

Vermont Agency of Transportation

Vermont Pedestrian and Bicycle Policy Plan

Submitted by:
WILBUR SMITH ASSOCIATES

in association with
Toole Design Group

January 17, 2008



ACKNOWLEDGEMENTS

Vermont Pedestrian and Bicycle Policy Plan Study Advisory Committee

Lou Bresee, Lake Champlain Bikeways
Linda Henzel, Vermont Department of Forests, Parks and Recreation
Nelson Hoffman, Federal Highway Administration
Peter Keating, Chittenden County Metropolitan Planning Organization
Rick Kehne, Addison County Regional Planning Commission
Suzanne Kelley, Vermont Department of Health
Becka Roof & Nancy Schulz, Vermont Bicycle and Pedestrian Coalition
Kevin Russell, Vermont Trails and Greenways Council
Susan Schreiber, Rutland Regional Planning Commission
Chuck Wise, Two Rivers-Ottawaquechee Regional Commission
Deb Lisi-Baker, Vermont Center for Independent Living

Vermont Agency of Transportation Executive Staff

Neale Lunderville & Dawn Terrill, Secretary of Transportation
David Dill, Deputy Secretary of Transportation
Mel Adams, Director of Policy & Planning
Tom Daniel, Director of Finance and Administration
John Dunleavy, Assistant Attorney General
Sam Lewis, Director of Operations
Bonnie Rutledge, Commissioner of Motor Vehicles
Richard Tetreault, Director of Program Development
John Zicconi & Ian Grossman, Director of Communications

VTrans Working Group

Scott Bascom, Project Manager, Policy & Planning Division
Amy Bell, Bicycle and Pedestrian Coordinator
Jon Kaplan, Safe Routes to School Coordinator

Advisory Panel

Ed Barsotti, League of Illinois Bicyclists
Andy Clarke, League of American Bicyclists
Bill Feldman, RBA
Roger Geller, City of Portland, Oregon
Martin Guttenplan, Florida Department of Transportation
Michael Ronkin, Oregon Department of Transportation

Information on Existing Conditions & Data

Bernard Bryne, Vermont Agency of Transportation
Al Neveau, Vermont Agency of Transportation
Chapin Spencer, Local Motion
Mary Spicer, Vermont Agency of Transportation
Jim Sullivan, Bennington County Regional Commission
Jim Tasse, Rutland Area Physical Activity Coalition

Consultant Team

Jim Donovan, FASLA, Wilbur Smith Associates
Carol Levine, Wilbur Smith Associates
Jennifer Toole, ASLA Toole Design Group
Robert Schneider, Toole Design Group

Thanks to the many Vermont citizens who participated in the public meetings that helped shape this plan.

TABLE OF CONTENTS

	<u>PAGE</u>
EXECUTIVE SUMMARY	ES-1
Chapter 1 INTRODUCTION	1
Chapter 2 BICYCLE AND PEDESTRIAN VISION, GOALS AND OBJECTIVES	3
Chapter 3 CURRENT STATUS OF PEDESTRIAN AND BICYCLE ACTIVITIES IN VERMONT	7
Chapter 4 IMPLEMENTATION PLAN	13
Chapter 5 VERMONT PEDESTRIAN AND BICYCLE PERFORMANCE MEASURES	23
APPENDICES	
Appendix 1 POLICY PLAN DEVELOPMENT PROCESS & PUBLIC INVOLVEMENT	37
Appendix 2 EXISTING BICYCLE AND PEDESTRIAN FACILITY GEOGRAPHICAL INFORMATION SYSTEM (GIS) DATA	47
Appendix 3 BACKGROUND FOR PERFORMANCE MEASURES	57

Note: Additional background information prepared during the developed of this policy plan is available in the form of Technical Memorandums on line at:
<http://www.aot.state.vt.us/planning/PBPP.htm>

Available Memorandums include

#1 State DOT Bicycle and Pedestrian Policies

#2 Existing Conditions: Facilities, Goals, Policies, & Management

#2B Existing Conditions: Data Collection and Classification

#3 Pedestrian and Bicycle Performance Measures

#4 Pedestrian and Bicycle Vision, Goals, Objectives & Policies

#5 Implementation Plan

EXECUTIVE SUMMARY

Introduction

The Vermont Pedestrian and Bicycle Policy Plan (Policy Plan) highlights the current status of bicycling and walking in the State of Vermont and provides a vision and direction on how it will proceed into the future. This five year Policy Plan has been developed by the Vermont Agency of Transportation (VTTrans) and outlines its policy, goals, objectives, actions and performance measures as they relate to bicycle and pedestrian facilities and programs.

The integration of the policies into all VTTrans projects and programs is the responsibility of every VTTrans employee. Even so, much of the specialized aspects of this policy plan will be implemented by the VTTrans Bicycle and Pedestrian Program (VBPP), established by VTTrans to address specific issues associated with bicycle and pedestrian transportation.

It is recognized that VTTrans' primary mission is to preserve the overall transportation system in Vermont, yet it must also balance the needs of individual modes of that system. VTTrans jurisdiction extends only to a small proportion of the total roadway mileage in Vermont (19.2% or 2,708 miles). In order to create an interconnected, well maintained, integrated bicycle and pedestrian system that works for all users, additional actions are necessary from numerous other agencies and organizations beyond VTTrans. Consequently, this Policy Plan can be used equally well by regional planning commissions, other State Agencies, municipalities and private businesses. This is particularly important because roadways throughout the State are owned and managed by both State and local agencies, however all of these roadways provide direct connections between destinations for pedestrians and bicyclists. This Plan therefore includes several recommended actions for regional planning commissions, municipalities, advocacy groups and others.

Vision, Goals, Objectives, and Policy

Vision:

The State of Vermont's Bicycle and Pedestrian Vision Statement reads:

The State of Vermont has safe, well used, convenient and accessible conditions for bicyclists and pedestrians of all ages and abilities. Bicycle, pedestrian and roadway networks provide mobility throughout the State and links with other transportation modes, while complementing Vermont's natural environment, community character, and overall quality of life.

Goals:

There are six basic goals or reasons for enhancing Vermont's pedestrian and bicycle system (order does not indicate importance or priority):

- **Cultural Environment.** Enhance the human scale and livability of Vermont's communities by improving opportunities for pedestrian and bicycle mobility and access in and between towns, downtowns, villages and rural landscapes.

- **Economic Vitality.** Enhance the economic vitality of Vermont by increasing economic development opportunities (e.g., create small businesses catering to pedestrian and bicycle needs, making commercial districts more attractive and accessible), providing greater transportation efficiency and choice, improving tourism activities, reducing health costs, and limiting the overall demand on the transportation infrastructure that would result from better pedestrian and bicycle transportation options.
- **Health.** Improve the health of Vermonters and reduce health care costs by making it easier, safer and more convenient for citizens to be more physically active by walking and bicycling on a regular basis.
- **Natural Environment.** Improve air quality, reduce greenhouse gas emissions which contribute to climate change, increase energy conservation and reduce vehicle miles traveled per capita by increasing the number of trips made by pedestrians and bicyclists.
- **Safety.** Improve the safety of pedestrian and bicycle travel throughout the entire roadway network, and the accessibility of accessible pedestrian facilities, shared use path, and rail-trail network in Vermont through education and physical improvements.
- **Transportation Choice.** Enhance pedestrian and bicycle transportation options in Vermont so that citizens, regardless of location socioeconomic status, or health can choose a seamless, convenient and comfortable mode that meets their needs. Promote a transportation network, including roadways, shared use paths, rail trails, rails with trails, and accessible pedestrian facilities, that allow pedestrians and bicyclists to reach their destinations throughout the State or to connect to other modes of travel.

Objectives:

The objectives provide a framework for the specific actions to be undertaken by a wide range of agencies, entities, or organizations to achieve each of the six goals. The Vermont pedestrian and bicycle objectives are listed below in no particular order of importance.

Objective 1. As appropriate and feasible, incorporate pedestrian and bicycle transportation needs in VTrans-funded projects and programs.

Objective 2. Build and maintain the ability and expertise within all VTrans Divisions to address pedestrian and bicycle needs and issues.

Objective 3. Provide pedestrian and bicycle planning, technical, educational, and financial assistance to local governments, regional planning organizations, and other State agencies.

Objective 4. Fund planning, design, construction and maintenance of pedestrian and bicycle projects and programs at an adequate level.

Objective 5. Maintain on- and off-road pedestrian and bicycle facilities in good operating condition for their expected use.

Objective 6. Educate motorists, pedestrians, and bicyclists regarding their shared responsibility to obey the law and engage in safe operating behavior.

Objective 7. Encourage more Vermonters to walk and bicycle through programs and promotions.

Objective 8. Work with citizens, municipalities, regional planning organizations, and other State agencies to develop, plan, and implement pedestrian and bicycle plans, projects, and programs.

Objective 9. Develop and apply measures to track progress toward implementing this Plan.

Objective 10. Assess the economic benefits (e.g., small business and community development, transportation efficiency and choice, tourism, and health) and the environmental and cultural benefits (e.g., clean air, clean water, energy efficiency and enhanced community character) of walking and bicycling in Vermont.

Objective 11. Promote land use and development principles throughout Vermont that make pedestrian and bicycle travel more convenient.

Objective 12. Provide a seamless transportation network for pedestrians and bicyclists by improving linkages between walking, bicycling and other modes of transportation

Policy Statement:

The main focus of the Vermont Pedestrian and Bicycle Policy Plan is to provide direction within VTrans through the following policy.

At each stage of planning, design, construction, implementation, operations and maintenance activities, VTrans-funded projects and programs shall reasonably include pedestrians and bicyclists. New projects, reconstruction projects and other transportation facility improvements will maintain or where feasible improve existing access and conditions for pedestrians and bicyclists to meet applicable Vermont standards. Education and encouragement programs will incorporate pedestrian and bicycle issues, as appropriate.

Actions

To implement the policies, and meet the goals and objectives in this Policy Plan, a variety of players must work together cooperatively to continue current or undertake new actions and initiatives. This list includes current and strategic or long term new actions for VTrans as a whole and the VBPP specifically, as well as for Regional Planning Commissions (RPC), the Chittenden County Metropolitan Planning Organization (MPO), and other agencies, individuals or organizations.

Current Actions

VTrans Current Actions:

CVT.1. Incorporate appropriate bicycle and pedestrian facilities into VTrans projects, programs and actions.

CVT.2. Fully implement current provisions of the VTrans Project Development Process that incorporate consideration of bicycle and pedestrian needs.

CVT.3. Continue to incorporate maintenance of State-owned pedestrian and bicycle facilities into routine maintenance activities.

CVT.4. Continue to share project plans for upcoming transportation projects with the RPCs/MPO.

CVT.5. Continue coordination efforts with other State and federal agencies and other groups.

CVT.6. Maintain the VTrans design manuals, design details, standard drawings to include the most recent non-motorized transportation facility design treatments.

CVT.7. Update the Americans with Disabilities Act (ADA) Transition Plan completed in May 1995.

CVT.8. Analyze the locations of police-reported pedestrian and bicycle crashes.

CVT.9 Consider staffing needs of the VBPP necessary to accomplish the current and strategic actions contained in this Policy Plan.

CVT.10 Include bicycle, pedestrian and transit considerations, as appropriate, in the scope of VTrans traffic impact study reviews.

CVT.11 Educate motorists, pedestrians, and bicyclists regarding their shared responsibility to obey traffic laws and engage in safe operating behavior.

VBPP Current Actions

CBP.1. Maintain the current involvement with VTrans projects beyond the scoping phase.

CBP.2. Continue to support the Safe Routes to School programs throughout Vermont.

CBP.3. Offer non-motorized transportation training for VTrans staff, RPC, MPO, consultants and other individuals.

CBP.4. Continue to build relationships with transportation and non-transportation partners to promote walking and bicycling.

CBP.5. Sustain current programs to encourage walking and bicycling as a means of transportation. (RPCs/MPO, Advocacy Groups)

CBP.6. Continue to conduct research of innovative pedestrian and bicycle treatments. (UVM University Transportation Center)

CBP.7. Continue to use short-term advisory committees to assist with specific issues or projects. (Advocacy Groups)

RPCs/MPO Current Actions

- CRP.1. Continue to promote walking and bicycling as a viable means of transportation.
- CRP.2. Promote the incorporation of pedestrian and bicycle considerations into municipal plans.
- CRP.3. Undertake, expand and/or implement regional bicycle and pedestrian plans.
- CRP.4. Coordinate facility planning and development with adjacent communities and regions.
- CRP.5. Continue to aid municipalities, tourism, and economic development partners in designing and undertaking GIS mapping that can be used as bicycle/walking promotional materials.
- CRP.6. Promote appropriate land uses to make walking and bicycling viable mode choices. (Municipalities)

Current Actions by Others

- CO.1. Expand current relationships with non-transportation partners to promote walking and bicycling. (Advocacy Groups)
- CO.2. Continue to increase awareness of pedestrian and bicycle planning and design issues at the local level through outreach to municipalities. (Advocacy Groups)
- CO.3. Encourage and actively assist local communities to build and maintain local bicycle and pedestrian facilities and amenities in accordance with the Vermont Design Manual. (Advocacy Groups)
- CO.4. Maintain in good condition and expand as possible bicycle accommodation and ADA accessibility on and to transit facilities. (Transit Agencies, RPCs/MPO, municipalities, VT Ride Share)
- CO.5. Enforce traffic laws and ticket violations that affect pedestrians and bicyclists. (Law Enforcement Agencies)
- CO.6. Include pedestrian and bicycle facilities in municipal maintenance activities. (Municipalities)

Strategic Actions

Strategic Actions are new activities, practices or programs that should be initiated within the next five years.

VTrans Strategic Actions

- SVT.1. Monitor progress on non-motorized transportation policies as measured by established performance measures. (RPCs/MPO)

VBPP Strategic Actions

SBP.1. Facilitate the implementation of this Policy Plan by others

SBP.2. Assist the RPCs/MPO in incorporating language relating to bicycle and pedestrian needs for use in model development ordinances prepared by the RPCs and MPO and used by their local municipalities. (RPCs/MPO)

SBP.3. Incorporate more bicycle and pedestrian questions into the Vermont Behavioral Risk Factor Surveillance System Survey. (Dept. of Health)

SBP.4. Conduct a research study to determine the overall economic and environmental benefits of bicycling and walking on the State's economy. (VBPP, UVM, Other State Agencies)

RPC/MPO Strategic Actions

SRP.1. Designate RPC/MPO pedestrian and bicycle coordinators.

SRP.2. Encourage the use of existing and the formation of new municipal and regional citizen committees to provide input on bicycle and pedestrian activities on the local and regional level. (Municipalities, Advocacy Groups)

SRP.3. Assist Towns to integrate multi-modal transportation guidelines into local land use regulations and local and regional land use and transportation plans. (Municipalities)

Strategic Actions by Others

SO.1. Increase the coverage of pedestrian and bicycle transportation issues in colleges and universities courses in Vermont. (Advocacy Groups, UVM University Transportation Center, VBPP)

SO.2. Initiate outreach to colleges and universities to increase bicycling and walking and address bicycle and pedestrian safety on campuses. (Advocacy Groups, Campus Area Transportation Management Association)

SO.3. Evaluate the need to reallocate highway safety fund expenditures, as administered through the Governor's Highway Safety Program, to a level proportionate to the percentage of highway fatalities in Vermont that involve pedestrians and bicyclists. (Department of Public Safety)

SO.4. Encourage bicycling and walking commuting by providing bicycle and pedestrian information, facilities and amenities at businesses, retail areas, and other destinations across the State. (State, Regional and Municipal Governments or Groups and Private Employers)

SO.5. Build and maintain well-planned accessible pedestrian facilities fully integrated into commercial, urban, and village centers and support pedestrian linkages within village and downtown centers. (Municipalities, Public and Private Employers)

SO.6. Encourage the integration of bicycle and pedestrian issues into new or existing municipal citizen committees to promote bicycle and pedestrian activities on the local level. (Municipalities with assistance from Advocacy Groups)

SO.7. Incorporate bicycle and pedestrian access into school siting policies. (Department of Education, School Districts VBPP, RPCs, MUN)

SO.8. Consider upgrading municipal roads as possible to readily accommodate bicycles. (Municipalities)

SO.9. Conduct a research study to evaluate the best strategies and funding mechanisms for adequately maintaining the shared use trails in Vermont of regional significance. (Advocacy Groups/ANR)

Long Term Actions

The following long term actions are anticipated to be implemented more than five years into the future.

VTrans Long Term Actions

LVT.1. Program funding to implement accessibility improvements in priority locations based on the ADA Transition Plan.

LVT.2. Evaluate education curriculum, materials and tests for drivers' licenses for their effectiveness in providing bicycle and pedestrian education. (DMV and Dept. of Education)

LVT.3. Coordinate with organizations that have existing surveys to obtain statistically accurate bicycle and pedestrian travel survey data. (VTrans)

LVT.4. Establish a long-term pedestrian and bicycle facility inventory and counting program. (VTrans, RPC/MPO)

VBPP Long Term Actions

LBP.1. Expand the State non-school oriented pedestrian and bicycle safety education programs. (RPCs/MPO, Advocacy Groups)

LBP.2. Determine the value and viability of using a Bicycle Level of Service (BLOS), Bicyclist Compatibility Index (BCI) or other appropriate measurement to gauge roadway bicycle suitability in Vermont. (VTrans, RPC, and MPO)

LBP.3 Implement the results of LBP.2 as appropriate.

Long Term Actions by Others

LO.1. Explore other methods of collecting unreported bicycle and pedestrian crashes using hospital discharge records. (Department of Health, VTrans)

Pedestrian and Bicycle Performance Measures

This section presents the Vermont pedestrian and bicycle performance measures. These performance measures will help measure progress towards the goals of the Policy Plan. The order of the list in the table does not indicate importance or priority. These categories represent important performance outcomes for improving pedestrian and bicycle transportation in Vermont.

Table 5.1 Performance Categories and Performance Measures

Performance Category	Performance Measure	Timeframe for Establishing Measure
Usage	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.	Mid-Term
	2. Change in percent of all workers who commute to work by walking or bicycling.	Current
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.	Current
Safety	4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.	Mid-Term
Facilities	5. Miles of sidewalk on State-owned roadways.	Long-Term
	6. Miles of shared-use paths.	Long-Term
	7. Total number of VTrans funded bicycle and pedestrian projects and new facilities.	Current & <i>Strategic</i>
Training and Assistance	8. Total number of VTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training sessions on pedestrian and bicycle accommodation and design.	Mid-Term
Education and Encouragement	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.	Current & <i>Strategic</i>
	10. Number of schools and students participating in pedestrian or bicycle safety education programs or events. (e.g., Safe Routes to School, Bike Smart, etc.).	Mid-Term
Economic Benefits	<i>NO ON-GOING PERFORMANCE MEASURE</i>	Mid-Term: Action Item SBP4

Chapter 1

INTRODUCTION

The Vermont Pedestrian and Bicycle Policy Plan (Policy Plan) highlights the current status of bicycle and walking in the State of Vermont and provides a vision and direction on how it will proceed into the future. This five-year Policy Plan has been developed by the Vermont Agency of Transportation and outlines its policy, goals, objectives, actions and performance measures as they relate to bicycle and pedestrian facilities and programs. By its nature, this Policy Plan must be implemented by VTTrans as a whole.

The Policy Plan compliments the existing *Vermont Pedestrian and Bicycle Facility Planning and Design Manual (Design Manual)*. The Policy Plan highlights the State's policies relating to walking and bicycling in Vermont as modes of transportation, while the *Design Manual* provides the details about how to plan, design and construct bicycle and pedestrian facilities. This Policy Plan is also part of a series of policy plans developed by the Vermont Agency of Transportation (VTTrans) addressing rail, transit, air and roadway policies. Together these policy plans provide direction for VTTrans' daily work, as well as forming the basis of the Vermont's long Range Transportation Business Plan.

The integration of the policies into all VTTrans projects and programs is the responsibility of every VTTrans employee. Even so, much of the specialized aspects of this policy plan will be implemented by the VTTrans Bicycle and Pedestrian Program (VBPP). VTTrans established the VBPP in 1992 to address specific issues associated with bicycle and pedestrian transportation as was called for in Federal Regulation. The VBPP is currently staffed by the Bicycle and Pedestrian Coordinator and the Safe Routes to School Coordinator. Each of these is a federally mandated position. The VBPP occasionally includes temporary employees that undertake specific VBPP sponsored activities. The VBPP staff works within VTTrans to assist in the overall integration of pedestrian and bicycle concerns and issues into other VTTrans projects. They also work outside of VTTrans with the regional planning commissions and the Chittenden County Metropolitan Planning Organization, municipalities, pedestrian and bicycle advocate groups and the general public to advance the state of walking and bicycling in Vermont.

It is recognized that VTTrans' primary mission is to preserve the overall transportation system in Vermont, yet it must also balance the needs of individual modes of that system. VTTrans jurisdiction extends only to a small proportion of the total roadway mileage in Vermont (19.2% or 2,708 miles). In order to create an interconnected, well maintained, integrated bicycle and pedestrian system that works for all users, additional actions are necessary from numerous other agencies and organizations beyond VTTrans. Consequently, this Policy Plan can be used equally well by regional planning commissions, other State Agencies, municipalities and private businesses. This is particularly important because roadways throughout the State are owned and managed by both State and local agencies, however all of these roadways provide direct connections between destinations for pedestrians and bicyclists. This Plan therefore includes several recommended actions for regional planning commissions, municipalities, advocacy groups and others.

The findings of the recent Statewide Transportation survey conducted as part of the update of the State's Long Range Transportation Business Plan indicate the importance of bicycling and walking in Vermont. Among other things, the survey found that:

- Vermonters walk almost as much as they drive. When asked what transportation activities they spent time on the previous day, approximately 80 percent of survey respondents reported spending time driving and walking. The average time spent on these activities was 70.4 and 61.9 minutes respectively;
- About 40 percent of Vermont residents surveyed used bike paths, trails or shared use paths in the past year; of the 40 percent who had used these amenities, one in five had used them one or two times and a similar proportion used them three to five times; the average number of times Vermonters used bike paths, trails, and shared use paths was 37.6 times in the past year; and
- About 28 percent of Vermont residents had used bike lanes or road shoulders in the past year per, the June 2000 study, the last Statewide Transportation Survey VTTrans conducted, the proportion making use of bike lanes was just over 15 percent.

Additional data from the survey can be found in the Vermont Long Range Business Plan Survey Update Report, which is available on line at the VTTrans web site: aot.state.vt.us.

Just as walking and bicycling has increased, the accommodation of bicycling and walking in Vermont has also increased since the adoption of the State of Vermont's first Bicycle and Pedestrian Plan in 1998 (the 1998 Plan). This Policy Plan, however, is more than an update of the 1998 Plan. It now includes more concise information on goals and objectives, as well as performance measures to be used to measure progress towards implementing the goals and objectives. To clearly present and explain this information, this Policy Plan contains four chapters after this introduction:

- Chapter 1: Bicycle and Pedestrian Vision, Goals and Objectives, which describes what the State wants the status of bicycle and walking to be in the future
- Chapter 2: Current Status of Bicycle and Pedestrian Related Activities in Vermont, which describes existing conditions for walking and bicycling in Vermont today
- Chapter 3: Implementation Plan, which describes how the State hopes to move from the current status to the vision of the future
- Chapter 4: Performance Measures, which describes how the State will measure progress towards the vision and goals

Tables and Appendices supplement the information in these four additional chapters.

This Policy Plan was developed with extensive input from the Vermont Bicycle and Pedestrian Coordinator, the VTTrans Safe Routes to School Coordinator as well as others at VTTrans. A study advisory committee comprised of members of diverse interest groups also participated in the development of this Policy Plan. The public provided input during two rounds of meetings with at least three public work sessions around the State in each round. **Appendix 1** includes a more comprehensive discussion of the development process.

Chapter 2

BICYCLE AND PEDESTRIAN VISION, GOALS AND OBJECTIVES

2.1 OVERVIEW

VTrans established a vision statement and a set of goals for pedestrian and bicycle transportation in the 1998 Plan which was meant to serve as a general vision for all of Vermont, not just for VTrans. In 2002, VTrans developed a revised policy statement in the *Pedestrian and Bicycle Facility Planning and Design Manual*. The 2002 policy had a mix of vision statements, action recommendations and policy within the same text. The current Policy Plan consolidates and clarifies these previous efforts into a more succinct and organized framework. The new framework is as follows:

Vision Statement which defines the desired condition of bicycling and walking in Vermont after the goals, objectives, policies and actions have been accomplished. Accomplishing the vision will require the efforts of many different agencies, organizations and individuals throughout Vermont, and thus, this vision is meant to represent the vision of the many various partnering agencies, entities, municipalities, individuals and others that are interested in the future of bicycling and walking in Vermont.

Goals are broad statements that refine the vision into specific goals. These are also meant to represent the broad goals of the larger Vermont population beyond VTrans.

Objectives are broad, but begin to identify specific strategies for accomplishing the vision and goals. The responsibility for carrying out the goals and objectives falls upon many different agencies and organizations beyond VTrans.

Policies are specific ways that VTrans will incorporate pedestrian and bicycle transportation needs into projects and programs undertaken by the Agency. Unlike the vision, goals and objectives, the policies are specific to VTrans.

Actions are specific activities that will be undertaken not only VTrans but also by a variety of project partners in order to achieve the objectives. Actions typically have a specific timeframe and are usually assigned to a specific agency, organization, municipality, division or section.

Performance Measures provide a method of measuring how the actions are fostering progress towards reaching the goals and objectives of the plan. They can be used to measure progress at one specific point in time or can be used annually, biannually, or some other regular time format to provide ongoing information on what progress is being made. They typically require the establishment of some initial benchmark against which future changes can be viewed.

2.2 VISION AND GOALS

2.2.1 Vision Statement

The State of Vermont's Pedestrian and Bicycle Vision Statement reads:

The State of Vermont has safe, well used convenient and accessible conditions for bicyclists and pedestrians of all ages and abilities. Bicycle, pedestrian and roadway networks provide mobility throughout the State and links with other transportation modes, while complementing Vermont's natural environment, community character, and overall quality of life.

The proposed pedestrian and bicycle vision and goals will give VTTrans staff, municipalities, regional planning organizations, businesses, advocacy groups, and other citizens a clear message about the responsibility to accommodate pedestrians and bicyclists and the benefits of having a non-motorized transportation system in Vermont.

2.2.2 Goals

The goals of the Policy Plan are meant to provide guidance on pedestrian and bicycle issues beyond VTTrans. There are six basic reasons for enhancing Vermont's pedestrian and bicycle system (order does not indicate importance or priority):

- **Cultural Environment.** Enhance the human scale and livability of Vermont's communities by improving opportunities for pedestrian and bicycle mobility and access in and between towns, downtowns, villages and rural landscapes.
- **Economic Vitality.** Enhance the economic vitality of Vermont by increasing economic development opportunities (e.g., create small businesses catering to pedestrian and bicycle needs, making commercial districts more attractive and accessible), providing greater transportation efficiency and choice, improving tourism activities, reducing health costs, and limiting the overall demand on the transportation infrastructure that would result from better pedestrian and bicycle transportation options.
- **Health.** Improve the health of Vermonters and reduce health care costs by making it easier, safer and more convenient for citizens to be more physically active by walking and bicycling on a regular basis.
- **Natural Environment.** Improve air quality, reduce greenhouse gas emissions which contribute to climate change, increase energy conservation and reduce vehicle miles traveled per capita by increasing the number of trips made by pedestrians and bicyclists.
- **Safety.** Improve the safety of pedestrian and bicycle travel throughout the entire roadway network, and the accessibility of accessible pedestrian facilities, shared use path, and rail-trail network in Vermont through education and physical improvements.

- **Transportation Choice.** Enhance pedestrian and bicycle transportation options in Vermont so that citizens, regardless of location socioeconomic status, or health can choose a seamless, convenient and comfortable mode that meets their needs. Promote a transportation network, including roadways, shared use paths, rail trails, rails with trails, and accessible pedestrian facilities, that allow pedestrians and bicyclists to reach their destinations throughout the State or to connect to other modes of travel.

2.3 OBJECTIVES

The objectives provide a framework for the specific actions to be undertaken by a wide range of agencies, entities, or organizations to achieve each of the six goals. The Vermont pedestrian and bicycle objectives are listed below in no particular order of importance. Nor are they listed according to each of the six specific goals because each of them will contribute to all six goals.

Objective 1. As appropriate and feasible, incorporate pedestrian and bicycle transportation needs in VTrans-funded projects and programs.

Objective 2. Build and maintain the ability and expertise within all VTrans Divisions to address pedestrian and bicycle needs and issues.

Objective 3. Provide pedestrian and bicycle planning, technical, educational, and financial assistance to local governments, regional planning organizations and other State agencies.

Objective 4. Fund planning, design, construction and maintenance of pedestrian and bicycle projects and programs at an adequate level.

Objective 5. Maintain on- and off-road pedestrian and bicycle facilities in good operating condition for their expected use.

Objective 6. Educate motorists, pedestrians, and bicyclists regarding their shared responsibility to obey the law and engage in safe operating behavior.

Objective 7. Encourage more Vermonters to walk and bicycle through programs and promotions.

Objective 8. Work with citizens, municipalities, regional planning organizations and other State agencies to develop, plan, and implement pedestrian and bicycle plans, projects, and programs.

Objective 9. Develop and apply measures to track progress toward implementing this Plan.

Objective 10. Assess the economic benefits (e.g., small business and community development, transportation efficiency and choice, tourism, and health) and the environmental and cultural benefits (e.g., clean air, clean water, energy efficiency and enhanced community character) of walking and bicycling in Vermont.

Objective 11. Promote land use and development principles throughout Vermont that make pedestrian and bicycle travel more convenient.

Objective 12. Provide a seamless transportation network for pedestrians and bicyclists by improving linkages between walking, bicycling and other modes of transportation

2.4 PEDESTRIAN AND BICYCLE POLICY

2.4.1 The Policy Statement

The main focus of the new Vermont Pedestrian and Bicycle Policy is to provide direction within VTrans. While coordination with other State agencies, organizations, citizens, businesses, and others is critical for improving pedestrian and bicycle transportation in Vermont, the responsibilities of these supporting agencies is articulated elsewhere in this Policy Plan.

At each stage of planning, design, construction, implementation, operations and maintenance activities, VTrans-funded projects and programs shall reasonably include pedestrians and bicyclists. New projects, reconstruction projects and other transportation facility improvements will maintain or where feasible improve existing access and conditions for pedestrians and bicyclists to meet applicable Vermont standards. Education and encouragement programs will incorporate pedestrian and bicycle issues, as appropriate.

2.4.2 Applicability of the Bicycle and Pedestrian Policy to VTrans Activities and Programs

Project Development Process

The VTrans Pedestrian and Bicycle Policy applies to the entire project development process. Projects should address the need to accommodate bicycle and pedestrian transportation during all phases of project selection, project definition, project design, construction, and maintenance.

VTrans will work with local and regional planning organizations to identify the appropriate type of pedestrian and bicycle accommodations that will be provided for each project, taking into consideration community needs, safety, and unique environmental and aesthetic considerations as they relate to specific projects. Projects will be designed and constructed in accordance with Vermont's *State Standards for the Design of Transportation, Construction, Reconstruction, and Rehabilitation of Freeways, Roads, and Streets (1997)*, *Vermont Pedestrian and Bicycle Facility Planning and Design Manual* (most recent addition), as well as the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* and the *Manual on Uniform Traffic Control Devices (MUTCD)*. (Note: The *Vermont Pedestrian and Bicycle Facility Planning and Design Manual* take precedent over *AASHTO Guide for Development of Bicycle Facilities* in Vermont).

There is no one size fits all solution to accommodating bicyclists and pedestrians in projects. There are a wide variety of facility types and levels of safety accommodation, and tradeoffs that are necessary in constrained rights-of-way. Exploring the issues covered in the lists provided below will

help to further refine the level of accommodation to be provided for pedestrians and bicyclists during the project development process:

- Is the project identified in an adopted transportation or related plan as a means of increasing pedestrian and/or bicycling activity?
- Does the project purpose and need statement identify bicycle and pedestrian safety and accommodation as important project considerations?
- Does the project accommodate existing and/or future bicycle and pedestrian use?
- Does the project improve or maintain safety for all users?
- Does the project provide connections to public transportation services and facilities?
- Does the project serve areas or population groups with limited transportation options?
- Does the project provide a connection to bicycling and walking trip generators such as employment, education, retail, recreation, and residential centers and public facilities?
- Is the project identified in a Safe Routes to School program or does it provide a connection to a school?
- Does the project provide a regional connection or is of regional or State significance?
- Does the project provide a link to other bicycle and pedestrian accommodations?
- Does the project provide a connection to traverse natural or construction barriers?
- Does the project provide a tourism or economic development benefit?

Exceptions to the new policy statement above will only be granted if one or more of the following factors are present:

- Scarcity of existing or projected pedestrian activity, bicycle travel, population, and activity centers indicate an absence of need for such accommodations, although planning for future accommodations may still be appropriate;
- Adverse natural and cultural resource impacts of providing additional space for bicycling and/or walking facilities far outweigh the need for these accommodations;
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Per the 2000 FHWA Design Guidance "excessively disproportionate" is defined as exceeding twenty percent of the cost of the larger transportation project.
- The type of specific project does not facilitate the provision of such accommodations (e.g., riprap placement; bridge bolt replacement; etc.);
- Bicycle and pedestrian travel is prohibited by State or Federal laws.

Statewide and Regional Planning

Pedestrians and bicyclists will be included as a component in statewide and regional planning activities to an extent that is commensurate with the level of consideration given to other modes. Pedestrians and bicyclists will be considered on an equal basis with other modes in state, MPO, and RPC lists of future projects.

Corridor Level Planning

Pedestrian and bicycle circulation will be a component of corridor level plans, as specified in the *VTrans Vermont Corridor Management Handbook*. Corridor plans will establish a balance between meeting the needs of motorized users with the needs of pedestrians and bicyclists, particularly with

respect to providing space for bicyclists for on-road travel, buffers from traffic for pedestrians, and providing safer and efficient crossings where pedestrian exposure and crossing distances are minimized.

Access-controlled corridors can create barriers to bicycle and pedestrian travel. Bicycling and walking may be accommodated within or adjacent to access-controlled corridors through the provision of facilities on physically separated parallel facilities within the right-of-way or parallel roadways, railroad corridors, or greenways. Ensuring the ability to cross such corridors should be provided to establish or maintain connectivity of bicycle and pedestrian accommodations.

Planning, Permitting, and Project Definition

Bicycle and pedestrian accommodations will be included in the preparation and selection of project alternatives. VTrans will consider the current and anticipated future use of the affected facilities by bicyclists and pedestrians, the potential impacts of the alternatives on bicycle and pedestrian travel, and the proposed measures to preserve or enhance accommodation of pedestrian and bicycle travel during all phases of project development, including:

- Local Concerns meetings;
- Field visits, counts, and other primary data collection activities;
- Reviewing existing plans, gathering GIS and CAD data, and other secondary data collection activities;
- Preparation of Scoping Reports, traffic impact studies, project plans, environmental documents, and permit requests (CE, EIS, Act 250 permit, VTrans access permit); and
- 502 Hearings.

Design and Construction

The bicycle and pedestrian modes will be considered throughout the project design phase including development and review of preliminary through final plan drawings. In order to accommodate bicycle and pedestrian transportation in an effective and safe manner in a project, it is necessary for the designer to be familiar with current pedestrian and bicycle facilities as well as future pedestrian and bicycle attractors or generators that may lie outside the project limits. Maintenance of traffic flow in work zones must also address the continuance of bicycle and pedestrian traffic, per the *Manual on Uniform Traffic Control Devices (MUTCD)* and *Americans with Disabilities Act Accessibility Guidelines (ADAAG)*.

Strategic Improvements

VTrans will establish methods and procedures to facilitate bicycle and pedestrian access through strategic improvements, such as:

- Enhancing pedestrian crossings;
- Encouraging traffic calming in appropriate locations;
- Re-striping and/or removing travel lanes on existing roadways that have excess width or capacity to accommodate bike lanes or wider paved shoulders; or
- Improving traffic signals and signage to accommodate pedestrians and bicyclists.

Maintenance

Prior to or during the project development process of any accessible pedestrian facility or shared use path construction on or adjacent to a State highway right-of-way (including construction initiated either by VTrans or another entity), VTrans and the other entity will finalize an agreement that identifies the party (local municipality, other State agency besides VTrans, or private entity) that will be responsible for maintenance of the facility including (but not limited to) winter snow and ice removal when deemed appropriate by VTrans or the municipality.

Education and Outreach Programs

VTrans education and outreach programs will incorporate pedestrian and bicycle issues, as appropriate. Programs will educate pedestrians, bicyclists, and motorists about the rights and responsibilities of each group and how to travel safely in a multimodal environment. These programs will also encourage pedestrian and bicycle activity for people of all ages and abilities throughout Vermont. While most programs may be initiated in the Local Transportation Facilities section, programs from other divisions and departments, such as the Department of Motor Vehicles and the Governor's Highway Safety Program, should also offer education and encouragement related to pedestrian and bicycle transportation.

Chapter 3

CURRENT STATUS OF PEDESTRIAN AND BICYCLE ACTIVITIES IN VERMONT

3.1 OVERVIEW

To understand how Vermont will move towards the realization of its goals and objectives regarding bicycling and walking, it is important to understand the current status of bicycling and walking in Vermont. This Chapter provides an overview of those conditions. **Appendix 2** contains an overview of existing Geographic Information System (GIS) data currently available in Vermont.

Vermont's scenic pastoral landscapes and historic small towns have long attracted people who enjoy bicycling and walking. The State is known as a destination for hiking, bicycling and other outdoor activities. The relatively compact nature of Vermont's villages and cities has fostered the use of bicycle and walking as a means of transportation. The natural beauty and high quality of life in Vermont have also made it an attractive place to settle. Residential and commercial development is occurring more rapidly now than at any time in the recent past. This growth is creating higher volumes of motor vehicle traffic, and concerns are growing about bicycle and pedestrian safety throughout the State.

This chapter describes the current status of bicycling and walking in Vermont and the efforts on the part of State and local governments to improve bicycle and pedestrian safety and accommodation throughout Vermont.

3.2 EXISTING WALKING AND BICYCLING FACILITIES

In comparison to other small States, Vermont has an impressive track record of identifying and addressing bicycling and pedestrian issues. VTTrans has a national reputation as a leader in the field: it is among the few State DOT's that has conducted bicycle and pedestrian research, and is also among the few States that have published stand-alone bicycle and pedestrian design guidelines.

Part of the reason for this impressive track record is that Vermonters highly value their ability to bicycle and walk throughout all parts of the State. In fact, Vermonters are walking and bicycling more now than at any recent time in the past. The latest VTTrans transportation survey found that Vermonters spent, on average, over an hour a day, walking.

Bicycling and walking are also a key components of Vermont's tourism industry. Vermont is known throughout the world for its high quality outdoor recreation offerings, and hiking and bicycling are both popular activities for tourists. Vermont's Scenic Byways Program has estimated that over 11,000 people travel to Vermont annually to participate in bicycle touring activities.

Vermont has an extensive network of facilities that support walking and bicycling activities including 13,700+ miles of state and local roadways, over 50 miles of bike lanes, over 350 miles of signed bicycle routes, over 100 miles of shared use paths and rail trails; hundreds of miles of sidewalks and an extensive network of hiking and mountain biking trails.

Sidewalks are generally concentrated in villages, hamlets and downtown centers. In some communities, the older sidewalks are surfaced with marble or slate. Bicycle lanes are a comparatively new addition to the bicycle network in VT and are found primarily in Chittenden County and select downtown and urban centers throughout the state. The distribution of shared use paths around the State also varies, but in general, most of these are also found in the larger municipalities. By far, paved shoulders constitute the largest category of pedestrian and bicycle facility in the State. Paved shoulders are found on most State routes and town roads, although their suitability for walking and bicycling varies significantly.

There are also several long distance rail trails in the State that provide regional, off-road bicycle and walking opportunities. These are augmented by over 500 miles of hiking trails and an extensive network of mountain biking trails. In addition to the facilities that already exist, the State is actively working to support the development of additional bicycle and walking facilities, including shared use paths, rail trails, bicycle lanes, wider shoulders, accessible pedestrian facilities and trails.

While these facilities are known to exist, Statewide data that clearly and consistently shows the location and condition of each bicycle and pedestrian facility is not currently available. Part of the reason for this is that many different government agencies and municipalities are responsible for building and maintaining pedestrian and bicycle facilities in Vermont. Each of the regional planning commissions in Vermont, as well as the Chittenden County Metropolitan Planning Organization, maintain some form of bicycle and pedestrian data. The particular focus and level of detail of the data are variable, depending on the specific needs and emphasis in each region.

3.3 CURRENT MANAGEMENT OF PEDESTRIAN AND BICYCLE FACILITIES

The VTrans Bicycle and Pedestrian Program (VBPP) implements much of the day-to-day work outlined in the 1998 Plan. Organizationally, the VBPP is located in the Local Transportation Facilities (LTF) section of the VTrans Program Development Division. The LTF administers the Transportation Enhancements grant program and transportation projects done by local municipalities with VTrans funds. Since most bicycle and pedestrian facility projects are initiated by regional planning commissions (RPC), the Chittenden County Metropolitan Planning Organization (MPO), or by municipalities via LTF Programs, most of the VTrans activities relating to bicycle and pedestrian planning and construction projects are associated with the LTF staff. VTrans also incorporates consideration of bicycling and walking issues and needs into other VTrans programs including paving, roadway, structures, public transit and maintenance.

The day to day implementation of this Policy Plan will be directed by the Vermont Bicycle and Pedestrian Coordinator, who leads the VBPP. The Coordinator's activities in the past were primarily directed by the 1998 Plan and federal guidance; they now primarily will be directed by this

new Policy Plan, as well as ongoing federal guidance. The activities undertaken by the VBPP staff, which in addition to the Coordinator currently includes the Safe Routes to School Coordinator and a part time/temporary position, are diverse and varied and generally fall within seven program categories listed below. The percentages in the following list represent the approximate amount of staff time historically devoted to the particular activity.

1. Bicycle & Pedestrian Program Infrastructure Improvement Projects (5%)
2. Project Planning (15%)
3. Safety (15%)
4. Education and Outreach (15%)
5. Research (5%)
6. Design Support (20%)
7. Coordination with other Programs and Partners (25%)

The LTF section is within the VTrans Program Development Division, which brings the Policy Plan under the management of the VTrans Director of Program Development. As a general rule, the day-to-day management of the VBPP relies on the directives of the Policy Plan, Federal guidance, and LTF staff recommendations to direct the VTrans work related to bicycling and walking. The Secretary of Transportation also relies on the Policy Plan.

3.4 DATA COLLECTION

3.4.1 Roadway Data

The majority of the data collected by VTrans is vehicle based. VTrans collects a variety of data related to the condition and use of State highways and Class 1 and 2 Town Highway Major Collectors in Vermont. Some of the data is collected directly from the roadways while other data is collected from secondary sources, and includes, among other things:

- The number and types of vehicles using the road, including turning movement counts at selected intersections;
- Vehicle weights and speeds;
- Physical roadway surface and subsurface conditions;
- Drainage and shoulder conditions and structures (except small culverts);
- Bridge and pavement conditions;
- Railroad crossing conditions;
- Driveway types and locations;
- Vehicle crash data collected by enforcement agencies; and
- Changes to the roadway over time.

VTrans collects roadway data by a variety of means including digital video logs which are one form of data collection that also becomes a permanent record of roadway conditions. VTrans creates a new video log of all State highways every two years. VTrans also undertakes 600 automated vehicle (tube) counts per year at different locations around the State, in addition to 19 permanent weight-in-

motion counter locations. The count data is extrapolated to provide traffic volume data for portions of the highway system not specifically counted.

3.4.2 Bicycle and Pedestrian Data

In addition to roadway data, VTrans also collects video logs on a number of shared use paths around the State each year. It has begun to work with the RPCs and the MPO to gather bicycle and pedestrian counts on a select group of shared use paths and sidewalks. Because there are no accepted national or state standards of how and when to count bicycle and pedestrian traffic, VTrans is working with the RPCs and MPO to develop a common protocol so that the data from different locations around the State will be consistent and comparable.

3.4.3 Other Data

VTrans collects data on transit provisions and use from the transit operators around the State.

3.5 DATA CLASSIFICATION & MANAGEMENT

3.5.1 Data Cleansing

Due to the large amount of data VTrans gathers, the Agency must constantly check to make sure that data is accurate and internally consistent. This process is referred to as “Data Cleansing.” Using the identical name for a roadway, making sure that each data set uses the same mile marker referencing system, or coordinating the computer input procedures are examples of “Data Cleansing.” VTrans not only works to ensure consistency in newly gathered data, but is also reviewing older information to ensure its continued compatibility with newer information. These efforts make it easier to examine trends and changes in data over time, supporting efforts to create benchmarks and track performance measures.

3.5.2 Data Sources

Data consistency allows VTrans to make much of its data available internally to VTrans staff via a computer-based data warehouse. The data base, or data warehouse, is searchable by queries.

The data warehouse includes a sign inventory, listing and describing the numerous signs VTrans erects around the State. The warehouse also includes the results of the yearly traffic counts and extrapolations.

VTrans also records, stores and interprets roadway data on Route Logs which provide a diagrammatical plan focused on the center line of the roadway and organized by mile markers. Additional information shows much of the specific roadway data described in Section 3.3.1, referenced to the appropriate location of the roadway via the mile marker system.

Crash location is one of the data sets available through the Route Log. Summary crash reports are available on the VTrans web site. It provides information on the location, type and severity of

vehicle crashes on the roadway system. The data is also analyzed to provide information on which locations within the State roadway system have higher crash rates than would be expected based on the volume of traffic and other conditions of any particular roadway.

A third data management system, Maintenance Activity Tracking System (MATS), tracks and organizes all the VTTrans maintenance activities conducted by the Operations Division personnel. This information is quite detailed and includes such information as pothole repairs and litter pickup.

3.5.3 Data Gaps

VTTrans collects a good deal of data. According to one data manager, “VTTrans is awash in data!” Even so, it is not feasible to collect enough data to meet the many different needs of VTTrans, RPCs, the MPO, or municipal staff. This is particularly true of bicycling and walking data. Nationally, data collection methodologies, technology and analysis do not yet exist. Consequently, VTTrans is at the forefront of working to correct this limitation. The Bicycle and Pedestrian Program has recently begun working with the RPCs and MPO to initiate a bicycling and walking count program. This program will greatly expand the existing data on the number of bicyclists and pedestrians using bicycling and walking facilities in the State. As yearly counts accumulate, they will help to chart the effectiveness of the State’s programs to increase walking and bicycling.

VTTrans is also developing an inventory of sidewalks and crosswalks within State highway rights-of-way by examining the video logs. New VTTrans software also lets VTTrans staff measure the width of the sidewalks, as well as shoulders, travel lanes and the separation distances between the edge of pavement and the edge of adjacent sidewalks directly from the video logs. The ability is allowing VTTrans to initiate vital inventories of bicycling and walking facilities in State highway right-of-ways.

The consistency and detail of crash data is also improving, however it still typically only covers crashes involving motor vehicles that result in a \$1,000 in property damage, an injury or a fatality.

VTTrans is just beginning to correlate its data with data from other State agencies, such as tourist or economic data from the Agency of Commerce and Community Development or health data from the Agency of Human Services. The need for such correlation is understood, and VTTrans is increasing its efforts to encourage the coordination of related data from various State agencies.

3.6 FEDERAL BICYCLE AND PEDESTRIAN MANDATES

Federal policies and codes have an influence on State and local bicycle and pedestrian transportation decisions in Vermont. These federal policies and codes affect pedestrian and bicycle facilities, such as curb ramps and sidewalks, as well as pedestrian and bicycle programs, such as Safe Routes to School. These excerpts of federal code mandate the following actions in Vermont:

- "Bicyclists and pedestrians shall be given due consideration in the comprehensive transportation plans developed by each metropolitan planning organization and State....” (23 USC Section 217(g));

- "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction and transportation facilities, except where bicycle and pedestrian use are not permitted." (23 USC Section 217(g));
- "Transportation plans and projects shall provide due consideration for safety and contiguous routes for bicyclists and pedestrians." (23 USC Section 217(g)); and
- "In any case where a highway bridge deck is being replaced or rehabilitated with Federal financial participation, and bicyclists are permitted on facilities at or near each end of such bridge, and the safe accommodation of bicyclists can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations." (23 USC Section 217(e)).

Policy Guidance drafted by the Federal Highway Administration in response to directives in TEA-21 provides a clear directive on Federal Policies relating to bicycle and pedestrian accommodations:

“While [the TEA-21] sections stop short of requiring specific bicycle and pedestrian accommodation in every transportation project, Congress clearly intends for bicyclists and pedestrians to have safe, convenient access to the transportation system and sees every transportation improvement as an opportunity to enhance the safety and convenience of the two modes. "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities. In the planning, design, and operation of transportation facilities, bicyclists and pedestrians should be included as a matter of routine, and the decision to not accommodate them should be the exception rather than the rule. There must be exceptional circumstances for denying bicycle and pedestrian access either by prohibition or by designing highways that are incompatible with safe, convenient walking and bicycling.”

Chapter 4

IMPLEMENTATION PLAN

4.1 INTRODUCTION

This Chapter describes the actions that should be taken to achieve the vision and goals articulated in this Policy Plan. It presents current, strategic, and long term actions for the Vermont Agency of Transportation (VTrans), the Vermont Bicycle Pedestrian Program (VBPP), regional planning commissions (RPCs) and Chittenden County Metropolitan Planning Organization (MPO), and other stakeholders. Overall, this implementation plan is meant to provide direction yet allow flexibility in day to day operations within VTrans to take advantage of shifting opportunities, needs or demands.

This implementation plan is meant to advance the goals and objectives of this Policy Plan. Each of the actions relates to at least one, if not more, of the objectives outlined in Chapter 2. **Table 4.1** highlights this relationship.

4.2 ACTIONS

4.2.1 Overview

To implement the policies, and meet the goals and objectives in this Policy Plan, a variety of players must work together cooperatively to continue current or undertake new actions and initiatives. The recommendations listed in **Sections 4.3.2, 4.3.3, and 4.3.4** describe current or strategic new actions for VTrans as a whole and the VBPP specifically, as well as for RPCs, the MPO, and other agencies, individuals or organizations. Each action is listed under the agency or organization that is most responsible for its implementation. Each action also identifies potential partners who will assist with implementing the activity. In some cases, partner agencies and organizations are more apparent than others – it is acknowledged that the list of partners for any given activity may change over time as new opportunities arise and priorities shift within agencies and organizations in the State.

Current actions are those that are already being done and which should continue into the future. Some would continue as is, while a few should be modified to more closely align with the goals and objectives of this Policy Plan. In addition, there are new activities, practices or programs that should be undertaken in the next five years. The list of these actions, shown as strategic actions, also identifies the responsible party to implement the action. Long term recommendations are those that are anticipated to be implemented more than five years into the future.

The actions are identified with unique labels which convey basic information about the action, such as “CVT.2.” The first portion of the label indicates whether the action is current (C), strategic (S) or long term (L). The second part of the label identifies the responsible party as VTrans (VT), the Bicycle and Pedestrian Program (BP), the regional planning commissions or MPO (RP), or other organizations (O). The last part of the label indicates whether the action is the first, second, third,

or more in the particular set of actions being discussed, but does not indicate a ranking of importance.

4.3.2 Current Actions

VTrans Current Actions

CVT.1. Incorporate appropriate bicycle and pedestrian facilities into VTrans projects, programs and actions. Bicycle and pedestrian improvements and programs are an integral part of transportation projects; the responsibility for accommodating bicyclists and pedestrians should be shared among all divisions within VTrans. These accommodations are not solely the responsibility of the VBPP. All VTrans initiatives and actions should address non-motorized travel. This will include not only those sections of VTrans that initiate and implement roadway design/operations projects and maintenance, but will also include the research program, data collection activities, the Department of Motor Vehicles, the Rail Section, Public Transit Section, regional maintenance activities, and other programs. The process of integrating bicycle and pedestrian concerns into a wider array of VTrans projects and programs has already begun, and should continue in the future.

CVT.2. Fully implement current provisions of the VTrans Project Development Process that incorporate consideration of bicycle and pedestrian needs. The VTrans Project Development Manual contains numerous directives and references for including bicycle and pedestrian considerations into the development of VTrans projects. VTrans staff needs to be aware of this information and actively follow the existing recommendations in the Manual. The Bicycle and Pedestrian Coordinator and the Local Transportation Facilities Program Manager should continue to be members of the VTrans Project Definition Team (PDT) to reinforce the consideration of bicycle and pedestrian issues during the project development process.

CVT.3. Continue to incorporate maintenance of State-owned pedestrian and bicycle facilities into routine maintenance activities. Regular State facility maintenance should continue to include repairs and maintenance to shoulders and curb ramps, as well as repainting lane lines and crosswalks, replacement of signs, sweeping shoulders, and addressing other bicycle and pedestrian related maintenance or repairs.

CVT.4. Continue to share project plans for upcoming transportation projects with the RPCs/MPO. VTrans should continue to share its plans for upcoming transportation projects with the RPCs/MPO. To increase the awareness of the RPCs/MPO of this opportunity, VTrans should actively solicit input. Providing review opportunities to the RPCs at regular intervals can help localities and regions identify additional opportunities to include bicycle and pedestrian facilities more easily.

CVT.5. Continue coordination efforts with other State and federal agencies and other groups. Walking and bicycling are affected by actions of agencies other than VTrans. By coordinating activities with other State agencies and departments, such as the Department of Health, the Agency of Natural Resources, the Department of Housing and Community Affairs, Department of Tourism and Marketing and the Department of Education, VTrans can be both more effective and strategic in its actions.

CVT.6. Maintain the VTrans design manuals, design details, standard drawings to include the most recent non-motorized transportation facility design treatments. VTrans staff should continue to update VTrans standard drawings and design details as needed to ensure that they incorporate new features and concepts such as traffic calming or roundabouts and reflect up to date pedestrian and bicycle facility design details.

CVT.7. Update the Americans with Disabilities Act (ADA) Transition Plan completed in May 1995. VTrans should continue to inventory the accessibility needs in the public right-of-way for non-access limited roads in the State system and develop a program of prioritizing ADA retrofits. Some ADA improvements will continue to be made through the standard process of road reconstruction and/or repaving or via VTrans permitting of work in the State right-of-way by others.

CVT.8. Analyze the locations of police-reported pedestrian and bicycle crashes. VTrans should conduct an analysis of bicycle and pedestrian crash locations and characteristics to identify the most significant bicycle and pedestrian issues and/or locations and when applicable develop countermeasures to address crash cause.

CVT.9 Consider staffing needs of the VBPP necessary to accomplish the current and strategic actions contained in this Policy Plan. In light of the current activities of the VBPP, the new strategic actions identified in this Policy Plan, and the new federal law that *requires* a full time coordinator for the SRTS program, VTrans should ensure the staffing needs of the VBPP are adequate.

CVT.10 Include bicycle, pedestrian and transit considerations, as appropriate, in the scope of VTrans traffic impact study reviews.

CVT.11 Educate motorists, pedestrians, and bicyclists regarding their shared responsibility to obey traffic laws and engage in safe operating behavior. The Department of Motor Vehicles and the Department of Education currently do most of the driver education work in Vermont. Several private advocacy groups also provide bicyclist and pedestrian educational programs aimed at the school age population. These efforts should be expanded to include the non-school age population with guidance and advice from the VBPP.

VBPP Current Actions

CBP.1. Maintain the current involvement with VTrans projects beyond the scoping phase. VBPP staff is already involved in the development of many projects throughout the various VTrans Sections in addition to their involvement with VTrans Local Transportation Facilities (LTF) projects. They should continue this involvement to ensure adequate consideration of bicycle and pedestrian issues in each VTrans project; however the need for this involvement will lessen as VTrans' staff becomes proficient at incorporating bike/ped facilities into projects.

CBP.2. Continue to support the Safe Routes to School programs throughout Vermont. In addition to safety, the Safe Routes to School program has multiple emphases, including physical activity and health of children and improving air quality near schools. Support efforts should include continuing outreach to interested individuals and organizations to broaden the coalition of partners

implementing and advocating for Safe Routes to School activities. Opportunities should be sought to incorporate identified Safe Routes infrastructure needs into larger transportation projects.

CBP.3. Offer non-motorized transportation training for VTrans staff, RPC, MPO, consultants and other individuals. VBPP staff should continue to offer appropriate training sessions to VTrans staff, consultants, advocacy groups, and other interested individuals on pedestrian and bicycle design and planning to enable these professionals to develop their skills to better accommodate these modes. The need for the training sessions will be reduced over time as more VTrans staff and consultants become skilled in this area. The need for the training will never be eliminated, however, due to staff turnover and the need for education on updated planning and design concepts.

CBP.4. Continue to build relationships with transportation and non-transportation partners to promote walking and bicycling. The VBPP should continue its outreach to the Departments of Health, Education, Tourism and Marketing and Housing and Community Affairs, the Agency of Natural Resources, Hospitals, non-profit organizations, Vermont Ride Share, and businesses to increase awareness, funding, activities, and political support for walking and bicycling.

CBP.5. Sustain current programs to encourage walking and bicycling as a means of transportation. (RPCs/MPO, Advocacy Groups) The VBPP should continue its assistance to municipalities, RPCs and advocacy groups in organizing Bicycle/Walk to Work days and other alternate transportation promotions. It should also work with the Department of Health and other appropriate agencies, departments or groups to show how walking and bicycling for transportation can be beneficial in terms of cost, time, air quality, energy conservation, green house gas emissions, environmental impact and physical activity.

CBP.6. Continue to conduct research of innovative pedestrian and bicycle treatments. (UVM University Transportation Center) VTrans is one of the few state departments of transportation that has done pioneering research on new design treatments for pedestrians and bicyclists. VTrans should continue to test new facility design techniques and safety countermeasures for use in Vermont. VTrans should explore partnering with the new UVM Transportation Center for this activity.

CBP.7. Continue to use short-term advisory committees to assist with specific issues or projects. (Advocacy Groups) While a Citizen Pedestrian and Bicycle Committee can provide useful feedback to the VBPP, this type of committee is most effective when it is given specific tasks to address and ceases to exist when the task is complete.

RPCs/MPO Current Actions

CRP.1. Continue to promote walking and bicycling as a viable means of transportation. The RPCs and MPO, with assistance from the VBPP, should maintain their assistance to municipalities and advocacy groups to sponsor promotion programs for walking and bicycling and to initiate other activities or publications that show adults how walking and bicycling for transportation can be beneficial in terms of cost, time, and physical activity.

CRP.2. Promote the incorporation of pedestrian and bicycle considerations into municipal plans. With assistance from VBPP and Advocacy Groups, RPCs should continue to advise local communities to include sections on pedestrian and bicycle transportation in their comprehensive plans. RPCs should encourage pedestrian and bicycle issues to be addressed when they exercise their Act 200 local plan approval authority.

CRP.3. Undertake, expand and/or implement regional bicycle and pedestrian plans. Many RPCs have undertaken regional bicycle and pedestrian plans, but their scope and purpose vary. At a minimum, each RPC should undertake and then work towards implementation of a bicycle and pedestrian plan.

CRP.4. Coordinate facility planning and development with adjacent communities and regions.

CRP.5. Continue to aid municipalities, tourism, and economic development partners in designing and undertaking GIS mapping that can be used as bicycle/walking promotional materials.

CRP.6. Promote appropriate land uses to make walking and bicycling viable mode choices. (Municipalities)

Current Actions by Others

CO.1. Expand current relationships with non-transportation partners to promote walking and bicycling. (Advocacy Groups) Advocacy Groups have realized that they can increase their effectiveness by partnering with other advocacy groups, private businesses or government agencies in addition to VTtrans to increase awareness, funding, activities, and political support for walking and bicycling. These partnerships should continue and increase over time to maximize the value of their work.

CO.2. Continue to increase awareness of pedestrian and bicycle planning and design issues at the local level through outreach to municipalities. (Advocacy Groups) Many decisions that affect the pedestrian and bicycle environment in Vermont are made at the local level. Advocacy Groups and their members can assist the VBPP and RPCs/MPO in offering or coordinating pedestrian and bicycle information, training courses and other educational opportunities for local staff and decision makers. This can be through existing training offered by the VT League of Cities and Towns and the Secretary of State or special courses organized specifically for this purpose and/or the preparation of a document to educate local municipalities in bicycle and pedestrian needs, issues, benefits and design concepts.

CO.3. Encourage and actively assist local communities to build and maintain local bicycle and pedestrian facilities and amenities in accordance with the Vermont Design Manual. (Advocacy Groups) Local communities can make a significant contribution towards providing adequate pedestrian and bicycle facilities in Vermont by providing shared use paths, sidewalks, wide shoulders or bicycle lanes on their local facilities. Of equal importance, however, is the provision of amenities, such as bicycle racks, good signage, bicycle lockers, and crosswalks. Such amenities serve to greatly increase the incentives for using the facilities.

CO.4. Maintain in good condition and expand as possible bicycle accommodation and ADA accessibility on and to transit facilities. (Transit Agencies, RPCs/MPO, municipalities, VT Ride Share) The ability to easily link a bicycle ride to a transit ride can increase this type of transportation choice, each such trip potentially removes one private motor vehicle from the roadway. Bicycle racks on buses, bicycle lockers, bicycle racks and even showers at transit stops, or linkages to bicycle facilities are examples of such amenities that can increase the bicycle/transit link.

CO.5. Enforce traffic laws and ticket violations that affect pedestrians and bicyclists. (Law Enforcement Agencies)

CO.6. Include pedestrian and bicycle facilities in municipal maintenance activities. (Municipalities)

4.3.3 Strategic Actions

As used in this report, Strategic Actions are new activities, practices or programs that should be initiated within the next five years. Several strategic actions are presented for VTrans and specifically the VBPP. Section 4.3.5 contains additional strategic actions for other critical participants in the implementation of this Plan.

VTrans Strategic Actions

SVT.1. Monitor progress on non-motorized transportation policies as measured by established performance measures. (RPCs/MPO) VTrans should use the non-motorized transportation performance measures established through this Bicycle and Pedestrian Policy Plan to direct the collection of data. Data should be collected with input from VBPP staff by municipalities, RPCs, CCMPO, and VTrans to determine the progress toward this Policy Plan's goals through performance measures. VTrans staff should conduct outreach and training to ensure the quality of the data is consistent throughout the State.

VBPP Strategic Actions

SBP.1. Facilitate the implementation of this Policy Plan by others

SBP.2. Assist the RPCs/MPO in incorporating language relating to bicycle and pedestrian needs for use in model development ordinances prepared by the RPCs and MPO and used by their local municipalities. (RPCs/MPO) The VBPP should work with the RPCs/MPO and the League of Cities and Towns to prepare or update model ordinance that shows municipalities how pedestrian and bicycle accommodations can be incorporated into development requirements and the development review process. The wording should include information on what to consider when establishing specific thresholds for when bike and pedestrian facilities should be required.

SBP.3. Incorporate more bicycle and pedestrian questions into the Vermont Behavioral Risk Factor Surveillance System Survey. The VBPP should work with the Vermont Department of Health to include additional questions about obtaining physical activity by walking and bicycling. It

is recommended that separate questions be asked for walking and bicycling. The survey should also ask respondents to report the amount of time that they spend doing each activity. **(VBPP)**

SBP.4. Conduct a research study to determine the overall economic and environmental benefits of bicycling and walking on the State's economy. (VBPP, UVM, Other State Agencies) The VBPP should work with the Agency of Commerce and Community Development, the Vermont Department of Tourism and Marketing, and other appropriate partners to create an overall picture of the economic and environmental benefits of bicycle and pedestrian facilities and activities on Vermont. This study would be a onetime snap shot of the total economic and environmental benefit (direct, secondary, and spin-off benefits) of bicycle and pedestrian facilities and activities, including tourism, environmental, air quality and green house gas emissions, real estate, health, reduction in demand on the transportation systems, and other economic benefits.

RPC/MPO Strategic Actions

SRP.1. Designate RPC/MPO pedestrian and bicycle coordinators. To maximize the ability of RPCs and the MPO to promote bicycle and pedestrian agendas, they should each designate an individual to assume responsibility for coordinating the various bicycle and pedestrian programs and projects.

SRP.2. Encourage the use of existing and the formation of new municipal and regional citizen committees to provide input on bicycle and pedestrian activities on the local and regional level. (Municipalities, Advocacy Groups)

SRP.3. Assist Towns to integrate multi-modal transportation guidelines into local land use regulations and local and regional land use and transportation plans. (Municipalities) Pedestrian and bicycle transportation are more viable choices when the density and mix of development create shorter trips between where people live, work, shop and recreate. Land use and transportation decisions should be coordinated. To this end, the RPCs can develop regional plans that support multi-modal transportation choices at local and regional levels. The RPCs can use the model ordinances developed as part of S.3 and other information to help local municipalities integrate multi-modal transportation guidelines into local regulations and plans. The RPCs should also, through their review authority over local plans, encourage development to be planned in a way that supports multiple transportation choices.

Strategic Actions by Others

SO.1. Increase the coverage of pedestrian and bicycle transportation issues in colleges and universities courses in Vermont. (Advocacy Groups, UVM University Transportation Center, VBPP) Bicycle and pedestrian advocacy groups should work with professors of urban planning, engineering, parks and recreation, and other university programs in the State to ensure course work that includes non-motorized transportation issues.

SO.2. Initiate outreach to colleges and universities to increase bicycling and walking and address bicycle and pedestrian safety on campuses. (Advocacy Groups, Campus Area Transportation Management Association) Advocacy Groups should conduct outreach to

colleges and universities across the State to ensure a focus on pedestrian and bicycle safety issues in student orientation programs on campus.

SO.3. Evaluate the need to reallocate highway safety fund expenditures, as administered through the Governor's Highway Safety Program, to a level proportionate to the percentage of highway fatalities in Vermont that involve pedestrians and bicyclists. (Department of Public Safety) On average, Vermont spends less than 1% of highway safety funds annually on pedestrian and bicycle safety programs. However, between 2001 & 2005, 7.07% of all fatalities in Vermont were pedestrians and bicyclists. Because the safety of pedestrians and bicyclists is an important issue, the Department of Public Safety should evaluate the need to shift more highway safety 402 Program funding to help prevent pedestrian and bicycle injuries and fatalities.

SO.4. Encourage bicycling and walking commuting by providing bicycle and pedestrian information facilities and amenities at businesses, retail areas, and other destinations across the State. (State, Regional, and Municipal Governments or Groups and Private Employers)

SO.5. Build and maintain well-planned accessible pedestrian facilities fully integrated into commercial, urban, and village centers and support pedestrian linkages within village and downtown centers. (Municipalities, Public and Private Employers)

SO.6. Encourage the integration of bicycle and pedestrian issues into new or existing municipal citizen committees to promote bicycle and pedestrian activities on the local level. (Municipalities with assistance from Advocacy Groups)

SO.7. Incorporate bicycle and pedestrian access into school siting policies. (Department of Education, School Districts VBPP, RPCs, MUN) Work with the Department of Education, RPCs, municipalities, and school districts to consider bicycle and pedestrian access in the set of criteria that are used to select school sites. Building schools that are near growth centers can make it possible for more students to bicycle and walk to school. Use nationally available best practices as a model for how to accomplish this.

SO.8. Consider upgrading municipal roads as possible to readily accommodate bicycles. (Municipalities)

SO.9. Conduct a research study to evaluate the best strategies and funding mechanisms for adequately maintaining the shared use trails in Vermont of regional significance. (Advocacy Groups/ANR)

4.3.4 Long Term Actions

The following long term actions are anticipated to be implemented more than five years into the future. The groups that are partners for undertaking the action are listed in parenthesis at the end of the action.

VTrans Long Term Actions

LVT.1. Program funding to implement accessibility improvements in priority locations based on the ADA Transition Plan.

LVT.2. Evaluate education curriculum, materials and tests for drivers' licenses for their effectiveness in providing bicycle and pedestrian education. (DMV and Dept. of Education) VTrans drivers' education and testing materials currently contain information relating to bicycle and pedestrian awareness. The curriculum, materials and tests should be revised as appropriate to maximize their effectiveness.

LVT.3. Coordinate with organizations that have existing surveys to obtain statistically accurate bicycle and pedestrian travel survey data. (VTrans) VTrans should work with other State agencies and organizations to incorporate questions about non-motorized trips, which would help benchmark mode share data over time. Data from the surveys could show trip purpose, trip length, trip time, and other information about non-motorized trips. They could also be used to develop methods for estimating pedestrian and bicycle demand and estimate exposure for crash analyses.

LVT.4. Establish a long-term pedestrian and bicycle facility inventory and counting program. (VTrans, RPC/MPO) The VBPP should coordinate with RPCs and the MPO to develop consistent methodologies for collecting pedestrian and bicycle counts and inventorying non-motorized facilities including accessible pedestrian facilities, shared use paths, rail trails, rails with trails, bike lane, bike routes and other facilities at the State and regional levels. VTrans and the Vermont Center for Geographical Information should be responsible for compiling and storing the data from around the State in a consistent format and preparing reports about the counts and facility inventories. This data collection effort, including automated and manual counts, in combination with census data, the new Statewide travel survey, and records for crashes, would provide the basis for the VTrans pedestrian and bicycle performance measures.

VBPP Long Term Actions

LBP.1. Expand the State non-school oriented pedestrian and bicycle safety education programs. (RPCs/MPO, Advocacy Groups) The successful BikeSmart bike safety training program should be expanded to be usable in non-school situations and a pedestrian safety component should be added to the program. Safety education programs with pedestrian components have been developed in other states and should be co-opted. These programs should be oriented towards adult walkers and bicyclists.

LBP.2. Determine the value and viability of using a Bicycle Level of Service (BLOS), Bicyclist Compatibility Index (BCI) or other appropriate measurement to gauge roadway bicycle suitability in Vermont. (VTrans, RPC, and MPO) One of the most commonly heard comments at the public work sessions for the development of the Vermont Bicycle and Pedestrian Policy Plan was the need to provide more or better paved shoulders on Vermont roads. Many factors in addition to paved shoulder width impact the suitability of any particular roadway for bicycle and/or pedestrian travel. A study that addresses the public concern but also provides

meaningful data may be appropriate for consideration. The most likely possibilities are the use of the BLOS or BCI.

LBP.3 Implement the results of LBP.2 as appropriate.

Long Term Actions by Others

LO.1. Explore other methods of collecting unreported bicycle and pedestrian crashes using hospital discharge records. (Department of Health, VTrans)

Chapter 5

VERMONT PEDESTRIAN AND BICYCLE PERFORMANCE MEASURES

5.1 Overview

Pedestrian and bicycle performance measures will be part of the official multi-modal performance measures used by VTTrans to monitor the efficiency and effectiveness of its transportation projects and programs throughout the State. Regular monitoring and evaluation of these performance measures will help ensure that pedestrian and bicycle modes are included in the everyday operations of VTTrans. The pedestrian and bicycle performance measures will also help document improvements in pedestrian and bicycle use, safety, and convenience throughout Vermont, providing data that can be used to help VTTrans understand how well the various actions have been in improving bicycle and walking in Vermont.

The performance measures can also describe progress towards the stated goals to the Legislature and the general public. Two of the performance measures in particular have been identified as *strategic* performance measures. In this case, these strategic performance measures are those that can quickly and easily describe the overall progress being made and provide an easily understood overview of key elements of this Plan.

Appendix 3 provides additional information on how these performance measures were developed.

5.2 Pedestrian and Bicycle Performance Measures

This section presents the Vermont pedestrian and bicycle performance measures. These performance measures will help measure progress towards the goals of the Policy Plan. The data required for these performance measures will be collected by a variety of Sections within VTTrans. Some will require assistance from other state, regional and local government partners and other organizations. Various sections within the Policy and Planning Division, in collaboration with the VBPP will be responsible for compiling, analyzing, and reporting these performance measures.

5.2.1. Performance Categories and Associated Performance Measures

Table 5.1 lists the 9 pedestrian and bicycle performance measures according to six topical categories. The order of the list in the table does not indicate importance or priority. These categories represent important performance outcomes for improving pedestrian and bicycle transportation in Vermont. Section 5.2.2 provides more detail about the purpose, data requirements, and limitations of each performance measure. Section 5.2.4 shows how the proposed performance measures relate to the goals of the Policy Plan described in Section 2.2.2.

Note that it will take time and resources to develop methodologies and collect the necessary data for some of the performance measures. The final column of Table 5.1 identifies the time frame within

which it is most likely the performance measure can be established. Some of these performance measures are based on data that already exists or on similar performance measures that are currently in place and can be upgraded to provide the measures; they are called current performance measures. Other performance measures should be established within five years (mid-term), while a third group of performance measures should be established within a longer time frame of five years or more (long-term). Performance measures in the long-term category may require further study.

It is also recommended that a couple of special studies be conducted to help measure some of the longer-term outcomes of non-motorized transportation improvements. Some of the desired outcomes of the Policy Plan, such as economic and public health benefits require more detailed study than can be practically done on an annual or bi-annual basis. Actions SBP4 and LBP2 provide more details about these potential longer-term special studies.

Table 5.1 Performance Categories and Performance Measures

Performance Category	Performance Measure	Timeframe for Establishing Measure
Usage	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.	Mid-Term
	2. Change in percent of all workers who commute to work by walking or bicycling.	Current
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.	Current
Safety	4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.	Mid-Term
Facilities	5. Miles of sidewalk on State-owned roadways.	Long-Term
	6. Miles of shared-use paths.	Long-Term
	7. Total number of VTTrans funded bicycle and pedestrian projects and new facilities.	Current & <i>Strategic</i>
Training and Assistance	8. Total number of VTTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training sessions on pedestrian and bicycle accommodation and design.	Mid-Term
Education and Encouragement	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.	Current & <i>Strategic</i>
	10. Number of schools and students participating in pedestrian or bicycle safety education programs or events. (e.g., Safe Routes to School, Bike Smart, etc.).	Mid-Term
Economic Benefits	<i>NO ON-GOING PERFORMANCE MEASURE</i>	Mid-Term: Action Item SBP4

5.2.2 Purpose of Performance Measures

The overall objective of collecting data and evaluating performance measures is to gauge progress toward improving conditions for pedestrians and bicyclists in Vermont. In other words, is VTTrans achieving its vision of safe, convenient and accessible conditions for bicyclists and pedestrians of all ages and abilities? Do bicycle, pedestrian and roadway networks provide mobility and links with other transportation modes, while complementing Vermont's natural environment, community

character, and overall quality of life? The recommended performance measures in the section below can be used to answer these questions.

Performance measures are a new initiative implemented by VTrans to evaluate progress towards reaching the goals and objectives of this Policy Plan. They should be reevaluated within two to three years to determine if the measures are effective, or if modifications are needed. Reevaluation of the performance measures will be based on the following questions:

- Are the findings from each performance measure useful for evaluating the goals and objectives of the Policy Plan?
- Are the resources required to collect the data for each performance measure reasonable, given the amount of information that they yield?
- Is the data for each performance measure reliable?

There may also be opportunities to improve the performance measures in the future using new national data on non-motorized transportation. Changes to the census and other national transportation surveys have the potential to increase the amount and quality of available pedestrian and bicycle data. This may change the paradigm of bicycle and pedestrian data collection significantly in the future, and would also necessitate periodic reevaluation of VTrans' performance measures.

5.2.3 The Performance Measures

Note: The performance measures highlighted with an asterisk () do not currently have data available for a complete analysis.*

Usage

1. **Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.** This measure would use the responses from the Vermont Long Range Transportation Business Plan (LRTBP) Survey that requires respondents to report the number of minutes they spent traveling by various modes on the previous day. This information can be reviewed to show changes over time in the use of facilities but it will not provide data on WHY the use may change from survey to survey.

Note: If VTrans is able to incorporate appropriate bicycle and pedestrian questions in existing statistically correct surveys conducted by other State agencies or organizations these results can be used in addition to the data in the LRTBP survey.

Data Collection Responsibility: VTrans Policy and Planning Division

Data Collection and Reporting Frequency: Every Five Years

2. **Change in percent of all workers who commute to work by walking or bicycling.*** This information is available from the U.S. Census. However, census data have the following limitations: the data applies to one reference week, which in 2000 was the week preceding April 1, (still cool weather in Vermont), the sample size is small; data are only for workers age 16 and over; means of transportation refers to the mode the person used for the longest distance on the way to work, so walking or bicycling as a part of a transit commute

would not be counted; people who used different means of transportation on different days of the week were asked to specify the one they used most often (e.g., the greatest number of days per week), so people who walk or bicycle once or twice in the study week are not counted. This data only captures a picture of those commuting to work and does not provide data on other types of bicycle or pedestrian transportation trips. It will also only capture the working population and may not be truly reflective of the activities of Vermont's aging population.

The value of the data is that it is readily available and it does provide an overall image of the trend in commuting by bicycling and walking. Consequently, this performance measure will only look at the percent change and not at the actual numbers themselves.

Data Collection Responsibility: US Census Bureau, VTrans Policy and Planning Division, and VBPP
Data Collection and Reporting Frequency: Every Ten Years

- 3. Number of pedestrians and bicyclists observed in different parts of Vermont*.** VTrans should explore pedestrian and bicycle counts as a method of measuring performance in the future. VTrans has initiated a process of collecting pedestrian and bicycle counts at sample locations throughout the State, on sidewalk and shared use path facilities. This process depends on assistance from the RPCs. VTrans should evaluate this process after 3 years and determine whether it can be an accurate and useful representation of pedestrian and bicycle usage over time. If the counts provide meaningful data, they can be used as a performance measure. Additional pedestrian and bicycle data may be obtained by incorporating pedestrian and bicycle counts into current intersection traffic counts (using extra spaces on the electronic counting boards). This data set would not be a valid representation of pedestrian and bicycle activity around the State, but would begin to provide some basic data on the actual use of specific facilities. Note that traditional highway data collection methodologies do not always work well for the pedestrian and bicycle modes. New and/or modified methodologies may be required to take accurate counts.

Data Collection Responsibility: Regional commissions, VTrans Policy and Planning Division, and VBPP
Data Collection and Reporting Frequency: Every Year

Safety

- 4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling*.** This measure would compare crash trends in terms of pedestrian and bicycle exposure. The exposure number used for this measure could be the average number of minutes spent walking or bicycling by the typical Vermont resident, as reported in the Vermont Long Range Transportation Business Plan Survey. This could be calculated by multiplying the average number of minutes per day by 365 (or 366), though this would not account for seasonal variations. The crash figures would be the annual police-reported crashes for the year of the survey. The specific measure would actually be a five year average, which would be updated every year to take the five most recent years of data. Due to the limitations of the current methods of reporting bicycle and pedestrian crashes, this measure will only provide a measure of crashes that are recorded by the police, which are typically those that also involve a motor vehicle or result in an injury or fatality. Pedestrian and bicycle safety should be evaluated separately.

Data Collection Responsibility: VTrans Policy and Planning Division, and VBPP

Facilities

- 5. Miles of sidewalk on State-owned roadways*.** The VTrans Policy and Planning Division Mapping Section, with data provided by VBPP, should create a GIS layer that shows the locations of sidewalks on State-owned roadways, including Class I town highways but excluding limited access highways. Sidewalk locations will be observed from the statewide roadway video log inventory. As of October 2006 this data has been compiled but no analysis has been undertaken.

Data Collection Responsibility: VTrans Policy and Planning Division and VBPP

Data Collection Frequency: Every Two Years (or Partial Collection Annually)

Reporting Frequency: Every Two Years

- 6. Miles of shared-use paths*.** To evaluate this performance measure, *VTrans Policy and Planning Division*, in collaboration with the VBPP, should develop a GIS database of all State- and locally-maintained shared use paths that are open to the public. In the long term, VTrans will look to develop measures of the condition and quality of shared-use paths in the future. These measures could include shared-use path width, surface type, surface condition and overall quality. Thresholds for these measures will be developed by the VBPP.

Data Collection Responsibility: VTrans Policy and Planning Division and VBPP

Data Collection Frequency: Every Two Years (or Partial Collection Annually)

Reporting Frequency: Every Two Years

- 7. Total number of VTrans funded bicycle and pedestrian projects and new facilities created. (A Strategic Performance Measure)** VTrans currently tracks the number of miles of facilities created on a yearly basis via Bicycle and Pedestrian program funds. This performance measure would expand this current measure to include other bicycle and pedestrian projects funded through enhancement grants, Safe Routes to School program or other VTrans administered programs. Initially, this performance measure will only look at those projects that are specifically undertaken as bicycle and/or pedestrian projects, rather than bicycle or pedestrian facilities included in larger VTrans projects that are primarily focused on non-bicycle or pedestrian facilities, with the plan to add this additional measurement at some time in the next ten years.

Data Collection Responsibility: VTrans Local Transportation Facilities and VBPP staff

Data Collection Frequency: Every Year

Reporting Frequency: Every Year

Training and Assistance

- 8. Total number of VTrans staff and consultants (including regional planning commissions) who participate in scheduled training sessions on pedestrian and bicycle accommodation and design.** This measure would help indicate the level of internal and external training that is provided on pedestrian and bicycle issues. This measure would also address one of the top five most frequently mentioned public comments during the public outreach meetings – the perceived need for more training of Agency personnel and consultants about bicycle and pedestrian design. VBPP staff would need to keep track

of training session locations, times, and numbers of participants to evaluate this measure. VBPP should also document the specialties of the training session participants (e.g., planners, engineers, designers, etc.). Finally, VTrans staff members should be counted separately from members of other organizations so that VTrans staff participation in training can be measured. The definition of a training session would be set as a training presentation of at least 30 minutes.

Data Collection Responsibility: VBPP

Data Collection and Reporting Frequency: Every Year

Education and Encouragement

- 9. Increase in walking and bicycling to and from school for Safe Routes to School (SR2S) program participating schools*. (A Strategic Performance Measure)** The VBPP would work with administrators at schools participating in the Safe Routes to School program to gather information about how students get to and from school. The VBPP would develop and maintain the database of journey to school counts compiled as a part of the SR2S statewide program. The process for evaluating SR2S programs is still being developed at the national level, so this measure may be changed in the future to meet federal requirements.

Data Collection Responsibility: VTrans, RPC's and teachers, VBPP

Data Collection and Reporting Frequency: Every Year for the duration of a school's participation in the SR2S program

- 10. Number of schools and students participating in pedestrian or bicycle safety education programs or events (e.g., Safe Routes to School, Bike Smart, Walk to School Day, etc.)*.** For all VTrans sponsored initiatives VBPP, Vermont pedestrian and bicycle advocacy organizations or consultants under contract to VTrans will identify schools that offer pedestrian or bicycle safety education programs or events, such as Safe Routes to School or BikeSmart. They will gather this information and provide it to the VBPP. The database should specify the type of program(s) that is (are) offered at each school and the total number of students reached by each program.

Data Collection Responsibility: Vermont Schools, Vermont Pedestrian and Bicycle Advocacy Organizations, RPCs and CCMPO, consultants and VBPP

Data Collection and Reporting Frequency: Every Two Years

Economic and Environmental Benefits

It is important to analyze the economic and environmental benefits of investments in pedestrian and bicycle projects and programs. However, it is impractical for VTrans and other State agencies to collect data on small business and community development, transportation efficiency and choice, and tourism and other economic and environmental benefits of non-motorized investments on a regular basis without significant expenditure of time and resources. Therefore, rather than using performance measures for this topic, VTrans will assess pedestrian and bicycle economic and environmental , benefits through a special study, as described in more detail in Action Item SBP.4.

There may also be data that is currently being collected by other State agencies that could provide some level of meaningful data. As part of its expanded efforts to coordinate with other agencies,

such as the Department of Health or the Department of Forests, Parks and Recreation, VTTrans will begin to see if the other agencies could have useful data available for use by VTTrans.

5.2.4 Relationship between the Performance Measures, Goals, Objectives, and Actions

Table 5.2 shows how each of the recommended performance measures are related to the goals of the Policy Plan. The order of the list in the table does not indicate importance or priority. While there is significant correspondence between the goals and performance measures, there is not a one-to-one relationship between them. For example, there are several performance measures that evaluate the amount of pedestrian and bicycle activity in Vermont. These performance measures are overarching—increasing non-motorized activity helps achieve the goals of economic vitality, health, and natural environment. Further, data for measuring goals such as economic vitality and natural environment are often impractical to collect, so these goals rely on overarching measures.

Table 5.2 Goals and Performance Measures

Goal	Performance Measure
Cultural Environment	5. Miles of sidewalk on state-owned roadways.
	6. Miles of shared-use paths.
Economic Vitality	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
Health	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.
Natural Environment	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.
Safety	4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.
Transportation Choice	5. Miles of sidewalk on State-owned roadways.
	6. Miles of shared-use paths.
	8. Total number of VTTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session on pedestrian and bicycle accommodation and design.
	10. Number of schools and students participating in VTTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).

Table 5.3 shows the relationship between the recommended performance measures and the objectives of the Policy Plan. The order of the objectives in the table does not indicate importance or priority. Like the goals, all of the objectives are covered by at least one performance measure, and several of the objectives will be assessed by multiple performance measures.

Table 5.3 Objectives and Performance Measures

Objective	Performance Measure
Objective 1. Accommodate pedestrian and bicycle transportation in VTrans-funded projects and programs.	5. Miles of sidewalk on state-owned roadways.
	6. Miles of shared-use paths.
	7. Total number of VTrans funded bicycle and pedestrian projects and new facilities.
	8. Total number of VTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session on pedestrian and bicycle accommodation and design.
Objective 2. Build and maintain the ability and expertise within all VTrans Divisions to address relevant pedestrian and bicycle needs and issues.	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
	8. Total number of VTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session on pedestrian and bicycle accommodation and design.
Objective 3. Provide pedestrian and bicycle planning, technical, and financial assistance to local governments and regional planning organizations.	8. Total number of VTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session on pedestrian and bicycle accommodation and design.
Objective 4. Fund planning, design, construction and maintenance of pedestrian and bicycle projects and programs at an adequate level.	5. Miles of sidewalk on State-owned roadways.
	6. Miles of shared-use paths.
	7. Total number of VTrans funded bicycle and pedestrian projects and new facilities.
	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
Objective 5. Maintain pedestrian and bicycle facilities in good operating condition for their expected use.	5. Miles of sidewalk on State-owned roadways.
	6. Miles of shared-use paths.
Objective 6. Educate pedestrians, bicyclists, and motorists about safe operating behavior.	4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.
	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
Objective 7. Encourage more Vermonters to walk and bicycle through programs and promotions.	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.
	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
Objective 8. Work with citizens, municipalities, and regional planning	5. Miles of sidewalk on State-owned roadways.
	6. Miles of shared-use paths.

Objective	Performance Measure
organizations to develop, plan, and implement pedestrian and bicycle plans, projects, and programs. Objective 8. (cont.)	7. Total number of VTrans funded bicycle and pedestrian projects and new facilities.
	8. Total number of VTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session on pedestrian and bicycle accommodation and design.
	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
Objective 9. Develop measures to track progress on improving pedestrian and bicycle programs, participation, safety, and accommodation.	<i>All performance measures apply.</i>
Objective 10. Assess the economic benefits (e.g., small business and community development, transportation efficiency and choice, and tourism) and the natural and cultural benefits (e.g., cleaner air, cleaner water, and enhanced community character) of pedestrian and bicycle activity in Vermont.	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.
	10. Number of schools and students participating in VTrans initiated pedestrian or bicycle safety education programs or activities (e.g., Safe Routes to School, Bike Smart, etc.).
Objective 11. Promote smart growth principles throughout Vermont to make pedestrian and bicycle travel more convenient.	1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.
	2. Percent of all workers who commute to work by walking or bicycling.
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.
	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.

To understand how progress on the various actions presented in Chapter 4 could be tracked, their relationship to the different performance measures, **Table 5.4** provides an overview of this review. The Table shows two different means of measuring progress, direct and indirect. Direct measurements are those that measure results that can be directly attributed to the specific action. Indirect measurements are those that can not be directly attributed to the specific action, but to which the specific action could contribute progress.

5.2.5 Performance Targets and Implementation

Each of the recommended performance measures should have performance targets established for five years in the future. **Table 5.5** shows the existing conditions and the limited number of five year targets that can now be recommended for each of the performance measures.

Baseline data is needed to establish specific performance targets. However, baseline data is not available for most of the measures, particularly measures of pedestrian and bicycle activity, facilities, safety and economic benefits. Therefore, baseline data should be collected for the performance measures that do not currently have data available in the first year after the performance measure is initiated. After the baseline data is collected, five-year performance targets should be set for the remaining measures.

The list in **Table 5.5** groups the performance measures into current, (updated in the next year) strategic (started in the next two-five years), and long term (started six or more years in the future). The performance measures in the long-term category will require further study.

Note that the targets that are established do not necessarily need to show an increase or decrease. For example, a target could be set to maintain a certain percentage of pedestrian and bicycle facilities throughout the State at a constant level of quality. If VTTrans is successful with its maintenance program, it will continue to provide this constant percentage of high-quality facilities, even as infrastructure throughout the state ages.

VTTrans is limited by the lack of data that is available from national data sources. However, there are currently efforts to improve these data sources. Proposals include revising the U.S. Census to include more questions about transportation other than journey to work trips and increasing the sample size of the NHTS (National Household Travel Survey) so that travel trends can be analyzed at the state level. In the long-term, VTTrans will continue to take advantage of improvements in national survey data to include other performance measures on pedestrian and bicycle use.

Table 5.5 Performance Measures, Existing Conditions, and Targets

Performance Measure	Existing Conditions	Target (Year)
<i>Current: Measures to be continued or upgraded within 1 year</i>		
2. Percent of all workers who commute to work by walking or bicycling.	5.63% walk; 0.31% bike (Census 2000)	A positive trend
3. Number of pedestrians and bicyclists observed in different parts of Vermont.	Unknown (Conduct 3 counts per RPC)	Targets to be set in the future
7. Total number of VTTrans funded bicycle and pedestrian projects and new facilities.	Unknown	Targets to be set in the future
9. Increase in walking and bicycling to and from school for schools participating in VTTrans Safe Routes to School program.	Ongoing (Survey students before and after program)	Targets to be set in the future
<i>Mid-Term: Measures to be established between two and five years from now</i>		
1. Number of minutes per day the average Vermont resident spends doing pedestrian and bicycle activity.	Approximately 62 minutes	Targets to be set in the future
4. Reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.	Unknown (Combine police data with LRTBP survey)	Targets to be set in the future
8. Total number of VTTrans staff and consultants (including regional planning commissions) who participate in scheduled training sessions on pedestrian and bicycle accommodation and design.	Obtain from VBPP (trainings each year)	Targets to be set in the future
10. Number of schools and students participating in pedestrian or bicycle safety education programs or events (e.g., Safe Routes to School, Bike Smart, etc.).	2003-04 21 schools, 1859 kids; 2004-05 60 schools, 4,682 kids; 2005-06 63 schools, 4,648 kids	100 schools (2010)
<i>Long-Term: Measures that could be established six years or more in the future but require further study</i>		
5. Miles of sidewalk on State-owned roadways.	Unknown (GIS layer under development from video logs)	Targets to be set in the future
6. Miles of shared-use paths.	Unknown (Create GIS layer)	Targets to be set in the future
<i>Performance measures that can be established using improved national data</i>	Unknown (Use improved national data)	Targets to be set in the future

5.3 Performance Measure Conclusion

The performance measures presented in this Policy Plan will help VTrans benchmark progress towards improving pedestrian and bicycle transportation in Vermont. While many of the performance measures are related to policies, programs, and projects within VTrans, they can also be impacted by the actions of other State agencies, local governments, businesses, and individuals. Therefore, achieving the performance measure targets requires cooperation between VTrans, other State, regional, and local agencies, businesses, and individuals.

Table 4.1 Actions as Related to Objectives

OBJECTIVES	CURRENT ACTIONS												STRATEGIC ACTIONS												LONG TERM ACTIONS																							
	CVT				CBP				GRP				CO				SVT				SBP				SRP				SO				LVT				LBP				LOB							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Accommodate bike/ped transportation in VTans-funded projects and programs.																																																
2. Build and maintain VTtrans ability/expertise to address bike/ped needs/issues.																																																
3. Provide bike/ped planning, technical, and financial assistance.																																																
4. Fund planning, design, construction and maintenance of bike/ped projects and programs at an adequate level.																																																
5. Maintain bike/ped facilities in good operating condition.																																																
6. Educate pedestrians, bicyclists, and motorists about safe operating behavior.																																																
7. Encourage Vermonters to walk and bicycle.																																																
8. Work to develop, plan, and implement pedestrian and bicycle plans, projects, and programs.																																																
9. Develop measures to track progress on improving bike/ped program participation, safety and accommodations.																																																
10. Assess the economic and natural and cultural benefits of bike/ped activity.																																																
11. Promote smart growth principles to make bike/ped travel convenient.																																																
12. Promote linkages between walking, bicycling and other modes of transportation.																																																
OBJECTIVES																																																

Direct Relation
Indirect Relation

POLICY PLAN DEVELOPMENT PROCESS & PUBLIC INVOLVEMENT

Appendix 1: Policy Plan Development Process and Public Involvement

The VTrans Policy and Planning Division took the lead on the preparation of the 2006 Vermont Pedestrian and Bicycle Policy Plan (the Plan). The Plan is one of five mode plans VTrans is preparing as part of the overall update of the States Transportation Business Plan. The VTrans Project Manager from the Policy and Planning Division, along with the staff of the VTrans Bicycle and Pedestrian Program formed a Working Group that worked with an outside consultant to develop the Plan. In addition to the input from the Working Group, VTrans Executive Staff (comprised of Directors of each of the Agency's five Divisions along with the Agency Secretary and Deputy Secretary), and a Study Advisory Committee (SAC) also provided overall guidance for the Plan. The SAC consisted of representatives from the regional planning commissions and the metropolitan planning organization, bicycle and pedestrian advocacy groups, local and regional bicycling organizations, the Federal Highway Administration, the VT Center for Independent Living, and the VT Department of Forests, Parks and Recreation.

The overall process included several smaller steps, each involving the development of a draft Technical Memorandum on a particular aspect of the overall plan. The draft technical memos were each subsequently reviewed by the VTrans Executive Staff and the Study Advisory Committee before they were finalized.

The development process for the Plan began with an overview of the current status of bicycle and pedestrian policy plans and planning around the country. The consultant then examined the current status of bicycling and walking facilities, data, management and participation in Vermont itself and shared the data with the SAC. With this data in hand, VTrans conducted a series of four public work sessions around the State to present the existing condition data for comment and to allow the public a chance to express their ideas of what the future of bicycling and walking in Vermont should be. The Northwest Regional Planning Commission hosted a work session in South Hero, the Two Rivers Ottauquechee Regional Commission hosted a session in Norwich, the Central Vermont Regional Planning Commission hosted a session in Montpelier and the Rutland and Bennington County Regional Planning Commissions jointly hosted a session in Wallingford. Using this input, the Working Group and consultant prepared a draft update of the State bicycling and walking vision and developed a set of accompanying goals, objectives and policies. After reviewing these with the VTrans Executive Staff, the Working Group reviewed and refined them with the SAC.

To provide a means of measuring the progress towards the vision, goals and objectives, VTrans is including performance measures. To begin this work, the consultants again reviewed how bicycle and pedestrian performance measures had been developed or were being used elsewhere in the country and assembled a panel of national bicycling and walking experts to discuss the topic. In conjunction with the Working Group, the consultants then developed a specific set of draft bicycle and pedestrian performance measures for Vermont. The initial list included over 30 different potential performance measures which they eventually refined to a list of 12. After passing the refined list by the expert panel, the Working Group presented the draft list of bicycle and pedestrian performance measures to the VTrans Executive Staff for their input and acceptance. After making the edits suggested by the Executive Staff, the Working Group presented the list of performance measures to the SAC for their input before finalizing the list.

After this extensive background work, the Working Group turned its attention to updating the list of actions included in the original 1998 Vermont Bicycle and Pedestrian Plan. Following extensive discussions and numerous drafts, they developed a set of proposed actions for consideration by the executive staff. After making the minor revisions requested by the Executive Staff, the Working Group presented the set of proposed actions to the SAC for their review and comment.

Upon completion of the various pieces, the Working Group focused on the preparation of a first draft of the final plan, this included refining and condensing the various technical memos into a cohesive, concise Plan document. After reviews by both the Executive Staff and the Study Advisory Committee, the Working Group put the draft Plan out for public review. They held a second round of public meetings to provide an opportunity for the public to comment on the draft final plan before it was finalized. After making minor edits and receiving the approval of the Executive Staff, VTTrans finalized the Plan.

**EXISTING BICYCLE AND PEDESTRIAN FACILITY
GEOGRAPHICAL INFORMATION SYSTEM (GIS) DATA**

**Appendix 2: EXISTING BICYCLE AND PEDESTRIAN FACILITY
GEOGRAPHICAL INFORMATION SYSTEM (GIS) & OTHER MAP
DATA**

Record of GIS Data Available by Vermont RPC's

Southern Windsor RPC					
Filename (Legend Title)	File Type	Level of Data within File	Projection	On Map	
DISTS (SWRPC Bike Routes)	ArcInfo Coverage	Dedicated bikeways Segment length (?) Posted Speeds ADT (year?) Shoulder Type?	none	Yes	
Trails (SWRPC Trails)	ArcInfo Coverage	Trails with some trail names located Trail ID # Trail Segment Length Trail Type (?)		Yes	
Trails_New (SWRPC Trails)	ArcInfo Coverage	Revised coverage of above data (for portion of region only)		Yes	
Southern Windsor RPC (continued)					
Filename (Legend Title)	File Type	Level of Data within File	Projection	On Map	
RDSADD (SWRPC Bike Routes)	Shapefile	Addition to DISTS file as above, with new segments		Yes	
Bike Path (Springfield Bike Path)	Shapefile	One ployline depicting Springfield Bike Path	NAD83	Yes	
Northeastern Vermont Development Association Maps & Route Directions available at: http://www.nvda.net/transportation/bikeped.html					
Mergedata (NVDA Roads Suitable for Bicycles)	Shapefile	Layer of roadways suitable to bike use (designated bike routes?) Terrain type,	Undefined	Yes	

		shoulder widths, cycling experience, food and lodging services			
Bikeway	ArcInfo	(seems to be easternmost road on above shapefile)	Undefined	No	
Northwest Regional Planning Commission http://www.nrpcvt.com/mvrt/Maps.html					
Railtrail (Missisquoi Valley Rail Trail)	Shapefile	Missisquoi Valley Rail Trail	Undefined	Yes	
Champ_bikeways (Lake Champlain Bikeways)	Shapefile	Champlain Bikeways Routes, Length (feet?)	Undefined	Yes	
mvrt_nbranchloop (MVRT North Branch Loop)	Shapefile	North Branch Loop of Missisquoi Valley Rail Trail	Undefined	Yes	
mvrt_moreselineloop (MVRT Morse Line Loop)	Shapefile	Morse Line Loop of Missisquoi Valley Rail Trail	Undefined	Yes	
mvrt_mineralbrookloop (MVRT Mineral Brook Loop)	Shapefile	Mineral Brook Loop of Missisquoi Valley Rail Trail	Undefined	Yes	
mvrt_lakecarmiloop (MVRT Lake Carmine Loop)	Shapefile	Lake Carmi Loop of Missisquoi Valley Rail Trail	Undefined	Yes	
mvrt_esheldonloop	Shapefile	East Sheldon Loop of Missisquoi Valley Rail Trail	Undefined	Yes	
Sidewalks (NRPC Sidewalks)	Shapefile	Digitized sidewalk layer in towns of St. Albans, Swanton, Enosburg, Richford	NAD83	Yes	
Lamoille County Planning Commission					
Rdshld00 (LCPC Roadway Data)	Shapefile	region-wide roadway layer with bike attributes shoulder width, terrain type, pavement quality, road name	Undefined	Yes	
Central Vermont Regional Planning Commission					
Barwashwill (Websterville Bike	Shapefile	Bicycle route, town of Websterville,	Undefined	Yes	

Route)		route length in miles			
Berlinpndrt (Berlin Pond Bike Route)	Shapefile	Berlin Pond bike path, surface type, location, mileage	Undefined	Yes	
Bikeped (CVRPC Bicycle Pedestrian Treatments)	Shapefile	Bike/ped treatments region-wide, location, treatment type	Undefined	Yes	
Calaisrt (Calais Bike Route)	Shapefile	Calais bike route, surface type, mileage, location	Undefined	Yes	North Calais Route and Adamant Route
Cvrpath (Central Vermont Regional Path)	Shapefile	Regional Bike Path Route, segment names, construction status, length (feet?)	Undefined	Yes	
CVTroute_approv (Cross Vermont Trail)	Shapefile	Approved cross-state bike route, segment lengths, towns, surface types, landowner	VT State Plane	Yes	
Emontprt (East Montpelier Bike Route)	Shapefile	East Montpelier Bike Route, segment, mileage, year opened, surface type, town	Undefined	Yes	3 routes
Lakesrt (Lakes Tour Route)	Shapefile	Lakes Tour Route, segment, mileage, year opened, surface type, town	Undefined	Yes	
Central Vermont Regional Planning Commission (continued)					
Filename (Legend Title)	File Type	Level of Data within File	Projection	On Map	Other Comments
Madrivpath (Mad River Bike Route)	Shapefile	Mad River Route, segment, mileage, year opened, surface type, town	Undefined	Yes	
Mrgrnwy (Mad River Greenway)	Shapefile	Bike Path, near Mad River, unidentifiable attributes	Undefined	Yes	
Mrvroutes (Mad River Valley Bike Routes)	Shapefile	Bike routes, town, mileage, year opened, surface type	Undefined	Yes	
Northfieldrt	Shapefile	Northfield Bike	Undefined	Yes	

(Northfield Bike Route)		Route, town, mileage, year opened, surface type			
Stowe (Stowe Waterbury Bike Route)	Shapefile	Stowe/Waterbury Bike Route, town, mileage, year opened, surface type	Undefined	Yes	
Watrbike (Waterbury Bike Route)	Shapefile	Waterbury Bike Path	Undefined	Yes	

Other RPC's/MPO Data

Chittenden County Metropolitan Planning Organization: <http://www.ccmpo.org/BikePed/>

Windham Regional Commission – Bicycle Suitability Map:
<http://www.rpc.windham.vt.us/bikemap/index.htm>

Please note this is not an exhaustive list of all available resources regarding bicycling and walking guides in Vermont. It is intended to provide a basic understanding of the publicly available data and maps.

Other Available Bicycling & Walking Resources

MAPS and WEBSITES:

Franklin County, VT: Bicycling & Walking Guide. Northwest Regional Planning Commission. 155 Lake Street, St. Albans, VT 05478. (802) 524-5958. <http://www.nrpcvt.com>

Windham County Bicycle Suitability Map. The Southeastern Vermont Bicycle Suitability Map is a project of the Windham Regional Commission's Bicycle and Pedestrian Committee. This map series provides information of interest to cyclists about roads in Southeastern Vermont. It includes traffic volumes, shoulder suitability, steep grades, cycling opportunities, and cycling hazards. Windham Regional Commission, 139 Main St., Suite 505, Brattleboro, VT 05301. (802) 257-4547. www.rpc.windham.vt.us/bikemap

Central Vermont Back Road Bike Tours. Central Vermont Regional Planning Commission and Central Vermont Chamber of Commerce. www.central-vt.com

Lake Champlain Region Road Map and Guide. Complete travel guide for the Vermont-New York Lake Champlain region. Detailed road map and comprehensive recreation guide including hiking, campgrounds, Lake Champlain Bikeways Map bicycle and auto tours, bird watching and much more. Available from Northern Cartographic, 450 Williston Rd. South Burlington 05403. Phone: 802-860-2886. Fax: 802-865-4912. Email: ncarto@together.net

Lake Champlain Bikeways Clearinghouse. Lake Champlain Bikeways is a public/private initiative to create a network of interconnected, international bicycle routes on existing roads

around Lake Champlain in New York, Vermont, and the Upper Richelieu Valley in Quebec. To date, a 350-mile principal route around the entire Lake in Vermont and New York, and along the Richelieu River to Chambly, Quebec, has been identified and mapped. The Web Site provides detailed directions of the Bikeway routes through VT, NY & Quebec: maps, a list of services and accommodations catering to cyclists, cycling publications and links to other bicycling related web sites. Contact: The Lake Champlain Bikeways, c/o Local Motion Trailside Center, 1 Steele Street, Suite #103, Burlington, VT 05401, (802) 652-BIKE phone & fax; Email info@champlainbikeways.org Homepage: <http://www.champlainbikeways.org>

“Cycling in the Kingdom” The Northeastern Vermont Development Association provides a detailed guide to both on-road and backroad bicycling in the Northeast Kingdom of Vermont (Orleans, Essex and Caledonia Counties). For guides, maps and directions Contact: Northeastern Vermont Development Association, 36 Eastern Ave., Suite 1, P.O. Box 630, St. Johnsbury, VT 05819 Phone: (802) 748-5181. Homepage: <http://www.nvda.net/transportation/bikeped.html>

Map Adventures' Topographic Maps and Guides. Map Adventures specializes in quality, topographic maps for the outdoor recreation enthusiast. Available information includes maps of Mountain biking, road biking and hiking trails in the Mt. Mansfield, Stowe Area, Lamoille County, Randolph and Burlington areas plus information on hiking, road biking, mountain biking, canoeing, nordic and backcountry skiing, snowshoeing and more. Contact: Map Adventures, P.O. Box 15214, Portland, ME 04112. Phone: 207-879-4777. Email: email@mapadventures.com. Homepage: http://www.mapadventures.com/main_products.htm

Adventure Cycling Association – Green Mountain Loop (2004). A 373.5 mile route that begins and ends in Burlington, VT that traverses the mountains and pastoral scenery of the Green Mountain state. The map and route description is downloadable via the web at: <http://www.adventurecycling.org/routes/greenmntnsloop.cfm>

Adventure Cycling Association – Northern Tier Section 11 (2004). A 404.5 mile route that begins in Ticonderoga, NY to Bar Harbor, ME including a 92 mile east-west route in Vermont between Rte. 74 in Shoreham, VT and Rte. 5 in East Thetford, VT. The map and description can be ordered via the web at: <http://www.adventurecycling.org/routes/northerntier.cfm>

Kingdom Trail Association – East Burke, VT. Choose from over 75 miles of single and double track mountain biking trails. <http://www.kingdomtrails.org/> P.O. Box 204, East Burke, VT ,(802) 626-3215.

Appendix 3

BACKGROUND FOR PERFORMANCE MEASURES

Appendix 3: BACKGROUND FOR PERFORMANCE MEASURES

A.3.1 Overview

The project consultant conducted background research to develop pedestrian and bicycle performance measures for Vermont. This research included reviewing existing pedestrian and bicycle performance measures in other states, obtaining practical advice from a panel of national experts, and gathering information from VTTrans staff about existing databases and current data collection efforts.

A.3.2 Performance Measures used by Other Agencies

Technical Memorandum #1 provides a detailed discussion of pedestrian and bicycle performance measures in several other states. This analysis found that a vast majority of states do not currently measure performance for pedestrian and bicycle modes. In most states, the available data on pedestrian and bicycle use, facilities, and safety do not exist or have significant limitations, such as small sample sizes and inconsistent data collection and reporting methodologies. However, in recent years, states such as Florida, Maryland, New Jersey, New York, Oregon, Tennessee, and Wisconsin have established non-motorized transportation performance measures. The performance measures in these states address many different aspects of pedestrian and bicycle transportation, including safety, usage, facilities, education/enforcement, land use, and institutionalization of non-motorized transportation issues within the DOT. The level of detail in these state performance measures varies. Some states measure only increases or decreases in non-motorized usage and/or crashes. Tennessee DOT has established specific targets to be achieved by certain dates.

To supplement this analysis, the project team assembled a panel of experts from around the United States to discuss their experience and opinions with respect to establishing and using pedestrian and bicycle performance measures. The Expert Panel included representatives of:

- Florida Department of Transportation;
- Oregon Department of Transportation;
- City of Portland, OR;
- League of American Bicyclists; and
- League of Illinois Bicyclists.

The project team combined the results of the background research on pedestrian and bicycle performance measures in other states with the advice from the Expert Panel to develop a revised list of characteristics of good state-level performance measures. It was determined that good bicycle and pedestrian performance measures in Vermont:

- Are related to the policies and goals of the state pedestrian and bicycle plan (e.g., measure information that is useful);
- Are quantifiable and time-constrained (can be measured and/or graphed over time);
- Use appropriate language and are easy to understand;
- Infer the data that need to be collected;

- Use data that is readily available and can be collected cost- and labor-effectively
- Can be reported at regular intervals, such as in an annual or biannual performance measures report;
- Serve as a benchmarking tool to measure how well the agency's practices match with its stated policies;
- Should consider the end user as a measuring tool (e.g., gather the opinions of pedestrians and bicyclists about non-motorized transportation); and
- Relate to outcomes that result from the actions (although there are often factors beyond agency control that also influence the measured outcomes).

The Expert Panel provided background about their practical experience with pedestrian and bicycle performance measures. Collectively, they recommended:

- Use care in establishing measures, to make sure they do not require a significant amount of resources be spent on data collection;
- Collect data only every two or three years for most performance measures;
- Expand existing data collection efforts currently focused on motor vehicle or public transit modes;
- Coordinate between divisions/sections of the DOT to know what data are available and obtain accurate and meaningful data for pedestrian and bicycle transportation;
- Fully understand the quality and validity of the data used in the pedestrian and bicycle performance measures;
- Balance the need for data that are easy to collect and data that are meaningful for evaluating performance;
- Incorporate performance measures that are process-oriented (measure the direct implementation of policies and actions of the agency) as well as those that are outcome-oriented (measure the end results of policies and actions in relation to pedestrian and bicycle use, safety, health, economic benefits, etc.), even if it may be more difficult to obtain data for the outcome-oriented measures; and
- Understand and explain, as needed, other state, regional, and local agency, business, and individual influences on outcome-based performance measures, such as land use decisions, cultural attitudes, and socioeconomic trends.

A.3.3 Existing Vermont Pedestrian and Bicycle Performance Measures

Vermont is one of several states that has made an initial attempt at establishing pedestrian and bicycle performance measures. VTtrans currently uses two performance measures, developed using the available data, to track pedestrian and bicycle performance on an annual basis:

- Reported motor vehicle crashes involving bicyclists & pedestrians; and
- Miles of bicycle and pedestrian facilities developed through the use of VTtrans Local Transportation Facilities Program funds.

Like many performance measures, both of the current Vermont performance measures are useful for tracking change over time and providing a basic level of information, but they have several

limitations. The first performance measure provides some information about pedestrian and bicyclist safety, but it does not include any measure of pedestrian or bicyclist exposure. Without this information, it would not be possible to determine whether a change in pedestrian and bicycle crashes is due to physical or behavioral improvements made by state, regional, and local agencies or simply a result of an increase or decrease in the total number of pedestrians and bicyclists in Vermont. This performance measure also relies on a statewide crash reporting system that does not represent the total number of crashes or injuries that occur—rather, just those that are included in police reports¹.

The second performance measure may be a more valid performance measure than the first. It measures investment in pedestrian and bicycle facilities, and takes facility length into account. Yet, it only focuses on a specific group of bicycle and pedestrian facilities (those funded via the VTrans Bicycle & Pedestrian Program (VBPP)). It could be improved by including a larger group of facility types, such as wide shoulders, bicycle lanes or other improvements that are developed with other funding sources or as a part of larger state and local transportation projects. It could also be improved by providing specific information about the location of facilities relative to the population, and how well the new facilities fill important gaps in the existing network of pedestrian and bicycle facilities.

While these two performance measures have some limitations, VTrans has been able to successfully collect the data necessary to evaluate and present them. The performance measures that are proposed for this policy plan or suggested for possible use in the future must also meet the practical requirement for data collection before they can be implemented. Additionally, new performance measures should be ones that provide meaningful information that either VTrans staff, the legislature or the general public would want to know.

¹ The Vermont police reporting form was updated and improved in 2003 to capture a greater number of crashes.

