0.0
Bennington Co.	2	0.0
Grand Isle	0	0.0
Total	14,262	100.0
<i>Commute Outside County</i>	<i>3,591</i>	<i>25.2</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
St. Johnsbury town Caledonia Co.	3677	25.8	25.8
Lyndon town Caledonia Co.	2825	19.8	45.6
Waterford town Caledonia Co.	1021	7.2	52.7
Hardwick town Caledonia Co.	744	5.2	58.0
Danville town Caledonia Co.	566	4.0	61.9
Littleton town Grafton Co. NH	400	2.8	64.7
Burke town Caledonia Co.	392	2.7	67.5
Barnet town Caledonia Co.	347	2.4	69.9
Haverhill town Grafton Co. NH	234	1.6	71.6
Ryegate town Caledonia Co.	233	1.6	73.2
Montpelier city Washington Co.	233	1.6	74.8
Morristown town Lamoille Co.	227	1.6	76.4

Source: U.S. Census Bureau, 2000 Census of Population and Housing

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



Chittenden County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Chittenden Co.	74,098	93.0
Washington Co.	1,852	2.3
Franklin Co.	1,126	1.4
Addison Co.	935	1.2
Out of State	801	1.0
Lamoille Co.	425	0.5
Grand Isle Co.	167	0.2
Rutland Co.	131	0.2
Windsor Co.	53	0.1
Orange Co.	44	0.1
Orleans Co.	22	0.0
Bennington Co.	11	0.0
Caledonia Co.	5	0.0
Essex	0	0.0
Windham	0	0.0
Total	79,670	100.0
<i>Commute Outside County</i>	<i>5,572</i>	<i>7.0</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Burlington city Chittenden Co.	25,042	31.4	31.4
South Burlington city Chittenden Co.	12,884	16.2	47.6
Essex town Chittenden Co.	12,732	16.0	63.6
Williston town Chittenden Co.	7,145	9.0	72.6
Colchester town Chittenden Co.	6,285	7.9	80.4

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Essex County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Essex Co.	1,201	41.3
Out of State	989	34.0
Caledonia Co.	571	19.6
Orleans Co.	109	3.7
Washington Co.	19	0.7
Orange Co.	8	0.3
Chittenden Co.	6	0.2
Rutland Co.	4	0.1
Lamoille Co.	2	0.1
Addison Co.	0	0.0
Bennington Co.	0	0.0
Franklin Co.	0	0.0
Grand Isle Co.	0	0.0
Windham	0	0.0
Windsor Co.	0	0.0
Total	2,909	100.0
<i>Commute Outside County</i>	<i>1,708</i>	<i>58.7</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Canaan town Essex Co.	384	13.2	13.2
Brighton town Essex Co.	309	10.6	23.8
Littleton town Grafton Co. NH	225	7.7	31.6
Lunenburg town Essex Co.	220	7.6	39.1
St. Johnsbury town Caledonia Co.	203	7.0	46.1
Lyndon town Caledonia Co.	172	5.9	52.0
Lancaster town Coos Co. NH	164	5.6	57.6
Colebrook town Coos Co. NH	119	4.1	61.7
Waterford town Caledonia Co.	117	4.0	65.8
Concord town Essex Co.	86	3.0	68.7
Stewartstown town Coos Co. NH	83	2.9	71.6
Northumberland town Coos Co. NH	78	2.7	74.3
Berlin city Coos Co. NH	48	1.7	75.9

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Franklin County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Franklin Co.	14,420	63.9
Chittenden Co.	7,292	32.3
Lamoille Co.	280	1.2
Out of State	223	1.0
Washington Co.	144	0.6
Orleans Co.	61	0.3
Addison Co.	59	0.3
Grand Isle Co.	49	0.2
Caledonia Co.	18	0.1
Rutland Co.	16	0.1
Orange Co.	13	0.1
Windsor Co.	3	0.0
Bennington	0	0.0
Essex	0	0.0
Windham	0	0.0
Total	22,578	100.0
<i>Commute Outside County</i>	<i>8,158</i>	<i>36.1</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
St. Albans city Franklin Co.	5,043	22.3	22.3
St. Albans town Franklin Co.	2,489	11.0	33.4
Essex town Chittenden Co.	1,883	8.3	41.7
Swanton town Franklin Co.	1,686	7.5	49.2
Burlington city Chittenden Co.	1,560	6.9	56.1
South Burlington city Chittenden Co.	1,217	5.4	61.5
Enosburg town Franklin Co.	1,057	4.7	66.1
Williston town Chittenden Co.	806	3.6	69.7
Colchester town Chittenden Co.	692	3.1	72.8
Richford town Franklin Co.	690	3.1	75.8

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Grand Isle County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Chittenden Co.	1,714	49.5
Grand Isle Co.	1,103	31.8
Franklin Co.	372	10.7
Out of State	219	6.3
Washington Co.	23	0.7
Addison Co.	16	0.5
Lamoille Co.	11	0.3
Windsor Co.	4	0.1
Orange Co.	2	0.1
Rutland Co.	2	0.1
Bennington	0	0.0
Caledonia Co.	0	0.0
Essex	0	0.0
Orleans	0	0.0
Windham	0	0.0
Total	3,466	100.0
<i>Commute Outside County</i>	<i>2,363</i>	<i>68.2</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Burlington city Chittenden Co.	505	14.6	14.6
Essex town Chittenden Co.	342	9.9	24.4
South Hero town Grand Isle Co.	306	8.8	33.3
Alburg town Grand Isle Co.	303	8.7	42.0
South Burlington city Chittenden Co.	299	8.6	50.6
Grand Isle town Grand Isle Co.	261	7.5	58.2
Williston town Chittenden Co.	204	5.9	64.1
North Hero town Grand Isle Co.	183	5.3	69.3
Colchester town Chittenden Co.	168	4.8	74.2
St. Albans city Franklin Co.	162	4.7	78.9

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Lamoille County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Lamoille Co.	8,669	71.4
Chittenden Co.	1,764	14.5
Washington Co.	931	7.7
Out of State	317	2.6
Franklin Co.	206	1.7
Caledonia Co.	88	0.7
Orleans Co.	84	0.7
Orange Co.	27	0.2
Addison Co.	21	0.2
Rutland Co.	16	0.1
Windham Co.	9	0.1
Windsor Co.	6	0.0
Grand Isle Co.	2	0.0
Bennington Co.	1	0.0
Essex	0	0.0
Total	12,141	100.0
<i>Commute Outside County</i>	<i>3,472</i>	<i>28.6</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Stowe town Lamoille Co.	2912	24.0	24.0
Morristown town Lamoille Co.	2678	22.1	46.0
Johnson town Lamoille Co.	982	8.1	54.1
Cambridge town Lamoille Co.	885	7.3	61.4
Hyde Park town Lamoille Co.	588	4.8	66.3
Essex town Chittenden Co.	492	4.1	70.3
Burlington city Chittenden Co.	429	3.5	73.8
Waterbury town Washington Co.	320	2.6	76.5

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Orange County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Orange Co.	6,734	46.7
Out of State	2,823	19.6
Washington Co.	2,776	19.2
Windsor Co.	1,553	10.8
Chittenden Co.	234	1.6
Caledonia Co.	102	0.7
Rutland Co.	60	0.4
Franklin Co.	35	0.2
Lamoille Co.	35	0.2
Orleans Co.	28	0.2
Addison Co.	21	0.1
Windham Co.	21	0.1
Bennington Co.	2	0.0
Essex	0	0.0
Grand Isle	0	0.0
Total	14,424	100.0
<i>Commute Outside County</i>	<i>7,690</i>	<i>53.3</i>



Orange County Commuting Data, 2000, continued

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Randolph town Orange Co.	1946	13.5	13.5
Lebanon city Grafton Co. NH	1194	8.3	21.8
Bradford town Orange Co.	1080	7.5	29.3
Barre city Washington Co.	820	5.7	34.9
Hanover town Grafton Co. NH	756	5.2	40.2
Montpelier city Washington Co.	654	4.5	44.7
Hartford town Windsor Co.	611	4.2	49.0
Thetford town Orange Co.	563	3.9	52.9
Barre town Washington Co.	493	3.4	56.3
Williamstown town Orange Co.	429	3.0	59.2
Chelsea town Orange Co.	406	2.8	62.1
Berlin town Washington Co.	400	2.8	64.8
Newbury town Orange Co.	342	2.4	67.2
Fairlee town Orange Co.	339	2.4	69.6
Royalton town Windsor Co.	315	2.2	71.7
Corinth town Orange Co.	248	1.7	73.5
Haverhill town Grafton Co. NH	242	1.7	75.1

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Orleans County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Orleans Co.	10,008	84.5
Caledonia Co.	589	5.0
Lamoille Co.	399	3.4
Washington Co.	245	2.1
Out of State	204	1.7
Chittenden Co.	156	1.3
Essex Co.	102	0.9
Franklin Co.	100	0.8
Windsor Co.	19	0.2
Orange Co.	16	0.1
Rutland Co.	5	0.0
Bennington Co.	2	0.0
Addison	0	0.0
Grand Isle	0	0.0
Windham	0	0.0
Total	11,845	100.0
<i>Commute Outside County</i>	<i>1,837</i>	<i>15.5</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Newport city Orleans Co.	3270	27.6	27.6
Derby town Orleans Co.	1703	14.4	42.0
Barton town Orleans Co.	1548	13.1	55.1
Newport town Orleans Co.	623	5.3	60.3
Troy town Orleans Co.	409	3.5	63.8
Irasburg town Orleans Co.	335	2.8	66.6
Craftsbury town Orleans Co.	320	2.7	69.3
Glover town Orleans Co.	246	2.1	71.4
Jay town Orleans Co.	235	2.0	73.4
Morristown town Lamoille Co.	210	1.8	75.1

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Rutland County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Rutland Co.	26,832	86.4
Out of State	1,140	3.7
Bennington Co.	1,020	3.3
Windsor Co.	860	2.8
Addison Co.	775	2.5
Chittenden Co.	190	0.6
Windham Co.	103	0.3
Washington Co.	69	0.2
Franklin Co.	22	0.1
Orange Co.	19	0.1
Orleans Co.	13	0.0
Lamoille Co.	5	0.0
Caledonia	0	0.0
Essex	0	0.0
Grand Isle	0	0.0
Total	31,048	100.0
<i>Commute Outside County</i>	<i>4,216</i>	<i>13.6</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Rutland city Rutland Co.	12805	41.2	41.2
Killington town Rutland Co.	1689	5.4	46.7
Rutland town Rutland Co.	1548	5.0	51.7
Clarendon town Rutland Co.	1330	4.3	56.0
Brandon town Rutland Co.	1276	4.1	60.1
Castleton town Rutland Co.	1260	4.1	64.1
Fair Haven town Rutland Co.	963	3.1	67.2
Poultney town Rutland Co.	899	2.9	70.1
Mendon town Rutland Co.	886	2.9	73.0
Pittsford town Rutland Co.	827	2.7	75.6

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Washington County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Washington Co.	25,345	82.1
Chittenden Co.	2,821	9.1
Lamoille Co.	729	2.4
Orange Co.	681	2.2
Out of State	645	2.1
Windsor Co.	185	0.6
Caledonia Co.	159	0.5
Franklin Co.	114	0.4
Addison Co.	64	0.2
Orleans Co.	51	0.2
Windham Co.	36	0.1
Rutland Co.	33	0.1
Bennington Co.	18	0.1
Essex	0	0.0
Grand Isle	0	0.0
Total	30,881	100.0
<i>Commute Outside County</i>	<i>5,536</i>	<i>17.9</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Montpelier city Washington Co.	6629	21.5	21.5
Barre city Washington Co.	3975	12.9	34.3
Berlin town Washington Co.	3088	10.0	44.3
Waterbury town Washington Co.	2233	7.2	51.6
Northfield town Washington Co.	1889	6.1	57.7
Barre town Washington Co.	1755	5.7	63.4
Waitsfield town Washington Co.	1,324	4.3	67.7
Burlington city Chittenden Co.	863	2.8	70.5
Warren town Washington Co.	812	2.6	73.1
East Montpelier town Washington Co.	620	2.0	75.1

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Windham County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Windham Co.	18,833	82.3
Out of State	2,674	11.7
Windsor Co.	740	3.2
Bennington Co.	475	2.1
Washington Co.	53	0.2
Rutland Co.	51	0.2
Chittenden Co.	26	0.1
Orange Co.	20	0.1
Franklin Co.	13	0.1
Addison Co.	6	0.0
Essex Co.	4	0.0
Caledonia	0	0.0
Grand Isle	0	0.0
Lamoille Co.	0	0.0
Orleans	0	0.0
Total	22,895	100.0
<i>Commute Outside County</i>	<i>4,062</i>	<i>17.7</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Brattleboro town Windham Co.	8053	35.2	35.2
Rockingham town Windham Co.	1772	7.7	42.9
Putney town Windham Co.	1176	5.1	48.0
Dover town Windham Co.	1030	4.5	52.5
Wilmington town Windham Co.	979	4.3	56.8
Townshend town Windham Co.	667	2.9	59.7
Guilford town Windham Co.	664	2.9	62.6
Westminster town Windham Co.	623	2.7	65.4
Vernon town Windham Co.	567	2.5	67.8
Londonderry town Windham Co.	533	2.3	70.2
Newfane town Windham Co.	468	2.0	72.2
Whitingham town Windham Co.	388	1.7	73.9
Marlboro town Windham Co.	355	1.6	75.5

Source: U.S. Census Bureau, 2000 Census of Population and Housing



Windsor County Commuting Data, 2000

County to County		
County of Work	Count	Percent
Windsor Co.	18,829	65.2
Out of State	7,508	26.0
Windham Co.	759	2.6
Rutland Co.	633	2.2
Orange Co.	572	2.0
Washington Co.	220	0.8
Bennington Co.	136	0.5
Addison Co.	133	0.5
Chittenden Co.	85	0.3
Caledonia Co.	9	0.0
Franklin Co.	7	0.0
Orleans Co.	6	0.0
Essex	0	0.0
Grand Isle	0	0.0
Lamoille Co.	0	0.0
Total	28,897	100.0
<i>Commute Outside County</i>	<i>10,068</i>	<i>34.8</i>

Towns where Top 75% of Resident Workforce is Employed			
Workplace	Count	%	Cumulative %
Springfield town Windsor Co.	3930	13.6	13.6
Lebanon city Grafton Co. NH	3488	12.1	25.7
Hartford town Windsor Co.	3486	12.1	37.7
Woodstock town Windsor Co.	1973	6.8	44.6
Hanover town Grafton Co. NH	1719	5.9	50.5
Ludlow town Windsor Co.	1355	4.7	55.2
Windsor town Windsor Co.	1,236	4.3	59.5
Chester town Windsor Co.	866	3.0	62.5
Royalton town Windsor Co.	767	2.7	65.1
Norwich town Windsor Co.	760	2.6	67.8
Cavendish town Windsor Co.	559	1.9	69.7
Bethel town Windsor Co.	548	1.9	71.6
Claremont city Sullivan Co. NH	541	1.9	73.5
Hartland town Windsor Co.	507	1.8	75.2

Source: U.S. Census Bureau, 2000 Census of Population and Housing





■ Documentation for:

**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 5: Vision, Goals, and Plan
Objectives

■ Prepared for:

Vermont Agency of Transportation

26 February 2007 Draft

Amended May 23, 2007

■ In Partnership with:

Snelling Center for Government
TransManagement
Center for Rural Studies
Hubert H. Humphrey Institute of Public Affairs

VT LONG RANGE TRANSPORTATION BUSINESS PLAN

Working Paper 5: Vision, Goals, and Plan Objectives

26 February 2007 Draft (Amended May 23, 2007)

TABLE OF CONTENTS

INTRODUCTION..... 1

VTRANS 2006 VISION, MISSION, AND GOALS 1

2006 PUBLIC OPINION SURVEY 4

SAFETEA-LU PLANNING FACTORS 7

MODAL POLICY PLANS GOALS..... 10

PROPOSED 2008 PLAN OBJECTIVES 15

INTRODUCTION

The Vermont Agency of Transportation (VTTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, public transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach.

This working paper, one of many being prepared in support of the plan¹, recommends refinements to the following objectives of the 2002 Long Range Transportation Plan:

1. Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.
2. Improve all modes of Vermont's transportation system to provide Vermonters with choices.
3. Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life.

Revisions to these objectives are suggested based on an updated Agency Vision and Mission Statement drafted in 2006, results from a public opinion survey conducted in 2006, SAFETEA-LU planning factors, and goals presented in the aviation, bicycle/pedestrian, highway system, public transit, and rail modal policy plans.

The objectives will provide the framework for developing specific policies, programs, and planning strategies that will form the basis for the 2008 Long Range Transportation Business Plan. This planning process is different because it will identify policy options for each objective under several possible future scenarios. Please visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/index.htm> for additional information on the scenario planning process.

VTRANS 2006 VISION, MISSION, AND GOALS

The 2002 Long Range Transportation Plan presents a vision and mission statement for VTTrans and establishes a set of supporting goals. Over the last couple of years, the VTTrans Executive Staff has undertaken a strategic planning process that has refined and focused the 2002 vision/mission statement and goals to further articulate a clear direction and set of priorities for the Agency. This effort resulted in the development of:

¹ Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

- A vision statement, that establishes the overall performance (safe and integrated) and purpose (support quality of life and economic well being) of the transportation system that the Agency seeks to provide;
- A mission statement, that describes the Agency's role in achieving the vision statement and further defines a set of overall performance categories for the transportation system (safe, reliable, cost-effective, and environmentally responsible); and
- Goals, consistent with the mission, to guide the Agency's daily operations, delivery of projects and services, and planning.

VISION & MISSION STATEMENT (2006)

The Vermont Agency of Transportation's vision is a safe, efficient and fully integrated transportation system that promotes Vermont's quality of life and economic wellbeing.

VTrans' mission is to provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.

GOALS

1. **SAFETY:** Make safety a critical component in the development, implementation and maintenance of the transportation system.
2. **EXCELLENCE:** Cultivate and continually pursue excellence in financial stewardship, performance accountability, and customer service.
3. **PLANNING:** Optimize the future movement of people and goods with corridor and natural resource management, balanced modal alternatives, and sustainable financing.
4. **PRESERVATION:** Protect the state's investment in its transportation system.

The VTrans' Vision and Mission statements are established, the goals are still in draft form, and the Agency's strategic planning process is continuing (as of the drafting of this Working Paper). VTrans Executive Staff have solicited input from all VTrans personnel on the drafted goal statements, and have asked for ideas on the first set of objectives that will move the Agency towards attainment of the goals. Ultimately, specific tasks objectives will be identified by VTrans for each goal.

COMPARISON TO 2002 PLAN OBJECTIVES

The Agency's Vision, Mission Statement, and supporting goals focus on the organization. They describe how the Agency will carry out its mission. The objectives of the Long Range Transportation Business Plan should be guided by the Agency Vision and Mission Statement but are directed more towards the transportation system. The following discussion compares each 2002 Plan objective to



the Agency Vision, Mission Statement, and Goals. It points out areas of consistency, inconsistency, and gaps.

2002 Plan Objective 1: *Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.*

- The overriding principle of objective 1, “system management”, is supported by the 2006 Agency goals for planning and preservation.
- The emphasis on the “existing” transportation system in objective 1 is consistent with the 2006 Agency goal for preservation. However, the concept of preserving the system’s condition should be strengthened within this objective.
- The principles of “effective and efficient” management included in this objective are clearly consistent with the 2006 Agency goals related to excellence, planning, and preservation.
- Safety is emphasized as a 2006 Agency goal. However, safety, as one component of objective 1, does not receive the same emphasis.
- The 2006 Agency mission statement includes the concept of reliability which does not appear in objectives 1, 2, or 3.

2002 Plan Objective 2: *Improve all modes of Vermont's transportation system to provide Vermonters with choices.*

- This objective is consistent with the 2006 Agency planning goal which calls for balanced modal alternatives and is focused on moving people and goods rather than simply moving trucks and cars.

2002 Plan Objective 3: *Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life.*

- This objective is consistent with the 2006 Agency Vision which states that the transportation system should promote Vermont’s quality of life and economic well-being.
- This objective is consistent with the 2006 Agency Mission to “provide for the movement of people and commerce in... (an) environmentally responsible manner”

FINDINGS AND RECOMMENDATIONS

Overall, the three long range plan objectives are strongly connected and consistent with the Agency’s 2006 Vision, Mission Statement, and goals. Potential modifications include:

- Include specific language on system preservation in objective 1.
- Include the concept of reliability in objective 1.
- Develop an objective that focuses on safety.



2006 PUBLIC OPINION SURVEY

In preparation for the 2008 Long Range Transportation Business Plan, VTTrans commissioned a public opinion survey in 2006 of Vermont residents regarding transportation issues. The summary report of the survey is available on line¹. The questions were designed to ascertain the preferences and priorities for transportation programs, projects, and services. In many cases, responses are compared to results from a similar survey conducted in 2000 to provide documentation on changing attitudes.

This section of the working paper compares the objectives of the 2002 plan to survey question responses and the analysis contained in the report. Many of the responses support the concepts contained in the three 2002 plan objectives, but some refinements are also suggested.

2002 Plan Objective 1: *Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.*

- Respondents were provided with a list of 14 transportation issues and the share of funds that each received in 2005. Respondents were asked whether each issue should receive a greater share, lesser share, or the same share of funds. Based on the responses to this question, bridge repair/replacement and summer highway road repair/repaving are the top issues that Vermonters feel should receive more funding. As noted above, objective 1 is consistent with the emphasis on maintaining the existing transportation system. The response to this question further supports a need to clarify system preservation within this objective.
- In addition, respondents favored an emphasis on maintaining existing highways rather than building new ones as the preferred means to prevent sprawl. Although this question, and its response, is less direct (it doesn't ask if system maintenance is a top priority relative to all other transportation strategies), it does suggest support for maintaining the existing system.
- Respondents were asked to rank eight issues generally considered important when thinking about the State's transportation system. Safety and security is identified as the most important issue. Because safety is grouped in this objective 1 with the concepts of capacity, flexibility, effectiveness, and efficiency, it does not receive the same emphasis suggested by the response to this survey question. The concept of security is not identified in any of the 2002 objectives.

¹ "Vermont Long Range Transportation Plan Survey Summary Report 2006"; Prepared by Wilbur Smith Associates for the Vermont Agency of Transportation
<http://www.aot.state.vt.us/Documents/VLRTPReport.pdf>



- The budget allocation suggested by respondents indicates support of greater funding for safety and security. This response further supports a stand alone objective for safety and inclusion of security.
- Objective 1 calls for managing capacity. Although capacity is a concept that applies to all modes, it is most often associated with the highway system (roadways and intersections). Traffic congestion is the most common measure used to assess highway capacity. The percentage of respondents statewide that reported experiencing congestion while traveling to work increased from 43% in 2000 to 50% in 2006. In the Burlington-centered region, 71% of respondents noted that they had experienced congestion¹. These responses suggest that capacity is a concept that should remain part of this objective.
- The idea that capacity should be managed is also consistent with survey responses. Management implies getting more from the existing system rather than building new capacity. More respondents suggested that the State concentrate on maintaining existing roadways rather than building new ones.
- None of the questions or responses suggests that flexibility should be included or removed. Nor is the concept of providing projects and services in an effective and efficient manner addressed by the survey (it is safe to assume that everyone agrees with the concepts of effectiveness and efficiency).

2002 Plan Objective 2: *Improve all modes of Vermont's transportation system to provide Vermonters with choices.*

The survey clearly indicates that the private automobile remains the dominant mode of travel for Vermonters. However, there are many responses to the 2006 survey that support the concept of providing multi-modal choices.

Responses to the survey indicate that 95% of Vermonters had traveled some distance in a vehicle on the previous day. The average distance traveled per day in a motor vehicle has increased 46% from 36 miles in 2000 to 52.5 in 2006. Local experience and observation also lead to the conclusion that the private automobile is the primary mode of transportation for most trip purposes in Vermont.

However, responses to the 2006 survey indicate significant portions of Vermonters use non-auto modes to some extent and that demand has increased since 2000. Of the non-auto modes in the State, use of air, bicycle and pedestrian facilities, ferries, and park and ride lots are the most significant. The 2006 survey indicates that:

¹ The Burlington-centered region includes all of Chittenden County, Grand Isle County, and Addison County.



- Vermonters spend as much time walking as they do driving. 80% of survey respondents reported spending time walking (61.9 minutes per day) and driving (70.4 minutes per day) on the previous day.
- 46% of all Vermont residents surveyed traveled round trip by air in the last year, compared to 37% in 2000.
- 28% had used bike lanes or road shoulders in the past year, compared to 15% in 2000. Vermonters are also using these facilities more frequently from an average of 19 times per year in 2000 to 43.8 times per year in 2006.
- 22% used park and ride lots at least once in the last year, compared to 15% in 2000; and
- 28% used the ferry service to cross Lake Champlain in the past year; although this share did not change significantly since 2000 (30%).

Smaller proportions of respondents used the remaining modes, and used them less frequently than those listed above. The other modes (and their proportional use by respondents) include taxis (14%), public transit bus service (12%), passenger train service (11%), intercity bus lines (11%), and special transportation services for senior citizens and the disabled (4%).

Public transit currently captures a small percentage of travel demand in the State. However, responses to the survey indicate that improvements to public transit service, both bus and rail, offer the greatest potential to reduce use of the personal automobile. The proposed budget allocation based on responses suggest that public transportation is the third priority for allocation of funds (tied with safety and security and following bridge maintenance and summer maintenance)

2002 Plan Objective 3: *Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life.*

- Responses to the survey support the concept of protecting and enhancing the quality of the natural environment. Respondents were asked to rank eight issues generally considered important when thinking about the State's transportation system. Environmental protection is the second most important issue (following safety/security as noted above). At the same time, 40% of survey respondents agreed that the natural environment in the state has deteriorated in recent years.
- There are questions in the survey related to quality of life. For example, only 4 percent of respondents felt that traffic congestion has a strong negative effect of their quality of life. The condition of roads and bridges may affect one's quality of life and some may feel urban sprawl affects quality of life. Regardless, none of these questions suggest more or less emphasis on quality of life.
- There are no specific questions related to using the transportation system to strengthen the economy.



FINDINGS AND RECOMMENDATIONS

In general, responses to the survey questions indicate support by Vermonters for the three plan objectives. The two concepts that stand out from the survey are preserving the existing system (objective 1) and improvement to all modes (objective 2). Survey responses do not suggest any changes to objectives 2 or 3.

The following modifications are suggested for objective 1:

- Include specific language on system preservation.
- Separate safety from objective 1 and include a separate objective for safety and security.

SAFETEA-LU PLANNING FACTORS

SAFETEA-LU¹ was passed in 2002 and states that: "...each State shall carry out a statewide transportation planning process that provides for consideration and implementation of projects, strategies, and services that will..." help achieve eight planning factors². The planning factors are listed in Table 1 (page 9).

SAFETEA-LU does not require that the planning factors be specifically articulated within the objectives, goals, or vision of a statewide long range transportation plan. Furthermore, failure to consider the planning factors is not reviewable by court "...in any matter affecting a statewide transportation plan, the transportation improvement program, a project or strategy, or the certification of a planning process."³

Despite these caveats, the SAFETEA-LU planning factors provide a check list of national issues that are reasonable to consider as part of updated plan objectives. Table 1 (page 9) compares each of the three 2002 plan objectives to the eight planning factors.

FINDINGS AND RECOMMENDATIONS

With the exception of security (Planning Factor C), the 2002 plan objectives address to some extent all of the planning factors. The following modifications are suggested:

- Provide a specific objective for safety and security
- Objective 2: Include the concept of connecting modes

¹ Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy of Users was passed in July 2005.

² Section 5304(d)(1) Scope of the Planning Process

³ Section 5304 (d)(2) Scope of the Planning Process



- Objective 3: Add the concepts of global competitiveness, productivity, and efficiency as they relate to transportation's role in strengthening the economy.
- Objective 3: Include energy conservation.



Table 1: Comparison of 2002 Long Range Plan Objectives to SAFETEA-LU Planning Factors

SAFETEA-LU Planning factor	Does VTrans 2002 Long Range Plan Objective Address the Planning Factor?		
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>
<i>(A) support the economic vitality of the United States, the States, non-metropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency</i>	Not applicable.	Not applicable.	Partially addressed. Consider adding the concepts of global competitiveness, productivity, and efficiency.
<i>(B) increase the safety of the transportation system for motorized and non-motorized users</i>	Partially addressed. Safety is included in this objective. As noted previously, safety should be a stand alone objective.	Not applicable.	Not applicable.
<i>(C) increase the security of the transportation system for motorized and non-motorized users</i>	Not addressed. Security is not addressed.	Not applicable.	Not applicable.
<i>(D) increase the accessibility and mobility of people and freight</i>	Addressed. Accessibility and mobility are provided through system management.	Addressed. Improving all modes and providing choices increases mobility and accessibility for all people and freight.	Not applicable.
<i>(E) protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development pattern</i>	Not applicable.	Not applicable.	Partially addressed. Energy conservation is not mentioned. Consistency with local planned growth and economic development patterns is a policy that should support this objective. It does not need to be included in the text of the objective.
<i>(F) enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight</i>	Not applicable.	Not addressed. This objective supports multi modes but does not emphasize connection between modes.	Not applicable.
<i>(G) promote efficient system management and operation</i>	Addressed.	Not applicable.	Not applicable.
<i>(H) emphasize the preservation of the existing transportation system</i>	Addressed.	Not applicable.	Not applicable.

MODAL POLICY PLANS GOALS

Since the publication of the 2002 Long Range Transportation Plan, modal policy plans have been updated by VTTrans to address air, bicycle and pedestrian, highways, public transit, and rail. The plans typically include goals, objectives, and policies, a profile of the existing system, issue identification, performance measures, recommendations and actions, and an implementation plan. An overview of the modal policy plans is provided in [Working Paper 1](#) and complete reports plans are available on the VTTrans web site at <http://www.aot.state.vt.us/planning/studies.htm>.

Tables 2-6 (pages 9-14) compare the goals of each policy plan to the three objectives of the 2002 Long Range Transportation Plan. The tables identify whether or not a policy plan goal is addressed by one or more of the 2002 plan objectives.

FINDINGS AND RECOMMENDATIONS

In general, the policy plan goals support all three objectives of the 2002 Plan. However, the following Policy Plan goals are not addressed in the 2002 Plan Goals:

- Using new technology to prepare for future transportation needs (Airport System Policy Plan). This goal is certainly applicable to all modes. It is arguably more appropriate as a policy and implementation strategy that supports larger objectives rather than an objective on its own.
- The Airport and Highway System Policy Plans include goals that encourage compact land use patterns. The Airport Policy Plan encourages appropriate land use around airports. The land use goal in the Highway System Policy Plan, to “...(s)upport and reinforce state policies for compact growth patterns” is much broader and is not addressed by the 2002 Long Range Plan objectives. The land use goal is discussed in more detail at the end of this working paper.

Table 2: Comparison of 2006 Airport Policy Plan Goals to 2002 Plan Objectives

Policy Plan Goal	Addressed in 2002 Plan Objective			Not Addressed in 2002 Objective
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>	
Be accessible and integrated with local, regional, and national transportation systems;			X	
Preserve and enhance existing airport infrastructure;	X			
Be safe and secure;	X			
Support economic activity;			X	
Use new technology to prepare for future transportation needs; and				X
Promote compatible land uses.				X

Table 3: Comparison of 2006 Public Transit Policy Plan Goals to 2002 Plan Objectives

Policy Plan Goal	Addressed in 2002 Plan Objective			Not Addressed in 2002 Objective
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>	
Basic mobility for persons who are dependent on public transportation;		X		
Access to employment;			X	
Congestion mitigation to preserve air quality and the sustainability of the highway network; and	X			
Advancement of economic development activities including service for workers and visitors that support the travel and tourism.			X	



Table 4: Comparison of 2006 Bicycle and Pedestrian Policy Plan Goals to 2002 Plan Objectives

Policy Plan Goal	2002 Plan Objective			Not Addressed in 2002 Objective
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>	
Cultural Environment. Enhance the human scale and livability of Vermont's communities by improving opportunities for pedestrian and bicycle activity in towns, downtowns, villages and rural landscapes.			X	
Economic Vitality. Enhance the economic vitality of Vermont by increasing economic development opportunities (e.g., create small businesses catering to pedestrian and bicycle needs, make commercial districts more attractive and accessible), providing greater transportation efficiency and choice, and improving tourism activities that are created by better pedestrian and bicycle transportation options.			X	
Health. Improve the health of Vermonters and reduce health care costs by making it easy and convenient for citizens to be more physically active by walking and bicycling on a regular basis.			X	
Natural Environment. Improve the environmental quality of Vermont by increasing the number of trips made by pedestrians and bicyclists and reducing pollutants emitted by motor vehicles.			X	
Safety. Improve and promote the safety of pedestrian and bicycle travel throughout the entire roadway, sidewalk, shared use path, and rail-trail system in Vermont.	X			
Transportation Choice. Enhance pedestrian and bicycle transportation options in Vermont so that citizens, regardless of location or socioeconomic status, can choose a convenient and comfortable mode that meets their needs. Ensure that the transportation system facilitates the ability for pedestrians and bicyclists to connect to other modes		X		



Table 5: Comparison of 2004 Highway System Policy Plan Goals to 2002 Plan Objectives

Policy Plan Goal	Addressed in 2002 Plan Objective			Not Addressed in 2002 Objective
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>	
Preservation				
Protect the existing investment in the highway network by keeping it in serviceable condition.	X			
Provide acceptably smooth and safe driving surfaces.	X			
Minimize the need to restrict or close bridges by maintaining their structural integrity in accordance with current and anticipated loadings.	X			
Negate the risks of structure failure.	X			
Minimize the life-cycle cost of maintaining acceptable condition levels.	X			
Safety				
Minimize the occurrence and severity of crashes on the highway network	X			
through application of appropriate, context sensitive design standards and cost-effective improvements to address high-accident or high-risk locations.	X		X	
Minimize conflicts between vehicles, pedestrians and bicycles.	X	X		
Mobility				
Maintain safe and efficient flow of traffic at acceptable speeds.	X			
Provide convenient interstate and intercity connections for passengers and freight.	X			
Support economic development consistent with established regional and local growth plans.			X	
Provide convenient connections to intermodal facilities.		X		
Environment/Quality of Life				
Support and reinforce state policies for compact growth patterns.				X
Manage undesirable impacts of truck traffic in downtown areas.			X	
Minimize negative environmental impacts of highways.			X	
Maintain existing air quality attainment status.			X	



Table 6: Comparison of 2006 Rail System Policy Plan Goals to 2002 Plan Objectives

Policy Plan Goal	Addressed in 2002 Plan Objective			Not Addressed in 2002 Objective
	<i>Manage the state's existing transportation system facilities to provide capacity, safety, and flexibility in the most effective and efficient manner.</i>	<i>Improve all modes of Vermont's transportation system to provide Vermonters with choices.</i>	<i>Strengthen the economy, protect and enhance the quality of the natural environment, and improve Vermonters' quality of life</i>	
Provide competitive freight and passenger service within the state and connections to the national rail system;		X	X	
Support Vermont's economy by providing rail access, as appropriate, to all areas of the state; ;			X	
Develop programs to assist in major rehabilitation projects and replacement of obsolete bridges, structures, and track required to maintain operations;	X			
Remove current weight and clearance restrictions, as appropriate, to enhance Vermont's competitive position within the industry;	X			
Strive to maintain the safest possible network of rail infrastructure and operations;	X			
Develop and maintain passenger stations and freight facilities to support efficient operation of the system and compatibility with the host community; and	X			
Maximize the use of rail system assets owned by the State for the fiscal and economic benefit of the State;.	X			



PROPOSED 2008 PLAN OBJECTIVES

The following additions and modifications to the 2002 plan objectives are recommended by the consultants based on the assessment of the 20006 Agency Vision, Mission Statement and Goals, the 2006 Public Opinion Survey, SAFETEA-LU, and the most recent modal policy plans (**bold face type** indicate additions):

1. **Provide a safe and secure transportation system.**
2. **Preserve the condition of and** manage ~~and~~ the state's existing transportation system to provide capacity, safety, ~~and~~ flexibility, **and reliability** in the most effective and efficient manner.
3. Improve **and connect** all modes of Vermont's transportation system to provide Vermonters with choices.
4. Strengthen the economy, protect and enhance the quality of the natural environment, **promote energy conservation**, and improve Vermonters' quality of life.

In addition to these modifications, the following fifth objective is recommended for consideration:

5. **Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.**

According to the 2006 public opinion survey, four out of ten Vermonters agree that VTTrans should take an active role in limiting urban sprawl, one-third disagree with the statement, and the remaining 28% are neutral. There has been a slight shift since 2000 towards support of a more active role by VTTrans. Despite the shift, feelings are strong on each side of the issue and there is a significant proportion of the public who remain neutral.

This objective is based on a goal articulated in the Vermont Planning and Development Act to "...plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside".¹ This goal is further supported by a sub-goal that "(p)ublic investments, including the construction or expansion of infrastructure, should reinforce the general character and planned growth patterns of the area".² This sub goal applies to the transportation system, infrastructure that is owned, and for the most part, financed by the public.

It also important to note that SAFETEA-LU planning factor E calls for plans that promote consistency between transportation improvements and state and local planned growth and economic development patterns.

¹ V.S.A. 24, Chapter 117 § 4302 (c)(1)

² V.S.A. 24, Chapter 117 § 4302 (c)(1) (A)



The desire to address transportation's affect on land use patterns by 40% of the state's population, and the SAFETEA-LU requirement that this issue be "considered" could be addressed without a specific planning objective. The 2002 plan addresses the issue by including an implementation strategy under Objective 3 to "...strive to develop transportation projects that adhere to the State's emerging Smart Growth policies"¹. This approach is acceptable but the 2008 update provides an opportunity to emphasize the significance of land use by recognizing it up-front as an objective.

23 MAY 2007 ADDENDUM

The following plan objectives reflect comments from the Internal Working Group, Executive Staff and Advisory Committee at various meetings in March and April:

1. Provide a safe and secure transportation system.
2. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability to move people and freight in the most effective and efficient manner.
3. Improve and connect all modes of Vermont's transportation system to provide choices for moving people and freight.
4. Strengthen the economy, protect and enhance the quality of the natural environment, facilitate energy conservation, and improve Vermonters' quality of life.
5. Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.

¹ Page 123, Vermont Long Range Transportation Plan, January 2002.





■ Documentation for:

**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 6: Scenario Development

■ Prepared for:

Vermont Agency of Transportation

23 May 2007

Draft

■ In Partnership with:

Snelling Center for Government
TransManagement
Center for Rural Studies
Hubert H. Humphrey Institute of Public Affairs

**VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 6: Scenario Development**

23 May 2007 Draft

TABLE OF CONTENTS

INTRODUCTION..... 1

WHAT IS A SCENARIO? 2

VT LRTBP WORKING PAPERS 2

VT BIG THINKER AND FOCUS GROUP INTERVIEWS..... 6

NATIONAL EXPERT PANEL INTERVIEWS..... 11

SCENARIOS..... 24

ATTACHMENT A – FOCUS GROUP MEETING PARTICIPANTS 35

ATTACHMENT B – FRAME ANALYSIS CODES 38

INTRODUCTION

The Vermont Agency of Transportation (VTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTrans maintains, operates, and builds the state's transportation system. The current plan was adopted in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, public transit and rail), transportation plans completed at the regional level, and public opinion surveys and outreach.

Long term plans are often used to identify needs for an assumed future condition. The challenge, of course, is to determine what that one future condition will be. This challenge is particularly difficult for transportation which is affected by numerous financial, demographic, economic, social, and even geopolitical factors and events.

This long range transportation business plan is different because it will be based on multiple future year scenarios. Objectives and strategies will be developed, with assistance from a broad range of stakeholders, to achieve the following (draft) goals under each scenario¹:

1. Provide a safe and secure transportation system.
2. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability to move people and freight in the most effective and efficient manner.
3. Improve and connect all modes of Vermont's transportation system to provide choices for moving people and freight.
4. Strengthen the economy, protect and enhance the quality of the natural environment, facilitate energy conservation, and improve Vermonters' quality of life.
5. Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.

This working paper, one of many being prepared in support of the plan², describes four future scenarios for presentation at the Scenario Planning Session.

The scenarios were prepared by the consultant team based on findings presented in Working Papers 1-4, interviews with national and VT big thinkers, focus groups held throughout the state, and input from the VTrans LRTBP Internal Working Group. This working paper summarizes the relevant

¹ See Working Paper 5 for a complete discussion of plan goals and how they relate to the VTrans agency goals of Safety, Excellence, Planning, and Preservation; the 2006 public opinion survey, SAFETEA-LU, and the VTrans modal policy plans.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

findings and driving factors identified through these efforts, and presents a matrix that describes the key elements and broad transportation implications of the preliminary scenarios.

WHAT IS A SCENARIO?

In land use and transportation planning, the term “scenario” often refers to different visions for a state, region, or town. For example, the Coalition for Utah’s Future completed a planning process called “Envision Utah”. It evaluated four alternative growth scenarios for the Greater Wasatch Area, surrounding Salt Lake City. Each scenario represented a different vision for how the region could grow. The scenarios were analyzed, results published, and a preferred growth scenario was selected with public input. People in the region made a decision about their future and will take actions to make it happen.

In the context of Vermont’s Long Range Transportation Business Plan, the term scenario means something different. VTTrans has a Vision and Mission Statement, and the five goals listed above already establish the transportation system’s role in supporting community and quality of life, economic opportunity, and environmental goals in the state. Vermonters have already defined the type of transportation system they need and desire.

We are interested in national and global events that may create obstacles to achieving these goals. This planning process is not about choosing Scenario A, B, or C. Rather than picking one definitive picture of the future and planning for that future, scenario planning enables stakeholders to consider various possibilities and identify policies that can adapt to changing circumstances. Scenarios do not describe a forecasted end state but rather are stories about future conditions that convey a range of possible outcomes.

Policies will be developed to help achieve the plan’s goals under a variety of scenarios. A scenario consists of a combination of different assumptions about driving factors, external to the transportation system, such as the aging of the population, energy prices and shifts in type of energy, land use patterns, and economic changes (manufacturing/agricultural to service / tourism / information for example).

The work completed to date on this plan has helped define the driving factors relevant to Vermont and is summarized below.

VT LRTBP WORKING PAPERS

This section summarizes the findings from Working Papers 1-4 that have helped define the preliminary scenarios.

Working Paper 1: State, Regional, and National Transportation Policy Review

Section 1.0 of Working Paper 1 summarizes modal policy plans related to aviation, highways, rail, public transit, and pedestrians and cyclists. Policy and goals are discussed and major issues and



recommendations are summarized. Brief summaries are also provided for other recent statewide transportation planning initiatives.

The purpose of scenario planning is to identify policies that help satisfy the five plan goals listed above if travel demand characteristics change in response to external factors. The policies and goals identified in the various modal policy plans may be modified as a result of the process. Therefore, the policy plans are not factors in developing the scenarios, but may be affected by the outcome of the scenario planning process.

Section 2.0 of Working Paper 1 presents a discussion on national trends in the transportation industry and how they relate to Vermont. The most significant issues include inadequacy of traditional funding sources and global changes in the delivery of freight. This section also discusses the affect on travel patterns related to changing demographics and the shift to a service economy, challenges to funding non-road modes of travel, and increasing congestion. The various requirements of SAFETEA-LU are woven through the discussion and new federal policies for planning, financing, and delivering projects are summarized.

The inadequacy of traditional funding sources is an issue that is incorporated into the preliminary scenarios and is also discussed further below (Working Paper 3-Financial Analysis). The affects of changing demographics and the shift to a service economy are included in the preliminary scenarios and are discussed further below (Working Paper 4-Demographics). The growing role of freight, (which is also related with the shift towards a service economy) is a current trend and is assumed as part of the “Business as Usual” scenario described below.

Working Paper 2: State Agency Issue Review

This working paper surveyed Vermont state government agencies and departments for information regarding transportation plans and policies that should be taken into account in the update of the VTrans Long Range Transportation Business Plan. It identifies gaps between the policies and plans of VTrans and other state agencies. Findings that have been incorporated into the preliminary scenarios include:

- Greenhouse gas emissions/internal combustion engine issues. Vermont’s largest source of green house gases is vehicle exhaust, which is directly related to transportation fuel consumption and vehicle miles traveled. The Department of Public Service (DPS) is currently updating Vermont’s Comprehensive Energy Plan. It will recommend strategies and policies that bear on transportation fuel consumption. The DPS has also been actively supporting a number of initiatives to promote alternative fuels in vehicles.
- Smart Growth - The principles and policies of “Smart Growth” have long been supported as goals within the Vermont Planning and Development Act. The recently enacted Growth Center



Bill supports implementation of Smart Growth by creating incentives for towns to locate new development in "growth centers", which must include either a designated downtown, village center, or new town center as a core area of dense development¹. The Growth Center Bill should entice more development to locate in traditional city and town centers and new growth centers. These policies may help curb sprawl, but the trend towards decentralization is likely to continue. The Business as Usual scenario therefore assumes that population dispersal continues. Other scenarios assume concentrated development occurs in response to other driving factors.

- Public Transportation - VTrans is charged with the responsibility for administering the Elders and Persons with Disabilities Transportation Program. In a 2006 "Analysis of Impediments to Fair Housing", by the Vermont Human Rights Commission, lack of public transportation is cited as one of nine impediments to fair housing. The challenges of providing comprehensive public transportation in a rural state are obvious and well known. There is clearly a funding gap. In the Business as Usual scenario, the challenges and funding gap will be exacerbated as the population ages and continues to disperse.
- Communications corridors and Information Technology - There is tremendous interest, coming from many directions, in the use of transportation corridors for fiber optic cable and other communications infrastructure. The Governor's goals for broadband and wireless coverage and access are presented in a "Strategic Vision and Business Plan for Job Creation and Economic Advancement" (January 2004). All of the scenarios assume that broadband and wireless coverage will be provided throughout the state.

Working Paper 3: Financial Analysis

This paper provides an overview of transportation funding in Vermont, describes federal and state sources of revenue, explains how transportation funds are spent, compares the costs of needs to revenue from 2006 to 2030, and identifies different options for funding transportation.

Two major findings that are accounted for in the preliminary scenarios are:

- Funding Gap. A cumulative funding gap from 2006-2030 of \$3-8 billion is projected (depending on assumptions about inflation). The projected gap assumes that the amount of revenue generated by motor vehicle fuel taxes will grow at a modest annual rate. However, if the current mechanism for generating revenue through motor vehicle fuel taxes remains unchanged, the amount of funds raised is likely to decrease as vehicles become more efficient and use of un-taxed alternative fuels and propulsion systems increases. Unless a different tax collection mechanism is initiated, perhaps one based on vehicle miles traveled, the gap would be larger than projected. Although the current taxing system has served the state and nation well in the past, many experts

¹ <http://www.dhca.state.vt.us/Planning/GrowthCenters.htm>



believe that it will soon require a major overhaul. The funding gap therefore assumes that the same amount of revenue would be generated, but the mechanism for collecting the funds would change.

- Devolution. Federal funds have been a crucial source of transportation revenues in Vermont. They contributed 40-45 percent of Vermont's transportation revenues in recent years. The balance is covered by state and local funds (approximately 50% and 5% respectively). Relative to the federal funds, Vermont is a "donee" state. For every dollar in federal gas tax collected in Vermont, the state receives about \$1.90 in return¹. The federal gas tax was originally established to fund national transportation initiatives such as the interstate system. Since large national transportation initiatives are largely completed, "donor" states now argue that their share should be related to the amount of monies they collect and contribute to the Highway Trust Fund. Some argue that each state should take care of their own needs with minimal financial and oversight involvement from the Federal government. This devolution of responsibility would result in a significant loss of revenues to Vermont and would widen the projected funding gap.

The paper recommends short and long-term strategies for addressing the projected funding gap. These strategies will be incorporated into the recommendations section of the LRTBP plan.

Working Paper 4 – Demographic and Employment Analysis and Projections.

This working paper documents historical trends in population and employment and provides projections for a twenty-year planning horizon (approximately 2030). The analysis helps to define the "Business as Usual" scenario. In other words, if the trends of the last twenty to thirty years continue, how many people will live in Vermont, how will the population be divided into different age groups, and how will Vermonters earn a living.

Key findings that define the Business as Usual scenario are:

- Slow to moderate population growth. Population change in the state has been equally affected by natural factors (birth and death rates) and by migration. Assuming these factors continue to affect growth similarly to current trends, Vermont's population will increase by about 17% between 2000 and 2030 (or from approximately 608,000 to 712,000 people). Birth and death rates are likely to remain stable, but changes in national and global migration patterns could affect this forecast and should be considered in different planning scenarios.
- Aging of the population. If current trends continue, by 2030, almost 174,000 people in the state will be over the age of 65. This age group's share of the total population will increase from 13% in 2000 to 24% in 2030. Vermont's population is projected to increase by approximately 104,000

¹ "Taking the High Road, A Metropolitan Agenda for Transportation Reform", Table 4-4, page 88; The Brookings Institution, 2005. Highway Trust Fund Account Receipts and Apportionments, by State, 1998-2003



persons between 2000 and 2030. Most of this increase, or 96,000, will be occurring in the 65 and older age cohort.

- Vermont's population is spreading out. Between 1960 and 2000, Vermont's population dispersed away from the traditional growth centers of 10,000 or more to communities of between 2,500 and 9,999 people. Vermonter's live and work in broader regions.
- Employment centralization. The vast majority (more than 75%) of Vermont towns experienced net exporting of workers during the day in both 1990 and 2000. This suggests that, even though people are living in dispersed patterns, jobs remain more centrally located.
- Shift to a service based economy. In 1980, the service sector represented 24% of the workforce and. By 2030, service sector employment will likely represent 43% of the total workforce. The second leading employment sector is retail trade. Manufacturing jobs in Vermont are expected to continue declining. Farm employment will drop only slightly, probably due to the growth of the agricultural specialty products.
- Positive general economic outlook. The general economic outlook for Vermont through 2010 is positive, with overall macroeconomic benchmarks expected to post moderate gains during the period. The Business as Usual scenario assumes this positive outlook continues through 2030.
- Continued dominance of the automobile. Current trends point towards continued dominance of the automobile. There were fewer Vermont households without an automobile in 2000 than in 1980 (total numbers and as a percentage). There was also a decrease in the percentage of households with one vehicle. The number of households with two vehicles and with three or more vehicles increased significantly. Driving alone accounts for 76% of the journey to work. Dispersion of the population, combined with regional centers of employment and services, create longer trips that encourage, and for the most part rely on, the availability and use of an automobile.

VT BIG THINKER AND FOCUS GROUP INTERVIEWS

The Snelling Center conducted six focus groups and several individual interviews with "VT Big Thinkers". The purpose was to engage in a conversation with transportation stakeholders about their expected and desired views for the future and to seek their input on driving factors that should be considered as scenarios are developed.

Focus groups were organized into three broad issue areas and three general geographic areas of the state as follows:

- Issue-based focus groups
 - Group 1: Large business/Economic Interests/Heavy transportation users



- Group 2: Environment/Energy/Land Use
- Group 3: Human Services/Passenger Transportation
- Geographical Locations
 - White River Junction
 - Bennington
 - Franklin County/Chittenden County

A complete list of focus group meeting participants is included in Attachment A.

The following VT Big Thinkers were interviewed:

- **Kathy Hoyt:** Former Chief of Staff and Administration Secretary, Gov.'s Dean and Kunin. retired, lives in Norwich, on Green Mountain Power Board of Directors.
- **Paul Bruhn:** Preservation Trust of Vermont. Active in many issues in Vermont particularly around preserving village centers. Member of Vermont Transportation Authority. Lives in South Burlington.
- **Tom Evlsin:** Former Secretary of Transportation under Snelling. Lives in Stowe, commutes to work in NYC. Works in technology and telecommunications.
- **Bill Stenger:** President, Jay Peak Resort. Also chair of Next Generation Commission.
- **Piet (Pete) Van Loon:** Marlboro College. Long-time member of Windham Regional Planning Commission. Lives in southern Vermont.

To consistency between the different meetings, the questions listed below were used during the VT Big Thinker interviews and focus groups. The questions provided launching pads for the interviewees. Once the questions were poised, each meeting followed different lines of discussion driven by the attendees. The VT Big Thinker interviews, which were held in advance of the focus groups, provided a means to test the questions and start developing themes for further exploration in focus groups.

Meeting Questions

1. Can you give me a brief description of your work, interests, participation in and around transportation issues in Vermont?
2. What do you see as the most important issues facing our transportation system now and as you look into the future (defined very generally to include all of the infrastructure and services that enhance mobility)?
3. What do you see as the future of the transportation system 20- 25 years from now?



4. There is a number of what might be called “drivers” that could influence Vermont’s transportation future. I’d like to ask you to discuss how you think they may influence Vermont’s future and/or what you see as that future.
 - Demographic changes, that is the so-called aging of Vermont (fact)
 - Energy issues related potentially to less available oil (or more expensive)
 - Environmental issues related to the environmental impacts of transportation
 - Economic issues
 - Political and policy issues around transportation
5. What is your vision of what the transportation system should look like 20-25 years from now?

ANALYSIS

The interviews and focus groups generated an enormous amount of qualitative data, resulting in almost 150 pages of transcripts. A qualitative research technique called frame analysis was used to identify common thoughts and comments that were combined together into frames to organize the data around alternative scenarios and expressed preferences for the future.

The method involved reading through the transcripts and identifying individual thought elements. A thought element is a specific comment or idea, and several may be contained in one statement. For example, an interviewee may have said that “public transit is important but it will be difficult to fund and hard for Vermonters to leave their car”. This statement includes three thought elements: “transit is important”, “funding is a challenge”, and “Vermonters depend on their cars”.

Common thought elements were then grouped into a list of 29 codes (see Attachment B for a list and description of each code). The codes were then grouped to define an overall frame. This method allows the researcher to organize the data into categories for discussion and presentation. The method is also transparent to outside readers so that anyone can read through the codes to understand how the frames were derived.

After reviewing the transcripts, the Snelling Center identified approximately 410 instances where comments or statements were made relative to Vermont’s future and how it may evolve or change. These thought elements were grouped into the codes listed in Attachment B. Table 1 shows how these thought elements have been organized into three alternative futures (frames) related to Slow Change, Aging Vermont, and Energy Collapse.

Table 1: Organization of Thought Elements into Frames

Frame (Scenario)	Comments Related to Frame	Percent of Total
Slow Change	180	44%
Aging Vermont	83	20%



Energy Collapse	150	36%
Total	413	100%

Additional explanation of these frames is provided below. The explanation also includes potential policy implications.

Slow Change

Vermont in 25 years will look a lot like it does now. The population will grow slowly. Our transportation systems will be similar to what we have. As a rural state we will continue to be very dependent on individual cars and trucks to get around and to deliver our goods and services. There will be some public transportation for the bigger areas. Most of us will drive to work and to pick up the kids just as we do today. Tourism will continue to be an important part of the state's economy and tourists will continue to rely on the existing road network. The road network we have today is generally in pretty good shape but will need continued investment.

Policy suggestions

- Maintenance first
- Some new capacity but generally ensure what we have works before new investments
- Some public transportation investment
- Some rail, maintain air

Aging Vermont (Internal Change)

Vermont is getting older fast and that will have a sharp impact on our transportation future. In twenty years all of the population growth will come from people older than 65. Aging Vermonters will be increasingly isolated in rural areas without public transportation options. To enable people to "age in place" will require different transportation investments. In addition, internal investment in telecommunications will also facilitate more people living in rural areas without reducing their transportation needs.

Policy suggestions

- Public transportation investments

Energy Collapse (External Change)

The future will look very different. One big difference will be a sharp decline in gas-powered vehicles. Factors outside of Vermont and outside of our control will have a major impact on the state's transportation future. The world is getting warmer; CO₂ from vehicle emissions is a major



contributor. We will have to reduce our car-caused CO2 emissions. Secondly, oil reserves have peaked or are close to peaking and our future will be a world without cheap oil. While automobiles may still exist they will run largely on different fuels. Regardless of how they are propelled or fueled, vehicles are a source of many problems from the gobbling up of land in transportation related sprawl to lack of community connections, physical exercise and the obesity epidemic.

Policy suggestions

- Public transportation
- Alt-fueled vehicles
- Downtown development

Other Observations

Comments from the interviews and focus group meetings has also been analyzed to describe the importance of different modes (Table 2) and to identify opportunities and obstacles (Table 3).

- Public transportation was the highest mentioned mode.
- Respondents were dismayed about some of the obstacles to change and slightly more pessimistic than optimistic about the opportunities for change.

Table 2: Modes Mentioned as Important

Modes	Number of Related Comments	Percent of Total
Important - Public transit	95	44%
Important - Non-motorized transport	33	15%
Important - Rail service	43	20%
Important - Roads	38	18%
Important - Air service	7	3%
TOTAL	216	100%

Table 3: Opportunities and Obstacles

OPPORTUNITY & OBSTACLES	Number of Related Comments	Percent of Total
Opportunity - Education and communications	20	6%
Opportunity - Time for change	77	24%



Opportunity - Vermont Characteristics	37	12%
Obstacle - Decision-making process	38	12%
Obstacle - Funding and Laws	95	30%
Obstacle - Small Rural state	49	16%
TOTAL	316	100%

NATIONAL EXPERT PANEL INTERVIEWS

Sarah Campbell from TransManagement conducted interviews with five individuals to gather their insights on the national and global issues that may affect demand for transportation services, financing, and the transportation system. The group includes individuals with broad management and analytical experience in transit, roads and highways, non-motorized transportation, toll roads, and rail. Several of these individuals have run state departments of transportations (DOTs). In addition, experts in economics, finance, energy and land use and transportation policy are represented.

A summary of each interview is presented below. Each person interviewed was given a brief summary of current issues and trends affecting the state based on findings from Working Papers 1-4 and the 2006 public opinion survey. They were asked to react to the current conditions and trends and then were invited to identify areas that may result in changing conditions for use in developing the scenarios. The conversation often spilled over into solutions and opportunities and those comments are presented as well and will be useful as policies and strategies are developed following the scenario planning session.

If there was one phrase that best summarizes the interviews with national experts, it would be: "Demographic and economic indicators for New England states are cause for concern in the mid and longer term and transportation investments must do their part to support changing economic, environment, and energy realities."

INTERVIEW 1: CARRIE CONAWAY

Carrie Conaway is the deputy director of the New England Public Policy Center, a unit of the Boston Federal Reserve. In this capacity Carrie fills three primary roles: external communications, policy analysis, and organizational development.

Overall, Conaway sees energy policy and global warming as two key areas where events are likely to occur that may have big impacts and/or be hard to predict. The interplay of the state's demographics and economic factors with these issues are important to future transportation needs.



Reaction to Current Trends and Issues

Ms. Conaway agreed with the basic trends outlined in the background material. She was not previously aware of how dependent Vermont was on federal funding for transportation and noted the low state GDP as an indicator of difficulty for the state in substituting or enhancing that funding. She pointed out that a number of other trends have important implications for the state in re-thinking any policy or funding. The growing cohort of aging population and the relatively low proportion of youth she thought were particularly important and had implications for the transportation system now and in the future.

With regard to population trends and migration of the population, Conaway offered the services of her Center to track migration of the population from county to county and within, as part of a project the Center has to look at migration patterns in New England. Upon request they could develop more detail for selected counties.

The Center is watching energy trends in New England carefully. Conaway saw the growing VMT/capita rate as running counter to Vermont's energy policy and to the Regional Greenhouse Gas Initiative (RGGI) that has been endorsed by Vermont's Governor. (Currently the RGGI is focused only on electricity.) She pointed out that the pattern of increasing population dispersal is a trend that makes reducing energy use more difficult and increases green house gas emissions.

Areas of Focus for Future Change

There are a number of events that could disrupt energy supplies for Vermont, especially in the area of electrical generation. She underscored that with only two sources of electrical energy, state policy concerning Vermont Yankee is very important. The aging nuclear plant is due for decommissioning soon, and analysts at the Center have heard references again to shutting it down. As the supplier of one-third of Vermont's energy, this action would put pressure on other types of energy supplies as substitutes. It would also make commitments under the RGGI extremely difficult and costly to meet, rather than a more gradual transition, leading to economic capacity issues.

The Center has concern for the fractured structure of local governments in New England in general. The Center has done a policy piece identifying all the relevant research and will be doing more work on this in the future. Conaway is not familiar with organizations for transportation at the state and local level, but noted that changes, such as devolving more responsibility to townships, could be problematic in part due to the tax burden that exists today.

Given the relatively slow economic growth of the state and some of the other indicators noted above, Conaway believes that the state's capacity to take on new and, even maintain current, funding could be challenged by other program demands. She suggested that both reform of school finance and health care could be program areas that grow and thus take priority for limited funds.



Environmental regulation was another area she suggested we keep on our list of events that may affect agency priorities in the future, such as the possibility of non-attainment for Clean Air.

The Federal Reserve is looking warily at global warming due to many possible effects and unknowns that can change economic circumstances for New England states, as well as impact the transportation system. For example, extremes of weather may cause flooding, which would increase the importance of methods to reduce and contain run-off from roads. It should be assumed that policies at the state and federal level may try to reduce vehicle emissions, but so far efforts like the RGGI have not done so.

Finally, she thought with so much of Vermont's economy dependent on small business and entrepreneurs that the role of information technology as a means of communication and possible substitute for some transportation was important to consider. However, she was not familiar with Vermont's policies on such things as right-of-way sharing etc, or the outlook for New England as a whole.

Summary of Events to Watch

- The trend to the population spreading out that leaves Vermont dependent on single occupant vehicles.
- Changes in supply and cost of energy that would increase pressure on households with high vehicle miles traveled rates
- Demands for growth in other programs that compete with transportation for limited state resources
- Potential role of information technology
- State and Federal response to green house gas reduction needs and potential impact on transportation and energy use
- State and Federal environmental policies that are evolving in response to a variety of environmental concerns, particularly global warming
- Delicate balance between the state economy and state program needs, especially with the possible changing role of the federal government.

INTERVIEW 2: ANNE CANBY

Anne Canby heads the Surface Transportation Policy Partnership (STPP). She is a nationally recognized leader in the field of transportation, having served in many senior policy roles at the state and federal level over more than two decades. These include: Secretary of both Delaware and New Jersey department of transportations, Deputy Assistant Secretary of Budget and Programs at US DOT, and Treasurer of the Massachusetts Bay Transportation Authority (MBTA). In the late 1980's,

Resource Systems Group, Inc.; Snelling Center for Government; TransManagement; Center for Rural Studies; Hubert H. Humphrey Institute



as an independent transportation consultant, she developed a new organizational structure for the Vermont Agency of Transportation. She recently served as chair of Council A of the Transportation Research Board and was honored at the 2007 annual meeting as the recipient of the Crum award for career endeavors.

Generally, she believes that change is coming to transportation delivery due to financial demands and changes in other sectors, notably environment and energy. She believes that traditionally Vermont has been better prepared to be innovative in land use and conservation and probably will need to be more so in the future. She believes that institutional capacity to adapt to change needs to be carefully considered.

Reaction to Current Trends and Issues

Canby noted that Vermont's aging population and the trend of population dispersal combine to create inefficient transportation patterns, an increasingly important transportation issue for the future. She was not surprised at continued growth in VMT given the dispersal pattern and lack of alternatives.

She pointed out that increasing energy cost is difficult to absorb in relatively modest family incomes and with relatively high state and local taxes. The small population base and relatively high tax rate limit some of the strategies in looking for more revenues for transportation that other states might consider. For example, local tax levies for increased transit may be harder, especially with the number of small and medium sized villages and townships involved that are very reliant on the property tax.

She underscored the importance of vehicle emissions in green house gas formation in the state and the difficulty of devising strategies to address this factor in the face of population dispersal and growing VMT. She pointed out that states with larger populations, and thus markets, could enact fuel and vehicle requirements to limit emissions, but that Vermont did not have the market strength to affect change in this way. Alternative strategies could include the various demand reduction methods that would reduce VMT per capita, such as carpool and van pool, improved intercity transit (to reduce air travel dependence) and visitor transportation strategies. (It may also create an incentive to work with other NE states to establish a market.)

Areas of Focus for Future Change

She discussed the following areas as promising:

- The dispersal of population has increased vehicle miles traveled and encouraged longer commuting. The predominance of small and medium-sized communities in this trend and the tendency for greater work at home also present opportunities to support walkable communities and other low-cost transportation solutions.



- To support the small business entrepreneur, who can work and live “locally” or at home, the state needs to ensure full Information Technology (IT) capability to enable them to compete in the global economy. This is good economic and transportation policy.
- She was interested in the costs of transportation and other energy use relative to household income. She saw the large number of Vermonters who work at home and essentially do not commute as an important factor in considering future strategies.

Canby sees three national policy areas as important to future transportation options in the state:

- Energy independence
- Greenhouse gas emissions (GHG)
- Transportation finance

Changes in national policy in these areas are likely, although the extent and timing of change is uncertain. These factors interact with the trends of aging and population dispersal and with each other. She felt that credible scenarios could be built accounting for the complex interactions among the policies and demographics by considering strategies that would: a) reduce energy use per capita, and b) reduce green house gasses per capita.

In developing strategies, she believes VTTrans should recognize that the federal/state/local partnership in transportation is changing. Vermont as a small state with a relatively high rate of taxation should watch these developments carefully, as it is more likely to be hurt if federal support for surface transportation stagnates or declines. However, she feels that this change in institutional roles is not all bad. For example, she believes generally that more local responsibility for transportation finance would encourage local governments to consider carefully the transportation implications of development decisions.

Canby suggested working on incentives for the state to use in encouraging locals to support walkable communities and paratransit.

She also noted that Vermont needed to consider rail freight and passenger investments in the mix of strategies to reduce GHG, given the impact of aviation and the role it appears to play in Vermont¹. She has no reason, however, to believe that national policy on rail will change much.

Summary of Events to Watch:

- Change in federal finance role through action or inaction;
- New environmental policies due to GHG, energy cost and/or energy independence;

¹ According the survey, air travel has increased by 7% since 2000.



- Importance of these changes and the projected demographics on household costs and quality of life.

INTERVIEW 3: LEW FELDSTEIN

Lew Feldstein is president of the New Hampshire Charitable Foundation and served as chairman of the panel that wrote the next 10-year transportation plan for New Hampshire completed in 2006. The 24 person committee included representatives from the health care industry, children's-services providers, environmentalists, transportation providers, and business promoters, among others. He is also a member of the New England Futures, an alliance of leaders in the six states seeking to advance strategies to arrest the decline of the New England economy and population. In 2000, he co-authored *Better Together* with Robert Putnam, describing the decline of social capital and the urgent need for increased civic engagement.

Feldstein views transportation as an important lever in managing long-term growth and economic development. His experience, however, leads him to see transportation planners as too narrowly focused to realize this potential. He sees institutional change across functional and state lines as important to meeting the challenges of the future.

Reaction to Current Trends and Issues

Feldstein sees the trends of aging and spreading out as common to the two states and as important issues for planning. He points out that the New Hampshire's economic and overall population growth levels differ from Vermont and have resulted in more immediate development pressure than in other parts of the region. However the loss of 24 to 45 year olds and the increasing dominance of the older cohorts is a compelling issue in both states, which implies different transportation needs in the future and different economic prospects. (Latest Census figures show New Hampshire has lost 17 percent of the 24-45 age group.) This trend makes New England generally less attractive to potential employers.

He is very concerned about the effects of spreading out of development on families and communities. Feldstein points to research identifying some of the impacts of more time spent in auto travel, especially long commutes: "every 10 minutes in a car, reduces every aspect of civic activity" from voting to time with the boy scouts.

Areas of Focus for Future Change

Feldstein sees institutional change as essential in making transportation a more positive contributor to a healthy state in terms of both community and economy. The New Hampshire plan explicitly states that the Department needs partners to achieve success. "Unless we change the way we do business," the plan warns, "our transportation network will not be able to serve future growth. Absent cooperative action at all levels of government, as a state we may be forced to choose between



either (1) keeping our present system safe but increasingly congested, or (2) addressing congestion at the expense of system maintenance and preservation needs. Both of these choices are unacceptable.”

The plan stresses the need for better integration of community concerns in transportation planning and proposes five early action items to improve linkage between transportation and the needs and values of the community and state economy:

- Coordinate social service transportation
- Improve process for transportation design
- Establish commuter rail from Lowell to Nashua
- Make relative reallocation of transportation resources among new, rehabilitation, and safety improvements
- Address needs for after-school transportation

As an engaged participant in the New England Futures project, Feldstein is interested in cooperation not just within his own state, but across New England. He is concerned that the six states lack institutions that effectively advocate for improving conditions within the region. For example, New England governors meet only sporadically and have a small staff (1/2 person) as compared to the Western Governors, with strong research and advocacy staff to support an aggressive, common agenda.

In considering how the future might look, Feldstein emphasized the recent work of the New England Futures and subsequently sent the publication: *New England: New Century, New Game*. The document describes trends in population, income, education, health, environment, economics and development, as well as transportation. Following are some key observations relevant to the Vermont plan:

- Graying of New England
- Declining educational preparedness - of 100 9th graders in New England, 77 will graduate from high school, 52 will enter college, and 29 will get either an associate or a bachelors degree. Vermont's rates are much lower.
- Shortage of graduates particularly in fields of engineering, science, and IT
- Population loss for the majority of New England states, although Vermont had a small gain between 1990 and 2000
- High cost of living and taxation – local property tax makes up 45% of all locally derived, public revenues in US as compared to 70% in Vermont, 89% in NH, and 54% in Maine (lowest among six states) This limits response to possible declining role of federal government in surface transportation.



- Growing poverty even in areas with strong job concentrations (White River Vermont was cited) linked to educational issues
- Sprawling development impacting traditional towns and villages
- Growing evidence of climate change in New England – total precipitation increased 12% and growing season increased by 8 days between 1900 and 2000, while snowfall declined 35% between 1970 and 2000.
- Poorly maintained roads and bridges, deteriorating rail system, lack of modern deepwater port and generally poor connections to the rest of the Country including “global economy dynamo – New York City.

Summary of Events to Watch:

1. Increased need for institutions to work across lines and form new institutional arrangements in the face of difficult demographics and economic realities;
2. Recognize need for preservation and better use of the system, but this requires broader knowledge of need than traditional transportation plans; and
3. New England, particularly, can not afford to pay for transportation for its own sake; it must be part of the bigger picture.

INTERVIEW 4: TOM DOWNS

Tom Downs is president and chief executive officer of the Eno Transportation Foundation in Washington, DC. A nationally recognized leader in transportation policy, Downs has led two state transportation agencies and served in senior policy and management positions in other transportation organizations and several cities. At New Jersey DOT he also served as chair of NJ Transit. As city administrator and director of transportation for the District of Columbia during the 1980s, he is especially proud of his role in overseeing the restoration of Union Station. From 1993 to 1998, Downs was chairman and chief executive officer of Amtrak. Before coming to the Eno Foundation, he served as Director of the University of Maryland's National Center for Smart Growth. He is a White House Fellow, a fellow of the National Academy of Public Administration and serves on the Board of the National Building Museum.

Downs sees the potential decline in federal surface transportation funding as an important issue for Vermont requiring a careful strategy with other similarly-impacted states. On the other hand, he saw one other “national issue” as less important for the state than for highly urban states: congestion. He underscored the importance of the continuing impact of the aging of the population on transportation needs and plans.



Reaction to Current Trends and Issues

The graying of the population combined with the national trend for aging in place is a double whammy for Vermont. This will create many transportation challenges – and they are coming soon.

The dispersal of the population is another negative. Downs would have liked to see more information on jobs access, such as major jobs locations versus population settlement patterns. How much of new job growth is where? And, how much may be in other states, such as southern NH. This detail is important to both understanding the problem and crafting effective solutions.

He questioned the large increase in VMT suggested by the survey information. He assumes, given the dispersal, that VMT had to increase, but not just as much as the survey data suggested. (The latest Working Paper indicates a significant fall off in the rate, but still an increase.)

He noted that the Journey to Work information, particularly the chart from the survey on “Transportation Services Used”, showed a strong interest in non-motorized vehicle travel (at least in some seasons) that should be paid attention to in future strategies. However, he also pointed to the very high use of air travel versus local public and intercity train and bus as challenging to public transit strategies.

Downs was interested in the large proportion of people who do not work in a formal workplace, because it implies a large telecommuting and home/farm based population. (This factor also was drawn from the survey.) He sees this as a positive factor for the state and for future transportation strategies. Downs also questioned how much internet access there was statewide to support this activity.

Regarding transportation conditions, he wanted to ensure that we separated out pavement condition from obsolescence factors in considering needs and strategies. He thought that the decline in rail freight was an indication of freight isolation that could be costly to Vermont in the future, given the growing importance of global trade both for getting supplies and for maintaining whatever manufacturing and good production remains. Also, that relying on roads for all freight would be costly to road preservation and impact main streets.

He was interested that the survey data showed a sizeable core of respondents still interested in environmental improvement and open to options to SOV.

Areas of Focus for Future Change

Federal policy on financing transportation is at a cross roads; it is unclear how much we can rely on the old funding mechanisms given the competition for money. Overall, there is no compelling vision for a national role in transportation any longer. The emphasis on road pricing and debt is not inspiring politicians to want to vote for unwanted taxes. Vermont probably has few corridors that fit the new paradigm of road pricing. However, he pointed out that most privatized sales and leases which are being talked about require substantial tolls in a relative short period of time, which are hard



for a squeezed electorate paying higher gas taxes to absorb. When asked to make a guess about the near-term, he speculated that the politics probably were there for about a nickel increase or status-quo for a few years. He urged the state to push for maximum flexibility in whatever funds will be available.

Downs believes that demography is destiny, and it should not be ignored. Aging implies many things for transportation, including the need for design changes to aide slower reflexes etc. However, that is not a negative; an ITE evaluation on graphics placement and reflectivity found that all drivers benefited from these reasonably low-priced improvements. (Like curb cuts helping people with baby carriages and luggage.) The land use changes and transit investments are more complicated.

He also thought that environmental policy and energy policy would play a large role in transportation of the future.

He encouraged consideration of rail improvements to maintain access to the main line system. He suggested we look at the rail provisions in SAFETEA-LU and partnerships with adjoining states.

One advantage in Vermont he felt was independent spirit that might make people more open to a variety of smaller scale improvements that could be implemented relatively inexpensively. Also many of the problems are not out of scale and are potentially subject to less massive solutions. Some of the ones discussed were:

- Support for telecommuting given the core that exists;
- Development of paratransit, especially tied to employers. This makes showing job location of primary employers by region in the plan important. He pointed out you could use commuter tax benefits for van pools if there is a reliable payer.
- Support as many people biking and walking to local destinations as possible;
- Why not improve the intercity bus/rail linkages and service similar to Maine; and
- Incentives for hybrids and other energy efficient options.

Like Canby, Downs thought the state/local relationship in most states needed to be improved and some responsibilities adjusted. (He acknowledged he did not know of the Vermont situation such as the RPCs, etc.) He suggested the New Jersey model called “Communities of Place”. Here counties have to show how transportation investment will maximize community building and transportation efficiency, rather than supporting sprawl development. The result has been more investments in linking modes, walkable communities, and paratransit. (New Jersey is now so burdened with debt that there is no money for new facilities. As a result, planning is now focused on preservation and overall community improvement.)



Summary of Events to Watch

- Impact of key demographic changes on transportation needs;
- Changing Federal finance policy that emphasizes road pricing does not advantage the state;
- Importance of fine tuning strategies that increase efficiency;
- Consider New England Futures material and possible alliances that might develop; and
- Re-look at state and local relationships in light of potential changes on the horizon.

INTERVIEW 5: MATTHEW COOGAN

Matthew Coogan is director of the newly-established New England Transportation Institute housed at the White River Junction train station. Coogan has spent most of the last 15 years as a consultant in transportation, specializing in the development and application of mobility strategies in intermodal and multimodal transportation programs. He is a nationally recognized expert in intermodal planning principles, regulations and procedures, specializing in the deployment of new transportation technology under those procedures. Previously, he was Undersecretary of Transportation of the Commonwealth of Massachusetts and served in a variety of positions at the Boston Redevelopment Authority. He has lectured on transportation issues throughout the United States, and in Europe and Asia and has been featured in such publications as: *Engineering News Record*, *The New York Times*, *Bloomberg News Service*, *The Wall Street Journal* and *The Washington Post*, and has appeared on The Today Show, CBS News and National Public Radio.

Overall, he sees information about services and improved connections between different types of transportation services as important to addressing some of the key trends. He believes these are strategic investments for the state to make, rather than trying to marginally support everyone.

Reaction to Current Trends and Issues

Coogan views the graying of Vermont as connected with decentralization of the population. He noted that the cohort of persons over 65 is growing fast and they seem to want to locate in beautiful rural areas.

He suggested that the state will not be able financially to support this disperse location with viable paratransit service when people reach the age they should not drive. Instead, he thinks the state should spend limited dollars in supporting and encouraging more central living locations, which can be supported by certain transit and other services: “Reinforce places where infrastructure can meet the need.”



Areas of Focus for Future Change

Coogan sees a growing interest in intermodal (freight) and multi-modal (passenger) connections around the Country. He believes that there are a number of areas where Vermont is working to improve modal connections, but that there are also areas where more improvements could be made that would improve future mobility. Many of these are relatively low cost investments primarily in the form of information.

One area he thinks the state is making headway is in supporting additional intercity bus connections and stops. As Coogan sees it, the intercity bus industry in Vermont has evolved from a multi-node network to a point-to-point express system, in particular Montreal to Boston. In this type of system, frequent stops are not scheduled. However, he notes the state has managed to support additional stops and connections in partnership with some of the regional agencies and Vermont Transit. For the next generation of services, Coogan thinks that much could be learned about the latent demand for this service and how to make the most effective investments by connecting the information systems for Vermont bus and the rail (Amtrak) system to see what markets users attempt to connect. Another multi-modal connection that Coogan would like to see is a direct road link between I-89 and the Burlington airport, as well as better signage to the airport and other traveler destinations.

He suggested two examples for improved intercity linkages as possible models from which to draw: New Hampshire's park and ride bus system and Concord and Portland stations with coordinated bus/train service to Boston. In these cases, the traveler is much advantaged by active collaboration between public and private organizations. The first example is not unusual in that it is primarily park and ride facilities. It is the extent and quality of the facilities and the effort to inform the public about them that gives them an edge over the traditional lots. The extensive Park and Ride system is managed by NH DOT, with links to both local transit and regional bus service as well as to providing support for carpool/vanpool. (There may be some local town and transit management as well, rather than all uniform.)

In the second example, Concord Trailways and Amtrak, with support from the states involved, have worked out cooperative ticketing along the Downeaster line to Boston: each honors the other's tickets giving passengers much more access to service. The Portland, ME station is both the bus and train station with local transit, taxi and shuttles to key destinations like the airport. Concord station offers the same conveniences but without the rail connection. However, they have closely coordinated schedules (8-10 per day) with Amtrak's service from Boston's South station.

Regarding federal funding, he focused on the aviation system and noted that he expected to see continuing funding for the traditional system: "they seem to do all right whatever the circumstances." He pointed out, however, that expansion at the smaller airports is totally dependent on Congress and he did not want to predict, except to note that the House chair had some common interests.



Summary of Events to Watch:

- Growing need for, and ability to provide, high-quality information about available services;
- Use of the response to the information to identify high pay-off investments; and
- Need to match up the limited housing investments the state can make in the coming years with infrastructure to increase the number of people who can be offered good quality transportation.



SCENARIOS

The consultant team exchanged ideas electronically and met twice to review and discuss the findings presented above and to brainstorm ideas for scenarios. Through these discussions, seven potential scenarios emerged. The seven options were discussed with the VTTrans Internal Working Group and were further refined and consolidated into the four scenarios listed below.

BUSINESS AS USUAL SCENARIO

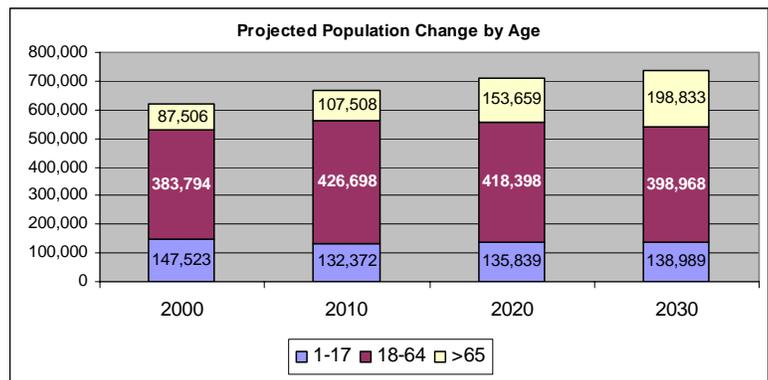
Vermont’s population is older, but the state feels and looks very similar to today. The state’s total population grows slowly and ages as the number of people over 65 more than doubles (Figure 1). Population and housing continue to decentralize into rural and suburban areas while growth in established cities and villages occurs at a slower place. Work force and affordable housing is located on less expensive land away from employment centers. Daily activities occur in regions where work, errands, education, recreation and entertainment are carried out in multiple towns. As a result, Vermonters remain very dependent on personal cars and trucks to get around and to deliver goods and services.

The economy grows slowly and is increasingly dominated by service sector jobs. Employment in the service sector accounts for three-quarters of the job growth between 2000 and 2030 while the number of manufacturing jobs decreases. Statewide broadband and wireless service support growth in the service sector economy and also create more at-home businesses. The number of jobs in the state grows faster than the population as more people continue to work beyond the traditional retirement age.

The supply and cost of oil and gas are volatile and Vermonters respond by purchasing more fuel efficient vehicles. However, this scenario assumes that oil remains available, is the primary source of energy for the transportation system, and that Vermonters continue to depend on their personal vehicles for daily activities.

On the environmental front, this scenario assumes that none of the air borne pollutants in Vermont exceeds the National Ambient Air Quality Standards (NAAQS). The recent weather trends of

Figure 1: Projected Population Change in VT - US Census



This projection is based on current trends. It shows slow change in VT’s overall population while the number of people over the age of 65 is expected to double. See Working Paper 4 for additional demographic information.



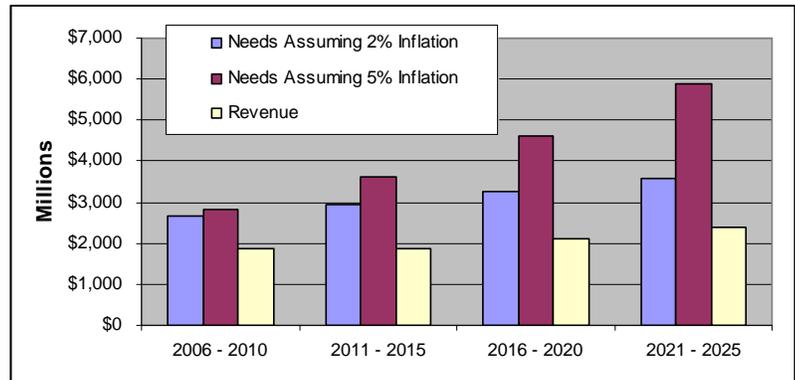
frequent and heavy rain, ice storms and high winds continue but do not intensify more than what has been experienced in recent years. These events require some short-term/emergency fixes (for example, a temporary bridge becomes necessary when the abutment for an old bridge is undermined), accelerate to some degree the deterioration of roadways, bridges, and culverts, and more frequently overburden stormwater management systems.

Transportation funding is a challenge in Vermont.

Transportation revenues have not kept pace with inflation. After taking care of the basic maintenance needs of existing roads, bridges and transit systems, there is not much money left to pay for new facilities and services (Figure 2). There is growing pressure for municipalities to fund projects and services and more competition for less state and federal funds. On the national

level, states that contribute more funds through the federal gas tax than they receive back (donee states), advocate for a “go it alone” approach to transportation funding. Each state, they argue, should be responsible for funding its transportation system with minimal federal participation. In Vermont, that means additional loss of revenue and widening of the funding gap.

Figure 2: VT's Projected Transportation Funding Gap



This chart shows the gap between projected revenue and the cost of transportation needs. See Working Paper 3 for a complete financial analysis.

ENVIRONMENTAL CHANGE SCENARIO

This scenario assumes that certain air borne pollutants exceed national air quality standards established to protect public health and Vermont becomes warmer and wetter due to climate change. The same basic demographic and economic trends, land use patterns, and funding challenges as described under the Business as Usual Scenario are assumed.

As required by the Clean Air Act (CAA), the EPA set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants. The criteria pollutants are generated by the transportation system (mobile sources) and stationary sources such as homes, non-residential buildings, and power plants (point sources). Non-attainment status is designated for a geographic area, (usually a county, metropolitan area, or state) when at least one of the criteria pollutants measured in the field exceed its standard.



Currently, there are no documented NAAQS violations in Vermont; but this status has not always been the case. Non-attainment status was assigned in Vermont during the 1970s related to particulate matter (small particles in the air). The violation was eliminated by implementing methods that reduced roadway dust and through technical improvements that reduced tail pipe emissions. There have not been any documented violations in Vermont since the mid 1980s.

In the context of a long range transportation plan, it is reasonable to plan for a scenario where Vermont falls into non-attainment. Non-attainment could occur because the air quality worsens or due to a regulatory or legislative action that revises the NAAQS (which has occurred several times).

It is not hard to imagine the first case, where air quality in Vermont becomes worse. Vermont is currently part of the Ozone Transport Region (OTR), which was established by the 1990 CAA to address ozone across the northeast region of the United States from New England to northern Virginia (Figure 3)². Ozone is a pollutant that can be created in one area and transported to another and is often referred to as smog. The OTR was established to develop a regional and coordinated solution to reducing ozone. In Vermont, the level of ozone is close to but does not currently exceed the standard. Changes throughout the northeast USA could result in increased ozone levels in Vermont resulting in violation of the NAAQS.

Being designated as a non-attainment area will make transportation planning and the development of projects and services more complex. It will be necessary to demonstrate how projects and services conform to a state implementation plan designed to address air quality problems. More importantly, poor air quality would have public health and quality of life implications, would threaten Vermont's clean environment "brand" important to tourism and business recruitment, and may hinder economic development activities.

Figure 3: Ozone Non-Attainment Areas as of December 2006¹



This map shows Vermont relative to the ozone non-attainment areas in the surrounding northeast states. The Environmental Change Scenario assumes that Vermont will also be in non-attainment.

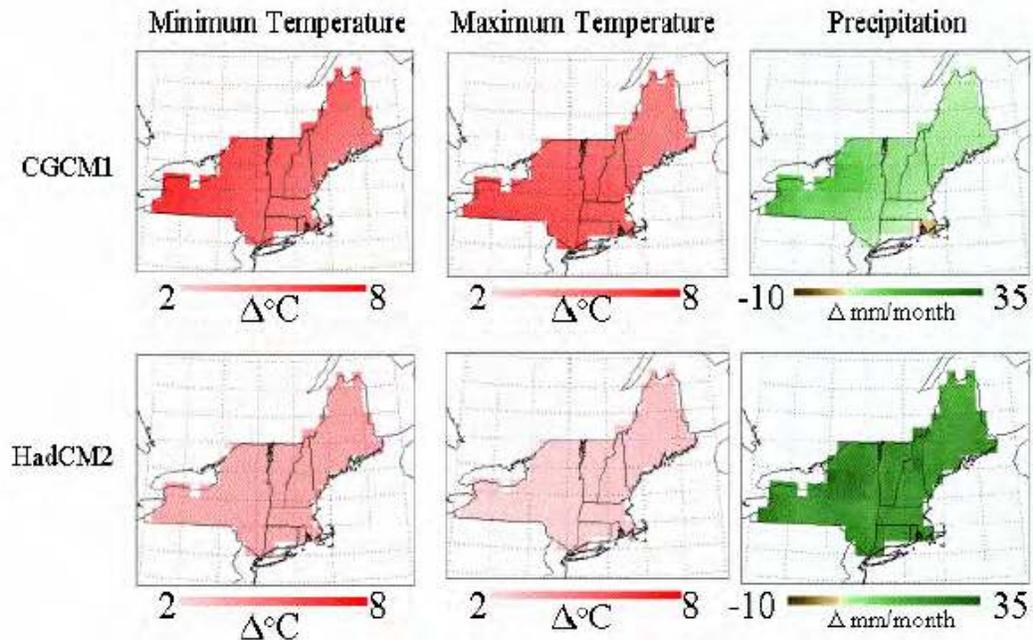
¹ Map generated using map tools available from EPA at <http://www.epa.gov/air/data/reports.html>

² The Ozone Transport Region includes all 6 New England States, New York, New Jersey Delaware, Maryland, and the Washington, D.C. area including the northern Virginia suburbs.



In addition to poor air quality, this scenario assumes that Vermont's climate will become warmer and wetter as described in the New England Regional Climate Variability and Change Assessment (Figure 4). The assessment analyzes how global climate change may affect New England and is a source of information for Governor Douglas's Commission on Climate Change. Two climate models referenced in the assessment predict an increase in New England's average annual minimum temperature of 6-10 degrees Fahrenheit and an increase in precipitation of 10-30% over the next century.

Figure 4: Forecasted Change in Temperatures and Precipitation by 2100¹



This graphic shows the best approximation of forecasted change in temperature and precipitation in New England using two different climate models. The Environmental Change Scenario assumes these forecasts are correct and Vermont becomes warmer and wetter.

These changes have two implications directly related to transportation. First, warmer temperatures promote the creation of smog (ozone) which would accelerate Vermont's fall into non-attainment. Second, storms will become more frequent and intense. As noted in Vermont's 2004 Hazard Mitigation Plan, warmer temperatures will likely increase the frequency and severity of flood inundation, erosion along rivers and streams, and landslide hazards. Vermont's roadway and rail networks were constructed near or along rivers, in flood prone areas, or in narrow, steep valleys

¹ "The New England Regional Assessment" available at <http://www.necci.sr.unh.edu/2001-NERA-Foundation-Doc.html>.



making them particularly vulnerable to floods. With global warming, more funds and resources will be necessary than currently anticipated (Business as Usual Scenario) to preserve and upgrade the transportation system's basic infrastructure: culverts, drainage and stormwater systems, and bridges; and to make emergency repairs that keep roadways open after severe weather events.

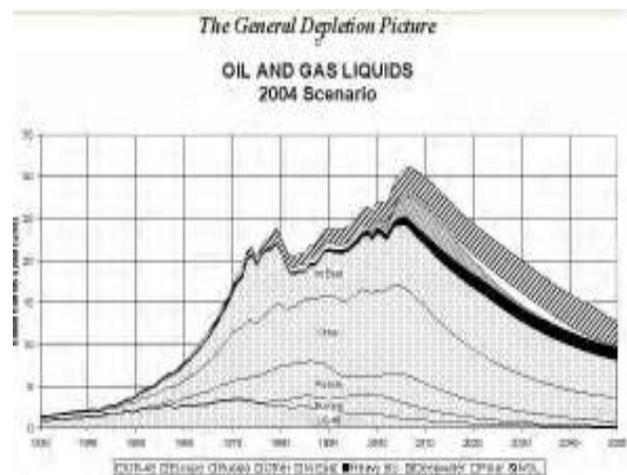
The potential impacts of climate change go well beyond the transportation system and include risks to human health due to increased levels of air pollution, encroachment of southern insects (like the deer tick) and tree diseases, and the loss of maples and other hardwood trees to pine and oak. With a changing forest and warmer weather, Vermont will be a different place and the economy may also be affected. The greatest economic impacts are in the human health sector and in the tourism sector, where a dull foliage season and less snow would reduce Vermont's attraction as a tourist destination during the fall and winter.

ENERGY CRUNCH SCENARIO

The global supply of oil peaks or is interrupted for other reasons (Figure 5). There is a permanent and significant rise in the cost of crude oil which over time causes gas prices to more than triple. In addition, Vermont Yankee, which provides 30% of the state's electricity, is decommissioned and a replacement source that provides electricity at a similar cost has not yet been secured. As a result, electricity is more expensive and not competitive as an energy source for electric or hybrid vehicles that need to charge batteries over night.

During the early years of the energy crunch, the jump in fuel costs for transportation squeezes Vermont families that earn the median income or less (Figure 6). The cost is greater for people with homes located further away from jobs, services, and other activities because they need to drive longer distances. These homes were initially more affordable than similar sized houses in town, even when

Figure 5: One Estimate of Future Declining Oil and Gas Supply¹



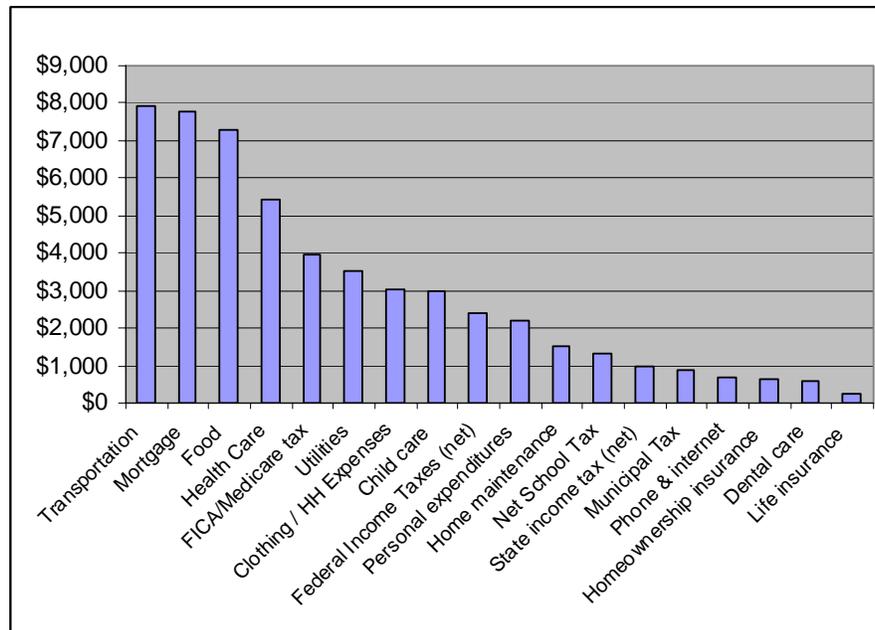
This chart shows one estimate of how oil and gas production could begin decreasing sometime after the year 2010. Assuming this analysis is correct, what policies and strategies should be incorporated into the VT LRTBP?

¹ From www.peakoil.com



transportation costs were considered. As the supply of oil drops, gasoline costs double and then triple. Rising transportation costs generate demand for more in-town housing. In the long term, these market forces reverse the trends of the last forty years and established cities, villages and growth centers are growing faster than rural areas.

Figure 6: 2006 Annual Household Expenses



This chart shows the annual expenses for a hypothetical household in VT with two adults and one child in 2006¹. They earn the median income and own a home that was purchased at the median price in 2000. Note that transportation costs are slightly more than the mortgage. If gas prices triple, their transportation costs will increase by about \$240 a month (\$2,880 per year).

Higher cost oil, gas and electricity make Vermont less attractive to new businesses and existing businesses begin to consider out-of-state locations with lower cost, and more reliable energy sources. High fuel costs also increase the cost for goods movement by truck and have resulted in a rail renaissance. Over the years, the state upgraded its priority rail lines to handle heavier and double stacked cars at higher speeds and the railroads have expanded the types of services they offer. Businesses located near the rail line were able to take advantage of the new services but most businesses in the state remain dependent on trucks for shipping and receiving.

¹ Based on data presented in "Vermont Household Affordability Analysis"; Douglas Hoffer and Paul Cillo; Public Assets Institute; October 2006. Available at <http://www.publicassets.org/publications/>



GROWTH SCENARIO

This scenario assumes that employment and population growth occur above the rate described in the Business as Usual Scenario. The additional growth occurs due to the establishment of major employers in two different regions of the state and a statewide increase in in-migration.

The employment growth occurs in two “hot spots” creating spin-off jobs and demand for new housing in the host regions. For the sake of the scenario planning exercise, the employment hot spots are assumed to be a manufacturing facility in the US 7 corridor south of Rutland and a high technology/information based company near Saint Johnsbury. Each facility is assumed to create 2,000 new jobs by 2030. (The locations, types of businesses and employment levels have been selected for the purpose of this exercise and do not reflect any known or anticipated development projects.)

This type of hot spot growth has occurred in the past and it is reasonable to think broadly about how to prepare for similar types of growth in the future. There are many examples of this type of hot spot economic growth in the state created by home grown businesses and out-of-state companies that choose to locate here. Although it is larger than the hypothetical examples in this scenario, the IBM facility in Essex Junction has been an economic force in and beyond Chittenden County for 50 years. Other examples include Ben and Jerry’s with facilities in many locations, Green Mountain Coffee Roasters in Waterbury, IDX in South Burlington, and C. & S. Wholesale Grocers in Brattleboro.

In addition to the hot spot growth, this scenario also assumes that the state’s total population will increase beyond current trends as more people choose to move into Vermont. During the 1990s through 2005, Vermont’s population change has been equally affected by the differences between birth and death rates (natural causes) and net in-migration. However, the contribution of natural causes and migration has varied significantly over the last 50 years (Figure 8). It is conceivable that national or global events could result in an increase in in-migration and the state’s population would grow more than current trends suggest.

Like the hot spot economic growth, changes in in-migration have occurred in the past and it is reasonable to plan for the same type of event for the future. During the 1950s, Vermont experienced a net out-migration of almost 40,000 people. High birth rates off-set the difference resulting in a

Figure 7: A Recent Growth Hot Spot

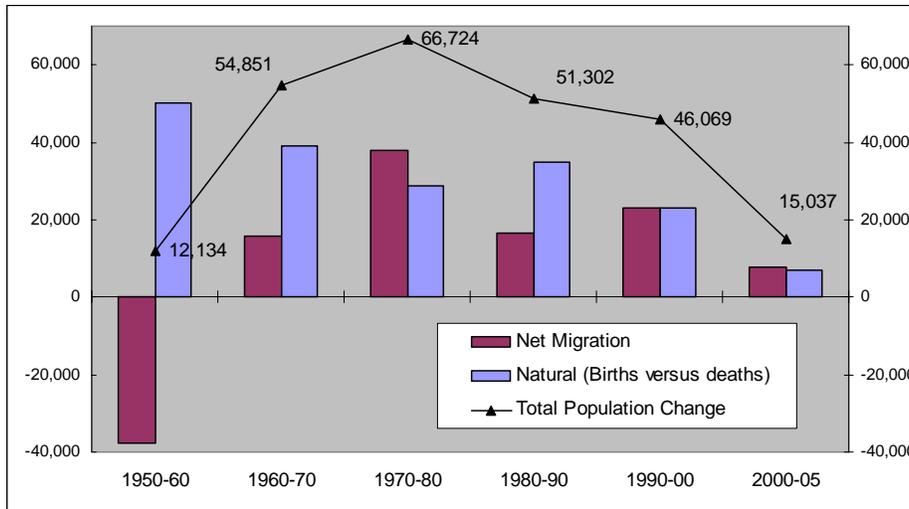


The Husky Injection Molding facility in Milton is a recent example of a growth hot spot. As noted on the Husky web site, “Vermont was chosen because of the area’s high standard of living and its close proximity to major transportation hubs in Montreal, New York and Boston.”



small increase in population. By the 1970s there was a significant change and a net in-migration accounted for more of the state’s population growth than natural causes. The in-migration of the 1970s affected two decades of population growth as those that moved into the state began to have children presumably resulting in the increased birth rates in the 1980s that are implied in Figure 8.

Figure 8: Components of VT’s Population Change from 1950 to 2005



This chart shows how natural causes (difference between births and deaths) and migration patterns have contributed to overall population change in Vermont. Note the large increase in in-migration in the 1970s followed by an increase in natural population growth in the 1980s. The growth scenario assumes that in-migration similar to the 1970s occurs again resulting in two decades of faster population growth.

It is generally accepted that a significant portion of the 1970s in-migration was due to a cultural change on the national level that could not have been anticipated in prior decades. It brought more young people into the state and affected Vermont’s own culture and economy in many ways. The Business as Usual Scenario assumes that current trends continue, the youth drain affecting all of New England occurs in Vermont, and the population becomes older. In the Growth Scenario, the opposite is assumed. Hot spot employment growth occurs and young people migrate into the state, grow their families and contribute to the economy in creative ways yet to be conceived.

SCENARIO DESCRIPTION TABLE

Each scenario is described in Table 4 using brief statements and broad observations. The table is organized as follows:

- **Scenario Name.** Same as above



- **Event or Primary Driving Factor.** Briefly describes the key event or change in driving factor that defines the scenario.
- **How other Driving Factors are Affected.** This section of the table describes how the primary event or driving factor could affect all other driving factors (listed in the general categories of land use/development, demographics, economy, etc). As scenarios were developed, it became clear that there are many interrelationships between the various driving factors. For example, the Migration Change scenario could result in additional land use decentralization and could also drive economic growth. The general areas of land use/development and economy are driving factors on their own. But in this example they change in response to the primary driving factor of migration. These columns are also the building blocks that help describe the scenario. They provide a framework for thinking about how a particular scenario could be modified or refined.
- **Transportation Implications.** This section begins to identify how a scenario affects transportation demand and the transportation system. This assessment is a key outcome of the analysis. Participants at the scenario planning session will be asked if these implications are consistent with the goals of the Long Range Transportation Business. If not, what policies, actions, and strategies should be put in place to address the issues or take advantages of any opportunities generated by the circumstances of a scenario?
- **General Comments and Other Implications.** This section identifies issues beyond transportation for consideration.



Table 4: Scenario Description Matrix

Scenario	Event or Primary Driving Factor	How other Driving Factors are Affected						Transportation Implications	
		Demographics	Land Use and Development	Economy	Energy	Environment	Technology		Transp. Funding
Business as Usual	Current trends continue. Vermont in 2030 looks very similar to today.	<ul style="list-style-type: none"> Low population growth Migration and natural causes are equal share of population change Doubling of people over the age of 65 and aging in place Youth drain 	<ul style="list-style-type: none"> Regional Communities Decentralization continues although some seniors may choose to locate closer to services Separation of housing from jobs and services 	<ul style="list-style-type: none"> Growth in service sector jobs Slow economic growth High cost of housing Traditional small entrepreneurs remain important part of state's economy 	<ul style="list-style-type: none"> Volatile energy costs and fossil fuel supply, but oil remains available. 	<ul style="list-style-type: none"> Stay within air quality attainment Degradation of scenic qualities, due to decentralization, which are major quality of life and tourism assets 	<ul style="list-style-type: none"> Single occupant vehicles remain dominant mode of personal transportation. Broad band and wireless access provided throughout the state 	<ul style="list-style-type: none"> \$3-8 billion funding gap 2006-2030. More reliance on state and local generated revenues Funding gap intensifies competition for funds between different modes and regions of the state. 	<ul style="list-style-type: none"> More older drivers: Safety concerns, Increased demand for transit and special transportation services combined with Land Use Dispersion could = Isolation Travel demand keeps pace with population and employment growth More regional travel on state highways Continued SOV dominance More truck traffic More delivery trucks to support internet economy Will be demand to improve and invest in system to support economic development, but less funds to do so.
Environmental Change	Vermont becomes a non-attainment area VT becomes warmer and wetter due to climate change	<ul style="list-style-type: none"> Same as Business as Usual 	<ul style="list-style-type: none"> More emphasis on concentrated development as a strategy to address non-attainment and Green House Gas reduction, but Market forces continue to favor decentralization. 	<ul style="list-style-type: none"> Generally the same as Business as Usual, but Perceived or actual cost increases for economic development on initial implementation 	<ul style="list-style-type: none"> More emphasis on alternative fuels to address non-attainment and Green House Gas reduction 	<ul style="list-style-type: none"> Negative health impacts Negative impact on water quality with more run-off due to storm intensity 	<ul style="list-style-type: none"> Same as Business as Usual 	<ul style="list-style-type: none"> Gap may increase due to increased needs from weather impacts and project development complexities. 	<ul style="list-style-type: none"> Must reduce total VMT and VMT/household, setting in motion new strategies for bicycling and walking, ridesharing, paratransit, transit, more compact development requirements; Funds for highway capacity restricted Shifts in air and rail transport with concomitant state investments. Some events such as increased major rainfall might effect transportation design.
Energy Crunch	Oil supply declines or international / security event restricts fuel supplies; De-commissioning Vermont Yankee	<ul style="list-style-type: none"> Population grows even slower, or declines due to slower economy. 	<ul style="list-style-type: none"> Market forces begin to encourage more growth in established cities, villages and growth centers 	<ul style="list-style-type: none"> Big economic negative impact in short term at least on both households and businesses Energy prices increase making VT less affordable to establish new or grow existing business 	<ul style="list-style-type: none"> Electricity less cost effective as source for transportation Vermonters become more energy independent using local resources 	<ul style="list-style-type: none"> Might cause use of domestic energy sources (wood) short-term that have larger environmental effects Less fossil fuel consumption combined with less travel means less impact on all aspects of environment 	<ul style="list-style-type: none"> Should stimulate technology innovations and more institutional collaboration to achieve long term improvement 	<ul style="list-style-type: none"> Same funding gap as Business as Usual Significant state and local financial implications beyond transportation. 	<ul style="list-style-type: none"> Increase in cost and need for substitution in construction and maintenance materials and in operations for VTRANS; Long term shift in agency priorities; similar strategies for provision of transportation, but need for more personal and business strategies for transportation such as carpooling/paratransit. Impacts on air travel and costs.

Scenario	Event or Primary Driving Factor	How other Driving Factors are Affected						Transportation Implications	
		Demographics	Land Use and Development	Economy	Energy	Environment	Technology		Transp. Funding
Hot Spot Growth and Migration Change	<p>Job growth occurs in two hot spots (St. Johnsbury and Rutland for example).</p> <p>Event occurs, either globally, or in nearby major metropolitan areas that causes significant increase in in-migration</p>	<ul style="list-style-type: none"> ▪ Population increases much faster than anticipated in first 5 years after event ▪ More younger people move to VT with growing families that fuel continued population growth into next generation ▪ Population growth occurs around new employment hot spot 	<ul style="list-style-type: none"> ▪ Sprawl around new growth hot spot ▪ Decentralization continues in rest of state 	<ul style="list-style-type: none"> ▪ Employment growth in hot spot ▪ Overall economy also grows in response to in-migration. Businesses may be started by people moving to VT. (Also depends on how other systems like education respond.) 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Some potential to generate funds through tax increment finance or impact fees around growth hot spots. ▪ These options could address capacity needs near hot spot, but would not address overall funding gap. • Some additional revenue generated through growth, but significant gap remains. 	<ul style="list-style-type: none"> ▪ Demand to improve/expand system in and around hot spot ▪ If location is rural and remote, will be challenging to provide non-auto modes.



ATTACHMENT A – FOCUS GROUP MEETING PARTICIPANTS

FOCUS GROUP ATTENDEES

Focus Group 1: Human Services/Passenger Transportation:

Richard Watts Facilitator

- Paul Wallace-Brodeur, Medicaid Program
- Pat Crocker, Executive Director, VPTA
- Nancy Schulz, Executive Director Vermont Bicycle and Pedestrian Coalition
- Jennifer Wallace-Brodeur, AARP
- Chris Cole, General Manager, CCTA and GMTA
- Kathy Voyer, Agency of Human Services

Focus Group 2: Energy, Environment and Land Use

Held on January 17, 2007; Richard Watts Facilitator

In Attendance:

- Sandy Levine, CLF
- Mark Lorenzo, National Wildlife Federation (NWF)
- Suzanne Kelley, Dept of Health
- Paul Burns, VPIRG
- Carl Etnier, Vermont Peak Oil Network
- Brian Shupe, Forum on Sprawl
- Beth Humstone

Bennington County Region Focus Group - January 16, 2007

Richard Watts Facilitator

- Keith Squires, the public works manager for the town of Dorset
- Lisa Stark, Bennington County Regional Planning Commission planning staff
- Donna Baker, Green Mountain Community Network (transit provider)
- Dick Pembroke, former chair House transportation Committee
- Lodie Colvin, Bennington Selectboard

- Brian Knight, Hildene, and BRP commissioner
- Robert Stannard, Better Bennington Community Group
- Dan Monks, town planner Bennington
- Jim Sullivan, Bennington County Regional Planning commission staff

Franklin County - Monday, January 29, 2007

- Nancy Patch, works in local forestry industry
- Perry Cooper, engineer (retired, also is 76)
- Tim Smith, Franklin County Industrial Group
- Bill Rose, NWRPC
- Dick Thompson, town administrator Swanton
- Dave Schofield, owns a few local businesses, an internet company that markets nutritional products
- Ruth Wallman, Director Grande Isle Chamber of Commerce
- John Roy, Alburgh Public Works, farmer
- Jim Tomnlinson, Selectboard in Richford,

Windsor County - Tuesday, January 30, 2007

- Mr. Wally Elton, Director, Upper Valley Trails Alliance
- Mr. Clay Adams, Chief Operating Officer, Resource Systems Group
- Mr. David Goudy, Director, Montshire Museum of Science
- Mr. Cary Hollingsworth, Owner Ardmore Inn; President, Benchmark Inns of Woodstock
- Former Senator Matt Dunne
- Ms. Ellen Terie, Owner, Shepherd's Hill Farm
- Mr. Mike Pomeroy, Owner, Thetford / West Fairlee General Stores
- Ms. Jill Kearney, Director, Norwich Recreation
- Mr. Chuck Wise, Transportation Planner

Heavy Transportation Users - Wednesday, January 31, 2007

- Rebecca Towne, Green Mountain Power



- John O'Kane, IBM
- Erik Bohm, OMYA
- Keith White, Champlain Oil Company
- Rob Hirss, St. Albans Coop
- Peter McDermott, McDermott Trucking



ATTACHMENT B – FRAME ANALYSIS CODES**FRAME ANALYSIS CODES***Table 5: Codes*

Codes	Number of Related Thought Elements	Percent of All Thought Elements
1) Cars - Alt fueled vehicles	22	3%
2) Cars - Promote alternatives	10	1%
3) Cars and Trucks -- Vermont very dependent	39	6%
4) Fix it first	76	11%
5) Important - Aging Population	24	4%
6) Important - Air service	5	1%
7) Important - Environment - Climate change	16	2%
8) Important - Environment - General	11	2%
9) Important - Environment - Sprawl	13	2%
10) Important - Fuel prices and Supply	20	3%
11) Important - Police and safety issues	7	1%
12) Important - Public transit	46	7%
13) Important - Rail service	28	4%
14) Important - Road infrastructure	19	3%
15) Important - Technology	41	6%
16) Important - Tourism	24	4%
17) Important - Transportation General	10	1%
18) Important- Non-motorized transport	25	4%
20) Obstacle - adequate funding	23	3%
21) Obstacle - Decision-making process	74	11%
22) Obstacle - Funding for public transit	19	3%
23) Obstacle - Small Rural state	15	2%
24) Obstacle-federal funds and rules	9	1%
25) Opportunity - Education and communications	16	2%
26) Opportunity - give people options	7	1%
27) Opportunity - Time for change	58	8%
28) Opportunity -- Vermont Characteristics	19	3%
29) Roads -- New projects needed	7	1%
TOTAL	683	100%

Table 6: Organization of Codes into Frames

Frame: Energy Collapse		Number of Related Thought Elements	Percent of All Thought Elements
Codes	Cars - Alt fueled vehicles	22	5%
	Cars - Promote alternatives	10	2%
	Important - Environment - Climate change	16	4%
	Important - Environment - Sprawl	13	3%
	Important - Fuel prices and Supply	20	5%
	Important - Environment - General	11	3%
	Opportunity - Time for change	58	14%
Thought Elements Related to Energy Collapse		150	36%
Frame: Aging Vermont		Number of Related Thought Elements	Percent of All Thought Elements
Codes	Important - Aging Population	24	6%
	Important - Technology	41	10%
	Obstacle - Funding for public transit	19	5%
Thought Elements Related to Aging		84	20%
Frame: Slow Change		Number of Related Thought Elements	Percent of All Thought Elements
Codes	Fix it first	76	18%
	Cars and Trucks -- Vermont very dependent	39	9%
	Roads -- New projects needed	7	2%
	Important - Road infrastructure	19	5%
	Important - Transportation General	10	2%
	Important - Tourism	24	6%
	Important - Police and safety issues	7	2%
Thought Elements Related to Slow Change		182	44%
Total Thought Elements Related to Future Changes		416	100%



CODE DESCRIPTIONS

1) Cars - Alt fueled vehicles

Any mention of alt fueled vehicles as an alternative to present vehicles, systems. Includes hybrids, bio-diesel.

Vermont has a role or not.

Some skeptics about the success if competing with food.

Or that its a diversion to reducing car use (enviros).

And some of the challenges to running on alternative fuels, i.e. cars & trucks getting heavier.

2) Cars - Promote alternatives

The key thing we have to do is promote/invest in alternatives to the car, (implied is the SOV).

Alternatives could include public transit, but when dominant thought is creating alternatives to the car, coded here. If dominant thought is public transit, coded as "Important - Public transit."

One reason is the aging population, another might be energy use or climate change. While those have their own codes to identify them, coded here if creating alternatives raised.

Reduce VMT as key thing that must be done.

3) Cars and Trucks -- Vermont very dependent

Vermonters very dependent on cars. Rural state etc.

This is linked to the "existing roads are important" thought element as both stress reliance on way the existing system.

Generally not negative, either positive or neutral on existing network and dependence -- the way it is.

However, some do see the over-dependence on cars as a problem i.e. congestion. (Stronger statements about climate change coded elsewhere?)

Some of the challenges faced by commuters, and the challenge commuters place on the state (extra driving).

Increases in commuting.



Why people have to commute (areas with work too expensive to live) The benefits of NOT commuting

Having to live further away from their jobs.

And cars drive too fast. Dependent on them but they negatively impact quality of life in villages, speed.

Traffic and congestion issues, commuter traffic--adverse effects of traffic (not positive statements about)

Various concerns about trucks on Vermont roads....Somewhat negative but understanding Vermont very dependent on trucks. Included also some suggestions for changing roads trucks run on (more interstate), but again they are dependent on the existing system.

Trucks as a source of revenue for towns or for the state (1).

4) Fix it first

Maintain what we have first before building new roads. Any reference to maintain first before building new contained in this code.

Or references to agency effort to promote the fix it first effort (i.e. Paul Bruhn comments).

Also, for environmental reasons fixing it first.

And statements about how existing infrastructure is aging when tied to need to be maintained. Implicit therefore is the need to fix what have when mention aging infrastructure.

Can be emphasis on bridges, or roads, but on existing infrastructure over new.

Can also be about fixing existing transit, rail systems over investing in new (most public transit/rail coded separately).

New roads and new systems are coded elsewhere.

Reducing use, using less energy, i.e. conservation included.

Can't pay for what exists today implies a fix it first code when suggested.

Make system more efficient, because talking about existing system...Not new roads.

Support for trucks hauling more (?) on existing roads which can handle them.



References to sustainable policy (2).

Concept that when towns do it locally they can do it better. more efficiently.

Building new roads difficult, because of environmental issues, permitting etc, long term implications etc.

Building new roads have aesthetic implications - which can be a problem.

Folded in the difficulty of building new roads which some see as a problem (Evslin) while others may cite this as a reason to focus on fix it first.

Opposition to circ highway sometimes coded in here when in the context of not being able to afford what we have before building new.

5) Important - Aging Population

Code is about how the aging population in effects the transportation system.

Older people isolated without transportation systems.

Will require more recreational transportation systems as many will be active seniors.

Need more emphasis on safety on sidewalks for example, therefore with older people

Where housing is located and its relationship to transportation systems.

Transportation needs for Medicare recipients are growing.

Want to enable people to "age in place" requires certain types of transportation systems. And supports connections to their community.

6) Important - Air service

Air service and airports listed as an important issue.

7) Important - Environment - Climate change

Impact on environment, climate change caused by transportation.

Raising the issue of climate change related to (caused by) transportation.

How climate change may force the need for different transportation systems and planning.

Possible overlap with "Car - Promote Alternatives" but in this case emphasis on raising the connection between transportation and climate change.



8) Important - Environment - General

General reference to impacts of transportation systems and vehicles on the environment.

Includes air quality, forest fragmentation, impact on animal species, impact on human health, obesity etc (Suzanne), incompatibility of transportation systems with human scale.

Recreational interests in transportation (shift these?).

Stormwater issues related to paved surfaces and salt on the roads.

9) Important - Environment - Sprawl

Issues and problems associated with sprawl and its effects on transportation.

Transportation investments supporting sprawl because much of it in rural areas.

Sprawl is bad, many negative effects including loss of habitat, water quality impacts.

Sense that sprawl is a big problem and will lead to disaster in the future.

That one of transportation's biggest impacts is creating sprawl, because of connection between land use and transportation

10) Important - Fuel prices and Supply

Fuel prices as something that impact behavior, either positive or negative.

And impacts on town budgets.

And that Vermont depends on cars, therefore more impacted than higher fuel prices than other places.

The high costs and availability of energy and how they affect transportation issues.

And dependence on cheap oil will end and need to prepare for it (enviros)

Taxing fuel at a higher price will also reduce car use. Taxed higher in other states.

Carbon taxes...Fuel emissions taxes.

Higher energy costs also push larger trucks and less driving of trucks.

11) Important - Police and safety issues



As related to transportation and enforcement of existing laws etc.

Also just raising the issue of police protection and safety around transportation.

And I put the 3 mentions of better regulation of taxi providers to ensure safety in here

12) Important - Public transit

Positive comments about public transit, but also concerns about how difficult it is to do in a rural state. (Negative comments opposed to public transit would not be coded here).

Large centralized employers and student base contribute to positive public transit

And because Vermont is aging when primary thought is public transit (Some overlap with Important - Aging Vermont).

And because of gas prices (Van Loon).

And reductions in environmental impacts of cars, emissions, particulates etc.

Sometimes include rail in public transit, when folded in under "public transit" umbrella -- not rail alone as a good thing.

And suggestions that there will be more of it.

Also creates more jobs. And makes it attractive to people to move here so they can get around.

13) Important - Rail service

References to passenger or rail service in positive terms, something that is needed...Sometimes in the context of something else (Peit Van Loon saying rail more important than air).

Also new technologies to improve rail service.

And as something to see more in the future.

Can be freight or passenger.

14) Important - Road infrastructure

Positive statements about existing roads infrastructure.

Built with lower environmental impacts.

Good connections to New England region



Also, statements about how Vermont in 20 years will look a lot like it does now (Kathy Hoyt, Piet both said that and it seems to show up in other places, so the big vision is Vermont a lot like it is now. .Not seeing any predictions of big changes from these folks.)

And importance of roads infrastructure for trucks.

Some concerns about road infrastructure.

As businesses think about locating to Vermont (transportation generally here, because most of it currently is roads).

Has to work for bikers also (crack sealant)

15) Important - Technology

Broadband and telecommuting have positive impacts on economic future of Vermont, and bringing people to Vermont.

Also about ITS and how that helps.

People can live here but work elsewhere.

Improve quality of road salt, places to dump it (Piet).

Improve communications systems with drivers (Evslin). Also positive things happening to use communications more.

New technology around rail cars will improve rail options.

As applies to road technology also.

But all in a positive light and that technology can reduce car commuting (GMP).

Cleaner buses that will make them more attractive.

The effects broadband have and could have on transportation; how people working from home will reduce travel.

Always technology seen in a positive light, although a few think more telecommuting does not mean less trips -- since many trips not work related. (More people means more trips).

16) Important - Tourism



Speaker raises tourism, talks about it as an important issue related to transportation.

Also that gas tax can be increased to pay for services and that will be money coming from tourists.

And that it has an impact on Vermont, so have to think about tourism when think about transportation.

Not just people driving here, but also second home-owners facilitated in their purchases by good transportation.

And that some tourists would like to get around with means other than their car.

Tourism is a big business, need to do more to provide info for tourists. Signage is key component of this.

Lots of attractive things about Vermont that we will always have. And those will draw tourists (like they do those of us who live here).

17) Important - Transportation General

General statements about the importance of transportation to the economy.

Transportation has to be looked at in context of larger picture.

Good transportation systems will attract people to Vermont.

Important to work together with the region and within regions on our transportation systems.

Issues related to Vermont residents who are employed outside of Vermont and use system.

18) Important- Non-motorized transport

References to non-motorized transportation systems in positive light.

19) No Codeable Frame No position implied on transportation system.

Comments not related to transportation systems or issues.

The question of whether roads or rail are privately or publicly owned (1).

More people will move to Vermont for variety of reasons; such as: telecommuting, exodus from rural areas
climate change.

Need to have more people for economic reasons. That is need more people.



20) Obstacle - adequate funding

Not enough funding for transportation in Vermont.

Transportation systems are expensive.

Difficult to raise taxes in Vermont to provide the revenues needed to support the system (link to Important - Fuel prices?).

Funding sources and process not clear.

Funding for bike roads and shoulders not existing.

Need more funds to support transportation projects at the local level/

21) Obstacle - Decision-making process

Way we make decisions makes change very hard (Beth).

Change resisted by powerful interests (i.e. the oil lobby) (or real estate developers on the Circ) that make change hard.

Public does not know impact of own decisions. Sprawl example, polls indicate Vermonters are opposed polls yet all contribute.

Pressure just to do things the way we've always done them.

Individuals will do what is easy and convenient.

Money moved from the transportation fund to other purposes.

Can't reduce impacts on environment without impacting economics (JO).

People with very different views (old and new) makes it difficult to arrive at decisions.

Legislature is inconsistent.

Regulations out of synch with other states, i.e. 53-foot trucks.

Takes too long to make decisions. By the time they are made no longer relevant.

Lack of political will to support downtowns and not allow low-density development outside of downtowns.



Individual insistence on personal convenience; the use of private cars, etc.

Raising taxes difficult in small state.

Raising taxes on border towns sends people to NH -- more driving.

Present tax policy that encourages driving by subsidizing gasoline.

How VTrans views public transit -- in cost/benefit and ignoring the human side of getting old people, sick people to appointments etc.

How we think about "investments" puts roads above public transit..

Stops and starts, i.e. the Champlain Flyer, no consistent policy.

Lack of leadership.

NIMBYism (Piet).

Different state plans are inconsistent, i.e. encouraging healthy Vermonters, yet also building more systems for cars.

What people want and what policy makers do are different (i.e. public transit).

Specific mention of the Ride Share program critically and VTrans management of it (4).

Negative comments about VTrans --that they are lacking something, not doing something, doing something wrong, not looking at the whole picture, etc.

Transportation funds subject to lobbying from the local level as people can see the results/lack of results clearly.

Costs of more environmental protections drive up the costs to consumers, i.e. cleaner burning trucks cost 10 percent more.

People can't afford to take the time to bike to work.

Difficult to find labor to drive buses and trucks.

22) Obstacle - Funding for public transit

Lack of funding g for public transportation

Comments about the cost/funding of transportation for Medicare and Medicaid recipients



Difficulty of getting to the critical mass of runs that attract riders

23) Obstacle - Small Rural state

Raising Vermont small size, distance from markets, end of supply chain as an obstacle.

Also, that because we are a small state at the whim of national policy (e.g. market for AFVs - Evslin).

Many things are out of our control. Need to have same size trucks, rail gauges as others.

Rural so hard to give people other choices than driving (whether it be public transit or walking/biking).

Growth of suburbanization as an obstacle to walking and biking.

Passenger rail can not work -- not enough density.

Long distances to drive required.

24) Obstacle-federal funds and rules

Lack of federal funding

Misplaced priorities at the federal level.

Federal requirements on road sizes, cross-walks etc that make it difficult to build, or build at the right scale.

Different state rules on how much milk can be carried in a truck (should combine these inconsistent state by state regulations displayed so prominently by business leaders).

25) Opportunity - Education and communications

Need to educate Vermonters about the choices and the impacts of their choices.

Need to be better job promoting the alternatives, explaining them.

And how much cheaper it is to take the bus, ride a bike.

Help get people physically fit enough to bike, walk.

26) Opportunity - give people options



If you give people options they could use them, but right now no other options.

Like car-pooling (KH).

It works in Europe where they have many options.

27) Opportunity - Time for change

Some factors suggest can change policy now, if communities support it. Positive statements about the possibility of change.

Also the importance of change why we have to do it for Vermont's future.

Gas tax increase and some other policy measures in this, when stated as positive things that can be done.

Needs political leadership to explain (does suggest fix it first as does with Evslin).

Public ready to change, e.g. all this public discussion on climate change. The time is now.

Plus national, international interest in change starting to happen.

Health and obesity crisis also factors in creating a positive climate for change right now.

Car reputation tarnished (RW, look up Pew poll on driving)

Regional rules will come into synch (link up these business ones?)

There will be fewer vehicles but larger we can figure out the trend, driven by efficiencies.

Targeting funding can make a difference

Collaboration between the transportation sector and the environmental sectors and how they are working together

Good leadership (i.e. Neale Lunderville).

Not enough money to do everything, have to make choices when said in context of creating a situation for positive change.

There is an opportunity for leadership -- although lacking -- positive statements that can happen.

Including getting more federal money to provide parking.

CATMA as an example of an innovative partnership around parking.



Policy and taxes that may be needed to alter people's driving habits or to give incentives for more sustainable behavior that will lead to a better transportation system are possible(?).

Policy as a tool to improve transportation.

people's perception on public transit and how they are shifting.

28) Opportunity -- Vermont Characteristics

Vermont's existing and vibrant downtowns an opportunity to change transportation patterns.

Existing downtowns can help make public transit work and reduce car trips as people can live closer to work.

People care about their downtowns, working hard to preserve historic buildings in them.

Small state is an opportunity to make changes. People know each other. There is no corruption.

Different interests can working together (e.g. the OMYA rail spur).

References to power of the Vermont delegation and their ability to fund transportation projects in Vermont.

29) Roads -- New projects needed

Selective new investments in road infrastructure.

In support of the circ highway.

New east west highway needed.

Or requested by towns and others (has to be roads).

30) Speaker Background

Background on the speakers interest in and around and participation in transportation





■ Documentation for:

**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Working Paper 7: Summary of Scenario
Planning Session

■ Prepared for:

Vermont Agency of Transportation

August 2007

■ In Partnership with:

Snelling Center for Government
TransManagement
Center for Rural Studies
Hubert H. Humphrey Institute of Public Affairs

VT LONG RANGE TRANSPORTATION BUSINESS PLAN
Working Paper 7: Summary of Scenario Planning Session
August 2007

TABLE OF CONTENTS

INTRODUCTION.....2

SCENARIO PLANNING 3

THE FOUR PLANNING SCENARIOS.....4

THE SCENARIO PLANNING SESSION5

ANALYSIS OF THE QUALITATIVE DATA 6

CROSSCUTTING THEMES 11

APPENDIX A – SESSION PARTICIPANTS.....14

APPENDIX B: POWERPOINT PRESENTATION OF THE FOUR PLANNING SCENARIOS..... 18

August 2007

INTRODUCTION

The Vermont Agency of Transportation (VTTrans) is currently updating its Long Range Transportation Business Plan (LRTBP). The LRTBP establishes the vision, goals, and objectives that guide how VTTrans maintains, operates, and builds the state's transportation system. VTTrans adopted the current plan in 2002. It built upon the findings and recommendations of modal policy plans (aviation, bike/pedestrian, highways, public transit and rail), transportation plans completed at the regional level and public opinion surveys and outreach.

Organizations often use long range plans to identify needs for an assumed future condition. The challenge, of course, is to determine what that one future condition will be. This challenge is particularly difficult for transportation, which is affected by numerous financial, demographic, economic, social, and even geopolitical factors and events.

This LRTBP is different because it will be based on multiple future year scenarios. Objectives and strategies will be developed, with assistance from a broad range of stakeholders, to achieve the following goals under each scenario¹:

1. Provide a safe and secure transportation system.
2. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability in the most effective and efficient manner.
3. Improve and connect all modes of Vermont's transportation system to provide Vermonters with choices.
4. Strengthen the economy, protect and enhance the quality of the natural environment, promote energy conservation, and improve Vermonters' quality of life.
5. Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.

This working paper, one of many being prepared in support of the LRTBP², synthesizes the results of a Scenario Planning Session, which was held on Tuesday, June 5, 2007 at the Capital Plaza Hotel in Montpelier, Vermont.

The preliminary scenarios were prepared by the consultant team based on findings presented in Working Papers 1-4, interviews with national and VT-based "big thinkers," and focus groups held

¹ See Working Paper 5 for a complete discussion of plan goals and how they relate to the VTTrans agency goals of Safety, Excellence, Planning, and Preservation; the 2006 public opinion survey, SAFTEEA-LU, and the VTTrans modal policy plans.

² Visit the VT Long Range Transportation Business Plan web site at <http://www.rsginc.com/vtplan/vermontplan/tasks.htm> for a complete list of all working papers to be produced and for an overview of the entire planning process.

throughout the state. This working paper summarizes the relevant findings and major cross cutting themes voiced by participants at the Scenario Planning Session.

SCENARIO PLANNING

The purpose of *scenario planning* is to identify policies that help VTrans satisfy the five objectives listed above if travel demand characteristics change due to external factors. The policies and goals identified in the various modal policy plans may be modified as a result of the process. Therefore, while the modal policy plans were not used to develop the scenarios, they may be affected by the findings of the scenario planning process.

The premise of scenario planning is that agencies and institutions are best served by a long range plan that incorporates the flexibility to respond to a variety of future conditions (scenarios), any of which may come to pass but that cannot be predicted with certainty. Scenario planning responds to the question of what might happen in the future and seeks to enable the agency or institution to adapt accordingly.

A scenario consists of a combination of different assumptions about driving factors, external to the transportation system, such as the aging of the population, energy prices and shifts in type of energy, land use patterns, and economic changes (for example, from manufacturing/agricultural to service/tourism/information). Scenarios are described to participating laypeople in short narratives supported by a few critical quantitative “facts” about the future.

The narrative structure of the scenario increases its usefulness as a tool for engaging public stakeholders in the planning process. Scenarios draw on the heuristics that enable people to make sense of and understand the future. The logical depiction of the different stories of the future embedded in scenario planning increases their accessibility.

In the context of Vermont’s LRTBP, scenarios involve national and global events that may create obstacles to achieving VTrans’ goals. This planning process is not about choosing a particular future or scenario. Rather, the process is about defining policies that can help VTrans adapt to changing circumstances.



THE FOUR PLANNING SCENARIOS

The consultant team developed four planning scenarios after considerable input from the VTrans Internal Working Group, focus groups and national experts. The consultant consolidated an initial group of seven scenarios into the ultimate set of four.

The scenarios are generally described as follows:

- **Business As Usual** – Existing trends continue through the 2030 planning horizon as described in Working Papers 1-4 and by New England Futures. The most significant characteristics are slow/moderate population growth, aging of the population, land use decentralization, shift to a service economy, and a projected gap between the costs of transportation needs and funding. The threat posed by devolution of federal user tax distributions is also included in the scenario. Additional trends identified by the New England Futures include a youth drain, energy vulnerability, and decline in higher education enrollment. All of these trends suggest slow or stagnant economic growth.
- **Environmental Change** – Air quality deteriorates and VT becomes a non-attainment area. In addition to negative impacts to our health and loss of Vermont’s clean environment “brand,” this unfortunate designation leads to regulatory requirements that affect project programming and selection. This scenario could also be characterized by additional measures designed to reduce green house gas emissions, which could be triggered by changes in national policies or implementation of state programs and policies (even if national policies are not implemented).
- **Energy Crunch** – The global supply of oil peaks or is interrupted for other reasons. There is a permanent and significant rise in the cost of fossil fuels. In addition, the Vermont Yankee nuclear power plant, which provides 30% of the state’s electricity, is decommissioned and a replacement source has not yet been secured. As a result, electricity is more expensive and not competitive as an energy source for electric or hybrid vehicles that use electricity from batteries charged over night. Higher cost oil/gas and electrical costs make Vermont less attractive to new businesses and existing businesses begin to leave for locations with lower cost, and more reliable energy.
- **Growth Scenario** – A new employer locates a major new manufacturing facility in one area of the state outside of Chittenden County (e.g., in Rutland or St. Johnsbury). There will be many jobs (by Vermont standards) available at the facility which in turn spurs additional services and retail growth in the surrounding region. In addition, a major event occurs globally or nationally that causes a significant increase in in-migration. Migration currently accounts for about ½ of the projected population change in Vermont. As a result, Vermont’s population grows faster and is more diverse. The migration includes people with growing families that fuel population growth into the next generation.



THE SCENARIO PLANNING SESSION

On Tuesday, June 5, 2007 over 75 people gathered at Montpelier's Capital Plaza Hotel to participate in an all-day Scenario Planning Session (SPS). The SPS participants had been carefully selected by VTTrans and the consultant team to represent a cross section of state transportation stakeholders. SPS participants are listed in Appendix A.

SPS participants were sent an informational package one week prior that included a description of Scenario Planning (Working Paper 6), a description of the four scenarios, an agenda for the June 5 SPS, and other related materials. Table 1 shows the SPS agenda.

Table 1: Agenda for the June 5, 2007 Scenario Planning Session

8:30-9:00am	Registration		
9:00 - 9:15am	Welcome	Introduction by VTTrans	
9:15 - 9:45	<i>Transportation Challenges in the 21st Century</i>	Dr. Michael D. Meyer	
9:45 - 10:30am	Presentation of Scenarios	Joe Segale, RSG	
10:30 - 10:40am	Break out Group Instructions	Glenn McRae, SCG	
10:40 - 11:00am	Break		
11:00am-12:00	Breakout Groups - First Session	Business As Usual Scenario	
12:00 - 1:00pm	LUNCH		
		B	C
1:00-2:00pm	Environmental Change Scenario	Energy Crunch Scenario	Growth Scenario
	Groups 1, 4	Groups 2, 5,7	Groups 3, 6
2:00-2:15pm	BREAK		
2:15-3:15pm	Environmental Change Scenario	Energy Crunch Scenario	Growth Scenario
	Groups 3, 6,7	Groups 1,4	Groups 2, 5
3:15-3:45	Next Steps in the LRTBP Process	VTTrans - process, public	

After an introductory speech by Dr. Michael Meyer of Georgia Tech, the consultant showed a PowerPoint presentation describing each of the scenarios participants would be asked to consider for the remainder of the day (Appendix B).

Following a brief morning break, the participants were grouped at seven different tables, each of which had a facilitator and a note recorder. Each table had information on the five VTTrans objectives and on the scenarios that table was to address over the course of three different facilitation periods. Each of the seven groups discussed the Business as Usual Scenario. Three of the groups discussed each of the other three scenarios – Energy Crunch, Environmental Change, and Growth. Thus, at the end of the day, each of the seven groups had discussed a total of three scenarios, including the Business as Usual scenario.

During each session, facilitators posed the general framework:



“What actions, plans, policies, or programs should VTrans pursue to achieve this objective (Objectives 1-5) given the future scenario that has been described?”

Generally groups tackled each objective in turn, spending 8-10 minutes discussing how VTrans should orient its Actions, Plans, Policies, and Programs to prepare itself for the future described by the scenario at hand. Note takers at each table took detailed notes of the discussion while facilitators noted major points on a flip chart.

Short breaks and a lunch were programmed into the day to punctuate the closure of discussion of each scenario. Facilitators remained with the same group through discussion of the Business as Usual scenario and one other scenario, and then moved to another group to facilitate the final scenario for that group.

At session’s end, each facilitator was asked to report out to the assembled audience the 2-3 major themes that emerged from their groups for each scenario. Sarah Campbell of TransManagement was invited to attend the day as a “raconteur,” and she provided her summary thoughts as part of this final session. A synthesis of all comments – from participants, facilitators, and the session raconteur – is provided in the next section.

ANALYSIS OF THE QUALITATIVE DATA

The Scenario Planning Session generated an enormous amount of qualitative data. Given the framework of discussion – “Given the future scenario, how should VTrans respond in Action, Plan, Program, or Policy?” -- participant responses varied widely. Categorizing participant comments was challenging, as the comments varied from “Big Picture Visions” to tactical recommendations on improving the viability of automobile alternatives.

Further, the logical categorizations differed by scenario. For the Business as Usual scenario the great majority of responses could be mapped to modes or program areas (e.g. Highway, Transit, Rail, etc.). For the other scenarios – Energy Crunch, Environmental Change, Growth – the key elements describing the scenario tended to mold the character of the discussion. Participants’ comments for these scenarios were more clearly directed toward modifying the policy direction of the Agency.



ANALYSIS: BUSINESS AS USUAL

All of the SPS participants engaged in a discussion of the Business As Usual scenario. The key elements describing this scenario are:

- aging population,
- spreading population with increased concentration of employment,
- moderate economic growth,
- increased shift to a service-based economy, and
- continued auto dominance.

Themes – Business as Usual Scenario

The themes on which participants focused under the Business as Usual scenario encompassed policies and actions related to enhancing transportation choices for Vermonters, particularly those that facilitate mobility for our aging population and support downtowns and compact growth patterns. In addition, participants saw the need for additional transportation revenues through both innovative and traditional means as well as better management of travel demand and operations as key elements of success under this scenario. Specific themes included the following:

- Encourage and promote downtown development and services (public transit, etc.) through VTrans infrastructure investments: the number, type, and scale to serve the most number of people.
- Consider the important policy implications associated with the aging of the population (e.g., opportunity for more compact growth patterns, safety concerns, increased need for public transit services, etc.)
- Increase public transit investment, including services for an aging population and services to and from downtowns that accommodate the elderly.
- Expand modal options and interconnectivity between the modes.
- Apply Smart Growth principles to transportation planning and investment.
- Use asset management to effectively manage system capacity and drive spending decisions.
- Maintain what we have and focus on alternative types of transportation.
- Find alternative and creative forms of paying for transportation.



- Make the transportation process transparent and easy to understand for the public and stakeholders.
- Address park and rides needs for the entire state.
- Consider the elderly as a stakeholder in the planning process to understand their needs better.
- Continue to review and improve the transportation spending prioritization process.
- Enhance freight planning to include a greater correlation between locations and volumes of freight movement and user fees accruing from those movements.
- Minor themes:
 - Continue access management to improve the system.
 - More/better multimodal centers and connections.
 - TDM and ITS are important

ANALYSIS: ENVIRONMENTAL CHANGE

Five of the seven participant tables discussed the Environmental Change scenario. The key elements describing this scenario are:

- Vermont becomes a non-attainment area according to the National Ambient Air Quality Standards (NAAQS);
- Non-attainment designation affects VTTrans project programming;
- Statewide efforts to reduce green house gas emissions directly impact VTTrans policy direction.

Themes – Environmental Change Scenario

Participants emphasized policies and actions under the Environmental Change scenario that related both to adjusting to a new environmental “reality” and to mitigating worsening conditions over time. These included reconsidering the adequacy of physical infrastructure to withstand more severe storms and directing more resources to activities and modes that help stem increases in greenhouse gas emissions. Specific themes included the following:

- Adjust bridge and culvert sizing to handle increased flows from flooding.
- Preserve wetlands and flood plains.
- Provide more intermodal, park and ride and transit options.
- Promote alternative fuels.
- Apply asset management principals to VTTrans practices and project development.



- Use new and innovative revenue enhancements: mileage based tax, gas guzzler tax, carbon tax.
- Emphasize intermodal connections and public transit.
- Use information technologies to inform the public of available modal options.
- Decrease dependence on fossil fuels.
- Support Smart Growth (Growth Centers) in order to influence settlement patterns.

ANALYSIS: ENERGY CRUNCH

Five of the 7 assembled participant tables discussed the Energy Crunch scenario. The key elements describing this scenario are:

- The global supply of oil peaks or is interrupted for other reasons;
- Vermont Yankee, which provides 30% of the state's electricity, is decommissioned and a replacement source has not yet been secured;
- Higher cost oil/gas and electrical costs make Vermont less attractive to new businesses and existing businesses begin to leave for locations with lower cost, and more reliable energy.

The scenario paints a very dire picture of the future where VTtrans, and society at large, must make very stark decisions regarding how to allocate financial resources. Falling gas tax revenues caused many groups to discuss a distance-based tax, or a tax based on vehicle miles traveled.

Themes – Energy Crunch Scenario

The key themes identified by participants under the Energy Crunch scenario included pursuing options for reducing fuel consumption while enhancing mobility options through transit, ridesharing and other innovative means. In addition, participants identified smart growth and urban and community planning as key elements of addressing this scenario, and believed that VTtrans needs to have an identified, value-added role in those activities. Specific themes included the following:

- Develop alternative fuel/energy sources and reduce fuel consumption needs.
- Increase funding for transportation in innovative ways.
- Increase the amount of and funding for public transit services.
- Increase ridesharing through new programs and facilities.
- Increase investment in intermodal connectivity and alternative modes.
- Examine opportunities for local research and development in alternative fuels and construction methods and materials.



- Determine a clear role for VTrans in urban and community planning, including facilitation of TOD, Smart Growth and travel demand management.
- Establish a closer relationship between state, federal and local agencies to find solutions for fuel problems and improve travel/commuting options.
- Find solutions for people who need to move without cars.

ANALYSIS: GROWTH

Four of the seven assembled participant tables discussed the Growth scenario. The key elements describing this scenario are:

- A new employer locates a major new manufacturing facility in one area of the state outside of Chittenden County (e.g. in Rutland or St. Johnsbury);
- A major event occurs globally or nationally that causes a significant increase in in-migration.

The scenario highlights faster than expected growth around the new growth center that leads to greater decentralization. At the same time, more young people are drawn to the new center through the growth of local economy and supports services.

Themes – Growth Scenario

Much of participants' focus under the Growth Scenario was on how VTrans can use its policies and programs to manage and direct growth in a desirable way. Of particular interest were prioritizing transportation spending with a focus on supporting downtown and transit-supportive development, transit expansion, and connectivity between communities. Safety for pedestrians and all transportation systems users as growth occurs was also highlighted. Specific themes included the following:

- Revise/review VTrans' highway design standards, primarily related to safety standards.
- Focus more on downtown development: VTrans should prioritize investments to focus them in downtowns to promote their safety, mixed use, and to reduce sprawl.
- Increase amount of transit oriented development (TOD) as well as amount of transit service itself.
- Enhance overall system performance through application of access management principles.
- Maximize the unused capacity of the system before considering new capacity projects.
- Make pedestrian safety a priority.
- Find a balance between focusing projects in downtowns and maintaining connections with other communities and needs.



- Find a new way to pay for transportation.

CROSSCUTTING THEMES

The preceding sections summarize the comments of the participants of the scenario planning session. While each scenario did motivate comments specific to the scenario, more often a pattern of comments or crosscutting themes emerged. In this section, we present seven themes that transcended scenarios throughout the day.

THEME: ROLE AND PROFILE OF VTRANS

Participants offered a variety of comments that address roles that VTrans should fill. These generally fell within two areas: VTrans as an advocate for and educator on transportation and related issues and priorities; and VTrans as a facilitator of inter-agency and inter-jurisdictional coordination and cooperation on transportation and growth planning and issues.

Suggested VTrans Advocacy/Education Roles:

- Promoting access management.
- Advocating for concentrated, traditional development patterns that, in turn, improve the viability of alternative modes and reduce the need for vehicle travel.
- Educating the public on alternative transportation modes and their societal and financial benefits.
- Educating the public and stakeholders on VTrans' existing successful programs and initiatives.
- Emphasizing maintaining existing infrastructure and application of system management strategies and technologies to maximize their efficiency and articulating the benefits of these approaches to the public.

Suggested VTrans Facilitation roles:

- Facilitating coordination of inter-agency, inter-municipal, regional and interstate activities. Important aspects of this role are coordination among towns with respect to planning and coordination between state agencies to better align goals and use funds more efficiently.
- Taking a more active role in the Act 250 process.



- Taking a more active role in local land use planning and development, including advocating for development patterns that improve the viability of alternative modes of transportation and reduce the need for vehicle travel.
- Engaging the private sector, particular those elements that rely heavily on a well-functioning transportation system, in transportation planning and policy development to ensure VTTrans has suitably global perspective.

THEME: IMPROVE MULTIMODAL ALTERNATIVES

The participants were very clear in their desire to see multimodal solutions to address the transportation needs of Vermont. They offered a broad range of comments that address the need for improved transit services and better pedestrian and bicycle facilities. Some participants saw public transportation as an integral link between transportation and environmental issues such as energy consumption and non-attainment status. In addition, participants believed that interconnectivity within and between modes of transportation as well as between Vermont and other states are critical issues to address for the future.

THEME: LAND USE PLANNING

Again, participants made a broad range of comments but predominant in them were the desire for access management and smart growth to mitigate the impacts of the scenarios. Frequently, these comments were part of the discussions to achieve Objective 5 (support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside). However, they did emerge as part of the discussion of all other objectives. Participants also wish to see more emphasis on corridor planning, including access management tools and policies, targeting of strategic improvements, and greater regionalism for larger scale projects.

THEME: EVOLVING DESIGN STANDARDS

Participants made many comments suggesting that VTTrans should consider design standards that reflect the situation rather than a "one-size fits all" policy. This reflects a national focus on what have been termed "context sensitive design" or "context sensitive solutions." In addition, some participants' comments reflected a desire to see the development of design standards for pedestrian and bicycle facilities, and standards that were targeted toward making transportation facilities more maintainable or less costly to maintain. It was also noted that different segments of roadway need to be treated differently. For example, while mobility should be emphasized in rural areas, roadway design in village centers should be focused on local circulation and supported with traffic calming, bicycle and pedestrian infrastructure and streetscape projects.



THEME: RAIL INVESTMENT

Throughout the day, participants made comments in support of a greater investment in rail infrastructure to provide both passenger and freight services. The remarks suggested that participants viewed this alternative mode as a means for reducing the impact on highways and to absorb projected increases in freight deliveries to the state. This theme correlates well with the theme of improved multimodal alternatives discussed earlier.

THEME: ENERGY AND CLIMATE CHANGE

Most participants believed that a fuel (petroleum) energy crisis is “very likely” to occur within the time horizon of the LRTBP and the real cost of transportation will continue to increase. They believe the state should have a clear and considered plan for responding to this situation when it occurs, and that the state and its businesses and residents should anticipate and prepare for increasing travel costs. In this regard, energy conservation and efficiency, and reducing air green house emissions, should be important state objectives and emphases.

THEME: ALTERNATIVE FINANCING

Participants stated that while existing and new transportation revenues should be used as efficiently and effectively as possible, the State needs to increase its revenue base for investments in transportation at both the state and local levels. Most agreed that a new framework for transportation funding should be developed. Such a framework should consider options such as impact fees, public-private partnerships, mileage-based taxes and environmental banks. No clear alternative to the gas tax, however, emerged from the discussions.



APPENDIX A – SESSION PARTICIPANTS

First Name	Last Name	Organization
Chris	Andreasson	Vermont Transit
Susan	Bandfield Abdo	Riders of Vermont
Murray	Benner	SSTA
Bruce	Bentley	CVPS
Eric	Bohn	OMYA
Darby	Bradley	Vermont Land Trust
Ted	Brady	Senator Leahy's Office
Trini	Brassard	VTrans - Operations Div.
Jim	Bush	VTrans - Advisory Committee LRTBP
Valerie	Capels	Waitsfield Town Administrator
Van	Chesnut	Advance Transit Inc., Executive Director
Susan	Coburn	Vermont Department of Health
Chris	Cole	CCTA
Sally	Collopy	Vermont Local Roads Program
Elizabeth	Courtney	Vermont Natural Resources Council
William	Driscoll	Associated Industries of Vermont
Bob	Dufresne	Dufresne and Associates, PC
Fred	Dunnington	Middlebury Town Planner
Kevin	Ellis	Kimbell, Sherman & Ellis
Peg	Elmer	Vermont DHCA
Barb	Farr	Vermont Emergency Management
Lori	Fisher	Lake Champlain Committee
Steve	Gladczuk	Central Vermont RPC
Mary	Grant	Rural Community Transit, Inc.



Peter	Gregory	Two Rivers RPC
Tom	Hengelsberg	Truex Cullins & Partners
Chris	Hill	Heritage Flight
Beth	Humstone	
Steve	Cook	Vermont Department of Tourism, Deputy Commissioner
Scott	Johnstone	CCMPO
Rick	Kehne	Addison County RPC
Fred	Kenney	Vermont Economic Progress Council
Karen	Lafayette	Vermont Low-Income Advocacy Council
Trevor	Lashua	Vermont League of Cities & Towns
Sandy	Levine	CLF
Deborah	Lisi-Baker	Vermont Center for Independent Living
Mark	Lorenzo	National Wildlife Federation
Dennis	Malloy	Vermont ANR - Advisory Committee LRTBP
Matt	Mann	Windham RPC
Mary Ellen	Mendl	Vermont 211
Marilyn	Miller	Vermont Auto Dealers Association
Doug	Morton	NVDA - Transportation Planner
Jim	Moulton	ACTR
John	O'Kane	IBM Corporation
Lt. Bill	O'Leary	Vermont State Police -Traffic Safety Coordinator
Steve	Patterson	NVDA
David	Pelletier	Lamoille County RPC
Robert	Penniman	CATMA
Jason	Rasmusen	Southern Windsor RPC
Diane	Reardon	Vtrans - Finance and Administration Division
Bill	Rose	Northwest RPC



Susan	Russell	COVE -CVCOA
Adel	Sadek	UVM Civil & Environmental Engineering
Arthur	Sanborn	Lyndon Town Administrator / VT State Transportation Bd
Mardee	Sanchez	Randolph Zoning Administrator
Susan	Schreibman	Rutland RPC
Brian	Searles	Burlington International Airport
Brian	Shupe	Forum on Sprawl
Chapin	Spencer	Local Motion
Robert	Stevens, PE	Stevens & Associates, P.C.
Steve	Terry	Green Mountain Power
Cathy	Voyer	Vermont Agency of Human Services
Jennifer	Wallace-Brodeur	AARP Vermont
Mike	Welch	St. Johnsbury Town Manager
Netaka	White	Vermont Biofuels Association
David W.	Wulfson	Vermont Railway, Inc. (VTR)

STAFF

Glenn	McRae	SCG
Charlie	Smith	SCG
Colleen	Oettinger	SCG
Ryan	Palumbo	SCG note taker
Peter	Kovacs	SCG note taker
Stephanie	Lehar	facilitator
Lisa	Aultman-Hall	University of Vermont Transportation Center
Richard	Watts	University of Vermont Transportation Center
David	Starrells	University of Vermont Transportation Center



Joe	Segale	RSG
Bob	Chamberlin	RSG
Clay	Adams	RSG
Tom	Adler	RSG
Dave	Saladino	RSG
Beth	Isler	RSG
John	Slason	RSG
Matthew	Richards	RSG
Mark	Smith	RSG
Lori	Hirshfield	Town of Hartford
Mike	Meyer	Georgia Institute of Technology
Sara	Campbell	TransManagement
Scott	Bascom	VTrans
Aimee	Pope	VTrans
Mel	Adams	VTrans
Johnathan	Croft	VTrans
Barry	Driscoll	VTrans
Chris	Jolly	FHWA
Charlie	Mark	VTrans
Clay	Postras	VTrans
Sue	Clark	VTrans
Gina	Campoli	VTrans
Costa	Pappas	VTrans



APPENDIX B: POWERPOINT PRESENTATION OF THE FOUR PLANNING SCENARIOS



The Vermont Agency of Transportation

Long Range Transportation Business Plan 2008

Scenario Planning Session

5 June 2007



Presentation

- LRTBP Plan Overview
- VT's Transportation System
- Planning Objectives & Scenarios
- Breakout Group Instructions

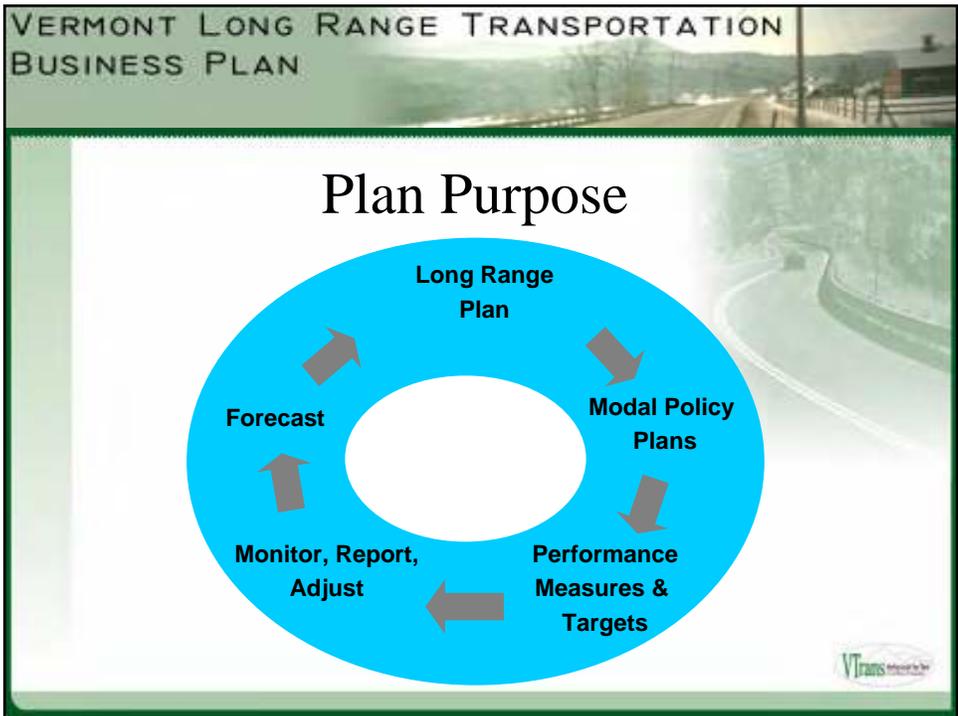


2008 Long Range Transportation Plan Overview



Planning Team





VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Results of Previous Plans

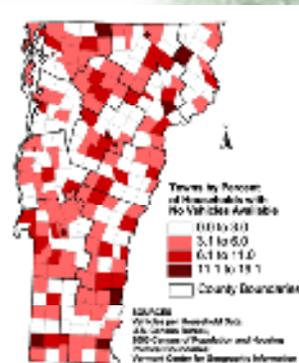
- **1992 Plan**
 - System Preservation Emphasis
 - Multimodal Plan
 - Project Scoping
- **1995 Plan**
 - VT State Design Standards
 - Local Transportation Facilities Program
 - Modal Policy Plans
- **2002 Plan**
 - Asset Management
 - Corridor Planning



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Completed Working Papers/Products

- WP 1: State, Regional, National Policy Plan Review
- WP 2: Other State Agency Policy Reviews
- WP 3: Financial Analysis
- WP 4: Demographic/Economic Analysis
- WP 5: Update Vision, Goals, Objectives
- WP 6: Scenario Development



Next Products

- Scenario Session Summary: July 2007
- Draft Plan: Sep 2007
- Final Draft: Dec 2007
- Outreach: Jan to Mar 2008
- Final Plan: May 2008



Outreach

- Advisory Committee
- Consultation with other State Agencies
- Presentation to RPC TACs and MPO
- 2006 Public Opinion Survey
- Web Site
- 6 Focused Group Discussions
- VT Big Thinker Interviews
- National Experts Interviews
- Scenario Planning Session
- General Public Meetings on VT Interactive Television after Draft Plan is Complete



VT Transportation System



Highways

- Poor pavement condition on 1/3 of miles
- Majority of bridges over 50 years old
- Vermonters don't feel congestion is a major problem
- Crash rates declining and less than national averages

Source: 2004 Highway System Policy Plan



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

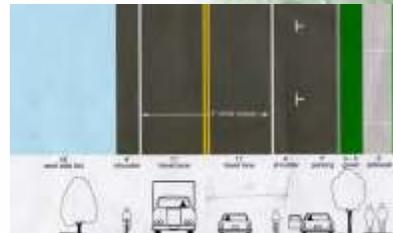


Source: VTrans Byway Program



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Pedestrian and Bicycle Facilities



Public Transit



Rail

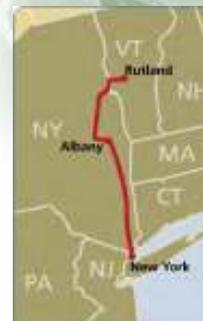
- VT owns 453 of 749 total miles of rail
- Freight
 - Increased movement of freight by rail of 44-55% by 2020
 - Increases in Intermodal Freight
 - Height and weight restrictions
 - Improvements necessary to transload facilities



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Rail

- Decreasing ridership in recent years
- First Priorities
 - Continue service along current Amtrak routes
- Second Priority
 - Bennington to Essex



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

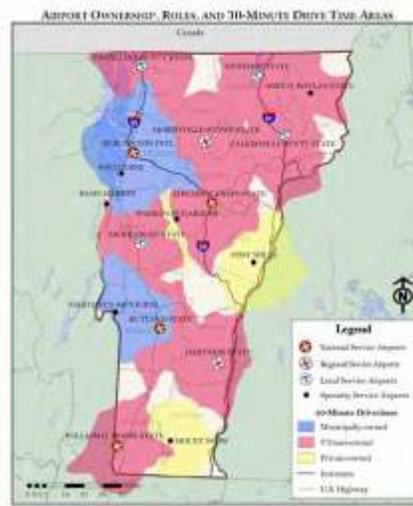
TDM & ITS



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

VT Airport System

- 17 Public Use Airports
 - 10 State Owned
 - 5 Municipally Owned
 - 2 Private



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Private Transportation Services



Planning Objectives & Scenarios



Scenario Planning

(What and Why)

*Scenario planning
enables stakeholders
to consider various
possibilities and
identify policies that
can adapt to changing
circumstances.*



VTrans Vision, Mission & Goals

The Vermont Agency of Transportation's vision is a safe, efficient and fully integrated transportation system that promotes Vermont's quality of life and economic wellbeing.

VTrans' mission is to provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.



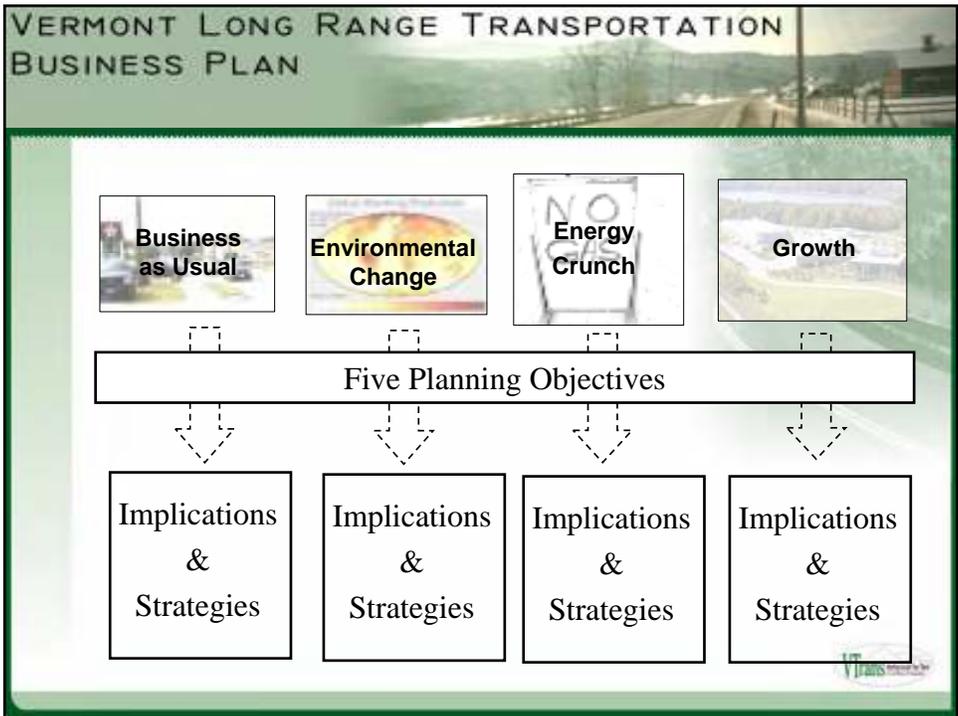
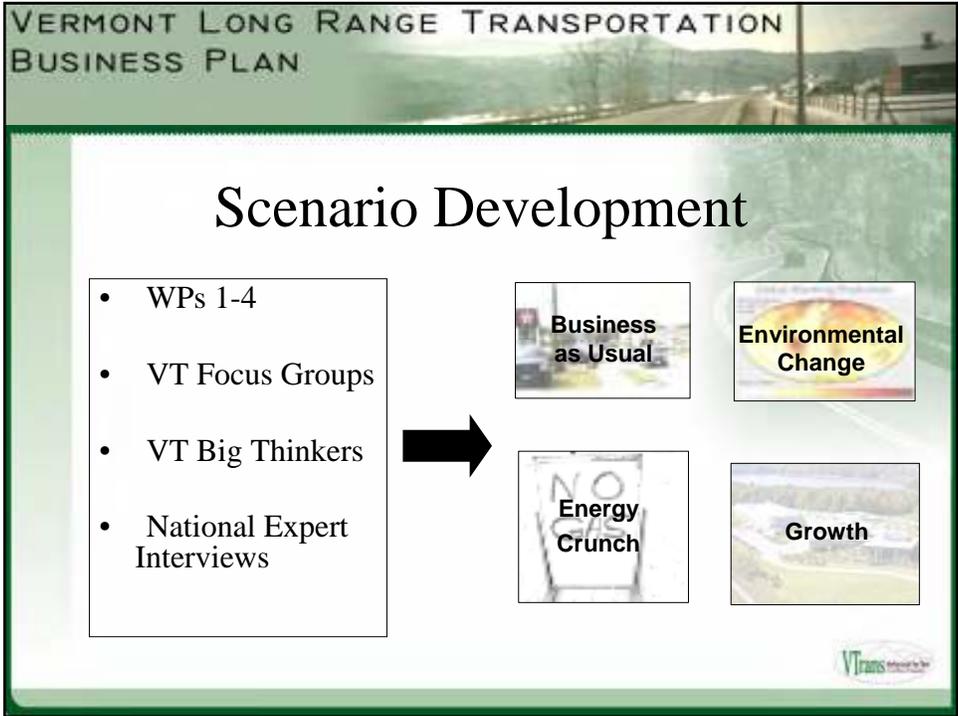
- Safety
- Planning
- Excellence
- Preservation



Plan Objectives

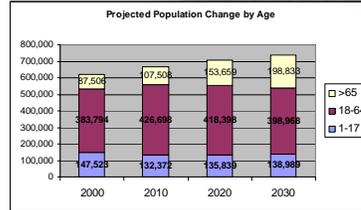
1. Improve and connect all modes of Vermont's transportation system to provide Vermonters with choices.
2. Strengthen the economy, protect and enhance the quality of the natural environment, promote energy conservation, and improve Vermonters' quality of life.
3. Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.
4. Provide a safe and secure transportation system.
5. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability in the most effective and efficient manner.



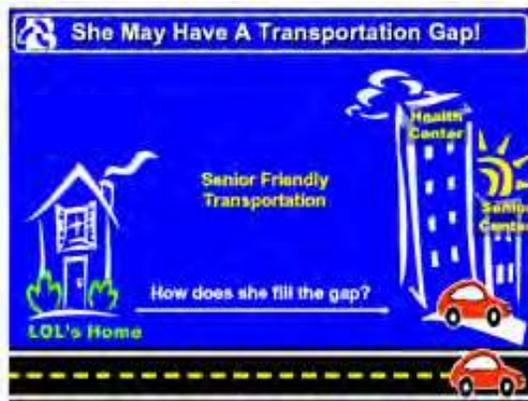


Business as Usual Scenario

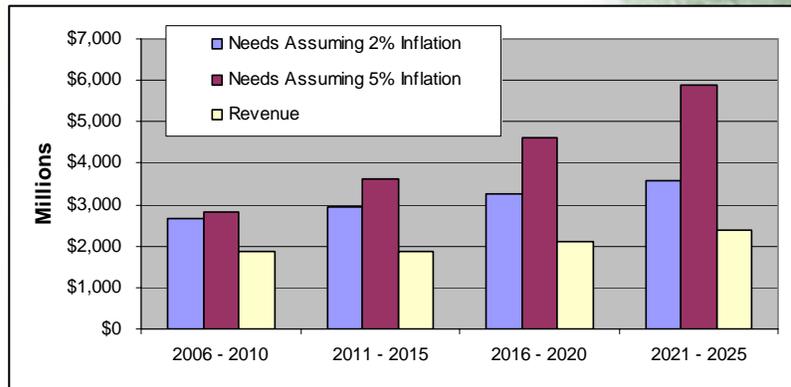
- **DEMOGRAPHICS:** Low Population Growth; Aging Population; Youth Drain
- **LAND USE:** Decentralization; Regional Communities; Job/Housing Separation
- **ECONOMY:** Slow growth, Service sector jobs
- **ENERGY:** Prices fluctuate but oil remains primary source
- **ENVIRONMENT:** Maintain Air Quality Attainment
- **TECHNOLOGY:** Broad band, wireless, continued SOV use (different fuel)
- **FUNDING:** \$3-8 billion gap over 25 years



Needs of an Older Population

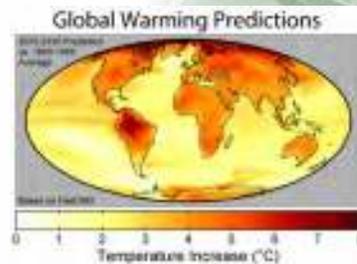


Financial Analysis



Environmental Change Scenario

- **DEMOGRAPHICS:** Same as Business as Usual
- **LAND USE:** More emphasis on concentrated development – but market forces favor decentralization
- **ECONOMY:** Increased cost of economic development
- **ENERGY:** More pronounced shift to alternative fuels
- **ENVIRONMENT:** Non-attainment air quality status, climate change intensification, more intense storms
- **TECHNOLOGY:** Same as Base Line
- **FUNDING:** \$3-8 billion gap over 25 years. Could increase due to project complexities



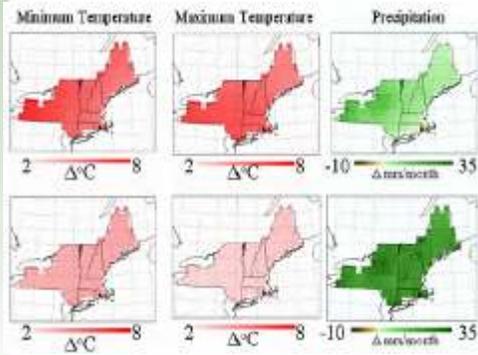
Source: http://en.wikipedia.org/wiki/Global_warming



Non-Attainment



Climate Change



Source: New England Regional Assessment



VT Department of Emergency Management

Climate Change

Value of Maple Syrup Production in
New England and New York

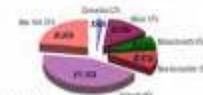


FIGURE 2-14
Average production value for New England states and New York
January 1999-2008

Source: New England Regional Assessment



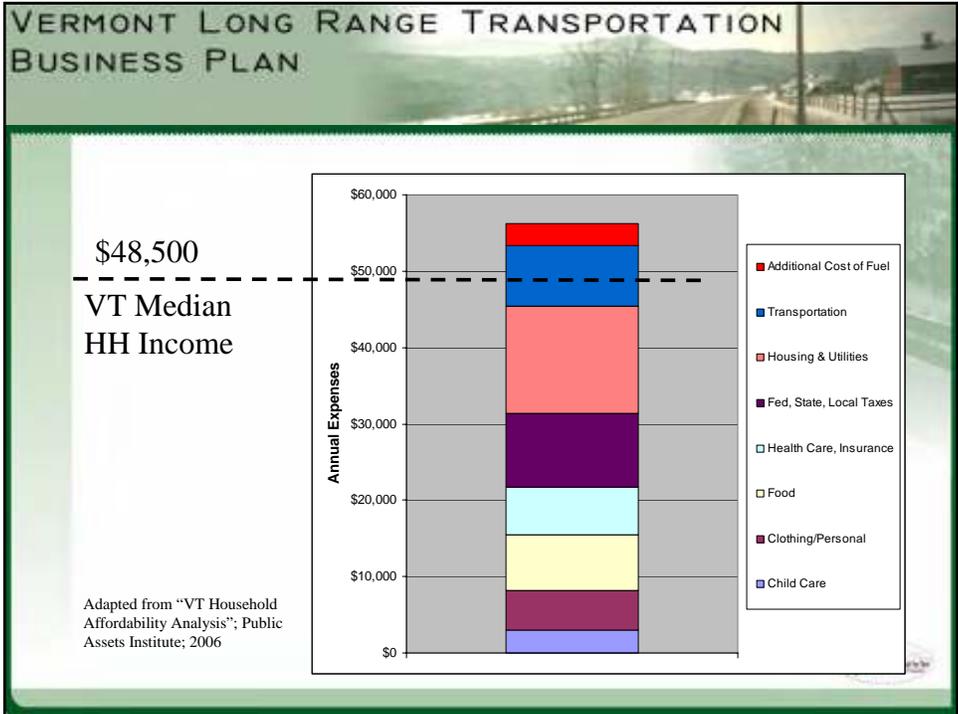
Rt 125 near Russian Falls by Dan Waszelewski, 2004



Energy Crunch Scenario

- **DEMOGRAPHICS:** Slower population growth
- **LAND USE:** More emphasis on concentrated development
- **ECONOMY:** High cost of energy challenges economic growth
- **ENERGY:** Higher cost, shift to alternative sources, push for energy independence
- **ENVIRONMENT:** Domestic energy source (wood) = worse air quality
- **TECHNOLOGY:** High costs drive innovations
- **FUNDING:** \$3-8 billion gap over 25 years. Additional competition for public funds from non-transport issues





VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Growth Scenario

- **DEMOGRAPHICS:** Faster population growth; increase in-migration
- **LAND USE:** Sprawl around hot spot; decentralization continues in rest of state
- **ECONOMY:** Employment growth and faster economic growth.
- **ENERGY:** Same as Business as Usual
- **ENVIRONMENT:** Same as Business as Usual
- **TECHNOLOGY:** Same as Business as Usual
- **FUNDING:** \$3-8 billion gap over 25 years. Opportunity to generate revenue thru growth

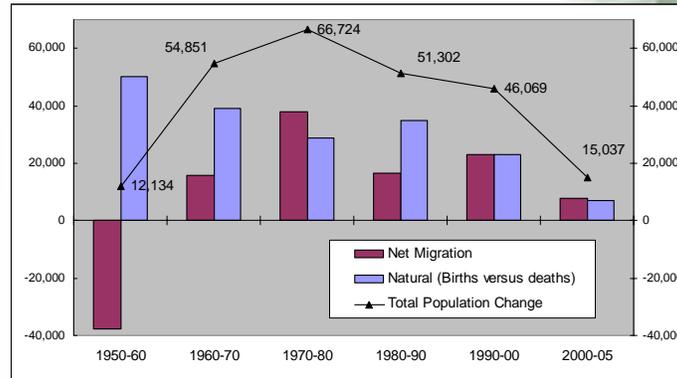
GROWTH SCENARIO

Trips TO and FROM Hypothetical Hot Spot Growth

- More than 1000
- 500 to 1000
- 100 to 500
- 50 to 100
- 25 to 50

Spots with roads affected by more than 25 vehicles/km

VT's Historical Population Change



The Scenarios



Break Out Group Instructions



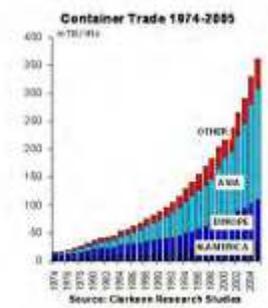
Appendix



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

Working Paper 1: State, Regional, National Policy Plan Review

- System Preservation
- Asset Management
- Safety
- Security
- Economic Vitality
- Energy and Environment
- Transportation/Land Use
- Highway Congestion



From: Prepared by Jeffrey Straka, USDOT, Under Contract for June 28, 2005



VERMONT LONG RANGE TRANSPORTATION BUSINESS PLAN

2006 to 2030 Transportation Funding Source

Source	\$ Millions	Notes
Federal Highway Funds (HTF)	\$2,959	CBO Forecast to 2015: 2.8% to 2009, 2.1% 2009 to 2030
Earmarks	\$721	\$57.7/ year thru SAFETEA-LU, \$20/year after
Federal Transit Admin	\$99	Growth rates same as HTF
State Funds	\$5,467	Assumes 2%/year, does not include JTOC
Total	\$9,246	



National Experts Panel

Name	Organization	Area of Expertise
Anne Canby	Surface Transportation Policy Project and Alliance for a New Transportation Charter	Agency management, public transportation and multi-modal perspective
Carrie Conaway	New England Public Policy Center, the Federal Reserve	Energy policy, economic issues
Matthew Coogan	New England Transportation Institute	Intermodal planning and deployment of technology in transportation
Lew Feldstein	President, NH Community Foundation	Civic engagement, NH long range transportation business plan
Tom Downs	CEO Eno Foundation, Former Sec of 2 state DOTs, CEO of Amtrak	Transportation planning and operations



VT Big Thinkers

- **Kathy Hoyt:** Former Chief of Staff and Administration Secretary, Gov.'s Dean and Kunin. retired, lives in Norwich, on Green Mountain Power Board of Directors.
- **Paul Bruhn:** Preservation Trust of Vermont. Active in many issues in Vermont particularly around preserving village centers. Member of Vermont Transportation Authority. Lives in South Burlington.
- **Tom Evlisin:** Former Secretary of Transportation under Snelling. Lives in Stowe, commutes to work in NYC. Works in technology and telecommunications.
- **Bill Stenger:** President, Jay Peak Resort. Also chair of Next Generation Commission.
- **Piet (Pete) Van Loon:** Marlboro College. Long-time member of Windham Regional Planning Commission. Lives in southern Vermont.



Focus Groups

- Issue-based focus groups
 - Group 1: Large business/Economic Interests/Heavy transportation users
 - Group 2: Environment/Energy/Land Use
 - Group 3: Human Services/Passenger Transportation
- Geographical Locations
 - White River Junction
 - Bennington
 - Franklin County/Chittenden County



State Modal Policy Plans

**Highway
System Policy
Plan**

2004

**Airport
System Policy
Plan**

2006

**Public
Transportation
Policy Plan**

2006

**VT State
Rail & Policy
Plan –**

2006

**Bicycle and
Pedestrian
Policy Plan –**

2006

- Vision & Goals
- Trends
- System Assessment & Needs
- Performance Measures

Voices of Vermonters

Vermont's Transportation Future

Draft May 10, 2007



Attendees at a group interview at the Montshire Museum in Norwich, Vermont.

Richard A. Watts
Senior Research Analyst
University Transportation Center
University of Vermont
www.uvm.edu/~transctr

Erica K. Campbell
Community Development &
Applied Economics
University of Vermont

Prepared in support of the Vermont Agency of Transportation Long Range Business Plan
In collaboration with Resource Systems Group & The Snelling Center for Government.

TABLE OF CONTENTS

INTRODUCTION.....	3
INTERVIEWS.....	3
FINDINGS.....	5
Transportation Modes.....	5
Influences on the Future.....	7
NARRATIVES.....	9
Fix it First.....	9
Energy Collapse.....	11
OPPORTUNITIES AND OBSTACLES.....	13
Opportunities.....	13
Obstacles.....	14
CONCLUSION.....	16
APPENDICES.....	17
APPENDIX A: INTERVIEWEES.....	17
APPENDIX B: INTERVIEW QUESTIONS.....	17
APPENDIX C: CODE DESCRIPTIONS.....	17
APPENDIX D: ALL COMMENTS BY CODE.....	17

TABLE OF TABLES

Table 1. Number of times different transportation modes are mentioned.....	5
Table 2. Mention of various “drivers” that could influence Vermont’s transportation future.....	7
Table 3. Codes that are grouped together into the <i>fix it first</i> frame.....	9
Table 4. Codes that are grouped together into the <i>energy collapse</i> frame.....	11
Table 5. Possible <i>opportunities</i> identified by Vermonters.....	13
Table 6. Possible <i>obstacles</i> identified by interviewees.....	14

INTRODUCTION

This report summarizes findings from a series of interviews conducted with Vermonters about the state's expected and desired transportation future. The information from these interviews was used, in addition to a number of other sources, to inform the development of four scenarios about Vermont's transportation future. The interviews were conducted between January and March 2007.

Fifty-two Vermonters participated in the interviews for this report. Their comments were taped generating 186 pages of transcripts for analysis.

The goal of the research was to try and identify common themes, or narratives that guide how Vermonters think about the transportation future. The conversations were future oriented with a planning horizon of twenty-five years. The researchers attempted to explore participant's vision for the future and the role of state government in achieving that vision. Interviewees were also asked about the "drivers" influencing Vermont's transportation future. This information was then used to inform the development of four scenarios for the Vermont Agency of Transportation's Long Range Transportation Business Plan. Those four scenarios are *Base Line*, *Environmental Change*, *Energy Crunch* and *Hot Spot Growth* and are explained in a separate report (Working Paper #6) which is to be posted at www.rsginc.com/vtplan/vermontplan/index.htm.

INTERVIEWS

The researchers conducted six group interviews and five individual interviews. The five individual interviewees were chosen as Vermonters with broad experience in transportation policy and selected in consultation with VTrans. Attendees at the six group interviews were chosen in consultation with VTrans and three regional planning commissions. Three regional focus groups were conducted in partnership with regional planning commissions in Bennington, Franklin and Windsor counties. The researchers coordinated three additional group interviews focusing on environmental and energy issues, on large business and freight transportation and on human services and passenger transportation. One researcher attended and conducted all the group and individual interviews. The list of questions and interviewees is attached.

The regional planning commissions were invaluable in the process of selecting interviewees and coordinating the group interviews, particularly transportation planners Chuck Wise, Bill Rose and Jim Sullivan. We'd also like to thank all of the Vermonters who gave up an afternoon or a morning to sit down and tell us what they think about Vermont's transportation future.

Interviews were taped and the comments transcribed generating 186 pages of data for analysis. Qualitative research techniques were used to understand and provide structure to the comments. The researchers analyzed the interviewee's comments to identify central ideas and themes which emerged inductively through the research process. Themes were

not predetermined at the outset. The researchers coded the data looking for common thought elements that could be collected into categories.

There are four appendices attached to this report which provide a list of interviewees, interview questions, code descriptions and the comments from interviewees.



Attendees at a group interview in Montpelier.

FINDINGS

The following discussion describes findings from the analysis of the interviews. The analysis is based on grouping codes into larger categories. The tables include a “Codes Displayed” column which refers to the number of times a certain code is displayed in the data. Percentages refer to percents of the category under discussion.

Transportation Modes

Public transportation was the most frequently raised and emphasized mode of transportation discussed by the Vermonters in these interviews. Interviewees saw public transportation as a critical mode when thinking about Vermont’s transportation future, raising it 40 percent of the time any transportation mode was discussed. Public transportation was followed by rail service, road infrastructure and non-motorized transportation (biking and walking).

Table 1. Number of times different transportation modes are mentioned.

MODES	Codes Displayed	Percent Total
Public transit	70	40%
Rail service	40	23%
Road infrastructure	29	17%
Non-motorized transport	27	16%
Air service	7	4%
Total	173	100%

Vermonters on Public Transportation

I'd like to see a public transportation system where you need to go to someplace that's not within walking distance and within 5 minutes you can be on a bus to your destination. That's my vision for public transportation.

There also needs to be a public transit piece and we've kind of dabbled at that and supported it sort of, but especially as we become more sensitive to gas prices and global warming, climate change issues. I think that there is the potential of building a base of people who use and depend upon public transit.

Rail Service

My first response to your comment was the rail system and we keep giving the rail system up for recreational use and I think it becomes – people fall in love with it and so it's a great thing -- but we've now lost and are losing our potential for future rail traffic and that could be a savior if we ever get into public transit.

I think my vision touches on a number of things mentioned. I think that they should consider the railroads as part of our transportation corridors to be protected. And I think that when that can be combined with the highways, I think we should do so.

Road Infrastructure

And, of course, I'd like to see our roads well maintained so that those times when you do need to use a car, and most of the time you're still going to have to – the roads are in good condition and safe.

Non-Motorized Transportation

We all know about the epidemic of obesity. Global warming is now daily on the headlines, which is a wonderful thing in some respects but scary and we have to as a society, shift the attitude we have. Bicycling and walking have to become no longer fringe activities. They have to be viewed as normal, commonplace means of activities.

Air Service

Air transportation – yeah, it's expensive, but it's still going to be important. It provides that quick and immediate personal access to a lot of businesses. So I think that airports are going to be very important for economic growth.



Attendees at a group interview at the Bennington town offices in Bennington.

Influences on the Future

Interviewees were asked about the major drivers that could influence Vermont's transportation future. For drivers, environmental issues were the most frequently raised, followed by technology, tourism, energy issues and Vermont's aging population.

Table 2. "Drivers" that could influence Vermont's transportation future.

DRIVERS	Codes Displayed	Percent Total
Environment	55	26%
Technology	50	24%
Tourism	39	19%
Fuel prices and Supply	32	15%
Aging Population	32	15%
Total	208	100%

There were three primary categories within environmental issues, including climate change impacts, land use patterns and development and other related environmental issues such as air quality and storm water pollution. The primary thought element in the technology category was telecommuting and the different types of impact this might have on Vermont's transportation future. Fuel prices and supply drivers concerned issues around the costs and availability of gasoline in the future. And, interviewees raised Vermont's aging population as a potential driver about 15 percent of the time.

Environment & Transportation

I guess I would look at it from the climate change perspective again since vehicle traffic is responsible for more than half of Vermont's current global warming conditions. It is a huge and difficult area to address I guess if we're serious about having Vermont be a leader to - in reducing our climate emissions we've got to do something about transportation in this state. And in a state like Vermont that's not an easy task.

Technology

Well, when you talk about technology, it's obviously - people will be able to transport themselves digitally as opposed to actually going to meetings and we may be able to build on that. To decrease our need to travel in person. But it will also mean that folks can live in Vermont that may not be able to in the past, but now can commute digitally so that may actually drive us to more modes than we have in the State.

We have this unique rural landscape and if we can somehow make sure that broadband is everywhere it will allow us to develop our economy in a way that minimizes travel in the traditional sense. It allows us to travel electronically.

Tourism

Well, we've got a magnificent State and a magnificent countryside and a great brand. So, people will – as long as we don't diminish the brand identity, we've got a product that people want and they will come here. And they will want to be coming here. We just need to do – to make sure that the communication system and the transportation system is keeping with the brand. Because you can ruin it. It will take strategic planning and very thoughtful planning to make sure that we expose the benefits of the State to people, but we don't break the brand.

Fuel prices and supply

I think we're going to be using a lot less oil – energy in particular in the coming decade or two either because of voluntary measures we take on to drastically reduce our emissions of global warming gasses or because the geology just doesn't allow the world to pump as much when it gets expensive. So I think any transportation plan needs to be set up around the very distinct possibility of a great drop in the use of oil in transportation.

Aging

You're going to have a lot of people who are going to be unable to drive in a pretty short time span. And if you're going to continue to have a policy of aging in place then you're going to have to begin to address those needs. But one of the other things is it's not just that people who are unable to drive and are needy because they need medical care, this is also a generation who is expected to be relatively active as well – and they want to go out and they want to socialize and they don't want to be isolated and one of the ways that people can avoid isolation is to have transportation.



Attendees at group interview on business related transportation issues.

NARRATIVES

In this analysis, we identify the core narratives, or frames that characterize the data. A frame is a central organizing idea for making sense of relevant events (Gamson, 1989, 1992). Frames are not the “objective structure” of the material, but one way to view, discover and to look at how the world is being interpreted. A frame has three essential elements; a central organizing idea that makes sense of relevant events, a range of policy positions, and condensing symbols or metaphors. The individual codes are made up of thought elements. Frames are a number of codes combined together, bound with a common narrative or story.

In the following analysis, some identified frames are discussed. The frames are described with a short narrative and the codes that combine together to form them.

Fix it First

The *fix it first* frame suggests maintaining the existing systems before building anything new. Vermonters displaying this frame believe that the existing road system works well but needs continued investment. It is cheaper to invest in preventative maintenance than after something breaks down. They further believe the future will look a lot like today with Vermonters continuing to be dependent on their cars. Transportation policy should invest in what we have and make sure it works well. Fixing what we have is the most prudent, sensible approach.

Vermonters articulating the *fix it first* frame suggest that cars will continue to be the primary way people get around in Vermont. With its emphasis on maintenance first, this frame registers with environmentalists concerned about new roads, downtown boosters and those concerned about sprawl by minimizing new transportation infrastructure that enables dispersed settlement patterns. In addition, the emphasis on maintenance first resonates with Vermont values of conservation and preservation. This frame has a status quo orientation, suggesting that the future will look a lot like today.

Table 3. Codes that are grouped together into the *fix it first* frame.

Fix it First	Codes Displayed
Cars and Trucks -- Vermont very dependent	36
Fix it first	73
Important - Environment - General	16
Important - Road infrastructure	22
Important - Transportation General	15
Important - Police and safety issues	10
Total	172

This frame suggests a policy approach, i.e. investing in the existing system before making new investments. Because the phrase *fix it first* is used today in the policy debate, this frame was fairly easy to identify. In fact the term “fix it first” or something very similar appeared 73 times in the interviews.

The display of this frame is consistent with the 2006 public opinion survey conducted by VTrans which found that the top two items survey respondents wanted more money spent on were “bridge repairs and replacement” and “summer highway road repair and repaving.” Forty-four percent of respondents suggested that the state should concentrate on “maintaining existing roadways rather than building new ones” (2006 Survey, ES-1, 2 www.aot.state.vt.us/Documents/VLRTPReport.pdf).

In a series of public meetings in 1998, maintenance first and increased investment in public transportation were the top two issues raised by attendees (1998 Transportation Public Forums Final Report).



Attendees at a group interview at the Agency of Transportation in Montpelier.

Fix it First

This notion about fixing it first is really important and it in fact is in the Vermont tradition. We don't normally throw things away that are still useful. And what in effect we've done over the last many years with our transportation system is ignored – we've been bad stewards. We've just haven't taken care of what we have. We've been so focused on these big, huge – sexier projects.

There's just such a crying need for making sure that this old infrastructure that we have in a small State like Vermont is really maintained.

We should use as efficiently as possible our existing infrastructure and not build out new roads to areas that are sprawling, not have to build new infrastructure to serve new areas and focus more on maintaining and improving that infrastructure that already exists.

The car is still going to be the primary mode of transportation in a rural area like Vermont.

Energy Collapse

The *energy collapse* frame suggests that factors outside of Vermont and outside of our control will have a major impact on the state's transportation future. Interviewees displaying this frame believe that the world is getting warmer and CO2 from vehicle emissions is a major contributor. Those articulating the *energy collapse* frame believe that the nation and Vermont will have to reduce our car-caused CO2 emissions. Furthermore, oil reserves have peaked or are close to peaking and our future includes a world without cheap oil.

Interviewees articulating *energy collapse* believe there is an opportunity to change if the state and nation can change direction on transportation investments and policy. While automobiles will still exist they will run largely on different fuels than gasoline. In the *energy collapse* frame, land use planning is crucial to limit sprawl. Policies need to promote alternatives to the car. This frame also includes the two environmental categories related to climate change and sprawl.

Table 4. Codes that are grouped together into the *energy collapse* frame.

Energy Collapse	Codes Displayed
Important - Environment - Climate change	23
Important - Environment - Sprawl	16
Important - Fuel prices and Supply	32
Opportunity - Time for change	72
Cars - Alt fueled vehicles	29
Cars - Promote alternatives	21
Total	193

Energy Collapse

The almost entire reliance on single-occupancy vehicles in time of peak oil and climate change is going to be critical for us and it's having VTrans get behind these

alternative modes of transportation because that's not going to be 20 years from now a realistic way of commuting or traveling and that, tossed together with land use patterns and affordability of homes. And so I think that's going to be the crunching issue because we're not going to be able to do that 20 years from now. The price of gas – whatever it's going to be – is not going to allow it.

I believe that we sell our fuels too cheaply because that is why we still have people using cars rather than public transportation.

I think any transportation plan needs to be set up around the very distinct possibility of a great drop in the use of oil in transportation.

I think getting in a car and driving somewhere is convenient and easy because that's where we have chosen to spend our money in the past making sure there are the roads that make it convenient and easy to get in a car and drive somewhere. If it were convenient and easy to get on a bus to go pick up my kid after school I would do that. If it were convenient and easy to get on a bike path and bike across town to go to my meeting, I would do that.

We're going to have to do things differently and start investing now in those long-term pieces of a transportation system that needs to be in place because we need to be ready in 25 years for the changes.

OPPORTUNITIES AND OBSTACLES

Vermonters identified a number of opportunities and obstacles to achieving their desired transportation future.

Opportunities

The codes discussed in this category were positive and optimistic about Vermont's transportation future. The most prominently displayed *opportunity* identified was the concept that there is an opportunity for change now because of fuel prices, climate change and budget issues among other reasons. Vermonters also expressed optimism that the states small size, particular "Vermont" characteristics, combined with a good education and communications efforts could lead to developing a transportation future that they agreed with. Interviewees also stated that giving people options to the automobile would increase the use of those options. The following table identifies possible *opportunities* identified by Vermonters available to achieve a desirable transportation future

Table 5. Possible *opportunities* identified by Vermonters.

OPPORTUNITY	Codes Displayed	Percent Total
Time for change	72	51%
Vermont Characteristics	36	26%
Education and communications	20	14%
Give people options	12	9%
TOTAL	140	100%

Time for Change

The other thing I would say is we have an opportunity to make things happen and it's so hard I think that in a political process – it's so easy to say no because you're so concerned that it might not be the right solution and it's so hard sometimes to say no. But there is always the opportunity to just make things happen – you know, to just leap forward and do it. And sometimes you make that wrong decision, but it's that – transportation is going to have to – you know, in the future make a lot of things happen.

There's no service the government provides that's perfect. But we can make targeted investments and we can recognize that in the State of Vermont the Emperor has no clothes. We don't have funding necessary to sustain our current system. And as soon as somebody recognizes that and publicly will state that then we can start building a plan that is actually achievable.

Give people options

The way that transportation industry designs its projects will have a big impact on whether or not people choose to use different modes of transportation like a bicycle or just walk on the sidewalks. If you don't provide that option because the design is not conducive to that, then you lose that opportunity for folks to make that choice – to save energy, to save...to make an effort, to have less of an impact on the environment.

I would like to see a transportation system that not just focuses on roads and bridges but focuses on opportunities for making alternative modes and I think it's really important for instance to recognize that public transit really depends on having walkable communities as well.

Vermont Characteristics

I think the big opportunity is that there has been some significant revitalization in downtown and there has been a 15-year strategy to try to re-invest in those centers of activity and that that's starting to pay off with a critical mass of folks locating down near employers, people who have...folks who have point to point commuters that have...and I think because of that, we have a chance to try again to integrate some of these modes of transportation.

Obstacles

Interviewee comments displaying an *obstacle* frames were less optimistic about Vermont's ability to achieve a desired transportation future. Comments displaying an *obstacle* frame were pessimistic and sometimes negative. Interviewees frequently expressed concern that the state's size, the way decisions are made and federal and state funding mechanisms and laws would continue to present major *obstacles*. The table below indicates possible *obstacles* identified by interviewees that could make it difficult to achieve a desirable transportation future.

Table 6. Possible *obstacles* identified by Vermonters.

OBSTACLES	Codes Displayed	Percent Total
Decision-making process	89	52%
Federal and state funding and laws	66	39%
Small Rural state	15	9%
TOTAL	170	100%

Decision-Making Process

I think the political process is perhaps the biggest obstacle in the sense that's it's already been talked about. You know the varying views of what Vermont is, what Vermont should be, what Vermont will be, the attitude towards business or against business, keeping it as it is as opposed to how are we going to grow and support ourselves. I think we've got to create some consensus about the vision of Vermont overall – not just in the transportation area, but as to do we want to create as a State here because we clearly bump into all these other roadblocks and then take forever to get something done.

We're not spending enough. Yet no one has the political will to actually put forth revenue increases, taxes – to actually put the money in the system that it needs.

The real need in Vermont with a statewide 25-year business transportation plan is leadership. I mean that's the real critical element that is missing from Vermont transportation, politically as well as policy – is leadership, either within the Executive Branch or the Legislative Branch.

The role of making decisions about future of transportation in our regions has resulted in pretty much a plan for the status quo... there's something wrong with the way we're making decisions.

Federal and state funding and laws

There's not enough flexibility with the Federal funds that come in to use them for public transportation operating and we cannot build public transportation as a viable alternative to this single occupancy vehicle unless we change the method for how we pay for the local share. The local share under Federal regulations means non-Federal dollars and trying to build the system on the property tax in Vermont is not going to be achievable.

Vermont Characteristics

I think transportation policy in the recent past has largely been reactive and unconnected to other concerns or issues and maybe what we need to do in Vermont is set some over-riding kind of goals for the State of Vermont that are related to health and healthcare and cost of healthcare and building communities and whatever we decide they are and then use transportation policy as one way to proactively drive things where we want them to lead.

CONCLUSION

This report summarizes findings from a series of interviews conducted with Vermonters about the state's expected and desired transportation future. The information from these interviews was used, in addition to a number of other sources, to inform the development of four scenarios about Vermont's transportation future. Those four scenarios are *Base Line*, *Environmental Change*, *Energy Crunch* and *Hot Spot Growth* and are explained in detail in Working Paper #6 prepared by Resource Systems Group for the Vermont Agency of Transportation's Long Range Transportation Business Plan.

This work was conducted on behalf of the VTrans LRTBP and in collaboration with the University Transportation Center at the University of Vermont and the Snelling Center for Government.

Findings indicate that Vermonters interviewed believe public transportation is a critical transportation mode to emphasize as the state develops its long range transportation plan. One narrative that emerged from Vermonters' views of the state's transportation future emphasized a transportation policy incorporating a *fix it first* approach. A second narrative that emerged, *energy collapse*, sees energy and climate change issues as having a major impact on Vermont's transportation future.



Attendees at St. Albans group interview at the St. Albans RPC offices.

Vermonters interviewed saw environmental issues, technology, tourism, fuel prices and supply and the state's aging population as having major influences on the state's transportation future.



 **VERMONT**
Vermont Agency of Transportation

**Vermont Long Range Transportation
Business Plan
June 5th Scenario Planning Session
8:30a - 4:30p, Capitol Plaza, Montpelier**

May 23, 2007

Thank you for agreeing to participate in the Scenario Planning Session on June 5th, an exercise that will inform and guide the development of ideas for the updated Vermont Long Range Transportation Business Plan. A team lead by Resource Systems Group of White River Junction has been charged with research and other activities to develop this updated plan. The Snelling Center, as one of the planning partners has helped to organize this day-long exercise.

The day is built around working with different scenarios. In using scenarios we seek to enlighten our future planning and to maximize our flexibility in response to national and global challenges which impact our resources and programs. You will confront four scenarios that represent emergent Vermont futures. The scenarios have been developed from extensive research and with National experts and many Vermonters who participated in interviews, a public opinion survey, and focused group conversations. We ask you to please review the scenario materials prior to the meeting. Your attention to this will make this a most productive process. The product of the forum will be strategies and policies to guide VTrans toward a transportation vision under each alternative scenario.

This is a by-invitation-only conference; it is a focused working session that will provide key input for the development of the long range plan. Seventy people have replied that they will attend and participate. Based on your discussions and deliberations, we will forge the drafts of the next strategic long range plan. These will be taken throughout the state to the many constituencies and stakeholders who have expressed interest while we also invite the public at large to participate and comment.

Enclosed you will find:

- An agenda for the day and a biography of Mike Meyer, our featured speaker
- A guidance document on the Scenarios and the planning process (PLEASE READ)
- A parking pass for parking behind the Capitol Plaza in their reserved lot (leave on your dashboard)
- A list of confirmed participants - please consider carpooling with someone from your area.

Thanks again for agreeing to join us. Please contact us if you have any questions.

130 So. Willard Street, Burlington, Vermont 05401

802-859-3090

Contact: Glenn McRae, phone ext. 308; email: glenn@snellingcenter.org

AGENDA
SCENARIO PLANNING SESSION
VTrans Long Range Plan
(June 5, 2007 - Capitol Plaza, Montpelier)

8:30-9:00am	Registration
9:00 - 9:15am	Welcome & Review of Agenda and logistics.
9:15 - 9:45	<i>Transportation Challenges in the 21st Century</i> Dr. Michael D. Meyer Professor of Civil and Environmental Engineering Georgia Institute of Technology.
9:45 - 10:30am	Presentation of Scenarios -Overview of Planning Process & Planning Objectives -Scenario Descriptions and Implications
10:30 - 10:40am	Break out Group Instructions
10:40 - 11:00am	BREAK - find break out group - You will be assigned to a specific group. Look for the Group number at an assigned breakout table.
11:00am-12:00	Breakout Groups - First Session "Business as Usual Scenario" All participants will work with this scenario.
12:00 - 1:00pm	LUNCH

Groups will reconvene at their assigned group tables and facilitators will present them with one of three Scenarios to be discussed. In the second and third sessions, participants will have an opportunity to address two of the three proposed scenarios. At the end we will have report outs from all groups covering all scenarios.

SCENARIO	A	B	C
1:00-2:00pm Breakout groups Second Session	Environmental Change Scenario	Energy Crunch Scenario	Growth Scenario
2:00-2:15pm	BREAK		

SCENARIO	A	B	C
2:15-3:15pm Breakout groups Second Session	Environmental Change Scenario	Energy Crunch Scenario	Growth Scenario

3:15-3:45	Next Steps in the LRTBP Process		
-----------	--	--	--

3:45 - 4:30	Report out and Summary Questions and Responses Introduce web site and opportunities for continued input		
4:30	Adjourn		



■ Documentation for:
**VT LONG RANGE
TRANSPORTATION
BUSINESS PLAN**

Scenario Planning Session

Background Information

■ Prepared for:
**Vermont Agency of
Transportation**

23 May 2007

- In Partnership with:
- Snelling Center for Government
 - TransManagement
 - Center for Rural Studies
 - Hubert H. Humphrey Institute of Public Affairs

TABLE OF CONTENTS

INTRODUCTION	1
SCENARIO PLANNING – WHAT’S IT ALL ABOUT?	1
LONG RANGE TRANSPORTATION PLAN OBJECTIVES	2
SCENARIO DESCRIPTIONS	3
BUSINESS AS USUAL SCENARIO	3
ENVIRONMENTAL CHANGE SCENARIO	5
ENERGY CRUNCH SCENARIO	7
GROWTH SCENARIO.....	9
SUMMARY	10



INTRODUCTION

Thank you for devoting a day to help VTrans develop its 2008 Long Range Transportation Business Plan (LRTBP). During the scenario planning session, you will be asked to generate ideas on how VTrans can achieve its long range planning objectives under four scenarios. Your suggestions will be used to develop policies that will guide how the Agency maintains, operates, and improves the state's transportation system.

This memorandum provides background information that will help you prepare for the day. It describes the scenario planning process, reviews the draft LRTBP planning objectives, describes four future year scenarios, and tells you how to obtain additional information about the work completed to date.

The scenario planning session is a major milestone in the development of the 2008 LRTBP. The overall process also includes information gathering and analysis, outreach efforts, and preparation of the draft and final plans. The update process began in the fall of 2006 and a final plan is due by May 2008. Please visit the LRTBP web site at <http://www.rsginc.com/vtplan/vermontplan/index.htm> to learn more about specific tasks and outreach efforts, see a list of consultants and advisory committee members, and to download products completed to date.

SCENARIO PLANNING – WHAT'S IT ALL ABOUT?

In land use and transportation planning, the term “scenario” often refers to different visions for a state, region, or town. For example, the Coalition for Utah's Future completed a planning process called “Envision Utah”. It evaluated four alternative growth scenarios for the Greater Wasatch Area, surrounding Salt Lake City. Each scenario represented a different vision for how the region could grow. The scenarios were analyzed, results published, and a preferred growth scenario was selected with public input. People in the region made a decision about their future and developed a plan to make it happen.

In the context of Vermont's Long Range Transportation Business Plan, the term “scenario” means something different. VTrans has a Vision and Mission Statement, and the five planning objectives described below already establish the transportation system's role in supporting broader community and quality of life, economic opportunity, and environmental goals in the state. Vermonters have already defined the type of transportation system they need and desire.

VTrans is interested in preparing for national and global events that may create obstacles to achieving the five LRTBP planning objectives. This planning process is not about choosing Scenario A, B, or C. Rather than picking one definitive picture of the future and planning for that future, scenario planning asks stakeholders to consider various possibilities and identify policies that can adapt to changing circumstances. For the LRTBP, scenarios do not describe a forecasted end state but rather are stories about future conditions that convey a range of possible outcomes. A scenario consists of a combination of different assumptions about driving factors, most of which are external to the transportation system, such as the aging of the population, energy cost and availability, climate change and economic changes.



LONG RANGE TRANSPORTATION PLAN OBJECTIVES

The five planning objectives support the Agency's Vision and Mission Statement, and were developed in consideration of: a public opinion survey conducted in 2006; SAFETEA-LU planning factors; goals presented in the aviation, bicycle/pedestrian, highway system, public transit, and rail modal policy plans; goals in regional plans; and goals articulated in the Vermont Planning and Development Act. For additional information on how the objectives were developed, please refer to Working Paper 5 available on the LRTBP web site at <http://www.rsginc.com/vtplan/vermontplan/index.htm>

VTrans Vision and Mission Statement (2006)

The Vermont Agency of Transportation's vision is a safe, efficient and fully integrated transportation system that promotes Vermont's quality of life and economic wellbeing.

VTrans' mission is to provide for the movement of people and commerce in a safe, reliable, cost-effective and environmentally responsible manner.

VTrans Goals

1. **SAFETY:** Make safety a critical component in the development, implementation and maintenance of the transportation system.
2. **EXCELLENCE:** Cultivate and continually pursue excellence in financial stewardship, performance accountability, and customer service.
3. **PLANNING:** Optimize the future movement of people and goods with corridor and natural resource management, balanced modal alternatives, and sustainable financing.
4. **PRESERVATION:** Protect the state's investment in its transportation system.

Proposed 2008 Long Range Plan Objectives

The VTrans Vision, Mission Statement, and supporting goals focus on the Agency. They describe how the Agency will carry out its mission. The following draft objectives of the Long Range Transportation Business Plan are guided by the Agency Vision and Mission Statement but are directed towards the transportation system.

1. Provide a safe and secure transportation system.
2. Preserve the condition of and manage the state's existing transportation system to provide capacity, safety, flexibility, and reliability to move people and freight in the most effective and efficient manner.
3. Improve and connect all modes of Vermont's transportation system to provide choices for moving people and freight.
4. Strengthen the economy, protect and enhance the quality of the natural environment, facilitate energy conservation, and improve Vermonters' quality of life.



- Support and reinforce Vermont’s historic settlement pattern of compact village and urban centers separated by rural countryside.

SCENARIO DESCRIPTIONS

The following four scenarios were developed by the consultants with assistance from the VTtrans LRTBP Internal Working Group. The planning horizon is 2030. The scenarios are based on the review of state and regional plans (Working Papers 1 and 2), the transportation financial analysis (Working Paper 3), the demographic and socioeconomic analysis (Working Paper 4), and interviews with national and VT big thinkers, and focus groups held throughout the state (summarized in Working Paper 6). All of these working papers are available on the LRTBP web site.

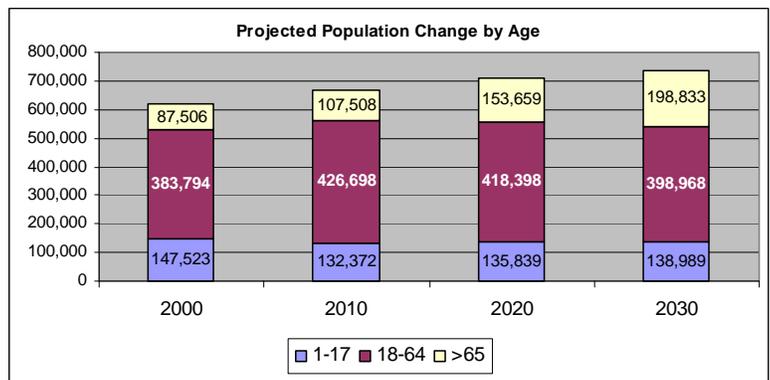
The text provides a general description and focuses on the primary driving factors that define each scenario. The attached table provides general information on the components of each scenario relative to demographics, land use and development, the economy, energy, the environment, technology, and transportation funding. The information will be reviewed at the planning session and additional comments will be provided on the transportation implications of each scenario.

Participants will be asked for recommendations to help achieve the five planning objectives under each scenario.

BUSINESS AS USUAL SCENARIO

Vermont’s population is older, but the state feels and looks very similar to today. The state’s total population grows slowly and ages as the number of people over 65 more than doubles (Figure 1). Population and housing continue to decentralize into rural and suburban areas while growth in established cities and villages occurs at a slower pace. Work force and affordable housing is located on less expensive land away from employment centers. Daily activities occur in regions where work, errands, education, recreation and entertainment are carried out in multiple towns. As a result, Vermonters remain very dependent on personal cars and trucks to get around and to deliver goods and services.

Figure 1: Projected Population Change in VT - US Census



This projection is based on current trends. It shows slow change in VT’s overall population while the number of people over the age of 65 is expected to double. See Working Paper 4 for additional demographic information.



The economy grows slowly and is increasingly dominated by service sector jobs. Employment in the service sector accounts for three-quarters of the job growth between 2000 and 2030 while the number of manufacturing jobs decreases. Statewide broadband and wireless service support growth in the service sector economy and also create more at-home businesses. The number of jobs in the state grows faster than the population as more people continue to work beyond the traditional retirement age.

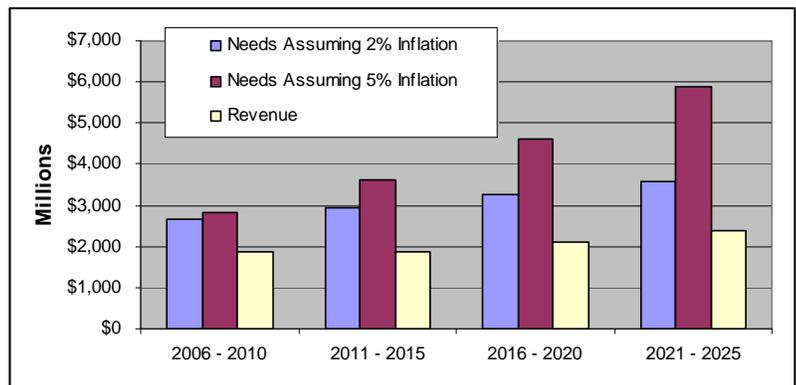
The supply and cost of oil and gas are volatile and Vermonters respond by purchasing more fuel efficient vehicles. However, this scenario assumes that oil remains available, is the primary source of energy for the transportation system, and that Vermonters continue to depend on their personal vehicles for daily activities.

On the environmental front, this scenario assumes that none of the air borne pollutants in Vermont exceeds the National Ambient Air Quality Standards (NAAQS). The recent weather trends of frequent and heavy rain, ice storms and high winds continue but do not intensify more than what has been experienced in recent years. These events require some short-term/emergency fixes (for example, a temporary bridge becomes necessary when the abutment for an old bridge is undermined), accelerate to some degree the deterioration of roadways, bridges, and culverts, and more frequently overburden stormwater management systems.

Transportation funding is a challenge in Vermont.

Transportation revenues have not kept pace with inflation. After taking care of the basic maintenance needs of existing roads, bridges and transit systems, there is not much money left to pay for new facilities and services (Figure 2). There is growing pressure for municipalities to fund projects and services and more competition for less state and federal funds. On the national level, states that contribute more funds through the federal gas tax than they receive back (donee states), advocate for a “go it alone” approach to transportation funding. Each state, they argue, should be responsible for funding its transportation system with minimal federal participation. In Vermont, that means additional loss of revenue and widening of the funding gap.

Figure 2: VT's Projected Transportation Funding Gap



This chart shows the gap between projected revenue and the cost of transportation needs. See Working Paper 3 for a complete financial analysis.



ENVIRONMENTAL CHANGE SCENARIO

This scenario assumes that certain air borne pollutants exceed national air quality standards established to protect public health and Vermont becomes warmer and wetter due to climate change. The same basic demographic and economic trends, land use patterns, and funding challenges as described under the Business as Usual Scenario are assumed.

As required by the Clean Air Act (CAA), the EPA set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants. The criteria pollutants are generated by the transportation system (mobile sources) and stationary sources such as homes, non-residential buildings, and power plants (point sources). Non-attainment status is designated for a geographic area, (usually a county, metropolitan area, or state) when at least one of the criteria pollutants measured in the field exceed its standard.

Currently, there are no documented NAAQS violations in Vermont; but this status has not always been the case. Non-attainment status was assigned in Vermont during the 1970s related to particulate matter (small particles in the air). The violation was eliminated by implementing methods that reduced roadway dust and through technical improvements that reduced tail pipe emissions. There have not been any documented violations in Vermont since the mid 1980s.

In the context of a long range transportation plan, it is reasonable to plan for a scenario where Vermont falls into non-attainment. Non-attainment could occur because the air quality worsens or due to a regulatory or legislative action that revises the NAAQS (which has occurred several times).

It is not hard to imagine the first case, where air quality in Vermont becomes worse. Vermont is currently part of the Ozone Transport Region (OTR), which was established by the 1990 CAA to address ozone across the northeast region of the United States from New England to northern Virginia (Figure 3)². Ozone is a pollutant that can be created in one area and transported to another and is often referred to as smog. The OTR was established to develop a regional and coordinated solution to reducing ozone. In Vermont, the level of ozone is close to but does not currently exceed the standard. Changes

Figure 3: Ozone Non-Attainment Areas as of December 2006¹



This map shows Vermont relative to the ozone non-attainment areas in the surrounding northeast states. The Environmental Change Scenario assumes that Vermont will also be in non-attainment.

¹ Map generated using map tools available from EPA at <http://www.epa.gov/air/data/reports.html>

² The Ozone Transport Region includes all 6 New England States, New York, New Jersey Delaware, Maryland, and the Washington, D.C. area including the northern Virginia suburbs.

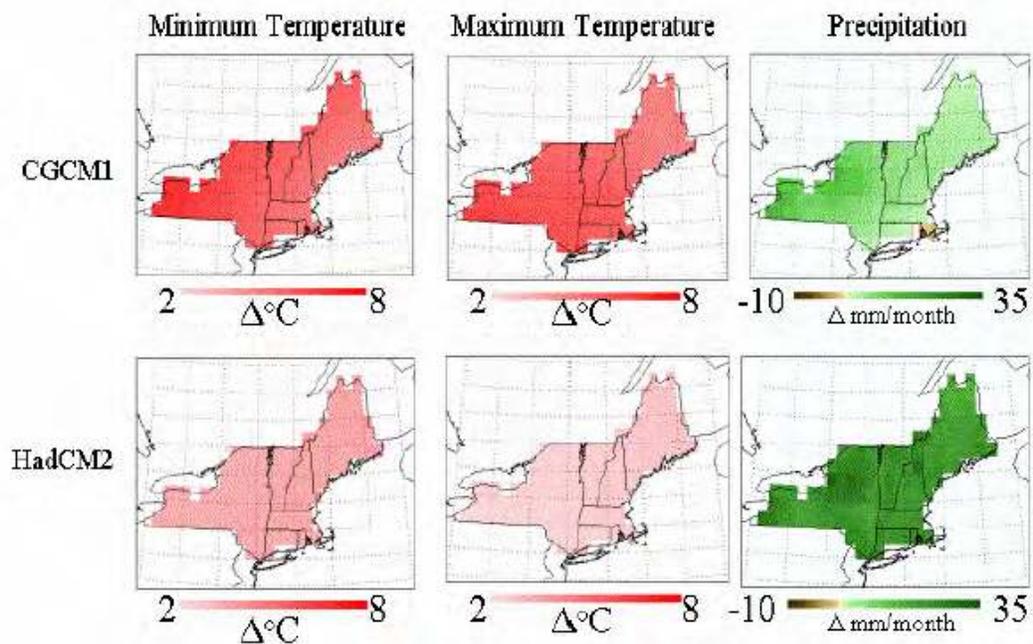


throughout the northeast USA could result in increased ozone levels in Vermont resulting in violation of the NAAQS.

Being designated as a non-attainment area will make transportation planning and the development of projects and services more complex. It will be necessary to demonstrate how projects and services conform to a state implementation plan designed to address air quality problems. More importantly, poor air quality would have public health and quality of life implications, would threaten Vermont's clean environment "brand" important to tourism and business recruitment, and may hinder economic development activities.

In addition to poor air quality, this scenario assumes that Vermont's climate will become warmer and wetter as described in the New England Regional Climate Variability and Change Assessment (Figure 4). The assessment analyzes how global climate change may affect New England and is a source of information for Governor Douglas's Commission on Climate Change. Two climate models referenced in the assessment predict an increase in New England's average annual minimum temperature of 6-10 degrees Fahrenheit and an increase in precipitation of 10-30% over the next century.

Figure 4: Forecasted Change in Temperatures and Precipitation by 2100¹



This graphic shows the best approximation of forecasted change in temperature and precipitation in New England using two different climate models. The Environmental Change Scenario assumes these forecasts are correct and Vermont becomes warmer and wetter.

¹ "The New England Regional Assessment" available at <http://www.necci.sr.unh.edu/2001-NERA-Foundation-Doc.html>.



These changes have two implications directly related to transportation. First, warmer temperatures promote the creation of smog (ozone) which would accelerate Vermont's fall into non-attainment. Second, storms will become more frequent and intense. As noted in Vermont's 2004 Hazard Mitigation Plan, warmer temperatures will likely increase the frequency and severity of flood inundation, erosion along rivers and streams, and landslide hazards. Vermont's roadway and rail networks were constructed near or along rivers, in flood prone areas, or in narrow, steep valleys making them particularly vulnerable to floods. With global warming, more funds and resources will be necessary than currently anticipated (Business as Usual Scenario) to preserve and upgrade the transportation system's basic infrastructure: culverts, drainage and stormwater systems, and bridges; and to make emergency repairs that keep roadways open after severe weather events.

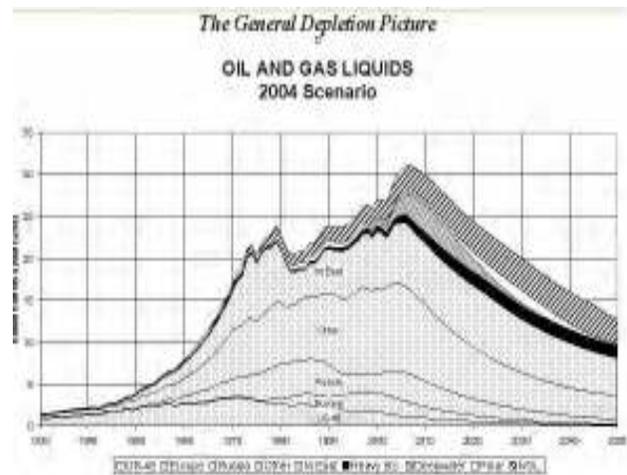
The potential impacts of climate change go well beyond the transportation system and include risks to human health due to increased levels of air pollution, encroachment of southern insects (like the deer tick) and tree diseases, and the loss of maples and other hardwood trees to pine and oak. With a changing forest and warmer weather, Vermont will be a different place and the economy may also be affected. The greatest economic impacts are in the human health sector and in the tourism sector, where a dull foliage season and less snow would reduce Vermont's attraction as a tourist destination during the fall and winter.

ENERGY CRUNCH SCENARIO

The global supply of oil peaks or is interrupted for other reasons (Figure 5). There is a permanent and significant rise in the cost of crude oil which over time causes gas prices to more than triple. In addition, Vermont Yankee, which provides 30% of the state's electricity, is decommissioned and a replacement source that provides electricity at a similar cost has not yet been secured. As a result, electricity is more expensive and not competitive as an energy source for electric or hybrid vehicles that need to charge batteries over night.

During the early years of the energy crunch, the jump in fuel

Figure 5: One Estimate of Future Declining Oil and Gas Supply⁴



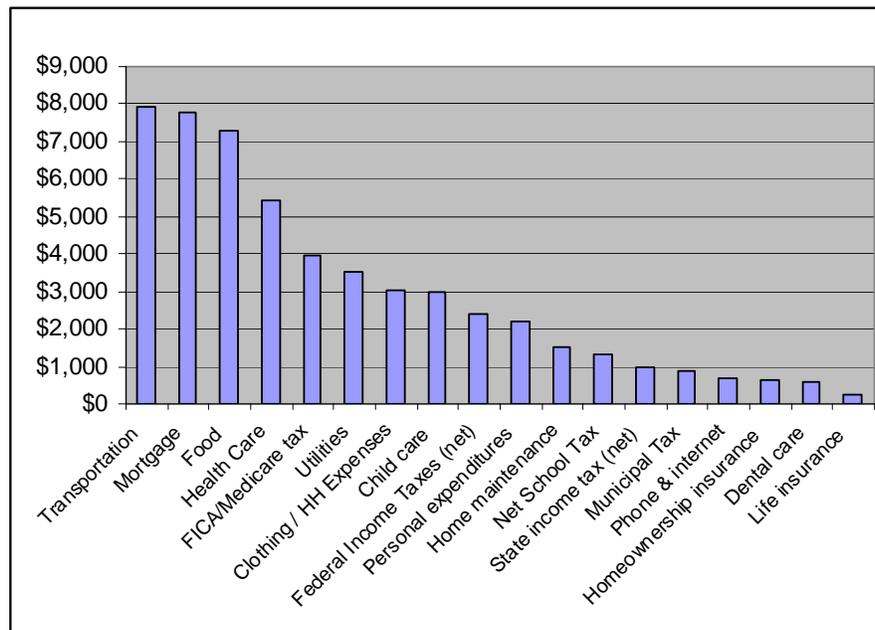
This chart shows one estimate of how oil and gas production could begin decreasing sometime after the year 2010. Assuming this analysis is correct, what policies and strategies should be incorporated into the VT LRTBP?

⁴ From www.peakoil.com



costs for transportation squeezes Vermont families that earn the median income or less (Figure 6). The cost is greater for people with homes located further away from jobs, services, and other activities because they need to drive longer distances. These homes were initially more affordable than similar sized houses in town, even when transportation costs were considered. As the supply of oil drops, gasoline costs double and then triple. Rising transportation costs generate demand for more in-town housing. In the long term, these market forces reverse the trends of the last forty years and established cities, villages and growth centers are growing faster than rural areas.

Figure 6: 2006 Annual Household Expenses



This chart shows the annual expenses for a hypothetical household in VT with two adults and one child in 2006⁵. They earn the median income and own a home that was purchased at the median price in 2000. Note that transportation costs are slightly more than the mortgage. If gas prices triple, their transportation costs will increase by about \$240 a month (\$2,880 per year).

Higher cost oil, gas and electricity make Vermont less attractive to new businesses and existing businesses begin to consider out-of-state locations with lower cost, and more reliable energy sources. High fuel costs also increase the cost for goods movement by truck and have resulted in a rail renaissance. Over the years, the state upgraded its priority rail lines to handle heavier and double stacked cars at higher speeds and the railroads have expanded the types of services they offer. Businesses located near the rail line were able to take advantage of the new services but most businesses in the state remain dependent on trucks for shipping and receiving.

⁵ Based on data presented in "Vermont Household Affordability Analysis"; Douglas Hoffer and Paul Cillo; Public Assets Institute; October 2006. Available at <http://www.publicassets.org/publications/>



GROWTH SCENARIO

This scenario assumes that employment and population growth occur above the rate described in the Business as Usual Scenario. The additional growth occurs due to the establishment of major employers in two different regions of the state and a statewide increase in in-migration.

The employment growth occurs in two “hot spots” creating spin-off jobs and demand for new housing in the host regions. For the sake of the scenario planning exercise, the employment hot spots are assumed to be a manufacturing facility in the US 7 corridor south of Rutland and a high technology/information based company near Saint Johnsbury. Each facility is assumed to create 2,000 new jobs by 2030. (The locations, types of businesses and employment levels have been selected for the purpose of this exercise and do not reflect any known or anticipated development projects.)

This type of hot spot growth has occurred in the past and it is reasonable to think broadly about how to prepare for similar types of growth in the future. There are many examples of this type of hot spot economic growth in the state created by home grown businesses and out-of-state companies that choose to locate here. Although it is larger than the hypothetical examples in this scenario, the IBM facility in Essex Junction has been an economic force in and beyond Chittenden County for 50 years. Other examples include Ben and Jerry’s with facilities in many locations, Green Mountain Coffee Roasters in Waterbury, IDX in South Burlington, and C. & S. Wholesale Grocers in Brattleboro.

Figure 7: A Recent Growth Hot Spot



The Husky Injection Molding facility in Milton is a recent example of a growth hot spot. As noted on the Husky web site, “Vermont was chosen because of the area’s high standard of living and its close proximity to major transportation hubs in Montreal, New York and Boston.”

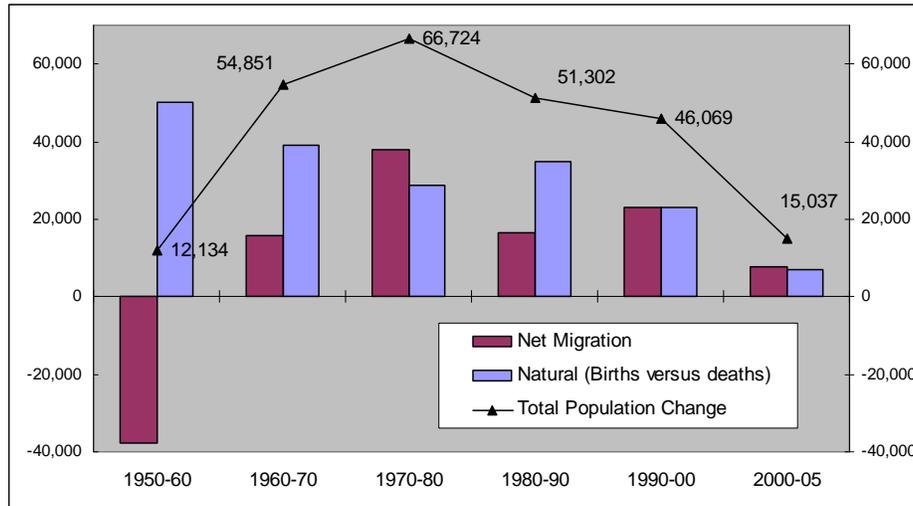
In addition to the hot spot growth, this scenario also assumes that the state’s total population will increase beyond current trends as more people choose to move into Vermont. During the 1990s through 2005, Vermont’s population change has been equally affected by the differences between birth and death rates (natural causes) and net in-migration. However, the contribution of natural causes and migration has varied significantly over the last 50 years (Figure 8). It is conceivable that national or global events could result in an increase in in-migration and the state’s population would grow more than current trends suggest.

Like the hot spot economic growth, changes in in-migration have occurred in the past and it is reasonable to plan for the same type of event for the future. During the 1950s, Vermont experienced a net out-migration of almost 40,000 people. High birth rates off-set the difference resulting in a small increase in population. By the 1970s there was a significant change and a net in-migration accounted for more of the state’s population growth than natural causes. The in-migration of the 1970s affected two decades of population growth as those that moved into



the state began to have children presumably resulting in the increased birth rates in the 1980s that are implied in Figure 8.

Figure 8: Components of VT's Population Change from 1950 to 2005



This chart shows how natural causes (difference between births and deaths) and migration patterns have contributed to overall population change in Vermont. Note the large increase in in-migration in the 1970s followed by an increase in natural population growth in the 1980s. The growth scenario assumes that in-migration similar to the 1970s occurs again resulting in two decades of faster population growth.

It is generally accepted that a significant portion of the 1970s in-migration was due to a cultural change on the national level that could not have been anticipated in prior decades. It brought more young people into the state and affected Vermont's own culture and economy in many ways. The Business as Usual Scenario assumes that current trends continue, the youth drain affecting all of New England occurs in Vermont, and the population becomes older. In the Growth Scenario, the opposite is assumed. Hot spot employment growth occurs and young people migrate into the state, grow their families and contribute to the economy in creative ways yet to be conceived.

SUMMARY

This memorandum provides background information to help participants prepare for the scenario planning session being conducted to support the Vermont 2008 Long Range Transportation Business Plan. It describes the five long range planning objectives and presents four scenarios. During the scenario planning session, participants will be asked to generate ideas on how VTTrans can achieve the long range planning objectives under the four scenarios. Suggestions will be used to develop policies that will guide how the Agency maintains, operates, and improves the state's transportation system. Additional information is available on the VT LRTBP web site at <http://www.rsginc.com/vtplan/vermontplan/index.htm>.



Table 1: Scenario Description Matrix

Scenario	Event or Primary Driving Factor	Demographics	Land Use and Development	Economy	Energy	Environment	Technology	Transportation Funding
Business as Usual	Current trends continue. Vermont in 2030 looks very similar to today.	<ul style="list-style-type: none"> Low population growth Migration and natural causes are equal share of population change Doubling of people over the age of 65 and aging in place Youth drain 	<ul style="list-style-type: none"> Regional Communities Decentralization continues although some seniors may choose to locate closer to services Separation of housing from jobs and services 	<ul style="list-style-type: none"> Growth in service sector jobs Slow economic growth High cost of housing Traditional small entrepreneurs remain important part of state's economy 	<ul style="list-style-type: none"> Volatile energy costs and fossil fuel supply, but oil remains available. 	<ul style="list-style-type: none"> Stay within air quality attainment Degradation of scenic qualities, due to decentralization, which are major quality of life and tourism assets 	<ul style="list-style-type: none"> Single occupant vehicles remain dominant mode of personal transportation. Broad band and wireless access provided throughout the state 	<ul style="list-style-type: none"> \$3-8 billion funding gap 2006-2030. More reliance on state and local generated revenues Funding gap intensifies competition for funds between different modes and regions of the state.
Environmental Change	Vermont becomes a non-attainment area VT becomes warmer and wetter due to climate change	<ul style="list-style-type: none"> Same as Business as Usual 	<ul style="list-style-type: none"> More emphasis on concentrated development as a strategy to address non-attainment and Green House Gas reduction, but Market forces continue to favor decentralization. 	<ul style="list-style-type: none"> Generally the same as Business as Usual, but Perceived or actual cost increases for economic development on initial implementation 	<ul style="list-style-type: none"> More emphasis on alternative fuels to address non-attainment and Green House Gas reduction 	<ul style="list-style-type: none"> Negative health impacts Negative impact on water quality with more run-off due to storm intensity 	<ul style="list-style-type: none"> Same as Business as Usual 	<ul style="list-style-type: none"> Gap may increase due to increased needs from weather impacts and project development complexities.

Scenario	Event or Primary Driving Factor	Demographics	Land Use and Development	Economy	Energy	Environment	Technology	Transportation Funding
Energy Crunch	<p>Oil supply declines or international / security event restricts fuel supplies;</p> <p>De-commissioning Vermont Yankee</p>	<ul style="list-style-type: none"> ▪ Population grows even slower, or declines due to slower economy. 	<ul style="list-style-type: none"> ▪ Market forces begin to encourage more growth in established cities, villages and growth centers 	<ul style="list-style-type: none"> ▪ Big economic negative impact in short term at least on both households and businesses ▪ Energy prices increase making VT less affordable to establish new or grow existing business 	<ul style="list-style-type: none"> ▪ Electricity less cost effective as source for transportation ▪ Vermonters become more energy independent using local resources 	<ul style="list-style-type: none"> ▪ Might cause use of domestic energy sources (wood) short-term that have larger environmental effects ▪ Less fossil fuel consumption combined with less travel means less impact on all aspects of environment 	<ul style="list-style-type: none"> ▪ Should stimulate technology innovations and more institutional collaboration to achieve long term improvement 	<ul style="list-style-type: none"> ▪ Same funding gap as Business as Usual ▪ Significant state and local financial implications beyond transportation.
Hot Spot Growth and Migration Change	<p>Job growth occurs in two hot spots (St. Johnsbury and Rutland for example).</p> <p>Event occurs, either globally, or in nearby major metropolitan areas that causes significant increase in in-migration</p>	<ul style="list-style-type: none"> ▪ Population increases much faster than anticipated in first 5 years after event ▪ More younger people move to VT with growing families that fuel continued population growth into next generation ▪ Population growth occurs around new employment hot spot 	<ul style="list-style-type: none"> ▪ Sprawl around new growth hot spot ▪ Decentralization continues in rest of state 	<ul style="list-style-type: none"> ▪ Employment growth in hot spot ▪ Overall economy also grows in response to in-migration. Businesses may be started by people moving to VT. (Also depends on how other systems like education respond.) 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Same as Business as Usual 	<ul style="list-style-type: none"> ▪ Some potential to generate funds through tax increment finance or impact fees around growth hot spots. ▪ These options could address capacity needs near hot spot, but would not address overall funding gap. ▪ Some additional revenue generated through growth, but significant gap remains.



Dr. Michael Meyer

Professor
School of Civil and Environmental
Engineering
[Transportation Group](#)

790 Atlantic Drive
Georgia Institute of Technology
Atlanta, Georgia 30332-0355 USA
Phone: (404) 385-2246
FAX: (404) 894-2278
Email: michael.meyer@ce.gatech.edu

Dr. Michael D. Meyer is a Professor of Civil and Environmental Engineering, and former Chair of the School of Civil and Environmental Engineering at the Georgia Institute of Technology. From 1983 to 1988, Dr. Meyer was Director of Transportation Planning and Development for Massachusetts where he was responsible for statewide planning, project development, traffic engineering, and transportation research. Prior to this, he was a professor in the Department of Civil Engineering at M.I.T.

Dr. Meyer has written over 140 technical articles and has authored or co-authored numerous texts on transportation planning and policy, including a college textbook for McGraw Hill entitled *Urban Transportation Planning: A Decision Oriented Approach*. He was the author of *Transportation Congestion and Mobility: A Toolbox for Transportation Officials*, a book sponsored by the Institute of Transportation Engineers and the Federal Highway Administration that focuses on transportation actions that can be implemented to enhance mobility. He is an active member of numerous professional organizations, and has chaired committees relating to transportation planning, public transportation, environmental impact analysis, transportation policy, transportation education, and intermodal transportation.

Dr. Meyer is the recipient of numerous awards including the 2000 *Theodore M. Matson Memorial Award* in recognition of outstanding contributions in the field of transportation engineering; the 1995 *Pyke Johnson Award* of the Transportation Research Board for best paper in planning and administration delivered at the TRB Annual Meeting; and the 1988 *Harland Bartholomew Award* of the American Society of Civil Engineers for contribution to the enhancement of the role of the civil engineer in urban planning and development. He was recently appointed to the Executive Committee of the Transportation Research Board.

Dr. Meyer has a B.S. degree in Civil Engineering from the University of Wisconsin, an M.S. degree in Civil Engineering from Northwestern University and a Ph.D. degree in Civil Engineering from M.I.T. He is a registered professional engineer in the State of Georgia.

Dr. Michael Meyer

Published Books and Parts of Books

- Gakenheimer, R. and Meyer, M.D., "Urban Transportation Planning in Transition: Sources and Prospects of TSM," in *Current Issues in Transportation Policy*, (A. Altshuler, Ed.) D.C. Heath, 1979.
- Meyer, M.D. and Miller, E.J., *Urban Transportation Planning: A Decision-Oriented Approach*, McGraw-Hill, New York, 1984 (new edition, 2000).
- Meyer, M.D., "Urban Transportation Planning in the United States: Trends and Future Directions," in *Transportation Planning and Mobility in an Era of Transition*, (G.R.M. Jansen, P. Nijkamp, and C.J. Ruigrok, Eds.), Amsterdam, North-Holland/Elsevier Science Publishers, The Netherlands, 1985.

Illustrative Presentations (Last Five Years)

- Research on Transportation Planning: An Agenda for the Future, Transportation Research Board, Irvine, CA April 1999.
- Transportation Planning In (and For) the Future: Challenges and Opportunities, Region II University Transportation Center Distinguished Lecture Series, World Trade Center, New York, NY, Nov. 1999.
- The Future of Transportation Technology and Its Influence on Statewide Transportation Planning, Symposium on Forces Shaping Mobility Strategies, California Transportation Futures, CalTrans, Sacramento, Nov. 2000.
- Future Challenges and Opportunities for State Transportation Agencies, Keynote speech at the Annual State Transportation Conference, Jefferson City, MO, Jan. 2002.
- The Issue, Challenges, and Opportunities for Moving from the State-of-the-Practice to the State-of-the Art, Presentation at the Annual Meeting of the Transportation Research Board, Jan. 2002.

Honors

- *National Associate of the National Academies*, in recognition of truly extraordinary service to the National Academies of Science, Engineering and Medicine, 2002
- *Theodore M. Matson Memorial Award*, AASHTO, American Road and Transportation Builders Association, Federal Highway Administration, Institute of Transportation Engineers, Intelligent Transportation Society of America and Transportation Research Board, Award in recognition of outstanding contributions in the field of transportation engineering. 2000

Vtrans
Scenario Planning Session 6-5-07

Program Participants

list current as of 5-23-07

Consider carpooling with a colleague

First Name	Last Name	Organization	Town	Phone Number	Email
Chris	Andreasson	Vermont Transit Co., Inc.	White River Junction	802-295-5074	candreasson@vermonttransit.com
Susan	Bandfield Abdo	Riders of Vermont	Montpelier	262-3377	susan@rovervt.org
Murray	Benner	SSTA	Colchester	878-1527	mabssta@together.net
Bruce	Bentley	Central Vermont Public Service	Rutland	747-5520	bbentley@cvps.com
Erik	Bohn	OMYA Inc.	Proctor	802-770-7132	erik.bohn@omya.com
Darby	Bradley	Vermont Land Trust	Montpelier	802-262-1202	darby@vt.org
Ted	Brady	Senator Leahy's Office	Montpelier	229-1701	ted_brady@leahy.senate.gov
Trini	Brassard	Vermont Agency of Transportation, Operations Division	Montpelier	802-828-2628	trini.brassard@state.vt.us
Jim	Bush	VTrans - Advisory Committee LRTBP	Montpelier	802-828-1468	Jim.Bush@state.vt.us
Valerie	Capels	Town of Waitsfield (Town Administrator)	Waitsfield	802-496-2218	townadmin@madriver.com
Van	Chesnut	Advance Transit Inc., Executive Director	Wilder	802-295-1824 x201	vchesnet@sover.net
Susan	Coburn	Vermont Department of Health	Burlington	802-951-5151	SCoburn@vdh.state.vt.us
Chris	Cole	Chittenden County Transportation Authority	Burlington	802-864-0211	ccole@cctaride.org
Sally	Collopy	Vermont Local Roads Program	Colchester	800-462-6555	scollopy@smcvt.edu
Steve	Cook	Vermont Department of Tourism, Deputy Commissioner	Montpelier	828-3516	steve.cook@state.vt.us
Elizabeth	Courtney	Vermont Natural Resources Council	Montpelier	802-223-2328	ecourtney@vnrc.org
Bob	Dufresne	Dufresne and Associates, PC	Windsor	802-674-2904	red@dufresneassociates.com
Fred	Dunnington	Middlebury Town Planner	Middlebury	802-388-8106	fdunnington@town.middlebury.vt.us
Kevin	Ellis	Kimbell, Sherman & Ellis	Montpelier	802-229-4900 X107	kevin@kse50.com
Peg	Elmer	Vermont Department of Housing and Community Affairs	Montpelier	802-828-5220	peg.elmer@state.vt.us
Barb	Farr	Vermont Emergency Management	Waterbury	802-241-5376	bfarr@dps.state.vt.us
Monty	Fischer	National Wildlife Federation	Montpelier	802-229-0650 x308	fischer@nwf.org
Lori	Fisher	Lake Champlain Committee	Burlington	802-658-1414	lorif@lakechamplaincommittee.org
Steve	Gladczuk	Central Vermont Regional Planning Commission	Montpelier	802-229-0389	gladczuk@cvregion.com
Mary	Grant	Rural Community Transit, Inc.	St. Johnsbury	802-748-8170	grant@kingcon.com
Peter	Gregory	Two Rivers RPC	Woodstock	802-457-3188	pgregory@trorc.org
Tom	Hengelsberg	Truex Cullins & Partners Architects	Burlington	802-658-2777 x242	thengelsberg@truexcullins.com
Chris	Hill	Heritage Flight	South Burlington	802-863-3626	christopher.hill@flyheritage.com
Beth	Humstone	Planning Consultant	Burlington	802-660-8747	ehumstone@yahoo.com
Scott	Johnstone	Chittenden County Metropolitan Planning Organization	South Burlington	802-660-4071 x15	sjohnstone@ccmpo.org
Rick	Kehne	Addison County RPC	Middlebury	802-388-3141	rkehne@sover.net
Fred	Kenney	Vermont Economic Progress Council	Montpelier	828-5256	fred.kenney@state.vt.us
Karen	Lafayette	Vermont Low-Income Advocacy Council	Burlington	802-862-9251	kmlafayette@aol.com
Trevor	Lashua	Vermont League of Cities & Towns	Montpelier	802-229-9111	tlashua@vlct.org
Sandy	Levine	Conservation Law Foundation	Montpelier	802-223-5992	slevine@clf.org
Deborah	Lisi-Baker	Vermont Center for Independent Living	Montpelier	802-229-6400	deborah2@vcil.org
Mark	Lorenzo	National Wildlife Federation	Montpelier	802-229-0650	lorenzo@nwf.org
Dennis	Malloy	ANR - Advisory Committee LRTBP	Waterbury	802-241-3614	dennis.malloy@state.vt.us
Matt	Mann	Windham Regional Commission	Brattleboro	802-257-4547	mmann@sover.net
Mary Ellen	Mendl	Vermont 2-1-1	So. Burlington	802-864-7541 x56	maryellen@unitedwaycc.org
Marilyn	Miller	Vermont Automobile Dealers Association	Montpelier	802-223-6635	vtada@adelphia.net
Doug	Morton	NVDA - Transportation Planner	St. Johnsbury	802-748-5181	morton@nvda.net
Jim	Moulton	ACTR	Middlebury	388-1946	jim@actr-vt.org
John	O'Kane	IBM Corporation	Essex Junction	802-769-3627	jokane@us.ibm.com
Lt. Bill	O'Leary	Vermont State Police -Traffic Safety Coordinator	Williston	802-872-4045	woleary@dps.state.vt.us

Vtrans
Scenario Planning Session 6-5-07

Program Participants

list current as of 5-23-07

Consider carpooling with a colleague

Steve	Patterson	Northeastern Vermont Development Association	St. Johnsbury	802-748-5181	spatterson@nvda.net
David	Pelletier	Lamoille County Planning Commission	Morrisville	802-888-4548	dave@lpcvt.org
Robert	Penniman	CATMA	Burlington	802-847-0223 x5	catma@uvm.edu
Jason	Rasmusen	SWCRPC	Ascutney	802-674-9201	jrasmusen@swcrpc.org
Diane	Reardon	Finance and Administration Division, Vtrans	Montpelier		diane.reardon@state.vt.us
Bill	Rose	Northwest RPC	St. Albans	802-524-5958	brose@nrpcvt.com
Susan	Russell	Central Vermont Council on Aging	Barre	802-476-2669	srussell@cvcoa.org
Bonnie	Rutledge	Vermont Department of Motor Vehicles	Montpelier	802-828-2011	bonnie.rutledge@state.vt.us
Adel	Sadek	UVM Civil & Environmental Engineering	Burlington	802-656-4126	asadek@cems.uvm.edu
Arthur	Sanborn	Lyndon Town Adm /VT State Transportation Board	Lyndonville	802-626-5834	lyndon@kingcon.com
Marty	Sanchez	Town of Randolph	Randolph	802-728-9724	mardee@municipaloffice.randolph.vt.us
Susan	Schreibman	Rutland RPC	Rutland	802-775-0871	
Nancy	Schultz	Vermont Bicycle and Pedestrian Coalition	Montpelier	802-225-8904	nancy@vtbikeped.org
Brian	Searles	Burlington International Airport	South Burlington	802-863-2874	bsearles@btv.aero
Linda	Seavey	University of Vermont Campus Planning Services	Burlington	802-656-3208	Linda.Seavey@uvm.edu
Brian	Shupe	Vermont Forum on Sprawl	Burlington	802-864-6310	bshupe@vtsprawl.org
Chapin	Spencer	Local Motion	Burlington	802-652-2453	chapin@localmotion.org
Robert	Stevens, PE	Stevens & Associates, P.C.	Brattleboro	802-257-9329	bstevens@stevens-assoc.com
Steve	Terry	Green Mountain Power	Colchester	802-655-8408	terry@greenmountainpower.biz
Cathy	Voyer	Agency of Human Services	Waterbury	802-241-4624	cathy.voyer@ahs.state.vt.us
Jennifer	Wallace-Brodeur	AARP Vermont	Montpelier	802-224-1113	JWBrodeur@aarp.org
Mike	Welch	St. Johnsbury Town Manager	St. Johnsbury	802-748-3926	mwelch@town.st-johnsbury.vt.us
Netaka	White	Vermont Biofuels Association	Middlebury	802-388-1328	info@vermontbiofuels.org
David W.	Wulfson	Vermont Railway, Inc. (VTR)	Burlington	802-658-2550	dwulfson@vrs.biz

Vermont Long Range Transportation Plan 2006 Survey Update Final Report

Prepared for:
The Vermont Agency of Transportation

Conducted by:



WILBUR SMITH ASSOCIATES



in association with
Digital Research, Inc.
and
US Field Research



TABLE OF CONTENTS

Executive Summary		ES-1
1.0 Study Overview		1
1.1 Introduction.....		1
1.2 Survey Instrument and Plan		1
1.3 Data Collection.....		1
1.4 Data Analysis		2
2.0 Survey Results		4
2.1 Transportation Services Used		4
2.1.1 Commercial Air Services.....		5
2.1.2 Bike Paths, Trails or Shared Use Paths		6
2.1.3 Bike Lanes or Shoulders		7
2.1.4 Ferry Service Across Lake Champlain.....		8
2.1.5 Park and Ride Lots		9
2.1.6 Minor Transportation Services		10
2.2 Motor Vehicle Usage.....		11
2.2.1 Total Mileage Traveled.....		11
2.2.2 Miles Driven Alone		12
2.2.3 Miles Driven on Average Day in the Summer		13
2.2.4 Encourage Vermonters to Drive Less.....		14
2.2.5 Time Spent on Selected Activities.....		15
2.2.6 Driving a Car, Truck, or Van		16
2.2.7 Walking.....		17
2.2.8 Riding as a Passenger in a Car, Truck, or Van.....		18
2.2.9 Traveled More Than 75 Miles.....		19
2.2.10 Primary Means of Transportation for Long Trips.....		20
2.2.11 Frequency of Long Distance Travel		20
2.2.12 Work Related Travel		21
2.2.13 Typical Travel to Work.....		21
2.2.14 Number of Miles to Work.....		22
2.3 Traffic Congestion in Vermont		23
2.3.1 Impact of Congestion on Quality of Life.....		24
2.3.2 Traffic Congestion Compared to Past Six Months.....		25
2.3.3 Seasonal Traffic Congestion.....		26
2.4 Ratings of Vermont’s Transportation Infrastructure & Spending.....		27
2.4.1 Highway Condition Compared to Five Years Ago.....		27
2.4.2 Comparison of Highway Condition with Other States.....		28
2.4.3 Condition of the Walking and Biking Facilities.....		29
2.4.4 Condition of the Non-motorized Transportation System.....		30
2.4.5 Winter Highway Maintenance.....		31
2.4.6 Winter Safety of Vermont’s Roadway System.....		32
2.5 Allocation of Agency Funds.....		33
2.5.1 Maintaining Highways and Repairing Bridges.....		34
2.5.2 New Roadway Projects		35

2.5.3	Funding for Non-highway Programs.....	36
2.6	Most Important Issues	37
2.7	Share of Transportation Budget Allocated to Specific Issues	38
2.7.1	Comparison of Budget Allocations 2006 and 2000.....	39
2.8	Statements about Vermont’s Environment	40
2.8.1	Natural Environment in Vermont	40
2.8.2	Role in Limiting Urban Sprawl.....	41
2.9	Proposals for Limiting Sprawl	42
3.0	Comparisons with Previous Surveys.....	43
3.1	Overview of Surveys.....	43
3.2	Analysis and Trends: Comparisons of 2006 and 2000 Results	43
3.3	Comparing 2006 Results to the 1995 Survey.....	46
4.0	Survey Participant Profile	47

Appendix A	Survey Questionnaire.....	50
-------------------	----------------------------------	-----------

Tables

Table 1.	Weights of Attributes Region of State & Age Group	2
Table 2.	Means of Travel to Work in 2006	21
Table 3.	Most Important Issues	37
Table 4.	Transportation Issues and Allocation to Budget (2006)	38
Table 5.	Transportation Issues and Allocation to Budget (2000)	39
Table 6.	Proposals for Limiting Urban Sprawl.....	42
Table 7.	Profile	47

Figures

Figure 1.	Five Regions of Vermont	3
Figure 2.	Transportation Services Used	4
Figure 3.	Used Commercial Air Services (Round Trips)	5
Figure 4.	Used Bike Paths, Trails or Shared Use Paths	6
Figure 5.	Used Bike Lanes or Road Shoulders.....	7
Figure 6.	Used Ferry Service Across Lake Champlain.....	8
Figure 7.	Used Park and Ride Lots	9
Figure 8.	Number of Miles Traveled in a Motor Vehicle	11
Figure 9.	Passenger Car Miles spent Driving Alone.....	12
Figure 10.	Miles Traveled by Passenger Car	13
Figure 11.	Activity Spent Any Time on the Previous Day	15
Figure 12.	Driving a Car, Truck or Van the Previous Day.....	16
Figure 13.	Walking the Previous Day	17
Figure 14.	Riding as a Passenger in a Car, Truck or Van the Previous Day	18
Figure 15.	Number of Trips More than 75 Miles One Way.....	19
Figure 16.	How Often Traveling More than 75 Miles from Home	20
Figure 17.	Number of Miles from Home to Work.....	22
Figure 18.	Ways People Have Changed Behavior to Avoid Traffic.....	23
Figure 19.	Effect of Traffic Congestion on Quality of Life	24
Figure 20.	Traffic Congestion Compared to a Year Ago.....	25
Figure 21.	Which Season Is Worse in Terms of Traffic Congestion?	26
Figure 22.	Condition of Vermont Highways Compared to Five Years Ago	27

Figure 23. Highway Condition Compared to Other States 28

Figure 24. Condition of Sidewalks, Trails, Paths, Shoulders and Other Facilities
Compared to 5 Years Ago 29

Figure 25. Condition of Sidewalks, Trails, Paths and Shoulders Compared
to Other States..... 30

Figure 26. Vermont’s Winter Highway Maintenance Compared to Other States 31

Figure 27. Overall Safety of Vermont’s Roadway System in the Winter..... 32

Figure 28. Agency Expenditure of Funds on Paving and Maintaining Highway
and Repairing Bridges 34

Figure 29. Agency Funding for New Roadway Projects..... 35

Figure 30. Agency Funding for Non-highway Programs Like Public Transit, Airports
and Rail..... 36

Figure 31. The Natural Environment in Vermont has Been Deteriorating in
Recent Years 40

Figure 32. The Vermont Agency of Transportation Should Take an Active Role
in Limiting Urban Sprawl 42

Figure 33. Total Mileage Traveled on Average Weekday 44

Figure 34. How Vermonters Manage Traffic 44

Figure 35. Changes in Vermonters’ Perceptions on VTrans Budget Items 45

Executive Summary

The Vermont Agency of Transportation (VTTrans) commissioned Wilbur Smith Associates (WSA), as part of a consortium of consultants, to conduct a public opinion survey of Vermont residents regarding transportation issues. The purpose of this survey was twofold: to gauge how Vermonters' travel habits are changing; and to provide current information about their attitudes, perspectives, and priorities for future transportation spending and infrastructure planning.

Survey results were obtained through a random telephone survey of 1,243 Vermont residents over the age of 18. Individuals were selected to participate in the survey using a list of randomly generated phone numbers purchased from a supplier of samples for telephone surveys. A summary of the data analysis follows.

Key Findings

- The average amount of time Vermont residents spent driving was 70.4 minutes per day. Average daily driving time was highest in the Southeast Counties at 83.1 minutes and lowest in the Burlington-Centered region (63.4 minutes).
- The average estimated number of miles traveled by the Vermont residents surveyed was 52.5 miles per day.
- Vermonters walk almost as much as they drive. When asked what transportation activities they spent any time on the previous day, approximately 80 percent of survey respondents reported spending time on driving and walking. The average time spent on these activities was 70.4 minutes for driving and 61.9 minutes for walking.
- Of the Vermonters surveyed, 70 percent said they were happy with the current VTTrans budget allocation. However, when asked about specific issues, the top two issues that survey respondents suggest spending a greater share of the budget on are *bridge repairs and replacement* and *summer highway road repair and repaving*.
- The majority of residents believe that Vermont does a better job of winter highway maintenance than other states (59%).
- On average, survey respondents ranked the safety of Vermont's roadway system in winter as "good" (6.7 on a 10 point scale). Only 15 percent ranked it as "poor" or "very poor."
- Close to half of Vermont residents (40%) agree that the natural environment in the State has been deteriorating in recent years and about one-third disagrees.
- Four out of 10 Vermonters (42%) agree that VTTrans should take an active role in limiting urban sprawl, whereas about one-third disagrees with this statement.

Regional Issues

Survey results were analyzed to ascertain if regional differences exist around the State. While most regions of the state were similar, the Study Team observed variations, primarily in the types and frequency of use of various transportation modes, between the Burlington-Centered region and the rest of Vermont.

- Residents in the Burlington-Centered region, which includes Chittenden, Grand Isle and Addison counties, are the most likely to travel by commercial air, use the Lake Champlain ferry service, bike paths, trails, shared use paths, bike lanes, and road shoulders.
- Residents in this region also felt the most strongly that biking and walking facilities are better now than they were five years ago.
- As compared with other parts of the State, use of Park & Ride facilities was high, but in this case the Burlington-Centered region was lower than Central Vermont.
- Taxi use was highest in the Burlington-Centered region.
- Use of local bus service, on the other hand, was rather low and not significantly different than other regions.
- Residents in the Burlington-Centered region were the most likely to have reported experiencing traffic congestion. Over 70 percent of residents experienced traffic congestion in the past six months whereas on a statewide level only 50 percent of residents had.
- In the Burlington-Centered region, 61 percent of those who experienced traffic congestion changed their behavior to avoid it versus only 46 percent statewide.
- Residents in and around Burlington were the most likely to say that traffic impacted their quality of life, and the most likely to say that a greater share of the VTTrans budget should be spent on relieving traffic congestion.

Analysis and Trends: Comparison of 2006 and 2000 Results

In addition to reviewing the current data, the Study Team compared the most recent data with the previous survey conducted in 2000.

- Since 2000, air travel has increased by 9 percentage points. At the same time, the average number of trips per resident has declined, indicating that more people are traveling by air, but taking fewer trips.
- Twice as many Vermonters are taking advantage of bike lanes and road shoulders as compared with 2000. They are also using them more than twice as often.

- Use of Park & Ride facilities increased from 15 percent to 22 percent, but people are using them less often than before, indicating more widespread but less frequent use.
- The average number of miles that Vermonters travel each weekday increased between 2000 (36 miles) and 2006 (over 50 miles) by 46 percent. The number of miles driven alone also increased by 34 percent from 28 miles in 2000 to just under 38 miles reported in 2006.
- When asked what would make them drive their vehicle less, 37 percent of Vermont residents responded that nothing would make them drive less. This represents a significant change over the previous survey when two-thirds of respondents said nothing would make them drive less. The next most popular responses to encourage less driving were improved public transportation (22%) and higher gas prices (17%).
- More Vermonters experienced congested traffic conditions in 2006 as compared with 2000.
- When dealing with traffic congestion, fewer people reported changing their route than in the past, but slightly more said that they avoid traveling at certain times of day.
- Vermonters believe that traffic congestion is worse in the fall and summer. In 2000 the majority of Vermonters thought traffic was worse in fall and winter.
- Consistent with 2000, in the current survey Vermonters rate, in order of importance, *safety & security*, *environmental protection*, and *preserving landscapes and village character* as the three most important transportation issues. *Cost to taxpayers* was ranked fourth in 2006.
- Compared to June 2000, the number of Vermont residents that would like to have a greater share of the transportation budget spent on *increased mobility - making it easier to get around the State* increased by 14 percentage points (18 percent in 2000 versus 32 percent in 2006). The number of residents would like to see a greater share of funding spent on *public transportation* increased by ten percentage points to 41 percent.
- Since 2000, the proportion of Vermonters recommending that more funds be allocated to *safety & security* decreased (49 percent in 2000 versus 41 percent in 2006).
- More Vermonters think the condition of state highways is worse today compared with five years ago (35 percent today versus 20 percent in 2000).
- More Vermonters think our highways are in worse condition than other states' highways (31 percent today versus 21 percent in 2000).

1.0 STUDY OVERVIEW

1.1 Introduction

The Vermont Agency of Transportation (VTrans) commissioned Wilbur Smith Associates (WSA) as part of a consortium of consultants to conduct a survey among Vermont residents to ascertain their preferences and priorities for transportation programs, projects and services. The survey and results are intended to support and advise the upcoming Vermont Long Range Transportation Plan.

The WSA Study Team prepared the following report to present and document the results of the survey. This first section of the report provides an overview of the Study and provides detail on how the survey instrument and plan were developed, the process used to collect the data and an overview on the data analysis. Immediately following this initial section, the report contains three sections:

- Section 2 presents the results from the 2006 survey;
- Section 3 compares results from this initial survey with previous versions; and
- Section 4 provides a profile of survey participants.

1.2 Survey Instrument and Plan

The 2006 Vermont Long Range Transportation Survey Update was the third public opinion survey focusing specifically on transportation conducted in the State since 1995. The second survey was conducted in 2000, five years after the first survey. Accordingly, the questionnaire remained largely consistent with the 2000 version of the exercise, specifically to ensure that the Study Team could examine trends across time in addition to evaluating current preferences and priorities.

The Study Team updated the questionnaire, based on comments and suggestions from VTrans. Questions were reworded to reflect current circumstances in the State and improve questionnaire diction and flow; in addition, a few new questions were added. A copy of the questionnaire is included as **Appendix A**.

The results of this study were derived from a random telephone survey of 1,243 Vermont residents over the age of 18. A total random sample of this size is considered accurate to plus or minus 2.8 percentage points at the 95 percent confidence level.

To ensure the sample of Vermont residents was representative of the State population, the Study Team purchased a list of randomly generated phone numbers from Survey Sampling, Inc. (SSI). SSI is nationally recognized as a supplier of samples for telephone surveys. Within each household contacted, an adult member was randomly selected using the most recent birthday method. If the eligible survey participant was not available at that time, arrangements were made to call again. Up to five attempts were made to secure an interview with the selected individual before substituting another household into the sample. Specific sample quotas were also established for each of Vermont's fourteen counties to assure a balanced geographic representation.

1.3 Data Collection

Interviews were conducted from April 21 to June 3, 2006 and were completed from a central telephone survey using computer assisted telephone interviewing (CATI) stations. By the end of the survey period, 1,273 completed interviews had been collected, slightly more than the target sample of 1,200.

During and immediately after the data collection exercise, the Study Team used a variety of methods to ensure data quality. During the data collection, field supervisors monitored at least 10 percent of each individual interviewer’s work to make sure that proper procedures and telephone interviewing technique were being followed. In addition, after the data was completed, the Study Team independently validated at least 10 percent of the interviews. This validation process involved calling individual households to confirm that appropriate person had been contacted, and had completed the interview. At the same time, a few key questions were asked to verify the accuracy of selected information that had been recorded.

1.4 Data Analysis

Once the data was collected, the Study Team embarked on data analysis. Prior to analysis, the Study Team weighted the database by two attributes – region of the State and age group. When conducting telephone surveys it is not unusual to have some segments of the population underrepresented and others overrepresented. This is particularly true regarding the respondents’ age. Younger adults are frequently harder to reach and are less willing to participate in telephone surveys, while older adults are typically more accessible and interested in sharing their opinions. Weighting the data is necessary so that the overall results are not skewed by this imbalance.

To weight the data by age, the Study Team looked at the percentage of respondents who fell into each age group and compared it to census data for Vermont. For an example, if adults 18-24 represented 5 percent of the survey sample but make up 10 percent of the actual population, each respondent 18-24 would have been given a weight of 2.0, or in other words, represented two people. This methodology is used regularly in studies to assure the sample is representative of the population demographically and geographically. The same method was used for regions of the State. **Table 1** shows the weights by region and age group.

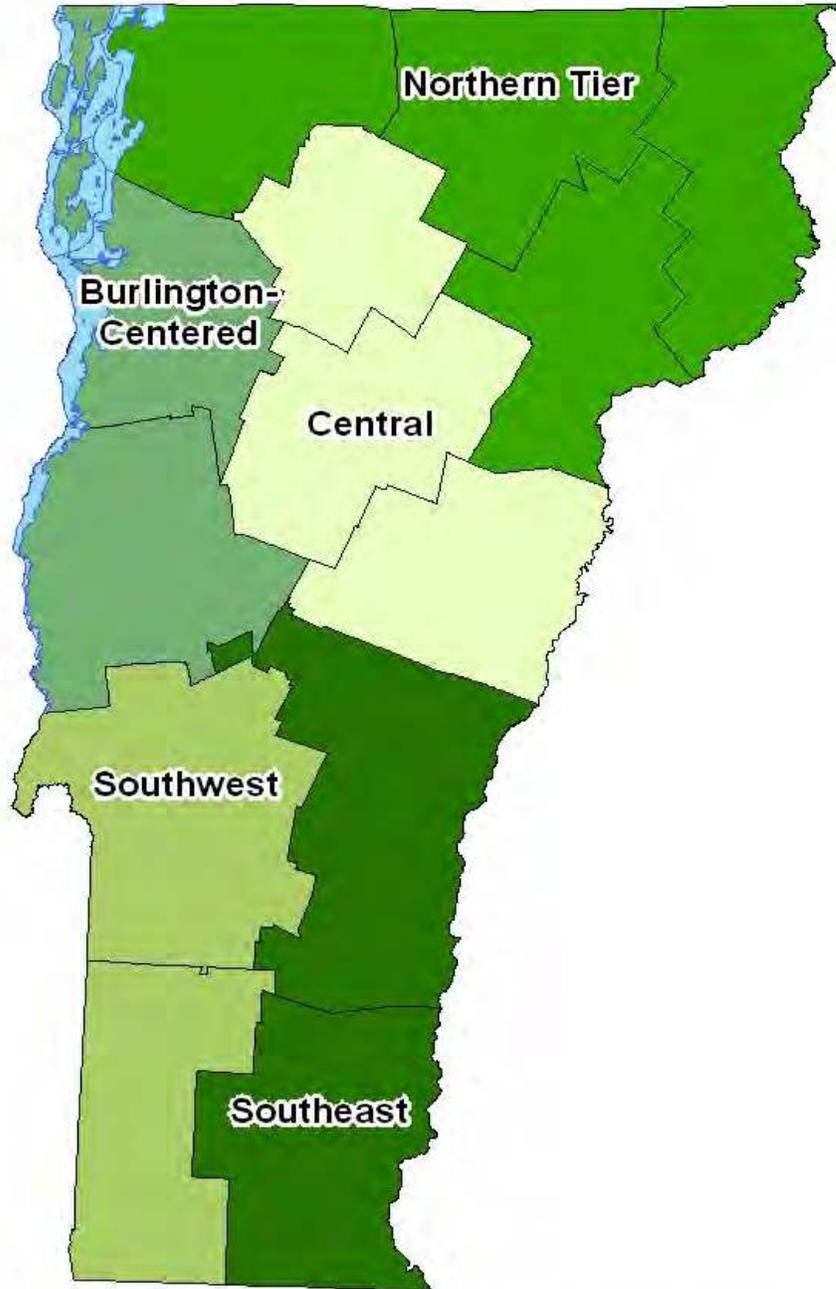
Table 1: Weights of Attributes: Region of State & Age Group

Region/Age	18-24	25-34	35-44	45-54	55-64	65+	No Ans
Northern Tier	3.241	1.770	1.340	0.964	0.729	0.629	1.037
Central Vermont	2.981	1.628	1.233	0.887	0.671	0.579	0.954
Burlington Central	3.116	1.702	1.288	0.927	0.701	0.605	0.997
Southeast Counties	3.141	1.716	1.298	0.935	0.706	0.610	1.005
Southwest Counties	3.172	1.733	1.311	0.944	0.714	0.616	1.015

Source: WSA

To maintain consistency with past surveys, the subdivision of Vermont into five regions, shown in **Figure 1**, is the same subdivision that was used for the 1995 survey.

Figure 1. Five Regions of Vermont



Counties in each region:
Burlington Centered: Chittenden, Grand Isle, Addison
Central: Washington, Lamoille, Orange

Northern Tier: Franklin, Orleans, Caledonia, Essex
Southwest: Rutland, Bennington
Southeast: Windham, Windsor

2.0 SURVEY RESULTS

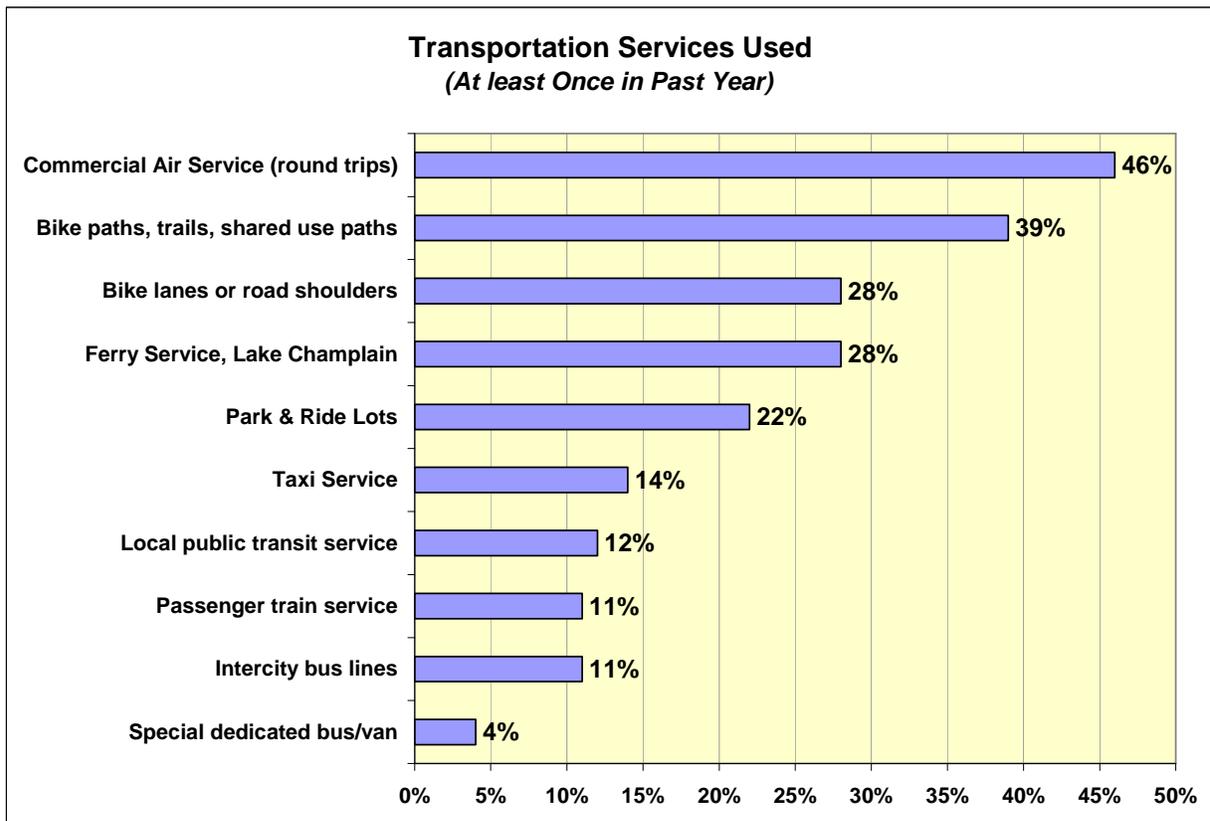
The following chapter presents the results for the 2006 survey. Results are shown in roughly the same order as the survey instrument. Data is organized into twelve sections, each consistent with a group of questions.

2.1 Transportation Services Used

Survey participants were presented with several transportation services (other than driving a car) in randomized order and asked how many times they had personally used each one in the past year.

- Of this list, the one most frequently used by Vermont residents at least once in the past year was round trip commercial air service.
- Other frequently used transportation services included bike paths, trails, shared use paths; bike lanes or road shoulders; and ferry service across Lake Champlain, exact percentages of the population that used each of these services are shown in **Figure 2**.
- Only about one in ten Vermont residents (12%) had used local public transit service, passenger train service or intercity bus lines in the past year.

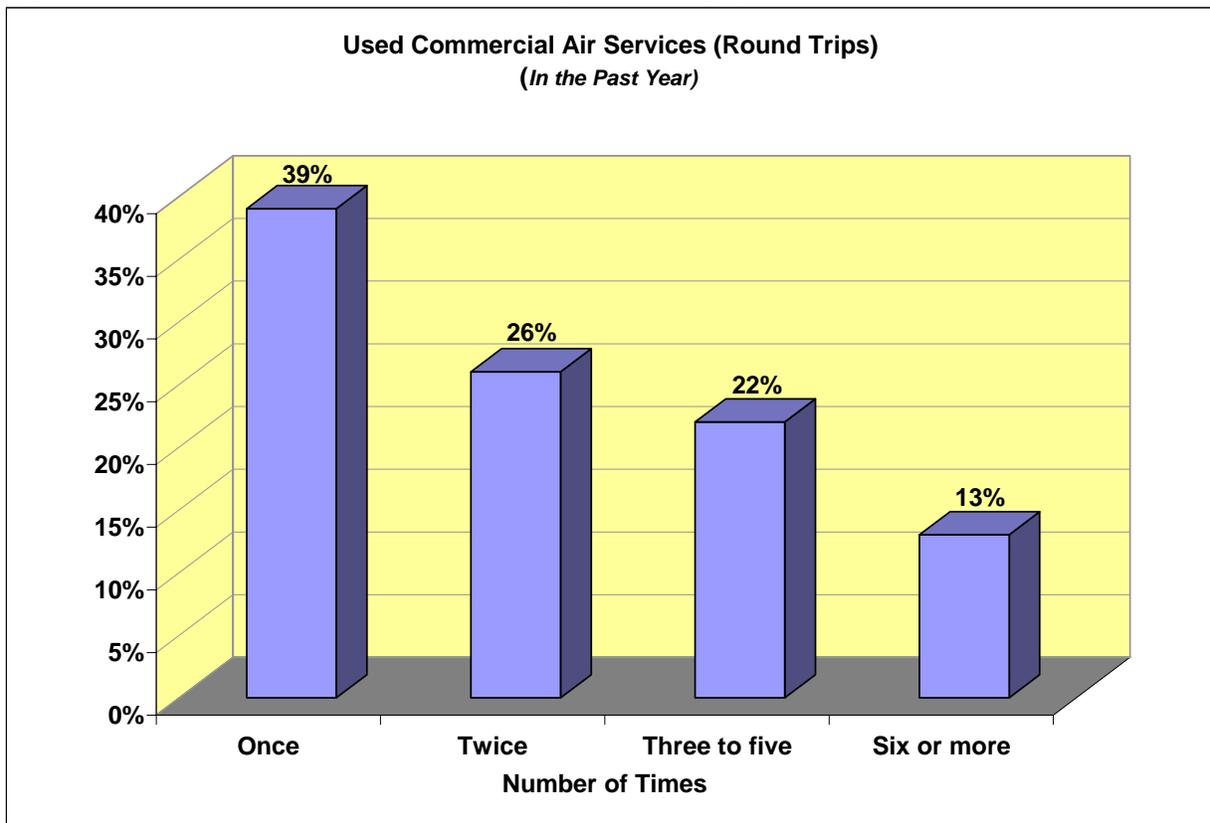
Figure 2. Transportation Services Used



2.1.1 Commercial Air Services

- Almost half of all Vermont residents surveyed (46%) had traveled round trip by air in the past year. This compares to 37 percent who reported traveling by commercial air in the June 2000 survey.
- Use of commercial air services was highest in the Burlington-Centered (56%) and Central (52%) regions of the State.
- Among those Vermont residents who had used round trip commercial air services, 39 percent only took one such trip and one in four (26%) made two trips by commercial air, see **Figure 3**. The average number of commercial air service trips completed by Vermont residents in the past year was 3.1. This is down slightly from the average of 3.9 reported in the previous study.

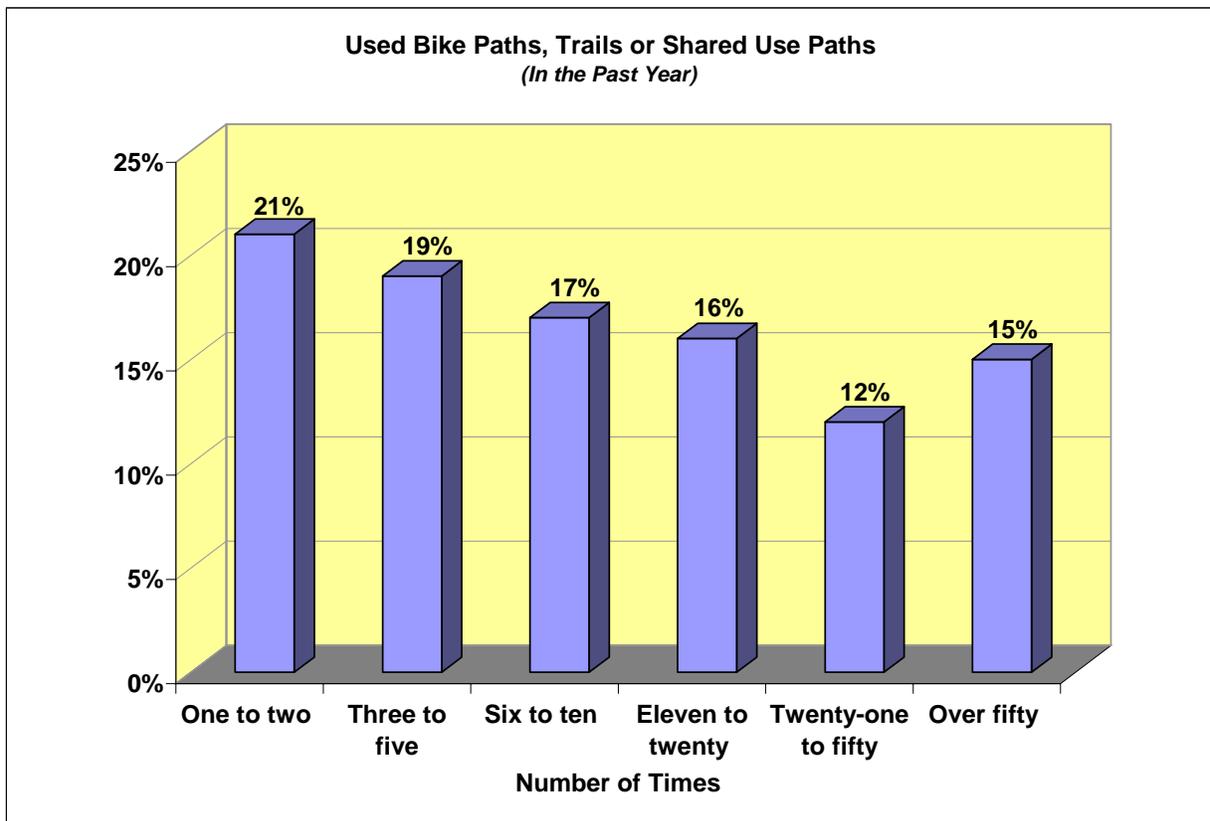
Figure 3. Used Commercial Air Services (Round Trips)



2.1.2 Bike Paths, Trails or Shared Use Paths

- About 40 percent of Vermont residents surveyed had used bike paths, trails or shared use paths in the past year. Of the 40 percent who had used these amenities, one in five (21%) had used them one or two times and a similar proportion used them three to five times, as shown in **Figure 4**. The average number of times Vermonters used such facilities, was 37.6 times over the past year.
- Use of bike paths, trails or shared use paths in the past year was highest in the Burlington-Centered region (55%) and lowest in the Northern Tier (24%) and Southwest Counties (23%).
- The 1995 survey only included bike paths in the question, but the results were the same as above; bike path use was highest in the Burlington-Centered region and lowest in the Southwest Counties. Rates of use in each of the areas also stayed level between 1995 and 2006. For the Burlington-Centered region 53 percent of residents reported using bike paths during the past year in 1995 versus 55 percent in 2006. In the Southwest Counties 20 percent of residents had used bike paths within the past year in 1995 versus 22 percent in 2006.

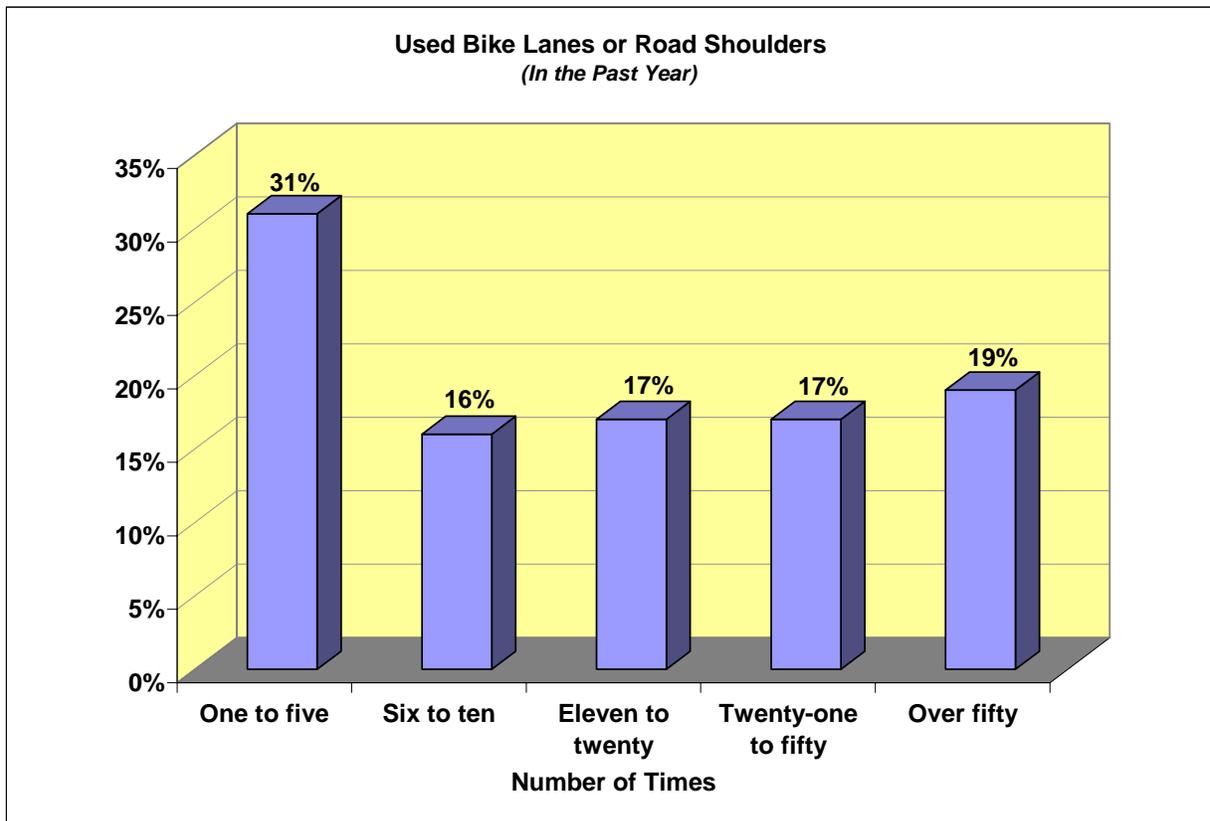
Figure 4. Used Bike Paths, Trails or Shared Use Paths



2.1.3 Bike Lanes or Road Shoulders

- One in four Vermont residents (28%) had used bike lanes or road shoulders in the past year. In the June 2000 study the proportion making use of bike lanes was just over 15 percent.
- Use of bike lanes or road shoulders was higher in the Burlington-Centered region (36%) and the Southeast Counties (34%). Similar to the bike paths, residents in the Northern Tier (16%) and the Southwest Counties (19%) were the least likely to have used this transportation amenity in the past year.
- Consistent with 2006 results, in 1995 bike lane use was highest in the Burlington-Centered region (32%) and lowest in the Northern Tier (16%).
- The region that saw the largest increase in percent of residents using bike lanes was the Southeast Counties region (23 percent in 1995 versus 34 percent in 2006).
- Among the 28 percent of Vermonters who had used them, about one in three respondents (31%) had done so between one and five times. One in five (19%) had use bike lanes or road shoulders more than 50 times in the past year, see **Figure 5** below. The average number of times Vermonters used this resource in the past year is 43.8 times, which is up significantly from the 19 times reported in 2000.

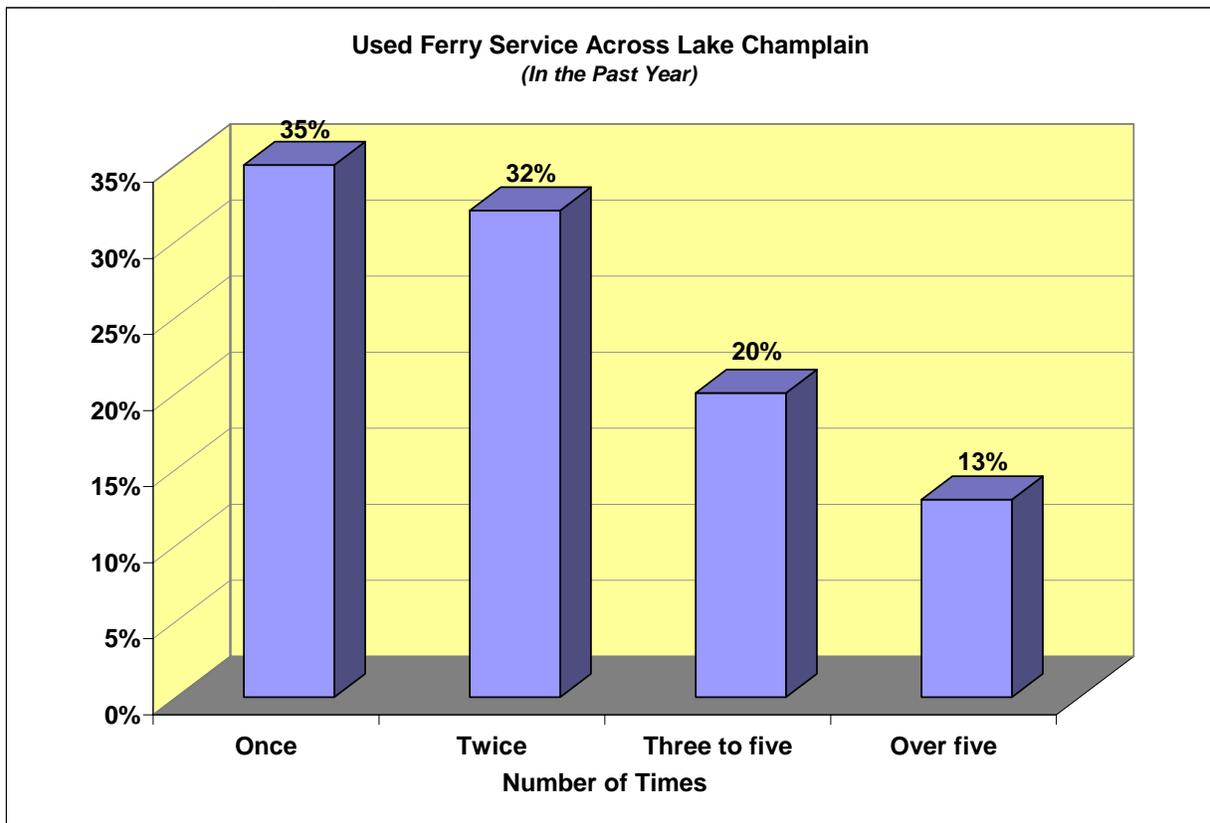
Figure 5. Used Bike Lanes or Road Shoulders



2.1.4 Ferry Service Across Lake Champlain

- One in four Vermont residents (28%) used the ferry service across Lake Champlain in the past year. This is almost identical to the 30 percent usage reported in June 2000.
- Utilization of the ferry service across Lake Champlain was most prevalent in the Burlington-Centered region (54%).
- Of the Vermonters who had used the Lake Champlain ferry service, one in three (35%) had used it once and a similar proportion used it twice, as shown in **Figure 6**. On average, Vermonters who reported traveling by ferry used the service 4.8 times during the past year; slightly higher than the 4.3 times noted in the 2000 survey.

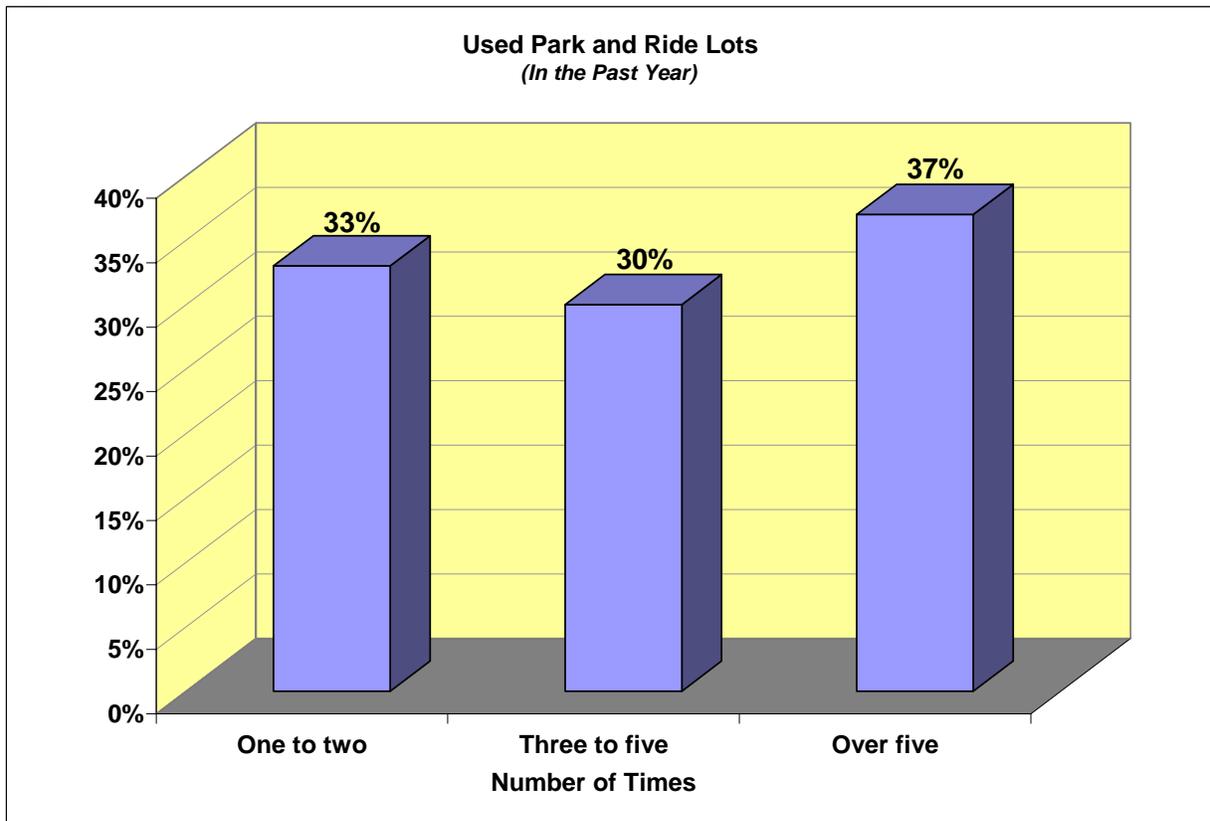
Figure 6. Used Ferry Service Across Lake Champlain



2.1.5 Park and Ride Lots

- One in five Vermont residents (22%) reported using park and ride lots at least once in the past year, which represents an increase from the June 2000 value of 15 percent. Use of this resource was highest in the Central Vermont Region (37%).
- Among those who had used this amenity, the responses were about evenly divided between one to two times, three to five times and over five times, see **Figure 7** below. The average number of times that park and ride lots were used was 12.6 times over the past year, which is down from the average of 17 times reported in 2000.

Figure 7. Used Park and Ride Lots



2.1.6 Minor Transportation Services

For the remaining services evaluated, the proportion of users was very small.

- Only 14 percent of Vermonters reported using a taxi service over the past year. Among those who used taxis, the average frequency of use was 7.5 times per year.
- Twelve percent had used local public transit bus service with users reporting an average frequency of public transit bus use of 34.9 times per year.
- Eleven percent used passenger train service such as Amtrak with an average frequency of 2.7 times annually.
- Eleven percent used intercity bus lines such as Greyhound/Vermont Transit with an average frequency of 3.1 times per year.
- Only 4 percent had used a special dedicated bus or van service for senior citizens and the disabled with an average frequency of 19.9 times each year. In 2000, only 3 percent used them which is nearly identical to 2006 results.

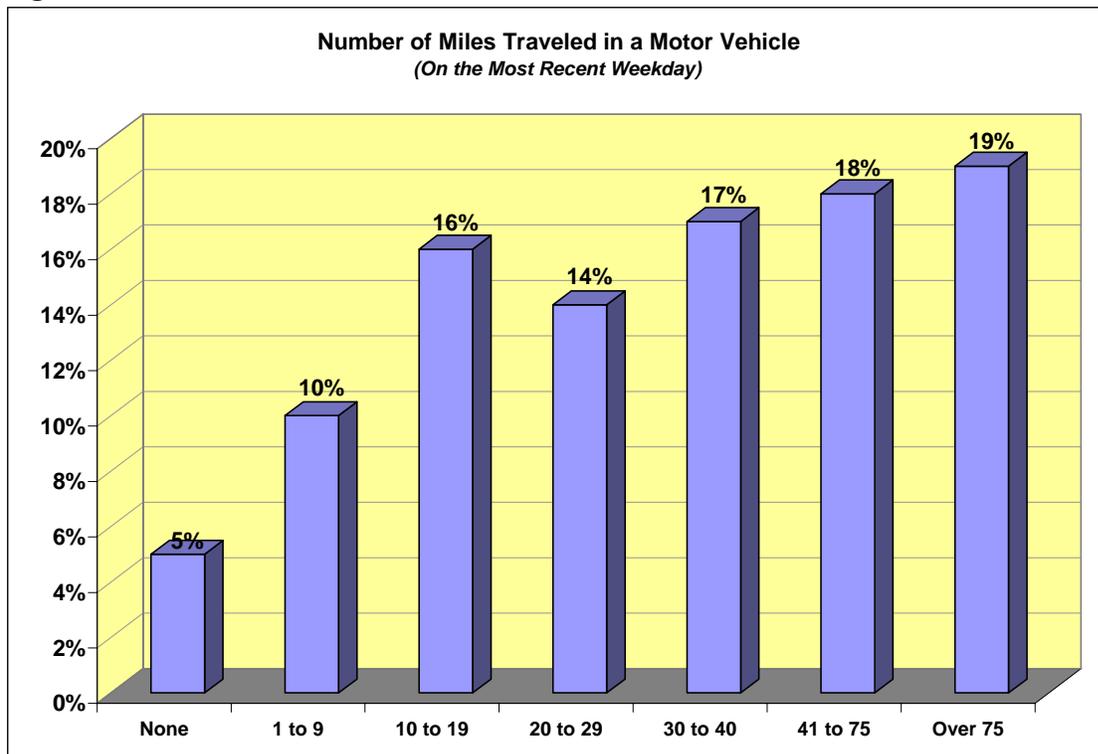
2.2 Motor Vehicle Usage

2.2.1 Total Mileage Traveled

Survey participants were asked to think about their travels either the previous day or on the most recent weekday, not the weekend. Then they were asked to estimate about how many miles they had traveled by passenger car, including automobiles, pick-up trucks, vans, minivans, motorcycles and SUVs. They were asked to take into consideration all of their activities such as commuting, running errands and leisure travel.

- Only five percent of the Vermont residents surveyed had not traveled any distance on the most recent weekday. Ten percent had traveled less than ten miles and one in five (19%) traveled over 75 miles.
- The average estimated number of miles traveled by the Vermont residents surveyed was 52.5 miles per day. The estimated distance traveled on an average day has increased significantly from the 36 miles reported in June 2000 – 46 percent increase in five years. No comparison was available from the 1995 survey.

Figure 8. Number of Miles Traveled in a Motor Vehicle

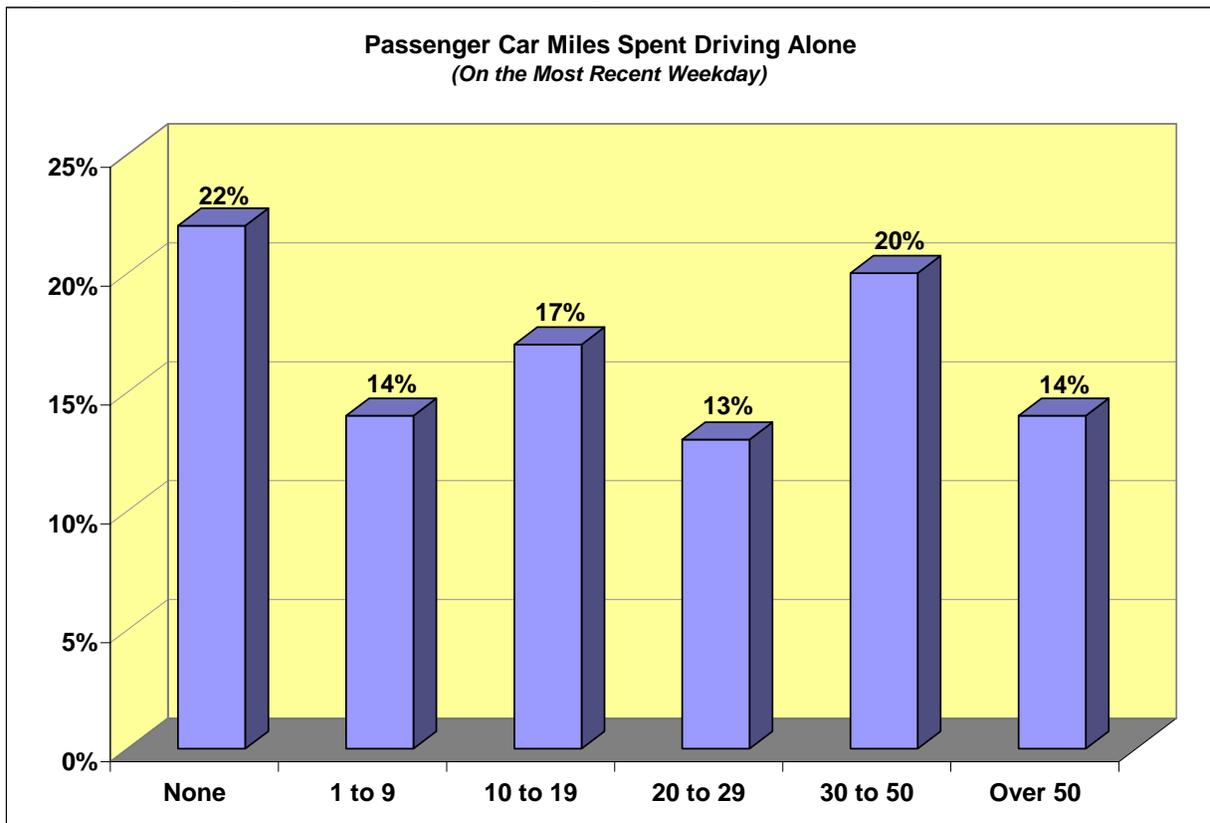


2.2.2 Miles Driven Alone

Survey participants were asked how many of the passenger miles traveled on the previous day were spent driving alone (only the driver in the vehicle).

- For those Vermont residents that traveled any distance in a motor vehicle the previous day, one in five (22%) did not travel any distance alone as illustrated in **Figure 9**. The majority (80%) drove at least some of the time alone.
- Fourteen percent had traveled less than 10 miles alone and the same percentage reported driving over 50 miles.
- The average number of miles traveled alone was 37.6 miles, which compares to only 28 miles in June 2000 – a 34 percent increase in mileage traveled alone.

Figure 9. Passenger Car Miles Spent Driving Alone

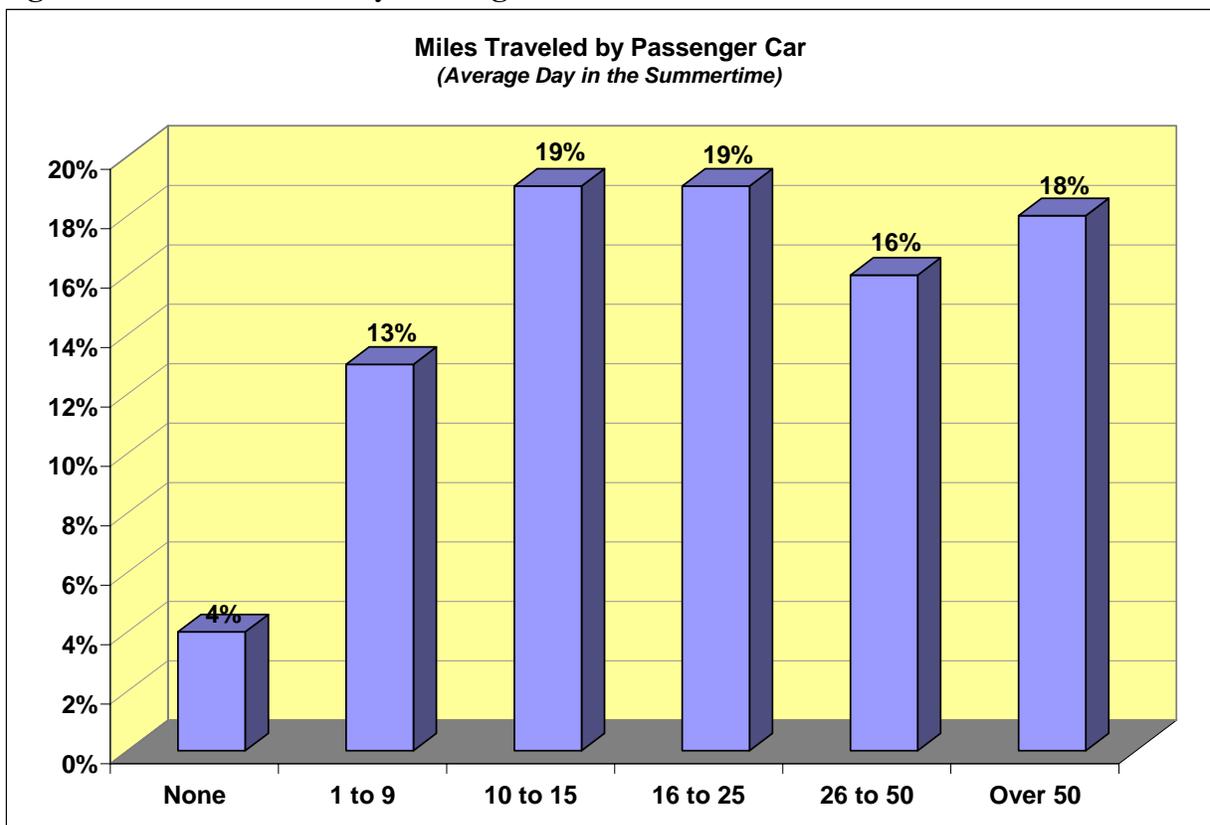


2.2.3 Miles Driven on Average Day in the Summer

Survey participants were asked to think back to an average day in the summertime and estimate how many miles they had traveled by passenger car either alone or with others.

- Four percent reported that on an average summer day they would not have traveled any distance in a passenger car. About one in ten (13%) would travel less than 10 miles. One in five (19%) reported traveling distances of 10 to 15, 16 to 25, and over 50 miles (**Figure 10**).
- The average distance traveled in a passenger car on an average day in the summertime was 42.7 miles, which is similar to the 44 miles reported in the June 2000 transportation survey.

Figure 10. Miles Traveled by Passenger Car



2.2.4 Encourage Vermonters to Drive Less

Survey participants were asked what actions, circumstances or transportation alternatives might cause or encourage them to drive their cars less. Respondents were not read any choices and multiple mentions were permitted.

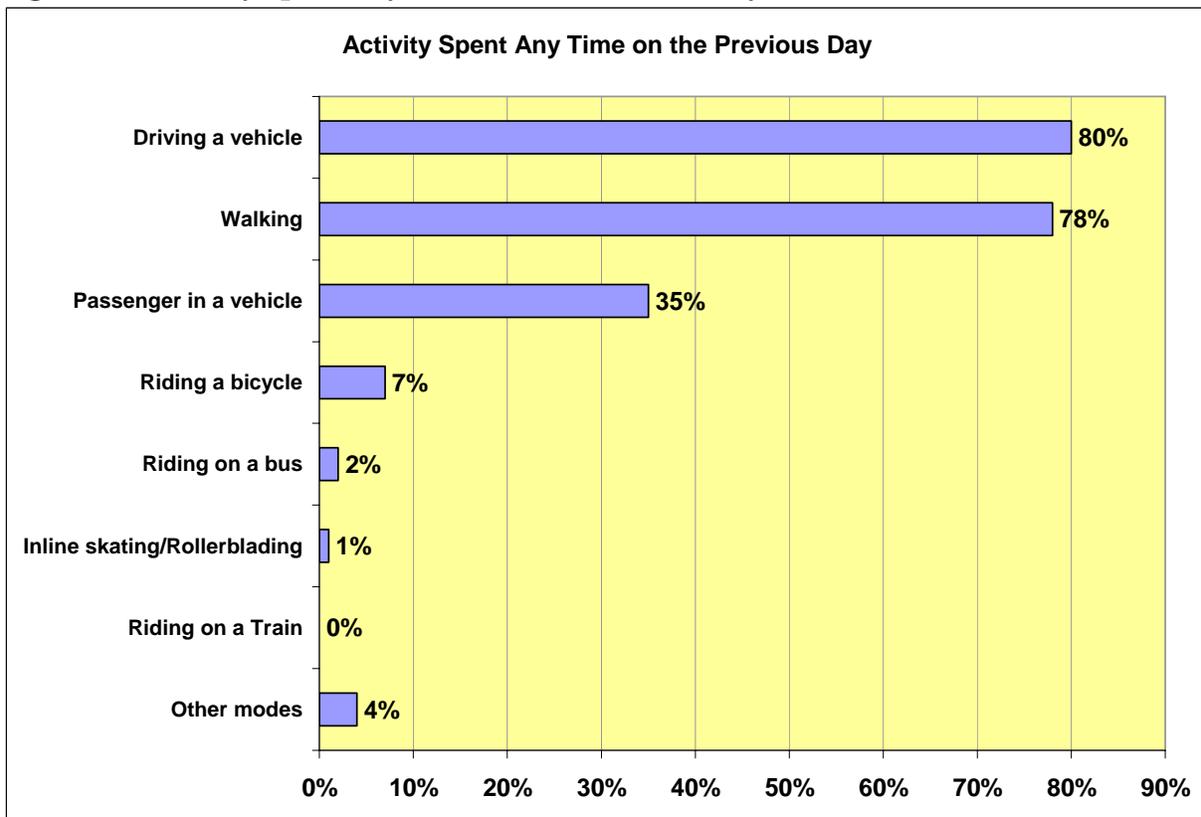
- More than one in three Vermont residents (37%) would not take any actions to drive their passenger vehicles any less than they do currently. In June 2000, almost two out of three (63%) responded that they would not take any action.
- The options that would be most likely to cause some residents to consider driving less were better public transit (22%) and higher gasoline prices (17%). An additional 7 percent specifically mentioned commuter trains. If the number of respondents who specified commuter trains or public transit are combined into one category, 29 percent of Vermonters who currently travel by car might drive less if there were better public transportation options.

2.2.5 Time Spent on Selected Activities

Survey participants were reminded that travel for work, shopping, and other activities can often involve many other options besides making trips in personal automobiles. They were then asked to think about all the travel they did the previous day including travel between the bus, car or stores, short trips over lunch or walking the dog, and estimate how many **minutes** they spent on each of the activities listed in the table below.

- Eight in ten (80%) Vermont residents spent at least some time the previous day driving a vehicle or walking. One in three residents spent some time riding as a passenger in a vehicle (**Figure 11**).
- Very few spent any time the previous day riding a bicycle, riding a bus, inline skating/rollerblading or using any other modes of travel.

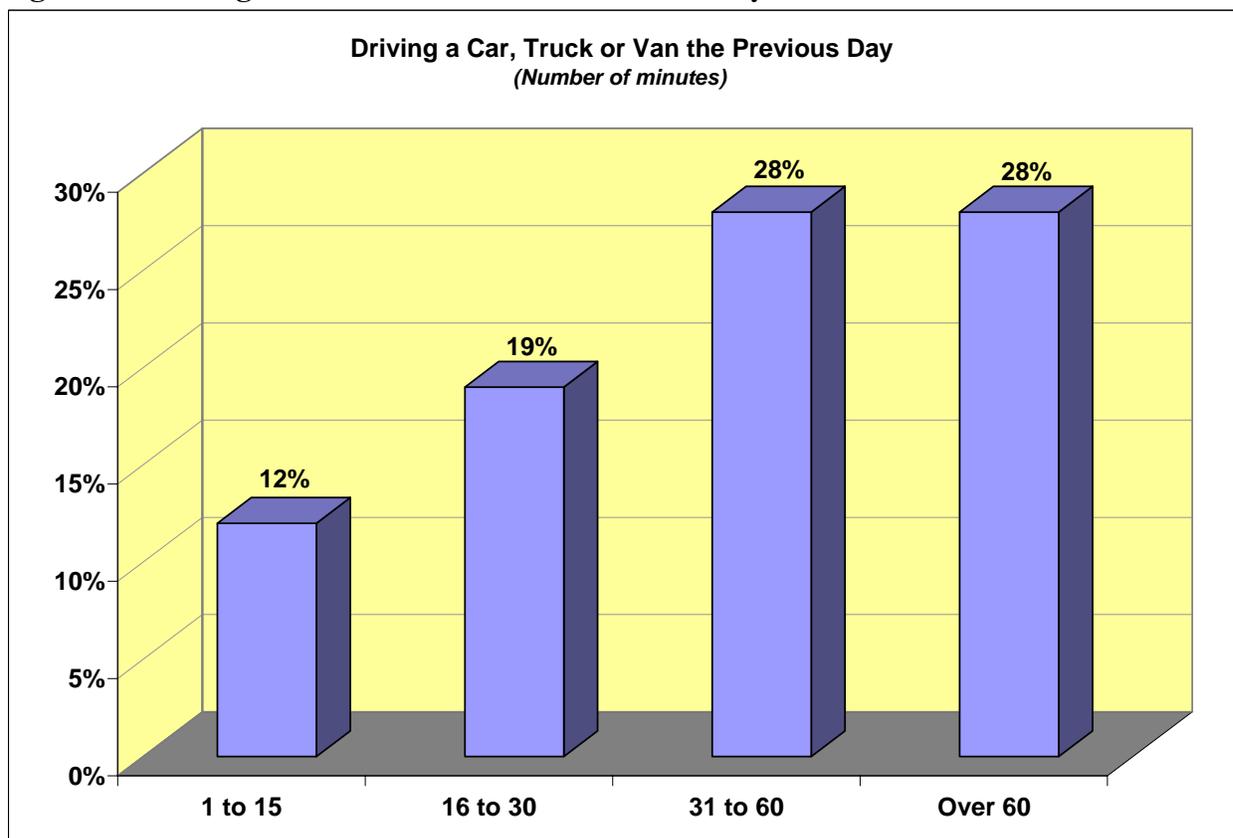
Figure 11. Activity Spent Any Time on the Previous Day



2.2.6 Driving a Car, Truck, or Van

- Eighty percent of Vermont residents spent at least some time during the previous day driving a motor vehicle. As shown in **Figure 12**, one in ten residents spent 15 minutes or less driving.
- One in four Vermont residents (28%) who did any driving in a vehicle the previous day spent either 31 to 60 minutes or more than one hour driving.
- The average amount of time spent driving was 70.4 minutes. Average driving time was highest in the Southeast Counties at 83.1 minutes and lowest in the Burlington-Centered region (63.4 minutes). No comparison from previous surveys is available.

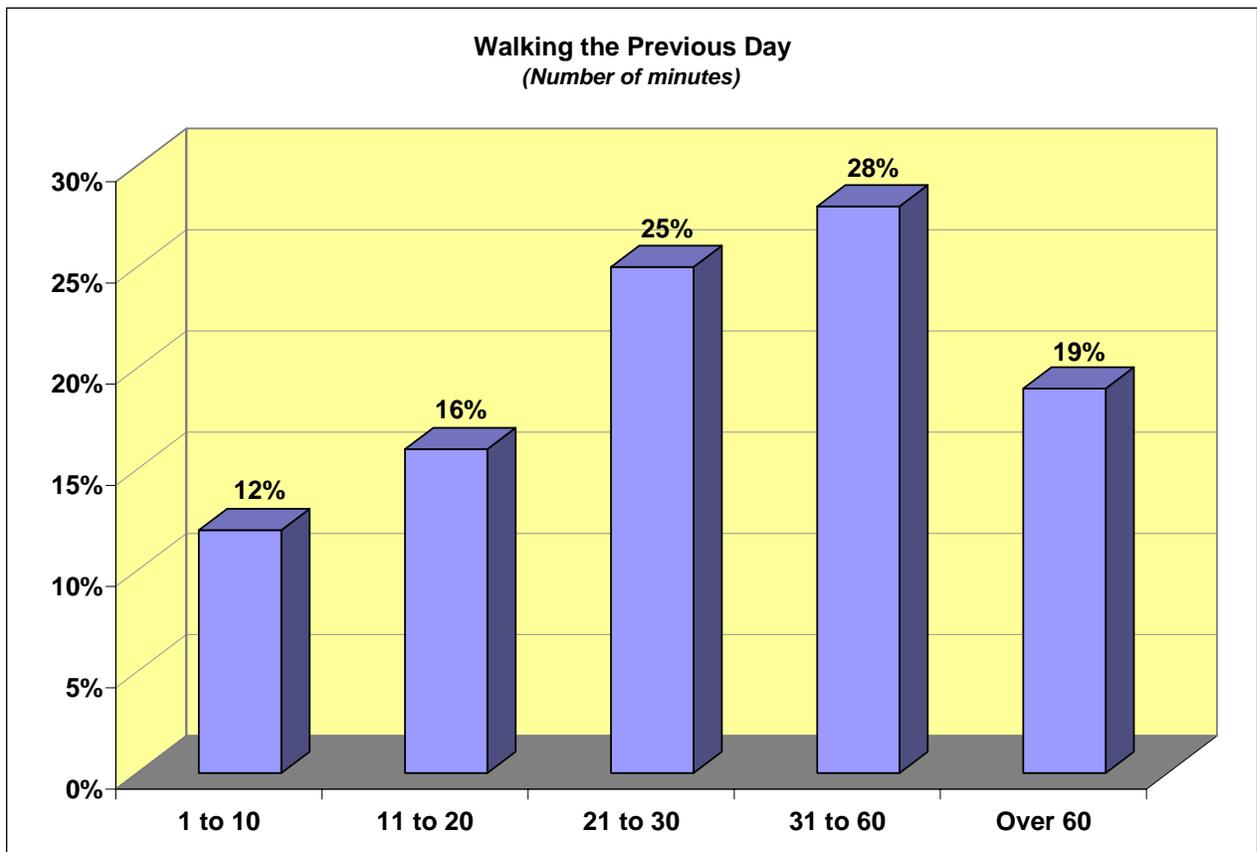
Figure 12. Driving a Car, Truck or Van the Previous Day



2.2.7 Walking

- Seventy-eight percent of the Vermont residents surveyed reported spending at least some time the previous day walking. One in ten (12%) reported spending 10 minutes or less engaged in this activity.
- One in four residents (25%) spent 21 to 30 minutes and 31 to 60 minutes walking the previous day and one in five (19%) spent over one hour (**Figure 13**).
- The average amount of time spent walking the previous day was 61.9 minutes or just over one hour. The average amount of time spent walking was highest in the Northern Tier (77.0 minutes) and lowest in the Central Vermont Region (53.4 minutes) and Burlington-Centered region (54.5 minutes). No comparison from previous surveys is available.

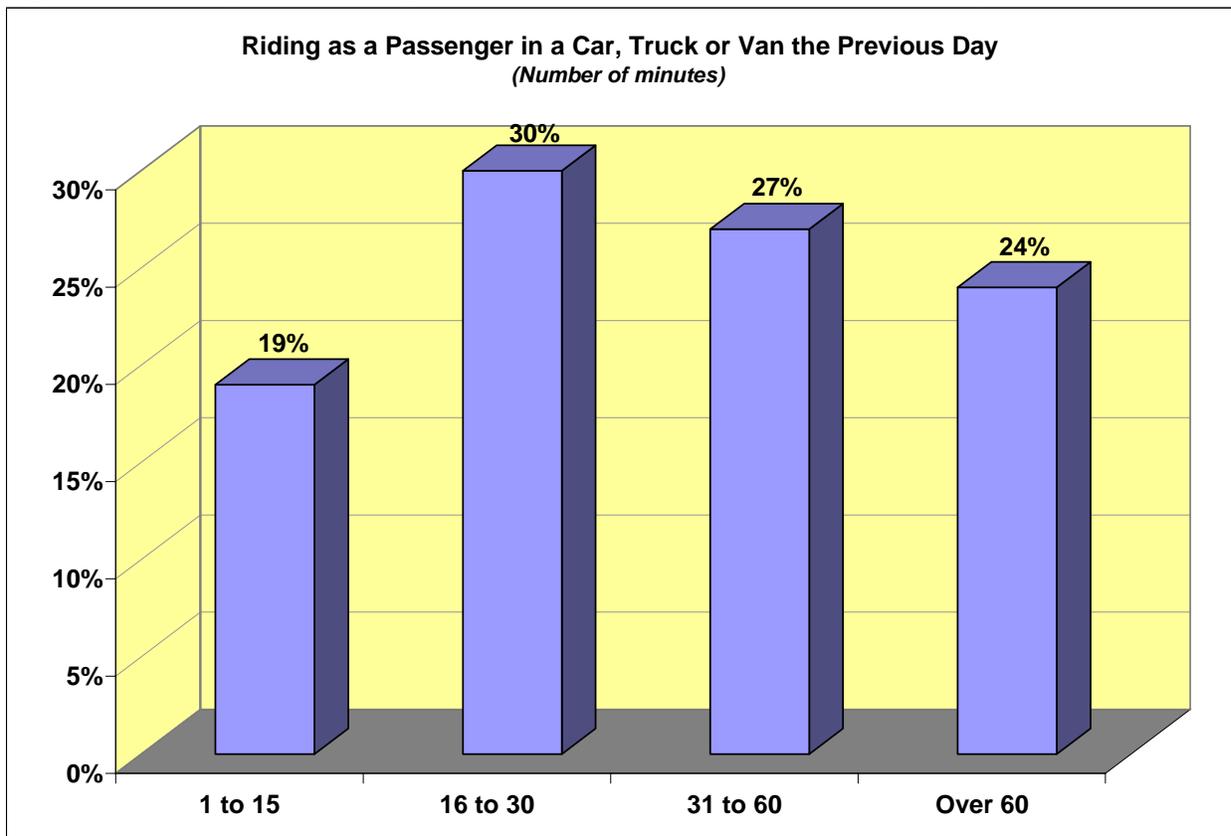
Figure 13. Walking the Previous Day



2.2.8 Riding as a Passenger in a Car, Truck, or Van

- One in three Vermonters (35%) spent at least some time the previous day riding as a passenger in a car, truck or van.
- Among those who reported spending time as a passenger, one in five (19%) said they were a passenger for 15 minutes or less. One in three (30%) traveled as a passenger for 16 to 30 minutes and one in four (25%) for 31 to 60 minutes and over 60 minutes respectively (**Figure 14**).
- The average amount of time spent riding as a passenger was 65.6 minutes or just over 1 hour. Compared to the other four regions, the average time spent riding as a passenger was substantially lower in the Burlington-Centered region (51.1 minutes).

Figure 14. Riding as a Passenger in a Car, Truck or Van the Previous Day



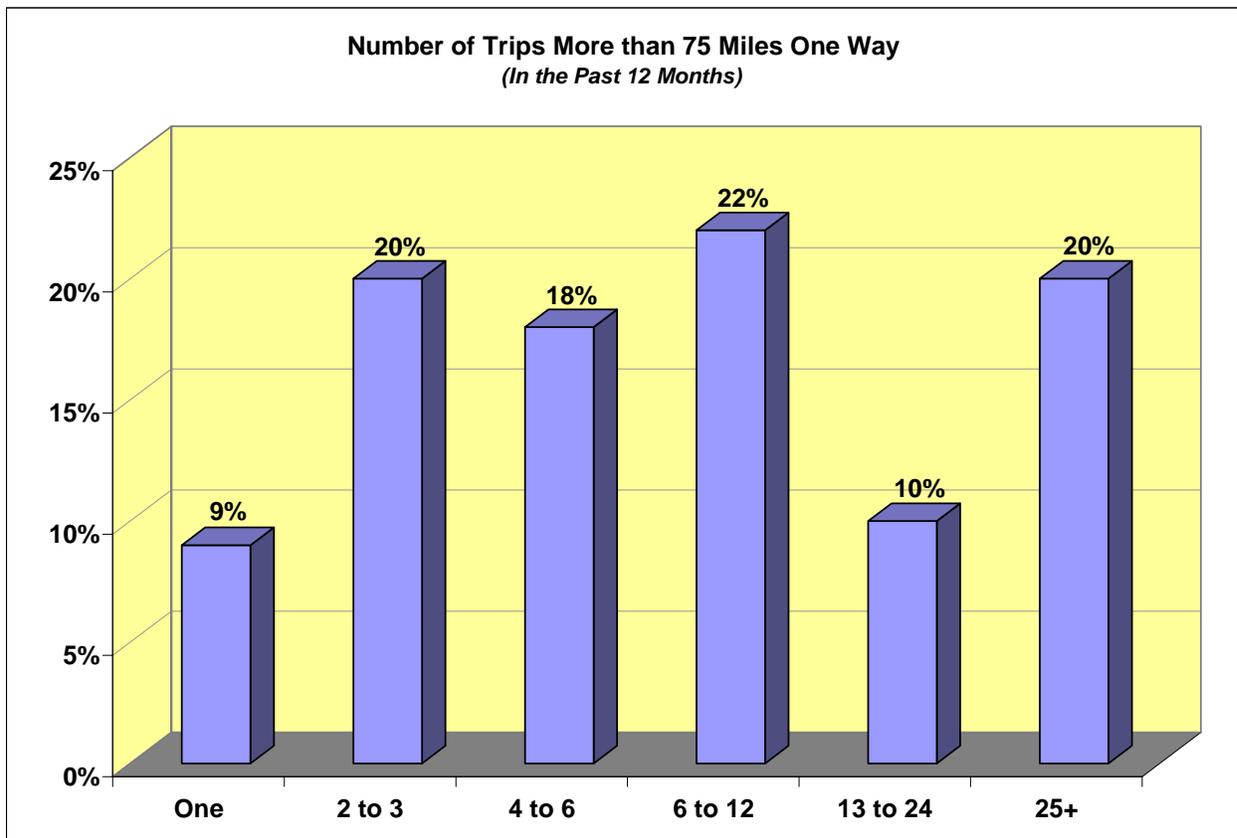
- For the remaining activities the number of residents participating was very small and any time estimates need to be interpreted with caution. Among those reporting that they had ridden a bicycle (7%), the average number of minutes was 45.4. Only 2 percent reported riding on a bus for an average of 63.3 minutes. Only 1 percent participated in inline skating/rollerblading for an average of 35 minutes.

2.2.9 Traveled More Than 75 Miles

Vermonters surveyed were asked how long it had been since they had made a trip of more than 75 miles one way from home using any method of transportation.

- Eighty-four percent of the respondents reported making such a trip within the past year. This compares to 82 percent in the June 2000 survey. An additional 10 percent had traveled more than 75 miles away from home more than 1 year to 5 years ago, 3 percent more than 5 years ago and 3 percent never.
- Residents who had traveled more than 75 miles from home in the past year were asked how many trips of that distance they had made. **Figure 15** shows that one in ten travelers (9%) had only made one trip in excess of 75 miles. About the same proportion had made 2 to 3 trips (20%), 6 to 12 trips (22%), and 25 or more trips (20%).
- The estimated average number of trips that were 75 miles or more in the past year was 11.4 trips per person.

Figure 15. Number of Trips More than 75 Miles One Way



2.2.10 Primary Means of Transportation for Long Trips

Vermont residents who had traveled more than 75 miles were asked for the primary means of transportation on their most recent trip.

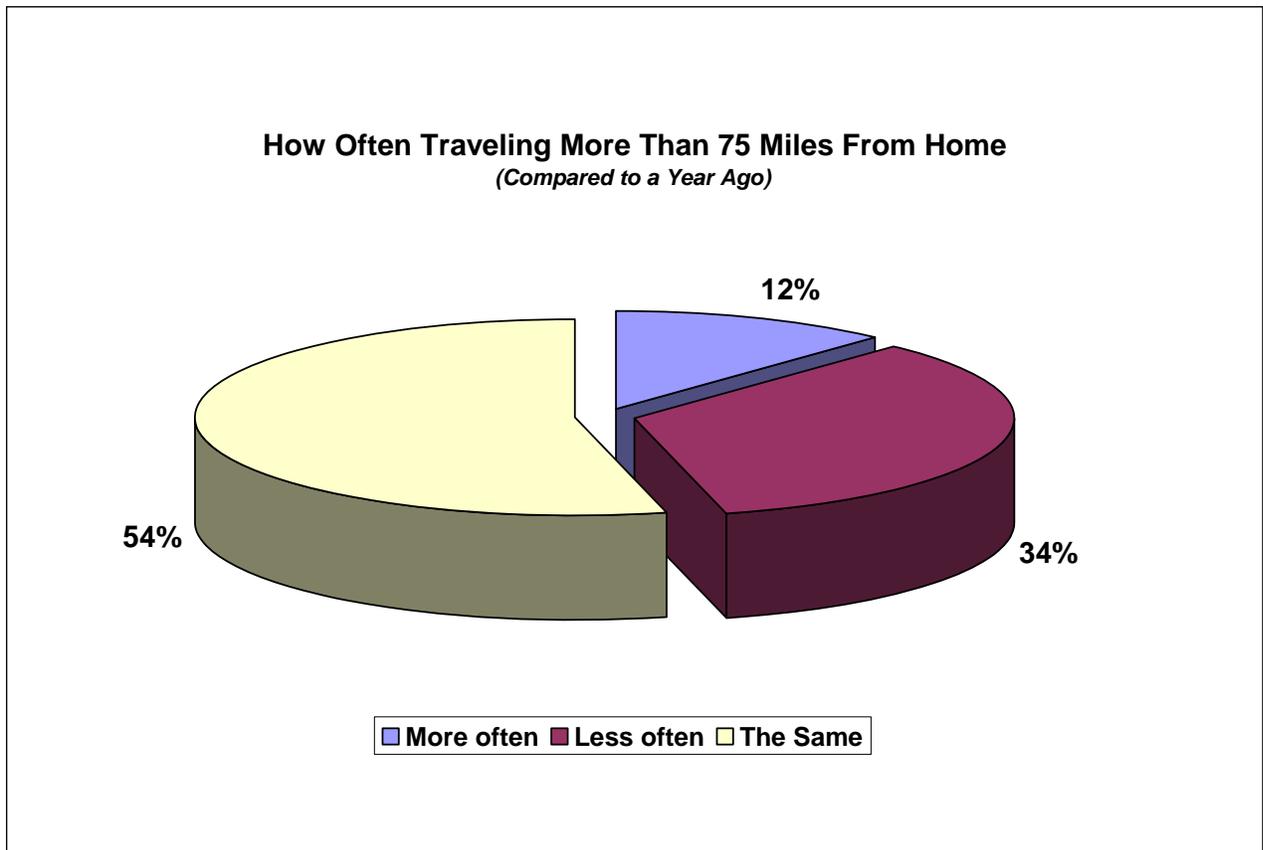
- More than eight in ten Vermonters (85%) who had traveled more than 75 miles used a private vehicle on their most recent trip, which is the same as in 2000.
- Ten percent traveled by airplane and the remainder used other means for their most recent trip of more than 75 miles. In 2000, nine percent traveled by airplane.

2.2.11 Frequency of Long Distance Travel

Those traveling more than 75 miles from home were then asked how often they were traveling this far compared to a year ago.

- Compared to a year ago, half (54%) are making the same number of trips of more than 75 miles from home (see **Figure 16**).
- One in three (34%) is making these trips less often and about one in ten (12%) more often.

Figure 16. How Often Traveling More than 75 Miles From Home



2.2.12 Work Related Travel

- Two out of three Vermonters surveyed (65%) are currently working outside of their homes, either for wages or on a volunteer basis. This finding is identical to the 2000 Vermont transportation study. Employment outside the home was highest in the Burlington-Centered region (69%) and lowest in the Northern Tier (60%).

2.2.13 Typical Travel to Work

Vermonters who are employed outside of the home were also asked how they usually travel to work and if more than one means is used, which one is their primary means and which one is their secondary means. For example, an individual who drives to work four days a week and takes the bus once a week would choose “drive alone” as their primary mode, and “public transit bus” as their secondary mode.

- **Table 2** below shows that 75 percent drive alone to work as their primary means. This is very similar to results collected in June 2000 where 80 percent of Vermont residents drove alone to work as their primary means.
- Twelve percent share a ride with one or more other passengers in a vehicle as their primary mode of travel to work. In June 2000, 13 percent drove alone as their primary mode to work.
- Overall, half (56%) have only one means of transportation to work.

Table 2. Means of Travel to Work in 2006

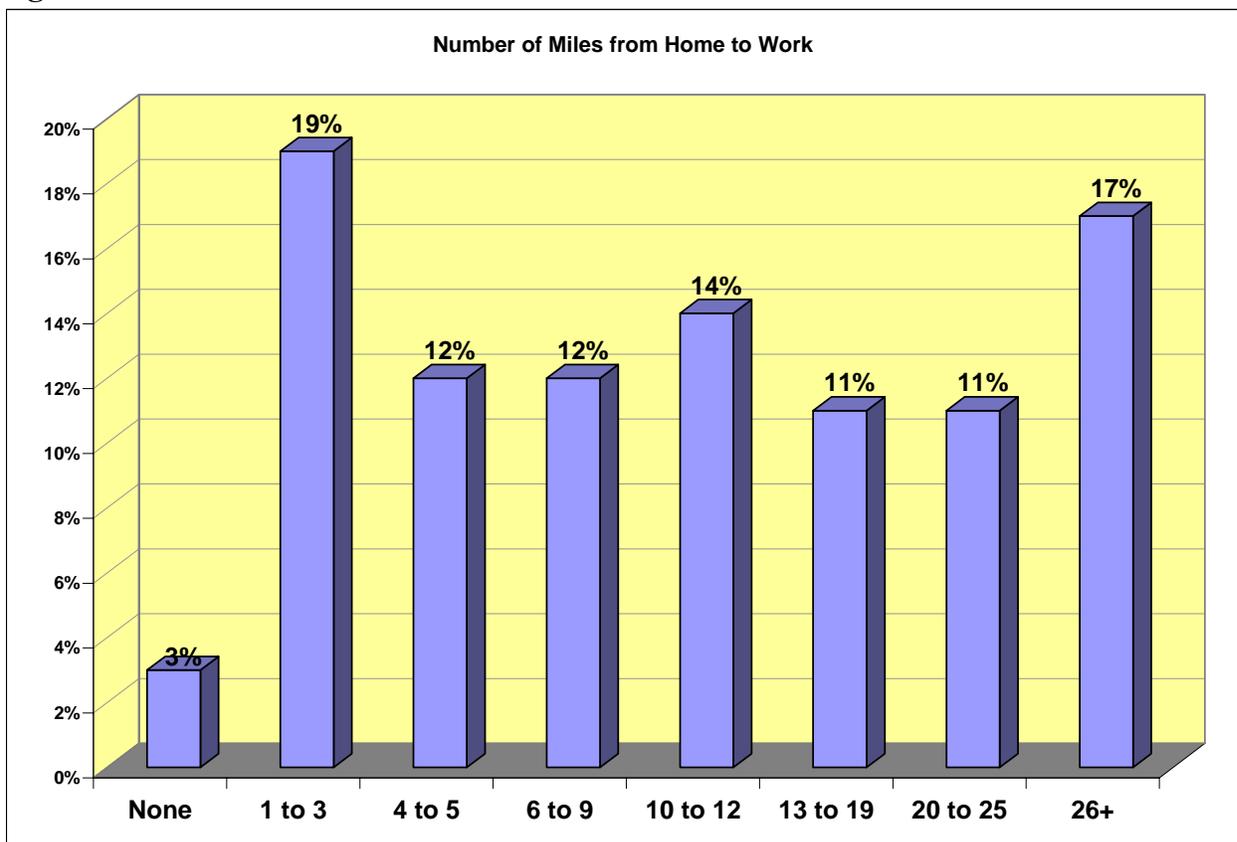
Means of Travel	Primary	Secondary	Combined
Drive Alone	75%	5%	80%
Drive with 1 or more others at least part way	12%	8%	20%
Walk	4%	8%	12%
Bicycle	1%	6%	7%
Public transit bus	1%	3%	4%
Other means	1%	2%	3%
None	1%	55%	56%

2.2.14 Number of Miles to Work

Survey respondents reporting that they worked outside of the home were asked how many miles they travel from home to work when they travel straight to their work destination.

- One in five Vermonters (19%) who work outside the home reported a very short distance of three miles or less. About one in five (19%) respondents also drove more than 25 miles one way to work (Figure 17).
- The average distance traveled straight to the respondent's work destination is 15.7 miles. In June 2000 the reported average was about 15 miles.

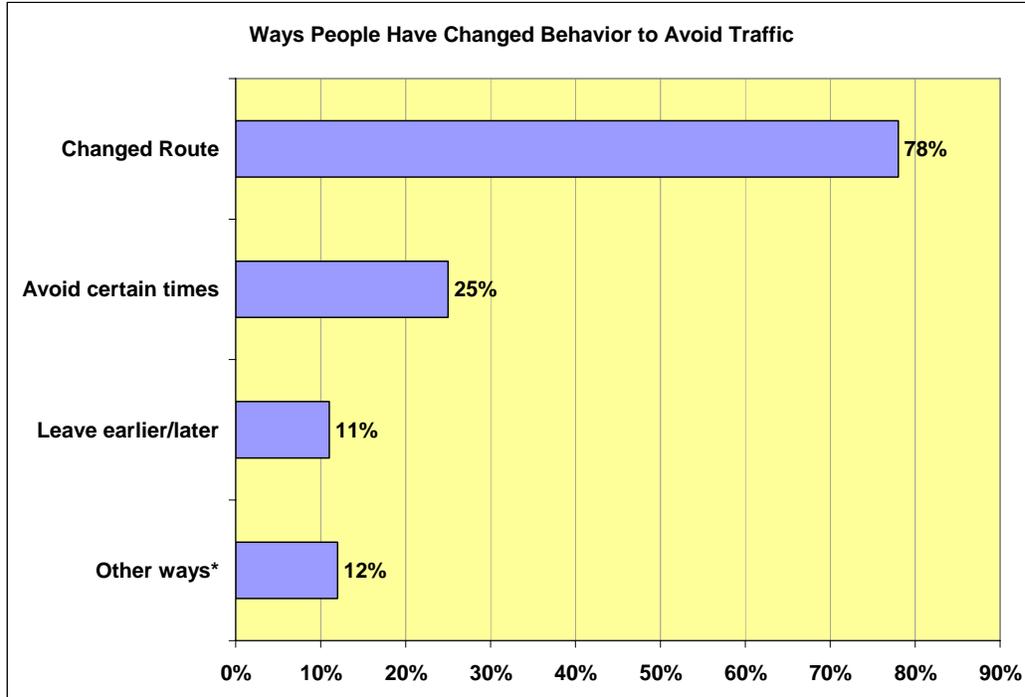
Figure 17. Number of Miles from Home to Work



2.3 Traffic Congestion in Vermont

- Half of Vermont adults surveyed (50%) reported that they had experienced traffic congestion while traveling in Vermont during the past six months. This represents a significant increase from the 43 percent reporting that they had experienced traffic congestion in June 2000.
- In the Burlington-Centered region, 71 percent of the Vermonters participating in this study noted that they had experienced traffic congestion. This is significantly higher than any of the other four regions.
- Among those who have experienced congestion, almost half (46%) have changed their behavior in order to avoid this traffic congestion. In the Burlington-Centered region, 61 percent reported changing their behavior, which is higher than in the other regions. In June 2000, among those in the State experiencing traffic congestion, 71 percent responded that they had changed behavior. No comparison data is available for the Burlington-Centered region specifically.
- **Figure 18** shows that out of the 46 percent that have altered their behavior, the primary means was changing their route (78 percent in 2006 versus 87 percent in June 2000). Twenty-five percent opted to avoid certain times of the day when the congestion is likely to occur, compared to 20 percent in June 2000.

Figure 18. Ways People Have Changed Behavior to Avoid Traffic



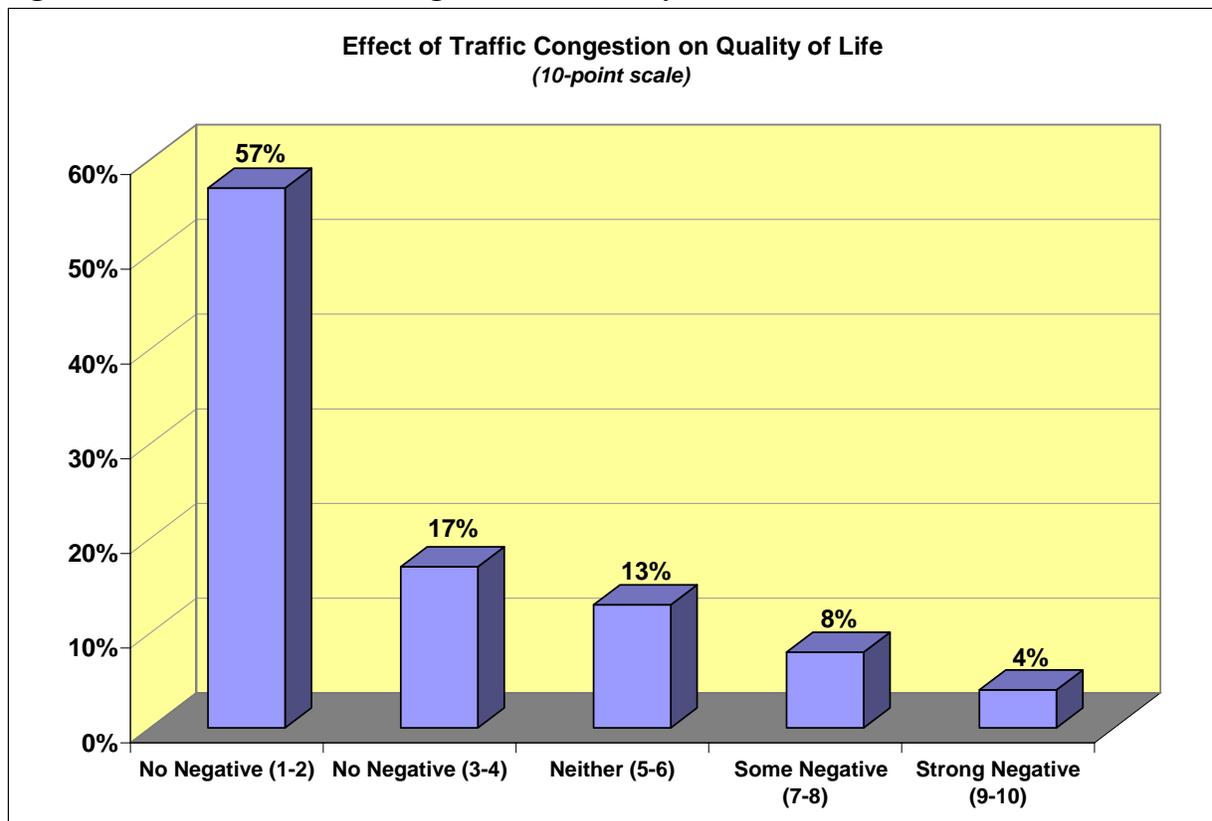
* Other ways includes conducting business in alternate locations (3%), walking (2%), reduce trips by combining errands (2%), and use alternative transportation (1%).

2.3.1 Impact of Congestion on Quality of Life

All survey participants were asked how experiencing traffic congestion affected their quality of life. A ten-point scale was used where a 1 indicated **No Negative Effect** and a 10 represented a **Strong Negative Effect**.

- Nearly three in five respondents (57%) rated it as either a 1 or 2 representing *No Negative Effect*. In the Burlington-Centered region, only 48 percent rated it as a 1 or 2 (**Figure 19**).
- The average score for all Vermont residents on the ten-point scale was 3.1, indicating that in general, traffic congestion is not perceived to have a negative effect on residents' quality of life.
- Even among those Vermont residents that reported experiencing traffic congestion the average score was 3.5 versus 2.6 for those who had not experienced it.
- Only four percent of Vermonters felt that traffic congestion has a strong negative effect on their quality of life. This is the same as in the 2000 survey.

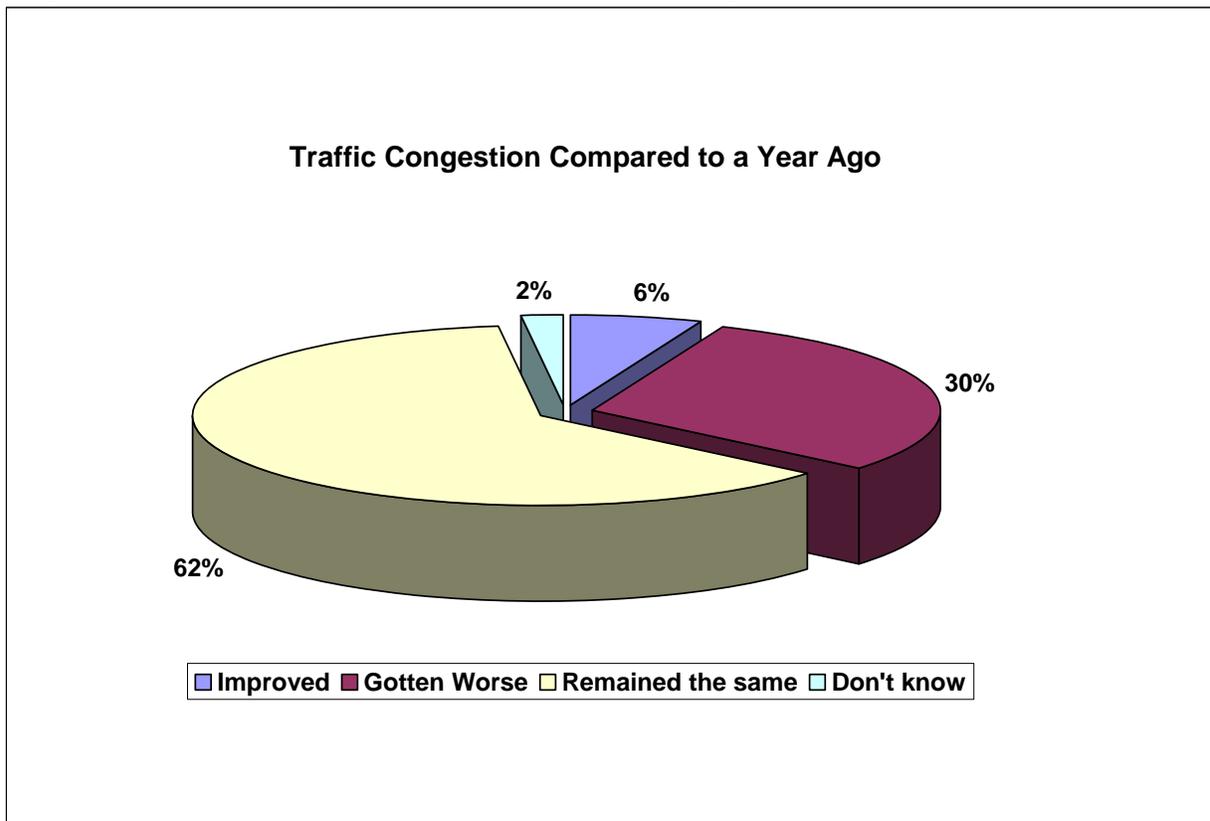
Figure 19. Effect of Traffic Congestion on Quality of Life



2.3.2 Traffic Congestion Compared to Past Six Months

- The majority of Vermont residents surveyed (62%) believe that the traffic congestion they have experienced has remained the same, as shown in **Figure 20**. However, among those who reported actually experiencing traffic congestion in the past six months only about half feel it is the same.
- Overall, one in three Vermonters (30%) believed that traffic congestion has gotten worse. For those who have experienced traffic congestion in the past six months, 44 percent responded that it has gotten worse.
- Less than one in ten Vermonters (6%) felt that traffic congestion had improved. This was equally true for those who had experienced congestion (7%) as for those who had not experienced it (5%).

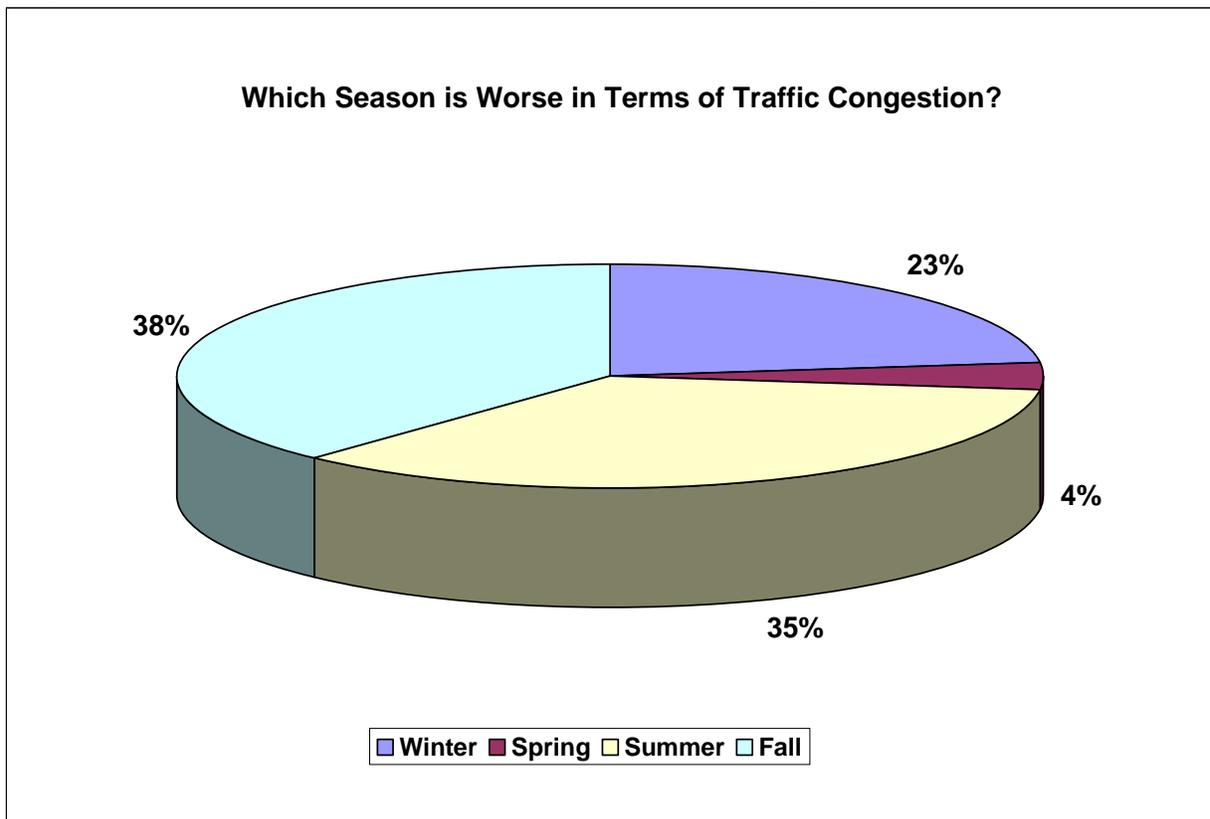
Figure 20. Traffic Congestion Compared to a Year Ago



2.3.3 Seasonal Traffic Congestion

- When asked if traffic congestion in Vermont was about the same for each of the seasons or worse in some seasons than others, 75 percent replied that some seasons are worse than others.
- Among Vermont residents who felt that there was a difference, the seasons mentioned most often were summer (35%) and fall (38%), see **Figure 21**. In June 2000, 37 percent mentioned the fall which is identical to the results of this study. In the prior survey, the Vermont residents surveyed were more likely to mention the winter (32%) and then the summer (27%).
- Each region rated the seasons differently. Winter was mentioned more often in the Southeast Counties (37%) and Southwest Counties (30%) than the other three regions. Summer received the most mentions in the Northern Tier (50%), Central Vermont (38%) and Burlington-Centered (47%) regions. Fall was noted more frequently in the Central Vermont Region (41%), Southeast Counties (43%), and Southwest Counties (51%).

Figure 21. Which Season is Worse in Terms of Traffic Congestion?



2.4 Ratings of Vermont's Transportation Infrastructure & Spending

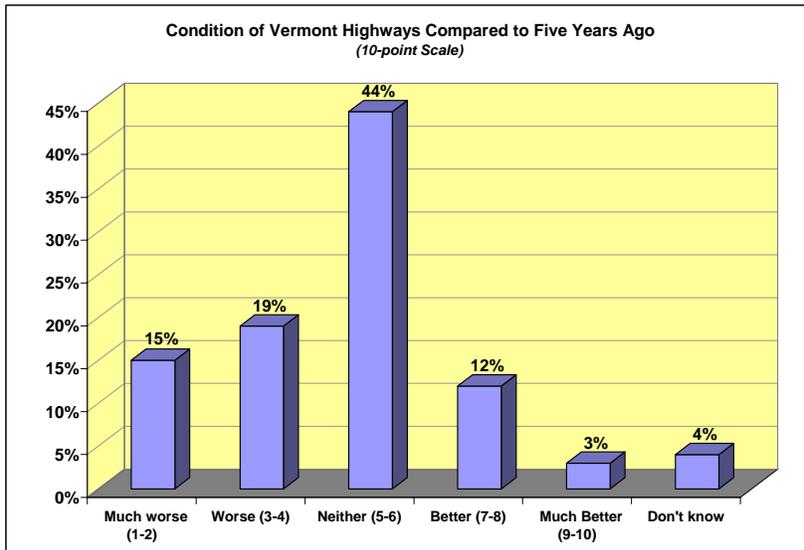
The Vermont residents participating in this survey were asked to rate the State's highways and other facilities on a number of attributes using a ten-point scale. The attributes include highway conditions, maintenance, and funding¹.

For all but one of these evaluations a 1 meant **Much Worse** and a ten represented **Much Better**. The final rating of Vermont's highway safety in the winter used a ten-point scale where a 1 meant **Very Poor** and a 10 meant **Excellent**.

2.4.1 Highway Condition Compared to Five Years Ago

- When asked to rate the condition of Vermont highways compared to five years ago, one in three residents (34%) rated it as worse, see **Figure 22**. In June 2000, only 20 percent of the Vermonters surveyed rated the current conditions as worse.
- Only 15 percent considered it to be better (7-10) on the ten-point scale. The June 2000 survey used 6-10 to describe better, which resulted in 22 percent in 2006 versus 35 percent in 2000.
- Almost half of the Vermont residents surveyed (44%) were relatively neutral in their opinions about highway conditions compared to five years ago.
- The average rating of 4.7 on this measure is slightly on the worse side of the scale. The average ratings were fairly similar across the five regions.

Figure 22. Condition of Vermont Highways Compared to Five Years Ago

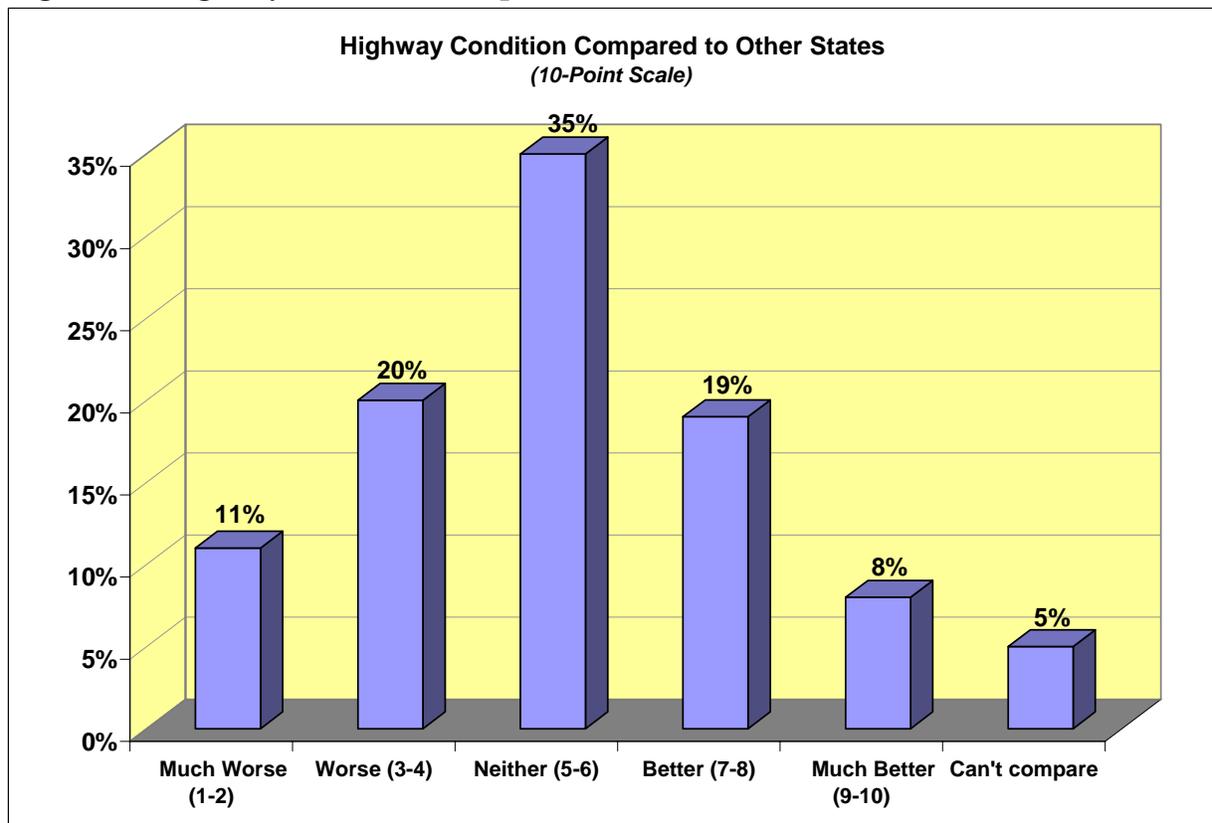


¹ The consultants note that VTTrans is currently responsible for 3200 miles of interstate, State, and US routes and Class 1 town highways. This represents a portion but not all of public use roadways in Vermont.

2.4.2 Comparison of Highway Condition with Other States

- Compared to other states' highways that Vermonters have experience with, 31 percent rated Vermont's highways as worse, see **Figure 23**. Again this is significantly higher than the 20 percent of Vermonters who rated the highway conditions as worse compared to other states in June 2000. The 2006 survey also reveals that one in ten (11%) considered Vermont's highways much worse as compared to eight percent who rated the conditions as much better.
- Twenty-seven percent described the highway conditions as better (7-10). The June 2000 survey used 6-10 on the scale as better. Under that broader definition, 34 percent rated the conditions as better compared to other states versus 41 percent in the prior transportation study.
- One in three Vermont residents (35%) were relatively neutral regarding their opinions of Vermont's highways as compared to other states they are familiar with.
- The average rating of 5.2 is in the neutral range on the 10-point scale. The average rating in the Southeast Counties was significantly higher than the other four regions at 6.0.

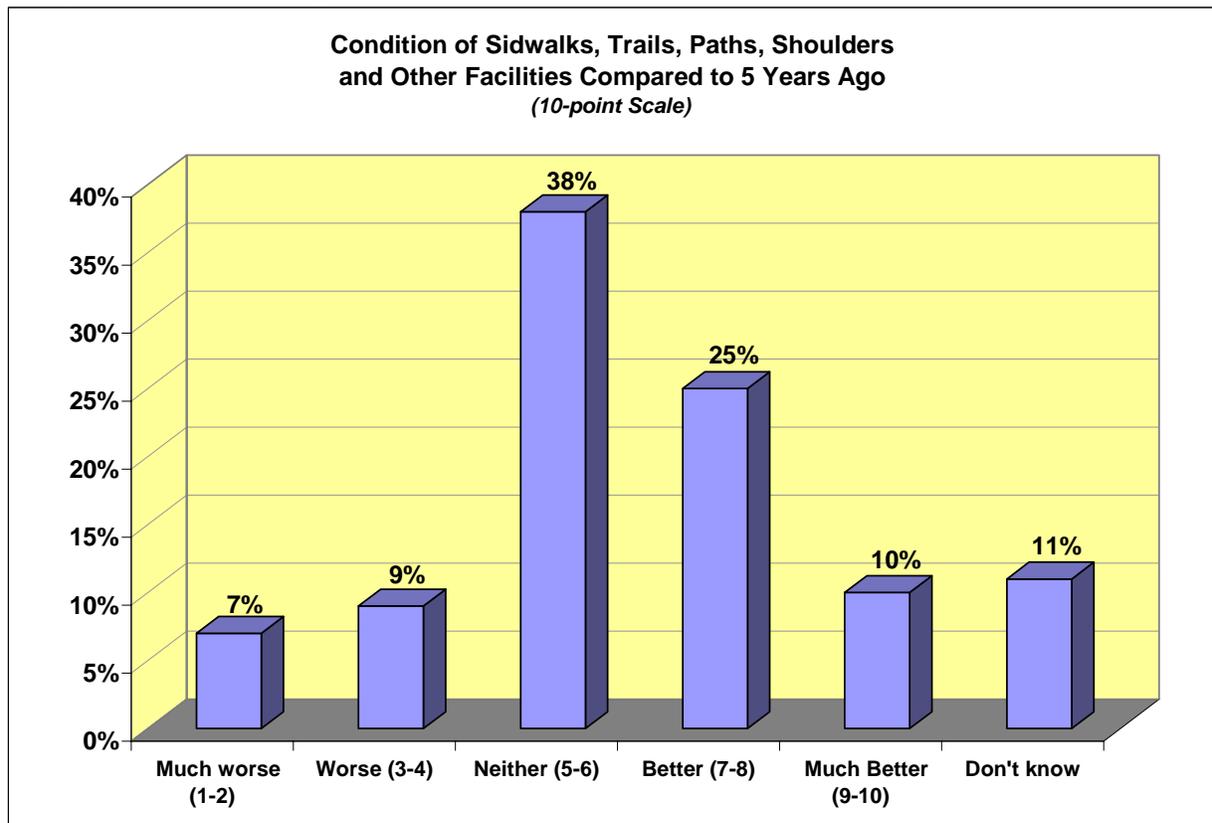
Figure 23. Highway Condition Compared to Other States



2.4.3 Condition of Walking and Biking Facilities

- The Vermont residents surveyed were asked to rate the condition of sidewalks, trails, paths, shoulders and other facilities for walking and bicycling in Vermont compared to five years ago. One in three Vermonters (35%) rated the conditions of these amenities as better, compared to only 16 percent who rated them as worse. One in ten residents (11%) responded that they were unable to make this comparison (**Figure 24**).
- Two in five Vermont residents (38%) were generally neutral with no strong rating either way.
- The average rating of 5.9 is at the end of the neutral range on this ten-point scale indicating a slight overall leaning toward rating this attribute as better compared to five years ago. The most favorable average rating was in the Burlington-Centered region (6.4)

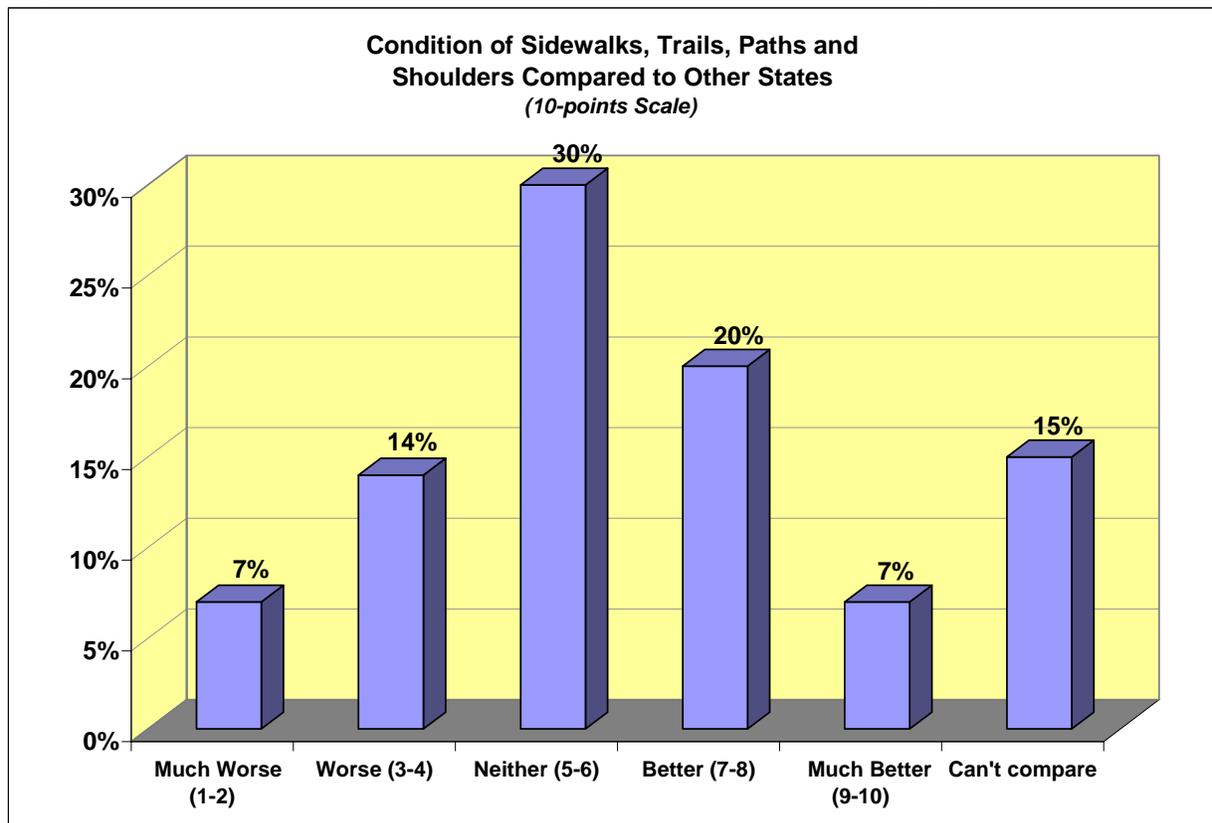
Figure 24. Condition of Sidewalks, Trails, Paths, Shoulders and Other Facilities Compared to 5 Years Ago



2.4.4 Condition of the Non-motorized Transportation System

- The Vermonters surveyed were asked to rate the condition of sidewalks, trails, paths, shoulders in Vermont compared to other states that they have experience with. One in five Vermonters (21%) rated the conditions of these amenities as worse and 27 percent rated them as better. Fifteen percent responded that they were unable to make this comparison (**Figure 25**).
- One in three Vermont residents (30%) rated it as neutral on this measure.
- The average rating of 5.6 is neutral on this measure of Vermont's non-motorized transportation system. The most favorable overall rating for this attribute was in the Burlington-Centered region with an average score of 6.2.

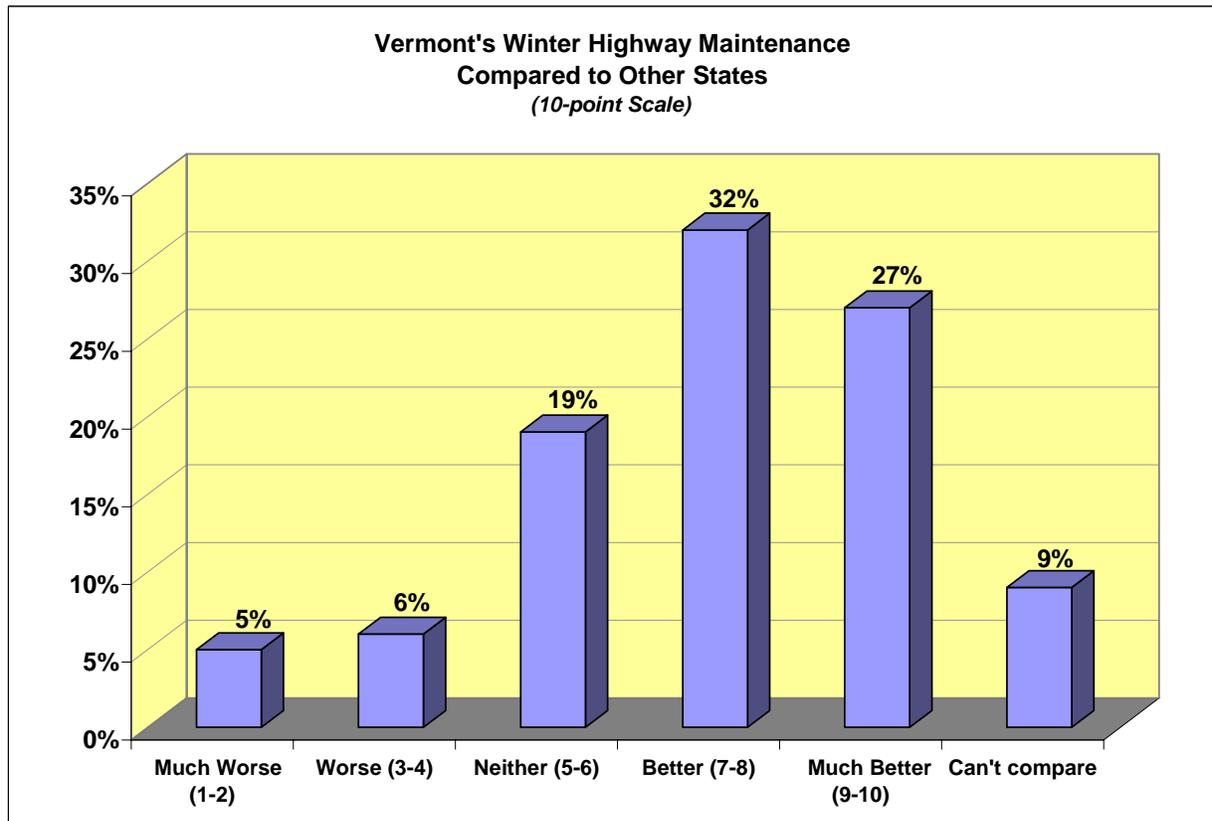
Figure 25. Condition of Sidewalks, Trails, Paths and Shoulders Compared to Other States



2.4.5 Winter Highway Maintenance

- Vermont residents were asked to rate how well Vermont is doing on winter highway maintenance, such as removing snow and ice, compared to other states with which they have experience. Three in five Vermonters (59%) rated the winter highway maintenance as better, including one in four (27%) rating it as much better. Only one in ten (11%) rated the winter highway maintenance as worse as or much worse than other states, as shown in **Figure 26**.
- One in five residents (19%) were neutral regarding this question on winter maintenance and one in ten (9%) could not compare.
- The average rating of 7.1 on the ten-point scale for winter highway maintenance is definitely in the better range as compared to other states. Winter highway maintenance was most favorably rated in the Central Vermont Region and Southeast Counties (7.4 for both). It was lowest in the Northern Tier (6.8) and Southwest Counties (6.9).

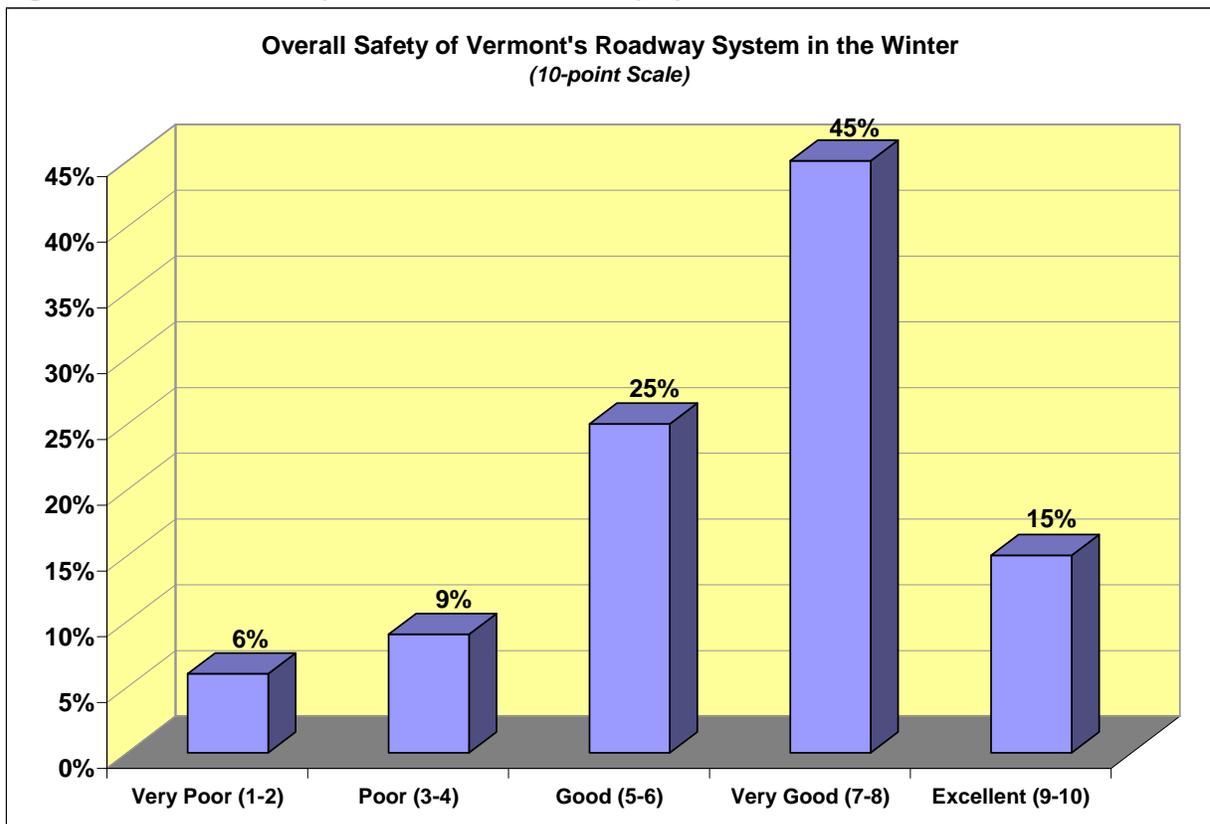
Figure 26. Vermont's Winter Highway Maintenance Compared to Other States



2.4.6 Winter Safety of Vermont's Roadway System

- Vermonters participating in this survey were asked how they would rate the overall safety of Vermont's roadway system during the winter. Three in five residents (60%) rated the safety as very good or excellent, with 15 percent rating it as excellent.
- Only 15 percent rated the safety of Vermont's road system as poor or very poor.
- The average rating of 6.7 on this measure is in the good to very good range on the ten-point rating scale. The highest rating for winter safety was in the Central Vermont Region (7.0) and lowest in the Southwest Counties (6.3).

Figure 27. Overall Safety of Vermont's Roadway System in the Winter



2.5 Allocation of Agency of Transportation Funds

Survey participants were read the following statement: “Last year, the Agency of Transportation spent about 55 percent of its available funds on paving and maintaining highways and repairing bridges. VTrans also spent about 20 percent of its funds on new roadway projects, and the other 25 percent of its funds on non-highway programs, like public transit and airports.”

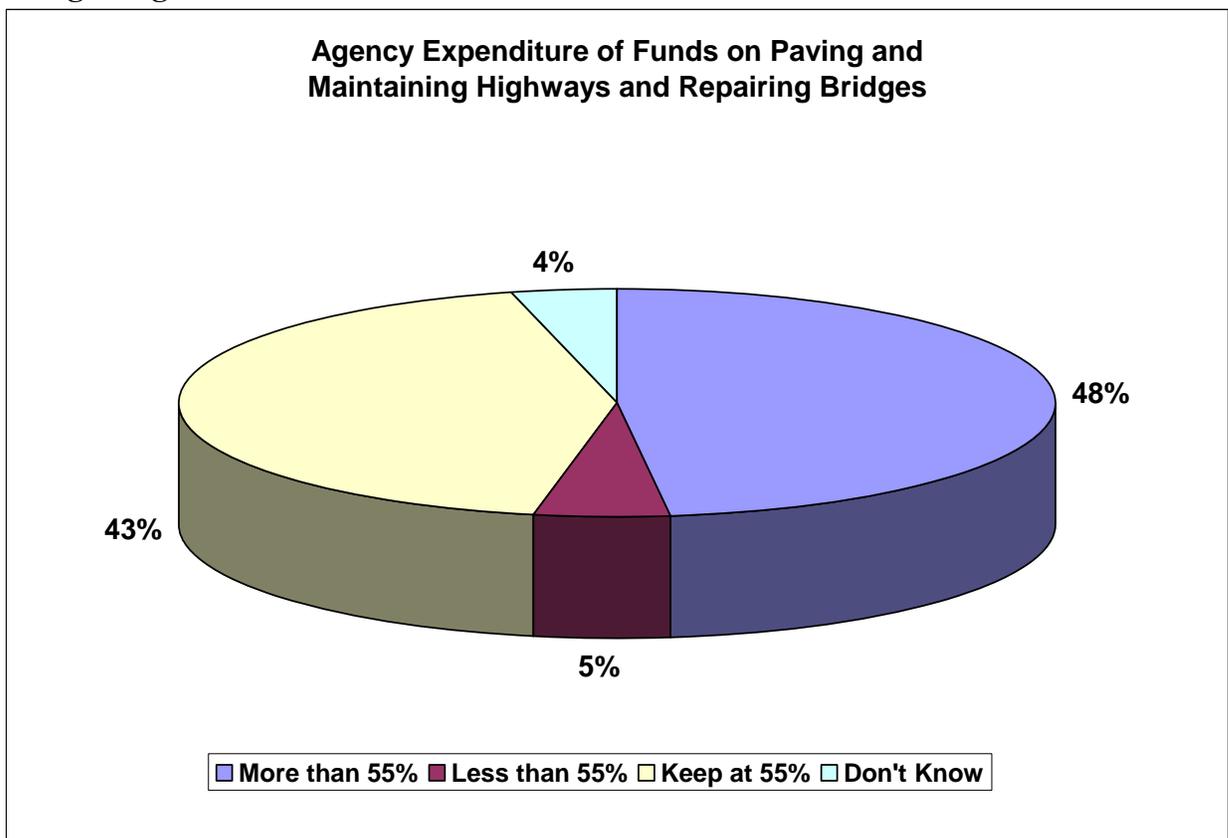
It should be noted that the allocation percentages in June 2000 were quite different as compared with the 2006 survey. In that year respondents were told that 70 percent of available funds were spent on paving and maintaining highways and repairing bridges, 15 percent on new roadway projects, and 15 percent on non-highway programs.

- When the Vermonters surveyed were asked if it were up to them would they continue to use the same allocation, 67 percent responded yes. Twenty-nine percent said no and the remaining five percent didn't know.
- In June 2000, 70 percent of the Vermont residents surveyed said yes to use the same allocation, 21 percent wanted the allocation changed and nine percent didn't know.

2.5.1 Maintaining Highways and Repairing Bridges

- One in two Vermonters surveyed (48%) believed that VTTrans should spend more than 55 percent of its available funds on paving and maintaining highways and repairing bridges. Forty-three percent would keep it at 55 percent and only five percent think VTTrans should spend less (Figure 28).
- In June 2000, 54 percent believed that VTTrans should spend more than 70 percent of its available funds on paving and maintaining highways and repairing bridges. Twenty-seven percent would have kept it the same and 14 percent thought it should be less.

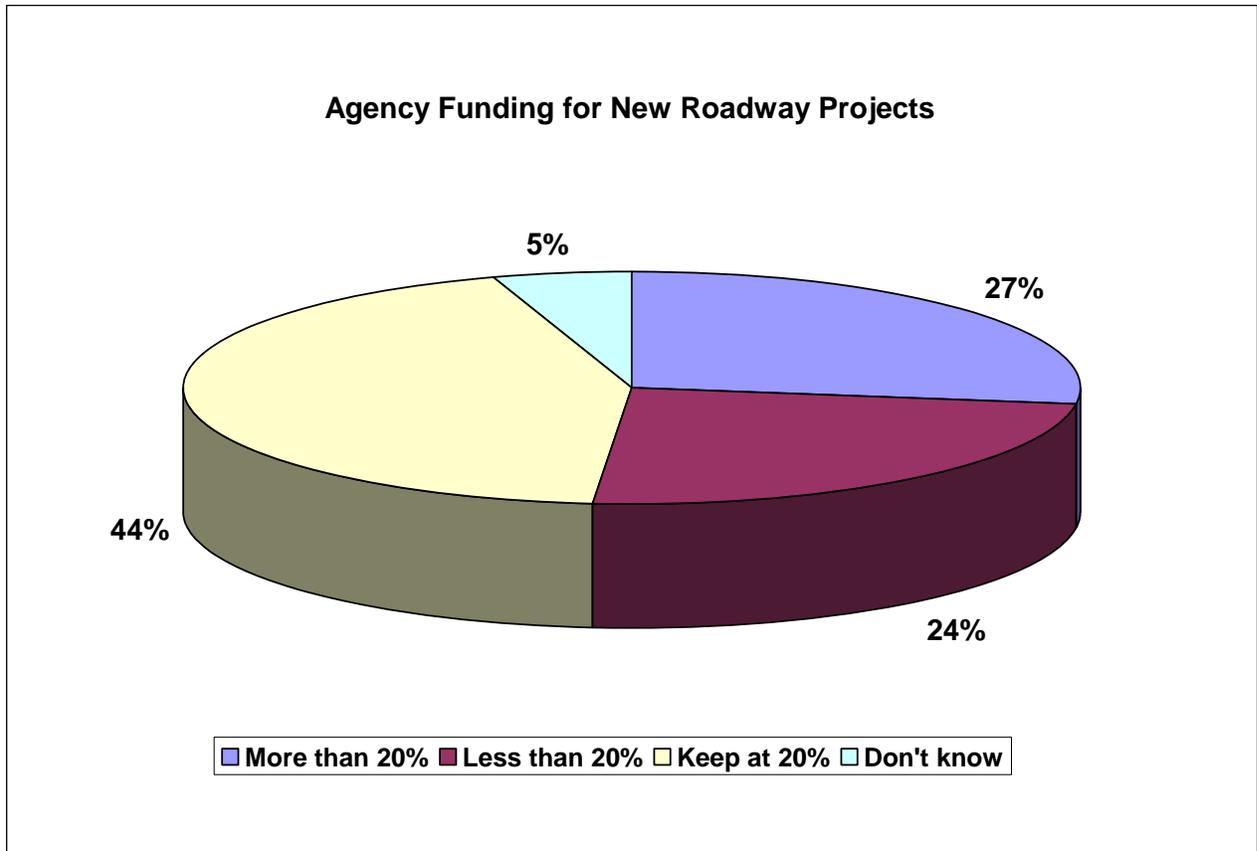
Figure 28. Agency Expenditure of Funds on Paving and Maintaining Highways and Repairing Bridges



2.5.2 New Roadway Projects

- Almost half of the Vermonters surveyed (44%) felt that VTrans should keep the funding for new roadway projects at 20 percent.
- Most of the remaining Vermont residents were about equally divided regarding whether VTrans should spend more or less than 20 percent of its available funds on new roadway projects (Figure 29).

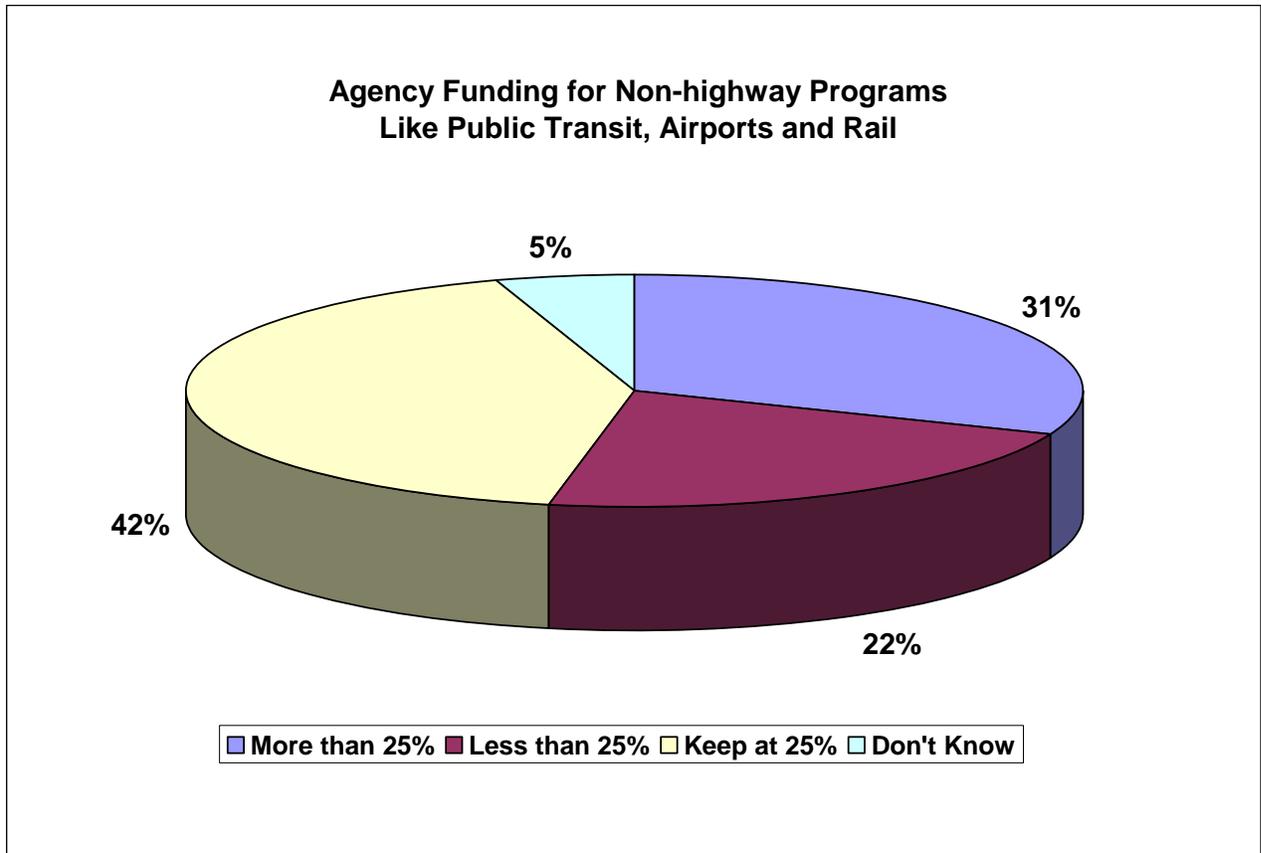
Figure 29. Agency Funding for New Roadway Projects



2.5.3 Funding for Non-highway Programs

- Forty-two percent of Vermont residents would like to see VTrans keep funding for non-highway projects like public transit, airports and rail at 25 percent (**Figure 30**).
- One in three residents (31%) think that it should be more than 25 percent and one in five (22%) responded less than 25 percent.

Figure 30. Agency Funding for Non-highway Programs Like Public Transit, Airports and Rail



2.6 Most Important Transportation Issues

Survey participants were presented with the following instructions: “I am going to read you a list of eight issues that are considered important when thinking about the State’s transportation system. With the understanding that all issues must be given some attention, please tell me which ones you think are the three most important issues.” The presentation of the issues was randomly rotated to prevent any positioning bias.

- Overall, Vermont residents consider *safety and security* and *environmental protection* as the most important issues for the State’s transportation system to address. In terms of which one is most important, *safety and security* has the edge over *environmental protection*, (**Table 3**).
- Next in overall importance are the *cost to taxpayers* and *preserving the landscapes and village character*.
- The lowest priority issues for Vermonters are *tourism*, *consistency with planned growth* and *delivery of goods*.

Table 3. Most Important Transportation Issues

Issues	Most Important	2 nd Most Important	3 rd Most Important	Combined
Safety and security	28%	15%	12%	55%
Environmental protection	22%	20%	13%	55%
Cost to taxpayers	14%	15%	15%	44%
Economic development	11%	11%	11%	33%
Preserving landscapes and village character	10%	17%	16%	43%
Tourism	5%	8%	9%	22%
Consistency with planned growth	4%	6%	9%	19%
Delivery of goods	4%	5%	7%	16%
Don't know	1%	2%	6%	9%

- In June 2000, the most important issue was *safety*, followed by *environmental protection* and *preserving landscapes and village character*.

2.7 Share of Transportation Budget Allocated to Specific Issues

The Vermont residents surveyed were given the following information and instructions: “Now, I am going to read you a list of fourteen state transportation issues in no particular order. For each one, please tell me whether you think it should receive a greater share of the State transportation budget, receive about the same share or receive a lesser share of the State transportation budget as now. Please keep in mind that if you think there should be increases in all or most of the areas, it could mean increased spending.” The presentation of the issues was randomly rotated to prevent any positioning bias.

- The top issues that Vermont residents would like to see a greater share of the transportation budget allocated to are *bridge repair/ replacement* and *summer highway road repair/ repaving*, (Table 4).
- Other important issues for Vermonters are *safety and security*, *public transportation*, *air quality*, *bicycle and pedestrian paths*, *preserving village landscape and character*, and *projects to relieve traffic congestion*.
- The transportation issues that rank the lowest in terms of resident interest in having greater funds allocated to them are *enforcement of traffic laws*, *projects to promote planned growth* and *new road construction*.

Table 4. Transportation Issues and Allocation to Budget (2006)

Transportation Issues (2006)	Greater Share	Lesser Share	Same Share	Don't Know
Bridge repair and replacement	49%	3%	46%	2%
Summer highway road repair & repaving	46%	4%	48%	2%
Safety and security	41%	6%	51%	2%
Public transportation such as buses or trains	41%	16%	41%	2%
Air quality	39%	8%	51%	2%
Bicycle and pedestrian paths	37%	19%	42%	2%
Preserving landscape & village character	36%	13%	49%	2%
Projects to promote economic development	36%	18%	45%	2%
Projects to relieve traffic congestion	35%	12%	51%	2%
Winter snow and ice removal	32%	2%	65%	1%
Increased mobility - making it easier to get around the State	32%	16%	50%	2%
Enforcement of traffic laws	28%	14%	56%	1%
Projects to promote planned growth	27%	21%	48%	4%
New road construction	25%	28%	44%	2%

2.7.1 Comparison of Budget Allocations 2006 and 2000

Vermonters' opinions on whether VTTrans should increase or decrease budget allocations for certain transportation issues were compared using the 2000 and 2006 surveys. During that time there have been significant changes in how much of the budget Vermonters believe should go to specific issues. **Table 5** below shows the 2000 data and highlights significant changes between this data and the 2006 data (shown in Table 4).

- The most notable change was for *Increased mobility - making it easier to get around the State* where the percentage suggesting a greater share increased by 14 percentage points from 18 percent to 32 percent. Other substantial increases in the percentage noting a greater share were:
 - Public transportation such as buses or trains (+10 percentage points from 31 percent to 41%); and
 - Summer highway road repair and repaving (+7 percentage points from 39 percent to 46%).
- The percentage of Vermont residents mentioning that a greater share should be allocated to safety and security decreased by 8 percentage points from 49 percent to 41 percent.

Table 5. Transportation Issues and Allocation to Budget (2000)

Transportation Issues (2000)	Greater Share	Lesser Share	Same Share	Don't Know
Bridge repair and replacement	51%	4%	41%	4%
Summer highway road repair & repaving	39%	7%	50%	4%
Safety and security	49%	3%	44%	4%
Public transportation such as buses or trains	31%	15%	47%	7%
Air quality	34%	7%	53%	6%
Bicycle and pedestrian paths	42%	17%	37%	4%
Preserving landscape & village character	36%	10%	50%	4%
Projects to promote economic development	N/A	N/A	N/A	N/A
Projects to relieve traffic congestion	36%	14%	44%	6%
Winter snow and ice removal	30%	4%	63%	3%
Increased mobility - making it easier to get around the State	18%	14%	58%	10%
Enforcement of traffic laws	33%	11%	53%	3%
Projects to promote planned growth	N/A	N/A	N/A	N/A
New road construction	28%	22%	45%	5%

Note:

Numbers bolded and shaded represent statistically significant differences at the 95 percent confidence level between the 2000 and 2006 percentages (Comparing Table 5 to Table 4). This means that the differences between 2000 and 2006 shaded in the table did not occur by chance, but likely represent a real difference over time.

N/A = Data not available.

2.8 Statements Pertaining to Vermont's Environment

Participants in the Statewide transportation survey were read the following two statements about Vermont:

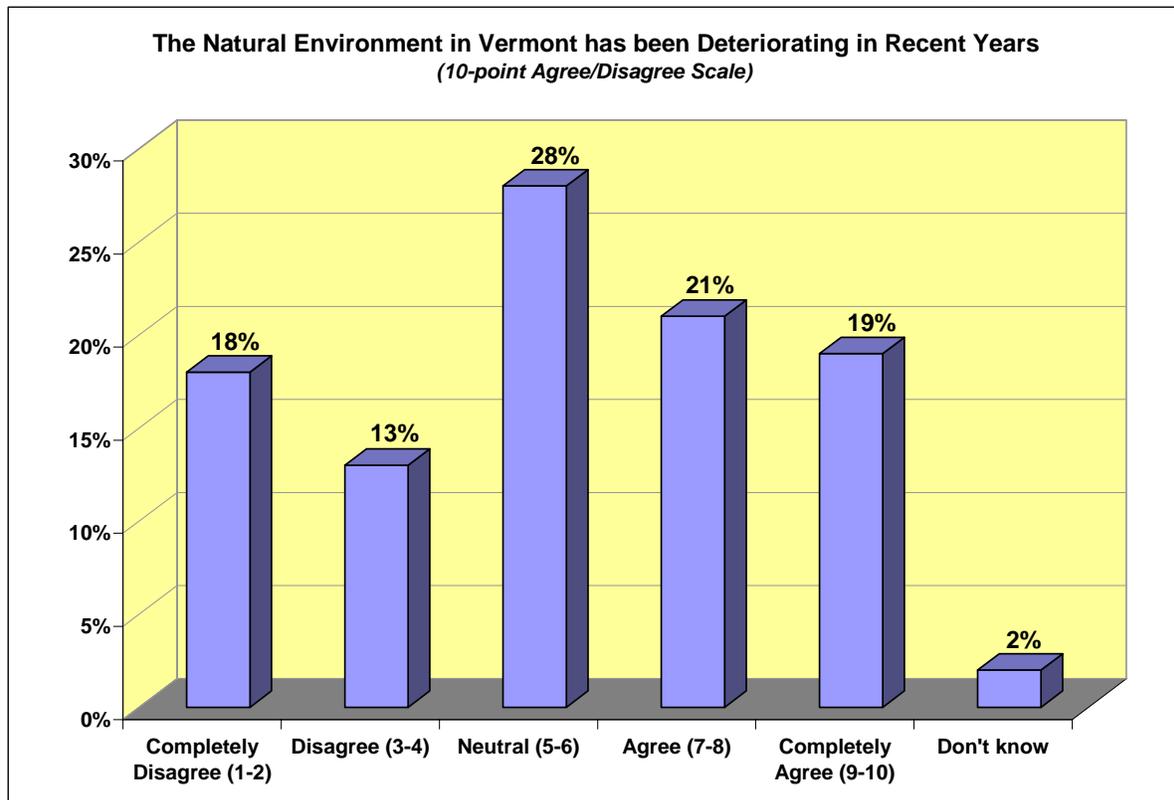
1. The natural environment in Vermont has been deteriorating in recent years.
2. The Vermont Agency of Transportation should take an active role in limiting urban sprawl.

For each one they were asked to indicate how strongly they agreed or disagreed using a ten-point scale where a 1 meant **Completely Disagree** and a 10 represented **Completely Agree**.

2.8.1 Natural Environment in Vermont

- Forty percent agree that the natural environment in the State has been deteriorating in recent years. One in five (19%) completely agree with this statement. One in three (31%) disagree that the natural environment has deteriorated (**Figure 31**).
- About one in four Vermonters (28%) gave relatively neutral responses regarding this question. The overall average rating of 5.7 is in the neutral range and very slightly on the agree side. The average rating has decreased since 1995. In 1995, the overall average rating was 6.2, which is still in the neutral range, but slightly higher on the agree side than in 2006.

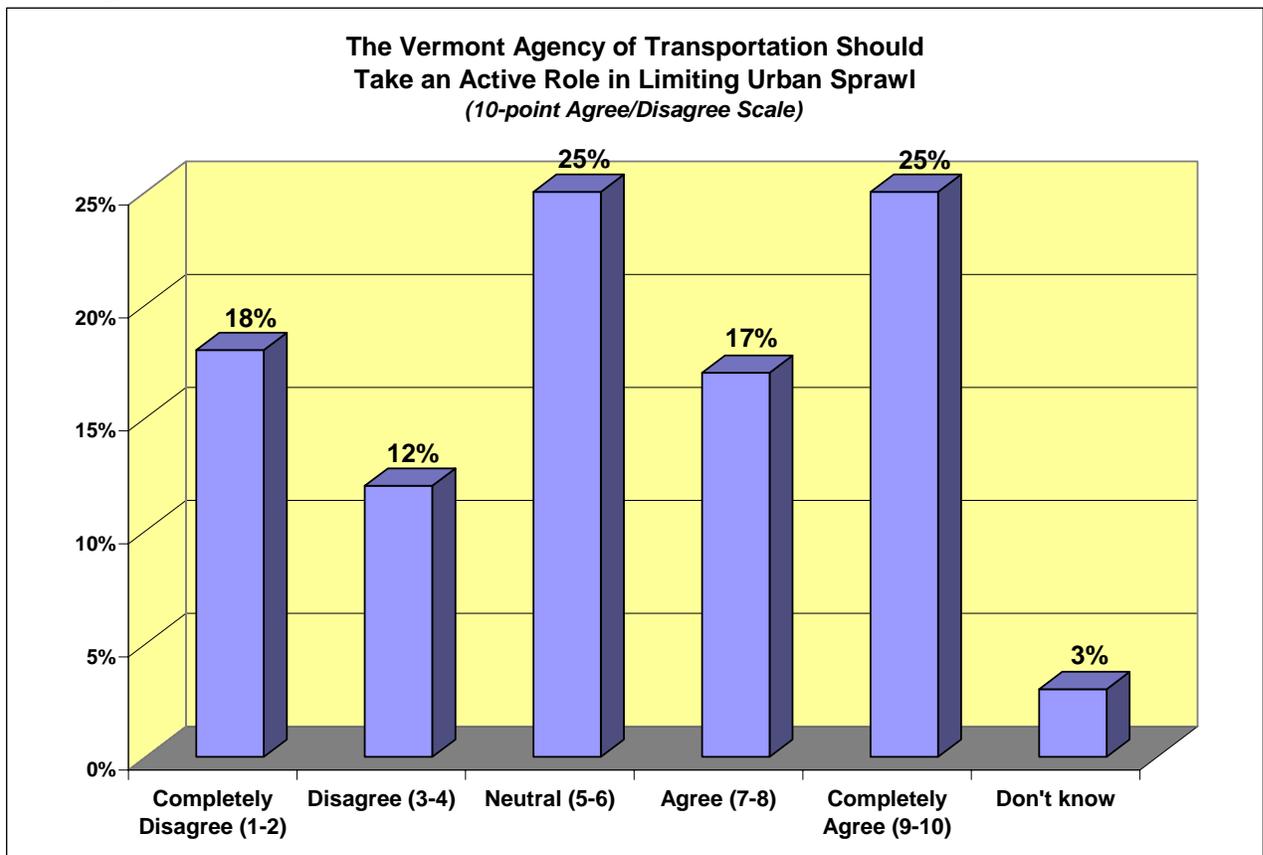
Figure 31. The Natural Environment in Vermont has Been Deteriorating in Recent Years



2.8.2 Role in Limiting Urban Sprawl

- Two in five Vermont residents (42%) agree that the Vermont Agency of Transportation should take an active role in limiting development outside of villages that is sometimes called urban sprawl. One in four residents (25%) completely agrees with this statement (**Figure 32**).
- One in three Vermonters (30%) disagrees with this statement, with 18 percent who strongly disagree. The average score of 5.9 on this statement is in the neutral range with a very slight leaning in the direction of agreeing.
- In 1995, 54 percent of survey respondents agreed with the statement “the government should seek to promote concentrated growth.”

Figure 32. The Vermont Agency of Transportation Should Take an Active Role in Limiting Urban Sprawl



2.9 Actions to Help Limit Sprawl

Survey participants who agreed that the Vermont Agency of Transportation should limit urban sprawl (7-10 on the scale) were informed that a number of proposals had been made about how VTTrans should help limit sprawl. They were then read four options in random order and asked which one VTTrans should concentrate on most and which one is the least desirable.

- Of the four options presented, the one that clearly appeals to the most Vermont residents is to *concentrate on maintaining existing roadways rather than building new ones* (Table 6). This finding is consistent with results from the 2000 survey.
- The least desirable option overall is to *concentrate on making transportation improvements in town centers rather than outlying areas*. In 2000, the least important action to limit sprawl was *invest in pedestrian/bicycle facilities*.

Table 6. Proposals for Limiting Urban Sprawl

Proposals for limiting urban sprawl	Concentrate on Most	Least Desirable	Net Difference
Concentrate on maintaining existing roadways rather than building new ones	44%	12%	+32%
Invest in more public transit and rail systems	20%	22%	-2%
Concentrate on making transportation improvements in town centers rather than outlying areas	18%	30%	-12%
Invest in pedestrian-friendly facilities, bike paths and sidewalks	16%	23%	-7%
None of these	--	3%	--
Don't know	2%	11%	-9

- In 1995, residents were asked to choose which of three possible scenarios for handling growth in Vermont they would like to see most: *Growth Centers*, *Current Growth Pattern*, or *Dispersed Growth*. The majority (48%) of respondents chose the *Current Growth Pattern* and thirty-nine percent of respondents chose *Growth Centers*. The *Current Growth Pattern* was defined in the 1995 survey as, “Growth will be allowed in rural areas and along highways. Significant resources, however, such as farmlands, wetlands, floodplains and steep slopes will continue to be protected. The emphasis will be on a transportation system which provides access and mobility; primarily by motor vehicle. Some resources will be used to expand current bus systems in urban areas. Current roads and rail lines would be maintained and expanded when necessary.”

3.0 COMPARISONS WITH PREVIOUS SURVEYS

3.1 Overview

In addition to an analysis of the most recently collected data, where appropriate, the Study Team also examined trends and changes in behavior by comparing current data with the June 2000 survey. The 2000 and 2006 survey tools were nearly identical with the exception of a few new questions added in 2006 to query residents about (among others) time spent on transportation activities, condition of the non-motorized transportation system, and winter highway maintenance and safety. A summary of key trends observed between 2000 and 2006 are shown in the following section, highlighted with graphics.

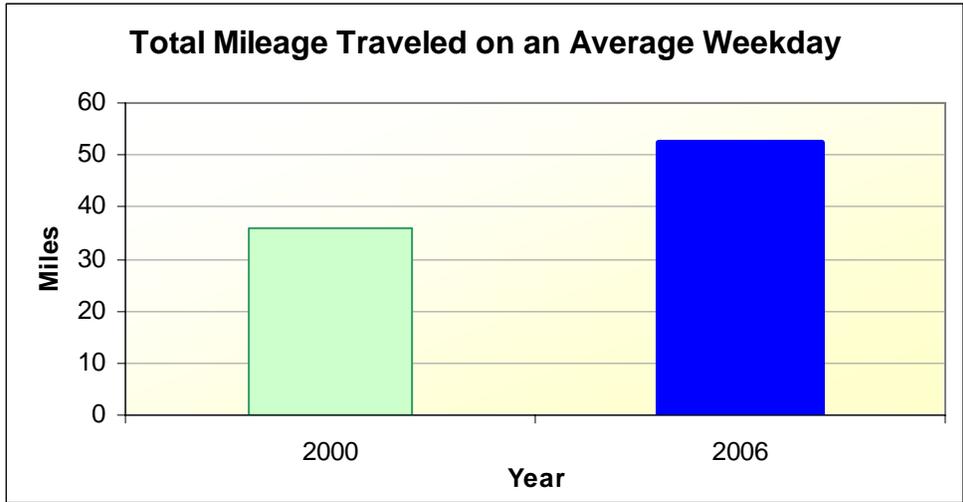
The Study Team also had access to the 1995 survey results. Unfortunately, few direct comparisons could be made between the 2000 and 2006 and the 1995 survey datasets because of varying objectives of the research projects. As compared with the 2000 and 2006 survey, the 1995 survey focused more on alternative means of transportation such as walking and bicycling and how much Vermonters used these alternative means for transportation versus recreation. It also asked questions regarding residents' awareness and desire for passenger rail service in Vermont, the economic impact of tourism on Vermont families, and State land use policies. Instances where the 1995 survey is comparable with the 2006 survey are included in this report and a few of the broad trends identified are included in this section.

3.2 Analysis and Trends: Comparison of 2006 and 2000 Results

In comparing 2006 survey data with 2000 survey data, the Study Team found several trends that are useful for future transportation planning in Vermont.

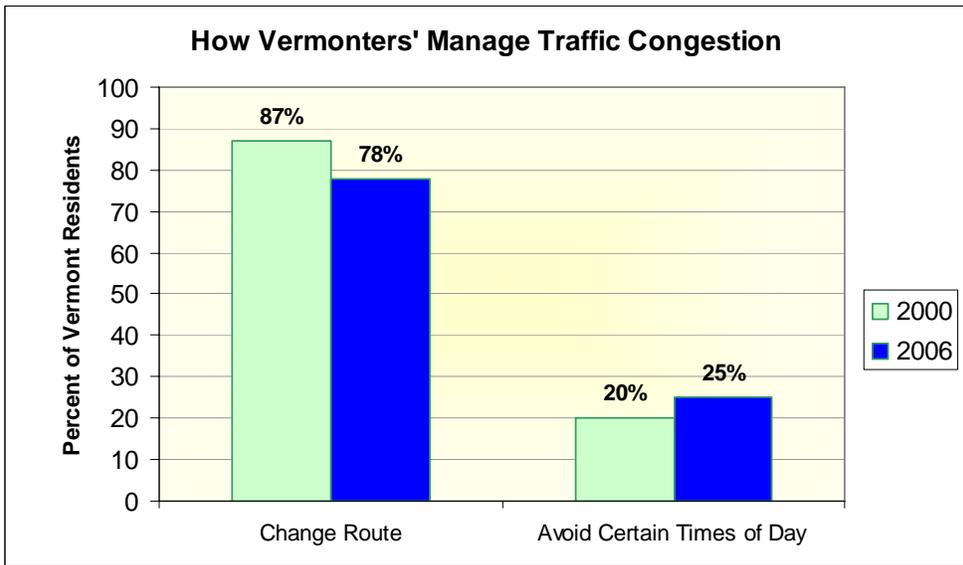
- Since 2000, air travel has increased by 9 percentage points. At the same time, the average number of trips per resident has declined, indicating that more people are traveling by air, but taking fewer trips.
- Twice as many Vermonters are taking advantage of bike lanes and road shoulders as compared with 2000. They are also using them more than twice as often.
- Use of Park & Ride facilities increased from 15 percent to 22 percent, but people are using them less often than before, indicating more widespread but less frequent use.
- The average number of miles that Vermonters travel each weekday increased between 2000 (36 miles) and 2006 (over 50 miles) by 46 percent. As shown in **Figure 33**, the number of miles driven alone increased by 34 percent from 28 miles in 2000 to just under 38 miles reported in 2006.

Figure 33. Total Mileage Traveled on an Average Weekday



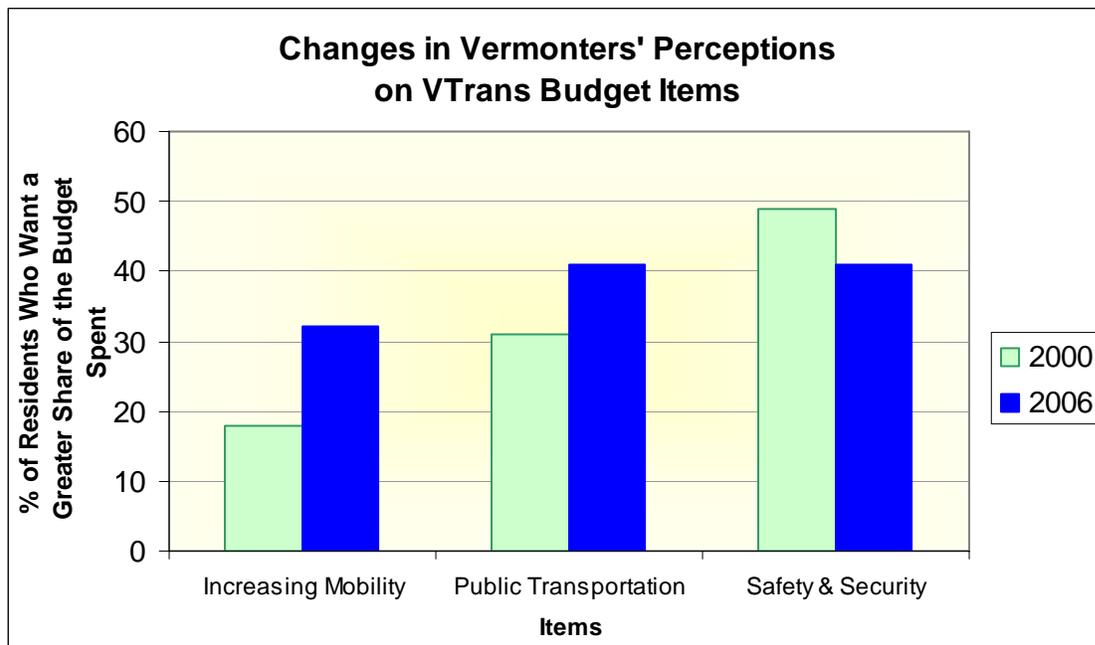
- When asked what would make them drive their vehicle less, 37 percent of Vermont residents responded that nothing would make them drive less. This represents a significant change over the previous survey when two-thirds of respondents said nothing would make them drive less. The next most popular responses to encourage less driving were better public transportation (22%) and higher gas prices (17%).
- More Vermonters experienced congested traffic conditions in 2006 (50%) as compared with 2000 (43%).
- When dealing with traffic congestion, fewer people reported changing their route than in the past, but slightly more said that they avoid traveling at certain times of day. This is shown in **Figure 34**.

Figure 34. How Vermonters Manage Traffic Congestion



- Vermonters believe that traffic congestion is worse in the fall and summer. In 2000 the majority of Vermonters thought traffic was worse in fall and winter.
- Consistent with 2000, in the current survey Vermonters rate, in order of importance, *safety & security*, *environmental protection*, and *preserving landscapes and village character* as the three most important transportation issues. *Cost to taxpayers* was ranked fourth in 2006.
- Compared to June 2000, the number of Vermont residents that would like to have a greater share of the transportation budget spent on *increased mobility - making it easier to get around the State* increased by 14 percentage points (18 percent in 2000 versus 32 percent in 2006). The number of residents would like to see a greater share of funding spent on *public transportation* increased by ten percentage points to 41 percent. This comparison is highlighted in **Figure 35**.

Figure 35. Changes in Vermonters' Perceptions on VTrans Budget Items



- Since 2000, the proportion of Vermonters recommending that more funds be allocated to *safety & security* decreased (49 percent in 2000 versus 41 percent in 2006).
- More Vermonters think the condition of state highways is worse today compared with five years ago (35 percent today versus 20 percent in 2000).
- More Vermonters think our highways are in worse condition than other states' highways (31 percent today versus 21 percent in 2000).

3.3 Comparing 2006 Results to the 1995 Survey

The 1995 survey was largely incomparable to the 2006 results because the survey instruments are different. As compared with the current survey, the 1995 survey focused on alternative means of transportation, use of such facilities for recreation and transportation, residents' awareness and desire for passenger rail service in Vermont, the economic impact of tourism on Vermont families, and State land use policies.

The 1995 findings broadly comparable to the 2006 and 2000 surveys include:

- Bike path use was highest in the Burlington-Centered region, and lowest in the Southwest Counties. This is consistent with findings in 2006.
- Bike lane use was highest in Burlington-Centered region, and lowest in the Northern Tier region. This is also consistent with 2006 survey results.
- In 1995, Vermont residents gave a fairly neutral response to the statement “the natural environment in Vermont has been deteriorating in recent years.” The average response was 6.2 on a 1 (strongly disagree) to 10 (strongly agree) point scale. In 2006 the average response to this statement decreased to 5.7, which is still in the neutral range.
- Fifty-four percent of respondents in 1995 agreed that “the government should seek to promote concentrated growth.” This sentiment is similar to results from the 2006 survey where 42 percent of Vermont residents said they agree that “VTTrans should take an active role in limiting development outside of villages that is sometimes called urban sprawl.”
- Despite the fact that 54 percent of 1995 survey respondents said the government should promote concentrated growth, 48 percent of 1995 respondents said that they would like to see the State develop in the *Current Growth Pattern*². In a relatively similar theme, in 2006, even though 42 percent of survey participants agreed that VTTrans should take an active role in limiting urban sprawl, the least desirable way of promoting that goal was to *concentrate on making transportation improvements in town centers rather than outlying areas* (30 percent of respondents).

² In 1995, the *Current Growth Pattern* was defined as, “Growth will be allowed in rural areas and along highways. However some significant resources, such as farmlands, wetlands, floodplains and steep slopes will continue to be protected. Emphasis on a transportation system which provides access and mobility; primarily by motor vehicle. Some resources will be used to expand current bus systems in urban areas. Current roads and rail lines would be maintained and expanded when necessary.”

4.0 SURVEY PARTICIPANT PROFILE

In addition to asking questions about travel behavior and public opinion, the survey also collected data on participant's transportation and demographic characteristics. The Study Team used this information to ensure the survey population has similar characteristics as compared with the wider population of Vermont residents. **Table 7** highlights transportation and demographic characteristics of the survey respondents.

Table 7. Demographic Characteristics of Survey Participants

Vermont Long Range Transportation Survey		Percent
Registered Vehicles (n=1,243)	None	3
	One	25
	Two	39
	Three	19
	Four or more	13
	Average # of vehicles	2.3
Miles driven by single vehicle (n=314)	1,500 or less	11
	1,501 to 5,000	11
	5,001 to 10,000	26
	10,001 to 12,000	10
	12,001 to 15,000	10
	15,001 to 25,000	12
	Over 25,000	12
	Average mileage	14,180
Mileage driven by multiple vehicles (n=878)	5,000 or less	8
	5,001 to 10,000	10
	10,001 to 15,000	13
	15,001 to 20,000	14
	20,001 to 30,000	17
	30,001 to 40,000	12
	Over 40,000	16
	Average mileage	26,607
Occupation (n=793)	Professional/Technical	27
	Clerical/Sales	19
	Managers/Officials/ Proprietors	16
	Service workers	11
	Other occupations	18
Present Home (n=1,243)	Own	77
	Rent	22

Vermont Long Range Transportation Survey		Percent
Length of residence present home (n=1,243)	1 year or less	14
	2 to 3 years	15
	4 to 5 years	11
	6 to 9 years	13
	10 to 14 years	12
	15 to 25 years	18
	More than 25 years	16
	Average No. of Years	13.8
Type of Household (n=1,243)	Single person	18
	Couple	21
	Family	55
	Other	4
Head of Household Arrangement	Both parents	60
	Single parent	19
	Other	19
Number of persons in household (n=1,243)	One	16
	Two	34
	Three	19
	Four	17
	Five or more	12
	Average No. of Persons	2.8
Household members 65+ (n=1,243)	None	75
	One	12
	Two or more	11
Household members 18-64 (n=1,021)	One	21
	Two	56
	Three	14
	Four or more	8
Children 17 or younger (n=674)	None	35
	One	27
	Two	26
	Three or more	13
Disabled persons with special transportation needs (n=1,243)	None	90
	One	6
	Two or more	2

Vermont Long Range Transportation Survey		Percent
How many work outside the home (n=1,243)	None	21
	One	27
	Two	36
	Three	9
	Four or more	6
	Average No. of Persons	1.5
Respondent works outside home	Yes	66
	No	32
How many are licensed drivers (n=1,243)	None	2
	One	23
	Two	51
	Three	14
	Four or more	8
	Average No. of Drivers	2.1
Respondent is licensed driver (n=1,243)	Yes	93
	No	5
Respondent Age Group (n=1,243)	18 to 24	12
	25 to 34	14
	35 to 44	18
	45 to 54	20
	55 to 64	15
	65 plus	16
	Refused	5
	Average Age	46.8
Live along ... (n=1,243)	State numbered road	15
	City or village street	26
	Paved town road	30
	Unpaved town road	26
Annual Household Income (n=1,243)	Under \$25,000	19
	\$25,000 to \$34,999	11
	\$35,000 to \$49,999	14
	\$50,000 to \$74,999	18
	\$75,000 or more	20
	Refused	18
	Average Income	\$55,390
Gender	Female	59
	Male	41

Appendix A Survey Questionnaire

Hello, my name is _____, from US Field Research and I'm calling on behalf of the Vermont Agency of Transportation. We are conducting a survey [today/tonight] about transportation in Vermont. May I please speak to the adult in your household who had the last birthday? (ONLY IF NECESSARY SAY...Our study requires that we interview an adult randomly selected from your household. May I please speak with the adult in your household who most recently had a birthday?) (ONLY IF NECESSARY SAY ... Your telephone number was chosen randomly from all of Vermont's phone numbers and your answers will remain strictly confidential.)

Refusal	1 Thank/Terminate
Speaking to correct respondent	2 Skip to Q#4
Transferring to correct respondent	3 Skip to Q#3
Correct respondent not available	4 Ask Q#1

1. What would the best day and time for me to call that person back?

Record day and time 1st callback _____
2nd callback _____
3^d callback _____

2. And what is that person's first name?

Record name for callback _____

Thank/Terminate

3. *(Upon transferring)* Hello, I'm calling on behalf the Vermont Agency of Transportation. We are conducting a survey today/tonight about statewide transportation in Vermont. (ONLY IF NECESSARY, SAY ... Your telephone number was chosen randomly from all of Vermont's phone numbers and you were randomly chosen to represent your household. Your answers will remain strictly confidential.)

Refusal	1 Thank/Terminate
Continue	2

4. In the past year, how many times have you personally used the following services...
(Randomize order of transportation types. **DK/refuse=999**)

- 4a. _____ Bike lanes or road shoulders?
- 4b. _____ Commercial air service (round trips)?
- 4c. _____ Special dedicated bus or van service for senior citizens and the disabled?
- 4d. _____ Ferry service across Lake Champlain?
- 4e. _____ Intercity bus lines, such as Greyhound or Vermont Transit?
- 4f. _____ Local public transit bus service?
- 4g. _____ Park and Ride lots?
- 4h. _____ Passenger train service, such as AMTRAK?
- 4i. _____ Taxi service?
- 4j. _____ Bike paths, trails or shared use paths?

5. Thinking about your travels either yesterday or on the most recent weekday, not weekend, about how many miles did you travel by passenger car, including automobiles, pick-up trucks, vans, minivans, motorcycles and sport utility vehicles? Please include all activities such as commuting, running errands, leisure travel, etc.

Record miles (DK/refused=999) _____

6. (If miles in Q#5=0 or 999, go to Q. 8, else ask:) Of these passenger car miles, how many of them were spent driving alone (only yourself in the vehicle)?

Record miles (DK/refused=999) _____

7. (If the mileage reported in Q#5 & Q#6 are equal, go to Q. 8, else ask:) So, for about [miles in Q#5-miles in Q#6] miles that you traveled by passenger car yesterday or on the most recent weekday, there was more than one person in the car?

Yes	1	
No	2	{re ask Q. 6}
Don't know/refuse	9	

8. Now, thinking back to an average day in the summertime, about how many miles did you travel by passenger car either alone or with others in the car?

Record miles (DK/refused=999) _____

9. (If Yesterday/weekday miles and summertime miles=0, skip to Q. 10, else ask:) In your opinion, what actions, circumstances or transportation alternatives might cause or encourage you to drive your car less? Any others? (Do not read responses. Multiple responses allowed)

- Nothing 0
- Better public transit 1
- Convenient (more convenient) van/carpools 2
- Economic hardship 3
- Retire/become unemployed 4
- Higher gasoline prices 5
- Park and Ride lots 6
- Better weather 7
- More bike paths/lanes and wider roadway shoulders 8
- Live closer to work 9
- Commuter trains 10
- More or better sidewalks 11
- Safer roadway crossings for pedestrians/bicyclists 12
- Public bicycle maps 13
- Activities/destinations closer to home 14
- Other 15
- Don't know/refused 16
- No others 17

Specify other: _____

10. Travel for work, shopping and other activities can often involve many other options besides making trips in personal automobiles. Thinking about all of the different travel that you did yesterday, including travel between the bus, car or stores, short trips over lunch or walking the dog, approximately how many MINUTES did you spend on each of the following activities? Read choices, if none enter zero.

- 10a. _____ Riding as a passenger in a car, truck or van?
- 10b. _____ Driving a car, truck or van?
- 10c. _____ Riding a bicycle?
- 10d. _____ Walking?
- 10e. _____ Inline skating/Rollerblading?
- 10f. _____ Riding on a bus?
- 10g. _____ Riding on a train?
- 10h. _____ Other travel modes?

11. How long has it been since you have made a trip of more than 75 miles one way from your home using any method of transportation? Has it been within the past year, more than one year to five years, more that five years or never?

- Within the past year 1
- More than 1 year to 5 years 2
- More than 5 years 3
- Never 8
- Don't know/refused 9

12. (If Q. 11 is within the past year ask:) How many times have you made a trip of more than 75 miles one way from your home in the past 12 months? Was it...

- ...1? 1
- ...2 to 3? 2
- ...4 to 6? 3
- ...6 to 12? 4
- ...13 to 24? 5
- ...More than 24? 6
- Don't know/refused 9

13. What was your primary mode of transportation on that trip? (IF MORE THAN ONE IN PAST YEAR ... What was your primary mode of transportation on that **last trip** of more than 75 miles from your home?) (Do not read responses, but prompt and clarify as necessary)

- Airplane 1
- Private vehicle 2
- Bus 3
- Rental car 4
- Train 5
- Some other method of transportation 6
- Don't know/refused 9

Specify other _____

14. Compared to a year ago, how often are you traveling more than 75 miles from your home? Is it more often, less often or the same?

- More often 1
- Less often 2
- The same 3
- Don't Know/Refused 9

15. Are you currently working outside of your home, either for wages or on a volunteer basis?

- Yes 1
- No 2 Skip to Q#19
- Don't know/refused 9 Skip to Q#19

16. (If Q. 15=Yes, ask:) What is your occupation?

Record occupation _____

In what Industry? _____

17. How do you usually travel to work? If you use more than one, what is your primary means of travel to work and what is your secondary means of transportation? *(Do not read responses, but prompt and clarify, as necessary)*

	<u>Prime</u>	<u>Second</u>
Drive alone	1	1
Drive with 1 or more other people in vehicle for at least part of the way	2	2
Passenger in a private vehicle	3	3
Walk	4	4
Bicycle	5	5
Public transit bus	6	6
Dedicated van service	7	7
Ferry	8	8
Taxi	9	9
Other (Specify below)	10	10
None	11	11
Don't know/Refused	99	99

Specify other _____

18. When you travel straight to your work destination, how many miles do you travel from your home to work?

Record miles to work (DK/refuse=999) _____

19. In the past six months have you experienced traffic congestion while traveling in Vermont?

Yes 1
No 2

20. Have you changed your behavior in any way in order to avoid traffic congestion at any locations in Vermont?

Yes 1
No 2
Don't know/refused 9

21. In what ways have you changed your behavior to avoid traffic? Any others? *(Do not read responses. Multiple responses allowed)*

- Changed route 1
- Avoid certain times 2
- Conduct business in alternative location 3
- Reduce trips by combining errands 4
- Cancel or postpone trip 5
- Use alternative transportation 6
- Use public transportation 7
- Walk 8
- Leave earlier or later 9
- Other 10
- Nothing 11
- Don't know 12
- Refused 13
- No others 14

Specify other _____

22. On a scale of 1 to 10, how would you say experiencing traffic congestion affects your overall quality-of-life, where a rating of "1" indicates that traffic congestion has NO NEGATIVE EFFECT and a "10" indicates that it has a STRONG NEGATIVE EFFECT on your quality-of-life. (one answer only). Record Don't know/refused as a 99.

No											Strong	
Negative											Negative	DK/ref
1	2	3	4	5	6	7	8	9		10	99	

23. Compared to a year ago, would you say that the traffic congestion you have experienced has improved, gotten worse or remained the same?

- Improved 1
- Gotten worse 2
- Remained the same 3
- Don't know 4

24. In your opinion, is traffic congestion in Vermont about the same for each of the seasons, or are some seasons worse than others?

- Same for each season 1
- Some seasons worse than others 2
- Don't know/refused 9

25. (If Q24=2, ask:) Which season is the worst in terms of traffic congestion? Is it... (read responses)

...Winter	1
...Spring	2
...Summer	3
...Fall	4
Don't know/refused	9

26. On a scale from 1 to 10, please rate the condition of Vermont highways compared to five years ago. On this scale a "1" indicates that the state highways are MUCH WORSE and "10" indicates that they are MUCH BETTER than five years ago.

Much Worse											Much Better
1	2	3	4	5	6	7	8	9	10		
Did not live in Vermont				98							
Don't know/refused				99							

27. And using the same 1 to 10 scale, please rate the overall condition of Vermont's highways compared to other states' highways you have experience with, where "1" indicates that Vermont highways are MUCH WORSE and "10" indicates they are MUCH BETTER than other states.

Much Worse											Much Better
1	2	3	4	5	6	7	8	9	10		
Do not have experience with other states				98							
Don't know/refused				99							

28. On this same 10-point scale, please rate the condition of sidewalks, trails, paths, shoulders and other facilities for walking and bicycling in Vermont compared to five years ago.

Much Worse											Much Better
1	2	3	4	5	6	7	8	9	10		
Do not live in Vermont				98							
Don't know/refused				99							

29. Please rate the overall condition of Vermont's non-motorized transportation system, such as sidewalks, trails, paths and shoulders compared to other states you have experience with.

Much Worse											Much Better
1	2	3	4	5	6	7	8	9		10	

Do not have experience with other states	98
Don't know/refused	99

30. On this ten-point scale how well is Vermont doing on winter highway maintenance such as removing snow and ice compared to other states you have experience with?

Much Worse											Much Better
1	2	3	4	5	6	7	8	9		10	

Do not have experience with other states	98
Don't know/refused	99

31. On a ten-point scale where a ten equals **excellent** and a one equals **very poor**, how would you rate the overall safety of Vermont's roadway system during the winter?

Very Poor											Excellent
1	2	3	4	5	6	7	8	9		10	

Do not live in Vermont	98
Don't know/refused	99

32. Last year, the Agency of Transportation spent about 55 percent of its available funds on paving and maintaining highways and repairing bridges. The agency also spent about 20 percent of its funds on new roadway projects, and the other 25 percent of its funds on non-highway programs, like public transit and airports. If it were up to you, would continue to you use the same allocation?

Yes	1
No	2
Don't know/refused	9

33. Do you think the agency should spend **more** or **less** than 55 percent of its available funds on paving and maintaining highways and repairing bridges?

More than 55 percent	1
Less than 55 percent	2
Keep at 55 percent	3
Don't know/refused	9

34. Do you think the agency should spend **more** or **less** than 20 percent of its available funds on new roadway projects?

More than 20 percent	1
Less than 20 percent	2
Keep at 20 percent	3
Don't know/refused	9

35. Do you think the agency should spend **more** or **less** than 25 percent of its available funds on non-highway programs, like public transit, airports and rail?

More than 25 percent	1
Less than 25 percent	2
Keep at 25 percent	3
Don't know/refused	9

I am going to read you a list eight issues that are considered important when thinking about the state's transportation system. With the understanding that all issues must be given some attention, please tell me which ones you think are the **three most important** issues. The eight issues are ... **(Randomize order of the issues presented to respondents. Repeat remaining options for Q#37 and #38):**

- Preserving landscapes and village character
- Cost to taxpayers
- Economic development
- Environmental protection
- Delivery of goods
- Tourism
- Safety and security
- Consistency with planned growth

36. Which **ONE** of these do you consider to be the **most** important issue? (Record below)

37. Which of these do you consider to be the **second** most important issue?

38. Which of these do you consider to be the **third** most important issue?

Issues	Most Important	Second	Third
Preserving landscapes and village character	1	1	1
Cost to taxpayers	2	2	2
Economic development	3	3	3
Environmental protection	4	4	4
Delivery of goods	5	5	5
Tourism	6	6	6
Safety and security	7	7	7
Consistency with planned growth	8	8	8
Don't know/Refused	9	9	9

39. Now, I am going to read you a list of fourteen state transportation issues in no particular order. For each one, please tell me whether you think it should receive a greater share of the state transportation budget, receive about the same share, or receive a lesser share of the state transportation budget as now. Please keep in mind that if you think there should be increases in all or most of the areas, it could mean increased spending. (ONLY IF NECESSARY, SAY ... Please answer based upon what you know about Vermont's current transportation system.) Okay, here's the first one. Should a greater share, lesser share or the same share of the state transportation budget be allocated to ...? (Read list and randomize order of transportation issues. Repeat choice options only if requested by respondent.)

Transportation Issues	Greater Share	Lesser Share	Same Share	Don't Know/ Refused
Preserving landscapes and village character	1	2	3	9
Air quality	1	2	3	9
Bicycle and pedestrian paths	1	2	3	9
Bridge repair and replacement	1	2	3	9
Enforcement of traffic laws	1	2	3	9
Increased mobility – making it easier to get around the state	1	2	3	9
New road construction	1	2	3	9
Projects to relive traffic congestion	1	2	3	9
Public transportation such as buses or trains	1	2	3	9
Safety and security	1	2	3	9
Summer highway road repair and re-paving	1	2	3	9
Winter snow and ice removal	1	2	3	9
Projects to promote economic development	1	2	3	9
Projects to promote planned growth	1	2	3	9

40. Next, I am going to read you two statements about Vermont. For each one, please tell me how strongly you agree or disagree. You will be using a 10-point scale, where “1 means you COMPLETELY DISAGREE, and “10” means you COMPLETELY AGREE , please tell me your opinion of the following statements.

Completely Disagree									Completely Agree	DK/ref	
40a. The natural environment in Vermont has been deteriorating in recent years.	1	2	3	4	5	6	7	8	9	10	99
40b. The Vermont Agency of Transportation should take an active role in limiting development outside of villages that is sometimes called urban sprawl.	1	2	3	4	5	6	7	8	9	10	99

41. (If Q.40b < 7, go to Q. 42, else ask:) A number of proposals have been made about how the Agency of Transportation should help limit sprawl. Which **one** of the following four actions do you think the Agency should concentrate on the **most**? (Randomize order presented to respondent)
- Invest more in public transit and rail systems
 - Invest in pedestrian-friendly facilities, bike paths, and sidewalks
 - Concentrate on maintaining existing roadways, rather than building new ones
 - Concentrate on making transportation improvements in town centers, rather than in outlying areas
42. Which **one** of the four actions do you think is the **least desirable**? (Re-read remaining items on the list)

Transportation proposals	Q#41. Concentrate on most	Q#42. Least desirable
Invest more in public transit and rail systems	1	1
Invest in pedestrian-friendly facilities, bike paths, and sidewalks	2	2
Concentrate on maintaining existing roadways, rather than building new ones	3	3
Concentrate on making transportation improvements in town centers, rather than in outlying areas	4	4
None of these actions	5	5
Don't know/Refused	6	6

43. I have just a few final questions for classification purposes. How many registered vehicles (passenger cars, pick-up trucks, sport utility vehicles, vans/minivans, and motorcycles) do you have in your household?

Record number of vehicles _____

44. (If Q.43=1, ask:) How many miles is that vehicle driven per year? (If Q.42=2+, ask:) About how many miles per year in total are all those vehicles driven?

Record miles on all vehicle(s) (DK/refused=99999) _____

45. Do you or the members of your household own or rent your present home?

Own	1
Rent	2
Don't Know/Refused	9

46. How long have you lived in your present home?

Enter years (less than 1 year=0; DK/refused=99) _____

47. Would you classify your household as a... (Read responses)

- Single person household 1
- Couple household 2
- Family household 3
- Roommate household 4
- Other 5
- Don't know/Refused 9

Specify other _____

48. Is this household headed by both parents, a single parent or other arrangement?

- Both parents 1
- Single parent 2
- Other 3
- Don't Know/Refused 9

49. How many persons live in your household?

Record number in household (DK/refused=9) _____

50. How many household members are 65 years old or older?

Record number in household (DK/refused=9) _____

51. (If Q.49=Q.50, go to Q.53, else ask) How many household members are 18 to 64 years old?

Record number in household (DK/refused=9) _____

52. (If Q.50+Q.51=Q.49, go to Q.53, else ask) How many children aged 17 years of age and younger are there in your household?

Record number in household (DK/refused=9) _____

(If Q.50-52 =Q.49, continue; If not equal, re-confirm household size and age ranges.)

53. How many disabled persons with special transportation needs do you have in your household?

Record number in household (DK/refused=9) _____

54. (If 53=1 or more, ask::) Are you a disabled person with special transportation needs?

Yes	1
No	2
Don't know/Refused	9

55. How many people in your household work outside the home?

Record number in household (DK/refused=9) _____

56. Do you work outside the home?

Yes	1
No	2
Don't know/Refused	9

57. How many people in your household are licensed drivers?

Record number in household (DK/refused=9) _____

58. Are you a licensed driver?

Yes	1
No	2
Don't know/Refused	9

59. In what year were you born?

Year (DK/refused=9999) _____

60. Do you live along ... (read responses)

A state numbered road (Route 7, 100, 2, etc.)?	1
A city or village street (Main Street, etc.)?	2
Paved town road?	3
Unpaved town road?	4
Don't Know/Refused	9

61. Which one of the following categories best describes your total annual household income before taxes? Just stop me when I read the right one. Is it ... (read responses)

Less than \$15,000	1
\$15,000 to \$24,999	2
\$25,000 to \$34,999	3
\$35,000 to \$49,999	4
\$50,000 to \$74,999	5
\$75,000 to \$99,999	6
\$100,000 or more	7

Don't Know/Refused 9

62. What is your five digit zip code? *(If asked, zip code of the home—not mailing address)*

Record zip code (DK/refused=99999) _____

63. Finally, I just need to confirm your name and address. *Record respondent name and address. Interviewer add phone number*

Name _____

Address 1 _____

Address 2 _____

City _____

Phone Number _____

64. *Thank and terminate. (Record gender without asking)*

Female 1

Male 2

Unsure 9