



*Communities working together to
meet Chittenden County's transportation needs*

CHITTENDEN COUNTY METROPOLITAN PLANNING ORGANIZATION

Regional Indicators: Measuring Our Progress Toward Chittenden County's 20-Year Transportation Goals

Year 2025 Metropolitan Transportation Plan Update Working Paper #1

**September 12, 2000
Staff Report**

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Dear Chittenden County Resident:

This report, "Regional Indicators: Measuring Our Progress Toward Chittenden County's 20-Year Transportation Goals," represents the development of a new and important tool for our region's residents to use to better understand where the region has been and where we might be going. With the establishment of standard regional indicators, we can more readily see where we're making headway toward long-term goals, where we need to strengthen our efforts, and, perhaps, where we need to rethink goals or approaches to meeting them. Further, the picture of our region given in this report is an important foundation for the pending update of Chittenden County's long-range Metropolitan Transportation Plan (MTP), due in early 2002.

The CCMPO intends to update and issue this report on a regular basis to assist our region's decision-makers and residents in making the important transportation and growth choices that face us.

Joseph Segale, CCMPO Principal Planner, acted as project manager on this report, and staff members Peter Keating, Christine Forde, David Roberts, and Bernadette Ferenc all contributed expertise and information. Questions regarding the report should be directed to Mr. Segale at 802/660-4071, ext. 14 or jsegale@ccmpo.org.

On behalf of the CCMPO, I thank you for your interest in this report and the region's future. It is concerned people like you that make our transportation planning process work.

Sincerely,

Peter E. Plumeau
Executive Director

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The preparation of this document has been financed through transportation planning funds provided by the U.S. Department of Transportation under the Transportation Equity Act for the 21st Century (TEA-21) and by matching funds provided by Chittenden County’s 18 municipalities, the Vermont Agency of Transportation, and the Chittenden County Transportation Authority.

Executive Summary

In 1997, the CCMPO adopted “A Twenty-year Vision for Transportation in Chittenden County,” the long-range transportation plan (LRTP) for the greater Burlington region. The LRTP set forth a vision for the region that was founded on preserving the existing transportation system, using the existing system more efficiently, increasing use of walking, biking and transit, closely linking transportation and land use planning and development and completing key highway system facilities.

The LRTP presented a blueprint for future transportation facilities and related community development under the broad umbrella of regional goals in four key areas:

- Project Selection & Participation
- Make the Land Use-Transportation Connection
- Smarter Mobility
- Be a Change Agent

This report, *Regional Indicators: Measuring Our Progress Toward Chittenden County’s 20-Year Transportation Goals*, reviews the 1997 long-range transportation plan by evaluating progress towards satisfying the 19 sub-goals falling under the key areas above. For each of the 19 sub-goals, progress is gauged based on an assessment of specific measures and actions. A Progress Indicator describes whether the trend has been positive (+), negative (-) or mixed (+/-). Progress indicators are discussed and summarized by the general planning area as part of this executive summary. Detailed assessments on the progress for each sub-goal are provided in the body of this report. A Summary section completes this report which includes an overall assessment of what we have learned to date from this process and observations for further consideration. It also highlights issues and opportunities for consideration in the 2025 Metropolitan Transportation Plan, an update of the 1997 LRTP, currently under development.

Progress by Planning Area

Progress has either been mixed or mostly positive when summarized for each of the four key planning goals. A summary report card is presented on page 5 listing the progress indicator for each sub-goal within each planning area.

On Project Selection and Participation Goal: *Ensure our limited financial resources are used in the most cost-effective manner.*

(+) Progress has been mostly positive due to local, CCMPO, VTrans and FHWA cooperation, extensive public participation outreach efforts, and the annual development of balanced and multi-modal Transportation Improvement Programs. Improvement in travel time and travel cost have also been realized, due more to land use changes than investments in transportation projects or services.

On Smarter Mobility Goal: *Ensure the mobility of people and goods by implementing systematic maintenance programs, and transit capacity improvements. Congestion management programs*

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designed exclusively to increase highway capacity for single-occupancy vehicles should be undertaken only when no better alternative can be found.

(+/-) Progress has been mixed. Congestion continues to grow faster than vehicle miles of travel and population growth, only about 1/3 of the County's transportation safety problems have been addressed, the functional integrity of highway arterials continues to be compromised by poor access management and, with a few exceptions, efforts at improving system efficiency are not being pursued. A positive and important trend is stabilization in the structural condition of highways and bridges. However, since data are not available for other modes, it is difficult to determine if the entire transportation system's physical condition is also remaining stable.

On Make the Land Use-Transportation Connection Goal: *Use investment in transportation infrastructure to improve the economic and environmental sustainability of the region by supporting existing and planned growth centers.*

(+/-) Progress has been mixed. Transportation investments have been made that support land use goals but development patterns continue in a manner that does not support the transportation system proposed in the 1997 LRTP. Over 60% of federal transportation funds have been obligated for projects that preserve or improve access to and within growth centers. Funding continues for projects that further improve livability and access to and within growth centers such as intermodal facilities, passenger rail, transit and sidewalks. The CCMPO is funding the development of projects that will further enhance livability through its TLC program. The ability of the transportation system recommended in the 1997 LRTP to improve the economic and environmental sustainability of the region depends on a mix of new development locating in growth centers. However, between 1993 and 1998 only 35% of new households and 50% of new jobs located in growth centers. Furthermore, the jobs to household ratio within growth centers, which has remained at approximately 3 jobs per household, suggests that development within growth centers has not been mixed. This imbalance means where people live is separated from jobs and services. As a result, congestion is spreading and the ability of transit, walking and biking to meet day to day transportation needs is limited.

On Be a Change Agent Goal: *Decrease automobile and truck dependency by offering sustainable transportation alternatives.*

(+) Progress has been mostly positive. Although the automobile continues to attract the largest share of the travel demand market, substantial efforts have been made at expanding and improving other travel choices. There has been progress made in both planning and constructing non-motorized paths. The CCMPO is leading efforts at redefining, expanding and funding the County's transit system addressing both fixed route bus service and passenger rail. Community needs and character are now incorporated into every project through extensive public involvement in the scoping process. One negative trend, as noted above, is the continued separation of housing, services and jobs which places transit, walking and biking at a competitive disadvantage to the automobile. It took decades for automobile use to reach its current level. It will take time and a continued commitment to expand transit, non-motorized facilities and mixed-use, walkable communities before automobile dependency is significantly reduced.

Summary Report Card

Goal 1: Project Selection and Participation. Ensure our limited financial resources are used in the most cost-effective manner

Sub-Goal	Description	Indicator
1-A	Ensure high level of local, state & citizen corporation	+
1-B	Ensure balanced financing among modes	+
1-C	Promote public involvement	+
1-D	Minimize cost of transporting people and goods	+
1-E	Utilize financial resources for maintenance & modernization of existing system; include alternative modes	+

GOAL 2: Smarter Mobility. Ensure the mobility of people and goods by implementing systematic maintenance programs, and transit capacity improvements. Congestion management programs designed exclusively to increase highway capacity for single-occupancy vehicles should be undertaken only when no better alternative can be found.

Sub-Goal	Description	Indicator
2-A	Relieve congestion, manage access, preserve functional integrity	-
2-B	Maintain existing facilities, meet demand by utilizing existing more efficiently	+/-
2-C	Ensure safety & security of transportation system users	-
2-D	Use management systems to improve mobility	+/-
2-E	Analyze multi-modal needs on corridor and sub-area basis	+

GOAL 3: Make the Land Use-Transportation Connection. Use investment in transportation infrastructure to improve the economic and environmental sustainability of the region by supporting existing and planned growth centers.

Sub-Goal	Description	Indicator
3-A	Create balanced, integrated, safe, accessible and energy efficient system	+/-
3-B	Support growth centers, recreational sites and provide intermodal connections	+/-
3-C	Support economic vitality, foster private sector participation in funding	+/-
3-D	Integrate public transportation and land use	-

GOAL 4: Be A Change Agent. Decrease automobile and truck dependency by offering sustainable transportation alternatives.

Sub-Goal	Description	Indicator
4-A	Establish regional, multi-purpose non-motorized path system	+/-
4-B	Integrate transportation facilities with community fabric	+
4-C	Promote higher utilization of rail corridors	+
4-D	Make transportation accessible to the elderly and the disabled	+
4-E	Use enhancement program to improve the natural and built environments	+/-

Key: + = positive trend/progress

- = negative trend/progress

+/- = mixed trend/progress

Introduction

The purpose of this report is to evaluate progress made toward satisfying the goals contained in the 1997 Long Range Transportation Plan (LRTP) for Chittenden County. The LRTP, "A Twenty-year Vision for Transportation in Chittenden County," was adopted by the CCMPO in 1997 and set forth a vision for the region that was founded on preserving the existing transportation system, using the existing system more efficiently, increasing use of walking, biking and transit, closely linking transportation and land use planning and development and completing key highway system facilities.

The LRTP presented a blueprint for future transportation facilities and related community development under the broad umbrella of regional goals in four key areas:

- Project Selection & Participation
- Make the Land Use-Transportation Connection
- Smarter Mobility
- Be a Change Agent

These broad regional goals are further supported by 19 sub-goals. Progress towards each sub-goal is evaluated below based on specific transportation system measurements, when available and appropriate, and related planning, policy and implementation actions. A Progress Indicator describes whether the trend has been positive (+), negative (-) or mixed (+/-). The 19 Progress Indicators presented in this report are the starting point in an ongoing assessment of regional goals and policies. Like the four 1997 Plan goal areas, these measures should not be viewed in isolation, but as a part of a dynamic system that sheds light upon areas of relative progress and need. One indicator cannot accurately describe "how we are doing;" however, the entire series of Progress Indicators allows for a broad region-wide assessment of progress.

Methodology: Selecting Meaningful Indicators

The measurements and actions presented here relate directly to the goals and sub-goals adopted as part of the 1997 LRTP. The overriding objective was to meaningfully reflect the region's progress toward LRTP goals with a set of indicators that are:

- ***Outcome-based.*** The measurements and actions focus on the results or outcomes of policies rather than only reporting inputs such as dollars or labor hours invested.
- ***Regional in geographic scope.*** With very few exceptions, indicators report results for all of Chittenden County.
- ***Measurable over the long term.*** In order to analyze trends, CCMPO relied on data series that have at least four or five years of historic data and that have a reasonably strong likelihood of continued availability in years to come.
- ***Publicly available data sources.*** Due to the high cost of data collection and the need for consistent and continuing reporting, CCMPO relied on existing public sources for the vast majority of indicators .

Data Limitations and Other Caveats

In order to keep the report understandable and accessible to the widest possible audience, the CCMPO limited the use of highly technical indicators that would have been of interest to only a small number of specialists in a particular discipline. (Technical information is available upon request from the CCMPO by calling 802/660-4071 x10 or via our web site at www.ccmppo.org.) Where necessary, additional explanation on the methods and data used is presented in Appendix A.

Several caveats are in order for interpreting the data presented in this report. The single largest challenge to developing meaningful regional indicators is that relatively little data is collected at the regional level. Federal, state, and local governments collect data for their own geographies and often use methodologies that are not directly transferable to other parts of the region.

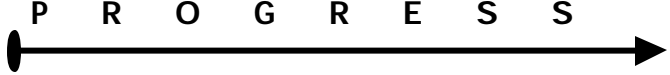
Use of U.S. Census data also posed a dilemma. On the one hand, the decennial Census is an extensive data set that provides consistent and detailed coverage across the region. On the other hand, the Census is taken once every ten years and at this stage of the decade, even the most recent Census (1990) is dated. As a result, CCMPO attempted to collect more recent data from non-Census sources wherever possible. In some cases, national and state data were used to draw conclusions about the situation in Chittenden County.

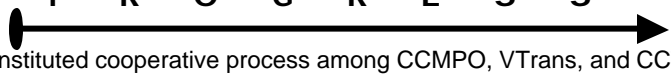
It is important to recognize that some goals lend themselves more easily to quantification than others. Concepts like "community character" and a "sustainable environment" may be harder to calculate than changes in traffic counts or number of structurally deficient bridges. The fact that they are harder to quantify does not mean that they are less important. Other goals such as air and water quality, while measurable, may be hard to reduce to a single, easily understandable number. It must also be noted that the CCMPO transportation plan is somewhat limited in its scope, and did not address other issues of great importance to the region such as the quality of education, health care, or crime.

L RTP Sub-Goal Progress Evaluation

This section presents a detailed evaluation of progress made toward each sub-goal in a table format. The table states the sub-goal and contains sections under the headings of "Progress", "Assessment Summary", and "Recommendations". A combination of quantifiable regional measurements, based on data available sometime before the L RTP was started and now, and examples of relevant decisions, planning work, engineering work and projects or services delivered are presented under the "Progress" heading. . The "Assessment Summary" justifies a progress indicator by discussing whether or not the measurements and actions listed, when considered together, generally support the intent of the sub-goal. The progress "Indicator" is a qualitative assessment of whether the trend has been positive (+), negative (-) or mixed (+/-). "Recommendations" for improving or maintaining progress towards the sub-goal are also presented.

GOAL 1: PROJECT SELECTION & PARTICIPATION
Ensure our limited financial resources are used in the most cost-effective manner

<p><u>Sub-Goal 1a:</u></p> <p><i>Ensure high level of local, state and citizen interaction and cooperation in project development, financing, design and implementation.</i></p> <p>Assessment: There are numerous opportunities for public participation in the process and a continuing and cooperative relationship with local and state entities.</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;"> <p>Indicator: †</p> </div> <p>Recommendations: Minor modifications should be considered to strengthen & facilitate additional meaningful public participation; to strengthen CCMPO ability to ensure implementation of regional priorities</p>	<div style="text-align: center; margin-bottom: 10px;"> <p>P R O G R E S S</p>  </div> <ul style="list-style-type: none"> • CCMPO working cooperatively with VTrans and CCTA on planning, investment, and project development tasks under an umbrella MOU that puts forth organizational roles and responsibilities • All CCMPO meetings are public sessions, rotated around region to facilitate public access, and CCMPO meetings and special events are taped and televised on Government Access Cable TV throughout region. • Scoping/project development process includes ongoing public involvement elements, including local concerns and alternatives presentation meetings • Major documents/reports, such as TIP, re-created to be more user-friendly and layperson-oriented. • CCMPO Web site established, including regularly updated meeting notices, publication lists, contact information, and downloadable documents • CCMPO newsletter – <i>Chittenden Transportation Quarterly</i> – distributed throughout region and available via web site. <i>Chittenden ITS Update</i> also distributed to interested parties around region and via web site • Major MPO documents – UPWP & TIP – as well as major amendments to those documents developed via public hearings and comment processes • Major planning efforts, such as Burlington-Essex Rail Study, include multiple public involvement events and opportunities, structured to be accessible in terms of both location and time of day (e.g., at multiple locations after working hours). • Co-hosted with VTrans public forum on statewide transportation investment priorities in June 1998.
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<p><u>Sub-Goal 1b:</u></p> <p><i>Work with state and federal entities to ensure balanced financing of all transportation modes</i></p> <p>Assessment: CCMPO is working cooperatively with local and state officials to develop the annual TIP. Funding is being directed to all modes with a balance approaching the targets established in the 1997 LRTP.</p>	<div style="text-align: center; margin-bottom: 10px;"> <p>P R O G R E S S</p>  </div> <ul style="list-style-type: none"> • Instituted cooperative process among CCMPO, VTrans, and CCTA to develop annual update of TIP • Annual TIP update process now includes assessment of TIP program against adopted 1997 LRTP goals which define balance financing among modes. • CCMPO is leading the regional effort to develop sustainable structure for adequately funding transit operations throughout County • Goals of current LRTP are key underpinning of annual work program
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Indicator: †

Recommendations: Minor modifications should be considered to (1) give region more options and flexibility for funding transportation needs, particularly non-highway modes and (2) more closely and aggressively tie prioritization and programming of projects in the UPWP and TIP to MTP goals.

and funding of planning efforts

- Developed, but not yet implemented, TIP project prioritization system tied directly to financing targets in the 1997 LRTP.
- Prioritizing planning assistance and project definition tasks based partly on relationship to goals of the 1997 LRTP.
- Federal funds have been obligated nearly consistent with the targets established by the 1997 LRTP as indicated in the **Table 1**.

	Bike, Ped & Multi-Modal	Capacity	Preservation	Transit	Other	Total
Actual Funds Obligated (Millions)	\$4.30	\$22.08	\$33.62	\$15.55	\$0.79	\$76.34
Actual % of Total	5.6%	28.9%	44.0%	20.4%	1.0%	100.0%
1997 LRTP Targets	6%	25%	58%	11%	0%	100.0%

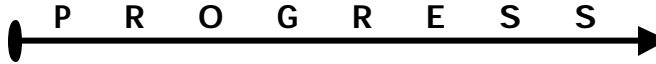
TABLE 1. Actual Funding Obligations Compared to 1997 LRTP Funding Targets

Sub-Goal 1c: Promote public involvement in all phases of transportation planning and development. Reach out to those traditionally excluded from transportation decision making (elderly, disabled, low income)

Assessment: The CCMPO is doing an excellent job bringing the traditional stakeholders to the table and providing frequent and accessible opportunities for public participation. Keeping the non-traditional interest groups involved is challenging because the process has a steep learning curve and the topics discussed may not always be seen as relevant.

Indicator: †

Recommendations: Continue efforts directed at the general public. Provide training for new Board and TAC members. Help non-traditional representatives identify and bring their important issues to the TAC and CCMPO.



- Sub-Goal 1A documents CCMPO's public involvement efforts.
- The Elderly and Disabled communities have voting representatives on the CCMPO Technical Advisory Committee. Both these positions are currently filled.
- The CCMPO is currently working on an Access to Jobs Plan. The primary purpose of the plan is to develop transportation strategies that connect low income people and people receiving Temporary Aid to Needy Families (formally known as "welfare") with jobs. The CCMPO has worked with SSTA and other social service agencies to bring the target population into the process through public meetings.

Sub-Goal 1d:

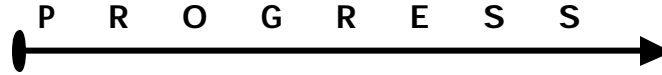
Minimize the cost in time and money for transporting people and goods in the region.

Assessment: Changes in land use, rather than changes in the transportation system, have resulted in a decrease in both the time and unit operating cost of the transportation system. Providing jobs and services outside of the urban core has resulted in decreased vehicle trip distances, which in turn directly affect average travel time, average delay and average cost per person trip. The decrease in travel time has apparently offset the delay caused by increases in congestion. Although congestion has increased in the County (by almost 40% between 1993 and 1998), congested VMT still only accounts for 10% of the total VMT in the County. Most of the congestion is located around the traditional and new growth areas providing jobs and services.

Although walking, biking and transit account for only 3% of the travel demand in the county, their unit cost are low enough to drop the entire unit cost of travel in the county.

Indicator: †

Recommendation: Progress has been positive due to a decrease in vehicle trip distances. The trend towards reduced travel time and costs could be built upon by increasing use of existing transit services, expanding transit to new growth areas, and by providing pedestrian and bicycle facilities. As demonstrated in Table 2, transit, walking and biking offer a lower unit cost per person trip than auto travel. Minor shifts from auto travel to these other modes could help maintain the trend towards minimizing travel costs. Providing these other travel choices will also help offset any losses in vehicle travel time as congestion continues to rise, especially in the outlying growth centers.



- The average travel time per person trip in the PM peak hour has improved slightly from 12.9 minutes in 1993 to 12.5 minutes in 1998. The average travel time per person trip accounts for trips made by vehicle, transit and walk/bike and was estimated using output from the Regional Transportation Model. The average travel time per person trip is heavily influenced by the average vehicle trip travel time which decreased from 12.99 minutes in 1993 to 12.54 minutes in 1998.
- Total vehicle delay during the PM peak hour, which is equal to the difference in travel time between all vehicle trips made on an uncongested network and all trips made under existing travel conditions, increased from 120,654 minutes in 1993 to 126,654 minutes in 1998. Total delay increased because there are more trips being made. Average delay per vehicle trip, however, decreased from 2.3 minutes in 1993 to 2.1 minutes in 1998.
- The decreases in average travel time and delay per person trip are explained by a decrease in average vehicle trip distance, for all trip purposes, from 6.6 miles in 1993 to 6.3 miles in 1998. Between 1993 and 1998 more jobs and services have located in the sub-regional growth centers (see Map B-2, Appendix B) such as Taft Corners, Essex Town, Exit 16 and Shelburne Road and beyond. As a result, people may not be travelling as far to satisfy daily needs and may also be more efficiently combining trips, for example, stopping to shop on the way home from work.
- Between 1993 and 1998 the average transit trip travel time increased from 20.7 minutes to 22.6 minutes. The current transit system runs along the most congested routes in the County. While people driving have the opportunity to find alternative routes, fixed route bus service must continue to travel along congested arterials.
- When adjusted for inflation, the total annual operating cost of the transportation system increased by 13% between 1993 and 1998. This increase is in line with the estimated increase in total VMT. However, the cost per person trip has remained stable, even dropping slightly from \$3.10 to \$3.04 per person trip. The public and private costs of automobile travel account for more than 99% of the total operating costs of the transportation system. Both the total and unit operating costs of travel are greatly affected by the amount and average length of vehicle trips. As described above, since the average vehicle trip distance has decreased, the unit cost of travel has decreased as well.

Annual Costs (\$1,000/Yr.)	1993	1998
Auto Costs	\$ 735,643.2	\$ 832,733.4
Transit/Paratransit Cost	\$ 2,942.6	\$ 3,525.7
Walk/Bike	\$ 103.6	\$ 100.2
All Modes	\$ 738,689.4	\$ 836,359.2

Cost Per Person Trip	1993	1998
Auto	\$ 3.15	\$ 3.09
Transit	\$ 1.95	\$ 2.25
Walk/Bike	\$ 0.02	\$ 0.02
All Modes	\$ 3.10	\$ 3.04

TABLE 2. Private and Public Operating Costs of the Chittenden County Transportation System (1997 Dollars)

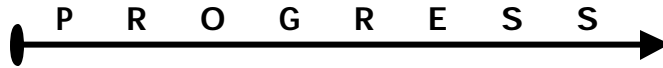
Sub-goal 1e:

Secure and efficiently utilize financial resources for the maintenance and modernization of existing facilities and for system expansion to include alternative modes

Assessment: Although the investment in system preservation has been less than the 60% target in the LRTP, many projects have been completed and the system's condition is stable (see goal 2B). Acceptable progress has been made incorporating bike, pedestrian and transit improvements with highway projects.

Indicator: †

Recommendations: Separate the system preservation goal from the goal to incorporate alternative modes. Quantify the true costs of system preservation. Continue to incorporate bicycle, pedestrian and transit facilities and amenities in highway projects.



- Between 1995 and 1999, \$33.6 million of federal funds have been obligated for system maintenance and modernization projects. This investment constitutes 44% of the total federal funds obligated in Chittenden County and is less than the 60% target set in the LRTP.
- Actual investment in system preservation fell short of the target recommended in the 1997 LRTP. However, that target is based on system preservation investment levels used in other areas rather than a quantitative assessment of needs in Chittenden County.
- A total of 107 projects received federal fund obligations from 1995 to 1999 in Chittenden County. Of these projects, 20 were bridge preservation and 52 were function and performance preservation projects. Therefore, 72, or 67%, of the projects are related to preserving the existing system.
- Each year, the TIP programs approximately \$400,000 for the following regional system preservation programs: bridge inspection, Town Highway Bridge Program, culvert repair, guardrail maintenance, and pavement markings.
- It is common practice to include pedestrian, bicycle and transit amenities in roadway and bridge projects where appropriate. Of the nine non-interstate bridge projects, eight included facilities for bicycles and/or pedestrians. Three of the eight capacity projects, Burlington's Main Street, Shelburne Road and Kennedy Drive, include bike lanes, sidewalks and bus pullouts. Of the 52 roadway and intersection improvement projects, 11 specifically included bicycle and pedestrian improvements. Twenty-one of these projects were highway resurfacing which often result in increased shoulder width used by bicyclists.

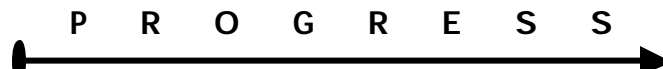
GOAL 2: SMARTER MOBILITY

Ensure the mobility of people and goods by implementing systematic maintenance programs, and transit capacity improvements. Congestion management programs designed exclusively to increase highway capacity for single-occupancy vehicles should be undertaken only when no better alternative can be found.

Sub-Goal 2a:

Relieve existing congestion and prevent future congestion; manage access to roadside development and coordinate signals in major corridors; preserve and maintain the functional integrity of streets and major roads.

Assessment: Efforts to improve the system's operation and efficiency and to maintain functional integrity of specific system components, have been sporadic and uncoordinated. Most efforts are still



- Congestion is growing faster than population or employment. From 1993 to 1998, County population grew by 5% and employment grew 12%.
- (Using a method developed by the Texas Transportation Institute (TTI), described in Appendix A, which measures congestion on principal arterials and freeways) between 1993 and 1998 in Chittenden County
 - Moderate congestion increased 74%,
 - Heavy to extreme congestion increased by 27%, while
 - Vehicle miles of travel (VMT) on freeways and principal arterials increased by 7%.

in the planning phase. This lack of progress has contributed, at least partially, to the increases in congestion.

Indicator: (-)

Recommendations: Consider a county-wide access management strategy, complete the county-wide traffic signal update plan and implement ITS projects to help slow the growth of congestion.

- (Based on output from the Regional Transportation Model, which includes additional arterials and local streets not covered by the TTI methodology) congested VMT increased by approximately 40% during the PM peak hour. Percent of congested VMT relative to total VMT increased from 8% in 1993 to 10% in 1998.
- Between 1993 and 1998, 120 access permits were issued to commercial establishments along state system highways in Chittenden County. As indicated on Map B-3 in Appendix B, many of these access permits were granted along congested arterials.
- Through its Technical Assistance program, the CCMPO provided updated timing plans for all of Essex Junction's traffic signals and updated the timing plan for the intersection of US 7 with Harbor and Falls Road in Shelburne.
- A county-wide traffic signal timing update plan will be conducted by the CCMPO as part of its 2001 work program. The purpose of that plan is to develop a schedule and cost estimate for re-timing traffic signals on a corridor by corridor basis. The goal is to establish an annual traffic signal timing line item in the transportation improvement program for implementation.
- The CCMPO recently completed an Intelligent Transportation System (ITS) Strategy Plan. Strategies identified as appropriate for the County include advanced traffic signal systems, transit vehicle tracking, transit fare management, incident management, broadcast traveler information and changeable message signs. These technologies are specifically designed to improve the transportation system's efficiency.

Sub-Goal 2b:

Preserve and maintain existing transportation facilities and corridors and, where practical, meet transportation needs by using existing facilities more efficiently.

Assessment: The highway and bridge sufficiency ratings suggest that the physical condition of roads and bridges has remained stable, and may have even improved slightly over the last five or more years. This finding is somewhat uncertain because of a lack of highway sufficiency data for collectors in urban areas. Sufficiency ratings are only available for 53% of the federal aid system in Chittenden County. The condition of other transportation facilities such as sidewalks, non-motorized paths, traffic signals, rail and bus shelters is not measured. Since data are not available, no conclusion can be reached about whether or not those facilities are being adequately preserved.

Related to using the existing system more efficiently, car-pool projects and programs, and CATMA's TDM and TSM programs have been effective. There



Relative to preserving and maintaining existing facilities:

- Twenty-three bridge rehabilitation, maintenance or reconstruction projects were funded from 1995 to 1999.
- VTrans inspects and develops a sufficiency rating from 1-100 for all bridges greater than twenty feet on all US, State and local roads. The average sufficiency rating for bridges in Chittenden County has remained relatively constant, increasing slightly from 64 in 1992 to 69 in 1998. This improvement may be attributed to the new VT State Standards which decreased minimum travel lane and shoulder width requirements for some functional classes of highways and bridges.
- The number of bridges classified by VTrans as structurally deficient in Chittenden County decreased from thirty-one in 1992 to twenty-three in 1998.
- Twenty-six highway resurfacing projects were completed from 1995 to 1999.
- As indicated in the Table 3 on the next page the percentage of highways with good, acceptable or poor structural condition has remained almost constant for state highways, during the most recent time periods for which data are available. These data suggest that both state and local forces are keeping the structural condition of highways stable. The data do not include major collectors in the urbanized area (See Map B-4, Appendix B). Structural condition is one component of VTrans's overall Highway Sufficiency ratings (See

has been little progress in other areas such as coordinating and updating traffic signal timings, and implementation of TDM measures in other areas of the County.

Indicator: † / -

Recommendations:

In order to better quantify and track system preservations, collect highway sufficiency ratings in the urban areas and begin assessing the condition of all modes.

Consider developing an annual program (TIP Line Item) that funds updating traffic signal timing plans throughout the County and other types of efficiency projects.

Look for opportunities to create other TMAs in Chittenden County.

Appendix A for more information).

Structural Condition	1991		1996	
	Miles	% of Total	Miles	% of Total
Good	55.73	34%	59.22	38%
Acceptable	86.38	53%	79.26	50%
Poor	19.74	12%	18.57	12%
Total	161.9		157.1	

US & State Highways

Structural Condition	1987		1998	
	Miles	% of Total	Miles	% of Total
Good	0	0%	0	0%
Acceptable	58.64	36%	63.34	40%
Poor	4.52	3%	0	0%
Total	63.2		63.3	

Major Rural Collectors (Class 2 Federal Aide Highways)

TABLE 3. Highway Structural Condition

- The CCMPO is funding a University of Vermont integrated management system study for Chittenden County. The study will develop a methodology for the CCMPO to use in measuring the existing physical condition of all modes and a method for predicting future system condition under different funding and preservation strategy alternatives

Relative to using existing facilities more efficiently

- Projects completed and services provided with the purpose of using existing facilities more efficiently:
 - Expansion and improvement of the I-89 Exit 11, Richmond Park and Ride lot.
 - Minor improvements to the I-89 Exit 17, Colchester Park & Ride lot.
 - Between 1994 and 1997, the number of rides facilitated by CCTA's Rideshare program during the year, grew from 66,460 to 145,860, a 177% increase. Between 1997 and 1999, participation has declined slightly by about 1% each year.
- The Campus Area Transportation Management Association (CATMA), which addresses transportation issues for the Burlington Hill Institutions, has ongoing transportation demand management (TDM) and transportation system management (TSM) programs. TDM measures include staggered work and class scheduling, a joint ridesharing program (RidesWork) and mass transit subsidies. TSM services include a shuttle system serving shared satellite parking facilities and intra-campus travel and peak hour traffic control measures such as lane changes. See <http://www.uvm.edu/~catma/> for more information on CATMA and transportation management associations (TMAs)
- Planning efforts have been completed or are underway with the purpose of using existing facilities more efficiently. The CCMPO provided updated timing plans for all of Essex Junction's traffic signals and the intersection of US 7 with Harbor and Falls Road in Shelburne. The CCMPO has completed an Intelligent Transportation System (ITS) Strategy Plan (See above for more information). A county-wide traffic signal timings update plan will be conducted by the CCMPO as part of its annual UPWP.

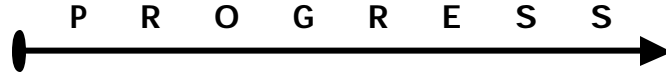
Sub-Goal 2c:

Ensure the safety and security of transportation system users

Assessment: Safety projects tend to be a lower priority than mobility projects. Safety data collection and system-wide analyses of safety is also a lower priority. The most recent HAL report released is now six years old.

Indicator: (-)

Recommendation: Project definition studies should begin to focus on High Accident Locations. The MTP should consider an emphasis on safety for all modes. Increase the frequency of HAL reports and expand the sufficiency rating analysis to include the urbanized areas.



- Only 1/3 of the County's High Accident locations are being addressed. There were 28 intersections and 6 road segments identified as High Accident Locations (HALS) during 1990 to 1994 in Chittenden County. Thirteen of the intersection HALs are being addressed through project definition studies or projects in the TIP. None of the road segments are currently being addressed. See Appendix D for a list of high accident locations and their current status.
- The number of reported vehicle crashes involving pedestrians or bicyclists has almost doubled from 35 in 1989 to 60 in 1997.
- Based on the 1996 State Highway Sufficiency Rating Report, About 5% (or 8 miles) of US and State highways in Chittenden County are rated as "poor" due to the accident rate and geometric features affecting safety (width, sight distance, alignment and grade).
- Based on the 1998 Major Collector Highway Sufficiency Report, about 26% (16 miles) of the Major Rural Collector Roadways (generally class 2 Town Highways) are rated as "poor" relative to the accident rate and geometric features affecting safety (width, sight distance, alignment and grade.)
- Since highway sufficiency ratings are not conducted on urban collectors, the analysis is not available for any of Chittenden County's 9 urban communities (See Map B-4, Appendix B).
- The national average crash rate for buses is 12 incidents/900,000 bus miles of travel (including dead head time). CCTA's crash rate falls below the national average. CCTA's crash rates for 1999, 1998, 1996 and 1995 were 3, 6, 5, and 0 per 900,000 bus miles. CCTA's average crash rate over those four years is 2.8 incidents/900,000 bus miles.

Sub-Goal 2d:

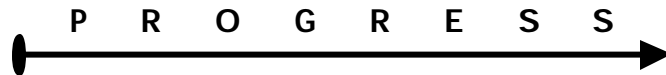
Use federally mandated management systems to improve regional mobility.

Assessment: ISTEA required bridge, pavement, safety, congestion, intermodal and public transit management systems. Given the emphasis in the LRTP on system preservation, the need to address congestion and the desire to increase the role of transit, management systems should still be considered.

Indicator: † / -

Recommendations

Prioritize and implement appropriate management systems for Chittenden County.



- In 1991, ISTEA required management systems for bridges, pavement, safety, congestion, intermodal and public transportation.
- With the exception of requiring a Congestion Management System (CMS) in air quality, non-attainment Transportation Management Areas (TMAs), the federal management systems were made optional and essentially eliminated under the National Highway System Act of 1995.
- The CCMPO is funding a University of Vermont graduate student who is conducting an integrated management system study for Chittenden County. The study will develop a methodology for measuring the existing physical condition of all modes in the system and a method for predicting future system condition under different funding and preservation strategy alternatives.

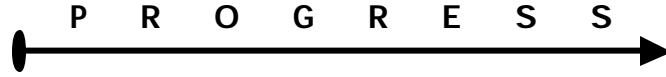
Sub-Goal 2e:

Continue to analyze transportation needs on a corridor and sub-area basis using the multi-modal approach.

Assessment: Corridor studies are a standard component of the CCMPO's Unified Planning Work Program. Many studies, both multi-modal and single-mode when appropriate, have been conducted.

Indicator: †

Recommendations: Develop a systematic program for completing and updating corridor studies. Studies should identify specific projects for further development.



The CCMPO completed the corridor studies listed below since 1993. In some cases, the CCTA System-Wide Study, I-89 Corridor Study and Essex-Burlington Rail Study for example, the study necessarily focused on one mode.

- Winooski to Georgia US 7 Corridor Study (Scheduled completion October 2000)
- VT 127 Corridor Study (October 1998)
- Hinesburg Village Transportation Study (January 1998)
- I-89 Corridor Study (December 1997)
- Essex-Burlington Passenger Rail Feasibility Study (Completed December 1999)
- Chittenden County Alternative Transportation Plan (1993)
- Burlington Multi-Modal Center (1996)
- Jericho Center Traffic Calming Plan (1995)
- Light Rail Study (1996)
- CCTA System-wide Study (1999)

GOAL 3: MAKE THE LAND USE-TRANSPORTATION CONNECTION

Use investment in transportation infrastructure to improve the economic and environmental sustainability of the region by supporting existing and planned growth centers.

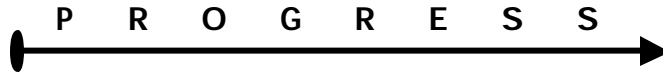
Sub-Goal 3a:

Create and support a balanced, integrated, safe, accessible and energy-efficient transportation system that serves the economic, social, and environmental needs of the Region

Assessment: This sub-goal is too broad and is therefore difficult to measure. Although related, each component of this goal (balance, integration, safety, accessibility and energy efficiency) should be evaluated independently. Some progress is being made on creating a balanced system, improving accessibility and system integration. Less progress has been made on safety and energy efficiency.

Indicator: † /-

Recommendation: Providing more travel choices that are effectively integrated will have a positive effect on all the other components of this goal. It has taken decades to reach an automobile mode share of greater than



Related to a Balanced Transportation System

- Some progress has been made to improve non-motorized travel choices including planning, engineering and construction of non-motorized paths (See sub-goal 4a) and development of a draft sidewalk plan that could allow access to Federal funds for local sidewalk projects.
- CCMPO worked with CCTA in developing a system-wide transit study that recommended improvements to the existing fixed route bus service given current funding and institutional constraints. The study also recommended a county-wide transit system assuming those constraints could be removed. CCMPO has been working with CCTA, VTrans, the State Legislature and local governments to find answers to the funding and institutional challenges preventing transit expansion.
- Federal funds have been programmed by the CCMPO nearly consistent with the targets established by the 1997 LRTP. (See Table 1 under Sub-Goal 1B for more information).
- Despite these efforts, the automobile remains the dominant mode in Chittenden County. The County mode split during the PM peak hour has not changed significantly between 1993 and 1998. Approximately 97% of all person trips are made in a car (92% single occupancy, 5% shared trip). Walking and biking account for 1.7% of the trips and transit about 0.7%. (Note: All trip purposes are included in this analysis)

97%. It will take time to make other travel choices competitive enough to capture more of the travel market. If the County wants to accelerate this shift, the transit funding & institutional issues need to be addressed and more funding should be directed to non-auto modes of transportation.

Related to an Integrated Transportation System

- The CCMPO has approved Federal funds for the Burlington and Essex Junction Multi-Modal facility studies.
- It is common practice to include pedestrian, bicycle and transit amenities in roadway and bridge projects where appropriate (See Sub-Goal 1e for more information)
- The CCMPO has conducted several corridor and facility studies that consider all modes of travel (See Sub-Goal 2e for more information).

Related to Safety

- Data on crashes are dated and somewhat limited because crashes that result in damage valued at less than \$1,000 are not recorded. However, the number of crashes is directly related to vehicle miles of travel. Therefore it is reasonable to assume that the number of crashes has increased since 1993 by about 15%.
- Pedestrian related accidents increased from 35 to 60.
- Only about 1/3 of the identified high accident locations are being addressed.
- The number of crashes is increasing while efforts to eliminate existing HALs are falling behind.

Related to an Accessible System

- The CCMPO has approved funding of transportation services that connect low income residents with jobs (Williston Road Runner and the Bolton Resort Shuttle for example).
- The CCMPO is currently working on an Access to Jobs Study and Plan. (See Sub-Goal 1c for more information.)
- SSTA provides paratransit services for the entire County.

Related to Energy Efficiency

Because automobile trips account for 97% of the person trips made in Chittenden County, auto use has the largest impact on the transportation system's energy consumption. As individual units, passenger cars and trucks are becoming more efficient. However, the way we use our vehicles and the types of vehicles we drive are not as efficient as they could be. (The information below assumes national and state trends apply to Chittenden County)

- According to the USDOT's *1999 Transportation Statistics Annual Report*, between 1980 and 1996, the amount of energy consumed per passenger mile has decreased 13.5% from 4200 to 3700 Btu/passenger-mile. This decrease is due to improvements in fuel efficiency for both passenger cars and light trucks.
- Also between 1980 and 1996, the annual amount of highway use of gasoline per capita in Vermont has increased 15% from 450 to 518 gallons (Source: FHWA Office of Policy Information / Census Bureau.) Despite improvements in fuel efficiency, the amount of energy consumed is increasing probably due to people driving more often and further.
- Since 1990 there has been a shift from high mileage (mostly passenger cars) to lower mileage (light trucks, SUVs) vehicles.

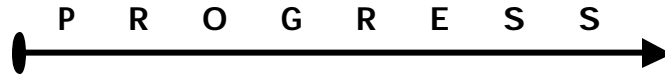
Sub-Goal 3b:

Use transportation routes, facilities, and investments to facilitate the orderly development of growth centers, recreational and cultural sites, and provide for convenient transfers of people and goods between transportation modes.

Assessment: More than 60% of the federal funds obligated in the County benefit growth centers mostly by maintaining or improving access. Keeping growth centers accessible is necessary to help guide development into growth centers. However, its clear that neither the mix or amount of new development envisioned within growth centers is happening. Improving a growth center's access is only one factor among many necessary to ensure that the type and mix of development envisioned in local and regional plans occurs.

Indicator: † / -

Recommendations: Continue developing and funding transportation projects that improve access to growth centers. Invest in projects proactively, rather than in response to new development. The CCRPC is currently working on a capacity study to determine if existing growth centers can accommodate 75% of the County's projected growth. Assuming the 2025 MTP relies on growth centers as well, the CCRPC study is necessary to make sure such a critical assumption is credible.



Relative to Investments in Growth Centers

Transportation Projects within GCs	\$ 32.0	42%
Projects outside of GCs that benefit GCs	\$ 15.0	20%
Not Related to GCs	\$ 29.3	38%
Total Obligated	\$ 76.3	100%

TABLE 4. FY 95 – 99 Investment in Transportation Projects Relative to Growth Centers (Millions)

- Over 60% of funds obligated between 1995 through 1999 paid for projects that are either located in a growth center or, if not in a growth center, improve or maintain access to a growth center. See Appendix F for a complete list of projects funded in Chittenden County with federal funds.
- \$30.0 of the \$32.0 million invested in transportation projects located within growth centers, were for projects that improved or maintained access, mobility and safety to and within a growth center.
- Approximately \$2.0 million was invested in transportation projects such as bike paths, sidewalks and landscaping that support the livability of growth centers.
- About 30% of the funds (a total of \$15 million) obligated for projects outside of growth centers, paid for projects that also improved or maintained access to growth centers.

Relative to the Orderly Development of Growth Centers

- In 1993, 37% of the existing households and 65% of the existing jobs were located within the County's designated growth centers.
- The current Chittenden County Regional Plan, on which the 1997 LRTP is based, has established a goal of locating 75% of new development in growth centers. Between 1993 and 1998, only 35% of new households and 52% of new jobs located in the County's designated growth centers. This analysis is based in the 1993 and 1998 land use gathered for the regional transportation model.
- As further evidence that more development is occurring outside rather than inside of growth centers, according to the CCRPC, 58% of Act 250 permits granted in Chittenden County between 1990 and 1996, were for projects located outside of growth centers.
- There is an imbalance between jobs and housing within growth centers. The jobs to housing ratio inside of growth centers changed only slightly from 3.0 to 2.8 jobs per household between 1993 to 1998. This imbalance suggests that growth centers are not developing as the mixed-use centers envisioned.

Relative to Intermodal Connections

- Federal funds were used to expand and improve the Richmond Park and Ride Lot and for upgrades to the Exit 17 Park and Ride lot in Colchester

- The City of Burlington, along with private partners, manages a park and ride lot on Lakeside Avenue which provides shuttle service to Downtown.
- The CCMPO TIP includes funding for design work on the Burlington Multi-Modal Center on the Waterfront.
- Essex Junction recently received a federal grant for planning and design work on a multi-modal center.
- The CCMPO is currently conducting a freight study that will provide information never available before on goods movement in the County. The information will make it possible to identify projects necessary to improve freight movement, including intermodal facilities.
- CCTA buses include bike racks.

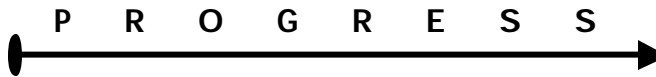
Sub-goal 3c:

Support the relationship between transportation systems and economic vitality, foster private sector participation in the provision, financing, and planning of the transportation system.

Assessment: Chittenden County has a done a good job both in planning and implementing projects that support economic vitality. However, there has not been any regional effort to build partnerships with the private sector in providing transportation facilities and services.

Indicator: † / -

Recommendations: The CCMPO should continue funding the TLC program and its support of projects such as North Street revitalization. The 2025 MTP should incorporate economic vitality as a goal. The CCMPO should work with regional business organizations, such as the Chamber of Commerce and GBIC, to explore the opportunity of public/private partnerships to provide transportation projects and services.



Related to Transportation Systems and Economic Vitality

- The CCMPO initiated the Transportation for Livable Communities (TLC) grant program. The TLC program encourages planning efforts for transportation projects that improve livability and foster economic vitality. For example, South Burlington was awarded a TLC grant to develop a streetscape plan in its City Center with the intention of attracting pedestrians and businesses.
- The CCMPO has approved funding of transportation services that connect low income residents with jobs (Williston Road Runner and the Bolton Resort Shuttle for example).
- Rail station locations are being planned and located where they maximize ridership and foster higher density, transit oriented development.
- Three specific projects the CCMPO has recently approved funding for that have a direct bearing on improving economic vitality are the Winooski River Walk extension, Burlington Lake Street Enhancement, Burlington North Street Revitalization and Old Colchester Road Railroad Crossing relocation and bike path.

Related to Private Sector Participation in Financing

- Several Chittenden County municipalities have traffic impact fees and some have worked out arrangements for specific projects (Lakeside Avenue Park and Ride Shuttle for example). However, there have been no coordinated, regional efforts to create public/private partnerships for the purpose of providing transportation projects and services.

Sub-goal 3d: Integrate public transportation considerations in land use planning and permitting processes such that all land use types are located along public transit routes and within growth centers.



- The availability of transit is not a consideration in either local or Act 250 development review.

Assessment: The CCTA fixed route bus service area passes through the most urbanized areas of Chittenden County. As a result, it does serve all land use types. However, transit is not available at the new County growth spots and transit availability is not a consideration in the permitting process.

Indicator: (-)

Recommendation: The CCMPO should work with CCTA, CCRPC, VAPDA, VPA, and the private sector to develop and recommend changes to Act 250's Criteria 5 that account for all modes of travel. CCMPO should provide technical assistance to local planning agencies who want to consider multi-modal transportation in development review.

- The Act 250 criteria related specifically to transportation, Criteria 5, requires the applicant only address the impact of a project on traffic safety and congestion. As a result, most applications only address the effect of development on traffic congestion and highway safety rather than considering all modes.
- Two of the County's most active growth spots over the last five years, Taft Corners in Williston and Water Tower Hill in Colchester are not accessible by transit.

GOAL 4: BE A CHANGE AGENT

Decrease automobile and truck dependency by offering sustainable transportation alternatives.

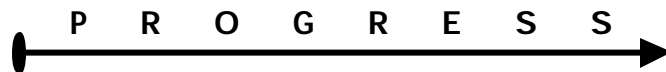
Sub-Goal 4a:

Establish a regional, multi-purpose greenway system of bicycle and pedestrian paths and open space.

Assessment: Bicycle and pedestrian paths are being constructed. However, all of the projects constructed occurred within municipal boundaries. Although there have been planning and scoping projects focusing on regional bike path connections, none have been built.

Indicator: +/-

Recommendations: The CCMPO should consider prioritizing the implementation of regional links to facilitate this goal. Local financial match for construction of regional non-motorized connections should be reduced or eliminated with the state covering the difference.



Planning Projects:

Adoption of the alternative path plans in 8 communities: Essex Junction Village to recreation fields path, Richmond Cochran Road/Cross Vt. Trail, Milton Alternative Path Plan, Lake Champlain Byways Project, Burlington/Colchester Bike Ferry, Colchester/South Hero Bike Ferry, Regional sidewalk plan, regional bike and pedestrian plan update, Extension of Williston Bike Path to Taft Corners, Williston/South Burlington Muddy Brook Crossing, I-89 Exit 14 Bike and Pedestrian Connection.

Scoping Projects:

Winooski River crossing, Burlington Intervale/Manhattan Drive bike path, VT 15 Alternative Path (Essex Jct. To So. Burlington), Williston bike bridge over the Circ. Highway., Hinesburg pathway

Projects Completed or Under Construction:

Williston Village Bike Path, Marshall Ave path (by developer), Burlington Main Street sidewalk and bike paths, Dorset Street sidewalks and bike paths, South Burlington Spear Street Bike Path, South Burlington Farrell Street to Spear St. Bike Path, Colchester Bayside to Creek Farm Bike Path, and Off-road trail development in Colchester, Charlotte, Richmond and Jericho.

Projects Creating Regional Links:

There are nine planning or scoping projects that create community-to-

community and regional links. No regional project has been constructed.

Winooski River Crossing, I-89 Exit 14 Bike Crossing, Lake Champlain Byways Project, Burlington/Colchester Bike Ferry, Colchester/South Hero Bike Ferry, Williston/South Burlington Muddy Brook Crossing, Richmond Cochran Road/Cross Vt. Trail, VT 15 Alternative Path

Sub-Goal 4b:

Integrate transportation services into the community fabric in a way that is cost-effective and is sensitive to and enhances a community's local character.

Assessment: Projects no longer just address vehicle needs. Project scoping balances the technology side of solutions with the impacts on community character. CCMPO planning efforts are also identifying projects that could directly improve and enhance community character while addressing a transportation need. Funding for the types of project that enhance community character is limited. Chittenden County projects must compete statewide for funding.

Indicator: †

Recommendations: General public and local official participation should continue as a requirement in the scoping process. Provide capital funding for TLC and enhancement projects in the TIP.

P R O G R E S S



- Recent highway projects that enhanced community character
 - Burlington Main Street Reconstruction
 - Dorset Street Reconstruction
- Twenty-two enhancement grants awarded in Chittenden County since 1993 (See Appendix E).
- In 1999, the CCMPO initiated the Transportation for Livable Communities (TLC) grant program which supports local planning efforts for projects that enhance community livability. In 1999, a total of \$40,850 was awarded to four separate projects. In 2000, \$50,000 was awarded for six grants. Projects include bike paths, pedestrian plans, streetscape design guidelines, village transportation plans and projects in support of the Cross Vermont Trail.
- CCMPO-managed scoping studies continue to balance transportation engineering with the needs and concerns of local citizens.
- Adoption of the Vermont State Standards for highway and bridge construction provide more flexibility when designing cross sections and other elements for arterials and collectors located in villages and urban areas.

<p><u>Sub-Goal 4c:</u></p> <p><i>Promote higher utilization of the Region's rail corridors.</i></p> <p>Assessment: VTrans and the CCMPO have encouraged higher utilization of the rail infrastructure by supporting improvements to the rail and rail bed and continued planning work for passenger rail.</p> <p style="text-align: center;">Overall Score: †</p> <p>Recommendations:</p> <p>The CCMPO and VTrans should continue to work cooperatively in rail development in Chittenden County.</p>	<p style="text-align: center;">P R O G R E S S →</p> <ul style="list-style-type: none"> • The CCMPO and VTrans have continued to support capital, planning and engineering expenditures for passenger rail in Chittenden County. <ul style="list-style-type: none"> - Funding of the Charlotte-Burlington Passenger Rail Project is included in the TIP. - The CCMPO recently approved funding for an alternatives analysis planning, and initial environmental documentation and engineering for the Burlington-Essex Passenger Rail project. • The CCMPO has funded and/or participated in several passenger rail related studies: <ul style="list-style-type: none"> - State Rail Feasibility Plan 1993 - Shelburne Road Corridor MIS - Burlington/Essex Rail Feasibility Study - State double stack clearance study - Vermont Tour Train study - Tri-center Transit study (a.k.a. light rail) - Charlotte/Burlington Passenger rail
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<p><u>Sub-Goal 4d:</u></p> <p><i>Make existing and future services physically accessible to the elderly and disabled.</i></p> <p>Assessment: ADA requirements are being satisfied by CCTA and SSTA. Paratransit service is available throughout the County. All new facilities must meet ADA requirements. Upgrading existing sidewalks and other transportation facilities to meet ADA requirements will be challenging.</p> <p style="text-align: center;">Indicator: †</p> <p>Recommendations</p> <p>Ensure ADA requirements are satisfied on new projects through project scoping.</p> <p>CCMPO should officially adopt the "Pedestrian Policy and Sidewalk Plan" and work with VTrans to develop additional funding opportunities for sidewalk projects.</p>	<p style="text-align: center;">P R O G R E S S →</p> <ul style="list-style-type: none"> • CCTA's entire fleet was made handicapped accessible in 1993 - 94. • Between 1992 and 1997 CCTA fully implemented the paratransit provisions of the ADA. SSTA provides those services under contract. • SSTA rides per year increased from 70,199 in 1995 to an expected 100,000 in 2000 (42.4% increase). • SSTA fleet increased from 8 vans in 1991 to 35 vans in 2000. • The CCMPO recently approved funding of a new maintenance and dispatch facility for SSTA. • Federal funds may be used for sidewalk projects as long a county-wide sidewalk plan exists. As a result, CCMPO prepared a draft "Pedestrian Policy and Sidewalk Plan for Chittenden County" (April 2000). The draft plan recommends that funds be used only for the construction of new sidewalks and upgrades of existing sidewalks to meet ADA requirements. • Recently completed projects, such as Dorset Street in South Burlington and Main Street in Burlington meet ADA requirements.
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<p><u>Sub-Goal 4e:</u></p> <p><i>Use transportation enhancement activities to preserve and improve the natural and built environments, thereby making the communities and the region more healthy and attractive</i></p>	<p style="text-align: center;">P R O G R E S S →</p> <ul style="list-style-type: none"> • Between 1995 and 2000 there were a total of 22 enhancement projects, worth \$2.3 million, awarded to Chittenden County municipalities and CCTA (See Appendix E).
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attractive.

Assessment: The enhancement projects implemented have helped achieved this goal's purpose. However, many enhancement projects do not receive funds in Chittenden County. TEA21 requires that a minimum of 10% of Surface Transportation Funds be used for enhancement projects. This requirement is satisfied, and sometimes exceeded statewide. In Chittenden County, investment in enhancement projects relative to STP funds is much less because Chittenden County enhancement projects must compete statewide for funding.

Indicator: † / -

Recommendations: Consider a goal of spending 10% of Surface Transportation Funds spent in Chittenden County on Enhancement projects. Find other sources of funds to cover the cost of enhancement type projects. Options may include an annual line item in the CCMPO TIP that is distributed to Chittenden County projects by the CCMPO, through a competitive process.

- On average, \$460,000 per year is spent on enhancement projects in Chittenden County. However, as Table 5 indicates, this level of funding represents less than 3% of the total value of federally funded transportation projects in the County.

Enhancement funding as % of TIP Total				
FY96	FY97	FY98	FY99	FY00
3.00%	2.10%	0.50%	0.90%	2.00%

TABLE 5. Enhancement Funding as % of Transportation Improvement Program in Chittenden County

Summary

What We Have Learned

- Meaningful change takes time. Progress towards increasing transit ridership, walking and biking and reducing automobile dependence and congestion has been limited. However, actions taken since the LRTP was initiated in 1993 have set a course for change. These actions include planning and engineering work, investments in non-motorized paths, support for livable community projects, efforts to fund transit and completion of key highway projects.
- Transportation investments have supported growth centers in terms of access and livability. However, most development in the County has occurred outside of growth centers and remains segregated by use, encouraging automobile travel and placing transit, walking and biking at a disadvantage. This development pattern has made it difficult to provide the multi-modal transportation system envisioned in the 1997 LRTP.
- The decentralization of jobs and services in the County has advantages and disadvantages for the transportation system. Vehicle travel time and costs have

CCMPO Staff Report

decreased because jobs and services are now more easily accessible by vehicle from more areas of the County. From a system-wide perspective, travel time savings due to these shorter trips has offset increases in delay due to rising levels of congestion. However, as a result of the decentralization, other modes such as walking, biking and transit are not viable options for most trips.

- The physical condition of highways and bridges has remained stable, and may have even improved slightly. This outcome, although tentative because of a lack of data for the entire highway system, suggests that the amount of money invested annually in the TIP for bridge and highway system preservation projects is adequate. However, due to lack of data, the same statement can not be made about the condition of other components of the transportation system.
- Safety has been a low priority in terms of both data collection and project implementation. Less than one-third of high accident locations have been addressed.
- Efforts to improve the transportation system's operation and efficiency and to maintain the functional integrity of arterial roadways have been sporadic and uncoordinated. While park-and-ride lot projects, the CCTA rideshare program, and CATMA's TDM and TSM programs have been effective, there has been little progress in coordinating and updating traffic signal timings or implementing TDM measures in other areas of the County.
- Transit is not available at the County growth hot spots and transit availability is not a consideration in the permitting process.
- Construction of non-motorized paths has occurred primarily within municipal boundaries while very few regional connections have been constructed.
- Several Chittenden County municipalities have traffic impact fees and some have worked out arrangements for specific projects (Lakeside Avenue Park and Ride Shuttle, for example). However, there have been no coordinated regional efforts to create public/private partnerships for the purpose of providing transportation projects and services.

Issues for Further Consideration

- Data are required to quantify system preservation needs, particularly in the urban areas and for non-auto modes. CCMPO should fund the collection of highway sufficiency ratings for the urban highway system and consider implementing the data collection recommendations expected from the UVM integrated management study. A report should be issued every one to two years documenting the physical condition of the entire transportation system.
- Project definition studies, which are the first step towards constructing a project, should begin to focus on High Accident Locations. The 2025 MTP should place

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more emphasis on safety. The CCMPO and VTrans should increase the frequency of safety reports and expand the sufficiency rating data collection, which includes a safety component, to include the urbanized areas.

- The trend towards reduced travel time and costs could be built upon by increasing use of existing transit services, expanding transit to all growth areas, and by providing pedestrian and bicycle facilities. Transit, walking and biking offer a lower unit cost per person trip than auto travel. Minor shifts from auto travel to these other modes could help maintain the trend towards minimizing travel costs. Providing these other travel choices could also help offset any losses in vehicle travel time as congestion continues to rise, especially in the outlying growth centers.
- Work with regional business organization, such as the Lake Champlain Region Chamber of Commerce, to explore the opportunity for public/private financing of transportation projects and services.
- Work with CCTA, CCRPC, VAPDA, VPA and the private sector to develop and recommend changes to Act 250's Criteria 5 targeted on accounting for all modes of travel. CCMPO should provide technical assistance to local planning agencies that want to consider multi-modal transportation in development review.
- Emphasize non-motorized path projects that make regional connections. VTrans should consider developing a state-owned system of paths that provide for regional and statewide connections. Local funding shares for paths on the statewide system would be less than paths on a local system.
- The CCMPO should consider a goal of spending 10% of Surface Transportation Funds obligated in Chittenden County on Enhancement projects. Develop other funding sources besides the statewide enhancement program, an annual line item in the CCMPO TIP or private sector participation for example, to help achieve this goal.
- Goals should be specific and measurable. Measuring progress toward many of the 1997 goals is difficult because they are too broad. Performance measures should be based on outcomes, not inputs. For example, rather than using a 60% funding target for system preservation, the plan could state that no more than "x" % of highway miles will be rated as poor. Since the objective is preserving system condition, not spending money, the latter measure provides a real measure of performance.
- Similarly, measure TIP consistency with the MTP based on outcomes such as miles of road paved, number of bridges rehabbed, miles of bike paths constructed, miles of sidewalks constructed or rehabbed rather than funding targets by project category percentages.
- Develop a county-wide access management strategy, complete the county-wide traffic signal update plan and implement ITS projects to help slow the growth of congestion. Look for opportunities to create other TMAs in Chittenden County.

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- The success of the 1997 LRTP relies heavily on development occurring in growth centers – an important assumption on which the projects and policies in the LRTP have only a partial effect. The access provided by the transportation system is only one factor among many affecting land use change. Other factors include available land, environmental and physical constraints, market forces, financial institution's lending policies, property owner decisions, other infrastructure investments, quality of schools, property taxes, amenities, local plans and regulations and so on. As indicated in this report, most development is not occurring in growth centers. If higher density, mixed-use growth centers as planned by the CCRPC, remain a cornerstone of the 2025 MTP, there must be some level of confidence that new development will and can locate in growth centers. Otherwise, the MTP will not be credible and the transportation system recommended will not be able to meet the County's needs.

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1.0 Highway Sufficiency Data (Structural Component & Safety Component)

VTrans has been using the highway sufficiency rating for over two decades to scientifically measure the structural condition, safety and service of highways. Sufficiency ratings are prepared for state system highways (US routes, VT routes and Interstates) and rural, major class 2 town highways. Collectors located in the Federal Aid Urbanized Area (in general, urban collectors are class 2 town highways in urban areas) are not evaluated. Map B-4 in Appendix B shows which roads are evaluated by VTrans in Chittenden County.

Sufficiency ratings for highways are developed by assigning a point value to each component of the rating according to how well it meets the standard for each particular class of highway and volume of traffic. A highway which meets all the standards in every respect receives 100 points.

The standards are based on those recommended by the American Association of State Highway and Transportation Officials (AASHTO) and the Vermont State Standards. The Vermont State Standards were adopted in October of 1997 and changed acceptable minimums for lane and shoulder widths affecting the safety and service component scores. As a result of the new standards, it is not possible to directly compare safety and service components developed before and after 1997. For more information on the specifics of the procedure, refer to “Highway Sufficiency Rating Manual”(Vermont Agency of Transportation, Technical Services Division, Highway Research Section, March 1997).

The various components of the sufficiency rating have the following point values:

Structural Condition	50 Points
Safety	25 Points
Service	25 Points

For the purposes of developing regional indicators, this report focused on the structural condition and safety components. The qualitative descriptors of good, acceptable and poor were assigned to each component as described in Table A-1.

Description	Structural Condition (Max 50 Points)	Safety (Max 25 Points)
Good	40 – 50	20 – 25
Acceptable	20 – 40	10 – 20
Poor	0 – 20	0 - 10

Table A-1. Structural and Safety Components Performance Descriptions

2.0 Bridge Sufficiency Ratings

VTrans rates bridges on both structural and functional standards. Bridges are rated from 0 to 100 under both categories. All local and state highway system bridges with spans

greater than twenty feet are inspected every one to two years (depending on condition). The bridge sufficiency ratings are developed from data collected in the field. Bridge sufficiency ratings were also affected by adoption of the Vermont State Standards which reduced lane and shoulder width requirements for some classes of highways. As a result of the new standards, bridges that were identified as functionally deficient before 1997, may no longer be considered functionally deficient after 1997. The complete list of bridges on which the analysis was based in the report is contained in Appendix C.

3.0 High Accident Locations

High Accident Locations (HALs) for road segments and intersections are identified by VTrans for all highways on the state and federal system. Intersections are identified as an HAL when the actual accident rate (crashes per million vehicles passing through an intersection) over a four or five year period is in excess of a critical rate for similar type of intersections. A roadway segment is defined as an HAL when the actual accident rate (crashes per million vehicle miles) over a four or five year period is twice the critical rate. The critical rates are derived from formulas relating the facility functional class and overall traffic level to the probability of an accident for those conditions. High Accident Locations are listed in Appendix D.

4.0 Texas Transportation Institute Mobility Measure

Every year, the Texas Transportation Institute (TTI) publishes the Urban Mobility Report. This report analyzes the performance of the highways across the United States. The Mobility Report is often used to call attention to the “worst” areas of congestion in the United States. The primary measure of congestion used for comparison is the Travel Rate Index (TRI). The TRI is developed using the most recent traffic count figures available on Principal Arterial and Freeway routes. In Chittenden County this includes I-89, I-189, Shelburne Road, Burlington’s Main Street, Williston Road, VT 289, Hinesburg Rd, VT 2A, and other roads of a similar nature. Urban and rural local roads are not included in the measurement. A TRI of 1.10, for example, means that vehicle travel during congested periods takes 10% longer than during non congested periods. The TRI is based on the percentage of VMT following into the congested categories of extreme, severe, heavy, moderate and un-congested. Levels of congestion are determined based on Table A2 below.

Level of Congestion	Freeways		Principal Arterials	
	ADT/Lane	Speed	ADT/Lane	Speed
Uncongested	< 15,000	60	< 5,500	35
Moderate	15, 000 - 17,500	45	5,500- 7,000	30
Heavy	17,500 - 20,000	38	7,000 - 8,500	27
Severe	20,000 - 25,000	35	8,500 - 10,000	23
Extreme	> 25,000	32	> 10,000	21

Table A-2. TTI Congestion / ADT / Speed Relationship

Since the TTI methodology leaves out many important local roads, it underestimates the total amount of congestion in the County. It is, however useful in tracking congestion growth on freeways and principal arterials, comparing levels of congestion in Chittenden County to other areas of the country and is based on actual ground counts. For more information on the methods used to compute the Travel Rate Index see <http://mobility.tamu.edu/>.

5.0 Chittenden County Regional Transportation Model

Change in Vehicles Miles of Travel (VMT), congested VMT, mode split, average travel time per person trip, average delay per person trip and total delay were estimated using the Chittenden County Regional Transportation Model (the model). Output from the model was used as an input to the Surface Transportation Efficiency Analysis Model (STEAM), developed for FHWA and discussed further below, to estimate the cost of the transportation system. An overview of the model is presented below followed by a description on how the model was used for this report.

Model Overview

The model is the third generation of computerized transportation models used by the region. Completed in 1994 and updated in 1998, it is a custom designed computer model developed by Resource Systems Group, Inc. (RSG) of White River Junction, VT. It includes several advanced features such as integrated land use allocation, mode split, and trip distribution that are all sensitive to highway, transit, and walk/bike accessibility.

The model combines the highway and transit network with land use. The network includes all arterials and significant collectors in the County. In transportation modeling terms, roads are described as links and intersections as nodes. Road characteristics such as length, class (freeway, principal arterial, local, ramp, etc.), speed limit, number of lanes, and capacity are assigned to each link. In addition to road characteristics, the CCTA route system is also coded into the links. Similarly, intersection characteristics such as type (signalized, coordinated signals, stop; yield, no control, etc.), geometry (number of turning lanes), and capacity are assigned to nodes.

For the purposes of the model, the County has been divided into 325 transportation analysis zones (TAZs). Another 17 TAZs are included to account for the areas outside of the county. The urban municipalities are covered in much greater detail. Burlington and South Burlington for example, have 81 and 69 TAZs respectively. The rural areas, such as Hinesburg and Underhill are divided into generally less than ten TAZs each. Land use is described in terms of dwelling units and employment. Each TAZ includes the number of households. Employment includes retail, office, industrial, institutional and hotel categories placed into various high, low or medium trip generation categories.

The model uses the five step process presented in Figure A1 to estimate location of new development and the subsequent AM and PM peak hour travel demand. Trip Generation estimates the number of person trips produced and attracted for each TAZ. Trip

Distribution connects the person trips between TAZs. Mode Choice splits person trips into either single occupant vehicle trips, shared vehicle trips, transit trips or walk/bike trips. The trip generation and trip distribution modules contain formulas calibrated to a 1998 household trip diary survey conducted throughout the County. The mode choice module was developed based on a stated preference survey conducted in 1993 in Chittenden County. The assignment module selects the shortest route for each vehicle and transit trip from one TAZ to another based on a dynamic relationship between speed and traffic volume.

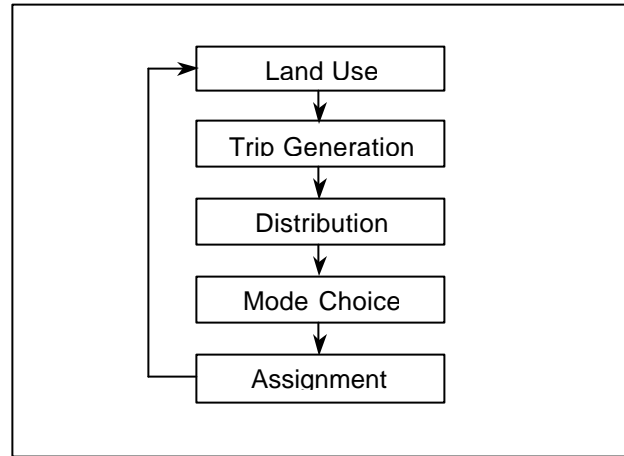


Figure A-1. Model Process

A key feature of the model is the integration of land use allocation with the transportation system. The model includes a land use allocation sub-model that distributes housing and employment to TAZs based in part on the characteristics of the transportation system. As indicated Figure A1, the model includes a land use/transportation feedback loop that accounts for the impact of land use allocation on the transportation system and vice-versa.

For more information on the model, contact Joe Segale at 660-4071 x14 or at jsegale@ccmpo.org.

Model Method for Regional Indicators Report

For the purpose of the Regional Indicators Report, the land use allocation module was not employed. Rather, the model was run for 1993 and 1998 using actual land use gathered when the current model was created in 1993 and in 1998 when the model was updated. 1993 and 1998 land use are based on an actual count of households and employment in the County. The land use was then distributed to the TAZs using the address matching capabilities of a geographic information system. Households were counted and distributed using the E-911 databases and grand lists for each municipality. 1993 employment was based on a Dunn and Bradstreet database purchased for the 1993 model project. 1998 employment was provided by the Vermont Department of Employment and Training.

6.0 Estimating Transportation System Costs

The transportation cost presented in Table 2 to assess Goal 1D include both the private and public costs to operate the system. Operational costs include owning and operating private vehicles, operating the CCTA fixed route and paratransit services, the routine maintenance and lighting of streets and highways and external costs. External costs for automobile and transit modes include impacts due to noise, emissions and crashes not

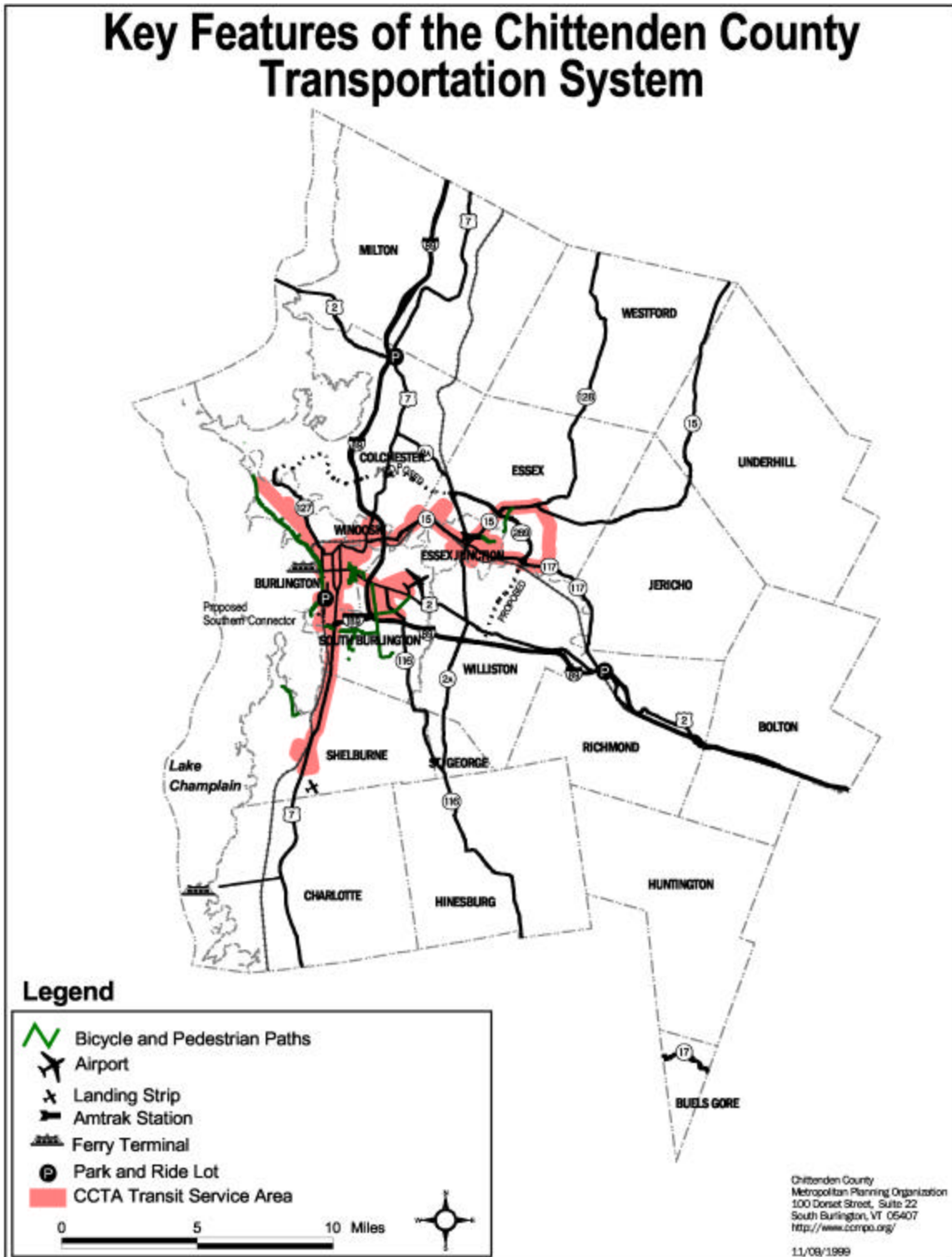
born directly by users. The cost for system preservation, such as paving highways, rehabbing existing bridges, or replacing buses is not considered part of routine maintenance and is therefore not included in the cost estimates. All costs were adjusted to 1997 dollars using the historical consumer price index available at <http://stats.bls.gov/cpihome.htm>.

The Surface Transportation Efficiency Analysis Model (STEAM) was used to estimate the costs of emissions, crashes, fuel consumption, other mileage based expenses and noise. STEAM was developed by the Federal Highway Administration as a tool for estimating benefit to cost ratios of different transportation strategies. STEAM applies national averages to the vehicle and bus miles of travel (VMT/BMT) and travel time outputs from the regional transportation model to estimate the annual quantity and costs of emissions, crashes, fuel consumption, noise and other VMT/BMT associated expenses. Emissions costs per ton include mortality, morbidity, agricultural damage, and loss of visibility. The pollutants included in the analysis are Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Dioxide (NOX), and Particulate Matter (PM10) and greenhouse gases. Non-fuel operating costs include such things as tires, oil etc. Crash costs account for the external costs not covered or perceived to be covered by a driver such as medical services, ancillary services, emergency services, lost wages, lost household production, lost quality of life, workplace disruption, insurance administration, legal and court, travel delay for uninvolved motorists, and property damage.

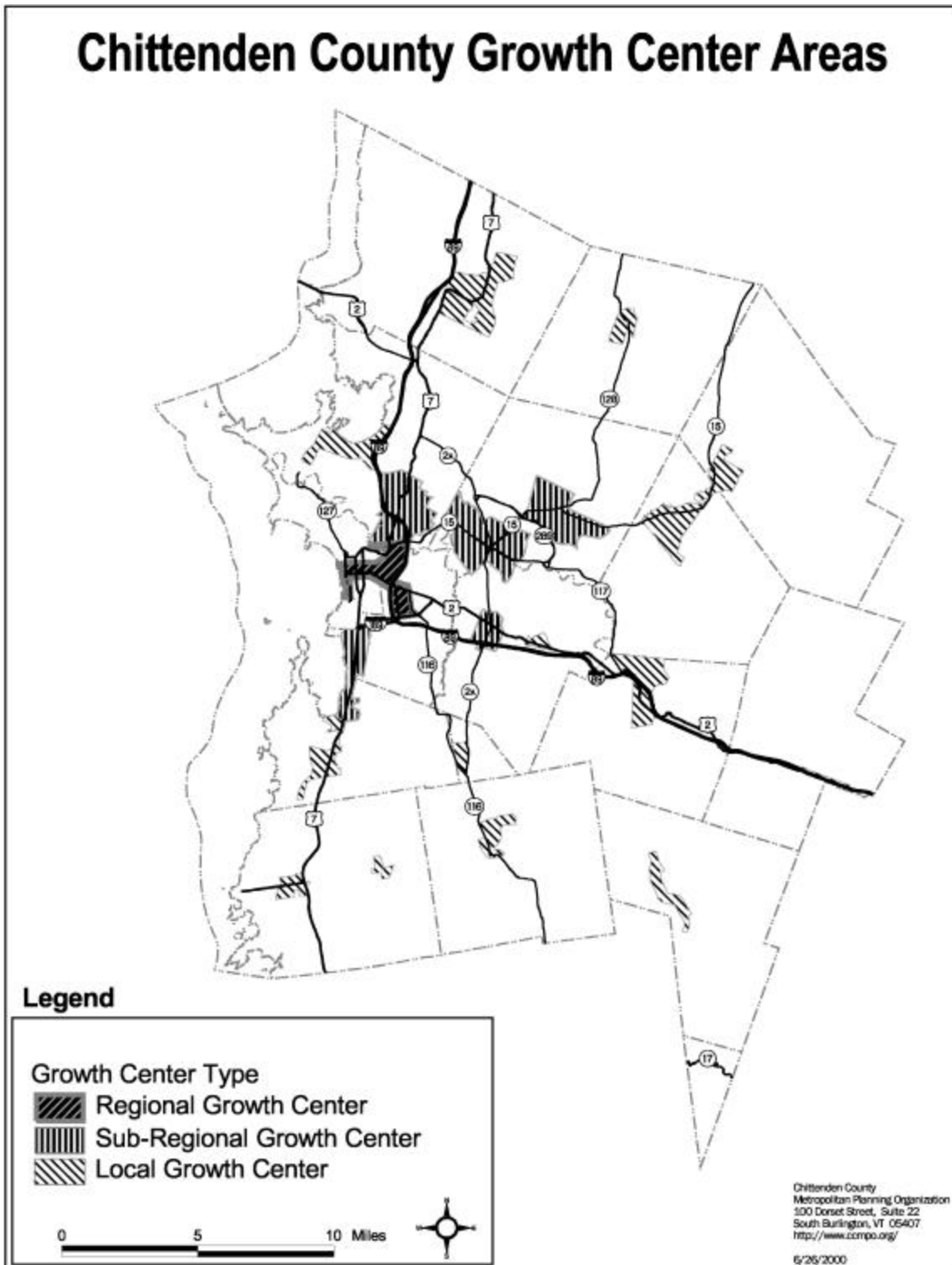
The per mile cost for routine maintenance and lighting of local streets, arterials and freeways and the annual per mile cost for owning a car is taken from the “Characteristics of Urban Transportation Supply, 1992” and adjusted to 1997 dollars. The cost for routine maintenance and lighting of highways and streets was distributed to auto, transit and walk/bike costs proportional to the mode share of each. The rationale for this distribution of costs being that transit and walk/bike trips also use the highway and street system. The cost of owning a car is by the far the largest component of the total transportation system operating cost. The operational cost and fare box recovery for CCTA fixed route bus and paratransit service was provided by CCTA staff based on the annual audit for 1993 and 1998. Both years were adjusted to 1997 dollars. Table A-3 presents a further breakdown.

Description		1993	1998
Auto Public Costs	Emission Costs	\$ 82,423.6	\$ 95,267.4
	Greenhouse Gas Costs	\$ 1,093.8	\$ 1,093.8
	Accident Costs	\$ 29,288.8	\$ 33,503.9
	Highway & Streets Operating	\$ 5,799.1	\$ 5,806.2
	Noise Cost	\$ 1,330.8	\$ 1,502.4
Auto Private Costs	Car Ownership	\$ 532,320.0	\$ 600,960.0
	Fuel Consumption	\$ 38,141.4	\$ 43,518.7
	Auto Non-Fuel Operating Costs	\$ 45,245.7	\$ 51,081.0
Transit Public Costs	Emmissions	\$ 102.5	\$ 102.5
	Greenhouse Gas Costs	\$ 12.8	\$ 12.8
	Highway & Streets	\$ 37.5	\$ 33.8
	Noise	\$ 15.0	\$ 15.0
	Fixed route bus operating costs supported by local, state & federal funds	\$ 1,723.8	\$ 2,254.0
	Paratransit Operations	\$ 140.3	\$ 191.1
Transit Private	Fares used to pay for fixed route bus operating costs	\$ 910.9	\$ 916.6
Walk & Bike	Highway & Street Operating	\$ 103.6	\$ 100.2
Total Annual Operating Costs		\$ 738,689.4	\$ 836,359.2

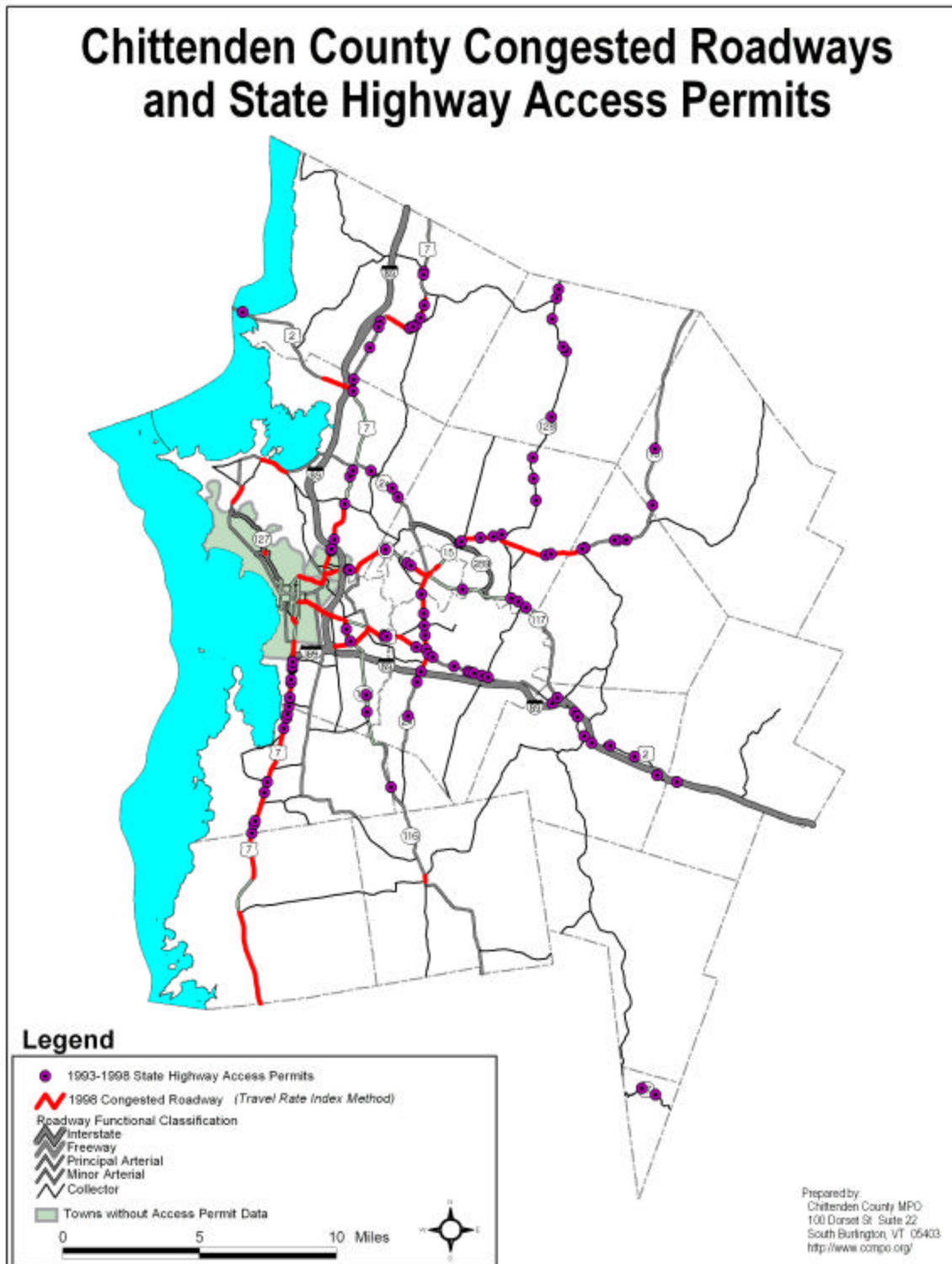
Table A-3. Transportation System Operational Costs
(\$1,000 / Year, 1997 Dollars)



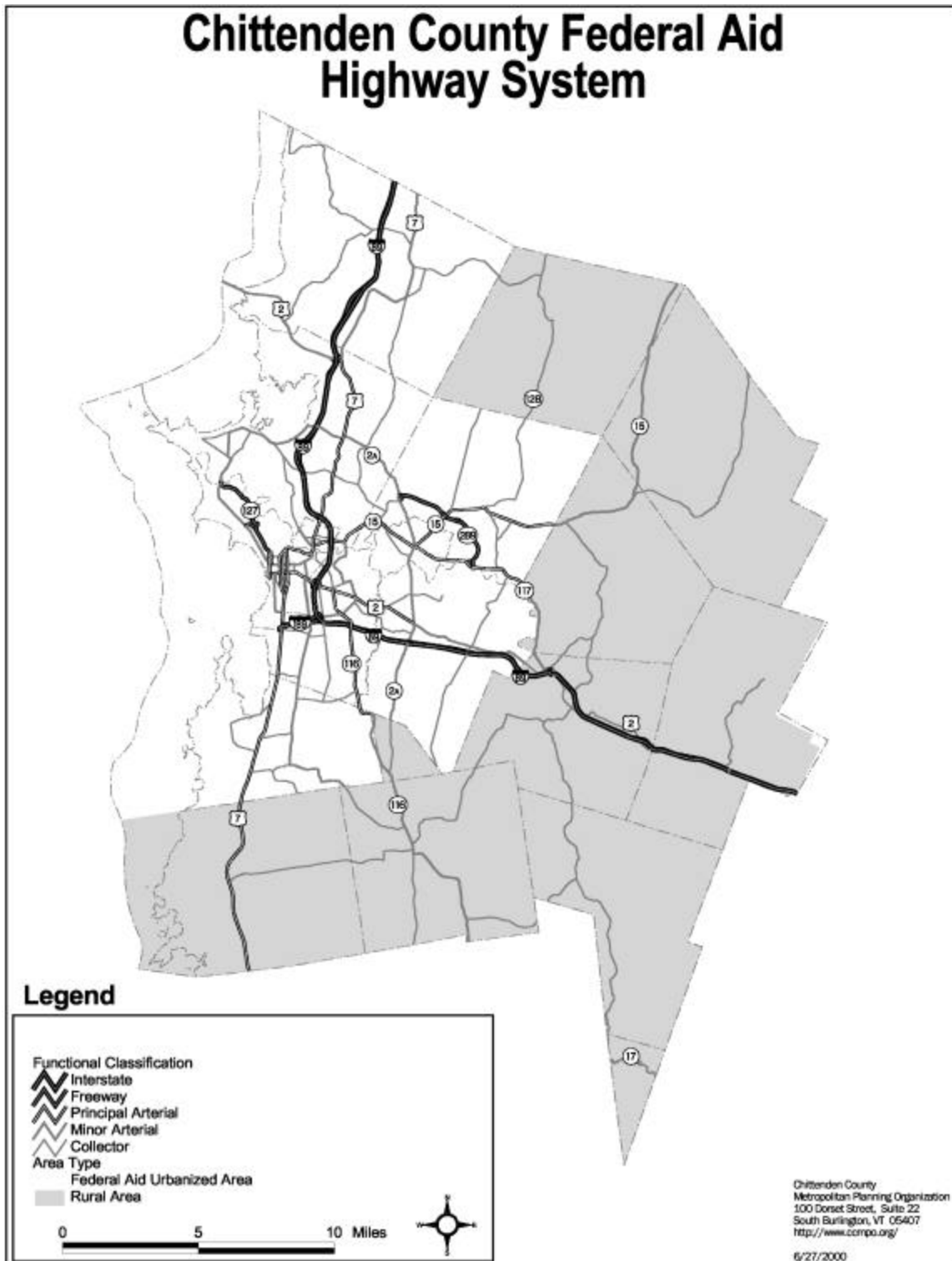
Map B-1



Map B-2



Map B-3



Map B-4

Chittenden County Long Range Plan Regional Indicators Report

9/12/00

Appendix C

Bridge Sufficiency Ratings

SYSTEM	Route	Bridge	Town	Location	Feature Crossed	98_Suf Rat	98_Stat	92_Suf Rat	92_Satus
S	I89	0051N	BOLTON	6.8 MI N EXIT 10	I 89 OVER US 2 & BRK	53	FD	52	FD
S	I89	0051S	BOLTON	6.8 MI N EXIT 10	I 89 OVER US 2 & BRK	56	ND	56	ND
S	I89	051-3	BOLTON	5.8 MI S EXIT 11	I 89 OVER TH NO 4	55	FD	55	FD
S	US2	00037	BOLTON	6.4 MI W JCT VT.100 N	JOINER BROOK	94	ND	85	ND
S	EA PKY	00015	BURLINGTON	.95 MI N JCT NORTH STREET	E A PKY OVER VT 127	76.9	FD	75	FD
S	FAU TH11	00D12	BURLINGTON	NORTH AVE. INTERCHANGE	FAU TH11 OVER VT127	100	ND	-999	NA
S	US2	0018B	BURLINGTON	0.4 MI E JCT US 7 S	PED UNDERPASS UVM	85	ND	85	ND
S	US7	00150	BURLINGTON	0.2 MI S JCT. VT.15	WINOOSKI RIVER	70.1	ND	-999	NA
S	US7	0147A	BURLINGTON	1189 EXIT 1	US 7 OVER I 189	97	ND	97	ND
S	VT127	00001	BURLINGTON	.31 MI N MANHATTAN DRIVE	NEC RR	97.5	ND	98	ND
S	VT127	00005	BURLINGTON	3.43 MI N MANHATTAN DRIVE	WINOOSKI RIVER	90.8	ND	89	FD
S	I89	00078	COLCHESTER	1.1 MI S EXIT 17	I89 OVER CAMP ROAD	66	FD	66	FD
S	I89	0074N	COLCHESTER	189 EXIT 16	I 89 OVER US 7	79	FD	67	FD
S	I89	0074S	COLCHESTER	189 EXIT 16	I 89 OVER US 7	68	FD	68	FD
S	I89	0076N	COLCHESTER	2.6 MI S EXIT 17	I 89 OVER TH NO 1	68.4	FD	72	FD
S	I89	0076S	COLCHESTER	2.6 MI S EXIT 17	I 89 OVER TH NO 1	68.4	FD	59	FD
S	I89	0077N	COLCHESTER	1.3 MI S EXIT 17	MALLETS CREEK	70.9	FD	72	FD
S	I89	0077S	COLCHESTER	1.3 MI S EXIT 17	MALLETS CREEK	69.7	FD	58	FD
S	MILL POND ROAD	00012	COLCHESTER	0.24 MI TO JCT W VT2A	INDIAN BROOK	59.4	SD	85	ND
S	TH9	00D75	COLCHESTER	2.0 MI N EXIT 16	TH NO 9 OVER I 89	72.9	FD	70	ND
S	US2	0018A	COLCHESTER	0.3 MI W JCT US 7 I89E17	I 89 UNDER US 2	80	ND	79	ND
S	US7	00157	COLCHESTER	1.0 MI N JCT. VT.2A	MALLETS CREEK	78	ND	88	ND
S	N. WILLISTON RD	00008	ESSEX	0.34 MI TO JCT W VT117	WINOOSKI RIVER	95.3	ND	84	ND
S	TH95	0016D	ESSEX	0.6 MI S JCT. VT 15	TH 95 OVER VT 289	99	ND	-999	NA
S	VT128	00003	ESSEX	1.0 MI N JCT. VT.15	BROWNS RIVER	45.5	FD	49	FD
S	VT15	00005	ESSEX	2.1 MI E JCT. VT.128	BROWNS RIVER	64	FD	63	ND
S	VT15	0002A	ESSEX	1.5 MI E JCT. VT. 2A	VT 15 OVER VT 289	98	ND	-999	NA
S	VT289	00013	ESSEX	0.1 MI E JCT. VT. 2A	RAMP D OVER NEC RR	98	ND	-999	NA
S	VT289	00014	ESSEX	0.1 MI E JCT. VT. 2A	RAMP A OVER NEC RR	98	ND	-999	NA
S	VT289	00017	ESSEX	0.9 MI E VT 15	ALDER BROOK	97.3	ND	-999	NA
S	VT289	00018	ESSEX	2.0 MI E JCT VT 15	ALDER BROOK	97.3	ND	-999	NA
S	FAS 0199	00010	HINESBURG	0.1 MI S JCT. VT.116	LAPLATTE RIVER	63.7	FD	63	FD
S	FAS 0199	00011	HINESBURG	3.1 MI S JCT. VT.116	LEWIS CREEK	73.6	ND	75	ND
S	FAS 0208	00006	HINESBURG	0.2 MI W JCT. VT.116	LAPLATTE RIVER	98.3	ND	99	ND
S	FAS 0212	00009	HINESBURG	0.5 MI E VT.116	HOLLOW BROOK	57.1	ND	59	ND
S	VT116	00021	HINESBURG	9.8 MI N JCT. VT.17 E	HOLLOW BRK	60.4	ND	81	ND
S	FAS 0211	00006	HUNTINGTON	1.5 MI N JCT. VT.17	BAKEN BROOK	59.6	FD	62	ND
S	FAS 0211	00008	HUNTINGTON	3.9 MI N JCT. VT.17	HUNTINGTON RIVER	73.7	FD	62	FD
S	FAS 0211	00010	HUNTINGTON	2.6 MI N JCT. VT.17	HUNTINGTON RIVER	52.9	FD	54	ND
S	FAS 0211	00012	HUNTINGTON	6.5 MI N JCT VT.17	BRUSH BROOK	90.7	ND	92	ND
S	FAS 0211	00013	HUNTINGTON	5.0 MI S JCT. U.S.2	HUNTINGTON RIVER	18.6	SD	-999	NA
S	FAS 0211	00014	HUNTINGTON	7.0 MI N JCT. VT.17	HUNTINGTON RIVER	63.4	ND	65	ND
S	FAS 0211	0007H	HUNTINGTON	4.4 MI N JCT. VT.17	COBB BROOK	87.2	ND	93	ND
S	FAS 0211	0009H	HUNTINGTON	6.0 MI S JCT. U.S.2	TEXAS HILL BROOK	54.9	FD	55	FD
S	FAS 0209	00015	JERICHO	3.3 MI N JCT. U.S.2	MILL BROOK	79.7	ND	80	ND
S	FAS 0209	00019	JERICHO	2.1 MI S JCT. VT.15	LEE RIVER	75.2	ND	75	ND
S	VT117	00007	JERICHO	5.8 MI E JCT. VT.15&2A	MILL BROOK	95.8	ND	96	ND
S	VT15	00007	JERICHO	3.3 MI E JCT. VT.128	BROWNS RIVER	65.4	FD	32	SD
S	VT15	00010	JERICHO	6.0 MI E JCT. VT.128	BROWNS RIVER	84	ND	84	ND
S	I89	00083	MILTON	1.8 MI S EXIT 18	I 89 OVER TH NO 12	66	FD	66	FD
S	I89	0081N	MILTON	3.7 MI N EXIT 17	LAMOILLE RIVER	72.7	ND	75	ND
S	I89	0081S	MILTON	3.7 MI N EXIT 17	LAMOILLE RIVER	72.7	ND	75	ND
S	TH3	00D82	MILTON	3.2 MI S EXIT 18	TH NO 3 OVER I 89	98	ND	99	ND
S	TH6	00D80	MILTON	3.1 MI N EXIT 17	TH NO 6 OVER I 89	98	ND	97	ND
S	US2	00017	MILTON	2.1 MI W JCT. U.S.7 N	LAMOILLE RIVER	84.9	ND	85	ND
S	US7	00162	MILTON	5.7 MI N JCT. U.S.2 W	LAMOILLE RIVER	19	SD	1	SD
S	FAS 0209	00031	RICHMOND	0.3 MI S JCT. U.S.2	WINOOSKI RIVER	46.8	FD	50	FD
S	FAS 0211	0009R	RICHMOND	4.6 MI S JCT. U.S.2	HUNTINGTON RIVER	77.9	FD	80	ND
S	I89	0052N	RICHMOND	4.8 MI S EXIT 11	I 89 OVER TH NO 14	66	FD	66	FD
S	I89	0052S	RICHMOND	4.8 MI S EXIT 11	I 89 OVER TH NO 14	78	ND	80	ND
S	I89	0053N	RICHMOND	4.4 MI S EXIT 11	I 89 OVER US 2	57	ND	56	ND
S	I89	0053S	RICHMOND	4.4 MI S EXIT 11	I 89 OVER US 2	67	ND	66	ND
S	I89	0055N	RICHMOND	1.3 MI S EXIT 11	I 89 OVER TH NO 4	66	FD	65	FD
S	I89	0055S	RICHMOND	1.3 MI S EXIT 11	I 89 OVER TH NO 4	66	FD	65	FD
S	I89	0056N	RICHMOND	189 EXIT 11	I 89 OVER US 2	54	SD	69	ND
S	I89	0056S	RICHMOND	189 EXIT 11	I 89 OVER US 2	53	SD	68	ND
S	I89	0057N	RICHMOND	0.1 MI N EXIT 11	I 89 OVER NECRR & BROOK	62.5	ND	64	ND
S	I89	0057S	RICHMOND	0.1 MI N EXIT 11	I 89 OVER NECRR & BROOK	74.7	ND	75	ND
S	I89	0058N	RICHMOND	0.3 MI N EXIT 11	I89 OVER WINOOSKI R.+TH1	74.7	ND	76	ND

SYSTEM	Route	Bridge	Town	Location	Feature Crossed	98_Suf_Rat	98_Stat	92_Suf_Rat	92_Satus
S	189	0058S	RICHMOND	0.3 MI N EXIT 11	189 OVER WIN.R&TH 16	74.7	ND	76	ND
S	189	0059N	RICHMOND	0.6 MI N EXIT 11	I 89 OVER TH NO 8	70.4	ND	57	FD
S	189	0059S	RICHMOND	0.6 MI N EXIT 11	I 89 OVER TH NO 8	70.4	ND	57	ND
S	US2	00024	RICHMOND	0.2 MI W JCT. VT.117	WINOOSKI RIVER	32.2	SD	50	SD
S	US2	00025	RICHMOND	0.1 MI W JCT VT.117	US 2 OVER NECR	77.1	ND	24	SD
S	US2	00029	RICHMOND	1.9 MI E JCT VT 117	I 89 UNDER US 2	46.1	SD	55	SD
S	US2	00032	RICHMOND	4.2 MI E JCT VT 117	SNIFE ISLAND BROOK	57.6	SD	68	ND
S	AIRPK	00006	S. BURLINGTON	AIRPORT PARKWAY	WINOOSKI R & NEC RR	24	SD	2	SD
S	CITY PATCHEN RD	0001B	S. BURLINGTON	PATCHEN ROAD	PATCHEN RD OVER I 89	79.2	ND	68	ND
S	1189 - CONN	0002E	S. BURLINGTON	1.1 MI W JCT.189 EXIT 13	I 189 OVER FARRELL	67.6	FD	68	FD
S	1189 - CONN	0002W	S. BURLINGTON	1.1 MI W JCT.189 EXIT 13	I 189 OVER FARRELL	67.6	FD	68	FD
S	1189 - CONN	0003E	S. BURLINGTON	0.3 MI W I89 EXIT 13	I 189 OVER SPEAR ST	88.3	ND	79	ND
S	1189 - CONN	0003W	S. BURLINGTON	0.3 MI W I89 EXIT 13	I 189 OVER SPEAR ST	88.3	ND	79	ND
S	1189 - CONN	0004W	S. BURLINGTON	I89 EXIT 13	I 189 WB OVER I 89	74.8	ND	-999	NA
S	189	0065N	S. BURLINGTON	DORSET STREET	I 89 OVER DORSET ST	69.9	ND	72	FD
S	189	0065S	S. BURLINGTON	DORSET STREET	I 89 OVER DORSET ST	69.9	ND	72	FD
S	189	0066N	S. BURLINGTON	EXIT 13 I89-I189 INTERS.	I89 OVER EB I189	79	FD	68	FD
S	189	0066S	S. BURLINGTON	EXIT 13 I89-I189 INTERS.	I89 OVER EB I189	79	FD	68	FD
S	189	0070N	S. BURLINGTON	1.3 MI N EXIT 14	WINOOSKI RIVER	87.4	ND	89	ND
S	189	0070S	S. BURLINGTON	1.3 MI N EXIT 14	WINOOSKI RIVER	87.4	ND	89	ND
S	189 RAMP E	0067E	S. BURLINGTON	0.1 MI E EXIT 13 I89	RAMP E OVER RAMP D	93	ND	82	ND
S	US2	0018C	S. BURLINGTON	1.1 MI E JCT. U.S.7 S	I 89 UNDER US 2	69	SD	85	ND
S	VT116	00031	S. BURLINGTON	1.1 MI S JCT. U.S.2	I 89 UNDER VT 116	81	ND	81	ND
S	BAY ROAD	00007	SHELBURNE	1.0 MI TO JCT W US7	LAPLATTE RIVER	43.1	ND	-999	NA
S	FALLS ROAD	00006	SHELBURNE	1.2 MI E JCT. U.S.7	LAPLATTE RIVER	95	ND	-999	NA
S	US7	00144	SHELBURNE	4.4 MI S JCT. I189	LAPLATTE RIVER	48.5	ND	38	SD
S	FAS 0233	00006	UNDERHILL	5.3 MI S JCT. VT.108	SEYMOUR BROOK	96.5	ND	95	ND
S	FAS 0233	00007	UNDERHILL	5.6 MI S JCT. VT.108	SEYMOUR RIVER	63.2	FD	75	FD
S	FAS 0233	00008	UNDERHILL	3.0 MI E JCT. VT. 15	STEVENSVILLE BROOK	71.4	ND	72	ND
S	FAS 0233	00009	UNDERHILL	2.6 MI E JCT. VT.15	BROWNS RIVER	43.8	SD	44	SD
S	VT15	00011	UNDERHILL	7.1 MI E JCT. VT.128	ROARING BROOK	67.9	FD	57	FD
S	VT15	00012	UNDERHILL	7.3 MI E JCT. VT.128	THE CREEK	43.6	ND	47	ND
S	VT128	00005	WESTFORD	2.7 MI S JCT. VT.104	BROWNS RIVER	94.3	ND	92	ND
S	VT15	00017	WESTFORD	4.3 MI W JCT. VT.104 N	BEAVER BROOK	66.5	ND	79	ND
S	189	0061N	WILLISTON	I89 EXIT 12	I 89 OVER VT 2A	75	ND	-999	NA
S	189	0061S	WILLISTON	I89 EXIT 12	I 89 OVER VT 2A	75	FD	-999	NA
S	189	0063N	WILLISTON	1.0 MI N EXIT 12	MUDDY BROOK	90.9	ND	92	ND
S	189	0063S	WILLISTON	1.0 MI N EXIT 12	MUDDY BROOK	90.9	ND	92	ND
S	INDUS	00017	WILLISTON	INDUSTRIAL AVE	ALLEN BROOK	71	SD	73	FD
S	TH1	00060	WILLISTON	2.3 MI N EXIT 12	TH NO 1 OVER I 89	97	ND	86	ND
S	TH3	00062	WILLISTON	0.8 MI N EXIT 12	TH NO 3 OVER I 89	100	ND	96	ND
S	VT2A	00006	WILLISTON	0.8 MI NO. JCT. U.S.2	ALLEN BROOK	61.2	FD	39	SD
S	VT2A	00008	WILLISTON	2.2 MI N JCT. U.S.2	WINOOSKI RIVER	85	ND	84	ND
S	189	0071N	WINOOSKI CITY	0.2 MI S EXIT 15	I 89 OVER NECRR	94.7	ND	84	ND
S	189	0071S	WINOOSKI CITY	0.2 MI S EXIT 15	I 89 OVER NECRR	62.9	FD	63	FD
S	189	0072N	WINOOSKI CITY	I89 EXIT 15	I 89 OVER VT 15	79	FD	68	FD
S	189	0072S	WINOOSKI CITY	I89 EXIT 15	I 89 OVER VT 15	79	FD	68	FD
S	189	0073N	WINOOSKI CITY	0.1 MI N EXIT 15	I89 OVER LAFOUNTAIN	84.9	ND	85	ND
S	189	0073S	WINOOSKI CITY	0.1 MI N EXIT 15	I89 OVER LAFOUNTAIN	84.9	ND	85	ND
S	US7	00151	WINOOSKI CITY	0.1 MI N JCT. VT.15	US 7 OVER N.E.C. RR	83.5	FD	72	FD
L	C3014	00007	BOLTON	0.1 MI TO JCT W CL2 TH3	MILL BROOK	40.7	SD	19	SD
L	C2001	00008	BOLTON	0.01 MI TO JCT W C3 TH12	PRESTON BROOK	52.3	ND	52	ND
L	C3015	00015	BOLTON	0.08 MI TO JCT W US2	JOINER BROOK	90.8	ND	80	ND
L	C2007	00002	BURLINGTON	0.18 MI TO JCT W CL2 TH8	VERMONT RAILWAY	54	FD	53	FD
L	C2001	00014	CHARLOTTE	0.2 MI TO JCT W CL3 TH12	LAPLATTE RIVER	62.1	ND	52	ND
L	C3009	00027	CHARLOTTE	0.2 MI TO JCT W CL3 TH43	HOME CREEK	12	ND	14	SD
L	C3039	00028	CHARLOTTE	0.01 MI TO JCT W C3 TH28	LEWIS CREEK	18.5	SD	-999	NA
L	C3036	00029	CHARLOTTE	0.01 MI TO JCT W CL2 TH1	LEWIS CREEK	71.7	FD	61	FD
L	C3014	00030	CHARLOTTE	0.52 MI TO JCT W CL2 TH1	LAPLATTE RIVER	44.9	FD	47	ND
L	C3013	00031	CHARLOTTE	0.2 MI TO JCT W CL3 TH14	LAPLATTE RIVER	43.6	SD	57	FD
L	C2001	00003	COLCHESTER	0.04 MI TO JCT US7	INDIAN BROOK	100	ND	-999	NA
L	C3015	00014	COLCHESTER	0.16 MI TO JCT W C3 TH17	COLCHESTER POND BRK.	53.2	FD	68	ND
L	C3044	00019	ESSEX	0.1 MI TO JCT W VT128	BROWNS RIVER	66.9	ND	56	ND
L	C3023	00020	ESSEX	0.04 MI TO JCT W VT2A	NEW ENGLAND CENTRAL RR	68.1	ND	65	FD
L	C2008	00027	HINESBURG	0.2 MI TO JCT W VT116	HOLLOW BROOK	80.9	ND	45	FD
L	C3023	00029	HINESBURG	0.17 MI TO JCT W C3 TH27	LEWIS CREEK	61	FD	60	ND
L	C3029	00030	HINESBURG	0.04 MI TO JCT W C3 TH28	LEWIS CREEK	99	ND	18	ND
L	C3003	00011	HUNTINGTON	0.1 MI TO JCT W CL2 TH1	HUNTINGTON RIVER	9	SD	16	SD
L	C3030	00028	HUNTINGTON	0.01 MI TO JCT W C3 TH31	JONES BROOK	49.5	ND	50	ND

SYSTEM	Route	Bridge	Town	Location	Feature Crossed	98_Suf Rat	98_Stat	92_Suf Rat	92 Status
I	C3029	00029	HUNTINGTON	0.2 MI TO JCT W CL2 TH1	COBB BROOK	73.9	ND	47	SD
I	C3022	00030	HUNTINGTON	1.2 MI TO JCT W CL3 TH21	BRUSH BROOK	18.7	SD	21	SD
I	C3022	00031	HUNTINGTON	1.0 MI TO JCT W CL3 TH21	BRUSH BROOK	17.5	SD	16	SD
I	C3022	00032	HUNTINGTON	0.7 MI TO JCT W CL3 TH21	BRUSH BROOK	30.3	SD	30	SD
I	C3022	00033	HUNTINGTON	0.03 MI TO JCT W C3 TH21	BRUSH BROOK	88.4	ND	88	ND
I	C3021	00034	HUNTINGTON	0.01 MI TO JCT W C3 TH22	BRUSH BROOK	26.3	SD	24	FD
I	C3028	00038	HUNTINGTON	0.01 MI TO JCT W CL2 TH1	HUNTINGTON RIVER	82.9	ND	80	ND
I	C3020	00039	HUNTINGTON	0.01 MI TO JCT W CL2 TH1	HUNTINGTON RIVER	79.8	ND	80	ND
I	C3031	00040	HUNTINGTON	0.01 MI TO JCT W CL2 TH1	HUNTINGTON RIVER	59.4	ND	58	ND
I	C3004	00041	HUNTINGTON	0.39 MI TO JCT W CL2 TH1	BRUSH BROOK	82.9	ND	80	ND
I	C3004	00042	HUNTINGTON	0.2 MI TO JCT W CL2 TH1	HUNTINGTON RIVER	34	SD	50	SD
I	C2003	00012	JERICO	0.4 MI TO JCT W CL3 TH28	MILL BROOK	72.7	ND	47	SD
I	C2003	00013	JERICO	JCT OF CL2 TH3 & CL3 TH27	MILL BROOK	65.9	FD	68	FD
I	C2003	00014	JERICO	JCT OF CL2 TH3 & CL3 TH26	MILL BROOK	78.1	FD	79	FD
I	C2001	00017	JERICO	0.1 MI TO JCT W CL2 TH2	LEE RIVER	77.3	FD	66	FD
I	C2002	00018	JERICO	0.15 MI TO JCT W CL2 TH1	LEE RIVER	82	ND	57	ND
I	C3029	00030	JERICO	0.13 MI TO JCT W CL2 TH3	MILL BROOK	81.1	ND	27	SD
I	C3035	00031	JERICO	0.04 MI TO JCT W CL2 TH1	MILL BROOK	19.2	SD	18	SD
I	C3033	00032	JERICO	0.1 MI TO JCT W CL2 TH4	MILL BROOK	93	ND	90	FD
I	C3007	00033	JERICO	0.25 MI TO JCT W CL2 TH2	LEE RIVER	87.8	ND	81	ND
I	C3012	00035	JERICO	0.07 MI TO JCT W VT15	ROARING BROOK	81.4	ND	62	SD
I	C3009	00037	JERICO	0.2 MI TO JCT W VT15	BROWNS RIVER	66.6	FD	48	SD
I	C3020	00038	JERICO	0.01 MI TO JCT W CL2 TH2	LEE RIVER	16.9	SD	20	SD
I	C3013	00039	JERICO	0.5 MI TO JCT W VT15	BROWNS RIVER	85.2	ND	17	SD
I	C3017	00040	JERICO	0.2 MI TO JCT W VT15	BROWNS RIVER	65.9	FD	40	SD
I	C3028	00047	JERICO	0.3 MI TO JCT W CL2 TH3	MILL BROOK	99.9	ND	100	ND
I	C3059	00051	JERICO	0.17 MI TO JCT W C3 TH13	ROARING BROOK	61.6	ND	62	ND
I	C4033	00007	RICHMOND	0.27 MI TO JCT W CL2 TH4	DONAHUE BROOK	64.3	ND	74	ND
I	C2003	00008	RICHMOND	0.01 MI TO JCT W C3 TH30	HUNTINGTON RIVER	88.6	ND	54	SD
I	C2003	00010	RICHMOND	0.02 MI TO JCT W US2	WINOOSKI RIVER	4.2	SD	27	SD
I	C2003	00015	SHELburne	1.0 MI TO JCT W US7	VERMONT RAILWAY	37.9	SD	-999	NA
I	C3033	00027	UNDERHILL	0.15 MI TO JCT W CL3 TH3	ROARING BROOK	19	SD	19	SD
I	C3048	00031	UNDERHILL	0.12 MI TO JCT CL2 TH1	BROOK	37.6	ND	38	FD
I	C3006	00014	WILLISTON	1.0 MI TO JCT W VT2A	ALLEN BROOK	87.2	ND	30	SD
I	C3006	00015	WILLISTON	1.1 MI TO JCT W VT2A	MUDDY BROOK	87.2	ND	2	SD
I	C30WE	00001	WINOOSKI CITY	.05 MI TO JCT W ALLEN ST	NEW ENGLAND CENTRAL RR	84	ND	84	ND
I	C3040	00018	MILTON	@ JCT W CL2 TH6	LAMOILLE RIVER	88.6	ND	3	SD
I	C2003	00022	WESTFORD	0.07 MI TO JCT W VT.128	BROWNS RIVER	86.4	ND	84	ND

1990 to 1994 High Accident Intersections in Chittenden County

County Rank	State Rank	Actual/Critical Ratio	Location	Municipality	Status of FY 2000
1	5	2.316	US 2 & VT 117	Richmond	PE funds identified for FY 2001
2	6	2.175	VT 15 I- 89 Ramp B	Winooski City	New traffic signals installed in 1996
3	10	1.904	Park St. & North St	Burlington	Included in North Street Revitalization Project (FY 2001)
4	14	1.837	US 2 & Airport Dr.	S. Burlington	Intersection modified by South Burlington
5	15	1.823	US 7/US 2/Main Street	Burlington	No Action
6	16	1.808	US 2 & FAS 0209 (Bridge Street)	Richmond	Traffic signal installed
7	21	1.708	North St. & N. Champlain St	Burlington	Included in North Street Revitalization Project (FY 2001)
8	22	1.704	VT 15 & Susie Wilson Rd	Essex	No Action
9	23	1.697	VT 116 & 0210 (Shelburne Rd & CVU Rd)	Hinesburg	No Action
10	24	1.687	US 7 & VT 2A	Colchester	Scoping project completed by Vtrans. Construction after 2002
11	25	1.685	US 7 & US 2	Colchester	No Action
12	32	1.634	VT 15 & Dion St	Winooski City	No Action
13	36	1.588	US 7 & VT 127 & TH #1	Colchester	Scoping project completed by Vtrans. Construction after 2002
14	37	1.587	Alt. US 7 & Main St	Burlington	No Action
15	44	1.477	VT 2A & East Road & Mill Pond Road	Colchester	Traffic signal installed
16	49	1.432	US 2 & I- 89, Ramps B- D	Richmond	Ramp reconfigured
17	53	1.396	Alt. US 7 & Pearl St	Burlington	No Action
18	54	1.392	US 7 & Homes Road	S. Burlington	No Action
19	57	1.368	US 7, Harbor Road & TH 1	Shelburne	Included in Shelburne Road project
20	67	1.252	US 7 & North St.	Burlington	Included in Shelburne Road project
21	74	1.177	US 7, Marsett Rd & TH 3	Shelburne	No Action
22	77	1.158	VT 116 & FAS 0212 (Hinesburg Hollow Rd)	Hinesburg	No Action
23	80	1.125	US 7, W Allen St & VT 15	Winooski City	No Action
24	82	1.122	US 7 & Pearl St	Burlington	No Action
25	83	1.108	VT 127 & Platsburg Ave	Burlington	No Action
26	87	1.097	VT 117 & Sand Hill Rd	Essex	Construction expected in 2002
27	88	1.096	US 2I-89, Ramps F- A-B	Colchester	No Action
28	91	1.062	VT 15 & Lime Kiln Rd	Colchester	No Action

1990 to 1994 Chittenden County High Accident Segments

County Rank	State Rank	Actual/Critical Ratio	Town	Route	Location	FY 2000 Status
1	6	3.873	Essex	VT 128	Osgood Hill Rd	No Action
2	16	3.313	Essex	VT 128	Bixby Hill Rd & Thomas Lane	No Action
3	33	2.696	Essex Jct (Thru Five Corners)	VT 2A	Thru Five Corners	No Action
4	37	2.602	Burlington- S. Burlington	US 2	Spear St to Exit 14 SB Ramps	No Action
5	50	2.327	S. Burlington	US 2	White St to Heath St	No Action
6	77	2.086	Essex Jct (Thru Five Corners)	VT 15	Thru Five Corners	No Action

Chittenden County Enhancement Grants Awarded 1995 to 1999

1. Burlington - pedestrian access to waterfront \$38,000, 1995
2. Charlotte and Williston - scenic easements, \$500,000, 1995
3. Westford - Covered bridge repairs, \$36,000, 1995
4. Winooski - Bike racks, \$1,000, 1995
5. Burlington - Lake St. rehabilitation, \$55,000, 1996 (Never used)
6. Richmond Land Trust - Barn renovation, \$150,000, 1996
7. Winooski - Riverwalk, \$280,000, 1996
8. South Burlington - Landscaping, \$4,700, 1996
9. CCTA - Bike racks and lockers, \$37,000, 1997
10. Essex - Footpath and landscaping, \$20,000, 1997
11. Richmond - sidewalks and scenic easement, \$136,000, 1997
12. Burlington - North Street revitalization plan, \$92,055, 1998
13. CCTA - Bus shelters, \$80,000, 1998
14. South Burlington - Storm water treatment pond, \$88,000, 1998
15. Burlington - North Street revitalization, \$311,200, 1999
16. Shelburne - sidewalks, \$84,000, 1999
17. Westford - Covered bridge restoration, \$60,000, 1999
18. CCTA - Bus stop kiosks, \$24,000, 1999
19. Colchester - Pedestrian overpass, \$46,900, 1999
20. Charlotte - Recreation trail, \$150,000, 1999
21. Hinesburg - Traffic calming/pedestrian improvements, \$40,000, 1999
22. Burlington - Bike path relocation, \$96,000, 1999 (Sec's discretion)

Municipality	Description	Project Type	Growth Center	Effect on GC	FY 95	FY 96	FY 97	FY 98	FY 99	FY 95-99
Bolton - South Burlington	Resurface I-89 SB	FP	Not In GC	Not Related			\$ 162,450	\$ 933,273	\$ 1,441,506	\$ 2,537,229
Burlington	Multimodal Center	A	Regional	Access	\$ 1,428,750					\$ 1,428,750
Burlington	Route 127 Bike Path - Ethan Allen Homestead to Manhattan Drive	BP	Not In GC	Access			\$ 10,013	\$ 35,173		\$ 45,186
Burlington	Champlain Parkway - US7 northwest approx. 4,500 ft	C	Not In GC	Access	\$ 750,000			\$ 148,283	\$ 9,310	\$ 907,593
Burlington	Main Street - So. Burlington Line to So. Willard	C	Regional	Access	\$ 820,624	\$10,117,583	\$ 872,174	\$ 314,819	\$ 91,406	\$12,216,606
Burlington	North Street Revitalization - North Ave to North Willard	FP	Regional	Livability		\$ 26,006				\$ 26,006
Burlington	Lake Street Rehabilitation	FP	Regional	Livability			\$ 40,000	\$ 15,000		\$ 55,000
Burlington	Resurface US2 from US7 east 0.232 mile	FP	Regional	Access				\$ 109,954		\$ 109,954
Burlington	Riverside Avenue - Colchester Ave to N.	FP	Not In GC	Access		\$ 140,046	\$ 129,992		\$ 58,444	\$ 328,482
Burlington	US7 Resurfacing - So. Burlington Line to Ledge Rd	FP	Not In GC	Access			\$ 1,203,674	\$ 605,573	\$ 29,189	\$ 1,838,436
Burlington	Lease for RR Station (FTA Transfer)	T	Regional	Access					\$ 1,400,000	\$ 1,400,000
Burlington Area	CCTA Bike Racks and	BP	Not In GC	Livability		\$ 29,880				\$ 29,880
Burlington Area	Greater Burlington Access Program - Public Info and coordination services for major construction projects	O	Not In GC	Not Related		\$ 1,710				\$ 1,710
Burlington Area	Charlotte-Burlington Passenger Rail (FTA)	T	Not In GC	Access	\$ 5,344,887			\$ 139,100	\$ 300,000	\$ 5,783,987
Burlington - Winooski	US7 Bridge over Winooski River - Replace Deck	BR	Regional	Access		\$ 159,215	\$ 286,416		\$ 1,350,491	\$ 1,796,123
CCTA	Capital + Operating	T	Not In GC	Not Related	\$ 1,044,913	\$ 3,336,238	\$ 1,519,067	\$ 377,073	\$ 456,597	\$ 6,733,888
Charlotte - Shelburne	US7/F5 in Charlotte, US7/Bostwick Road in Shelburne	FP	Not In GC	Access			\$ 23,498			\$ 23,498
Colchester	Colchester Park and Ride Lot North of Chimney	A	Subregional	Access		\$ 12,142				\$ 12,142
Colchester	New Colchester Park and Ride Lot North of Chimney	A	Not In GC	Access	\$ 30,000					\$ 30,000
Colchester	Colchester Bike Path - Bayside Park to Hollow	BP	Subregional	Livability	\$ 1,036,201	\$ 40,540				\$ 1,076,741
Colchester	I-89/CCCH Interchange	C	Not In GC	Not Related				\$ 1,103,849		\$ 1,103,849
Colchester	VT2A/Mill Pond Road Intersection - Traffic signal installation	FP	Local	Access				\$ 14,337		\$ 14,337
Colchester	VT2A/US7/Creek Road/Bay Rd Intersection	FP	Local	Access	\$ 42,000					\$ 42,000
Colchester	US7 Resurfacing	FP	Not In GC	Access					\$ 4,709	\$ 4,709
Colchester	US7/US2 Traffic Signal	FP	Subregional	Access				\$ 112,673		\$ 112,673
Colchester	US7 Traffic Signals and Street Lighting	FP	Not In GC	Not Related					\$ 1,259	\$ 1,259
Colchester	Northern Connector	FP	Not In GC	Access				\$ 3,043		\$ 3,043
Colchester	Resurfacing I-89 Exit 16-17	FP	Not In GC	Not Related		\$ 14,295				\$ 14,295
Colchester	US7 Reconstruction from MM 1.8 to 2.0	FP	Not In GC	Not Related					\$ 59,520	\$ 59,520
Colchester	I-89 Truck Weigh and Inspection Station	O	Not In GC	Not Related	\$ 521,625	\$ 45,900	\$ 30,074	\$ 45,520	\$ 54,005	\$ 697,124
Colchester - Milton	I-89 Bridge Rehabilitation	BR	Not In GC	Not Related	\$ 270,000					\$ 270,000
Colchester - South Burlington	Lime Kiln Bridge Over the Winooski River (BR6 on	BR	Not In GC	Access			\$ 291,420			\$ 291,420
Essex	Footpath Extension and Landscaping	BP	Subregional	Livability		\$ 19,000				\$ 19,000

Project Types

A: Alternative **BP:** Bike Path
FP: Function & Performance Preservation

BR: Bridge Project
O: Other

C: Capacity
T: Transit

Municipality	Description	Project Type	Growth Center	Effect on GC	FY 95	FY 96	FY 97	FY 98	FY 99	FY 95-99
Essex	CCCH - Susie Wilson Rd. Reconstruction and Partial Relocation	C	Subregional	Access		\$ 124,580				\$ 124,580
Essex	CCCH Segment E - VT15 to Essex Way	C	Subregional	Access		\$ 38,000		\$ 271,862		\$ 309,862
Essex	CCCH Segment F - VT2A to VT15	C	Not In GC	Access				\$ 35,515	\$ 440,405	\$ 475,921
Essex	Old Colchester Rd. RR Crossing	FP	Subregional	Access	\$ 22,500					\$ 22,500
Essex	VT15/VT128 Signal Improvements	FP	Subregional	Access		\$ 37,000		\$ 3,000		\$ 40,000
Essex	VT 15/Old Stage Road Intersection	FP	Subregional	Access	\$ 81,080					\$ 81,080
Essex	Kellogg Rd - Susie Wilson Rd to Colchester Line	FP	Subregional	Access	\$ 68,800	\$ 12,973				\$ 81,773
Essex	Sand Hill Rd/VT117	FP	Not In GC	Not Related			\$ 9,730			\$ 9,730
Essex	CCCH Landscaping - Segment D	O	Subregional	Access			\$ 1,529			\$ 1,529
Essex	CCCH Wetland Mitigation - West of Brown River So of	O	Not In GC	Not Related				\$ 57,752		\$ 57,752
Essex Jct.	Resurface VT117/5 Corners	FP	Subregional	Access			\$ 85,682	\$ 278,104		\$ 363,787
Essex Jct.	Resurface VT15 from Fairground Rd. to 5 Corners	FP	Subregional	Access	\$ 24,942				\$ 369,033	\$ 393,975
Essex Jct.	Resurface Main Street from North of 5 Corners to Village Line	FP	Subregional	Access			\$ 399,620			\$ 399,620
Essex Jct.	Resurface VT2A from Williston Line to 5 Corners	FP	Subregional	Access			\$ 181,691	\$ 260,267		\$ 441,957
Essex - Colchester	Resurface VT2A in Essex and Colchester	FP	Subregional	Access		\$ 736,330				\$ 736,330
Essex - Jericho - Richmond	VT117 Paving and Safety Improvements	FP	Subregional	Access				\$ 52,680	\$ 436,036	\$ 488,716
Essex - Jericho - Underhill	Resurface VT15 from VT128 to Jericho Line	FP	Subregional	Access	\$ 1,453,924					\$ 1,453,924
Essex - Jericho - Underhill	VT15 Ditching	FP	Not In GC	Not Related				\$ 699,180		\$ 699,180
Essex - Westford	Resurface VT128	FP	Not In GC	Not Related		\$ 476,802				\$ 476,802
Essex - Williston	Replace BR8 on TH1	BR	Not In GC	Not Related					\$ 102,011	\$ 102,011
Huntington	Audubon Bridge	BR	Not In GC	Not Related	\$ 218,592					\$ 218,592
Jericho	Footbridge adjacent to BR7 on RT15	BP	Local	Livability		\$ 32,432				\$ 32,432
Milton	Truss Bridge for bike/ped	BP	Regional	Access		\$ 20,270				\$ 20,270
Milton	Replace US7 Bridge (Br 162) over Lamoille River	BR	Not In GC	Not Related		\$ 1,696	\$ 2,210,723	\$ 52,067	\$ 223,280	\$ 2,487,766
Milton	Replace BR18 (truss bridge) on TH40 over Lamoille River	BR	Not In GC	Not Related		\$ 42,940		\$ 1,842,276		\$ 1,885,216
Milton	I-89 Bridges over Lamoille	BR	Not In GC	Not Related	\$ 229,629					\$ 229,629
Milton	Reconstruct Main Street/RR Crossing	FP	Local	Access					\$ 225,000	\$ 225,000
Milton	US7 Resurfacing	FP	Not In GC	Access					\$ 17,771	\$ 17,771
Milton - Georgia	US7 Resurfacing and improvements - Milton Village line 2.92 mi north	FP	Not In GC	Access			\$ 342,128			\$ 342,128
Regional	Rideshare	A	Not In GC	Not Related	\$ 140,000	\$ 140,000	\$ 140,000	\$ 140,000	\$ 140,000	\$ 700,000
Regional	Town Highway Bridge	BR	Not In GC	Not Related	\$ 20,000					\$ 20,000
Regional	Bridge Inspection	BR	Not In GC	Not Related		\$ 160,000	\$ 160,000	\$ 160,000	\$ 160,000	\$ 640,000
Regional	Guardrail	FP	Not In GC	Not Related	\$ 20,000	\$ 20,000	\$ 20,000		\$ 20,000	\$ 80,000
Regional	Local Roads	FP	Not In GC	Not Related	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 80,000
Regional	Culvert Repair	FP	Not In GC	Not Related	\$ 100,000	\$ 100,000	\$ 100,000			\$ 300,000
Regional	Pavement Markings	FP	Not In GC	Not Related	\$ 160,000	\$ 160,000	\$ 160,000	\$ 160,000	\$ 160,000	\$ 800,000
Richmond	Replace BR10 on TH3 over Winooski River (Jonesville Bridge)	BR	Not In GC	Not Related	\$ 58,031					\$ 58,031
Richmond	US 2 Bridge over the Winooski River	BR	Not In GC	Not Related	\$ 121,648					\$ 121,648
Richmond	US2 Ledge Removal - US2/TH3/TH14 Intersection to Bolton Line	FP	Not In GC	Not Related	\$ 222,390					\$ 222,390
Richmond - Williston	I-89 Bridge Rehabilitation	BR	Not In GC	Not Related				\$ 174,427	\$ 7,201	\$ 181,628

Project Types

A: Alternative **BP:** Bike Path
FP: Function & Performance Preservation

BR: Bridge Project **C:** Capacity
O: Other **T:** Transit

Chittenden County Long Range Plan Regional Indicators Report

9/12/00

Appendix F

Projects Receiving Federal Funds In Chittenden County FY 1995 - 1999

Municipality	Description	Project Type	Growth Center	Effect on GC	FY 95	FY 96	FY 97	FY 98	FY 99	FY 95-99
Shelburne	US7 LaPlatte River Bridge (2 project numbers - FEGC 019-4(19)C/2)	BR	Not In GC	Access	\$ 2,490,900					\$ 2,490,900
Shelburne - South Burlington	US7 Rehabilitation - LaPlatte River to Imperial Dr.	C	Subregional	Access			\$ 63,334	\$ 61,580	\$ 3,434,250	\$ 3,559,164
South Burlington	Dorset Street Sidewalks	BP	Regional	Livability				\$ 31,065	\$ 20,386	\$ 51,451
South Burlington	Spear Street Bike Path - Mall 189 to Gutterson Field	BP	Not In GC	Access		\$ 37,957	\$ 11,018		\$ 38,729	\$ 87,704
South Burlington	Rehabilitation of I-89 Bridges - BR64, 65 N&S, 67, 67E and 69 (Design)	BR	Not In GC	Not Related			\$ 401,090	\$ 27,875		\$ 428,965
South Burlington	I-89 Bridge Painting - BR64, 65 N&S, 66 N&S, 67, 67E, 69, 3E&3W on 189	BR	Not In GC	Not Related				\$ 845,276		\$ 845,276
South Burlington	I-189 Bridge Improvements Deck & substructure, BR 3E&3W	BR	Not In GC	Not Related			\$ 105,934	\$ 2,111	\$ 839,671	\$ 947,716
South Burlington	Reconstruction of Dorset St. - Kennedy Dr. to Williston	C	Regional	Access		\$ 462,527		\$ 564,244		\$ 1,026,771
South Burlington	Kennedy Drive	FP	Regional	Access	\$ 263,510					\$ 263,510
South Burlington	Resurface US2 from Dorset St. to Milham Ct.	FP	Regional	Access		\$ 4		\$ 90,097	\$ 447,052	\$ 537,153
South Burlington	Resurface US7 - mm 0.529 1.738	FP	Subregional	Access		\$ 43,716	\$ 388,475	\$ 581,289	\$ 29,432	\$ 1,042,912
South Burlington	Interstate Drainage Emergency Project	FP	Not In GC	Not Related			\$ 86,306	\$ 213,549		\$ 299,854
South Burlington	Landscaping for Bike Path	O	Not In GC	Livability			\$ 4,200	\$ 500		\$ 4,700
South Burlington	Stormwater treatment - Bartlett Brook watershed	O	Not In GC	Not Related		\$ 10,960				\$ 10,960
Transit	FTA Transfers	T	Not In GC	Not Related	\$ 100,000	\$ 544,000	\$ 400,000	\$ 319,760	\$ 263,600	\$ 1,627,360
Underhill	River Road Bridge (BR 9 on TH1) over Brown River	BR	Local	Access	\$ 12,000					\$ 12,000
Williston	Bike Path from North Williston Rd. to Old Stage	BP	Local	Livability			\$ 268,929	\$ 72,846	\$ 420,271	\$ 762,047
Williston	Reconstruction of US2/VT2A Intersection	FP	Subregional	Access					\$ 9,338	\$ 9,338
Williston	Traffic signal at US2/VT2A Intersection	FP	Subregional	Access	\$ 73,252				\$ 10,275	\$ 10,275
Williston	US2/VT2A Intersection (Tafts Corners)	FP	Subregional	Access						\$ 73,252
Williston	US2/Industrial Ave	FP	Not In GC	Not Related			\$ 35,504	\$ 41,286		\$ 76,790
Williston	Resurface VT2A from RT2 to Essex Jct. Line	FP	Subregional	Access		\$ 332,284				\$ 332,284
Williston	Resurface US2	FP	Subregional	Access			\$ 5,757	\$ 46,213	\$ 91,215	\$ 143,185
Williston	Scenic Easement	O	Not In GC	Not Related					\$ 18,706	\$ 18,706
Williston - Berlin	Repair and/or replace guardrail, signs, fences, drainage	FP	Not In GC	Not Related				\$ 26,248		\$ 26,248
Williston - Essex - Colchester	CCCH	C	Not In GC	Access	\$ 491,461	\$ 4,494	\$ 1,075,000	\$ 210,965	\$ 574,451	\$ 2,356,371
Williston - Highgate	Repair and/or replace guardrail, signs, fences, drainage	FP	Not In GC	Not Related					\$ 49,267	\$ 49,267
Williston - South Burlington	Bridge No. 15 over Muddy Brook on TH6	BR	Not In GC	Not Related			\$ 20,785	\$ 6,540	\$ 302,860	\$ 330,185
Winooski	Bike Racks	BP	Regional	Livability					\$ 1,000	\$ 1,000
Winooski	Winooski Riverwalk	BP	Regional	Livability				\$ 1,000		\$ 1,000
Winooski	Reconstruct US7 From City Line North 0.9 Miles	FP	Regional	Access				\$ 29,840		\$ 29,840
Winooski	VT15 Resurfacing	FP	Regional	Access		\$ 36,863	\$ 30,220	\$ 30,220	\$ 388,055	\$ 485,358
Winooski	Rehabilitate Culverts	FP	Regional	Access					\$ 176,964	\$ 176,964
Winooski - Colchester	I-89 Bridge Rehabilitation	BR	Not In GC	Not Related		\$ 92,246	\$ 14,529	\$ 41,805	\$ 3,634,918	\$ 3,783,498
Subtotals					\$ 16,178,793	\$ 19,125,495	\$ 11,306,961	\$ 11,405,109	\$ 18,323,614	\$ 76,339,973

Project Types

A: Alternative **BP:** Bike Path
FP: Function & Performance Preservation

BR: Bridge Project
O: Other

C: Capacity
T: Transit

Accessibility	The facilities and services that make it possible to get to any destination, measured by the availability of physical connections (roads, sidewalks, etc.), travel options, ease of movement, and proximity of destinations.
CATMA	Campus Area Transportation Management Association. Offers ridesharing "match-up" and assistance for Champlain and Trinity Colleges, Fletcher Allen Health Care, and the University of Vermont.
CCMPO	Chittenden County Metropolitan Planning Organization. Established under federal law in 1983, CCMPO is the County's transportation planning and funding approval agency.
CCRPC	Chittenden County Regional Planning Commission. Regional comprehensive land use planning agency for Chittenden County . It works cooperatively with the CCMPO .
CCTA	Chittenden County Transportation Authority. Manages and operates the regional bus system and offers ridesharing services.
Corridor	A travel way, often a major road or rail line and its immediate environs.
Discretionary Funds	Funds whose distribution is not automatic and not by formula but dependent on the decision of some agency or party.
FAA	Federal Aviation Administration.
FHWA	Federal Highway Administration. A federal agency under the Department of Transportation that is responsible for highways, and a key player in TEA-21 implementation.
FRA	Federal Railroad Administration.
FTA	Federal Transit Administration. A federal agency under the Department of Transportation that is responsible for public transit, and a key player in TEA-21 implementation.
FY	Fiscal Year. The CCMPO's fiscal year is October 1 – September 30.
Flexible Funds	Federal transportation funding that may be used for highway and/or transit.
Formula Grants	Funds distributed according to some legislated or regulated scheme.
Functional Classification	The classification of urban roadways by function or purpose. Roadways at the top of the hierarchy serve inter-city and other long-distance movement of traffic; roadways at the bottom provide access to land.
HAL	High Accident Location (highway).

HOV	High-Occupancy Vehicle. Vehicles carrying two or more people. Roads may have lanes solely for HOV use, such as carpools, vanpools, and buses.
ITS	Intelligent Transportation Systems. The application of telecommunications and computer technology to improve the operation and efficiency of our transportation system.
Intermodal	Planning that reflects a focus on connectivity between modes and emphasizes choices, coordination, and cooperation.
LOS	Level of Service. A measure given to roads and intersections that relates to the frustration experienced by drivers due to congestion. It is expressed from Level of Service “A” (least congested area) to Level of Service “F” (most congested area).
MPO	Metropolitan Planning Organization. The organization required by the federal government, designated by states and operated by local officials for developing transportation plans and programs in urbanized areas of 50,000 or more people. (See CCMPO .)
MTP	Metropolitan Transportation Plan. A fiscally-constrained blueprint to guide Chittenden County’s transportation development and investment for the next 25 years. Per federal law, the MTP is updated every five years to ensure the Plan remains current and effective at achieving regional transportation goals.
Mode	A particular means of transportation (e.g., rail, auto, bike, walk).
Mobility	The door-to-door experience of traveling or shipping goods throughout our communities and across the region, measured in terms of travel time, comfort, convenience, safety, and cost.
Multimodal	Planning that reflects consideration of more than one mode to serve transportation needs in a given area and is included in the meaning of intermodal.
Paratransit	A demand-responsive system that applies to a variety of smaller, flexibly scheduled and routed transportation services using low-capacity vehicles. Used by persons, such as the elderly and other persons with disabilities, for whom use of standard mass transit services may prove difficult.
Person Trip	The movement of a <u>person</u> from an origin to a destination. A carpool carrying three people from origin-to-destination make one <u>vehicle</u> trip, its occupants together have made three <u>person</u> trips.
Scoping	Scoping is part of the Project Definition process for major transportation improvements. Improvements must undergo resource team review,

	alternatives analysis, resource agency coordination, an alternatives presentation meeting, and alternatives acceptance.
SOV	Single Occupancy Vehicle (driver only).
SSTA	Special Services Transportation Agency. Offers specialized bus service and ridesharing opportunities for the disabled. SSTA contracts with CCTA to provide Americans with Disabilities Act (ADA) paratransit service for Chittenden County.
STIP	State Transportation Improvement Program. <u>See Transportation Improvement Program (TIP).</u>
Sufficiency Rating	A measure of road or bridge adequacy. A section of road that is completely adequate in every respect is rated at 100. Any deficiency in the road that affects the structural condition, efficient movement of traffic, or safety reduces the rating as far down as zero.
TAC	Technical Advisory Committee. A committee of the CCMPO that makes recommendations on transportation plans and programs to the CCMPO Board of Directors for action.
TDM	Travel Demand Management. Any action that attempts to control or alter existing travel patterns or use. Included in this group are promoting ridesharing, requiring alternative work hours or flextime, and increasing travel costs for certain modes, mainly automobile, through parking controls, fees, or fuel taxes.
TEA-21	Transportation Equity Act for the 21st Century. Overall federal surface transportation law that authorizes six years of funding for surface transportation programs nationally, including highways, transit, and non-motorized modes. Passed by Congress in 1998, TEA-21 is the successor to the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).
TIP	Transportation Improvement Program. A fiscally constrained program of transportation projects consistent with the Metropolitan Transportation Plan. It lists projects to be funded under federal programs for a three-year period. Both the MPO and the State complete a TIP.
TMA	Transportation Management Association. A voluntary association of public organizations, private agencies, and businesses joined to develop cooperative transportation programs in a given area.
Transit	Generally refers to urban passenger transportation service, (private or public) along established routes with fixed or variable schedules at published fares.

Transportation**Capital****Program**

The annual program devised by the State of Vermont to determine and prioritize transportation capital investments statewide. These needs and cost estimates are updated annually in the program. This process is coordinated with the **CCMPO** through the **TIP** development process.

UPWP

Unified Planning Work Program. The CCMPO's annual work plan that identifies the local and regional transportation planning priorities and activities for each fiscal year.

VTrans

Vermont Agency of Transportation. A cabinet-level agency that sets state policies and plans for all modes of transportation and oversees public transit, general aviation, rail and water transport, and state/local highway programs. Works hand-in-hand with CCMPO and has voting seat on CCMPO Board.

VMT

Vehicles Miles of Travel. Represents one vehicle traveling a distance of one mile. Often used as a measure of car and road usage in a region.

Vehicle Trip

An origin-to-destination journey by a single vehicle. A bus carrying 40 people from an origin to a destination makes one **vehicle trip**, while its occupants make a total of 40 **person trips**.