# 5 Implementation Plan

## *5.1 Regional Facilities and Local Facilities*

A cornerstone of this plan is the identification of two recommended regional networks: an on-road bicycle facility network and a regional shared use path network. With the exception of a few critical links (described in section 4.1), sidewalks were left out of the recommended regional network since they tend to serve local rather than regional needs. As described in Chapter 4, Recommended Networks, these networks are intended to provide high quality transportation connections to major transportation facilities and systems and connections between existing and future centers. These centers include Metropolitan and Village centers (as identified in the Regional Plan by the Chittenden County RPC, 2001) and major activity and employment centers such as Taft Corners in Williston.

Importantly, the two regional networks provide a regional framework for establishing implementation and funding priorities by the CCMPO and its member communities and agencies. They also identify corridors important to bicycling and walking from a regional perspective.

## *5.2 Baseline Costs for Bicycle-Pedestrian Facilities*

Costs can vary widely depending on the type of bicycle-pedestrian facility being developed and by the standards used (which may be dictated by the funding source), the area (urban, suburban, or rural), and environmental considerations.

The types of facilities considered here include sidewalks, shared use paths, and on-road facilities which include bike lanes and shoulders. Each of these facilities has implications for the level of accommodation they provide to the user, initial costs, and on-going maintenance costs. For example, bicycle lanes have higher initial and on-going costs related to roadway signing and striping. The facilities themselves can be implemented by constructing additional roadway width or by retrofitting existing width to provide additional room for bicycles. This may include reducing the number of travel lanes and/or removing or relocating on street parking.

For shared use paths, costs are also widely variable due to right-of-way acquisitions, standards used, material types, environmental considerations, and potential additional needs such as bridges, boardwalks, trailheads, fencing, railings and signage. Environmental considerations include wetlands, topography, and stream or river crossings.

For sidewalks, costs are variable depending on whether or not it includes a curb and the type of materials used. Pedestrian signals, Americans with Disabilities Act compliant ramps, curb cuts, and crosswalk markings can all add to the cost as well. See **Table 5.2** for a list of estimated facility costs.

**Table 5.2: Estimated Typical Facility Development Costs**

| SIDEWALK/CURB CONFIGURATIONS | Cost per linear foot | Cost per mile |
|---|---|---|
| 5-foot wide concrete sidewalk with granite curb | $154 | $813,120 |
| 5-foot wide concrete sidewalk with concrete curb | $145 | $766,656 |
| 5-foor wide concrete walk with no curb | $96 | $505,296 |
| 5-foot wide bituminous Sidewalk with granite curb | $117 | $615,648 |
| 5-foot wide bituminous Sidewalk with concrete curb | $108 | $569,184 |
| 5-foot wide bituminous Sidewalk with no curb | $57 | $302,016 |
| 5-foot wide aggregate walk with granite curb | $103 | $545,952 |
| 5-foot wide aggregate walk with concrete curb | $95 | $499,488 |
| 5-foot wide aggregate walk with no curb | $44 | $232,320 |
| **TYPICAL SHARED-USE PATH COSTS** | | |
| 8-foot wide bituminous Shared-use path | $128 | $673,728 |
| 10-foot wide bituminous Shared use path | $145 | $766,656 |
| 12-foot wide bitmuninous Shared-use path | $165 | $871,200 |
| 8-foot wide aggregate shared-use path | $108 | $569,184 |
| 10-foot wide aggregate shared-use path | $122 | $644,688 |
| 12-foot wide aggregate shared-use path | $136 | $720,192 |
| **BIKE LANES** | | |
| Bike lanes with durable pavement markings and appropriate signs (restriping road, not building new width) | $1.90 | $10,000 |
| Bike lanes with regular painted pavement markings and appropriate signs (restriping road, not building new width) | $0.85 | $4,500 |
| **SHOULDERS** | | |
| 4' Shoulder, Paving existing gravel (cost per side) | $42 | $219,200 |
| 4' Shoulder, New Construction (cost per side) | $285 | $1.5 million |
| **SIGNALS** | **Unit Cost** | **Installation** |
| Accessible Pedestrian Signal with audible tone | $650 | $1,500 for 8 (full intersection) |
| Countdown Timer | $500 | $1,500 for 8 (full intersection) |
| Bicycle Loop Detector with amplifier for bicycles | $1,200 | already included in price |
| Bicycle Detection Camera (avoids digging) | $3,000 | $2,000 for 4 approaches |
| **CROSSWALKS** | **Unit** | **Cost per Unit** |
| Imprinted Crosswalk | S.F. | $15-$20 |
| Crosswalk Pavement Marking (8 foot wide crosswalk—block pattern) | L.F. | $24 |

Notes: 1) Many of the cost estimates are from the VTrans 2006 Bicycle & Pedestrian Facility Unit Cost Report. The Report provides 5 year averages. This Plan adds 10% to the VTrans estimates to account for inflation, which may be low due to cost fluctuations related to the price of oil. 2) The above costs only include materials and installation. They do not include costs related to right of way acquisition, engineering, project management, or construction inspection. Sources: Wilbur Smith Associates; HighwayTech.com; VTrans 2006 Bicycle & Pedestrian Facility Unit Cost Report.

## 5.3 Estimated Costs for the Recommended Network

**Map 4.1-A** shows on-road facilities that are designated bicycle routes and common on-road bicycle routes that have not yet been designated. **Map 4.1-B** identifies existing and proposed shared use paths and a select number of existing sidewalks that are of regional significance because they provide links to on-road and shared use facilities of regional significance.[1] Together, these maps illustrate more than 500 miles of the recommended regional network.

**Table 5.3** shows the miles of each type of facility in 2003 compared to 2008. The 2008 figures include facilities and common routes that were identified in 2003 but had still not been built or designated as of December 2007, as well as facilities that were proposed after the 2003 Update was published.

The Table also gives an estimate of how much it would cost to build the proposed shared use facilities or designate common on-road routes. In 2003 it was assumed that it would cost $465,000 per mile to build a shared-use path, and a $350,000 per mile to build an on-road facility. By comparison, in 2008 it is estimated that it would cost $766,600 per mile for a shared use path and $1.5 million per mile for an on-road facility. The 2008 cost estimates are intended to provide an order of magnitude cost for building these facilities as standalone projects—for instance, adding paved shoulders to a road independent of the road's rehabilitation or reconstruction, and assuming that the shoulders would need to be constructed from scratch.

***On-road Bicycle Route connecting South Burlington and Colchester***

[1] There are more than 300 miles of facilities not shown in the regional network maps because they serve local, rather than regional, needs. Most of these facilities are sidewalks.

| Table 5.3: Regional Network Implementation Status and Potential Costs | | | | |
|---|---|---|---|---|
| ***Shared Use Paths*** | **2003** | | **2008** | |
| **Status** | **Miles** | **Estimate Costs ($ millions)** | **Miles** | **Estimate Costs ($ millions)** |
| **Existing** | 30 | - | 39 | - |
| **Proposed** | 67 | 31.2 | 118 | 90 |
| **Total** | 97 | 31.2 | 157 | 90 |
| | | | | |
| ***On-Road Bicycle Facilities*** | **2003** | | **2008** | |
| **Status** | **Miles** | **Estimate Costs ($ millions)** | **Miles** | **Estimate Costs ($ millions)** |
| **Designated** | 20 | - | 81 | - |
| **Common Routes, not Designated** | 226 | 79.1 | 298 | 447 |
| **Total** | 246 | 79.1 | 379 | 447 |

Table 5.3 Notes: 1) The 2003 data listed in this table is slightly different than what was printed in the original 2003 Update Plan. This table was created using a GIS layer of the regional network provided by the Chittenden County Regional Planning Commission that tracks the status of network segments by type as well as the Plan year of its most recent status. It was also modified to correct minor inaccuracies discovered on the 2003 map such as the incorrect status or location for a network segment. The data compiled in the GIS layer provided by CCRPC is presumed to be more accurate than the data in the 2003 Update and should be used as the baseline for future Plan Updates.

The cost estimates in Table 5.3 for 2008 provide a high-cost scenario. It is likely that at least part of the on-road network could be implemented by paving an existing gravel shoulder, restriping a road to accommodate bike lanes, or posting bicycle route signage which would cost considerably less than building new shoulders. A detailed field review would be required to determine what improvements are necessary on each segment. Additionally, the cost to add an on-road facility can be significantly less if it is added as part of a larger project such as a roadway rehabilitation or reconstruction.

The critical crossings (shown in Map 4.1-C and described in section 4.1) that are proposed but not yet existing would require specific feasibility studies to determine the potential constructions costs.


***Bicycle Lane in South Burlington***

## 5.4 Funding Sources

There are numerous funding sources that may be used to develop bicycle and pedestrian projects or enhance the bicycle and pedestrian system. Many require matching funds and must be incorporated into longer-range, multi-year programs (such as the CCMPO TIP) and are awarded through a competitive process. See Appendix D for a summary of funding sources currently available for transportation projects in Chittenden County.

This list of sources may change after the current federal transportation bill, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), expires in September of 2009. Until Congress authorizes a new transportation bill, funding for future transportation projects is largely unknown. Nevertheless, project recommendations and actions must be moved forward with the expectation that there will be available funding in the future. Whatever the next transportation bill is, a creative mix of funding coupled with local and county commitment will be required to implement the regional bicycle and pedestrian network. In addition to traditional funding sources there may be special local, state, or federal grant or other funding opportunities available to help implement the recommendations in this Plan. The CCMPO and its partner organizations should be ready to pursue any opportunities that arise.

A review of national experience finds that continual commitment of funds, official staff efforts, and volunteer involvement over the long term are the major factors in areas that are recognized for excellence in their facilities and by the high use of those facilities. For more than 20 years Davis, California and Madison, Wisconsin have been developing extensive bicycle facility networks and as a result have a high percentage of commuting and other transportation trips by bicycle.

### 5.4.1 Federal Funding

The federal funds that the CCMPO allocates to projects each year come through the State transportation agency, VTrans. There are also State dollars spent in Chittenden County that are programmed by VTrans, but it is a federal requirement that the CCMPO, in cooperation with VTrans and the Chittenden County Transportation Authority (CCTA), approve the spending obligation of federal transportation funds within the County.

Numerous federal funding programs provide opportunities to build or maintain bicycle and pedestrian facilities and programs. The following is a brief summary of funding categories and eligible types of projects and programs through the Federal Highway Administration, Federal Transit Administration and other federal agencies and departments. More detailed information can be obtained at: www.fhwa.dot.gov/environment/bikeped/BP-Guid.htm#App-2 . It is important to remember that much of the money that VTrans receives has limitations on the types of projects on which it can be spent, but there is some flexibility to transfer money between funding sources.

Federal Highway Administration

*Interstate Maintenance (IM) funds:* IM funds are targeted at maintaining and improving the Interstate Highway System. These funds are programmed directly by VTrans to maintain/improve the interstate highway system in Vermont. There are no specific funds set aside for bicycle or pedestrian facilities but these funds may be used to improve facilities (for example, sidewalks, widen to provide shoulders or bicycle lanes, pedestrian crossings at interchanges, or overpasses) but only if included in the design of "new features" on an existing interstate. This may have specific applicability along I-89 and the Circumferential Highway at existing and/or future interchanges or overpasses.

*National Highway System (NHS) funds.* The NHS is comprised of "urban and rural roads serving major population centers, major travel destinations, international border crossings, and intermodal transportation facilities. The Interstate System is part of the National Highway System." A wide range of pedestrian and bicycle facilities are eligible for NHS funds including shared-use paths within interstate highway right-of-way, bicycle lanes, paved shoulders and sidewalk improvements on major arterial roads that are part of the NHS roadways, as well as underpasses/tunnels or overpasses of NHS roadways. State transportation agencies receive NHS money using a formula set by Congress and typically program these funds directly with concurrence from MPOs, where applicable.

NHS funds may have specific applicability to providing a shared use path along or over the Circumferential Highway or I-89, and adding shoulders or bike lanes to NHS non-access limited roads. In Chittenden County, the NHS primarily consists of the Interstate Highway, US RT 7 south, US RT 2 connecting to the airport, and the Circumferential highway.

*Highway Bridge Replacement funds.* These are funds to rehabilitate or replace highway bridges over waterways, other topographical barriers, other highways or railroads. Bicycle accommodations *shall* be provided on rehabilitated or replaced bridges when bicycles are allowed on the roadway *and* when it can be done at a reasonable cost. In Vermont this partially funds the Town Highway Bridge Program and the Adaptive Use Bridge Program (described in more detail below).

This program may have specific applicability to provide improved on-road bicycle facilities when bridges are rehabilitated or replaced with federal funds.

*Surface Transportation Program (STP).* This is the largest federal transportation funding source that provides VTrans with the flexibility to build a wide variety of transportation facilities (and non-construction projects), including bicycle-pedestrian projects, on any Federal-aid highway including the national highway system, bridges on any public road and transit facilities.

STP funds may have specific applicability by including improved or new bicycle-pedestrian facilities (on and off road facilities, bicycle parking, planning studies, state and local bicycle and pedestrian coordinator positions, spot improvement programs, sidewalks, crosswalks, bicycle and pedestrian signals, parking and other incidental facilities) as part of roadway reconstruction/ rehabilitation/widening and new alignment

roadways. Other programs such as bicycle maps and bicycle-pedestrian promotion/ encouragement programs can be funded with STP money.

Historically VTrans has transferred or "flexed" some of its STP funds for the 'Bicycle and Pedestrian Program' (CCMPO, *Funding Sources for Transportation Projects*, 1999). However, due to the increasing maintenance demands of the existing transportation infrastructure, it will be more difficult to flex money for standalone bicycle and pedestrian projects in the future.

*Transportation Enhancements (TE).* This is a federally mandated program that includes a 10 percent set-aside of VTrans' STP funding to be used specifically on projects that 'enhance' the transportation system through methods that have not traditionally been included in the design and construction of the transportation system. There are twelve eligible activities, three of which include bicycle-pedestrian transportation: provision of facilities for bicyclists and pedestrians; provision of safety and educational activities for pedestrians and bicyclists; and preservation of abandoned railroad corridors (including the conversion and use thereof for pedestrian or bicycle trails).

Transportation Enhancements has specific applicability by being one of the major funding sources nationally for bicycle or pedestrian projects. Projects using TE funds do not need to be located on the Federal-aid Highway System and may be non-construction activities. This program is currently the primary federal source of pedestrian/bicycle project funding. It requires a 20% non-federal match.

*Safety Set-aside.* This also is a 10% set-aside of VTrans' STP funding allotment. The set-aside includes the Railway-Highway Crossing Program and Hazard Elimination Program (HEP). Under the Railway-Highway Crossing program, bicycle safety must be considered when implementing projects. Within the Hazard Elimination Program, bicycle or pedestrian projects can be funded that address a high priority (relative to statewide safety needs) safety problem.

The Safety Set-aside has specific applicability to locations with a high incidence of bicycle and/or pedestrian crashes. VTrans evaluates and funds project proposal locations at the statewide level.

*Congestion Mitigation Air Quality (CMAQ) Funds.* These funds are for projects that reduce congestion, reduce energy consumption and/or improve air quality. States with areas in non-compliance with air quality regulations receive higher amounts of money. All other states, including Vermont, receive a minimum allotment. Eligible projects must be likely to contribute to the attainment of national ambient air quality standards (or the maintenance of such standards where this status has been reached), and eligible activities include pedestrian and bicycle spot improvement programs, bicycle parking, bicycle racks on buses, sidewalks, trails and promotional programs. Vermont has historically allocated these funds exclusively to transit projects.

*Transportation, Community, and System Preservation Program (TCSP).* This is a competitive grant program designed to support exemplary or innovative projects that show how transportation projects and plans, community development, and preservation

activities can be integrated to create communities with a higher quality of life. Bicycling, walking and traffic calming projects are eligible activities.

*Recreational Trails Program.* These funds are administered by the Vermont Department of Forests, Parks & Recreation to plan, maintain, restore and construct primarily recreation, not transportation, trail projects. This funding source may be more suitable for implementing local trails and paths. Projects are competitive Statewide and require a 20 percent local match. State funds are also used to fund this program, but if Federal funds are used projects must be included on the CCMPO TIP.

*National Scenic Byways Program.* This program "recognizes roads having outstanding scenic, historic, cultural, natural, recreational and archeological qualities by designating them as National Scenic Byways or All-American Roads" (*FHWA website*). These projects may include sidewalks, crosswalks, paved shoulders or bicycle lanes, shared-use paths, informational signing, bicycle parking and crosswalks.

In 2003, $143,000 in byways funds was granted to the Chittenden County Regional Planning Commission (CCRPC) for the development of interpretive and directional signage in Charlotte, Shelburne, South Burlington, Essex Junction, Winooski, Burlington, Colchester, and Milton. Some of the non-motorized facilities listed in this plan are also identified in the *Chittenden County – Lake Champlain Byways Corridor Management Plan*, which is available through the CCRPC. Over the past three years, $270,000 has gone to wayside exhibits, signage and the development of interpretative materials.

Bicycle and pedestrian-related projects that are affiliated with a National Scenic Byway, All American Road, or State Scenic Byway are eligible for funding.

*High Priority Projects/Demonstration Projects/Congressional Earmarks.* These are transportation projects with a specific earmark for a specific project. They are inserted into the annual federal transportation appropriation.

Earmarks have specific applicability for bicycle-pedestrian projects for which there is broad public and political support. They are generally more expensive projects that would burden typical funding sources. Projects most likely to be included are bridge projects with bicycle-pedestrian accommodations, bridges for paths, long distance rail trail projects, or high profile path projects.

Other Bicycle and Pedestrian programs supported with Federal funds include:

*CCMPO Sidewalk Program*. The CCMPO offers competitive grants to municipalities in Chittenden County to fund sidewalk design and construction. A 20 percent local match is required, and in its third year, the program makes available $250,000 annually.

*Safe Routes to School Educational Program*. This VTrans administered program offers competitive grants to participating K-8 schools to offer bike and pedestrian education and outreach. Funds are available biennially and no local match is required. Projects must be included on the CCMPO TIP.

*Safe Routes to School Infrastructure Program*. This VTrans administered program offers competitive grants to participating K-8 schools for bike and pedestrian infrastructure. Funds are available biennially and no local match is required. Projects must be included on the CCMPO TIP.

Federal Transit Administration

*Urbanized Area Formula Grants.* These grants to urbanized areas with populations greater than 50,000 are for capital projects that may include "pedestrian and bicycle access to a mass transportation facility" (FHWA website).

### 5.4.2 State Funding

*VTrans Bicycle and Pedestrian Program*. The Bicycle and Pedestrian Program oversees a majority of the pedestrian programs and projects throughout the State. 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. However, the program is no longer accepting new projects.

*Vermont Downtown Program.* A municipality with a Designated Downtown District may apply to the Downtown Development Board (Department of Housing and Community Affairs) for financial assistance to finance eligible transportation-related capital improvements in support of economic development, within or serving the downtown district. Eligible activities include pedestrian and streetscape improvements.

VTrans funding programs include the following:

*Town Highway Grants.* State funding allocation is provided for Class 1, 2 and 3 highway and bridge improvement, maintenance and construction, and bicycle route fund program.

*Town Highway Class 2 Roadway Program*. This program provides state funds (with a local match) to Class 2 town highways for rehabilitation projects.

*VTrans Municipal Park and Ride Program.* This program provides state funds for developing small municipally-owned and maintained park and ride facilities.

*Town Highway Structures Program.* State funds (with a local match) are available for bridge maintenance, preservation or repair of a structure with a span greater than 6' on a Class 1, 2 or 3 town highway.

### 5.4.3 Local Funding

Local matching funds are typically required for the federal and state programs listed above. Other sources of local funds may be:

- General fund revenues programmed into an annual capital improvement program (CIP) that may include an occasional or annual allotment of funds for specific projects or groups of projects including roadway reconstruction/ resurfacing, sidewalks, spot bikeway improvements and paths.
- Local bonds to fund bicycle or pedestrian projects such as paths and sidewalks and are repaid over the life of the bond (e.g., 20 years). South Burlington, Williston, and Shelburne have used bond issues in the past to fund multiple phases of shared use path construction.
- In-kind services such as labor by a public works department or the value of rights-of-way can be used as local match for certain federal funding sources.
- Impact fees, which are charges assessed against development activity that recover some of the cost incurred by local municipalities when they provide public facilities required to serve a new development. This can include sidewalks and bicycle lanes.

### 5.4.4 Private Funding

Private funds and groups are increasingly being asked to construct and maintain paths, sidewalks and support facilities such as bicycle parking.

- Local developers. Developers may voluntarily or by requirement of municipal ordinances provide sidewalks, paths, bicycle parking, showers/lockers, traffic signal improvements and roadway improvements with bicycle accommodations. South Burlington has been very successful at requiring and encouraging developers to reserve rights-of-way for paths and to construct paths as part of development projects.
- Bicycle-Pedestrian/Trails Groups. Many CCMPO municipalities have active advisory groups that raise money or provide labor for the construction and/or maintenance of bicycle-pedestrian facilities.
- Community service projects. Groups such as the Rotary Club, National Guard or Boy Scouts often ‘adopt’ trail projects as a community service and/or training opportunity and provide either funding or labor/equipment.
- Local Motion ACTIVE Fund. This fund was established by Local Motion in 2008 and is an endowment for walking and bicycling initiatives.

## 5.5 Recommended Annual Funding Level for the CCMPO TIP

The 2003 Plan Update recommended that CCMPO program on the order of 3 percent per year on average over the course of each three year funding cycle for standalone bicycle-pedestrian projects. The 3 percent figure was based on the average estimated amount of total Transportation Improvement Program (TIP) funds that would go to standalone bike and pedestrian projects from 2002 to 2004. These estimates were calculated at the start of the three year period and did not reflect all projects that subsequently had federal funds obligated to them during that period.

A review of Federal obligated funds in the TIP, shown in **Table 5.5**, suggests that 3 percent is low based on historical trends. The 10-year average for TIP obligated funds going to standalone bicycle and pedestrian projects was actually 6.6 percent. Based on the historic trend in TIP funds obligated to bicycle and pedestrian projects (which closely follow actual expenditures), this Plan recommends that the CCMPO program on the order of 6 to 7 percent per year on average over the course of each three year funding cycle for standalone bicycle-pedestrian projects.

**Table 5.5: Federal Funds Obligated to Projects on the CCMPO TIP (FY1998-2007)**

| FY | Federal TIP Obligations for Bicycle & Pedestrian Projects | Total Federal Obligations in the TIP | Percent of Total TIP for Bicycle & Pedestrian Projects |
|---|---|---|---|
| FY98 | $150,199 | $19,111,196 | 0.8% |
| FY99 | $1,036,201 | $16,178,793 | 6.4% |
| FY00 | $2,242,011 | $27,802,561 | 8.1% |
| FY01 | $2,365,319 | $26,620,082 | 8.9% |
| FY02 | $4,108,341 | $32,323,171 | 12.7% |
| FY03 | $5,204,882 | $34,286,901 | 15.2% |
| FY04 | $772,509 | $47,842,839 | 1.6% |
| FY05 | $1,784,111 | $49,013,312 | 3.6% |
| FY06 | $1,131,588 | $31,377,816 | 3.6% |
| FY07 | $1,328,819 | $25,933,564 | 5.1% |
| | | 10-Year Average | 6.6% |

Table 5.5 Notes: 1) Figures are Federal funds only and do not include State and/or local match that may be required. 2) Percentages may actually be higher because some projects categorized under *Function and Performance Preservation*, *Bridge Preservation* and *Capacity* include a bike/pedestrian facility component that is not accounted for in the standalone Bike/Pedestrian category. 3) The percent of obligated funds that went to bicycle and pedestrian projects in fiscal years 2002 and 2003 was exceptionally high due to the construction of the Winooski River Bridge on the Burlington Bike Path. The percent of obligated funds that went to bicycle and pedestrian projects in FY 1998 and 2004 were exceptionally low. If the high and low years are excluded the average is approximately 5.9 percent annually which is close to the recommended level. Since this Plan recommends that a number of critical crossings are built to complete the regional network large projects similar to the Winooski River Bridge will be necessary in the future. For this reason the Plan uses the full 10-year average.

Source: CCMPO TIP Fiscal Years 1998-2007 Summary Report. March, 2008.

The annual average of funds going to bicycle and pedestrian projects may be higher still if other roadway and bridge improvement projects that include a bicycle-pedestrian component were included. It is difficult to quantify how much of the funding for those projects are specifically set aside for the bicycle-pedestrian component. This data limitation makes it impractical to recommend a percentage of annual funding that should go to projects with bicycle-pedestrian components. Instead, these projects should be recognized and deliberate action should be taken to ensure that they are carried out and the bicycle-pedestrian component is not eliminated.

## *5.6 Implementation Strategies*

Key strategies that will maximize the implementation of the Plan and make the most effective use of transportation funds and opportunities are:

**Facility Placement**

1. Work to make every street bicycle and pedestrian compatible to the extent practicable, where bicycling and walking are not specifically prohibited.

2. Give highest construction and planning fund priority to inter-municipal on-road and shared-use path projects that overcome barriers, address critical crossing needs and fit into or connect with regional or local systems.

3. Give priority to projects that provide on-road and shared-use path and sidewalk connections between Town Centers, designated Growth Areas, and other regional destinations.

4. Ensure that bicyclists and pedestrians are accommodated in every transportation project such as roadway reconstruction/rehabilitation, bridge rehabilitation/replacement, development of intermodal centers, and design of transit services.

**Facility Design**

1. Use the VTrans Pedestrian and Bicycle Facility Planning and Design Manual guidelines for projects receiving funding through the CCMPO.

2. Encourage flexibility in the application of design standards and guidelines as long as safety concerns are not compromised.

3. Design with the appropriate level of anticipated demand for the facility and for the skill level of expected users.

4. Design with maintenance and life-cycle costs in mind through material choice and construction methods.

**Education, Encouragement & Enforcement**

1. Develop and implement a multi-faceted approach to education related to bicycle and pedestrian issues, focusing on safe operation and sharing the road.

2. Advocate for the funding and implementation of Education, Encouragement, and Promotion activities.

3. Work with local police departments to encourage the enforcement of motor vehicle laws and laws governing bicyclists and pedestrians.

4. Work with local, regional and statewide partners to improve the accident reporting system related to bicycling and walking.

5. Support the growth and maintenance of Safe Routes to Schools (SRTS) efforts.

6. Create a user-friendly bicycle map of the CCMPO region.

7. Review municipal plans for pedestrian and bicycle content during CCRPC's local plan review process.

8. Educate local recreation path committees and other interested groups on the content and intent of this plan.

**Funding**

1. Encourage developer funded bicycle and pedestrian accommodations since they are an essential part of all commercial and residential developments/redevelopments.

2. Ensure that full consideration of bicycle-pedestrian facilities is provided in the use of all federal transportation funds by the CCMPO, as required by federal law. This means including these facilities, where practicable and feasible, in all traditional roadway projects.

3. Develop an innovative mix of local funds to implement bicycle and pedestrian facilities.

4. Expand the use of state and federal funding for bicycle and pedestrian projects by publicizing the flexible use of funds for standalone bicycle-pedestrian projects and for including bicycle-pedestrian facilities in traditional road and bridge projects.

5. Maximize the use of private funding through the use of developer exactions, impact fees, or other private fundraising efforts.

6. Program 6 to 7 percent of funds per year in the CCMPO TIP, on a three year average, for standalone bicycle-pedestrian projects.

7. Work to increase the number of funding programs available and diversify existing programs for use in maintaining shared use paths, on-road bicycle facilities and sidewalks through a working group consisting of municipal representatives.

**Measuring Progress**

1. It is recommended that the CCMPO adopt a series of bicycling and pedestrian-related performance measures. Specific data collection efforts should be incorporated into the CCMPO's annual work plan so that responsibility for obtaining the data will be assigned to appropriate staff.

2. The CCRPC should maintain the GIS database of the regional bicycle and pedestrian network between plan years as the data becomes available. As additional segments of the bicycle and pedestrian network are built or designated they should be entered into the CCRPC's GIS database as "existing" and be marked with the year they were built or designated.

***Bicycle Parking in Downtown Burlington***

## 5.7 Performance Measures

Performance measures are tools to monitor progress toward the goals stated in this Plan over time. Performance measures are typically quantitative in nature; baseline information is collected and then the data is tracked through time at specified intervals to monitor progress.

For performance measures to be useful they should:

- Be relevant to the goals stated in this plan
- Be easily understood and measured
- Be measurable from data that has been collected and is available
- Be collected at least every 5 years
- Assign the agency responsible for gathering the data

Fulfilling these criteria will make the performance measures easy to collect and use, and ensure that they are appropriate.

The performance measures recommended in the 2003 Plan Update provided little monitoring capability because they were confusing and responsibility to track the measures was not assigned. Recognizing these difficulties, the performance measures have been refined so that they will be easier to implement. **Table 5.8** summarizes each of the five goals and recommends performance measures that can be used to track progress towards each one. The measures were designed based on data that is already available and performance measures that are used in the VTrans *Vermont Pedestrian and Bicycle Policy Plan*. Table 4 also lists the source of the data and how often the data should be collected. The CCMPO should incorporate these data collection efforts into the organization's annual work plan so that responsibility for obtaining the data will be assigned to appropriate staff.

It should be recognized that no one performance measure by itself will determine the success of this Plan. The performance measures must be examined together to fully assess progress. For instance, if the total mileage of bicycle and pedestrian facilities were to increase dramatically, but the number of users walking and bicycling remained the same or even declined, that would signify that there is an issue somewhere in the system that needs to be addressed.

## Table 5.7: Recommended Performance Measures

| Goal | Performance Measures | Source and Responsible Party | Data Collection Cycle |
|---|---|---|---|
| #1: Continue to Build and Enhance the Regional Network of Bicycle and Pedestrian Facilities | Miles of non-motorized facilities (on-road, shared-use, and sidewalk facilities) | CCMPO - inventory | every 5 years |
| | Percent of TIP allocated to bicycle/pedestrian projects | CCMPO | annually |
| | Percent Change in the number of non-Enhancement and Bicycle and Pedestrian projects that include accommodations for bicyclists and pedestrians | CCMPO | annually |
| | Number of connections between Town Centers/Growth Areas (via on-road, shared-use, and sidewalk facilities) | CCMPO - monitoring | biannually |
| #2: Continue to Make Bicycling and Walking Safer Throughout the CCMPO Region | Number and severity of police-reported bicycle crashes | Police | biannually |
| | Number and severity of police-reported pedestrian crashes | Police | biannually |
| | Total number of students participating in bicycling or walking education and safety programs | Local Motion | annually |
| | Number of law enforcement officers receiving bicycle and pedestrian rights and responsibilities training | CCMPO survey | biannually |
| | Municipal expenditures on bike/pedestrian maintenance activities | Municipalities | biannually |
| #3: Ensure Facilities are Appropriately Planned and Designed | Ratio of designated on-road miles (Type A Bicyclist appropriate) to shared-use miles (Type B and C Bicyclist appropriate) | CCMPO - inventory | every 5 years |
| | Percent of major destinations that are bicycle and pedestrian accessible | Municipalities & CCRPC | every 5 years |
| #4: Enhance Community and Regional Acceptance of Bicycling and Walking as Transportation Modes | Share of work commute trips made by walking, bicycling, or 'other modes' out of all work commute trips | American Community Survey* | Annually or biannually |
| | Change in percent of all workers who commute to work by walking or bicycling | American Community Survey* | biannually |
| | Number of bicycle boardings on CCTA | CCTA | annually |
| | User satisfaction with bicycle/pedestrian facilities | MTP survey | every 5 years |
| | Changes in walking and bicycling to and from school for Safe Routes to School program participating schools | Local Motion | annually |
| | Changes in walking and bicycling participation from Way to Go! Week | CCMPO and Way to Go! partners | annually |
| | Bicycle and pedestrian use of shared use paths and other bike/pedestrian facilities | CCMPO and VTrans counts | annually |
| #5: Enhance Environmental Protection, Economic Vitality, and Healthy Lifestyle Efforts | To measure economic and environmental benefits of investments in pedestrian and bicycle projects and programs, the *Vermont Pedestrian and Bicycle Policy Plan* states that these indicators would be measured through a special study. It is recommended that CCMPO partner with VTrans on completing this study. Healthy Lifestyles can be tracked through usage numbers. | | |
| Goal #6: Educate the Public and the Business Community on the Benefits of Bicycling & Walking | Number of programs listed in the continuing, near-term, and long-term education and encouragement program that have been implemented | Primary agency operating program | annually |

* The American Community Survey is performed annually by the US Census Bureau. Detailed data tables are available to show communities how they change year to year. There is data for Chittenden County that could be used to track community indicators in the years between each full Census, the next of which will be completed in 2010.

## 5.8 Timeline and Funding Priorities

Section 5.3, Estimated Costs for the Recommended Network, estimates that the cost to implement the recommended regional shared use path and on-road bicycle networks is more than $500 million. This total far exceeds the recommended minimum twenty year spending total for standalone bicycle and pedestrian projects. This amount is approximately $40 million at $2 million per year if 6 to 7 percent of the Federal TIP funds are designated for bicycle and pedestrian projects as recommended in this Plan. As discussed previously, a combination of funding and implementation strategies will be needed to construct all these facilities.

The timeline below places emphasis on the near-term. The focus of this time period should be on increasing the effectiveness of existing paths and on-road bicycle facilities by filling gaps in the network.

**Near-term (0-5 years)**

1. Focus Shared Use Path implementation efforts on filling high priority gaps in the existing shared use path network. Priorities include:
    - Allocating funds for two major river crossings over the Winooski River between Burlington and Winooski.
    - Funding shared use path projects that complete missing sections between existing paths identified in the regional network, including: The Muddy Brook Path between South Burlington and Williston, Champlain Path along the rail corridor from Burlington south to Charlotte, VT RT 15 Corridor path segments linking Essex to Winooski and out to Jericho, and the Cross Vermont Trail segments between Richmond and Williston.

2. Roadway projects will be planned, designed and constructed under the assumption that they will be used by pedestrians and bicyclists (except where specifically prohibited such as on limited access highways).

3. Allocate some portion of planning and TIP funds to safety, education and promotion projects such as Safe Routes to School, pedestrian and bicycle safety, bicycle and pedestrian maps, and signage and roadway marking programs.

4. Continue supporting the CCMPO sidewalk program and increase funding as appropriate.

5. Roadway paving projects on facilities designated as part of this plan's On-Road network will mark, as appropriate, safe shoulder widths for pedestrians and bicyclists.

6. Implement the highest priority bicycle and pedestrian elements of the Lake Champlain Bikeways program including low cost route improvements, maps and route signage.

7. For the critical crossings identified in this plan, design and implement safe pedestrian and bicycle facilities whenever these are scheduled for repair, rehabilitation or replacement.

**Long-term (6 or more years in future)**

1. Continue to ensure that bicycle and pedestrian components (sidewalks, pedestrian signals, on-road bicycle facilities, paths or reserved rights of way for paths) are included in all roadway and bridge projects, except where prohibited by law.

2. Work outwards from established population and employment centers when prioritizing shared use path projects to ensure that funded projects make regional connections.

3. Continue support and funding of the near term recommendations cited above.

***Bicycle Lane and Pedestrian Crosswalk in Burlington***