

TECHNICAL MEMORANDUM #3
Vermont Agency of Transportation
Pedestrian and Bicycle Performance Measures

**Vermont Bicycle and
Pedestrian Policy Plan**

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Technical Memo #3

3.0 Vermont Pedestrian and Bicycle Performance Measures

Disclaimer: The information in this memorandum is presented as a draft document to facilitate the discussion of performance measures as they relate to the revision of the VT Bicycle and Pedestrian Policy Plan. Inclusion here does not constitute an endorsement by VTTrans of the performance measures unless otherwise noted.

3.1 Introduction

This memorandum presents performance measures for the updated Vermont Bicycle and Pedestrian Policy Plan (VBPPP). In addition to being an important element of the VBPPP, these 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 describe progress towards the stated goals to the legislature and the general public.

The following information is discussed in detail in this memorandum:

- Characteristics of good, state-level pedestrian and bicycle performance measures;
- Existing Vermont pedestrian and bicycle performance measures;
- Proposed pedestrian and bicycle performance measures; and
- Potential special studies for issues that have long-term outcomes (e.g., economic benefits, health, etc.).

3.2 Background for Proposed Performance Measures

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.

3.2.1 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 (though 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.

3.2.2 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. VTrans 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 VTrans 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 is not possible to determine whether a decrease in pedestrian and bicycle crashes is due to physical or behavioral improvements made by state, regional, and local agencies or simply a result of a reduction in the total amount 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.

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

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.

3.3 Proposed Pedestrian and Bicycle Performance Measures

This section presents the proposed Vermont pedestrian and bicycle performance measures. These performance measures will help measure progress towards the goals of the Vermont Bicycle and Pedestrian Policy Plan (described in detail in Technical Memorandum #4). The data required for these performance measures will be collected by a variety of Sections within VTrans. Some will require assistance from other state, regional, and local governments 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.

3.3.1. Performance Categories and Associated Performance Measures

Table 3.1 lists the 9 proposed 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 3.3.2 provides more detail about the purpose, data requirements, and limitations of each proposed performance measure. Section 3.3.3 shows how the proposed performance measures relate to the goals of the Plan.

Note that it will take time and resources to develop methodologies and collect the necessary data for some of the proposed performance measures. The final column of Table 3.1 identifies the proposed performance measures that should be established within one year (short-term), measures that should be established in two to five years (medium-term), and measures that could be established in six years or more (long-term). Performance measures in the long-term category will require further study.

The project consultant also recommends several special studies to help measure some of the longer-term outcomes of non-motorized transportation improvements. Some of the desired outcomes of the Plan, such as economic and public health benefits require more detailed study than can be practically done on an annual or bi-annual basis. Section 3.4 provides more details about these potential longer-term special studies.

Table 3.1 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.	Medium-Term
	2. Change in percent of all workers who commute to work by walking or bicycling.	Short-Term
	3. Number of pedestrians and bicyclists observed in different parts of Vermont.	Long-Term
Safety	4. Police-reported pedestrian and bicycle crashes per number of minutes spent walking and bicycling.	Medium-Term
Facilities	5. Miles of sidewalk on State-owned roadways.	Short-Term
	6. Miles of shared-use paths.	Medium-Term
	7. Total number of VTtrans funded bicycle and pedestrian projects and new facilities.	Short-Term
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.	Short-Term
Education and Encouragement	9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.	Medium-Term
	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.).	Short-Term
Economic Benefits	<i>NO PERFORMANCE MEASURE</i>	

3.3.2 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.

The recommended performance measures are a new initiative by VTtrans to evaluate progress towards the goals and objectives of this 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 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.

3.3.3 Descriptions of Recommended Performance Measures

This section describes the purpose, data requirements, and limitations of each recommended performance measure. The performance measures are organized according to the six topical categories listed above.

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 to a new question proposed for 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. Pedestrian and bicycle activity should be reported separately. 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: Use of this performance measure is dependent on the pedestrian and bicycle activity question being included in the LRTBP survey. Additionally, if VTrans is able to incorporate appropriate bicycle and pedestrian questions in existing statistically correct surveys conducted by other State agencies or organizations or institutes its own specific bicycle-pedestrian statistically correct survey in the future, 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 was the week preceding April 1, 2000 (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. This will take an initial effort to go back over the last few data sets to document the previous changes in the overall percentages. Once the initial effort is complete, it should only take a small amount of time to process the new data and track the changes.

Data Collection Responsibility: US Census Bureau, VTTrans 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*.

VTTrans should explore pedestrian and bicycle counts as a method of measuring performance in the future. VTTrans is currently investigating a process of collecting pedestrian and bicycle counts in a sample of 36 locations throughout the State, equally divided between on-road, sidewalk and shared use path facilities. This process depends on assistance from the RPCs. VTTrans 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. The counting methodology specifies that counts should be taken by RPCs during September or early October on three different types of bicycle/pedestrian facilities (sidewalk, on-road facility, and shared-use path). Further analysis of the counts would be done by VBPP. 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, VTTrans 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*. (A Strategic Performance Measure)

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 each year, 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, which are typically available for use three years after the survey data itself is taken. 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: VTTrans Policy and Planning Division, and VBPP
Data Collection and Reporting Frequency: Every Five Years

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 April 2006 this data is currently under development and approximately ½ of the data collection is complete. VTrans will look to develop measures of sidewalk quality and condition in the future. These measures could include sidewalk 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

- 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.** VTrans currently tracks the number of miles of facilities created on a yearly basis with Local Transportation Facilities funds. This performance measure would expand this current measure to include other bicycle and pedestrian projects funded through enhancement grants, Safe Routes to School funds or other VTrans administered funds. 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 bike/ped 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 Benefits

It is important to analyze the economic 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 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 benefits through a special study, as described in Technical Memo #5.

There may also be data that is currently being collected by other State agencies that could provide some level of meaningful data. VTrans should make contact with other agencies, such as the Department of Health or the office of Parks and Recreation, that could potentially have useful data.

3.3.4 Relationship between the Performance Measures, Goals, and Objectives

Table 3.2 shows how each of the recommended performance measures are related to the goals of the plan (contained in Technical Memo #4). 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 3.2 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 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.).

Table 3.3 shows the relationship between the recommended performance measures and the objectives of the plan (contained in Technical Memo #4). 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 3.3 Objectives and Performance Measures

Objective	Performance Measure
Objective 1. Accommodate pedestrian and bicycle transportation in VTTrans-funded projects and programs.	5. Miles of sidewalk on state-owned roadways.
	6. Miles of shared-use paths.
	7. Total number of VTTrans funded bicycle and pedestrian projects and new facilities.
	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.
Objective 2. Build and maintain the ability and expertise within all VTTrans Divisions to address relevant pedestrian and bicycle needs and issues.	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.).
	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.
Objective 3. Provide pedestrian and bicycle planning, technical, and financial assistance to local governments and regional planning organizations.	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.
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 VTTrans funded bicycle and pedestrian projects and new facilities.
	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.).
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 VTTrans 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 VTTrans 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 organizations to develop, plan, and implement pedestrian and bicycle plans, projects, and programs.	5. Miles of sidewalk on State-owned roadways.
	6. Miles of shared-use paths.
	7. Total number of VTTrans funded bicycle and pedestrian projects and new facilities.
	8. Total number of VTTrans staff and consultants (including regional planning commissions) and local officials who participate in scheduled training session

Objective	Performance Measure
	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.

3.3.5 Performance Targets and Implementation

Each of the recommended performance measures should have performance targets established for five years in the future. Table 3.4 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 are needed to establish specific performance targets. However, baseline data are 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 are collected, five-year performance targets should be set for the remaining measures.

The list in Table 3.4 groups the performance measures into those that should be started in the next year (short-term), those that should be started in the next two-five years (medium-term), and those that could be started six or more years in the future (long-term). 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 VTrans 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.

VTrans is limited by the lack of data that are 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, VTrans will continue to take advantage of improvements in national survey data to include other performance measures on pedestrian and bicycle use.

Table 3.4 Performance Measures, Existing Conditions, and Targets

Performance Measure	Existing Conditions	Target (Year)
<i>Short-Term: Measures to be established 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
5. Miles of sidewalk on State-owned roadways.	Unknown (GIS layer under development from video logs)	Targets to be set at some point in the future
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) who participate in scheduled training sessions on pedestrian and bicycle accommodation and design.	Obtain from VBPP (trainings each year)	Targets to be set at some point 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, 4670 kids; 2005-06 60 schools, #kids TBD	100 schools (2010)
<i>Medium-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. (This performance measure is dependent on a question being added to the LRTBP survey)	Unknown (Add question to LRTBP Survey)	Targets to be set at some point 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 at some point in the future
6. Miles of shared-use paths.	Unknown (Create GIS layer)	Targets to be set at some point in the future
9. Increase in walking and bicycling to and from school for schools participating in Safe Routes to Schools programs.	Unknown (Survey students before and after program)	Targets to be set at some point in the future
<i>Long-Term: Measures that could be established six years or more in the future but require further study</i>		
3. Number of pedestrians and bicyclists observed in different parts of Vermont.	Unknown (Conduct 3 counts per RPC)	Targets to be set at some point in the future
<i>Performance measures that can be established using improved national data</i>	Unknown (Use improved national data)	Targets to be set at some point in the future

3.4 Conclusion

The performance measures presented in this memorandum 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. Specific actions that should be taken to improve pedestrian and bicycle transportation in Vermont are provided in Technical Memorandum #5.