C • C • T • A

CHITTENDEN
COUNTY
TRANSPORTATION
AUTHORITY

Transit Development Plan

EXECUTIVE SUMMARY

SEPTEMBER 2010

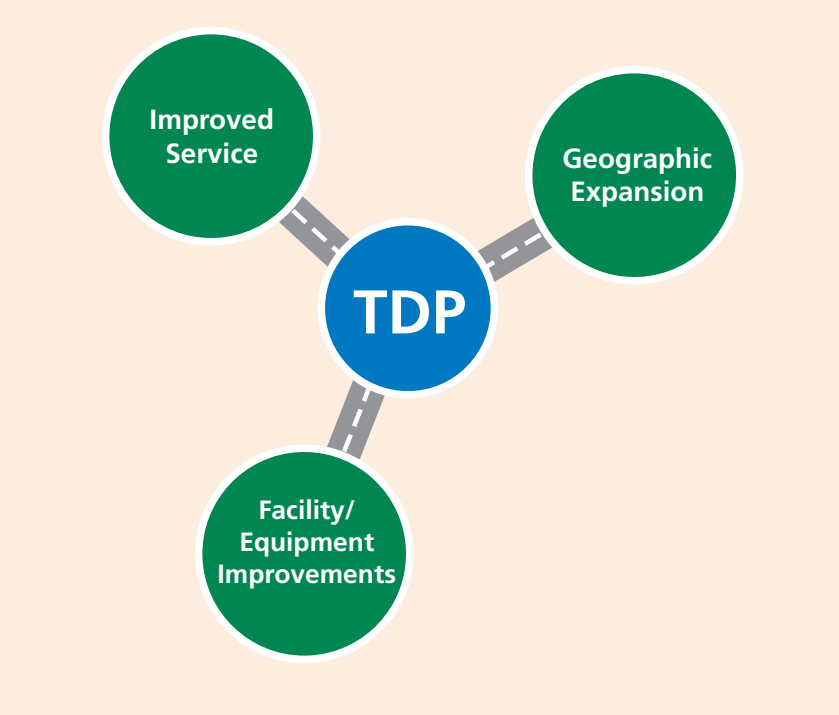
Executive Summary

"Business as usual will not allow public transportation to deliver desired outcomes. Only with policy changes and increased support will public transportation help achieve the region's mobility and sustainability goals."

–Chapin Spencer, CCTA Board Chair

The Transit Development Plan (TDP) for the Chittenden County Transportation Authority provides a program for the expansion and enhancement of public transportation service in Chittenden County over a 10-year period and beyond. It is the foundational planning document for the agency, as it establishes the framework within which all other short term service planning and capital planning occurs. The TDP also provides detailed strategies to meet the goals of numerous other regional and state entities as listed in such documents as the City of Burlington's Transportation Plan, the CCMPO's Metropolitan Transportation Plan, the VAOT Long Range Transportation Business Plan, and the Governor's Climate Change Action Plan. Increased financial and political support from municipalities, the state, the business community, and other organizations will be crucial to CCTA's success in meeting multiple regional goals.

Primary TDP Elements



The mission of CCTA is to operate safe, convenient, accessible, innovative and sustainable public transportation services in the Chittenden County region that reduce congestion and pollution, encourage transit oriented development and enhance the quality of life for all.

The Strategy Committee of the CCTA Board has developed a vision statement to describe CCTA's future role in the region and its relationship with its member communities:

> *The Chittenden County Transportation Authority will play an important role in northwest Vermont's transportation system and will carry an increasing number of passengers each year. With growing ridership, CCTA will provide the region with economic development, environmental benefits and a cost effective means of transportation. The public transportation options offered by CCTA will serve a wide range of passengers, including those who are transit dependent and those who have other transportation choices. CCTA's services and facilities will use technology in order to be convenient and attractive enough to entice individuals to use their cars less. In order to maximize access to CCTA's public transportation services, communities will focus development along existing transit routes, considering the presence of transit when contemplating future development, and will work to improve the pedestrian environment in all areas served by CCTA buses. By combining efforts with bicycle, pedestrian, carpool, and carshare entities, alternative modes of transportation will rival the primacy of the single occupancy vehicle and will surpass it in terms of affordability.*

In order to make this vision a reality, the following items must be pursued:

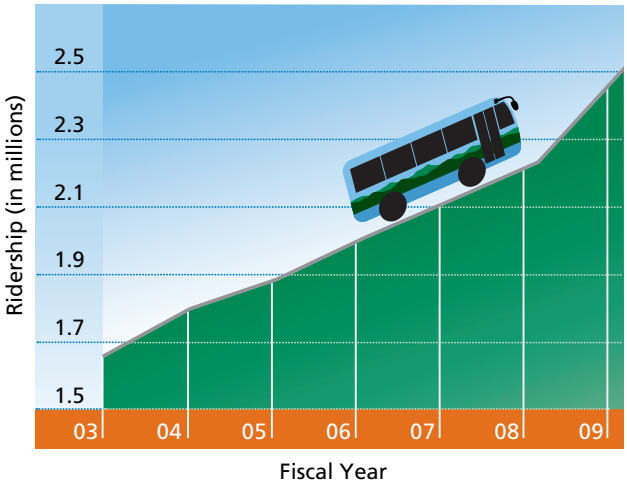
- Municipalities should change their local zoning to more strongly support and incentivize transit oriented development, including higher density and mixed use projects, along transit corridors in their communities.
- CCTA, the municipalities of northwest Vermont, and the State of Vermont should work together to develop a regional funding mechanism for public transportation that relieves the burden on the property tax.
- The Chittenden County Metropolitan Planning Organization (CCMPO) must have greater autonomy and control regarding programming the region's federal transportation funding.
- CCTA and the CCMPO must have greater control to develop and implement transportation infrastructure projects, such as park and ride lots, in our region.

Service Summary

CCTA operates 13 local fixed routes, traveling within and to Burlington, South Burlington, Essex, Essex Junction, Colchester, Shelburne, Williston, and Winooski. CCTA operates a new (Feb. 2010) regional commuter route linking Milton to Burlington and three interregional commuter routes linking downtown Burlington to St. Albans, Montpelier, and Middlebury. CCTA's fixed-route services mostly operate six days per week and most CCTA routes offer trips every 30 minutes, though the Essex Junction route and the new (June 2010) Route 1 to Williston operate every 15 minutes during peak periods. For most routes, evening service and morning service on Saturdays is operated hourly. Sunday service is only operated on the Route 1 – Williston, Route 12 – South Burlington Circulator, and Route 18 – Sunday Special.

Since 2003, CCTA has been working to implement new routes and service expansions recommended in the last Short Range Public Transportation Plan (the predecessor to the TDP). In response to these improvements, marketing efforts, capital upgrades, and institutional relationships, CCTA has enjoyed annual ridership increases in the range of 5-7% for each year since 2003, including an increase of 12% in from 2008 to 2009.

CCTA Annual Ridership FY03–FY09



Market Assessment

Chittenden County is, by far, the most densely populated county in Vermont. Population density is essential for mass transit services as there must be enough people along a route to produce sustainable ridership. For buses to be competitive with driving, they need to run at a high frequency (at least four trips per hour in each direction). The higher the frequency, the more seats there are to be filled, and thus the higher the density needs to be to support the service. Most of the areas served by CCTA's local routes have moderate to high densities, with the highest densities found near the downtown area of Burlington.

There are a few areas in the county that have densities that support high levels of service, but which are outside of the current service area. The further removed these areas are from current routes, the greater the cost will be to tie them into the system.

While CCTA now serves the most important commuting corridors, there are other opportunities for new commuter service including the VT 15 and VT 116 corridors, among others. Overall, the town of Colchester has the greatest amount of unserved territory with adequate density to support public transportation, and is thus the next best market for local and commuter transit service. However, there are barriers to extending service to Colchester *(see Chapter 7).*

3 households per acre is an industry-standard measure of the residential density needed to support fixed-route bus service. It is roughly equivalent to quarter-acre zoning. The New North End of Burlington is an example of this level of residential density.

Needs Analysis

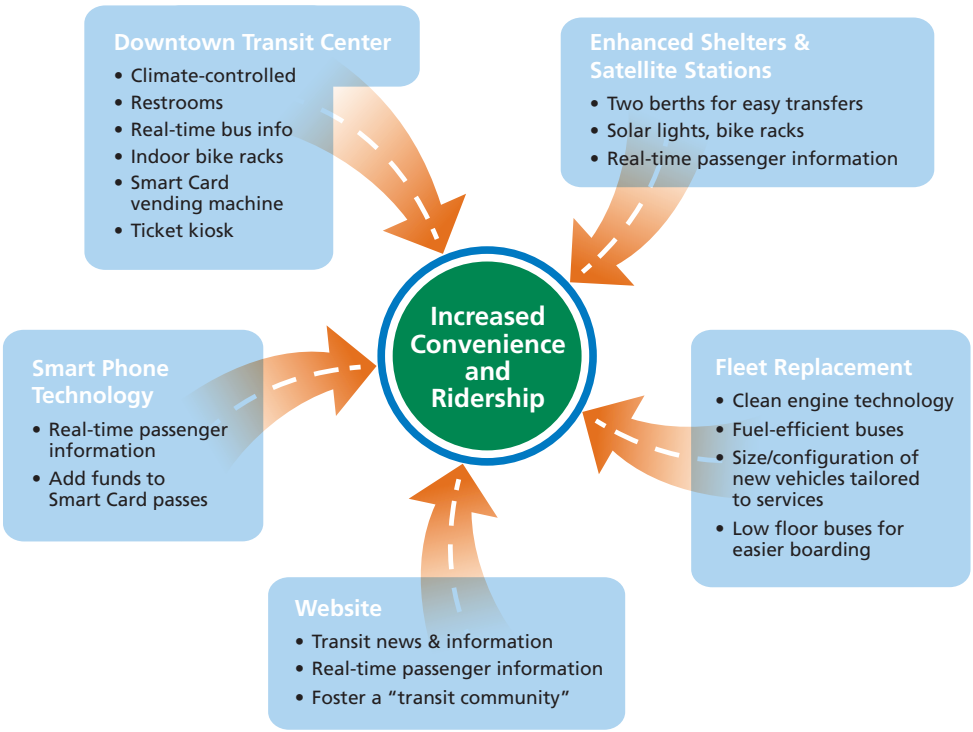
The answer to the question "what are the greatest unmet needs for public transportation in Chittenden County" depends on who is asked. For residents outside of the urban core, the answer is clearly new commuter routes to outlying communities such as Colchester, Hinesburg, Jericho and Richmond. For residents of communities that already have some service, the answer is more hours (including weekend service) and higher frequency on the existing routes. Additional connections, such as cross-town links between the two parts of South Burlington, would also expand the travel options of current riders.

Increased frequency on major corridor routes is likely to be the most cost-effective investment in new service CCTA can make.

In the transit industry, 30-minute service is considered unattractive to choice riders, while 15-minute service in the peak periods is considered a significant threshold to making transit competitive with driving. Establishing 15-minute peak service on all four of the major corridors into Burlington—North Ave, Colchester Ave/Pearl Street (VT 15), Williston Road/Main Street (US 2), and Shelburne Road (US 7)—is likely to be the most cost-effective investment in new service that CCTA can make. This is the central transit recommendation in the Burlington Transportation Plan.

Expanding the hours of service on CCTA routes is likely to be the next most cost-effective investment. Service offered 14-16 hours per day (such as 6:00 a.m. to 10:00 p.m.) is considered to be the minimum needed to

Capital and Technology Investments



Capital and technology investments are key factors in transit's ability to draw people out of their cars.

attract choice riders, but many CCTA routes end service by 7:00 p.m. In addition to more evening service, Sunday service on the four major corridors, with the Essex Junction route leading the way, would generate additional ridership.

Beyond service expansion, respondents to surveys and participants in public outreach requested further investment in shelters, benches, bike racks and other passenger facilities, as well as new technology such as real-time passenger information, wi-fi on buses, and trip planning software. Such investments in physical infrastructure and technology make the system more appealing to existing riders and future choice riders.

The pedestrian environment in bus service corridors is an essential element of the overall system. All passengers are pedestrians (either on foot or in a wheelchair) before they board the bus and after they exit. If the pedestrian environment is not safe, comfortable, and attractive, then neither is the bus system, no matter how good the service is. CCTA member communities must continue to work with CCTA to improve pedestrian facilities along and extending from bus routes to provide better access to transit service from neighborhoods.

A safe and comfortable pedestrian environment is essential to the success of public transportation.

Existing Shelters

ABOVE: Examples of improved bus shelters already implemented.

Proposed Investments

Real-time bus information

Solar-powered shelter lighting

Smart Cards

Bike racks

ABOVE: Examples of further facilities investments to enhance passenger convenience and safety.

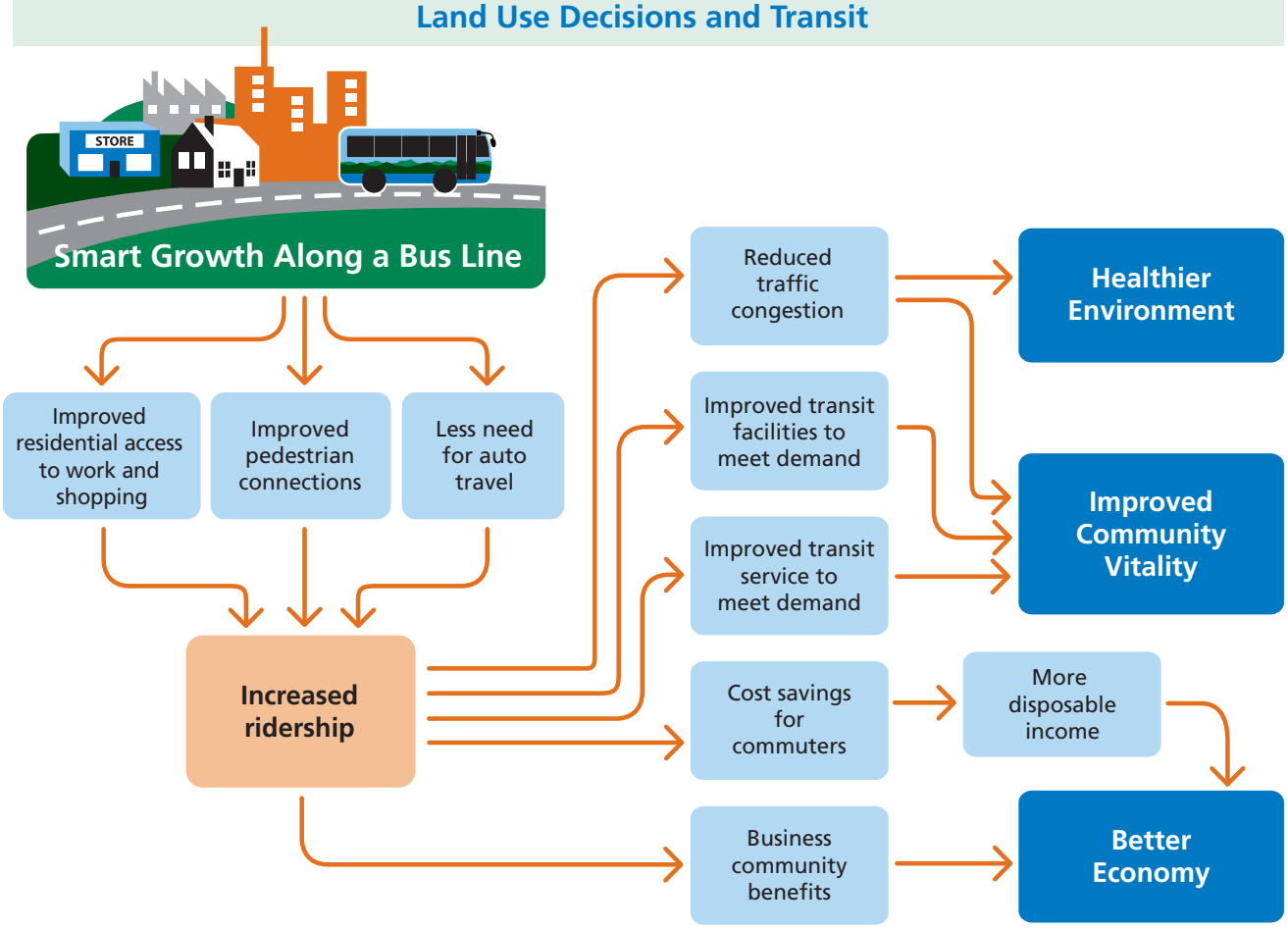
Regional Coordination and Sustainability

To an ever larger extent, CCTA plays a vital role in the economy of Chittenden County, allowing for continued economic growth in a way that is consistent with reduced energy use, environmental protection, sustainable land use, and reduced traffic congestion. In order to achieve this, CCTA coordinates closely with local, regional, and state governments and works with the private sector to leverage investment in transportation.

The future system envisioned in the TDP can only be achieved if future land use decisions support public transportation. Whether this land use is called "smart growth," "transit oriented design," "pedestrian oriented design," or some other term, future development (especially the type that generates demand for public transportation) must be focused in a geographical area that is compact and conducive to efficient operations. As municipalities and developers consider new construction of homes and commercial space within CCTA's member communities, communication and cooperation with CCTA and other regional organizations is necessary.

Land use decisions that promote efficient public transportation service will result in a healthier environment, a revitalized community, and an improved local economy.

Land Use Decisions and Transit



Transit Investments

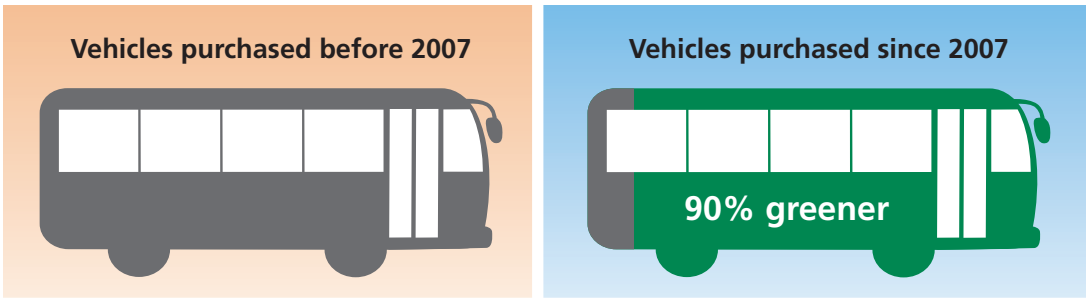
The TDP includes a wide range of service recommendations to be implemented as funding becomes available. These include the following:

- **Interregional commuter routes** to Cambridge (via VT 15), Waterbury, and Swanton
- **Intermodal connection routes** to Grand Isle (ferry) and Rutland (Amtrak)
- **Regional commuter routes** to Colchester, Hinesburg, and Richmond
- **Service upgrades on trunk corridors:** North Ave, VT 15, US 2, Pine Street, Shelburne Rd.
- **Service upgrades on local routes:** Riverside, Essex Center, City Loop, South Burlington Circulator
- **New local services** in South Burlington, Colchester, and Essex
- **New parking shuttles** to downtown, Fletcher Allen and the airport from intercept lots at exits 12, 14, and 16
- **Feeder services** to commuter and trunk routes in outlying towns
- **ADA complementary paratransit service** and other demand response services

Capital Investments

Capital investments are also a critical part of the TDP. CCTA has established a vehicle replacement plan, and additional expansion vehicles will be required as new services are implemented. The size and configuration of new vehicles purchased will be tailored to the services. All new vehicles purchased will employ clean engine technology to reduce harmful emissions. CCTA will also seek to acquire fuel-efficient and low-emissions buses.

CCTA's Fleet Replacement



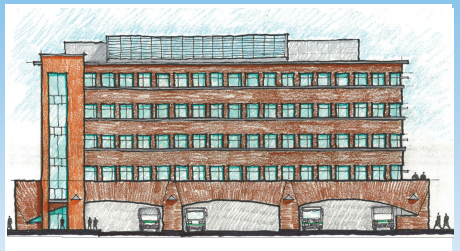
Since 2007, **one half** of the fleet has been replaced with **90% greener** vehicles.

Investments in Facilities

CURRENT: Cherry Street Station

- No indoor waiting area
- No place to sit
- No Restrooms
- No covered bike racks
- Not well lit at night
- Long walk to buses
- Brrrrrrrr!

PROPOSED: Downtown Transit Center



- Climate controlled and well-lit waiting area
- Real-time bus info
- Restrooms
- Indoor bike racks
- Ticket kiosk & smart card vending machine

The most needed facility investment for CCTA's system is the replacement of Cherry Street Station by a new **Downtown Transit Center** in the downtown core of Burlington. The current passenger environment at Cherry Street Station, without a climate controlled waiting are or other passenger amenities, is insufficient to attract new riders to transit. Outside of Burlington, there are several locations that could be considered transit satellite stations—where two or more routes come together—and would include large shelters with lights, bike racks, real-time passenger information (in the future), and two bus berths to allow for easy transfers.

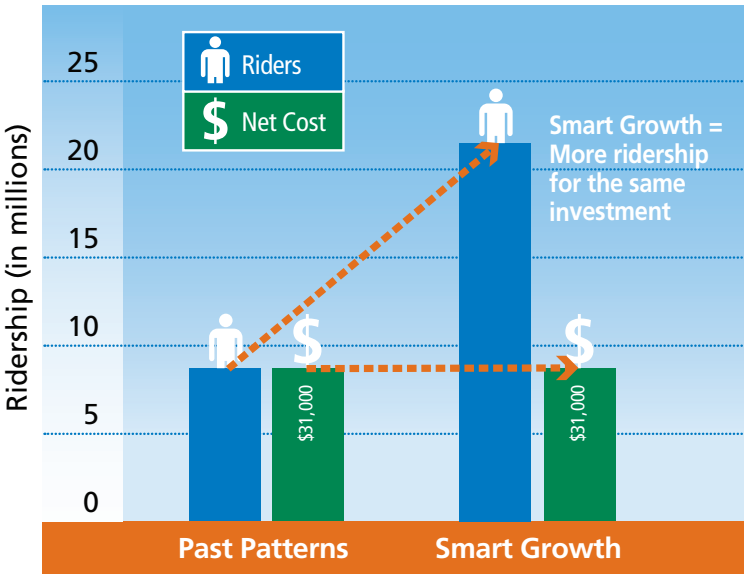
A new Downtown Transit Center is imperative to make the entire bus system more convenient and attractive for passengers.

An increase in the number of publicly owned park and ride lots is crucial to the development of future transit services and CCTA strongly advocates for such an expansion. Park & Ride lots are an integral part of successful commuter transit service in the region, especially since parking and traffic congestion are an issue in downtown Burlington and on the Hill/University of Vermont area. Existing transit routes can be made more successful and cost-effective through the expansion of park & ride capacity at existing lots and the creation of new lots as they increase access to transit services without significant new operating costs.

Impact of Improved Transit Services

The discussion of costs and benefits of public transportation usually focus on the financial costs of operation, the number of riders, fare revenue and other easily calculated values. The impacts of transit, however, go well beyond these types of figures. Public transportation plays a critical role in the

2020 Ridership Under Two Scenarios



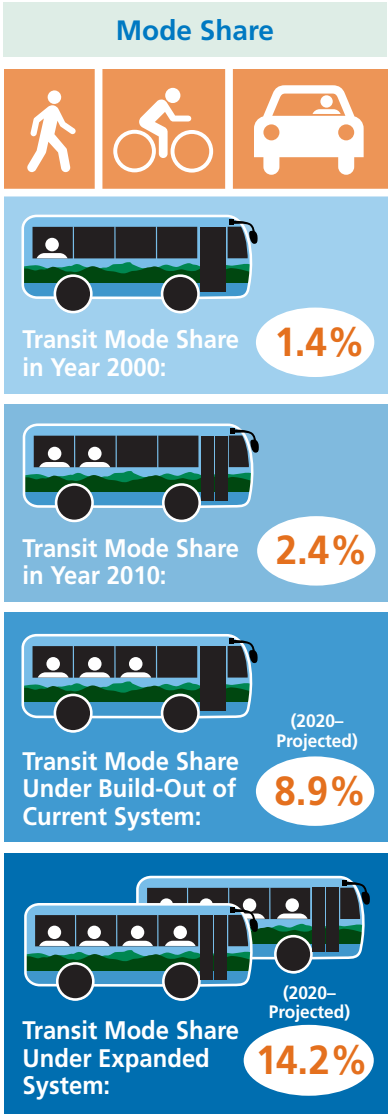
See Notes section for details regarding projections.

economic vitality and future sustainability of Chittenden County. Effective transit service makes more sustainable development patterns feasible and reduces the need for additional road capacity. The mobility afforded to all residents and workers is also a major benefit offered by CCTA. The commuter service offered by CCTA, which draws people out of their cars, results in significant environmental benefits. In FY2009, the LINK Express commuter routes operated by CCTA carried over 117,000 passengers. With an average trip length of roughly 30 miles, this bus ridership represents over 3.5 million miles not driven in cars. These saved miles translate into a savings of at least 140,000 gallons of fuel and a reduction of carbon monoxide and carbon dioxide emissions of 193,545 pounds and 2,815,200 pounds, respectively. These benefits of transit tie directly back to the policies articulated in local, regional, and state plans.

While future ridership is an important figure, the statistic most relevant to measuring whether CCTA is achieving its mission is perhaps the percentage of trips in the region that is made on public transportation, also known as the transit mode share. In 2000, the transit mode share was estimated to be 1.4% of all trips made within the six core communities of Chittenden County (Burlington, Essex, Shelburne, South Burlington, Williston, and Winooski). By 2010, it is estimated that the transit mode share has increased to 2.4% based on the growth of CCTA ridership compared to overall traffic growth.

Extending that trend in mode share growth out to 2020 with the current system results in an estimated 4.2% transit mode share. A full build-out of the system would lead to an 8.9% mode share in 2020. However, full implementation of the TDP, plus "optimistic" assumptions about future prices and policy decisions, at least with respect to transit's competitive position to the private automobile, could result in much higher mode shares. With gasoline and parking fees rising substantially (to $10 per gallon and $5 per day for parking at all locations that are within CCTA's service area), and with a land use policy to focus new development in transit priority corridors designed in a way consistent with TOD/POD principles, transit mode share could rise to 14.2% if all of the TDP recommendations were implemented. That translates into a 590% increase in mode share, compared to a 380% increase in costs.

The percentage of travel in the region that takes place on buses can increase substantially with an expanded CCTA system and pricing and policies that make automobile travel more expensive.



Funding

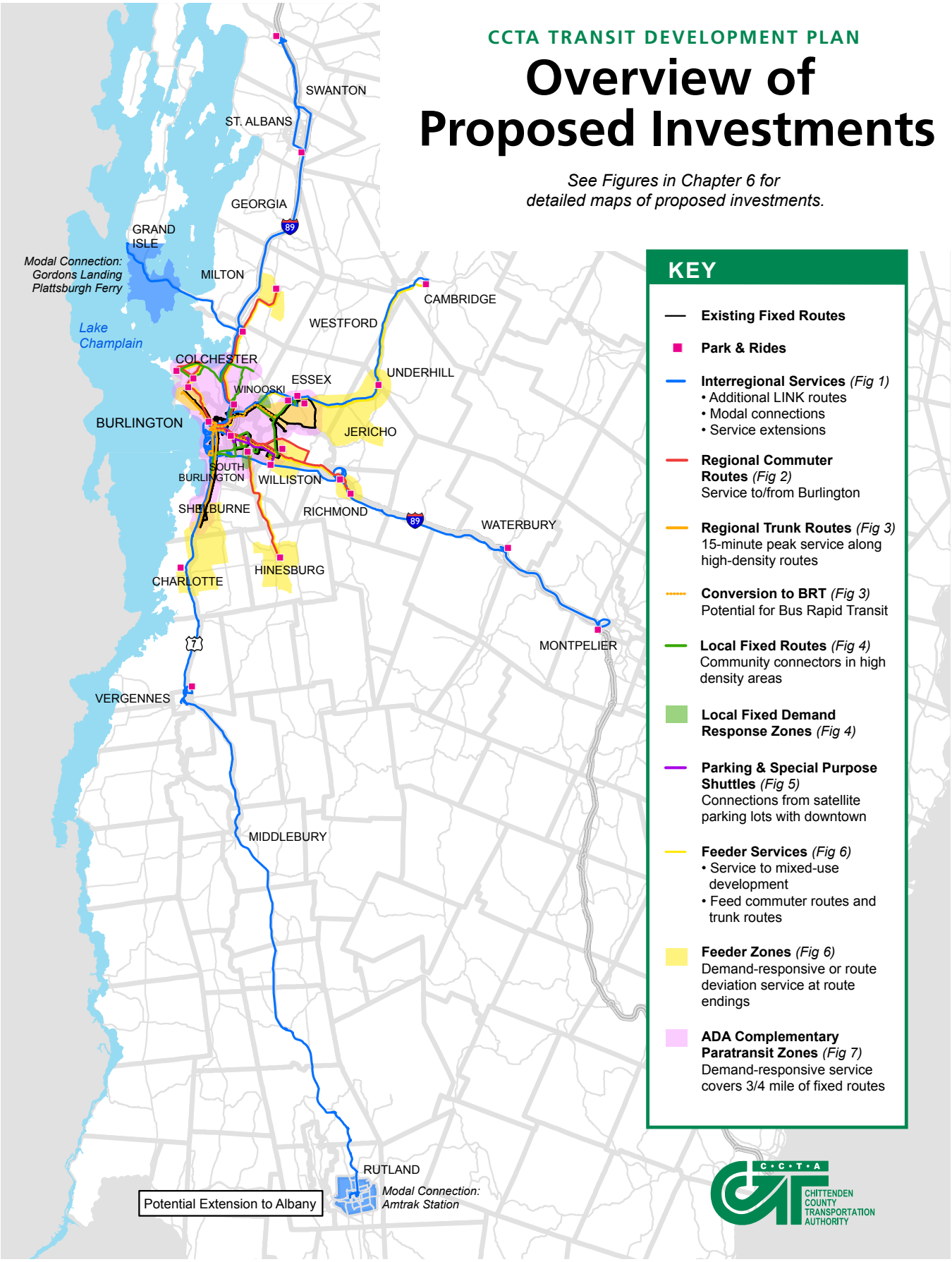
It has been clear for many years that the current funding mechanism for public transportation is insufficient to support the expanded transit system that most Chittenden County residents believe is needed. Through expanded use of federal funds and diligent work at the local level to increase local contributions and membership, CCTA has managed to pursue its mission to the extent possible. However, the ambitious agenda in this TDP is impossible without a significant change in the funding structure. The imperatives of supporting economic vitality, reducing traffic congestion, improving air quality, mitigating the severity of climate change, and enhancing mobility for all citizens argue strongly for a much more robust public transportation system.

At the state and regional level, it is clear the recognition that the current funding structure is unsustainable must be converted into action. There is no means of raising revenue that will be completely painless for all parties. Most economists and environmental scientists believe that increasing taxes on motor fuels is a necessary step toward curbing CO2 emissions. One of the major barriers to this option is the lack of political support. Perhaps the multiple imperatives of lessening the burden on local property taxes, supporting public transportation and reducing carbon emissions will finally result in action.

CCTA TRANSIT DEVELOPMENT PLAN

Overview of Proposed Investments

See Figures in Chapter 6 for detailed maps of proposed investments.



Notes:

2020 RIDERSHIP UNDER TWO SCENARIOS:

1. Federal funding and costs are assumed to increase 5% annually through 2015 and 4% annually from 2016 to 2020.
2. All costs shown are net of fare revenue, assumed to remain constant at 23% of costs.
3. "Maintain Current System" is operation of the system as it exists in June 2010; "Expanded" means full implementation of all TDP recommendations.
4. Net cost of ADA complementary paratransit is included in estimates, assuming that demand for ADA trips grows in proportion to fixed route service.
5. Ridership on the current system is projected to grow at 3.9% annually, based on the experience of ridership change since 2001, excluding new routes and major service increases.
6. The "steady state" scenario assumes no major changes in transportation prices or land use policy. The "optimistic" scenario assumes that gasoline will retail for $10 per gallon in 2020 (more than triple the current price), that there will be an increase in parking fees of $5 per day at all locations that are within CCTA's service area, and that land use decisions are made to focus new development in transit priority corridors, and that the new development is designed in a way consistent with TOD/POD principles.

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Chapter 1

Introduction

Purpose of this Plan

The Transit Development Plan (TDP) for the Chittenden County Transportation Authority provides a program for the expansion and enhancement of public transportation service in Chittenden County. In many ways, it is the foundational planning document for the agency, as it establishes the framework within which all other short term service planning and operations planning occurs. It also acts as the transit component of the Chittenden County Metropolitan Planning Organization's Metropolitan Transportation Plan, the region's long-range transportation planning document.

This TDP is not restricted to the short-term period (five years from the present) as previous transit plans have been, but rather covers at least a 10-year time frame. Projects included here for the long-term future are intended more as guideposts and reference points than detailed plans. The goal is to have a coherent plan with short-term actions that make sense on their own merits, as well as building toward a future enhanced system.

This chapter serves as the introduction to the TDP, including various background materials that offer a context for the chapters that follow. It begins with an overview of the TDP document, followed by a discussion of CCTA's mission and vision of the future. After a listing of the accomplishments since the time of the last comprehensive plan and a brief overview of the history and structure of CCTA, the key partners in the process of creating and implementing the TDP are identified and discussed. The chapter closes with a hierarchy of public transportation services to set a context for the existing and proposed services discussed in later chapters.

Overview of TDP

Following this introductory chapter, Chapter 2 is a review of existing transit services in Chittenden County, including CCTA, SSTA, and other transportation providers. Chapter 3 provides a demographic and economic profile of Chittenden County, with special emphasis on target populations: youth, older adults, low income households, and autoless households. Important destinations, such as senior housing, accessible housing, major employers, social service agencies, and major employers are also discussed. Chapter 4 is a needs assessment, based on findings from Chapter 3 as well as recent surveys and public outreach, and Chapter 5 discusses regional coordination and sustainability. The service and facility recommendations of the TDP are listed in Chapter 6, while Chapter 7 discusses costs, funding and ridership impacts. Chapter 8 offers conclusions and next steps for the Transit Development Plan.

CCTA Mission and Vision of the Future System

The mission statement of CCTA is focused on the immediate purpose and benefits of public transportation service in Chittenden County:

> The mission of CCTA is to operate safe, convenient, accessible, innovative and sustainable public transportation services in the Chittenden County region that reduce congestion and pollution, encourage transit oriented development and enhance the quality of life for all.

Part of the purpose of the TDP is to outline a future system that will allow CCTA to achieve its mission to a greater extent than is possible today.

The Strategy Committee of the CCTA Board has developed a vision statement to describe CCTA's future role in the region and its relationship with its member communities:

> *The Chittenden County Transportation Authority will play a major and important role in northwest Vermont's transportation system and will carry an increasing number of passengers each year. With growing ridership, CCTA will provide the region with economic development, environmental benefits and a cost effective means of transportation. The public transportation options offered by CCTA will serve a wide range of passengers, including those who are transit dependent and those who have other transportation choices. CCTA's services and facilities will use technology in order to be convenient and attractive enough to entice individuals to use their cars less. In order to maximize access to CCTA's public transportation services, communities will focus development along existing transit routes, considering the presence of transit when contemplating future development, and will work to improve the pedestrian environment in all areas served by CCTA buses. By combining efforts with bicycle, pedestrian, carpool, and carshare entities, alternative modes of transportation will rival the primacy of the single occupancy vehicle and will surpass it in terms of affordability.*

The following attempts to show what the achievement of this vision would look like from the perspective of a future rider. The entire process of planning and then taking a trip is described, taking full advantage of advances in technology, facilities, service, and the supporting infrastructure.

Planning My Trip

- I need to go from my home in the New North End of Burlington to my job near Champlain Mill in Winooski. Rather than fight with traffic, I decide to use the bus and get some reading done.
- I'll need to take a bus into downtown Burlington and transfer to a bus to Winooski, but I can take the Essex Junction route which will speed up the trip.

- The North Ave route runs every 15 minutes and takes me to the downtown transit center with weather protection, heat, restrooms, and passenger information.

Reaching the Bus Stop

- I don't really need to check the schedule because the route runs quite frequently.
- But I check the bus information system using my smartphone, key in my bus stop number (on the sign at my stop), and the time of the next arrival shows up on my screen. I know the time estimate is accurate, because it is calculated from a global positioning system device on the bus.
- My local bus stop has a shelter with a solar light, and is in a safe and easy-to-reach location, since the City has made it a priority to provide safe access to bus stops.

Boarding the Bus

- The low-floor, low-emissions bus pulls up to the stop within 1 minute of the scheduled arrival.
- I board easily, and the farebox reads the chip in my smartcard; hardly anyone uses cash any more so boarding is quick.
- The bus is clean inside and much quieter than those old buses from years ago.

Transferring at the Transit Center

- After the short trip from my neighborhood, I reach the downtown transit center.
- A display at the transit center shows that the next Essex Junction bus will depart in 9 minutes; time to grab a cup of coffee.
- I don't have to worry about paying on my next bus because I already have my transfer ticket.
- The Essex Junction bus always seems to have green lights (due to transit signal priority), and can bypass congestion at a few of the busiest intersections via a queue jumper lane.

Reaching My Destination

- I leave the Essex Junction bus at Champlain Mill, and can either walk from here to my destination or take a local circulator bus. It is raining today, so I decide to take another bus.
- The circulator is waiting for me, as it is timed to meet the Essex Junction bus.
- I transfer again with no fare, and the smaller, friendly circulator bus takes me to a stop a half-block from my office.

- The sidewalks here are also in very good shape and there are crosswalks at every stop. Even during the winter, the City is committed to keeping sidewalks and bus stops clear and accessible.
- The trip, even with the transfers has been about the same as I could have done it driving because of all the traffic congestion, but taking transit allowed me to get my coffee and get some reading done.

Other Features of the Bus System that Make It Work for Me

- Many services run later in the evening than they used to
- All local routes run seven days per week
- Trip planning is a snap with the improved website that tells me which buses to take to get anywhere I need to go.

In order to make this vision a reality, investments must be made on many fronts, both by CCTA and by its municipal partners. Clearly, a significant amount of technology is involved, from planning the trip, to finding out about the expected arrival time, to paying the fare, and finally to having a quick trip because of all of the green lights for the bus. Systems that support these functions include:

- Trip planning software, either residing on CCTA's website or hosted through a private partner such as Google Transit;
- Automatic vehicle location with GPS units on each bus, central data processing of the geospatial data, algorithms to predict arrival times at particular spots, and communications channels to disseminate this information via the Web, mobile data units, and interactive voice recognition;
- Electronic fare collection, with fareboxes that communicate with smartcards;
- Transit signal priority, with transponders on vehicles and receivers built into traffic signals along major corridors so that buses receive extended or advanced green lights to speed them through intersections.

In addition to the technology, CCTA would also need to upgrade service, so that buses run more frequently on trunk and local routes. Peak frequency of buses every 15 minutes on trunk routes,

with 10-minute service on the major corridors such as US 2 and VT 15, and local neighborhood buses timed to meet the trunk routes, would require a major increase in operating funding.

The vision includes a new downtown transit center with enclosed waiting areas and many passenger amenities. CCTA has been working with the City of Burlington for several years to plan for a new facility.

Finally, supportive infrastructure such as sidewalks and crosswalks are necessary to make the transit trip attractive to riders who have other alternatives available. In this vision, the cities of Burlington and South Burlington have invested in improved pedestrian facilities and have also committed to maintaining them in all weather conditions. Other elements of supportive infrastructure include bike lockers, more passenger shelters, more park & ride and intercept lots, showers and locker rooms at major employers, and car-sharing programs that allow more people to forego automobile owners and rely on public transportation.

Such a future system can only be viable if it is planned in concert with future land use decisions that support public transportation. Whether this land use is called “smart growth,” “transit oriented design,” “pedestrian oriented design,” or some other term, it is essential that future development (especially the type that generates demand for public transportation) be focused in a geographical area that is compact and conducive to efficient operations. If public transportation is instead spread too thinly by being asked to serve larger and larger geographic areas infrequently, it will never be able to operate at a level of service that can be attractive to choice riders.

Review of Accomplishments since last SRPTP

Since 2003, CCTA has been working to implement new routes and service expansions recommended in the last SRPTP. The following lists the improvements made since 2003:

- Interregional commuter routes
    - Montpelier
    - Middlebury
    - St. Albans
- Regional commuter route to Milton
- Regional line-haul services
    - Restructuring of service along the Route 2 Corridor between Burlington and Williston (June 2010)
    - 15-minute peak service on the new Williston Road (US 2) route (June 2010)
    - Peak hour service to Williston Village (June 2010)
    - Restructuring of the Essex Junction and Pine Street routes
    - 15-minute peak service on Essex Junction route
    - Late-night service on Friday and Saturday on Essex Junction route
    - Increase in service on Shelburne and Essex Center routes
    - Implementation of the CATMA Park and Ride Shuttle (discontinued June 2009)

    - Adjustment of running times through timepoint analysis
- Facilities
    - Upgrade and expansion of CCTA offices and maintenance facility
    - Installation of 23 shelters throughout the system
- Vehicles
    - Replacement of half the bus fleet with ultra-low sulfur, particulate-filter-equipped biodiesel buses
- Programs
    - Unlimited Access program covering Hill institutions and Saint Michael's College

In response to these improvements, marketing efforts, capital upgrades, and institutional relationships, CCTA has enjoyed annual ridership increases in the range of 5-7% for each year since the last SRPTP.

Table 1 below connects these service and facility improvements to the elements of CCTA's mission statement (see page 1). Specific definitions of the mission elements are provided below. A similar table is provided in Chapter 6, which demonstrates how the proposed investments in the TDP promote CCTA's mission.

Definition of Elements

Safety	Security of passengers on-board and waiting for transit vehicles, and offering safe transportation options for travelers (e.g. late night service)
Convenience	Greater flexibility of travel times due to span increases, reduced waiting time due to more frequent service, and reduced travel time due to more direct service, plus greater reliability. Also easier fare payment (UA).
Accessibility	Geographic service expansion to increase access for more people, plus ADA-related improvements in vehicles and shelters (plus surrounding areas). Also widening the audience through UA program.
Innovation	Use of technology and new programs to improve reliability and efficiency and increase ridership.
Sustainability	Projects that promote public transit use among more populations and choice riders and that have a greater impact on the environment.
Congestion/ Pollution Reduction	Projects that are directly targeted at commuters in major congested corridors and that reduce emissions from CCTA vehicles.
Encouraging TOD/POD	Supportive of higher-density development and a lifestyle less dependent on automobile use. Includes capital investments and service increases to a level that makes transit an attractive option.
Enhanced Quality of Life	Various types of improvements which raise transit service to an attractive level, mitigate negative impacts of bus operations, and encourage a sustainable transportation system

Table 1: Comparison of Completed Projects to Mission

Service/Facility	Safety	Convenience	Accessibility	Innovation	Sustainability	Congestion/ Pollution Reduction	Encouraging TOD/POD	Enhanced Quality of Life
Montpelier LINK			*		*	*		*
Middlebury LINK			*		*	*		*
St. Albans LINK			*		*	*		*
Milton Commuter			*		*	*		*
US 2 Restructuring		*	*				*	*
15-min. peak service on US 2		*			*	*	*	*
Peak service to Williston Village		*				*	*	
Essex Junction Restructuring		*					*	
15-min. peak service on Essex Junction		*			*	*	*	*
Essex Junction Late-night weekend service	*	*						
Increase service to Shelburne	*	*					*	*
Increase service on Essex Center route		*					*	*
Pine St. Restructuring		*						
CATMA Shuttle (discontinued in June 2009)					*	*		
Adjustment of running times		*		*				*
CCTA maintenance facility				*				
Install 23 shelters	*	*	*				*	*
Replace 50% of bus fleet	*		*	*	*	*		*
Unlimited Access		*	*	*	*	*		*

Historical Background and Funding

CCTA was established by the Vermont legislature in 1973 as a municipal corporation. The legislature acted to maintain public transportation service previously operated by Burlington Rapid Transit, a private bus company, which had gone out of business. CCTA was given the power to assess fees on its four original member municipalities according to the number of revenue miles operated in each municipality. The members—Burlington, South Burlington, Winooski, and Essex—made up the CCTA Board of Commissioners, each with two representatives. The mileage formula was inadvertently structured in such a way as to discourage new municipalities from joining CCTA. It also discouraged changes in service to the existing route structure.

The mileage formula was finally abandoned in FY2007 after a two-year systematic review and analysis and was replaced by a new means of determining local assessments. This new method allows for greater flexibility in providing service and removes barriers to new members joining. As a result, Williston, Milton, and Hinesburg have since joined CCTA, and the planning staff has been able to implement several service changes to improve operational efficiency and attract new ridership.

The primary sources of capital and operating funding for CCTA are:

- Federal funds (about 30% of total operating funds)
    - Section 5307 Urbanized Area Funding
    - Section 5309 Capital Program
    - Surface Transportation Program Transfers for Capital
    - Surface Transportation Program Transfers for Preventive Maintenance
    - Section 5316 Job Access and Reverse Commute (JARC)
    - Congestion Mitigation and Air Quality (CMAQ) Improvement Program
- State operating and capital assistance (about 17% of total operating funds)
- Farebox and advertising revenue (about 23% of total operating funds)
- Assessments on member communities (about 24% of total operating funds)
- Passes funded by Medicaid (less than 1% of total capital plus operating)
- Employers and institutions enrolled in the Unlimited Access program (included in farebox revenue)
- Purchase of service (regular ongoing routes) by municipalities and private organizations including management of GMTA (about 5% of total operating funds)

Charges for new services or for major service changes are assessed based on 1) the number of driver pay hours required 2) the fully allocated operating costs for the upcoming year and 3) any foregone fares for no- or reduced-fare service. Special one-time or multi-year assessments may also be required for communities seeking new membership or for capital equipment for new routes or new segments. Member communities pay their assessments from local property tax revenues, an overburdened source, thereby limiting CCTA's ability to expand service. See chapter 7 for a full discussion of funding issues.

Each municipality receiving ADA complementary paratransit service through CCTA is assessed according to the percentage of total trips originating from each municipality during the most recently completed prior year of service. Member municipalities are charged 50% the net cost of service, while non-member communities are invoiced 100% of the net cost of service.

Relationship to GMTA

In 2003, Wheels Transportation, a private, non-profit agency that had operated public transportation service in Washington County, went bankrupt, and CCTA was asked by VTrans to restore and manage service. A new non-profit known as the Green Mountain Transit Agency was formed, and it has been operating under the supervision of CCTA since that time. What now makes up GMTA was taken over by CCTA in stages: Capital District in 2003, Mad Bus in 2004, Stowe/Lamoille in 2004, and Franklin/Grand Isle in 2009.

GMTA has its own Board of Directors, but the Executive Director and several senior managers are CCTA employees. All planning work for GMTA is also done by CCTA staff. The shared resources between the two agencies has led to a high degree of coordination of services. The interregional commuter routes operated by CCTA, the LINK Express routes, connect to local services in St. Albans and Montpelier. Coordinated schedules and fare policies have allowed for improved regional accessibility for residents and employees of Washington, Chittenden and Franklin counties.

Due to Act 71 of the 2010 legislative session, as of July 1, 2011, CCTA and GMTA will be merged into one legal entity. From that time, CCTA will operate all services in the GMTA service area, initially doing business as GMTA. Rural public transportation funds that currently flow from VTrans to GMTA will instead flow to CCTA to fund its operations in the rural portion of its service area.

Key Partners

Public Sector

In the process of planning, implementing, and operating public transportation service in Chittenden County, CCTA has many partners. CCTA interacts with governmental bodies on four levels: federal, state, regional, and local. At the federal level, CCTA receives funding from and reports to the Federal Transit Administration (FTA), part of the US Department of Transportation. As a transit operator in a metropolitan area with more than 50,000 people, CCTA is a direct recipient of federal funds for operating and some capital expenses. In return, CCTA must comply with a long list of federal regulations and requirements—on which it is audited every three years—and report monthly and annual data as part of the National Transit Database. FTA provides funding through formula programs, competitive grants, and congressional earmarks. As of this writing, Congress is in the early stages of a new transportation authorization

bill that will set potential funding levels for the next five years. The amount of federal funding available will be a factor in how quickly the TDP can be implemented in the coming years.

The Vermont Agency of Transportation (VTrans) is the designated recipient of FTA funds for the State of Vermont and has responsibility for overseeing the non-urban public transportation program in the state. CCTA has some degree of independence from VTrans in that CCTA is also a direct recipient of FTA funds, but about one third of its federal capital funds and 10% of federal operating funds pass through the state. VTrans also provides state funding to CCTA for capital and operating expenses. These funds also serve as "local match" for the federal funds and make up some 10% of the capital budget and almost 25% of the operating budget. In the past, VTrans had paid for Short Range Transit Plans to be developed for all of the transit providers in the state, following a legislative mandate, but in 2009, VTrans decided to halt the process of producing new short range plans and reallocate the funds to other priorities. This TDP is being conducted by CCTA.

At the regional level, CCTA's main partners are the Chittenden County Metropolitan Planning Organization (CCMPO) and the Chittenden County Regional Planning Commission (CCRPC). The CCMPO is the federally designated transportation planning organization for the Burlington metropolitan area and is responsible for producing the long range Metropolitan Transportation Plan (MTP) and the short range Transportation Improvement Program (TIP), both of which cover all surface transportation modes. The transit element of the the MTP and the TIP are closely related to this TDP, as the TDP will serve as the source for projects to be fed into the federally-mandated documents produced by the CCMPO. The CCRPC has planning responsibilities beyond transportation, including housing, water, sewer, land use, etc., and the great majority of the regional transportation planning activities occur at the CCMPO and at CCTA. All federal funding for public transportation flows to CCTA as a result of planning and programming completed by the CCMPO.

The service area for CCTA is all of the cities and towns in Chittenden County, but eight of these municipalities are members of the authority and are represented on CCTA's Board of Commissioners. These member communities are Burlington, South Burlington, Winooski, Essex (including Essex Junction), Shelburne, Milton, Hinesburg, and Williston. Colchester is not a member, but does receive some fixed route service and pays separately for ADA complementary paratransit service for its residents. The local members are assessed fees that together fund about 25% of operations and 10% of capital expenditures, virtually the same level that the state provides. The Board of Commissioners, which includes two representatives from each member town, make CCTA policy and must approve the TDP and all major changes in service. CCTA works closely with city and town officials, planners, and the public in developing future service concepts and establishing supportive infrastructure on the roadway network.

Private Sector

A key private-sector partner for CCTA is the Special Services Transportation Agency (SSTA), a non-profit provider based in Colchester. CCTA contracts with SSTA to provide ADA complementary paratransit trips for those who cannot use fixed route bus service. SSTA also works with a number of human service agencies and Medicaid to provide demand response service in Chittenden County. The human service agencies and the Vermont Agency of Human Services are partners of CCTA in providing transportation for elderly and disabled residents of Chittenden County.

Over the years, CCTA has established relationships with important institutions in the Burlington area such as the University of Vermont, Champlain College, and Fletcher Allen Health Care (through the Campus Area Transportation Management Association, or CATMA), Saint Michael's College, and the New England Culinary Institute. These relationships allow members of these institutions to make better use of CCTA services and help to increase CCTA ridership.

CCTA works closely with Local Motion, Carshare Vermont, and other organizations that promote transportation alternatives. Through CCTA's Smart Business program, it works directly with employers to promote transit use among commuters in the regional core.

The final partner is the population of CCTA riders, including daily users and infrequent users. For some, CCTA is an absolute necessity and for others it is a convenient choice. Service changes and expansions in the TDP are generally geared toward serving as many riders as possible, in as convenient a way as possible, given scarce resources. There are also service improvements proposed for specific populations to meet essential mobility needs.

Hierarchy of Public Transportation Services

Public transportation in its broadest conception includes a wide array of services from a taxi ride or carpool with two passengers, up to a high-volume, high-performance transit such as bus rapid transit or rail that can carry hundreds of passengers in the peak hour.[1] The following list describes the various levels in this array in ascending order and provides some indication of the type of market and the level of demand for which the levels are appropriate. In many cases, a service offered in one level of the array can be seen as building a market for higher level services that follow it.

1. **Volunteer Driver** – Many areas in Vermont, Maine, and other states have established volunteer driver programs, by which individuals use their own cars to transport other people who have requested a ride. Often, these trips are for medical appointments, such as kidney dialysis. Some drivers request reimbursement for mileage at the standard

[1] For the purposes of this discussion, water transportation and intercity modes of travel—such as air, intercity rail, and intercity bus—are not included.

federal rate (currently 50 cents per mile). These trips are usually arranged through a non-profit or government brokerage, and are the most cost-effective means of providing these essential transportation services.

2. **Taxicab** – Available to all at a fee, typically used infrequently for a given trip because of the high cost per mile. CCTA could be involved with taxi transportation as a broker of trips, as has occurred in the past with some rides for people with disabilities. CCTA discontinued the use of taxis for ADA trips when it became more cost effective to have SSTA provide these trips using newly-purchased sedans.
3. **Carpools** – The simplest form of shared-ride transportation. Often occurs within a household or between acquaintances, but can be organized through a ridematching pool or website. Typically includes up to three passengers all headed to a single destinaton (such as a workplace) from a common area.
4. **Vanpools** – When larger groups of people (up to 15) are headed to a single destination, they can meet up in a neighborhood or at a park-and-ride lot to form a vanpool. Vanpools are currently facilitated by the State of Vermont through the GoVermont program, but CCTA organized these and provided the vans until October 2008. Vanpools are almost exclusively associated with commuting trips.
5. **Demand response service** – Low-volume general purpose transportation is best served by "demand response" service, which, as the name implies, responds to a particular demand for a trip. Virtually all of the current demand response transportation in Chittenden County is oriented toward seniors and people with disabilities, but general public "dial-a-ride" service is available elsewhere in Vermont and in many locations around the country. This type of service is appropriate for lower-density areas where there is not enough passenger demand to warrant a regularly scheduled service. Service can be provided by a non-profit agency using vans or sedans or a taxi company, working through a dispatch/brokerage office that takes in requests for trips from the public and assigns them to particular drivers and vehicles. The drivers could also be volunteers who use their own vehicles (see number 1 above). The broker attempts to use the lowest cost option to meet the need of the rider.
6. **Commuter bus peak only** – The minimal level of bus service that would typically be provided is two trips inbound in the morning and two trips outbound in the afternoon, possibly with a small bus (30 feet or less). Such a route could serve a town center or two and park-and-ride lots along the way. Total ridership would need to number at least 80 daily to make the service viable (roughly 20 passengers per bus trip). With a typical market penetration of about 5%, there would need to be at least 800 commuters who be in the service area of the route (accessible to the origin end and having a destination within walking distance of places served by the route in the urban core).
7. **Commuter bus expanded service** – Additional trips for a commuter service would be warranted to the extent that demand exceeds the market of 800 commuters, or if there is demand in both directions (so that buses would be carrying passengers outbound in the

morning as well as inbound). A third and fourth peak period round-trip would be added first, followed by midday service.

8. **Full day service** – Regular full day service (6:00 a.m. to 7:00 p.m.) on weekdays is warranted when there are enough generators along the route to create demand for non-work trips as well as commuting trips. The minimum level of service would be 30 minutes during the peak periods and 60 minutes in the midday. Total corridor ridership would need to exceed 250 on a weekday to make this service viable.
9. **Extended weekday service** – Extension of service into the evening hours (until 9:00 or 10:00 p.m.) is warranted depending on the type of generators along the route and the level of demand. Daily ridership of at least 400 would be needed to make extended service viable. This would typically be coupled with a higher level of service during the midday period (every 30 minutes instead of every 60).
10. **Saturday service** – If a route serves retail generators or employers that are open on Saturdays, then Saturday service on the route would be justified. Saturday ridership is typically about 50% of weekday ridership, thus a demand of at least 200 passengers would be needed to make the service viable.
11. **Frequent peak service** – Major commuting corridors can support service at a higher level during peak periods. Service every 15 minutes is considered to be the minimum needed to draw people out of cars and onto public transportation. Corridor ridership would exceed 1,000 per weekday for such a route.
12. **Sunday service** – Once Saturday service has been established and is successful, Sunday service can be considered. Sunday ridership is typically half of Saturday ridership, or only about 25% of weekday ridership. Thus, weekday demand of 1,000 would translate into enough Sunday demand to make the service viable.
13. **Upgraded corridor service** – After improvements in peak and midday frequency have been implemented, elements of bus rapid transit can be applied to a corridor. These can include further improvements in frequency (to 10-minute headways), improved passenger facilities (enhanced shelters), technology applications (such as real-time passenger information), and roadway priority treatments such as transit signal priority and queue jump lanes (to allow buses to bypass congestion at intersections). Corridor ridership approaching 2,000 passengers on a weekday would justify these investments.
14. **Bus rapid transit** – A full application of bus rapid transit, including those elements listed above plus branding, articulated vehicles, further upgrades in the service level, some exclusive right of way, and enhanced passenger stations, would be warranted as ridership in a corridor approaches 5,000 passengers on a typical weekday. This could also involve a limited-stop overlay on regular local service to allow passengers a faster trip.
15. **Rail** – Rail transit can take several forms, including commuter rail with traditional locomotive-drawn trains, commuter rail with self-propelled cars (known as diesel multiple units, or DMUs), streetcars or light rail powered by overhead catenary, and heavy rail rapid transit. Each of these forms of rail requires a substantial investment in

right of way, track, facilities and equipment, and they have much higher operating costs than bus transportation. Full day ridership in a corridor needed to justify this investment ranges from 7,000 and higher, depending on the form of rail service. Commuter rail, which is typically operated only during peak periods, is appropriate for corridors with very large worktrip demand and a high degree of road congestion so that the travel time advantage of rail is maximized. It also works best when the worktrip destinations are concentrated at the end of the rail corridor within easy walking distance of the terminal. Peak hour, peak direction trips would need to exceed 1,000 to make the service viable, though even at this level it would not be as cost effective on a per passenger basis as bus transportation. Light rail typically operates more like a bus, with lower speeds and more frequent stops, and is appropriate for a corridor with a high level of demand all day and with multiple generators along the corridor. Most light rail systems in the US have weekday ridership of at least 7,000 passengers, with the exception of some very short trolley and streetcar routes which tend to be oriented toward tourists. Heavy rail rapid transit is only seen in major metropolitan areas, usually operating in a subway or on elevated tracks.

As CCTA's current services are described in chapter 2 and new services recommended in chapter 6, their relationship to this hierarchy will be identified.

Chapter 2

Existing Transit Services

CCTA operates 13 local fixed routes, traveling within and to Burlington, South Burlington, Essex, Essex Junction, Colchester, Shelburne, Williston, and Winooski. Of the communities receiving local service, only Colchester is not currently a member of CCTA. CCTA operates a regional commuter route linking Milton to Burlington and three inter-regional commuter routes linking downtown Burlington to St. Albans, Montpelier, and Middlebury. During the school year, CCTA operates school trippers to accommodate demand for school travel aligned with existing CCTA routes in Burlington where CCTA offers the density of service necessary to meet this need. Finally, on Tuesdays, CCTA's three shopping shuttles pick up passengers at senior apartment complexes and takes them to local grocery stores such as Hannaford and Price Chopper.

Service Summary

Fixed Route

Coverage

Within Chittenden County, the following communities are served by CCTA local fixed routes: Burlington, South Burlington, Colchester, Essex (including Essex Junction), Shelburne, Williston, and Winooski. Taken together, these cities/towns had an estimated population of 123,624 in 2007, making up almost 81% of the county's total population, but only about 17% of the county's land mass. In addition, the town of Milton is served by a new commuter route as of February 2010.

U.S. Census data for the year 2000 at the block level was used to determine the approximate number of persons within easy walking distance of CCTA fixed route service (not including the LINK Express or Milton commuter routes). Assuming an even population distribution within individual Census blocks, nearly 65,000 persons, or 44% of the county population, live within a ¼ mile radius of CCTA's fixed-route services (equivalent to a 5-minute walk). Another 21,000 people (15% of the total) live within ¾ of mile from a CCTA local bus route (equivalent to a 15-minute walk).

By town, 88% of Burlington residents, 93% of Winooski residents, and 58% of South Burlington residents are within ¼ mile of a bus route. For the ¾ mile buffer, the figures are 97%, 99% and 86%, respectively. Though only one route travels into Shelburne, about 35% of the town's population is within ¼ mile of that route and 73% is within ¾ of a mile. The percentage for

Essex, including Essex Junction, is 47% with ¼ mile (85% within ¾ mile) and for Williston, it is 22% within ¼ mile and 38% within ¾ mile.

Level of Service

CCTA's fixed-route services range from peak-period-only commuter routes (level 6 in the hierarchy shown in chapter 1) to full-day routes with frequent peak service and Sunday service (level 12 in the hierarchy). Table 2.1 below lists all of CCTA fixed routes by service category and also shows the relationship to the route classes used in chapter 6 to present service strategies:

Table 2.1: Hierarchy of Current Routes

Level in Hierarchy	Span	Frequency	Routes	Route Class
6. Commuter bus peak only	Weekday peak periods	2 or more trips per peak period	1V Williston Commuter 3 Lakeside Commuter 76 Middlebury Link Express 96 St. Albans Link Express	Commuter Commuter Commuter Commuter
7. Commuter bus expanded service	Weekday peak plus some midday	4 trips per peak plus midday	56 Milton Commuter 86 Montpelier Link Express 13 PARC Shuttle	Commuter Commuter Shuttle
8. Full day service	Weekdays 6:00 a.m. to 7:00 p.m.	2 trips per hour peak/ hourly off-peak	4 Essex Center	Local
9. Extended weekday service	Weekdays 6:00 a.m. to 10:00 p.m.	2 trips per hour most of day	None	
10. Saturday service	Weekday full day plus Saturday	1 or 2 trips per hour on Saturday	1E Williston-Essex 5 Pine Street* 6 Shelburne Road 7 North Ave* 8 City Loop* 9 Riverside/Winooski	Local Local Trunk Trunk Local Local
11. Frequent peak service	Mon-Sat full day	4 trips per hour during peaks, 2 at other times	None	
12. Sunday service	7-day service	4 trips/hr peak, 2 trips/hr off-peak, hourly on Sunday	1 Williston 11 College St. Shuttle (Summer) 12 South Burlington Circulator	Trunk Shuttle Local

* Route 18 Sunday Service provides limited Sunday coverage for these routes

CCTA's current routes do not fit perfectly into the service hierarchy. For instance, Saturday service is offered on several routes, even though they do not operate extended weekday service into the late evening. The Milton Commuter offers only two trips per peak period, but it does operate a midday and an evening trip, thus it falls into the same level as the Montpelier Link Express. The PARC Shuttle is not really a commuter bus, but its service level most closely resembles that of level 7. Finally, the South Burlington Circulator has Sunday service even though it does not offer frequent peak service. Detailed service profiles by route are included as Appendix B. Figure 1 illustrates CCTA's fixed-route service.

Figure 1 CCTA Fixed-Route Service

Profile of Riders

During the spring of 2008, CCTA surveyed approximately 10% of its weekday ridership (660 riders) in an effort to learn more about their background, socioeconomic characteristics, need for transit, and overall satisfaction with the current services being offered. According to the survey results, respondents had an average of 0.85 cars per household. The percentage of households with no vehicle, 38%, a significant drop from the previous survey conducted in 2003, indicated the presence of many more choice riders on CCTA routes.

The approximate median household income of riders was $27,000. The largest share, 32%, reported an annual household income of $20,000 or less. Those with household income between $20,000 and $30,000 made up 24% of riders and those with annual household income between $30,000 and $40,000 made up 27%. Those with household income between $40,000 and $70,000 made up 19% of riders and those with household income greater than $70,000 made up 9% of survey respondents.

Thirty-five percent of riders reported receiving some type of government assistance, including Food Stamps, or participation in Social Security, Medicaid, Temporary Assistance for Needy Families (TANF), Vermont Health Access Program, Women, Infants, and Children, or Medicare. The largest share of assistance recipients, 18%, received Social Security, followed by 15% Medicaid participants. Only 1% of those receiving benefits participated in TANF.

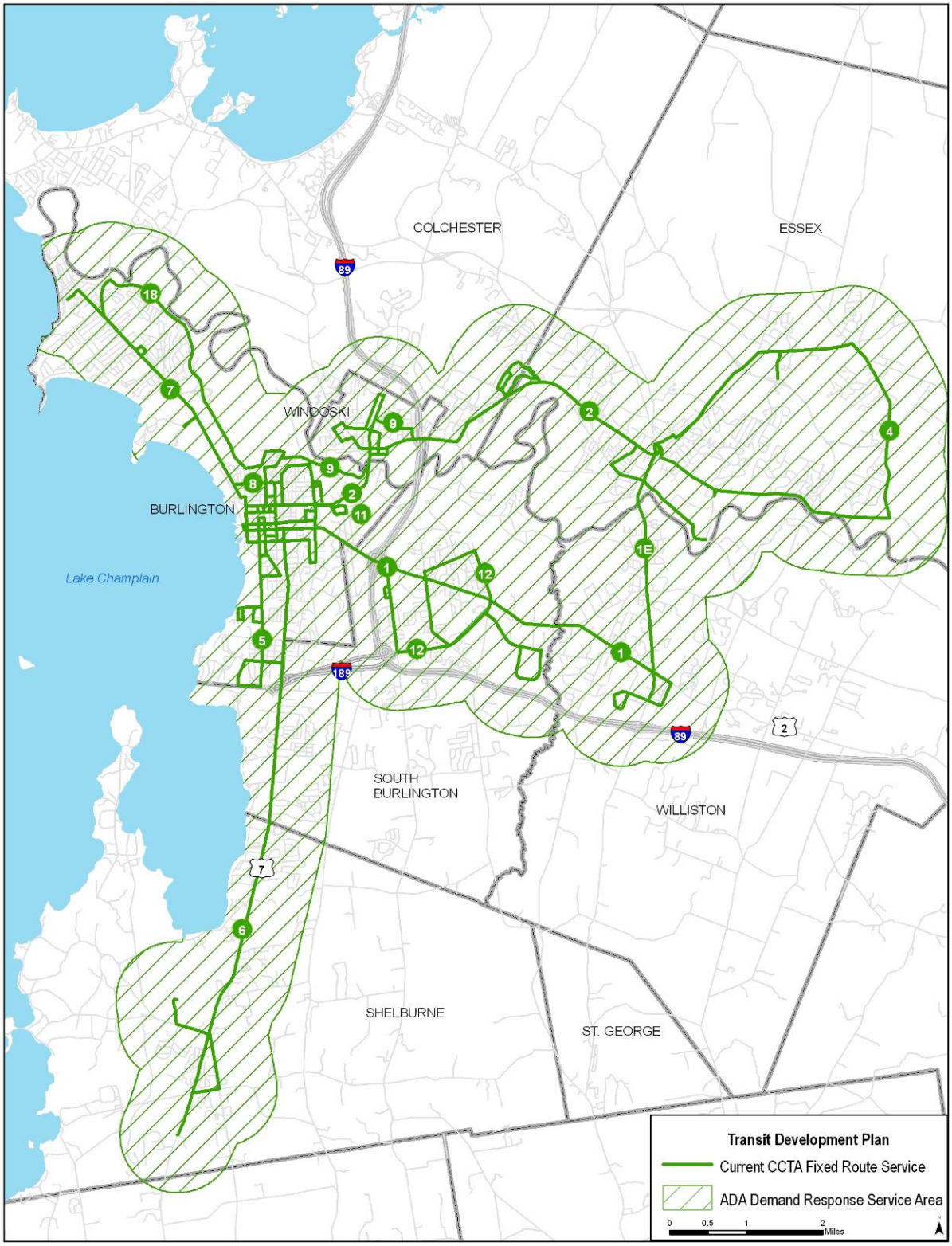
About three quarters of CCTA riders were in the 19 to 55 age group. Riders age 19-25 made up 19% of those surveyed; riders age 26-35 made up 21%; riders age 36-45 made up 18%; and riders 46-55 made up 17%. Other age groups, including those 18 and under, 56-65, 65 and over, and those who declined to answer, made up no more than 10% of the total each, respectively. A small majority, 53%, of riders were female. A large majority of riders, 81%, were Caucasian. Eight percent were African American, 3% were Asian, 2% were Hispanic, and 5% were another race or did not indicate race.

Employed persons made up 57% of total riders, a much greater share than any other group. Fifteen percent of riders were students and 8% were disabled. Homemakers, retirees, unemployed, and those who were both employed and students each made up no more than 6% of the total ridership.

Complementary ADA Paratransit and Elderly and Disabled

Complementary Americans with Disabilities Act (ADA) paratransit is operated by Special Services Transportation Agency (SSTA) under contract to CCTA. As required by the ADA, paratransit service is available within ¾ mile of CCTA's fixed route service, during the same hours and days as comparable fixed-route service. Service area and hours of service vary according to the availability of similar fixed-route service. Figure 2 illustrates CCTA's ADA paratransit service area.

Figure 2 CCTA ADA Complementary Paratransit Service Area



Riders schedule paratransit trips by contacting SSTA directly, Monday through Friday, from 8:00 a.m. until 5:00 p.m. During other hours, riders are able to leave a message requesting a ride. Reservations can be made up to seven days in advance of a desired trip, but not later than 5 PM the previous business day. A one-hour pick-up window is negotiated with the rider.

The vehicles used by SSTA to provide ADA paratransit service are owned by CCTA; 22 lift-equipped vehicles in all. Twelve, 10-passenger vans, purchased with federal Section 5307 funds make up the dedicated ADA fleet, while ten, 4-passenger vehicles provide additional paratransit service. All of the vehicles are gasoline powered.

During fiscal year 2009, CCTA's ADA service provided 37,405 paratransit rides during 21,796 revenue hours of service and 294,195 revenue miles of service; equal to 1.72 boardings per hour and 0.13 boardings per mile. The gross cost for providing this service was $912,775, or $24.40 per passenger.

SSTA also operates transportation services for local human service agencies as well as the Elderly and Disabled Transportation (E&D) program for rural areas of Chittenden County, under contract to Green Mountain Transit Agency (GMTA), a partner agency of CCTA. E&D service is provided for eligible residents or clients of municipalities and human service agencies that partner in the program, providing the local match to the federal funds that support it.

Fares

CCTA's fare structure is summarized in Table 2.2 below. The College Street Shuttle is a fare-free shuttle service linking Hill institutions to the Waterfront area. Youth between the ages of 6 and 17, adults over 60 years of age, and Medicaid card holders ride at discounted rates. The one-way fare for paratransit service is $2.50.

CCTA's Unlimited Access Program allows students, faculty, and staff of participating institutions to ride CCTA's fixed routes for free with valid identification. Participating institutions include the University of Vermont, Champlain College, Saint Michael's College, and Middlebury College (faculty and staff only). Member institutions cover the cost of the ride through an agreement with CCTA.

The Smart Business Program is a way for local business to provide transit passes to their employees, or for employees to purchase transit passes, on a pre-tax basis. Participants of CCTA's smart business program are also eligible for Sure Ride, which reimburses participants for the cost of a taxi ride home in emergency situations.

Table 2.2 Summary of CCTA Fares

Service Type	Fare Type	Regular	Discount*
Local routes	Cash (one-way trip)	$1.25	$0.60
	10-ride Ticket	$10.00	$5.00
	Monthly Pass	$42.00	$21.00
PARC Shuttle	Cash (one-way trip)	$1.25	N/A
	Monthly Pass	$18.00	N/A
Non-Peak Commuter	Cash (one-way trip) - Milton	N/A	$1.00
	Cash (one-way trip) - Montpelier	N/A	$2.00
Local Commuter (Within Chittenden County)	Cash (one-way trip)	$2.00	N/A
	10-ride Ticket	$20.00	N/A
	Monthly Pass	$67.00	N/A
LINK Express	Cash (one-way trip)	$4.00	N/A
	10-ride Ticket	$40.00	N/A
	Monthly Pass	$125.00	N/A

* Discount fares apply to people age 6 to 17, seniors age 60 and over, and people with disabilities. Children under 6 ride free with paying adult.

Fleet and Facility

CCTA's system is operated out of its facility located on Industrial Parkway, in Burlington. The facility houses CCTA's administrative offices, maintenance facilities, and a fueling station. The facility was expanded in 2007-2008 to provide more indoor storage for buses.

As of July 1, 2009, CCTA's bus fleet consisted of 59 active vehicles and 6 contingency vehicles; all of which are wheelchair accessible. All buses use diesel fuel; CCTA currently uses a mix of ultra-low-sulfur diesel and biodiesel. In the summer months, up to 20% of the fuel consists of biodiesel. The oldest vehicles in the fleet, six 35-foot buses, were manufactured in 1989. CCTA is in the midst of a major fleet replacement effort, phasing out use of its oldest buses and replacing them with new, much cleaner and more efficient buses. Approximately a third of the fleet (buses twelve or more years old) is still in need of replacement. A vehicle inventory is provided as Table 2.3.

All buses are equipped with bicycle racks that can accommodate two bicycles. CCTA is also in the midst of a study to upgrade its radio system, which can lead to further upgrades in technology to track the location of buses in real time.

CCTA's vehicles are generally purchased through a combination of funding from federal Section 5309 earmarks and STP transfers. State and local sources usually split evenly the cost of the required 20% match.

Table 2.3 Vehicle Inventory

Bus Number	Year	Model	Length (ft)	Bus Number	Year	Model	Length (ft)
104	2003	Eldorado	25	901	2003	Opus	29
420	1989	TMC RTS	35	902	2003	Opus	29
421	1989	TMC RTS	35	903	2003	Opus	29
422	1989	TMC RTS	35	904	2003	Opus	29
423	1989	TMC RTS	35	910	2007	Gillig	35
424	1989	TMC RTS	35	912	2007	Gillig	35
425	1989	TMC RTS	35	913	2007	Gillig	35
426	1989	TMC RTS	35	914	2007	Gillig	35
501	1998	Nova RTS	30	915	2007	Gillig	35
502	1998	Nova RTS	30	916	2007	Gillig	35
503	1998	Nova RTS	30	920	2007	Gillig	40
504	1998	Nova RTS	30	921	2007	Gillig	40
505	1998	Nova RTS	30	922	2007	Gillig	40
506	1998	Nova RTS	30	923	2007	Gillig	40
507	1998	Nova RTS	30	924	2007	Gillig	40
601	1999	Nova RTS	40	926	2009	Gillig	40
602	1999	Nova RTS	40	927	2009	Gillig	40
603	1999	Nova RTS	40	928	2009	Gillig	40
604	1999	Nova RTS	40	940	2008	Gillig	40
701	2000	Nova RTS	40	941	2008	Gillig	40
702	2000	Nova RTS	40	942	2009	Gillig	40
703	2000	Nova RTS	40	943	2009	Gillig	40
704	2000	Nova RTS	40	944	2009	Gillig	40
705	2000	Nova RTS	40	945	2009	Gillig	40
706	2000	Nova RTS	40	946	2009	Gillig	40
801	2001	Nova RTS	35	947	2009	Gillig	40
802	2001	Nova RTS	35	948	2009	Gillig	40
803	2001	Nova RTS	35	949	2009	Gillig	40
804	2001	Nova RTS	35				
805	2001	Nova RTS	35				
806	2001	Nova RTS	35				

CCTA Service Statistics and Performance

Ridership and Productivity

Ridership, vehicle miles, and revenue hours of service, by route, for fiscal year 2009 are presented in Table 2.4. As shown, CCTA's fixed-routes provided over 2.5 million passenger trips during 95,700 revenue hours of service, or an average of 26 boardings per hour per bus. During these hours, buses traveled over 1.3 million miles. For each mile that a bus traveled, there was an average of 2.0 passenger boardings. UMall/Airport and Essex Junction were CCTA's highest ridership routes during fiscal year 2009, each serving over 400,000 passenger trips. South

End/ Shelburne and North Avenue were also heavily used routes, with over 250,000 passenger trips each. Among regular local routes, the UMall and North Ave routes had the highest number of boardings per vehicle revenue hour, in the range of 37 to 44, with most of the rest of the local routes in the mid to upper 20s.

Costs and Revenues

In fiscal year 2009, the total operating cost (including maintenance and administration) for fixed routes buses was nearly $8.0 million. The total operating budget for the agency was approximately $10.3 million. Farebox revenue covers roughly 27% of the cost of operating the CCTA bus routes. The net cost per passenger trip (accounting for fare revenue) was approximately $2.32 in FY09. In addition to farebox revenue, services are funded through federal and state grants, assessments from member municipalities, advertising revenue, and other sources. The budget for fiscal year 2010 is presented in Table 2.5.

Table 2.4 CCTA Ridership Statistics for Fiscal Year 2009

Route	Name	Ridership	Revenue Hours	Riders/ Hour	Gross Cost	Est. Fare Revenue	Net Cost/ Passenger
1	UMall/Airport	402,495	9,175	43.9	$ 758,204	$ 342,000	$ 1.03
2	Essex Junction	444,784	18,117	24.6	$ 1,497,208	$ 378,000	$ 2.52
3	Lakeside Commuter	5,957	255	23.4	$ 21,073	$ 5,000	$ 2.70
4	Essex Center	27,611	2,295	12.0	$ 189,660	$ 23,000	$ 6.04
5	Pine Street	122,636	3,838	32.0	$ 317,132	$ 104,000	$ 1.74
6	South End/Shelburne	253,282	8,484	29.9	$ 701,134	$ 215,000	$ 1.92
7	North Avenue	318,181	8,591	37.0	$ 709,963	$ 270,000	$ 1.38
8	City Loop	96,475	4,959	19.5	$ 409,813	$ 82,000	$ 3.40
9	Riverside/Winooski	140,561	4,957	28.4	$ 409,607	$ 119,000	$ 2.07
11	College Street Shuttle	193,531	6,701	28.9	$ 553,773	$ -	$ 2.86
13	PARC Shuttle	25,500	1,021	25.0	$ 84,396	$ 32,000	$ 2.05
23	Williston	81,850	7,349	11.1	$ 607,331	$ 70,000	$ 6.56
30	CATMA Shuttle	83,166	7,843	10.6	$ 648,148	$ 71,000	$ 6.94
18	Sunday Service	6,427	455	14.1	$ 37,601	$ 5,000	$ 5.07
76	Middlebury LINK	22,835	2,718	8.4	$ 237,970	$ 75,400	$ 7.12
86	Montpelier LINK	75,248	3,784	19.9	$ 351,715	$ 176,300	$ 2.33
96	St. Albans LINK	19,292	2,154	9.0	$ 186,802	$ 68,200	$ 6.15
	Shoppers	5,968	481	12.4	$ 39,750	$ 4,000	$ 5.99
	Neighborhood Specials	180,240	2,554	70.6	$ 211,063	$ 108,000	$ 0.57
	TOTALS	2,506,039	95,731	26.2	$ 7,972,346	$ 2,147,900	$ 2.32

Table 2.5 CCTA Fiscal Year 2010 Budget

Revenues		
Passenger Revenue	$	1,993,905
Paratransit Passenge Revenue	$	93,894
Advertising Revenue	$	90,000
Planning Revenue	$	307,251
Interest Earnings	$	10,000
Miscellaneous Revenue	$	10,000
Sales of Equipment	$	15,000
Medicaid	$	42,000
Labor Warranty Reimbursement	$	10,000
Purchase of Service	$	835,430
GMTA - Reimb - Maint Wages	$	25,396
GMTA - Reimb - Maint Parts	$	-
Operating Revenues	$	3,432,875
Local subsidy - formula, shuttle, bond	$	1,845,365
Local subsidy - paratransit	$	447,901
Federal Formula	$	1,500,000
State Regular Subsidy	$	1,438,034
Federal Grants	$	2,129,502
Subsidies	$	7,360,802
Total Revenues	$	10,793,677
Expenses		
5000 Payroll Wages	$	1,348,577
5010 Revenue Vehicle Oper (ST)	$	2,337,130
5015 Revenue Vehicle Oper (OT)	$	233,713
5020 Vehicle Repair (ST)	$	620,038
5025 Vehicle Repair (OT)	$	60,228
Payroll Wages	$	4,599,686
5420 Legal Fees	$	16,000
Legal Expenses	$	16,000
5580 Office Supplies	$	18,000
5585 Postage & Freight	$	7,000
5850 Recruiting	$	16,000
5740 Dues & Subscriptions	$	21,500
5750 Travel & Meetings	$	20,000
5890 Computer Services	$	47,800
5455 Cash Counting Expense	$	3,750
5900 Bank Charges	$	5,000
Admin.Exp./Supplies	$	139,050
5860 Employee Dev	$	25,000
Employee Dev/Training	$	25,000
5610 Communications	$	18,000
Communications	$	18,000
5120 Payroll Tax Expense	$	351,876
5150 Pension Plan Expense	$	183,000
5190 CCTA Disab Plan Exp	$	48,000
5200 CCTA Life Ins Exp	$	10,300
5210 Medical Ins Pymt	$	975,000
5250 Vision Reimb	$	4,000
5270 Vision Service Plan	$	15,000
5280 Delta Dental Plan	$	75,000
5320 Unemployment	$	37,000
5330/5880 Other Employee Benefits	$	26,200
5425 Payroll Services	$	17,500
Employee Benefits	$	1,742,876
5430 Accounting Consultants	$	5,000
5430 Audit Fees	$	20,465
5970 Consulting Fees	$	5,000
Auditing/Consulting	$	30,465
5445 CVRPC Expenses	$	8,000
5440 CCTA Planning	$	100,000
MPO Planning	$	108,000
5620 Insurance Premiums	$	499,671
Insurance	$	499,671

Expenses (Continued)		
5310 Employee Testing	$	6,780
5400 Drivers' Uniforms	$	17,000
5610 Communications (Repeater Fee)	$	7,440
5565 Misc. Operating Expenses	$	8,000
Operating Expenses	$	39,220
5550 Parts Exp Non Rev Veh	$	10,000
Service Vehicle Maint	$	10,000
5520 Facility Maintenance	$	35,112
5415 Park/Ride Lease payment	$	15,350
5770 Kiosk & Shelter Expense	$	9,095
Facilities & Kiosk Maintenance	$	59,557
5480 Fuel Revenue Vehicles	$	1,402,281
Fuel Rev Vehicles	$	1,402,281
5390 Maintenance Uniforms	$	18,232
5530 Small Tools Expense	$	5,000
5570 Maint Supplies	$	20,000
Supplies	$	43,232
5410 Tool Allowance	$	9,000
Tool Allowance	$	9,000
5590 Radio Maintenance	$	10,000
Radio Maintenance	$	10,000
5460 Tires	$	60,825
Tires	$	60,825
5630 Vehicle Reg & Fees	$	1,400
Vehicle Registration & Fees	$	1,400
5680 Contractor Exp - ADA	$	93,894
Contractor Expenses	$	93,894
5650 ADA/SSTA	$	874,311
GMTA Link	$	113,491
5730 Other Medicaid Reimb	$	-
Purchase of Service	$	987,802
5450 Cleaning	$	48,292
Cleaning	$	48,292
5600 Light, Heat & Water	$	151,738
Utilities	$	151,738
5500 Hardware	$	23,734
5540 Parts Exp Rev Vehicles	$	291,164
4336 Parts Warranty Reimbursements	$	(10,000)
Parts (Rev Vehicles)	$	304,898
5582 Bus Tickets/Fare Media	$	15,000
5780 Marketing Exp	$	65,000
5830 Rideshare	$	-
5950 CMAQ Marketing Grant	$	10,000
5800 Bus Advertising	$	2,000
5810 Public Information	$	41,500
Marketing	$	133,500
Allowance for Doubtful Accounts	$	5,000
Repayment of Debt Service	$	45,000
Capital Match Fund	$	200,000
Other Expenses	$	250,000
5920 Bond Interest	$	3,348
Capital Debt Service	$	3,348
Total Expenses	$	10,787,735
Balance	$	5,942

Performance

While CCTA continuously monitors its own performance, the Vermont Agency of Transportation (VTrans) developed a performance framework to allow for comparisons among similar services and to provide a means to track how well services are doing in meeting the needs of the public. As part of the 2007 Public Transportation Policy Plan (PTPP), VTrans revised the Performance Framework to allow for a more accurate picture of transit system performance.

Currently, the performance framework consists of two measures:

- Productivity: measurements vary depending on service type
- Cost-effectiveness: measured by the cost per passenger trip, except for volunteer driver trips, which is measured by administrative cost per trip

For each measure and for each type of route, a group of peers was selected from among comparable agencies nationwide. The average performance of the peers for each route type is used as the "successful" standard, and 50% of the standard is used as the "acceptable" standard. For cost measures, the acceptable standard is twice the peer average.

Each measure is applied to each of seven service types:

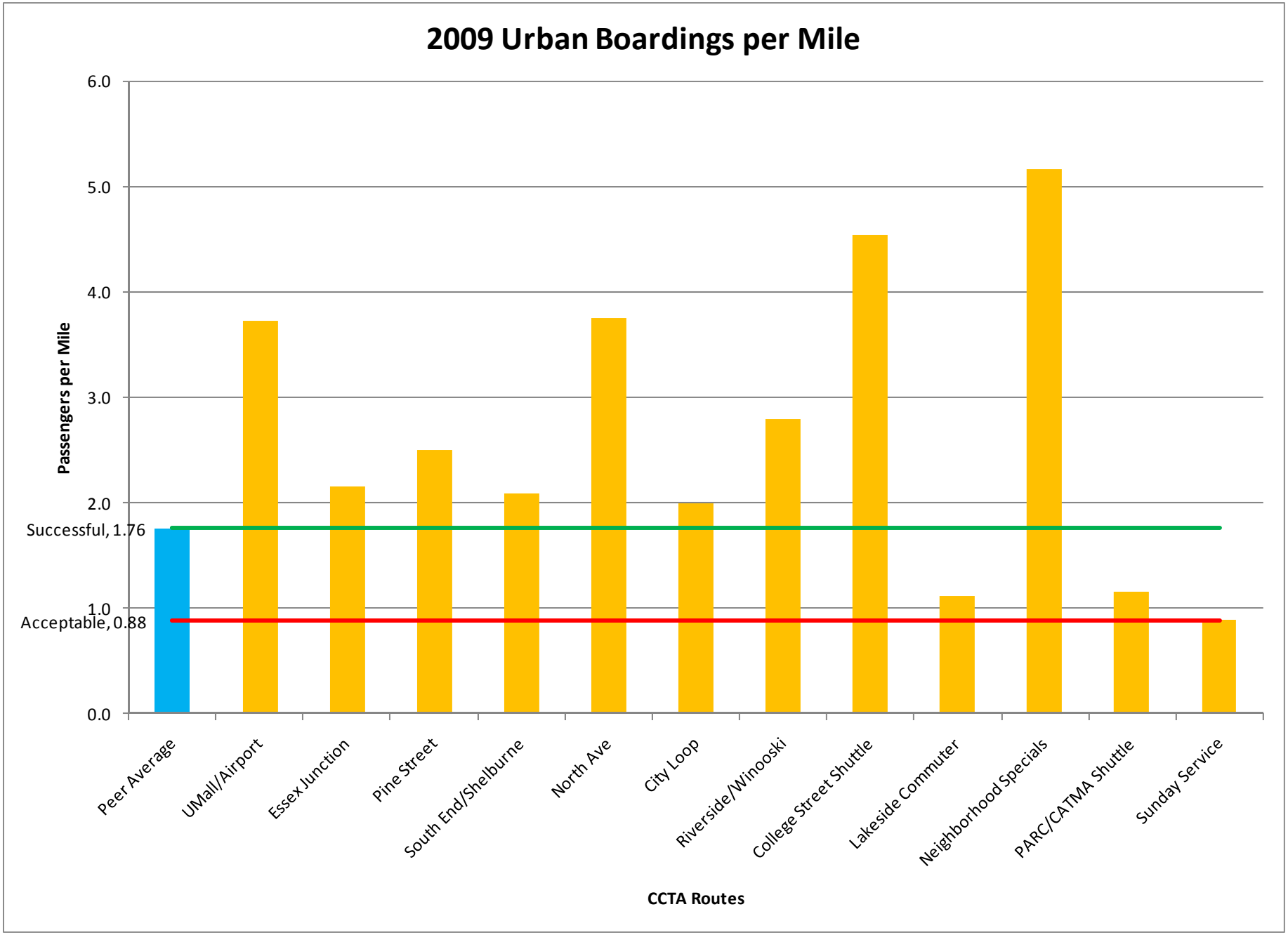
- Urban
- Small Town
- Rural
- Commuter
- Demand Response
- Tourism
- Volunteer Driver

Productivity

Figure 3 shows the productivity, measured by boardings per mile, for CCTA's urban routes during 2009. As shown, nine of CCTA's 12 urban routes exceeded the threshold for successful routes, which was 1.76 boardings per mile. The other three routes operated at or above the acceptable level of 0.88 boardings per mile.

Small town route productivity is measured in boardings per hour. Two of CCTA's routes are categorized as small town: Essex Center and Williston. In 2009, the Essex Center route achieved 12.0 boardings per hour, while the Williston route achieved 11.1 boardings per hour. Both of these are above the successful standard of 10 boardings per hour.

Productivity on commuter service is measured in terms of boardings per trip, since these routes tend to run express over many miles and have little passenger turnover during the trip. In 2009, the successful benchmark for commuter routes was 13.1 boardings per trip; and acceptable was 6.6 boardings per trip. All three of CCTA's LINK Express routes were above the acceptable


2009 Urban Boardings per Mile
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Passengers per Mile
Successful, 1.76
Acceptable, 0.88
Peer Average
UMall/Airport
Essex Junction
Pine Street
South End/Shelburne
North Ave
City Loop
Riverside/Winooski
College Street Shuttle
Lakeside Commuter
Neighborhood Specials
PARC/CATMA Shuttle
Sunday Service
CCTA Routes

threshold and the Montpelier LINK performed above the successful benchmark. The actual results were 11.2 boardings per trip for both the Middlebury and St. Albans LINKs, and 20.6 boardings per trip for the Montpelier LINK.

General public and elderly and disabled demand response service productivity is measured in boardings per hour. Chittenden County's elderly and disabled demand response service is operated by SSTA under contract to GMTA.. In 2009, the service exceeded the acceptable threshold of 1.25 boardings per hour, achieving 1.99 boardings per hour. CCTA's ADA complementary paratransit service, also operated by SSTA, is not part of the VTrans performance evaluation since it is a required service and receives no state funding, but for reference, the productivity on this service is 1.72 boardings per hour.

Cost-effectiveness

Figure 4 shows the cost per passenger for CCTA's urban routes in 2009. Routes with a gross cost (not including fare revenue) less than $3.60 per passenger were considered successful; and under $7.20 was acceptable. Nine routes fell with the successful range and the other three routes were within the acceptable range.

In 2009, small town routes with gross costs of less than $5.98 per passenger were successful; $11.96 was the acceptable standard. The Essex Center and Williston routes were both acceptable, with costs per passenger of $6.87 and $7.42, respectively.

As of 2009, a cost effective commuter route was one that cost less than $18.41 (acceptable) or $9.21 (successful) per passenger. The Montpelier LINK was the most successful commuter route in the state, with a cost per passenger of only $4.67. The St. Albans LINK was also successful at $8.18 per passenger, while the Middlebury LINK was acceptable at $10.42 per passenger.

Cost per passenger on general public and elderly and disabled demand response service was successful at $14.16 per passenger and acceptable at $28.32 per passenger. In 2009, E&D service operated by SSTA was in the middle of the acceptable range, costing $21.03 per passenger. ADA complementary paratransit service cost $24.40 per passenger.

Figure 5 presents another view of cost effectiveness, comparing net subsidy per passenger trip for the CCTA system as a whole to that of its peer agencies (the same peers used to establish the standards in the VTrans performance report). The operating subsidy is the operating cost per trip minus the fare revenue. This figure shows that CCTA is among the most cost-effective of its 19 peer agencies, with a net operating subsidy ($2.65) well below the average of its peers ($3.30).

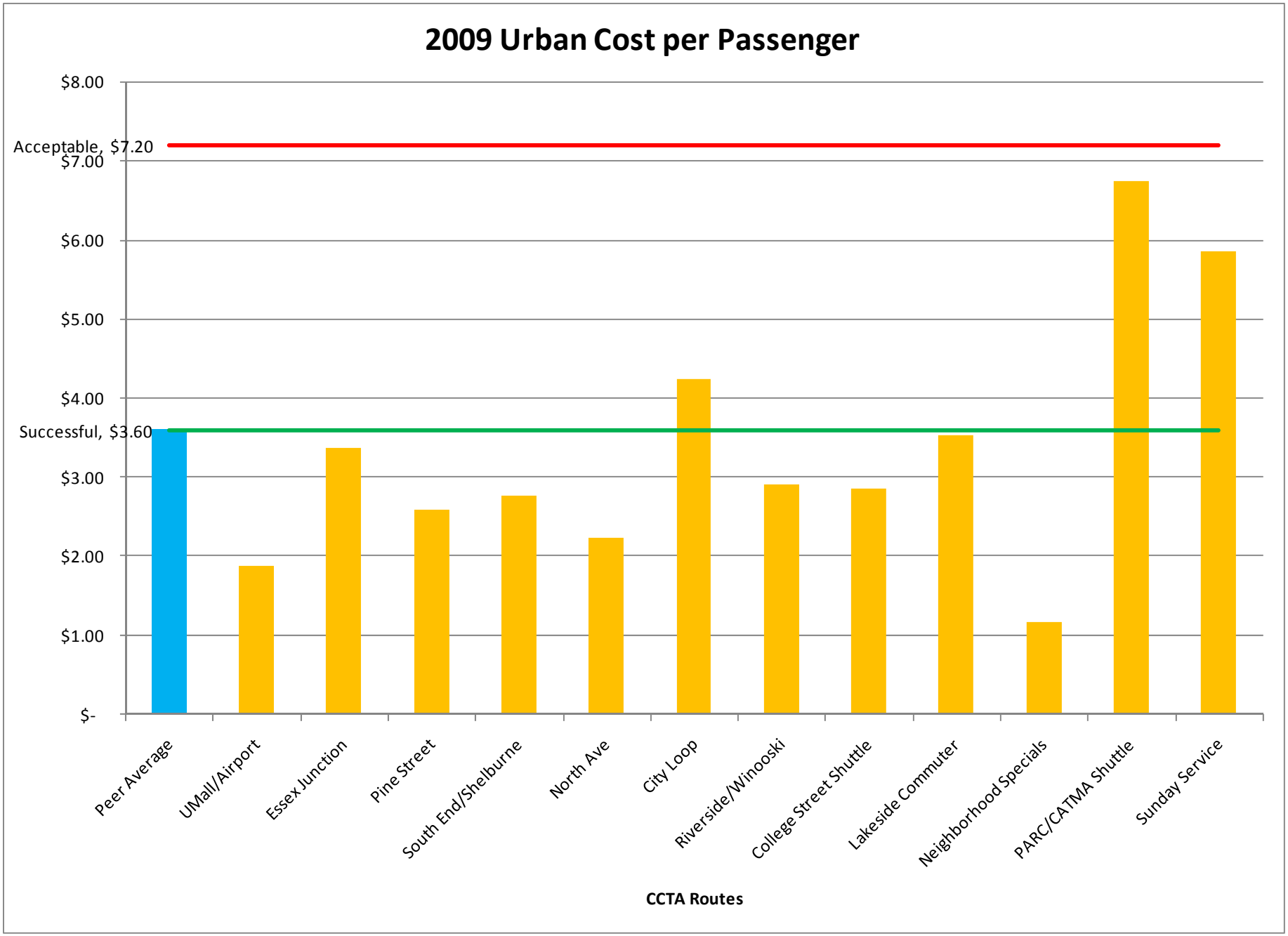
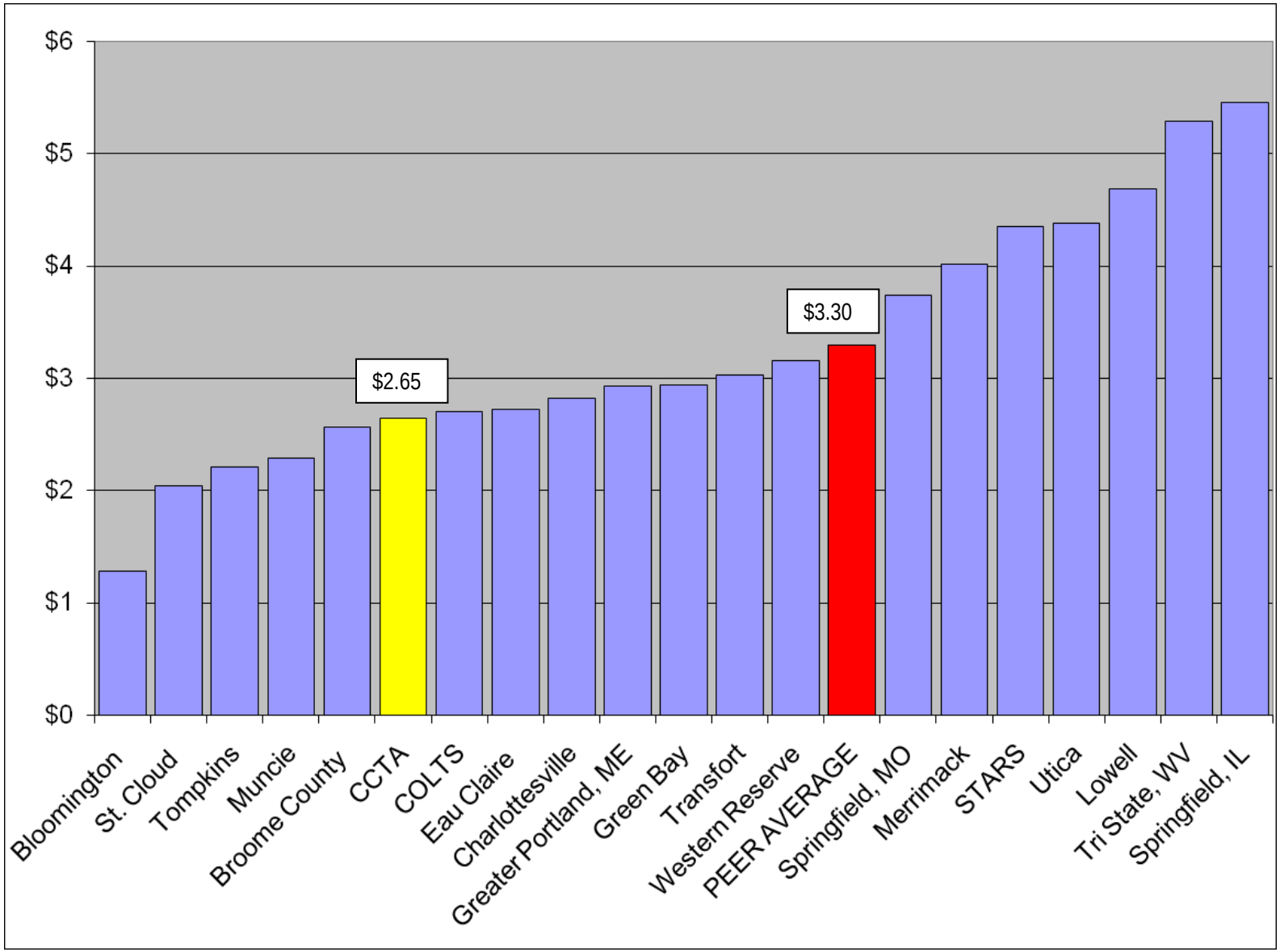

2009 Urban Cost per Passenger
$8.00
Acceptable, $7.20
$7.00
$6.00
$5.00
$4.00
Successful, $3.60
$3.00
$2.00
$1.00
$-
Peer Average
UMall/Airport
Essex Junction
Pine Street
South End/Shelburne
North Ave
City Loop
Riverside/Winooski
College Street Shuttle
Lakeside Commuter
Neighborhood Specials
PARC/CATMA Shuttle
Sunday Service
CCTA Routes

Figure 5 Net Operating Subsidy Per Passenger Trip



Other Transportation Providers

Human Service Transportation Providers

Numerous human service agencies in Chittenden County provide transportation assistance of some kind. A number of agencies directly operate service, while others either purchase service or utilize a combination of service types. A summary is provided below:

Special Service Transportation Agency (SSTA)

- Service area: Chittenden County
- Operates ADA Paratransit service under contract to CCTA
- Directly operates county-wide Medicaid transportation service (previously operated under contract to CCTA)
- Operates E&D transportation under contract to GMTA for Chittenden County partner agencies
- Other contractual services are provided for:
  - Committee on Temporary Shelter (COTS)
  - Fletcher Allen Health Care
  - Vermont Kidney Association
  - Agency for Human Services day care van service, service for Reach Up clients
  - PACE service for seniors as of May 1, 2007 (Chittenden is one of three counties served)
    - Contract is with the Vermont Department of Disabilities, Aging, and Independent Living

E&D Partner Agencies

The following partner entities provide local matching funds to make service available to eligible residents and clients through the E&D program:

- **Town of Colchester** – Critical Care Non-Medicaid, Non-Medicaid Medical, Senior Meals, Shopping, Vocational, Social/Personnel
  - 4 one-way trips per rider per week for any purpose; unlimited Critical Care Non-Medicaid, Non-Medicaid Medical trips (over 4 trips per month, medical trips only)
- **Town of Huntington** – Critical Care Non-Medicaid , Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
  - 8 trips per month (medical trips only)
- **Town of Richmond** – Critical Care Non-Medicaid , Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
  - 8 one-way trips per month

- **Town of South Burlington** – Shopping trips UMall / Hannafords Shopping Special every Tuesday
- **Town of Williston** – Critical Care Non-Medicaid , Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
    - No restrictions on purpose or number of trips
- **Town of Winooski** – Critical Care Non-Medicaid , Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
    - Trips limited by monthly budget only
- **Cathedral Square** – Shopping, Social/Personnel; service to senior meal sites for residents of Jericho, Richmond, and Hinesburg
- **Champlain Valley Agency on Aging** – Critical Care Non-Medicaid , Non-Medicaid Medical, Senior Meals,
    - Eight one-way trips per month for non- Medicaid medical
    - Up to sixteen critical care trips per month
    - Makes funding available for individuals who are not sponsored by another agency or program
- **Champlain Valley Senior Center** – Senior Meals
- **Milton Family Community Center** – Critical Care Non-Medicaid , Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
    - Provides transportation only on Tuesdays and Fridays and limits to one day a week for each non-medical trip
- **Visiting Nurses Association** – Adult Day Services
- **Town of Hinesburg** – Critical Care Non-Medicaid, Non-Medicaid Medical, Shopping, Vocational, Social/Personnel
    - No restrictions

Because E&D funding is limited, some partners restrict the types of trips that are eligible and/or the number of trips an individual may make in a month.

Economic Services Division, Department for Children and Families

- Service area: Chittenden County
- Reimbursement of CCTA or Vermont Transit fare, mileage, car insurance

Vermont Refugee Resettlement Program

- Service area: Burlington, Winooski, Colchester, Essex, So. Burlington, Shelburne, Milton, Waterbury, Montpelier, Barre

- Staff uses privately owned vehicles to transport clients

Town of Essex, Parks and Recreation Department

- Service area: Essex town and village
- Direct operation of two, 12- passenger, lift- equipped vans

Milton Family Services

- Service area: Milton
- Direct operation of one, 15- passenger van used to transport pre-school-aged children
- CCTA E&D partner agency

Spectrum Youth and Family Services

- Service area: Burlington
- Direct operation of a 15- passenger van

Howard Center

- Reimburses case managers for transporting clients

Cathedral Square

- Recently purchased a van, but has no plans yet for its use

Good News Garage

- Repairs donated vehicles for purchase by eligible clients of Department for Children and Families' Reach Up program
- Provides rides to jobs and job-related destinations for eligible clients of Department for Children and Families, Economic Services Division

Vermont Association for the Blind and Visually Impaired (VABVI)

- Service area: Statewide
- Utilizes volunteer and paid drivers, taxi services, and paratransit services to provide rides for adults with vision impairments

Other

- Two grocery stores in the Burlington area fund one CCTA shopping bus each
- United Way reimburses volunteer drivers participating in the RSVP program
- King Street Youth Center owns one vehicle

- Burlington Parks and Recreation owns a bus and a van
- American Cancer Society reimburses volunteer drivers
- Senior residential and medical facilities that operate vehicles: Wake Robin, Shelburne Bay, Burlington Health and Rehabilitation, and St. Joseph's

Intercity Operators

There are two options for surface intercity transportation in Chittenden County. Service is limited to only a few trips per day on these providers.

Amtrak

- Vermonter line from Washington, DC to St. Albans
  - One daily stop in each direction at Essex Junction

Vermont Transit

- Inter-city bus service
- Montreal- Burlington- Boston route
  - Serving Burlington, White River Junction, Springfield, New York, Boston

Private Operators

Chittenden County, especially in Burlington and the surrounding area, has greater private transportation options than other counties in Vermont. A summary of available service is provided below:

Campus Area Transportation Management Association (CATMA)/ UVM Campus Area Transportation Systems (CATS)

- Shuttles and Commuter Services- centered around the University of Vermont, Fletcher Allen Healthcare, and Champlain College

Burlington Taxi Companies

- Everywhere Taxi of Vermont
- Friendly Fare Taxi
- Leo Cab/ Yellow Cab (L&L)
  - Have lift-equipped vehicles
- Solo Taxi
- Quick Cab
- Morf Transit/ Benways Taxi

- Have lift-equipped vehicles

On-the-Go Transit

- Hinesburg

Mountain Transit

- Milton

Premier Coach, Inc.

- Colchester

Adam's Taxi

- Richmond

Chapter 3

Market Analysis

Located along Lake Champlain in northwestern Vermont, Chittenden County covers approximately 540 square miles. It includes three cities, Burlington, South Burlington, and Winooski, and sixteen towns: Bolton, Buels Gore, Charlotte, Colchester, Essex, Essex Junction, Hinesburg, Huntington, Jericho, Milton, Richmond, Shelburne, St. George, Underhill, Westford, and Williston. The county is home to some of the state's major educational, medical, and cultural institutions, including the University of Vermont, and the Fletcher Allen Health Center and its affiliated facilities, and other major employers such as IBM.

This chapter of the TDP takes a closer look at the development patterns and the characteristics of the population in Chittenden County. Special focus is put on traditional indicators of a need for transit service—age, income, auto ownership—but the locations of employers and commuting patterns are also considered. CCTA serves both "transit-dependent" and "choice" riders; this chapter analyzes these two markets, while following chapters consider how services can be enhanced to meet their needs.

Demographic Profile

The county, with an estimated 151,826 residents in the year 2007, is by far the most populous in Vermont, more than twice the size of the runner-up, Rutland County. On the other hand, Chittenden County has the third smallest land area in Vermont; only Grande Isle and Lamoille counties are smaller. Not surprisingly then, Chittenden County is by far the most densely populated county in Vermont. It also has the highest median household income in the state, estimated to be $58,376 in 2007.

The Burlington, Vermont Urbanized Area (UZA) stretches from parts of Milton in the north, though Shelburne along US7 to the border of Charlotte in the south, and from Lake Champlain in the west through Underhill in the east. Portions of Burlington, South Burlington, Williston, Essex, Underhill, Jericho, and Colchester are encompassed by the UZA; only Winooski is completely contained. In 2000, there were 105,365 persons within the Burlington UZA.

Table 1 provides an overview of demographic characteristics of Chittenden County, by city/town. The majority of the data reported is from the 2000 Census, although 2007 estimates were available for the City of Burlington, Chittenden County, and Vermont. In addition, 2007 population estimates, by town, were provided by the Vermont Center for Geographic Information (VCGI). Note that 2007 population estimates provided by the Census Bureau and VCGI differ slightly.

Table 1 Chittenden County Demographics

Town	Est. 2007 Pop.	2000 Pop.	Est. Change	Persons per Sq.Mi.	Pop. 65+	Pop. < 18	Disability Status	Total HH	Median HH Inc.	0-Veh. HH
Bolton	1,006	971	4%	22.86	58	281	113	368	$49,625	7
Buels Gore	12	12	0%	2.38	3	1	0	6	$39,583	0
Burlington	38,531	38,889	-3%	3770.56	4,092	6,331	6,246	15,885	$33,070	2,348
**Burlington*	*38,600*	*39,819*	-3%	*3655.30*	*4,284*	*6,014*	*5,439*	*15,142*	*$38,288*	*1,884*
Charlotte	3,754	3,569	5%	86.05	275	1,059	270	1,287	$62,313	17
Colchester	17,207	16,986	1%	460.52	1,093	3,833	1,826	6,144	$51,429	253
Essex	19,465	18,626	5%	477.48	1,519	5,197	1,888	7,013	$58,441	272
Essex Junction	*9,000*	*8,591*	*5%*	*1804.06*	*860*	*2,265*	*938*	*3,409*	*$53,444*	*183*
Hinesburg	4,619	4,340	6%	109.01	237	1,254	460	1,596	$49,788	44
Huntington	1,956	1,861	5%	48.79	101	527	235	692	$49,559	9
Jericho	5,170	5,015	3%	141.69	321	1,548	548	1,751	$65,375	13
Milton	10,539	9,479	11%	184.19	551	2,721	1,104	3,333	$49,379	51
Richmond	4,171	4,090	2%	128.44	277	1,197	483	1,504	$57,750	47
Shelburne	7,143	6,944	3%	285.65	1,068	1,920	777	2,632	$68,091	64
South Burlington	17,445	15,814	10%	894.01	2,067	3,415	1,616	6,332	$51,566	406
St. George	690	698	-1%	194.46	47	209	86	264	$44,028	6
Underhill	3,080	2,980	3%	58.03	169	864	291	1,055	$66,492	23
Westford	2,205	2,086	6%	53.13	117	637	215	725	$61,205	21
Williston	8,371	7,650	9%	252.15	896	2,106	845	2,921	$61,457	16
Winooski	6,462	6,561	-2%	4586.14	899	1,413	1,328	2,944	$30,592	415
Chittenden County	151,826	146,571	4%	271.91	13,780	34,513	18,331	56,452	$47,673	4,012
**Chittenden County*	*151,105*	*146,571*	3%	*280.32*	*15,477*	*32,990*	*18,359*	*59,195*	*$58,376*	*3,673*
Vermont	621,254	608,827	2%	65.82	77,510	147,523	97,167	240,634	$40,856	16,461
**Vermont*	*620,589*	*608,827*	2%	*67.09*	*82,771*	*134,051*	*95,362*	*250,871*	*$49,382*	*15,218*

** Indicates Census Bureau 2007 estimates. The 2000 estimated population for Burlington differs from the actual population counted in the 2000 Census.*
Data source: Vermont Indicators Online, Vermont Center for Geographic Information; U.S. Census Bureau
Note that the figures for Essex include the figures for Essex Junction

Only parts of the county are served by the CCTA fixed route service: Burlington, South Burlington, Colchester, Essex (including Essex Junction), Shelburne, Williston, and Winooski. Taken together, these cities/ towns had an estimated 123,624 persons in 2007, making up almost 81% of the county's total population, but only about 17% of the county's land mass. Population density outside of CCTA's service area is very low, about 120 persons per square mile.

Land use in Chittenden County is varied. About 34% of land in the county is devoted to residential use. Natural-resource related uses, including all types of farming, logging, and mines take up 26% of the county's land area and "unclassified" uses make up 18%, including large portions of Bolton and Buels Gore. Ten percent is devoted to leisure activities; about 9% of the county's land area provides institutional and infrastructure uses such as colleges, libraries, public safety facilities, airports, and roads; 2% for industrial, business, or waste-related uses; and 1% of land, primarily in metropolitan areas or village centers, is used for retail, service, or trade.

Residential Density

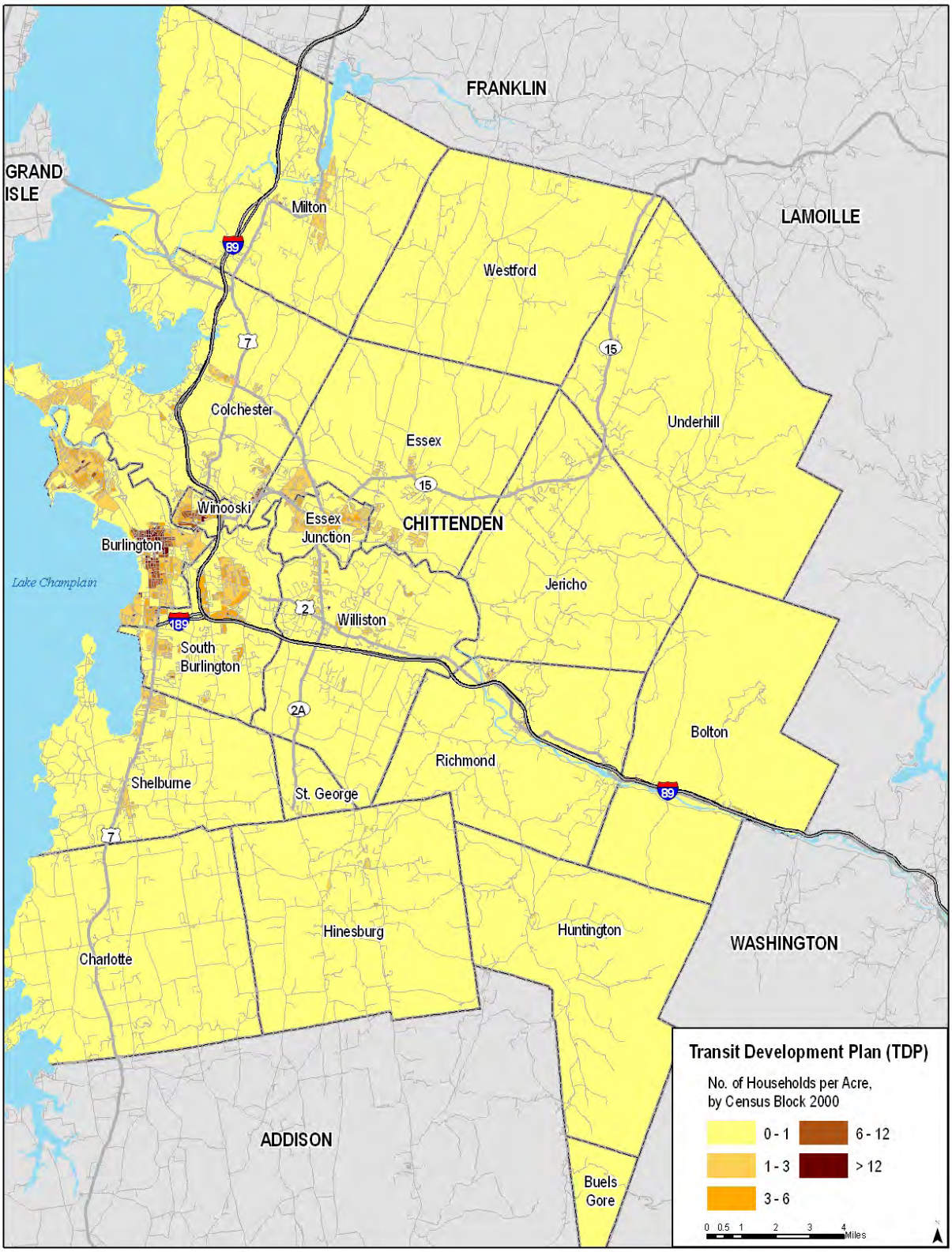
As previously indicated, Chittenden County is, by far, the most densely populated county in Vermont. In spite of this, about 89% of the residential development in the county has a rural density of less than one household per acre. As shown in Map 1, outside of the urbanized core, there are only a few isolated census blocks (the smallest unit of census geography) where density rises above one household per acre. The outer ring of towns is almost exclusively rural, with the exceptions of the center of Milton and small sections of Hinesburg. Map 2 zooms in to show the household density in Burlington and surrounding areas and also shows the alignments of CCTA's current local bus routes. It can be seen that the existing local routes serve almost all of the areas with densities in the upper categories.

The *Transit Capacity and Quality of Service Manual* identifies a threshold density of 3 households per acre as necessary to support fixed route transit service that operates hourly for up to 12 hours per day (such as 6:00 a.m. to 6:00 p.m.). Densities of 6 households per acre or more can support bus routes with higher frequencies, such as buses running every 20 minutes or better. Of course, residential density is just one of many factors that affect demand for transit service.[1]

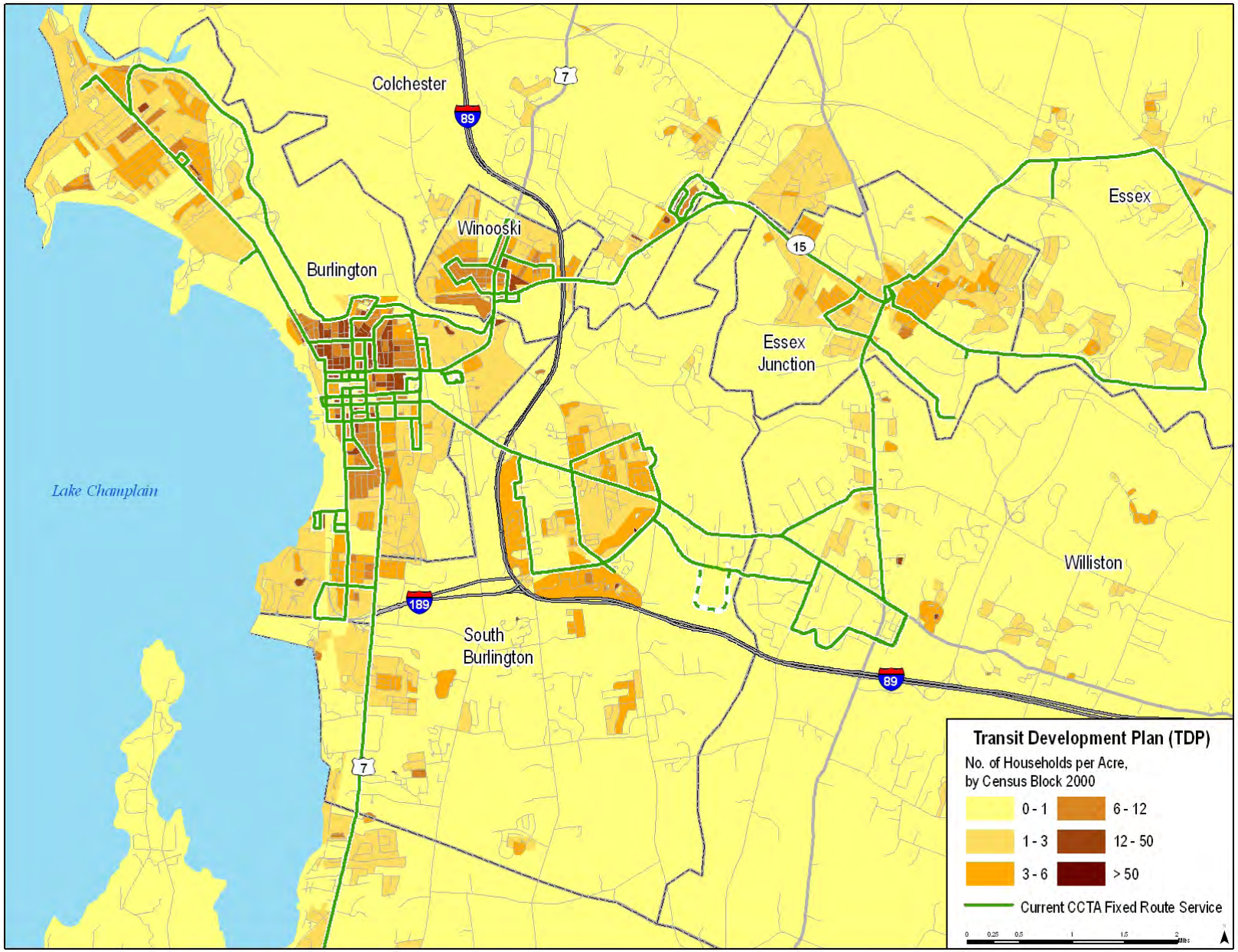
Moderate to high densities are seen throughout most of the city of Burlington, with especially high density in the Old North End. Almost all of the city of Winooski also exhibits moderate and high densities. In other core communities, density tends to be restricted to major transportation corridors. In Colchester, areas along VT 15, especially in Fort Ethan Allen, have moderate to high density, although Map 1 shows that the Malletts Bay section and Colchester Village also have moderate density. A significant portion of Essex Junction is densely developed, while

[1] See TCRP Report 100, *Transit Capacity and Quality of Service Manual*, page 3-33. Employment density of 4 jobs per acre is also considered supportive of transit service. Transit corridors that have both sufficient residential and employment density can support higher frequency service than would be suggested by each of the measures separately.

Map 1 Chittenden County Household Density



Map 2 Burlington and Surrounding Areas Population Density



density in the Town of Essex is more limited. In South Burlington, the UMall/Airport route (now the South Burlington Circulator as of June 2010) reaches most of the blocks with more than 3 households per acre along Dorset Street, Kennedy Drive, Airport Drive and White Street.

Map 2 shows that virtually all of the census blocks with more than 6 households per acre are within close proximity to a bus route, and that the great majority of blocks with more than 3 households per acre are also close to current routes. Some exceptions are some isolated blocks in South Burlington south of I-89 (such as Butler Drive, Cedar Glen Drive, and Brand Farm Drive), an isolated development in Williston, and a few blocks in the new North End that are relatively far removed from North Avenue (between 0.5 and 1 mile from the main road). Unfortunately, these isolated blocks are difficult to reach with traditional bus routes, as CCTA would incur significant operating costs to reach them, but would see only a marginal increase in ridership.

Certain characteristics of the population can make people more or less likely to use transit service. The following section provides maps and a brief analysis on certain target populations more likely to utilize public transit: youth (persons ages 14-18), older adults (persons 65 and older), persons with disabilities, low income households (household earning less than $19,999 per year), and zero vehicle households. All data included in this analysis was obtained from the U.S. Census Bureau for the year 2000. Where possible, data was projected to the year 2009. Where applicable, a more detailed explanation is provided in the sections below.

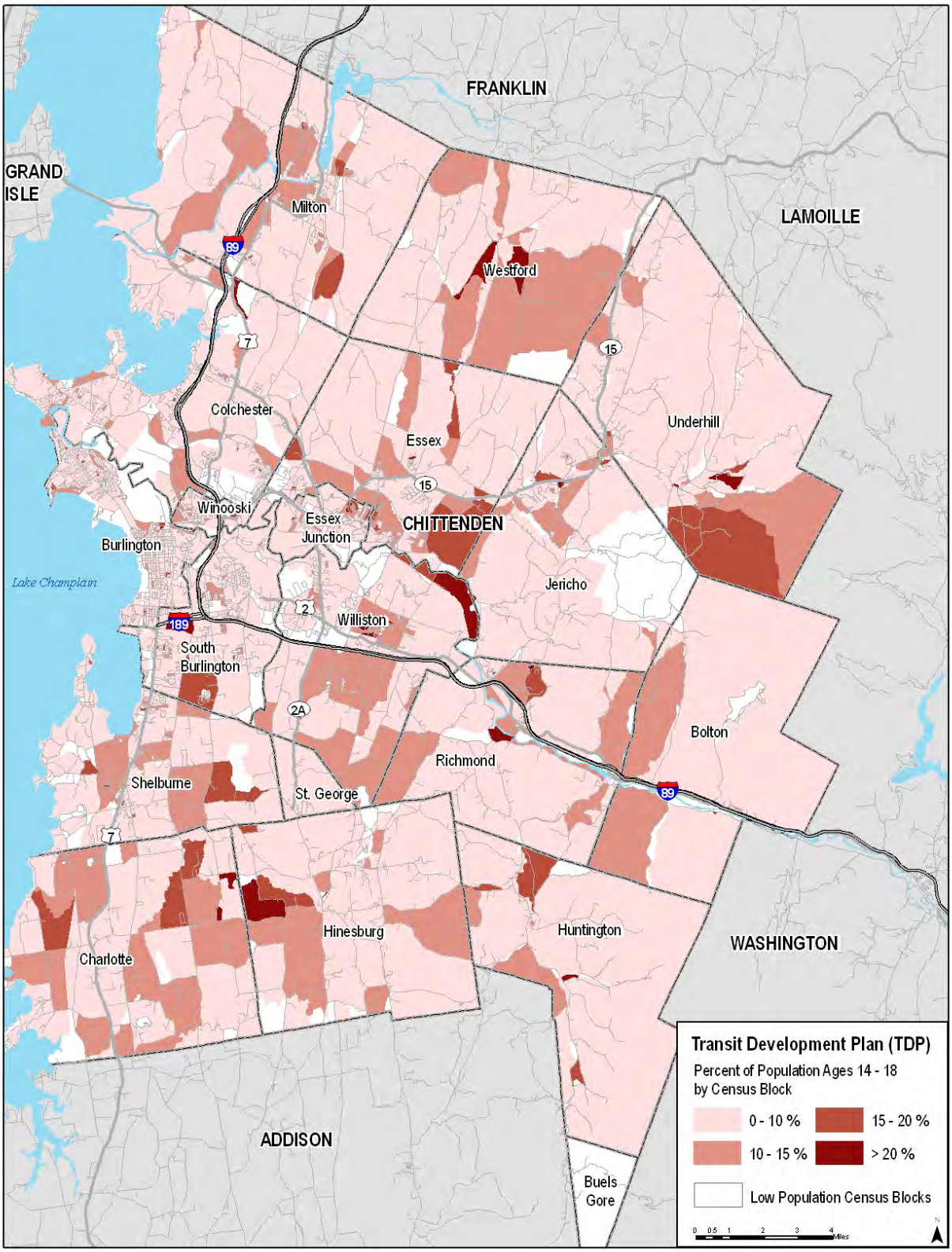
Youth

Map 3 illustrates youth ages 14-18 as a percentage of the total population in Chittenden County, at the Census block level. Blocks with fewer than 10 residents are suppressed, since percentages in these sparsely populated blocks are essentially meaningless. Data for persons age 5-9 at the time of the 2000 Census were used to generate this map, since, in 2009, those persons would fall within the “youth” category. Of course, this method ignores the effects of families moving into or out of the area—as well as local moves in the area—over the past 9 years, but it is a reasonable proxy, given the lack of new detailed data on demographics in the county.

Most blocks within the county contain less than 10% youth. In the regional core, blocks with greater than 10% youth are rare, but there are a few scattered in the New North End and Old North End of Burlington. There are several blocks with between 10 and 15% youth in Winooski and the center of South Burlington (between Dorset Street and Hinesburg Road). However, most of the residents close into the regional core are of working age or older.

Higher percentages of youth are more common in suburban communities, with South Burlington (south of I-189), Williston, Hinesburg, Charlotte, Richmond, Underhill and Westford having some blocks with more than 20% of the population being in the youth category. Other suburban areas have blocks with between 15 and 20% of the population in this age category, including Essex Town and Shelburne. These suburban towns are the more typical residences for families with young children.

Map 3 Percentage of Population Ages 14 – 18



Older Adults

Map 4 shows the percentage of persons age 65 and older. Once again, data from the 2000 U.S. Census was projected forward to account for the difference in years between the TDP and the 2000 U.S. Census. In this case, the older adult category consists of persons age 55 and older, less those who were 85 years of age and older during the 2000 Census. It should be noted that the percentages of older adults is generally higher than that of youth, mainly because it is a much broader age cohort (20 years or more compared to the 5 years for youth), and also because Vermont's population is older on average than other parts of the country.

In contrast to the youth map, the map of older adults shows high concentrations closer to the regional core relative to the suburbs and outer ring towns. This may be due to the desire of older adults to have easier access to municipal services, cultural amenities, shopping, and medical facilities. The outer ring towns have fewer seniors; remote housing in hilly areas that is accessible only by dirt road may be less attractive to people as they get older.

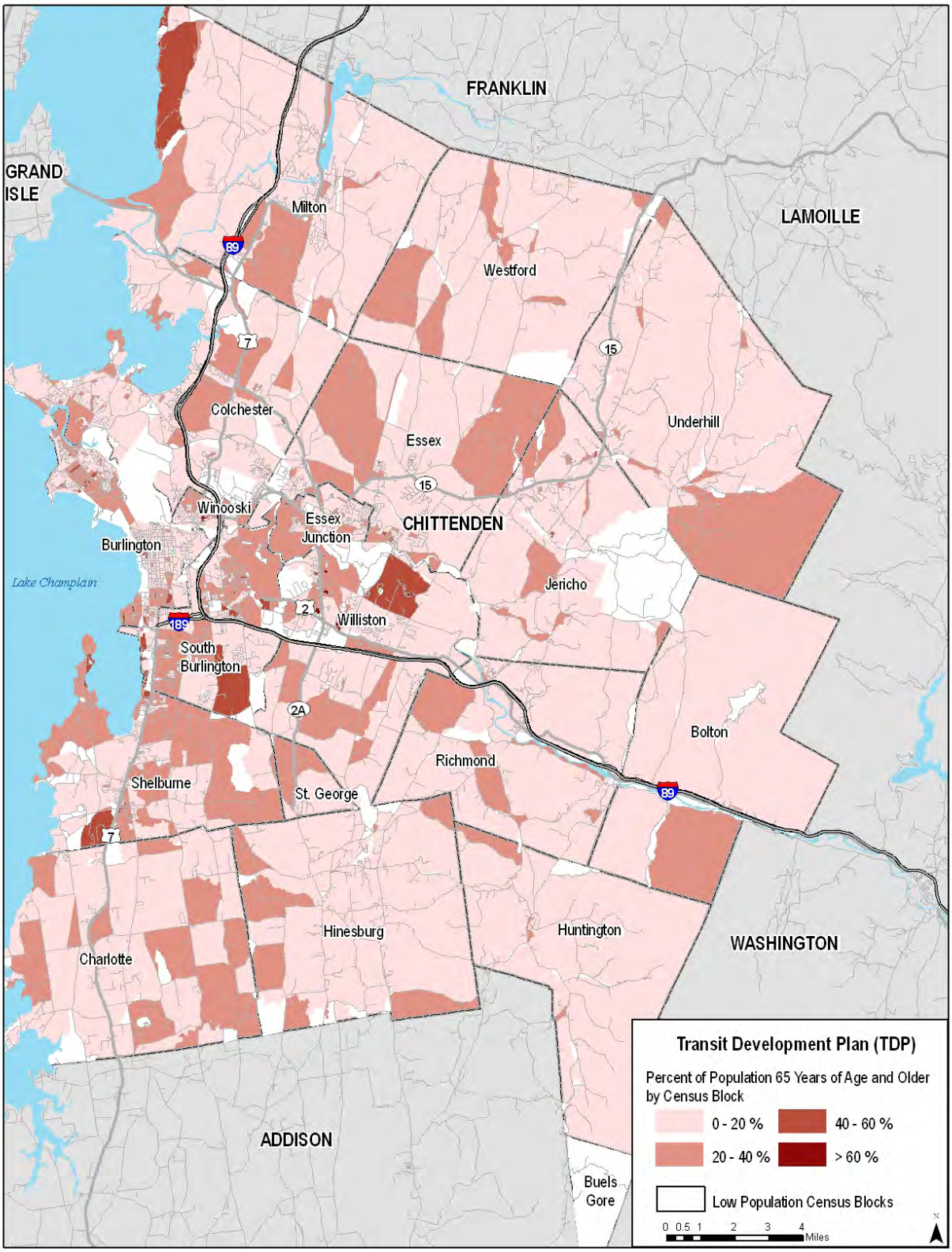
The highest percentages of older adults—where they make up over 40% of the population—are seen in Williston, South Burlington, Shelburne, Burlington, and Milton. Many of the coastal areas along Lake Champlain have relatively high percentages of seniors, reflecting the attractiveness of these scenic areas to retirees. As seen in Map 5, a closer look at the distribution of seniors in the regional core, some isolated blocks in almost all of the core towns have percentages greater than 60%, reflecting senior housing developments or neighborhoods with long-time residents. Many of these are well-served by the current bus route network, but some are not, particularly those in the northern section of Williston. In some cases, demand-response service may be more appropriate for these residents, depending on their travel and mobility needs.

Somewhat surprisingly, much of the area in and around downtown Burlington has relatively few seniors. Very few blocks in the Old North End have more than 20% older adults. Given the relative lack of teenagers in these areas (as shown on Map 3), the large majority of the residents in this part of Burlington are between 20 and 65 years old.

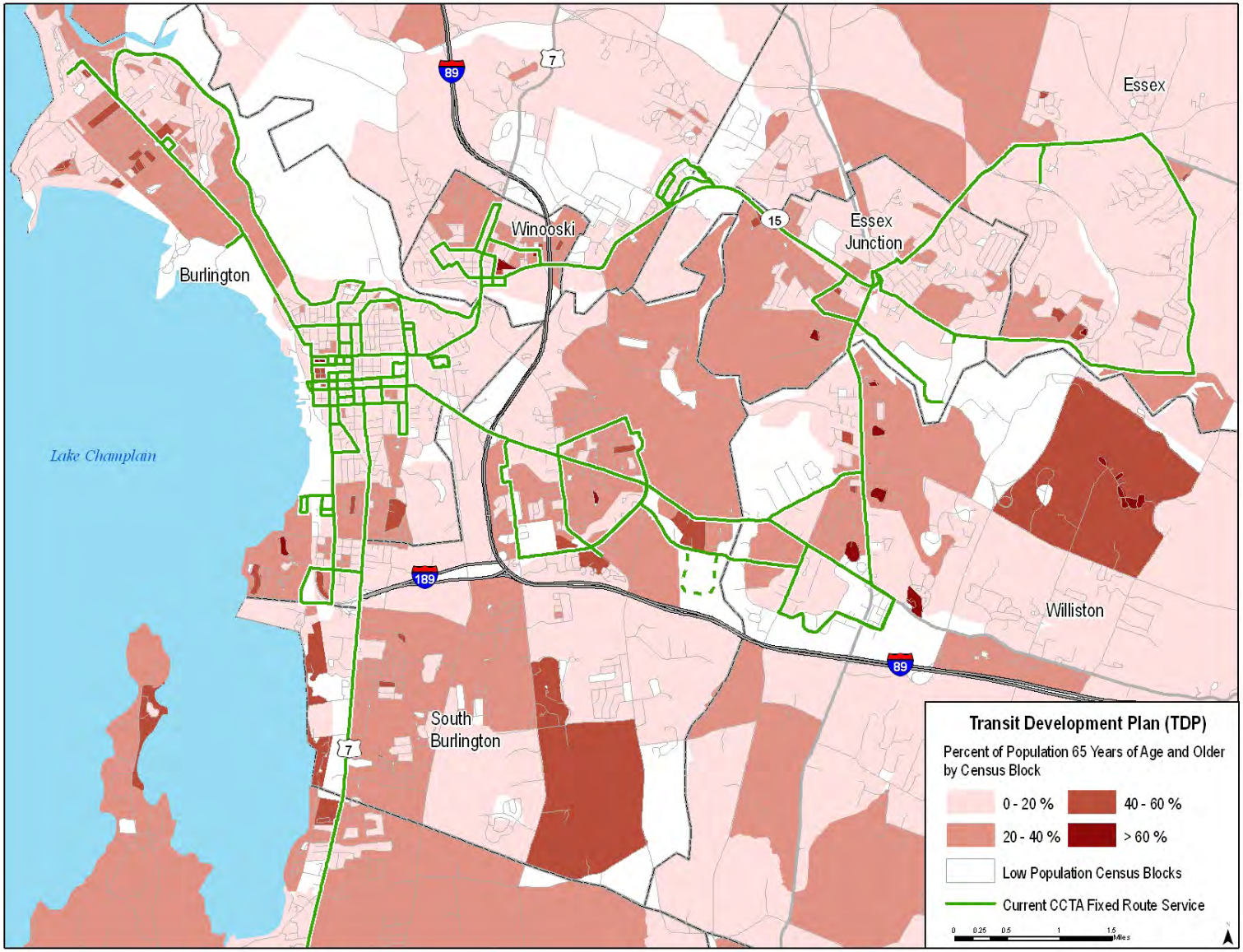
Low Income Households

Data on low income households, those with less than $20,000 annual income, were not projected from its 2000 level. Outside of the regional core, virtually all Census block groups (which are collections of blocks, typically 3 to 5) have a percentage of low income households below 20%. Closer into the regional core, as shown in Map 6, there are block groups with more than 20% of households having low incomes. Burlington, South Burlington, Winooski and Colchester all have neighborhoods with moderate concentrations of low-income families. The highest concentrations are in Winooski and Burlington, especially the central parts of each city, where more than 45% of the households in some block groups have less than $20,000 in annual income. Much of the UVM campus appears in the 35-45% category, reflecting the low incomes of college students.

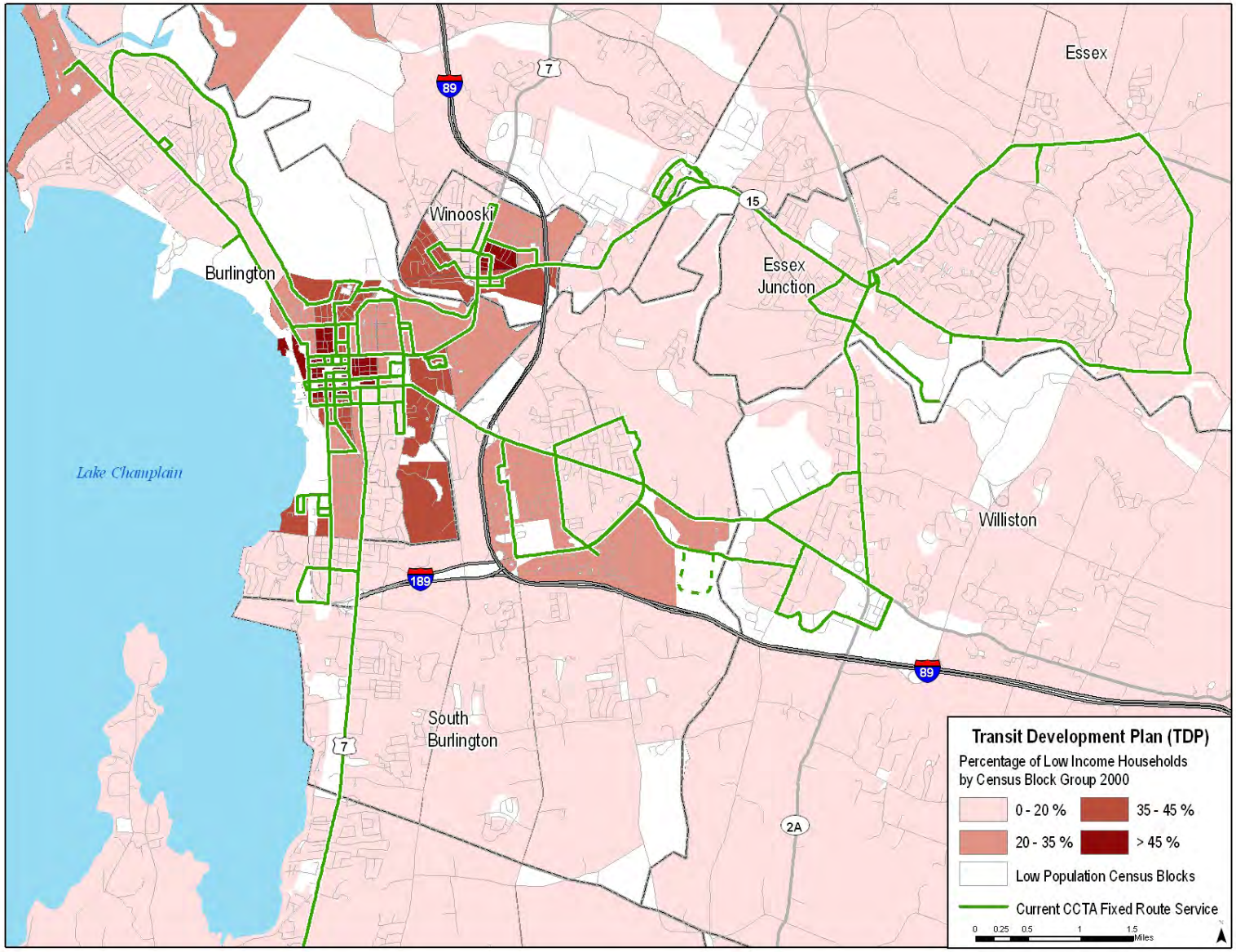
Map 4 Percentage of Population Ages 65 and Older



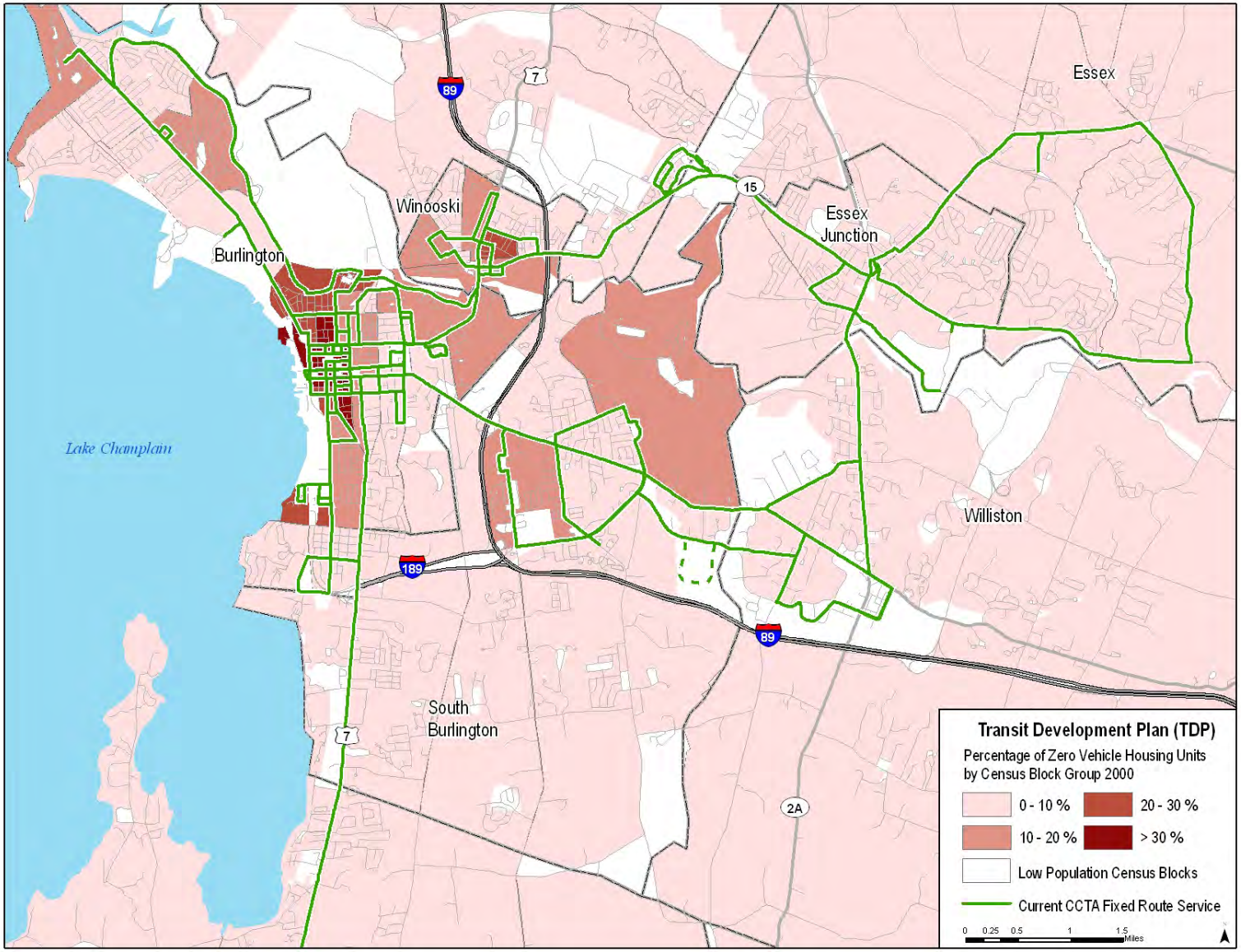
Map 5 Percentage of Population Ages 65 and Older in Regional Core



Map 6 Percentage of Low Income Households



Map 7 Percentage of Zero Vehicle Housing Units



Most of the low income areas have reasonably good or very good access to CCTA routes, as shown on Map 6. Many of the areas noted above as having transit-supportive density but no current service are located in areas with few low-income families, thus lowering the likelihood that potential transit service would generate significant ridership there.

Zero Vehicle Households

Map 7 shows the percentage of households that do not own any vehicles by Census block group. The data represent the year 2000. Note that Census data regarding automobile ownership is provided in terms of housing units and not households. Because the difference between the two is generally insignificant, the terms are used interchangeably here to symbolize a "household" with no access to an automobile.

Throughout the majority of the county, less than 10% of households lacked access to an automobile in the year 2000. The map shows the only portion of the county where significantly more households did not have vehicles. In some suburban parts of Burlington, Winooski and South Burlington, between 10 and 20% of households had no vehicles. The large block group in this range in the western part of South Burlington includes Burlington International Airport, and thus appears to be more significant than it is, given the relatively sparse population there. In downtown Winooski, the Lakeside community and the Old North End of Burlington, between 20 and 30% of households had no vehicle. As would be expected, the highest percentages of zero-vehicle households are located in the central part of Burlington; it is here, where transit access is best that it is most feasible to live without a car. These are also the locations where many low income families live, as well as students and young people just out of school.

Trip Generators for Transit-Dependent Populations

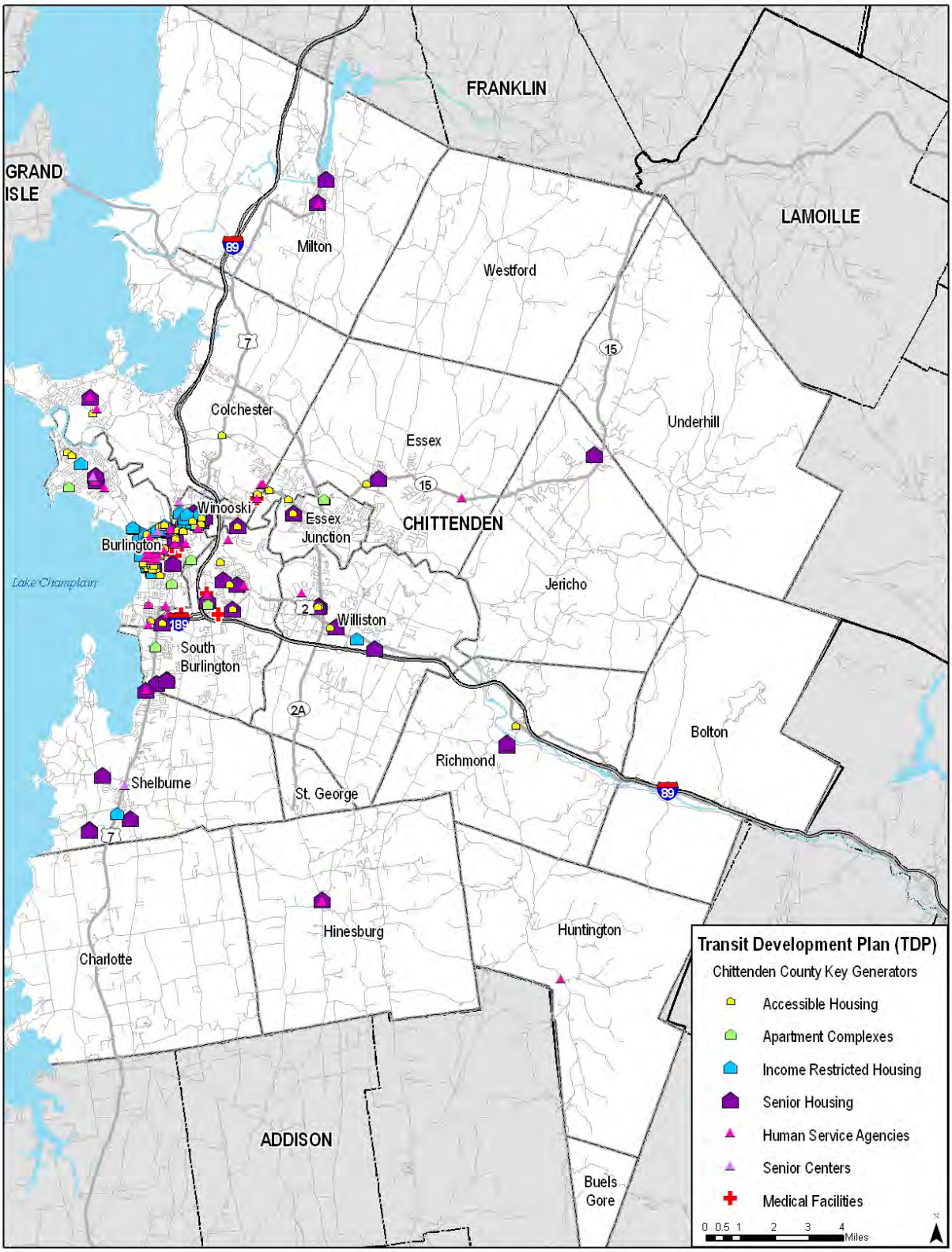
The previous section used data from the 2000 Census to identify areas within Chittenden County that have concentrations of people who are more likely to need access to public transportation services. This section considers data from local sources which provide more detailed information on the location of specific trip generators. Data on these trip generators was obtained from a variety of sources, including the previous SRPTP and the Vermont Human Service Transportation Coordination Plan. Other sources consulted include the Burlington Housing Authority, Community Resource Guide – Champlain Valley Agency on Aging, Champlain Housing Trust, Directory of Affordable Rental Housing, the University of Vermont, and the Vermont Agency of Human Services.

Map 8 shows some of the trip generators within Chittenden County, including:

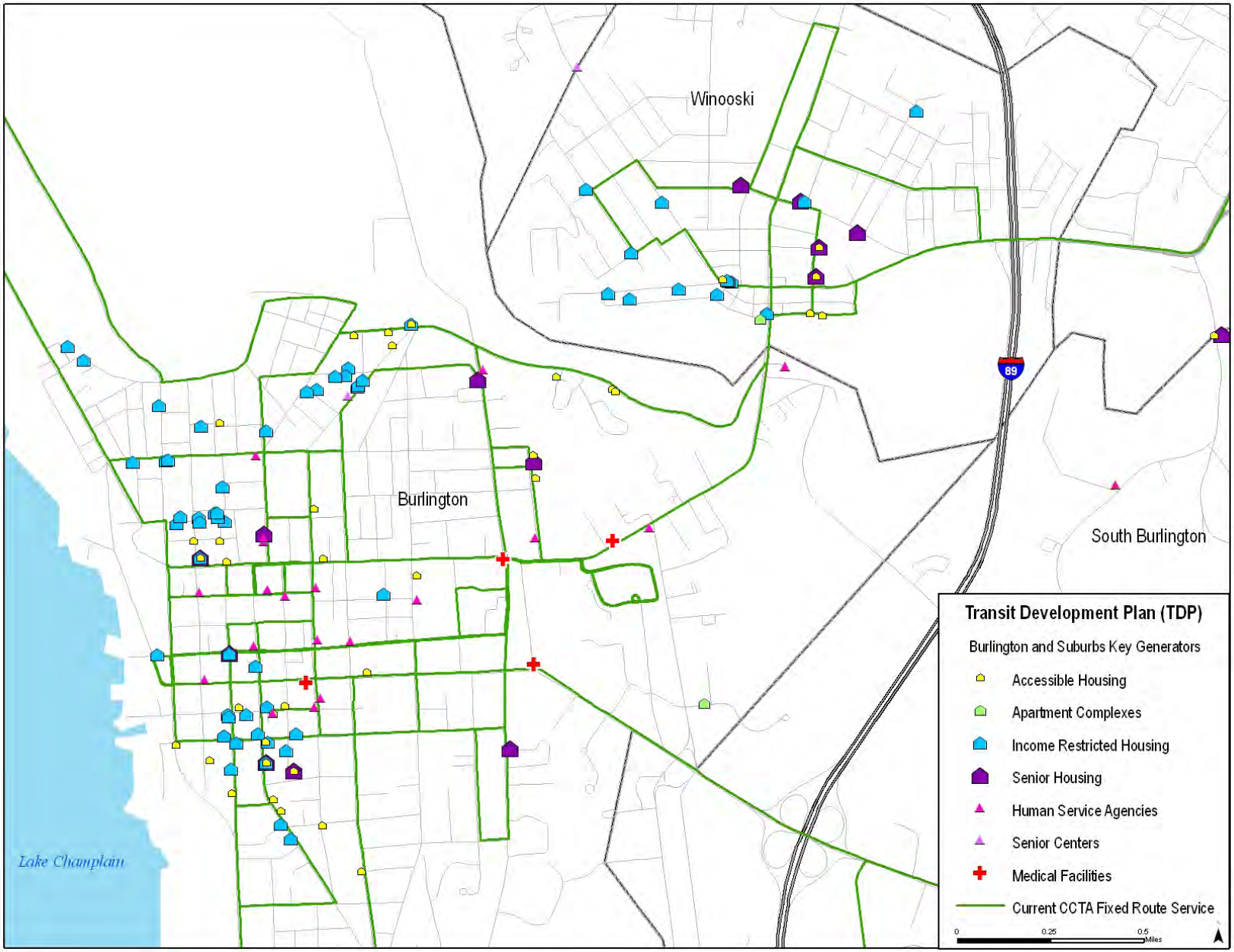
- Accessible housing
- Affordable/ income restricted housing
- Apartment complexes
- Human service agencies
- Medical facilities
- Senior centers and housing

Map 9 focuses on Burlington and Winooski, the locations for many of these generators.

Map 8 Trip Generators



Map 9 Trip Generators in Burlington and Winooski



Many trip generators serve multiple purposes. For example, many senior housing complexes could also be categorized as accessible housing and a few senior centers also serve as senior nutrition sites, which would generally be categorized as human service agencies.

Not surprisingly, the majority of generators are concentrated in more densely-populated areas: Burlington, Essex Junction, South Burlington, Shelburne along US 7, Winooski, and Williston. Outside of these areas, senior housing is located in Hinesburg, Richmond, Jericho, Essex, and Milton, and human service agencies are found in Huntington, Hinesburg, Essex, and Milton.

On Map 9 CCTA's current fixed-route service is compared to the locations of important trip generators in Burlington and Winooski. Certain destinations are clustered together in specific areas: income-restricted housing in Burlington, north of Pearl Street and south of King Street and in Winooski on the west side of Main Street; or human service agencies in Burlington, between Pearl and College streets. Accessible housing locations, though somewhat more dispersed, are also generally located in Burlington, west of South Union Street.

Also illustrated is that CCTA serves many of the important destinations within Burlington and Winooski. Most of the trip generators identified are located directly along CCTA's fixed route service and those that are not are within the generally accepted ¼ mile walking distance to bus service.

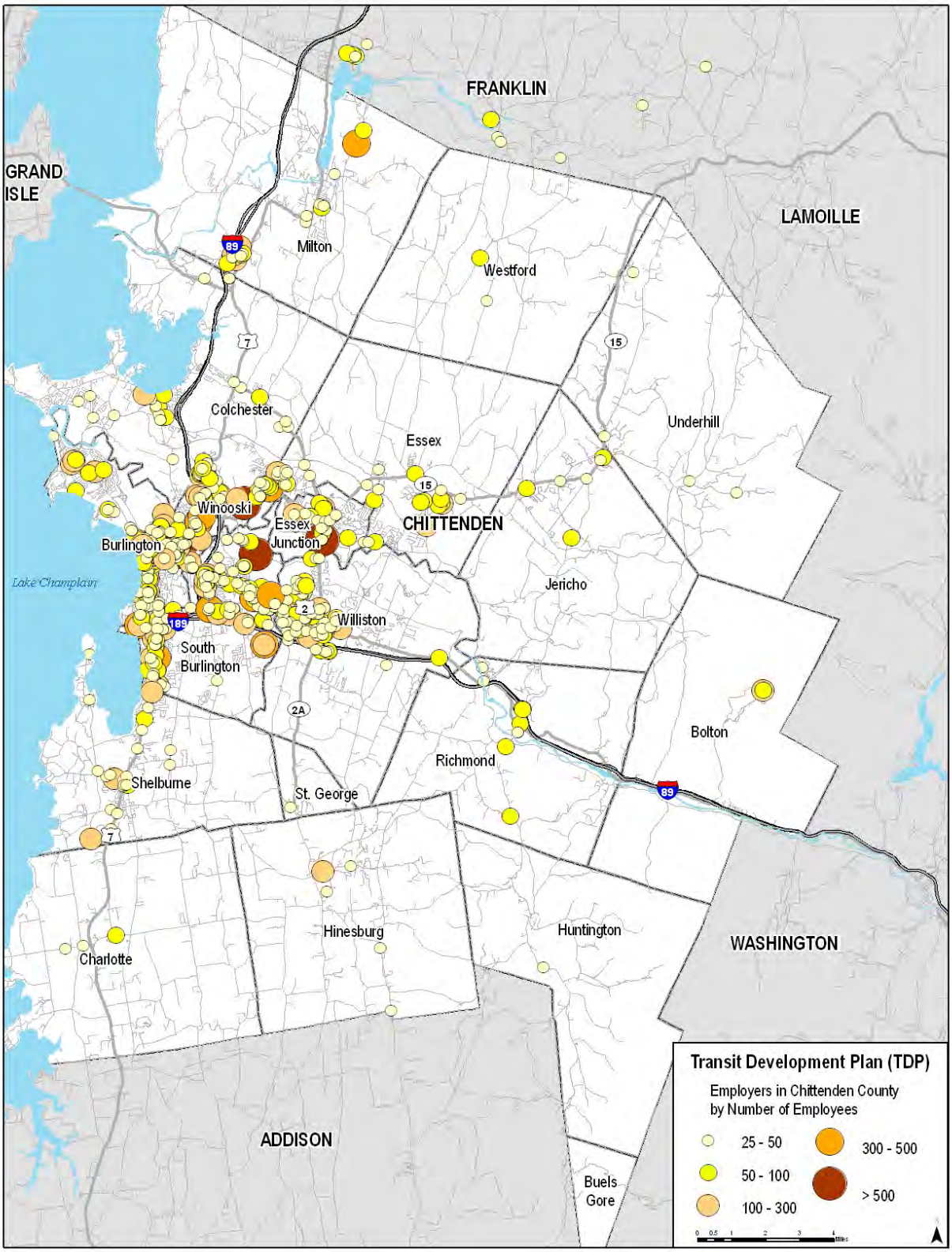
Employers

Data on Chittenden County employers were purchased from Dun & Bradstreet and are shown on Maps 10 and 11. The employers shown are worksites with 25 or more employees. As expected, these employers are clustered in Burlington and Winooski and along major corridors such as I-89, US 7, US 2, and VT 15. Some of the largest area employers include:

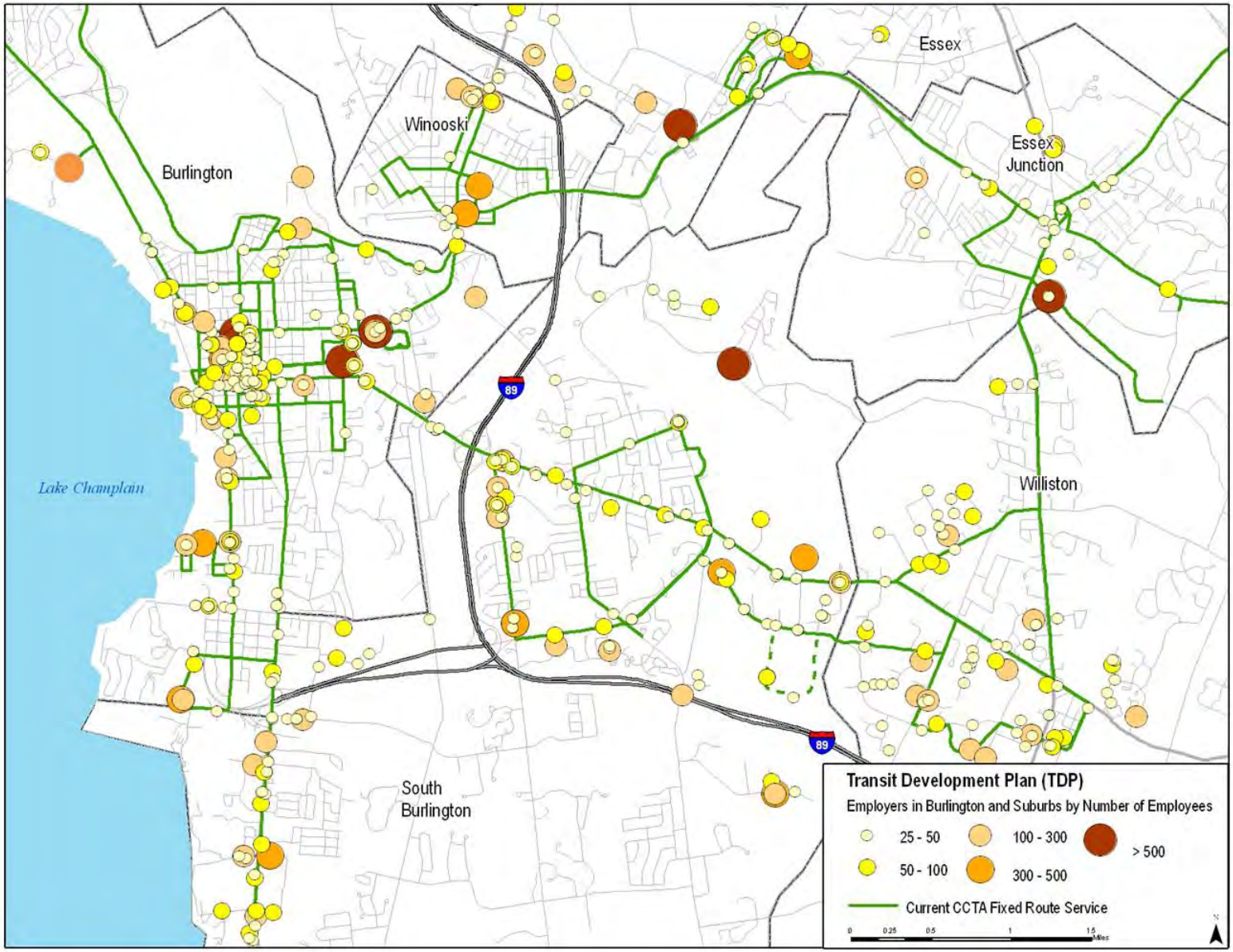
- South Burlington High School – 500 Employees
- Vermont Department of Health – 550 Employees
- Burlington School District – 750 Employees
- Vermont Air National Guard – 1,000 Employees
- University of Vermont (S. Prospect) – 2,000 Employees
- Community College of Vermont – 2,000 Employees
- Vermont National Guard – 4,000 Employees
- Fletcher Allen Health Care – 4,000 Employees
- IBM – 5,000+ Employees (rough estimate as number was not available)

Map 11 provides a detailed view of employers in Burlington, Essex Junction, and Winooski.

Map 10 Chittenden County Employers



Map 11 Burlington and Surrounding Areas Employers



In Map 11, the concentration of major employers in downtown Burlington and along major roadways is even more evident. Areas to note are:

- Downtown Burlington, between Pearl and King streets
- Burlington, along North Avenue, Pine Street, and Industrial Parkway
- In and around the UVM campus
- Essex Junction, along Pearl and Main streets
- South Burlington, along US 7, Dorset Street, and Williston Road
- Williston, close to Williston Road and Industrial Avenue
- Winooski, along US 7

According to the 2008 Customer Service Survey, about half of the typical weekday trips on CCTA routes are between home and work, constituting by far the largest trip purpose. Map 11 demonstrates that these routes are designed to serve as many of these worksites as possible. South Burlington, south of I-89 and Colchester north of I-89 are the only locations within the vicinity of Burlington where there are large employers without direct CCTA service.

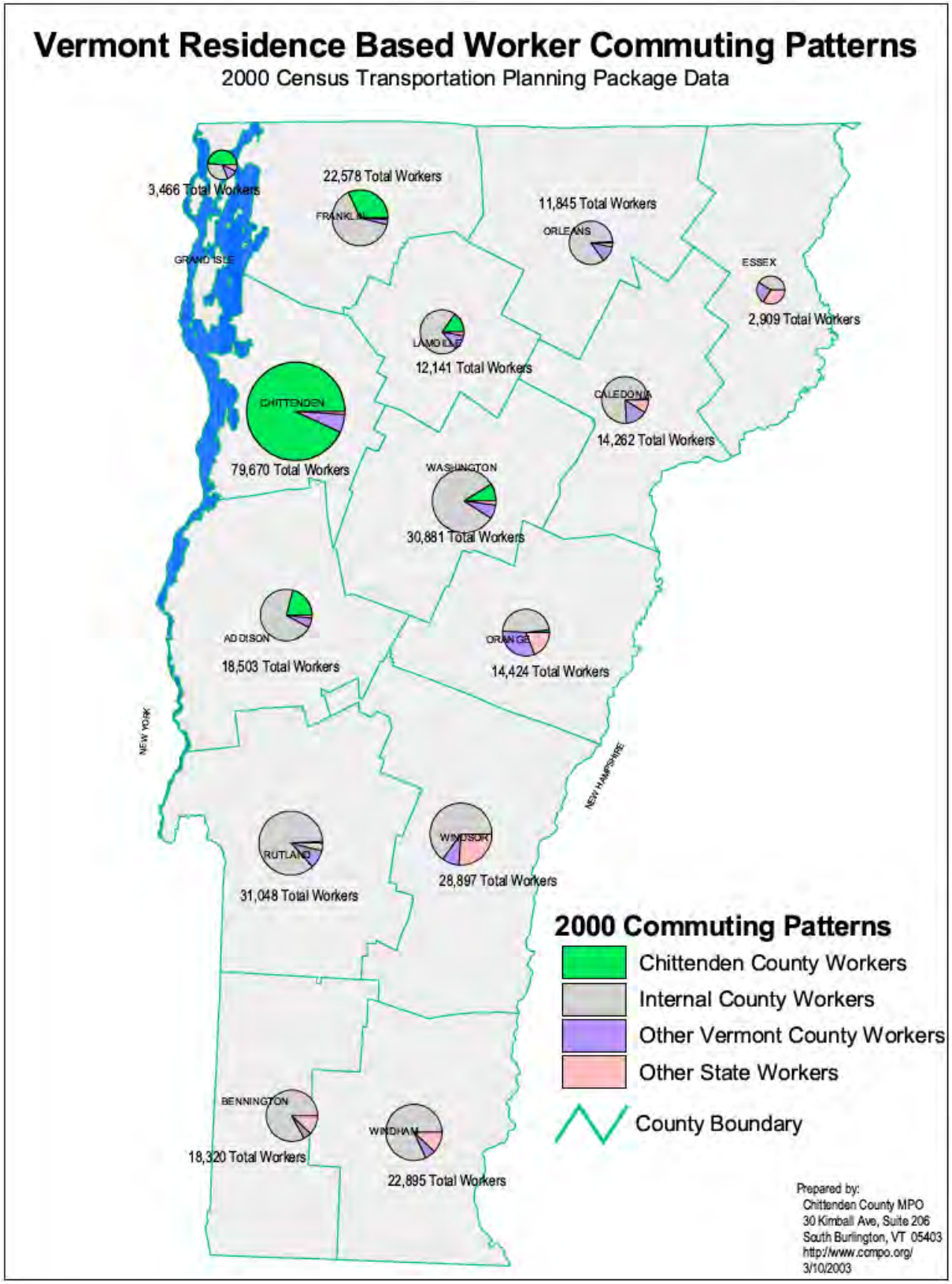
Commuting Patterns

Data from the Journey-to-Work portion of the 2000 Census provide direct information connecting residences to workplaces. Maps 12 through 14 illustrate some of the commuting patterns related to Chittenden County.

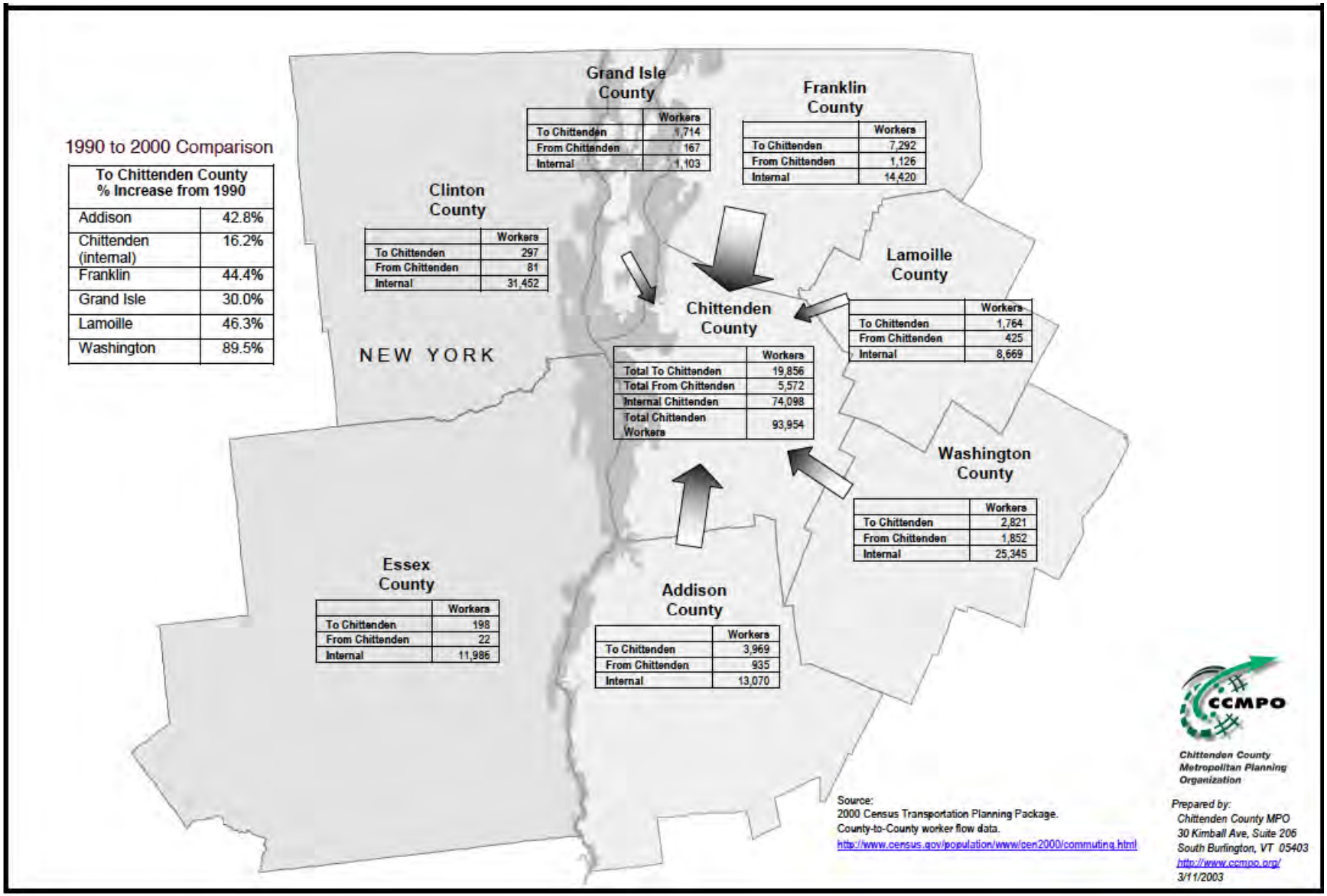
In Map 12, prepared by CCMPO, the share of commuters traveling to various places is shown for all Vermont counties. The bright green slice in each county graph shows the percentage of commuters headed to Chittenden County. As would be expected, the vast majority of Chittenden County residents also work in the county. Nearly half of Grand Isle residents work in Chittenden and about a third of Franklin County residents also commute to Chittenden County. Lamoille and Addison counties send somwhat less than a quarter of their workers to Chittenden, and Washington County contributes about 10% of its workders. Other Vermont counties house only a small number of Chittenden workers; these other counties send far more workers to out-of-state jobs.

Map 13, also prepared by CCMPO, provides a closer look at commuting patterns between Chittenden County and the surrounding counties in Vermont and New York. The thickness of the arrows indicates the actual volume of commuters from each county while the tables show the numbers of commuters in each direction, compared to the number of commuters internal to each county. Franklin and Addison counties contribute the greatest numbers of workers to Chittenden County, while the greatest outflow of Chittenden County residents is headed toward Washington County. Compared to 1990, all surrounding counties have experienced significant growth in the number of Chittenden workers, with Washington County leading the way. These figures are consistent with the high ridership seen on the Montpelier LINK Express route.

Map 12 Vermont County Commuting Patterns



Map 13 Chittenden County Work Flow Data (2000)



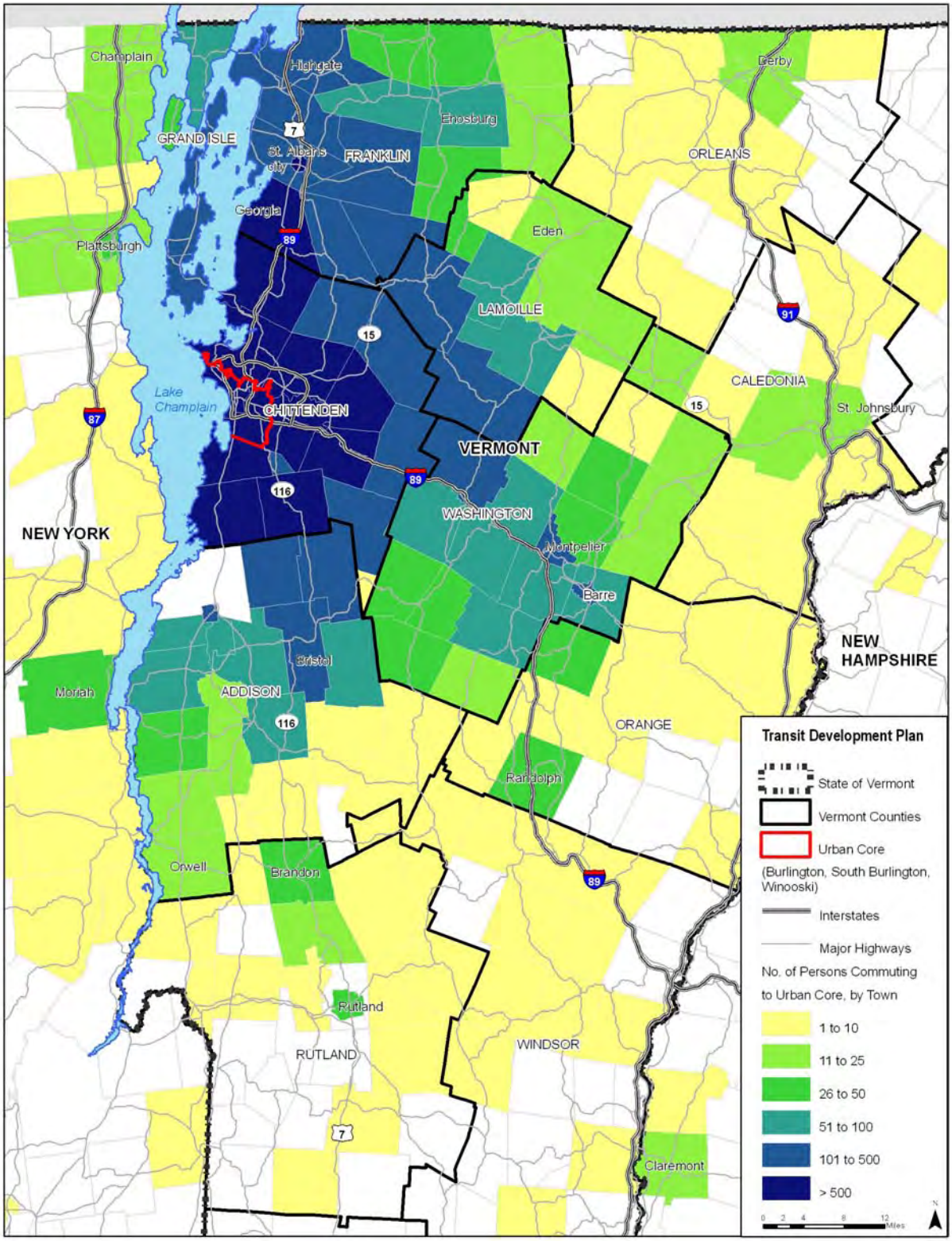
Finally, Map 14 provides a more detailed look at the origin locations of people who work in the core of Chittenden County. This “urban core,” comprises Burlington, South Burlington, and Winooski. Based on the 2000 Census data, almost all towns within a 15-mile radius of downtown Burlington send at least 500 workers to the urban core. The pattern of large-volume commuter source towns extends somewhat further to the north than in other directions—covering Colchester, Milton, Georgia, and St. Albans City—due to the access provided by I-89 and the lack of intervening job centers. In contrast, commuters from the east are perhaps more likely to be traveling to Essex Junction or Williston than those from the north, though there is a well-established commuting pattern from the north to the IBM plant in Essex Junction.

More distant communities such as Montpelier, Barre, and Highgate, as well as several towns in Addison County, send between 100 and 500 commuters to the urban core. I-89 allows for tolerable commuting times for these workers but leads to congested conditions at the urban core interchanges (exits 13, 14, and 15). Commuters from Addison and Lamoille counties have to rely on state highways such as VT 15, VT 116, and US 7. These routes experience severe congestion at particular locations such as town centers or traffic signals where there is substantial traffic volume on intersecting streets and/or large turning movements.

Communities that send at least 26 workers daily to the urban core stretch as far as 50 or 60 miles from Burlington, including Randolph in Orange County, Brandon and Rutland in Rutland County, and Moriah, NY. Commuters from Plattsburgh are not so distant, but they are separated from the urban core by Lake Champlain.

Concentrations of urban core workers along corridors offer opportunities for express transit services oriented toward commuters. Indeed, as discussed elsewhere in this TDP, CCTA is operating services to tap into these markets, with LINK Express routes operating to Montpelier via I-89, St. Albans via I-89, and Middlebury via US 7. Of these, the most successful is the Montpelier LINK because of the high volume of commuters from Washington County, the service it offers to Chittenden County commuters at the Richmond Park & Ride, and the significant reverse commuting market to Montpelier which results in full or mostly full buses traveling in both directions in both peak periods. Other commuter routes are considered further in chapter 6.

Map 14 Commuters to the Urban Core



Conclusion

This analysis has found that CCTA provides some level of transit access to high-density residential areas and important trip generators. A few areas were identified that have transit-supportive densities but are outside of the current service area. The further removed these areas are from current routes, the greater the cost will be to tie them into the system. A thorough discussion of the impact of development patterns and development design can be found in the "TOD/POD and Future Development" section in Chapter 5.

Overall, the town of Colchester has the greatest amount of unserved territory with residential density higher than any other unserved municipality, and is thus the next best market for local and commuter transit service. However, there are barriers to extending service to Colchester and a complete summary of the status of transit in Colchester can be found in Chapter 7. While CCTA now serves the most important commuting corridors, there are other opportunities for new commuter service including the VT 15 and VT 116 corridors, among others. Please refer to Chapter 6 for an extensive list of services CCTA deems appropriate for the various areas and markets in Chittenden County.

Chapter 4

Needs Analysis

As a prelude to developing service strategies in the TDP, the needs for improved public transportation were identified. As mentioned in the previous chapter, CCTA serves two large markets of riders, and these markets have somewhat different needs; these are discussed below. These needs were illuminated through input from CCTA riders and the general public, which was solicited through a series of surveys about the most important improvements CCTA could make to its service. In addition, an analysis was conducted based on the information presented in prior chapters on the existing service and market analysis.

Needs of CCTA's Primary Markets

For much of CCTA's history, the great majority of its riders belonged to the market segment made up of people who depend on public transit for most or all of their mobility needs. These "transit-dependent" riders either do not have a car available or cannot drive for any number of reasons, but must make trips that are too long for walking. More recently, as its service level has improved and new routes have been introduced, CCTA has been tapping into the commuter market, attracting riders who are able to drive. These riders choose to take transit, and are thus known as "choice" riders. Serving the needs of transit-dependent riders fulfills part of CCTA's mission: to be a public utility and meet the mobility needs of people in Chittenden County. Attracting choice riders fulfills the other part of the mission, to help reduce congestion and air pollution, and to support a more sustainable economy and development pattern.

The main needs of the transit-dependent market segment are longer service hours and wider service coverage. Longer hours means both extended hours on weekdays (early in the morning and late in the evening) and full service on weekend days. Many people work on Saturday and Sunday and need transportation to and from their jobs. They also work shifts on weekdays that do not necessarily coincide with the traditional 9-5 job; their jobs may start very early in the morning, or let out late in the evening. Wider service coverage means bus routes going to more places. As was seen in chapter 3, the current system serves most places with high residential density, concentrations of people with transit-dependent characteristics, social service agencies, and clusters of employment, but by no means all of them. In some cases, transit-dependent riders are faced with long walks to get from the bus to their final destinations.

The single most important service characteristic to choice riders is frequency of service. Underlying this claim is the assumption that the span and coverage of service already is largely sufficient for the majority of regular commuters, who mostly do work in traditional 9-5 jobs.

Frequency, on the other hand, is a key determinant of how long someone is likely to be waiting for a bus and how flexible someone can be about their departure times. For someone who has a car available, and therefore has an option with no waiting time and complete flexibility of departure time, a bus route will only be attractive if waiting time is minimized and flexibility is maximized.

This is not to say that frequency is unimportant to transit-dependent riders, and that nothing else matters to choice riders. Indeed, improved frequency is a large benefit to all riders, and many other factors are very important to choice riders, including travel time and directness of the route, comfort and cleanliness of the buses, and passenger amenities at bus stops (shelters, benches, lighting, etc.). However, since transit-dependent riders do not have a choice (by definition), the important thing is being able to get to their destination at all, even if it involves some waiting and inconvenience.

CCTA's services are designed to appeal to and meet the needs of both markets, though some routes are more oriented toward one or the other. The "commuter" routes are obviously aimed at commuters, as are the two primary trunk routes on US 2 and VT 15. The commuter expresses, while operating with limited frequency, offer fast and inexpensive service from outlying areas to downtown Burlington and the Hill institutions. These routes offer choice riders a way to save money and use their commuting time more productively while avoiding the stress of driving. The US 2 and VT 15 services offer trips every 15 minutes during peak periods and direct routings[1] from Williston and South Burlington (for US 2) and Essex, Colchester, and Winooski (for VT 15) into downtown Burlington. National research shows that service every 15 minutes is the minimum acceptable to most choice riders.

Most of CCTA's local routes are more oriented to transit-dependent riders mostly within the cities of Burlington and Winooski. These routes are slower and more indirect, but offer wide coverage to densely developed neighborhoods. For the most part, these routes operate every 30 minutes. The North Avenue, Pine Street and Shelburne Road routes, considered to be trunk routes by CCTA, straddle the difference between commuter and local services. They are direct corridor services, but do not yet have the high frequency to make them attractive to choice riders.

Needs Identified in Recent Data Collection and Outreach

In May of 2008, CCTA conducted an on-board passenger survey. Among other things, this survey asked riders about potential service improvements. In July of 2008, public meetings were held as part of the State's Short Range Public Transportation Plan process to solicit opinions about transit service. Finally, in the Spring of 2009, CCTA conducted a telephone survey of

[1] Both of these routes leave the main corridor to serve a large trip generator: Fort Ethan Allen for VT 15 and University Mall for US 2. In spite of the time penalty for through travelers, these generators are too important to bypass.

Chittenden County residents and a web survey open to all interested parties but targeted to Chittenden County residents. Needs identified by survey respondents and attendees at the public meetings are summarized below.

In the 2008 on-board survey, riders were asked to mark up to three choices (from a list of 11) for ways to improve service. The top eight choices are shown below in rank order, along with the percentage of riders who chose that option. The prominence of span issues (Sunday service and evening service) reflects the fact that many of the on-board survey respondents are transit-dependent riders.

1.	More service on Sunday	55%
2.	Later hours in PM	44%
3.	More frequency	35%
4.	More service on Saturday	31%
5.	Faster, more direct	19%
6.	More shelters	19%
7.	Routes to more locations	15%
8.	Earlier hours in AM	15%

Among the requests for routes to more locations, the following communities were cited:

	Town	**Number of Requests**
1.	Milton	16
2.	Colchester	12
3.	Hinesburg	4
4.	Jericho	3

The telephone and web surveys also asked about desired locations for new routes. The following were the most commonly mentioned:

2009 Telephone			**2009 Web**		
Town	*No.*	*Pct.*	*Town*	*No.*	*Pct.*
Colchester	103	10.4%	Colchester	52	13.0%
Williston	85	8.6%	Burlington	50	12.5%
Essex	81	8.1%	Williston	42	10.5%
Milton	65	6.5%	So. Burlington	38	9.5%
So. Burlington	61	6.1%	Essex	34	8.5%
Jericho	56	5.6%	Winooski	28	7.0%
Burlington	54	5.4%	Hinesburg	22	5.5%
Charlotte	51	5.1%	Richmond	21	5.3%
Richmond	51	5.1%	Shelburne	21	5.3%
Underhill	51	5.1%	Bolton	17	4.3%
Shelburne	50	5.0%	Charlotte	16	4.0%
Hinesburg	47	4.7%	Jericho	15	3.8%
Winooski	39	3.9%	Milton	14	3.5%
Westford	21	2.1%	Underhill	13	3.3%

By public consensus, it seems that Colchester is the community in the greatest need of more service. Several communities that already have service (such as Burlington, Williston, Essex, and South Burlington and Winooski) are mentioned frequently as needing new routes. As coverage is reasonably thorough in at least some of those communities, these mentions should be interpreted as requests for a higher level of service on existing routes, and/or connections to areas other than downtown Burlington. After Colchester, the community with little present service mentioned most often is Milton. (Note that a commuter route to Milton was implemented on February 15, 2010.) Telephone and web survey respondents agreed that "regional commuter" routes, such as those that would connect Milton, Colchester, or Hinesburg to Burlington are the highest priority, over interregional commuters (like the existing LINK Express routes) or all-day local services.

Extending the reach of CCTA services to more communities was the primary interest of telephone survey respondents, likely because a higher percentage of them (compared to the web and on-board surveys) were non-riders and lived outside of the urban core. The following figures show how telephone and web survey respondents ranked five categories of possible improvements to CCTA service:

2009 Telephone	**2009 Web**
Average ratings shown – higher score is better (range 1 to 5)	*Number of top rankings*
Hours – 3.27	Hours – 30
Frequency – 3.25	Frequency – 34
Amenities – 1.95	Amenities – 2
Coverage – 4.17	Coverage – 24
Speed – 2.45	Speed – 23

While span of service seemed to be the most important item for current riders (as shown above), frequency of service seems to rank just as high or higher among telephone and web survey respondents. All three surveys agree that speed of service and amenities (such as better shelters) are relatively less important.

Another interesting contrast between the views of current riders and the mix of riders and non-riders in the telephone and web surveys is that when it comes to hours of service, current riders feel strongly about having more weekend service, especially Sunday service, while telephone and web respondents ranked expansion of weekday service most highly, and Sunday service last. These findings reflect the differing mix of transit-dependent people and people who have the option to drive in the various surveys. Transit-dependent riders are best represented in the on-board survey, while choice riders appear to be best represented in the web survey. Non-riders are best represented in the telephone survey.

Comments received from the general public and from invited stakeholders in July 2008 largely echo the findings from the data collection efforts. Routes, especially commuter routes, were requested from the following communities:

- Colchester
- Hinesburg (and Bristol via Hinesburg)
- Milton
- Jericho
- Westford
- Essex
- Underhill
- Williston
- New North End of Burlington
- Richmond-Williston via US 2
- Cambridge
- Grand Isle (ferry connection)

In addition, improved weekend and weekday night service was requested to assist people who work at those times.

Unmet Needs

The answer to the question "what are the greatest unmet needs for public transportation in Chittenden County" depends on whom you ask. For residents outside of the urban core, the answer is clearly new commuter routes to outlying communities such as Colchester, Milton, Hinesburg, Jericho and Richmond. For residents of communities that already have some service, and especially among current riders, the answer is longer hours (including weekend service) and higher frequency on the existing routes. Additional connections, such as cross-town links between the two parts of South Burlington, would also expand the travel options of current riders.

Service Frequency

In the transit industry, 30-minute service is considered to be unattractive to choice riders, while 15-minute service in the peak periods is considered a significant threshold to making transit competitive with driving. This threshold mainly relates to the amount of time people are willing to wait if they just miss a bus. With a 30-minute wait until the next bus, most people with a car available will not risk having to wait for that long, and thus will not attempt to take the bus at all.

For years, CCTA has been slowly building ridership by offering 30-minute service on almost all of its routes. It is clearly recognized, though, that 15-minute peak service is desirable on all of the main corridors leading into Burlington; a goal that was endorsed in the recent Burlington Transportation Plan. In 2008, after successfully obtaining a grant of federal Congestion

Mitigation/Air Quality money from the State, CCTA established 15-minute peak service on the Essex Junction route, and promptly saw ridership jump by some 30% on that route.

Given the experience on the Essex Junction route, establishing 15-minute peak service on the four major corridors into Burlington—North Ave, Colchester Ave/Pearl Street (VT 15), Williston Road/Main Street (US 2), and Shelburne Road (US 7)—is likely to be the most cost-effective investment in new service that CCTA can make. US 2 received 15-minute peak service with the major restructuring that took effect in June 2010.

Service Hours

Expanding the hours of service on CCTA routes is likely to be the next most cost-effective investment. Service offered 14-16 hours per day (such as 6:00 a.m. to 10:00 p.m.) is considered to be the minimum needed to attract choice riders. In addition to more evening service, Sunday service on the four major corridors, with the Essex Junction route leading the way, would generate additional ridership.

Service Coverage

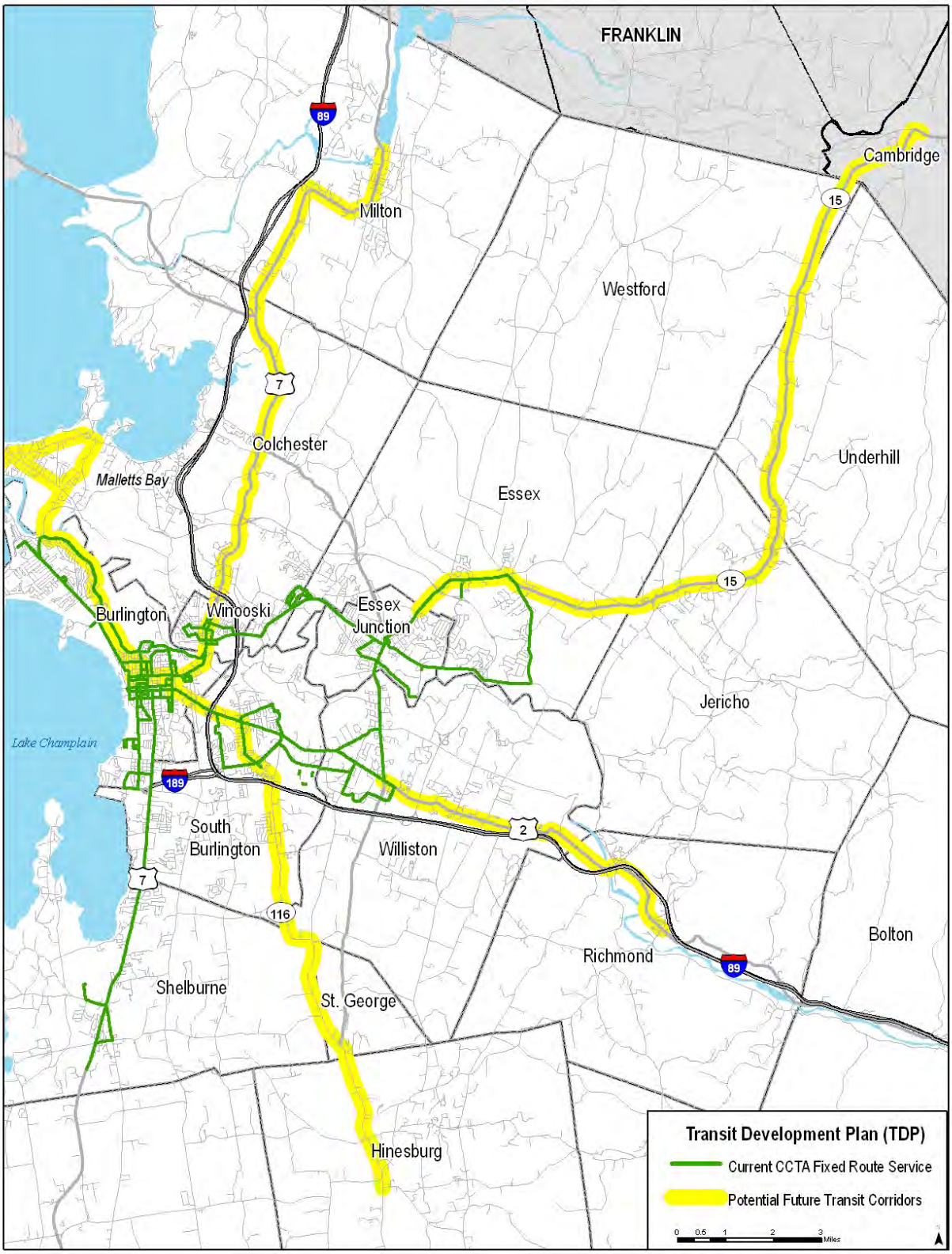
Extending service to new places is critical to CCTA's mission as a regional public transportation service provider, but is somewhat less likely to be as cost-effective (in terms of cost per new rider) than boosting service on existing routes. Peak-period commuter services linking outlying areas with the regional core have been proven successful with the interregional LINK Express routes (which also serve Chittenden County communities through park-and-ride lots). Commuter service to surrounding communities such as Colchester, Milton, etc. (see map on next page) would likely be successful, but would take more time to mature and reach their full potential. It should be noted that a higher level of service on the core system will make the future commuter routes more attractive when they are implemented, by allowing for better access throughout the regional core through transfers in the downtown.

Amenities and Facilities

Beyond service expansion, respondents to surveys and participants in public outreach requested further investment in shelters, benches, bike racks and other passenger facilities, as well as new technology such as real-time passenger information, wi-fi on buses, and trip planning software. Such investments in physical infrastructure and technology make the system more appealing to existing riders and future choice riders.

The facility that will have the greatest impact on passengers is the new Downtown Transit Center. More than 2,000 passengers board at the current transit center every weekday, 900 of whom are transferring between buses. A new transit center will offer more comfortable waiting areas, weather protection, and better customer information and signage, including real-time information on bus arrivals and departures. It will also provide significant benefits on the operational side, with more efficient access and egress and layover possibilities.

Future Regional Commuter Corridors



It is also critical to note that the pedestrian environment in bus service corridors is an essential element of the overall system. All passengers are pedestrians (either on foot or in a wheelchair) before they board the bus and after they exit. If the pedestrian environment is not safe, comfortable, and attractive, then neither is the bus system, no matter how good the service is. CCTA member communities must continue to work with CCTA to improve pedestrian facilities along and extending from bus routes to provide better access to transit service from neighborhoods.

Human Service Transportation Needs

In addition to the above, the 2007 Human Service Transportation Coordination Plan identified transportation service gaps and unmet needs in Chittenden County. Types of needs were divided into three categories: general, employment-related, and human service- related. They included the following:

- Service outside current CCTA member towns, especially to new developments in Williston
- Institution of flexible routing
- Additional bus stops within Burlington
- Commuter service between Burlington and Bennington
- Increased E&D funding to meet the demand for service, especially ongoing medical trips
- Transportation to senior meal sites

Conclusion

This chapter identified the broad markets that CCTA serves and the most important features of the system to those markets. Several types of improvements are needed to help CCTA fulfill its mission. These are addressed in chapter 6.

Chapter 5

Regional Coordination and Sustainability

To an increasing extent, CCTA plays an essential role in the economy of Chittenden County, allowing for continued economic growth in a way that is consistent with reduced energy use, environmental protection, sustainable land use, and reduced traffic congestion. In order to achieve this, CCTA coordinates closely with local, regional, and state governments and works with the private sector to leverage public investment in transportation. This chapter discusses this coordination and the region's pursuit of a sustainable transportation system.

Regional and Multi-modal Coordination

As mentioned in chapter 1 of this TDP, CCTA is joined by many partners at all levels of government. At the regional level (Chittenden County), CCTA is heavily involved in ongoing activities at the Chittenden County Metropolitan Planning Organization (CCMPO) which is responsible for planning intermodal federal aid surface transportation projects in Chittenden County. CCMPO's Board contains appointees from each of the 18 Chittenden County municipalities. CCMPO's bylaws are located at http://www.ccmpo.org/about/bylaws.php4

CCTA staff serves on the following CCMPO committees and groups:

- *CCMPO Board (ex officio)* – Considers and provides final approval for the region's Transportation Improvement Program (TIP), annual Unified Planning Work Program (UPWP), long range plans, and major studies.
- *CCMPO Transportation Advisory Committee* – Provides technical and municipal staff guidance to CCMPO staff on a variety of topics, including corridor studies, scoping studies, the annual planning program, the creation of and amendments to the TIP, and the creation of evaluation criteria for various grant programs.
- *CCMPO Public Transportation Committee* - Provides recommendations to the Board for the development of a comprehensive public transportation system in the region. Specifically, the committee is charged with developing policy recommendations related to the public transportation system(s) in the region, including system improvement and system funding.
- *CCMPO TIP Committee* – Develops the TIP and makes recommendations to the TAC and the CCMPO Board.
- *CCMPO UPWP Committee* – Sets budgets for various planning tasks and projects performed by the CCMPO and partner organizations such as CCTA
- *CCMPO Bike/Ped Committee* – Reviews and prioritizes ongoing projects in the region, helps CCMPO staff write and update the Bike/Ped Plan, and helps coordinate a Bicycle and Pedestrian Summit.

- Representation on corridor study and plan advisory committees, including:
    - Route 15 Corridor Study
    - US 2 Corridor Study
    - Colchester Ave Corridor Study
    - Park & Ride Plan Update
    - Metropolitan Transportation Plan Update

In addition to serving on these committees, CCTA staff is engaged in the review process of local and regional plans and offers comments on proposed zoning changes, Act 250 permit applications, and other local plans.

In the process of developing this TDP, CCTA formed a Stakeholder Committee with broad representation from local municipalities, advocacy groups, and regional organizations. This committee met three times through the Autumn of 2009 and Winter 2010 and provided valuable input about the transportation markets served by CCTA and the vision of the future system.

CCTA also works on an ongoing basis with its member municipalities and grassroots organizations such as Local Motion to promote an environment along streets and in other public spaces that is conducive to public transportation and other alternatives to driving. Specifically, investments in transit facilities and services are being linked to other infrastructure such as sidewalks, crosswalks, traffic signals, bikeways, roads, and parking facilities through ongoing communication and coordination with local public works departments. Carshare Vermont also supports transit, as it makes automobile *ownership* less important and allows people to feel that they have an inexpensive option to use a car for those trips that cannot be served effectively by the existing bus system.

Park & Ride and Automobile Intercept Opportunities

Park & Ride lots are an integral part of successful commuter transit service in the region, especially since parking and traffic congestion are an issue in downtown Burlington and on the Hill. Existing transit routes can be made more successful through the expansion of park & ride capacity at existing lots and the creation of new lots. These can increase access to transit services without incurring significant new operating costs.

The MPO's 2004 park and ride study is in the process of being updated. That study differentiates between two types of parking facilities: Park & Ride lots and Intercept or Satellite parking lots. These are defined below:

> **Park & Ride Lot** – Generally located in a suburban or rural area. This type of lot is typically a surface lot with a capacity of under 100 cars, and it may or may not be paved. The lot may be served by bus routes (low frequency commuter service), but also may be intended primarily for carpool or vanpool formation. It is usually publicly owned, built and maintained. Walk and bike access is desirable but not always provided. Helps to reduce vehicle miles of travel (VMT) by shifting travelers to higher-occupancy modes close to the origin point.

Intercept or Satellite Facility – Generally located within 3 miles of a central business district (CBD) or major activity center. This type of facility is intended to offer a remote parking option for automobile commuters so as to reduce congestion and parking demand within the CBD. Frequent transit/shuttle service is offered between the lot and the CBD/activity center. May include structured parking, and capacity is typically greater than 100 cars to provide enough volume to support the frequent shuttle service. Walk and bike access is desirable. Has less of an impact on VMT since commuters will have driven most of the way to the destination, but can have a greater impact on congestion due to higher volume of riders. Also allows parking facilities within the CBD/activity center to be redeveloped for higher value purposes.

An increase in the number of publicly owned park and ride lots is crucial to the development of future transit services and CCTA will strongly advocate for such an expansion. CCTA on its own, or in cooperation with CCMPO, could begin development of park & ride lots through land purchase/lease and construction. In the recent past, the use of private land, through lease agreements or shared-use agreements, has been necessary to support existing routes due to a lack of capacity at state- and municipality-owned lots.

While the MPO study is not yet complete, some recommendations CCTA will make on the location of future parking facilities are the following:

- Park & Ride Lots
    - Along existing transit routes
        - To support LINK Express routes
            - New Haven
            - Middlebury
        - To support Regional Commuter routes
            - Williston
            - Milton
        - To support local routes
            - Taft Corners
            - VT 15 in Essex Junction and Colchester
            - Essex Way
    - Ideally located outside or on the edge of village/town centers so as to not interrupt a walkable/bikable urban form. Land in town/village centers should be devoted to buildings and green spaces rather than auto storage.
    - To support future routes
        - Hinesburg
        - Jericho
        - Underhill
        - Richmond
- Intercept Facilities
    - Exit 14 (South Burlington/Burlington border)
    - Exit 16 (Colchester/Winooski border)
    - Pine Street Corridor – Burlington

It is critical that any new lots be designed to accommodate full-size transit buses, to ease access and egress and minimize bus travel time. Existing lots that are too small to allow for efficient bus operations should be redesigned and expanded. In addition, all lots should include a passenger shelter and bicycle storage facilities.

Working with the Private Sector

In addition to its public sector partners, CCTA reaches out to the private sector to build relationships with employers and institutions. These relationships lead to new funding sources for operations as well as increased ridership. Perhaps the greatest example of this is the Unlimited Access program. As discussed in Chapter 2, this program allows students, faculty, and staff of the University of Vermont, Champlain College, Saint Michael's College, and Middlebury College (faculty and staff only) to ride CCTA's fixed routes for free with valid identification. These institutions pay for these rides directly to CCTA.

CCTA works with employers through its Smart Business Program. In this program, an employer can provide transit passes to their employees, or the employees can purchase transit passes, on a pre-tax basis. This program is modeled on the much larger Eco Pass program in Boulder, Colorado, which is partly subsidized by the City of Boulder.[1] Participants are also eligible for Sure Ride, which reimburses participants for the cost of a taxi ride home in emergency situations. CCTA contacts employers along its routes on a regular basis, and especially when service improvements are implemented, to encourage them to take advantage of this program.

Transportation Management Associations, or TMAs, are another means for the private sector to work with CCTA. The Campus Area TMA (CATMA) has a long history of cooperation with CCTA through the Unlimited Access program and direct funding of operations. There has been discussion of forming a TMA in downtown Burlington in order to pool resources in support of CCTA. While some employers may be reluctant to commit individually to support public transportation, the value of their support can increase exponentially when it is combined with others in a focused area such as the central business district.

Another initiative pursued by CCTA is cooperation with private developers. As discussed more below, the location and design of future development can have a significant impact on transit

[1] Eco Pass is an annual transit pass purchased by a company and its employees or a collection of residences. The pass provides unlimited usage of RTD services. Companies purchase the Eco Pass for all full-time employees, with an option to include part-time employees. Eco Pass is also tax deductible to employers and tax free to employees (up to $230/mo or $2,760 annually). The City of Boulder rebates 50% of the Eco Pass contract cost to the employer (for first-time participants – 25% for second-time participants) if an employee volunteers to serve as an Employee Transportation Coordinator (ETC). According to GoBoulder's promotional brochure: "An ETC is [a] company representative who is passionate about protecting our environment and is ready to encourage other employees to bus, bike, walk, carpool, vanpool, telework, or take advantage of a flexible work schedule, like working a compressed work week to reduce the dependence on SOVs for the work commute."

ridership. By being engaged early in the development process, and especially having developers come to CCTA to discuss transit needs and accommodations, the region can be built to allow for efficient and sustainable transportation in the future.

TOD/POD and Future Development and Investment

Chapter 3 discussed current development patterns and the ability of CCTA routes to serve residences, jobs, and other important destinations that are clustered around important roadways. It was noted that some residential development and employment was isolated from these clusters, and thus not easily served by CCTA, at least, not in a cost-effective manner.

As municipalities and developers consider new construction of homes and commercial space within CCTA's member communities, communication and cooperation with CCTA and other regional organizations is essential to promote a sustainable economy. Public transportation works best when origins and destinations are focused in linear corridors and city and town centers rather than being spread out in suburban-style subdivisions and office parks. And the regional economy and transportation system as a whole works best when public transportation service is effectively delivered to provide affordable and attractive alternatives to private automobile travel. Shaping the future Burlington metropolitan area in such a way as to promote efficient public transportation service will result in a more vibrant economy, less traffic, and a healthier environment.

The mechanism to make this happen is called "transit oriented design" (TOD) or "pedestrian oriented design" (POD). It is a departure from the prevailing automobile-centric development pattern that has been in place since 1950. The idea is that future homes and commercial space would be built in compact, mixed-use developments and that the streetscape would be designed with the pedestrian in mind, not the automobile. Rather than seeking to maximize automobile speeds and throughput, the safety and comfort of pedestrians is the primary goal.

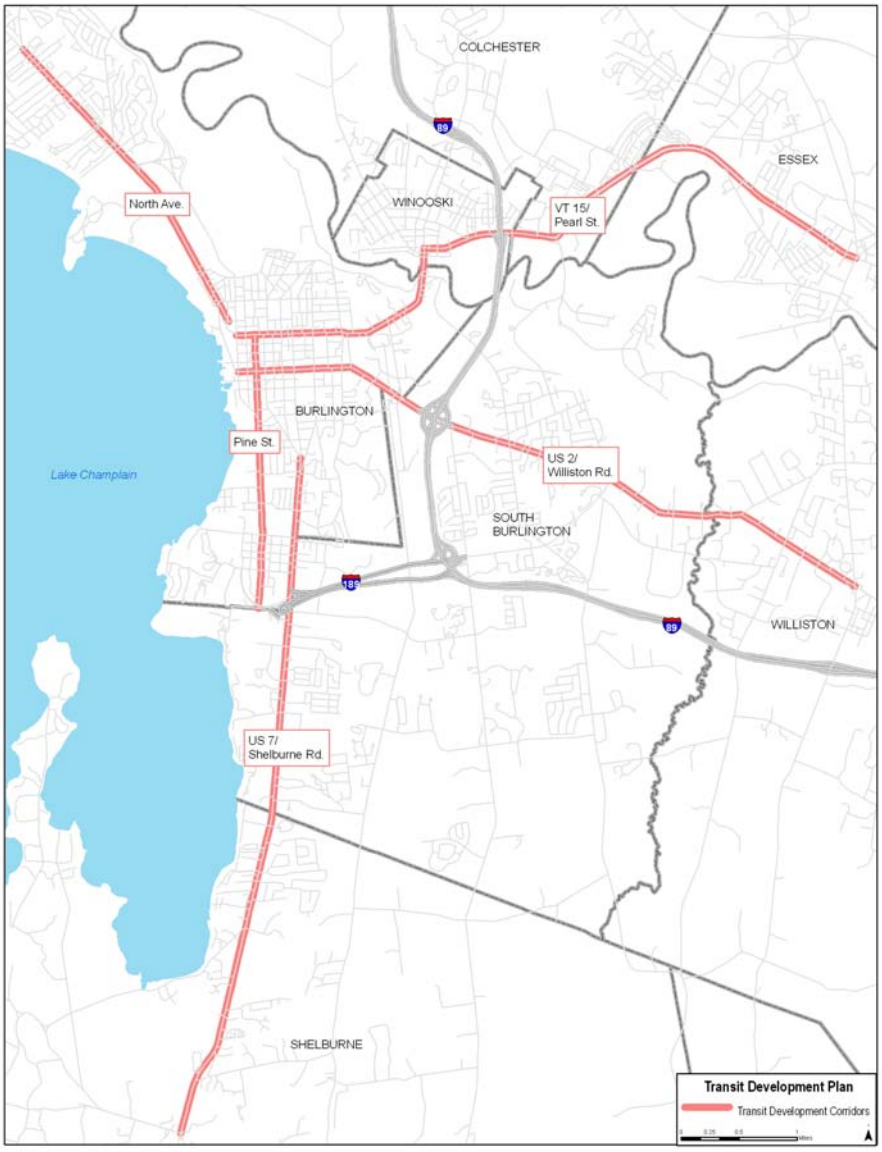
In such an environment, public transportation has a much greater chance of attracting choice riders. There would be many more origins and destinations within easy walking distance of a bus route, and the actual walk between those locations and the bus stop would be much more pleasant and safe. Pedestrians and public transportation riders would be treated as "first-class" users of public space, rather than as an afterthought. Accommodations for bicyclists also are an essential feature of TOD and POD, as the slowing down of traffic and the reduction of public space devoted to automobiles allows for greater space devoted to all modes of non-motorized transportation.

Car-sharing arrangements are also supported by TOD/POD. When many trips can be accomplished on foot, by bike, or by transit, the need to own an automobile is greatly reduced. There are, of course, some types of trips for which is it necessary or much more convenient to have an auto available. Shared cars, offered by organizations such as Carshare Vermont, can fulfill this need and allow many people to avoid the large expense of owning a car. Carshare Vermont started operations in 2009 and currently (Spring 2010) has a fleet of nine cars and one pick-up truck.

The maps in Chapter 3 indicate that a significant amount of development already exists on some important roadway corridors. To make best use of CCTA resources and promote future improvements in service on these corridors, and thus attract more choice riders, future development and enhancements of the pedestrian environment should be focused here. These corridors include the following (see Map 1):

- North Avenue in Burlington
- US 7 from Burlington to Shelburne Village
- US 2 from Burlington to Tafts Corners in Williston
- VT 15 from Burlington to Essex Junction
- Pine Street in Burlington.

Map 1 TOD/POD Focus Corridors



These focus corridors are the same ones that were designated as “priority corridors” in the Burlington Transportation Plan and are grouped as the “trunk” corridors in the recommendations section in Chapter 6. As indicated in Chapter 4, investments in enhanced service in these corridors—especially for improved frequency during peak commuting hours—is likely to be the most cost-effective investment CCTA can make in terms of increased ridership. As service and ridership builds in these corridors, CCTA can begin to take incremental steps toward bus rapid transit (BRT), level 14 in the service hierarchy presented at the end of Chapter 4.

In addition to a high level of service, BRT includes a range of physical investments that can make transit more attractive to choice riders and actually reduce operating costs by allowing for faster and more efficient bus operations. Roadway-related investments include exclusive bus lanes, queue jumpers at intersections, and transit signal priority. While transit demand is likely to be insufficient to justify exclusive lanes in the foreseeable future (especially given the constrained right of way in many corridors), moving buses more quickly through congested intersections can lead to substantial reductions in running time. Queue jumpers—short exclusive bus lanes approaching an intersection—can allow buses to bypass the worst congestion and save several minutes. Transit signal priority throughout a corridor can help to ensure that buses spend as little time as possible waiting at red lights.

BRT-style investments can also improve the passengers’ experience. Enhanced passenger shelters improve passenger comfort and mitigate the negative aspects of waiting for a bus. Even more important is real-time bus arrival information so that passengers know how long it will be until the next bus arrives. GPS units on the buses, communicating with a central computer, can generate accurate estimates of arrival times, which can then be disseminated via the Internet, text messages, and electronic signs at bus stops. One of the main factors that drives away choice riders is the uncertainty about when the bus will arrive and the anxiety that they will be stranded in an unsafe and uncomfortable location. Better knowledge of where the bus is and where it is going can overcome this anxiety.

In addition to the immediate benefits of comfort and knowledge, capital investments in public transportation, particularly those that are obvious to the public, send a message that service is not going to be abandoned and that transit riders are worthy of the same investments made in other modes of transportation. Bus transportation has usually been considered the “cheap” mode of transit (compared to rail) and thus has been historically shortchanged in terms of capital investment. This has led to many people thinking that bus transportation is only for poor people or those who cannot drive. Visible capital facilities, new and attractive buses, and technology can overcome this perception and lead to increased ridership.

Beyond the trunk corridors of the CCTA system, village and town centers should be the focus of development and of enhancement of the pedestrian environment. The terminal point of a bus route is often one of its largest sources of ridership. To the extent that a town or village center offers mixed-use development and a pedestrian-friendly environment, a bus route serving that

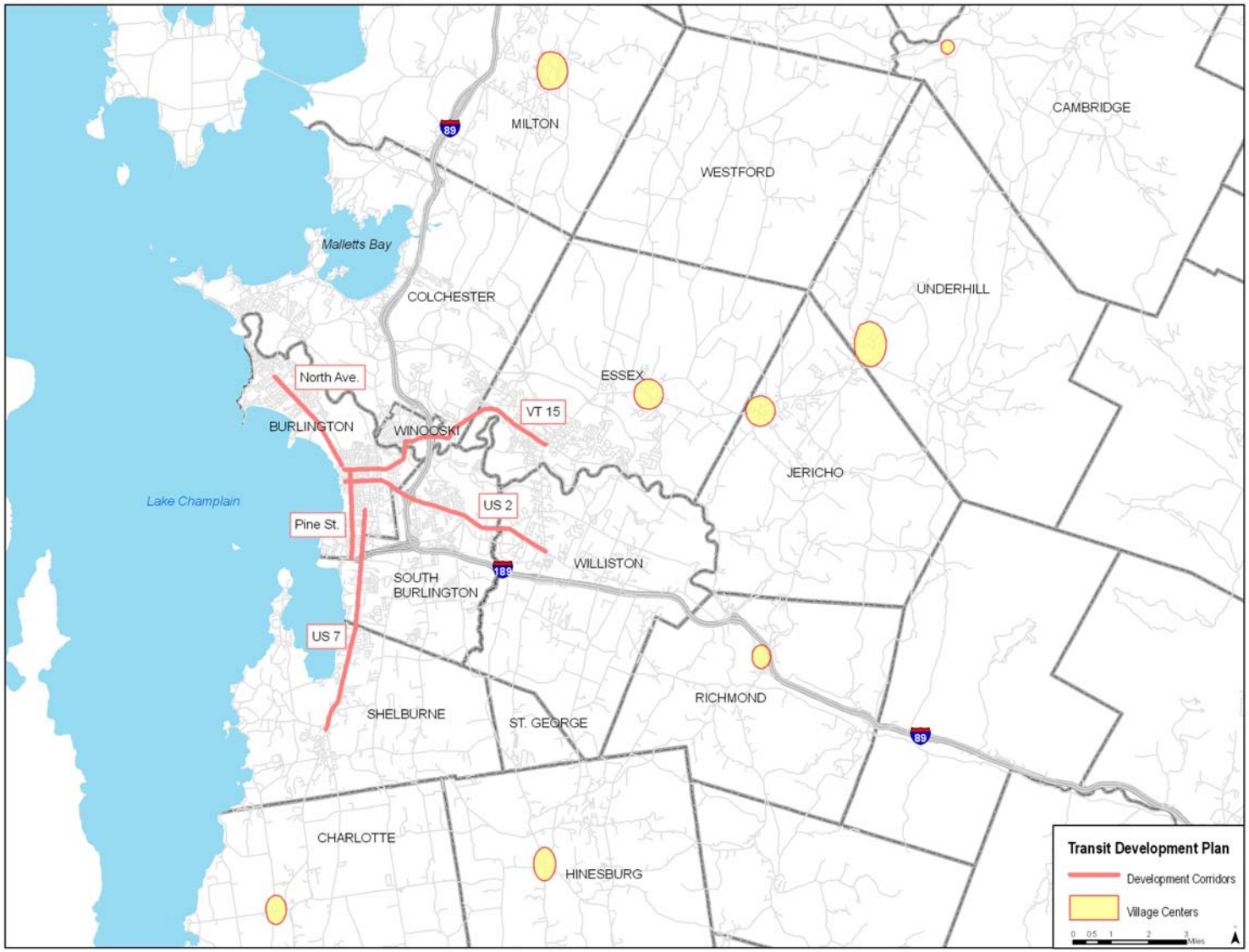
location will be more successful. The following town and village centers outside of the regional core are the best candidates for such focused efforts (see Map 2):

- Hinesburg
- Essex Center
- Milton
- Jericho/Underhill/Cambridge (village centers along VT 15 corridor)
- Richmond
- Charlotte

It is important to note that CCTA fully supports focused development in town and village centers along existing transit corridors closer to the regional core (as shown in Map 1).

A cooperative effort of CCTA, member municipalities, the state of Vermont, CCMPO, CCRPC, and the development community is needed to reshape the area into a form that is more conducive to efficient and sustainable transportation. Organizations such as AARP and other non-profits that have been promoting these concepts should also be involved. To the extent that the member municipalities can achieve TOD/POD in these corridors, their current and future investments in land development and public transportation become much more effective and valuable.

Map 2 TOD/POD Town and Village Centers



Chapter 6

Proposed Investments

The purpose of the Transit Development Plan is to identify a series of service, facility, and technology investments to guide CCTA's growth over the coming years. The following pages present the types of services that could potentially be implemented in Chittenden County and its surrounding counties in response to the unmet transit needs and the system vision identified earlier in the plan. It is recognized that this document proposes an ambitious vision for transit in the region, and that implementation is dependent on the availability of federal, state, and local funding. Nonetheless, it is important to set forth an outline of the steps needed to achieve it. This section does not include detailed service plans for improved services; these will be developed by the CCTA planners as funds/resources become available for implementation.

Service Strategies

Service strategies are grouped into the following categories and subcategories:

1. Commuter Routes
    - Inter-regional Routes
    - Regional Routes

2. Regional Trunk Routes

3. Community Connectors
    - Local Fixed-Route Community Connectors
    - Parking and Special Purpose Shuttles
    - Fixed-Route Deviation or Demand-Responsive Connector Services in Feeder Zones
    - Demand-Responsive Connector Services for Americans with Disabilities Act (ADA) Eligible Persons in Fixed-Route
    - County-Wide Demand-Responsive General Public Service in Rural Areas

4. Other Specialized CCTA Services
    - Senior Shuttles
    - Neighborhood Specials
    - Elders and Persons with Disabilities Program

COMMUTER ROUTES
INTER-REGIONAL
(Figure 1)

Service Statistics

Span:	Monday through Friday Peak commute hours	Frequency: Vehicle:	4-6 round trips each weekday Suburban coach

Primary Market

Daily long-distance commuters between adjoining counties and the core of Chittenden County

Service Concept

- Express services with limited stops from outlying communities into Burlington
- Would serve park and ride lots along the routes
- Since the services would serve persons outside the county, they would be implemented at the request of local communities in surrounding counties or at the request of the CCTA Board to meet the transportation needs of member municipalities.

Implemented LINK Express Routes

- St. Albans (link to GMTA-Franklin)
- Montpelier (link to GMTA)
- Middlebury (link to ACTR)

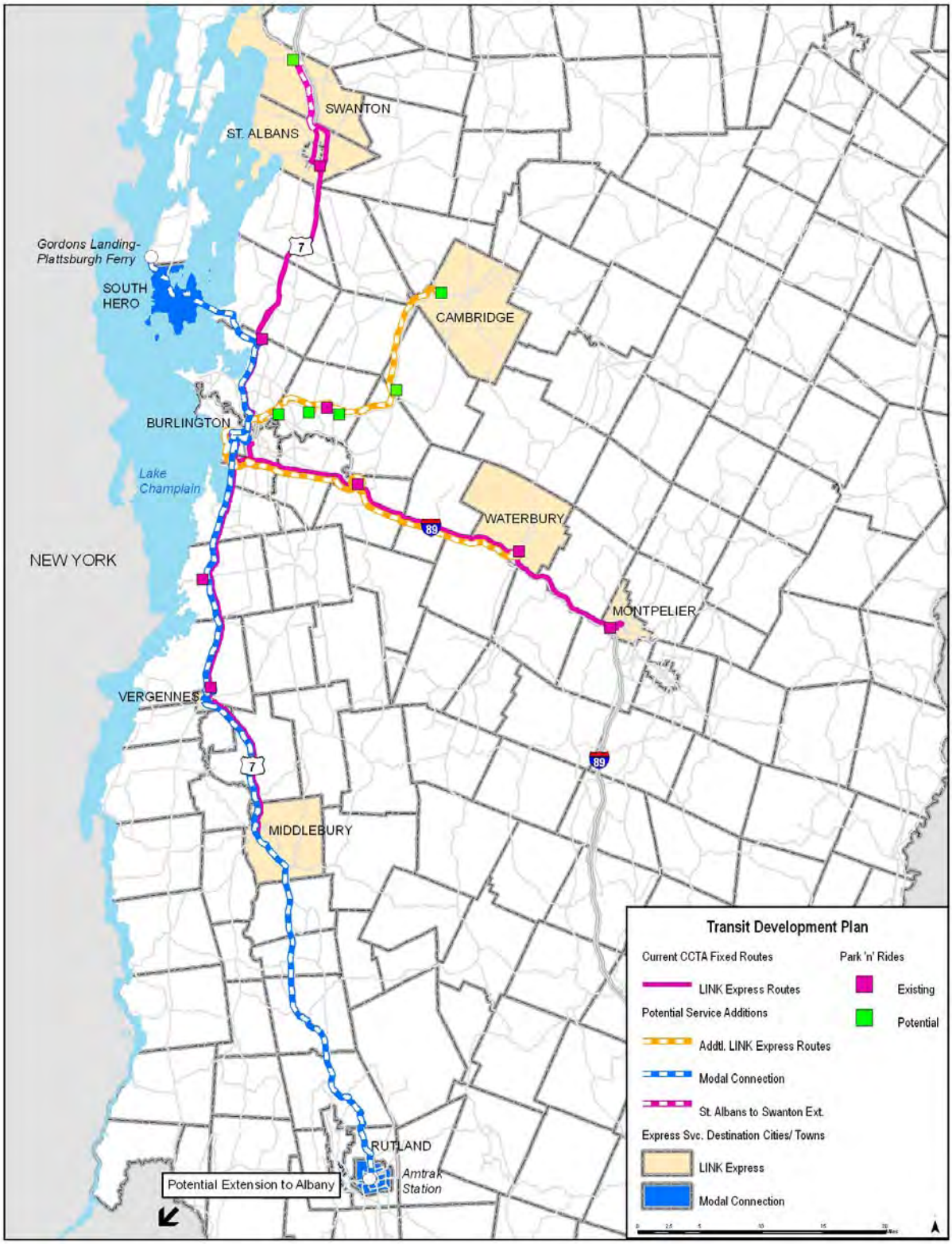
Potential Additional LINK Express Routes

- Cambridge (via VT 15) to Essex and Burlington (also serves Underhill and Jericho)
- Waterbury to Burlington (note, as of Feb 2009, CCTA operates one morning round trip on the Montpelier LINK as a short-turn trip to Waterbury)
- Extension of St. Albans LINK to northern Franklin County

Potential Intermodal Connection Routes

- Grand Isle to Burlington, to connect with Gordons Landing-Plattsburgh Ferry
- Rutland to Burlington, to connect with Amtrak's Ethan Allen Express (EAE), using over-the-road coaches (assumes continued operation of EAE). Possible extension of this route to Albany or Bennington via US 7 (if EAE is discontinued).

Figure 1 Interregional Services



COMMUTER ROUTES
REGIONAL ROUTES
(Figure 2)

Service Statistics

Span:	Monday through Friday Peak commute hours	Frequency:	4-6 round trips each weekday
		Vehicle:	Smaller vehicles initially, such as 25-30 ft buses. Could use larger buses as demand grows

Primary Market

Daily commuters between middle and outer ring towns and the core of Chittenden County

Service Concept

- Services with more limited stops than local routes and service terminating in Burlington
- Would serve park and ride lots along the routes
- End of the routes could be served by community connectors (see below)

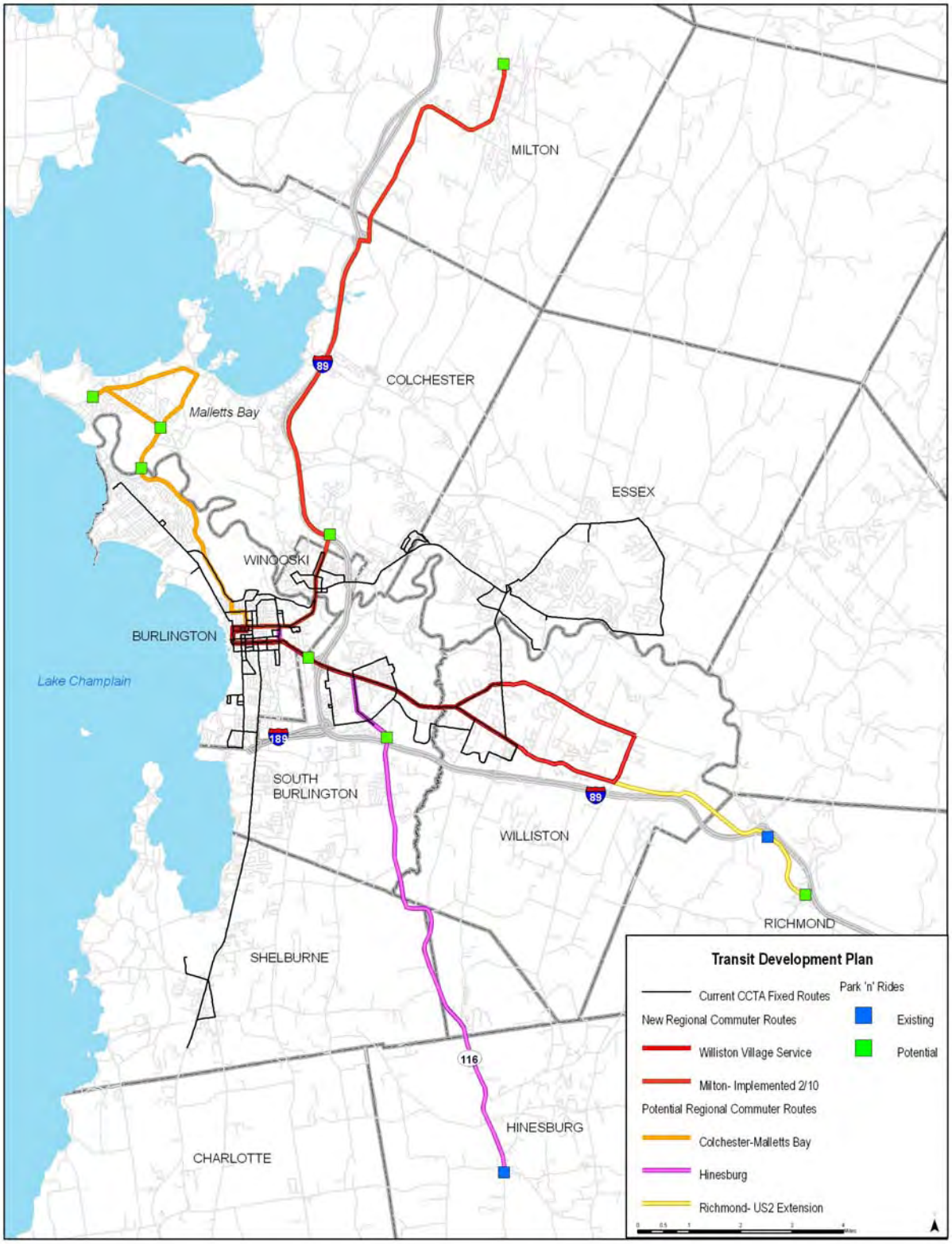
Implemented Regional Route

- Milton to Burlington

Potential Connections

- Colchester - Malletts Bay to Burlington
- Hinesburg to Burlington
- Richmond to Burlington (extension of Williston Village US 2 service)

Figure 2 Regional Commuter Routes



REGIONAL TRUNK ROUTES
(Figure 3)

Service Statistics

Span:	Monday through Sunday All day	Frequency: Vehicle:	10-60 minute headways Standard-sized buses

Primary Market

Commuters and other travelers on main arterial corridors in the core of Chittenden County

Service Concept

- Connect high density areas to downtown and the Hill
- Improve existing line haul services including the North Avenue, Essex, US 2/Williston, Pine Street and South End/Shelburne routes
- Potential locations for future Bus Rapid Transit and/or transit priority investments

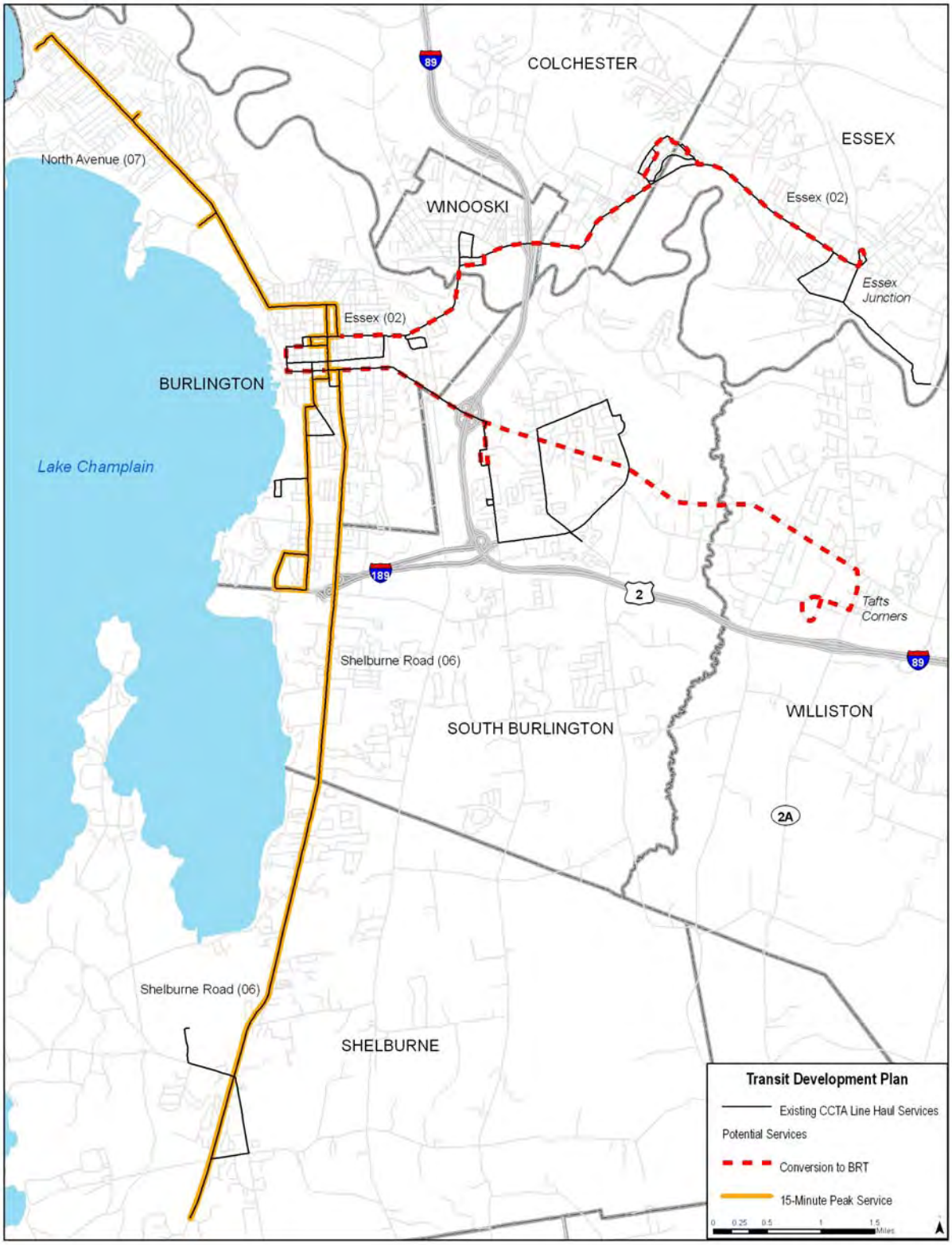
Implemented Service Improvements

- 15-minute peak period service on the Essex Junction route
- US 2 service from Tafts Corners and Williston Village (selected trips only) to Burlington with 15-minute peak hour service. This route diverts from US 2 only at Dorset Street to reach University Mall. (June 2010)

Proposed Service Upgrades

- North Ave corridor, including 15-minute peak service and new Sunday service
- Pine Street corridor, including 15-minute peak service and new Sunday service
- Shelburne Road corridor, including 15-minute peak service and new Sunday service
- Incremental upgrade of US 2 to bus rapid transit, including better frequency, enhanced passenger facilities, and roadway priority treatments.
- Incremental upgrade of VT 15 service to bus rapid transit, including better frequency, enhanced passenger facilities, and roadway priority treatments.
- Future upgrade of all trunk routes
    - 10-minute peak service
    - 15-minute midday service
    - 30-minute evening service
    - 15-minute peak service on Saturday (12:00 p.m. to 5:00 p.m.)
    - 30-minute service for Saturday base and Sunday peak
    - 60-minute service on Sunday base
- Future extension of service to midnight on weekdays and until 2:00 a.m. for Burlington routes on Friday and Saturday.
- Future extension of Sunday service until 10:00 p.m.
- Begin service at 5:00 a.m. on weekdays and 6:00 a.m. on weekends

Figure 3 Regional Trunk Routes



COMMUNITY CONNECTORS
LOCAL FIXED ROUTES
(Figure 4)

Service Statistics

Span:	Monday through Sunday All day	Frequency: Vehicle:	15-60 minute headways Medium to standard buses

Primary Market

Non-work travel in Burlington and surrounding cities and towns

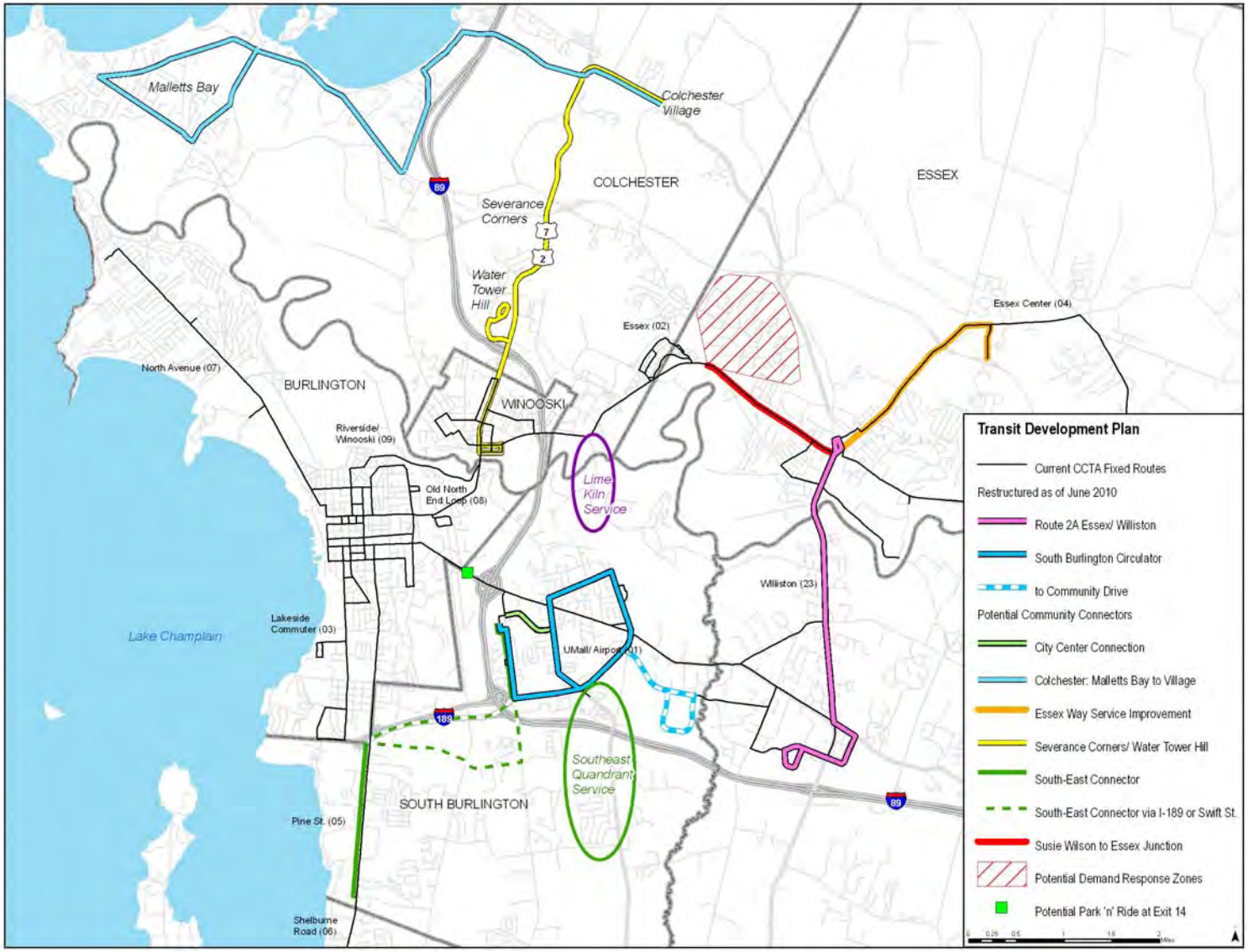
Service Concept

- Serves high density areas within or close to the urban core
- Existing local fixed route services include the Riverside/Winooski, Essex Center, City Loop and South Burlington Circulator routes

Potential New Community Connector Services

- Extension of coverage to South Burlington's Southeast Quadrant
- Extension of service to Lime Kiln Road in South Burlington
- Inclusion of future South Burlington City Center in local service
- New connection between southern and eastern sections of South Burlington via I-189 or Swift St and Dorset St
- New connections to Colchester via US2/7 to Water Tower Hill, Severance Corners, and Colchester Village
- New connection in Colchester from Malletts Bay to Village
- Improve service to Essex Way to support development
- New connection to Essex Junction route from Susie Wilson and surrounding areas.
- Future upgrade of all community connector routes
    - 15-minute peak service
    - 20-minute midday service
    - 30-minute evening service
    - 20-minute peak service on Saturday (12:00 p.m. to 5:00 p.m.)
    - 30-minute service for Saturday base and Sunday peak
    - 60-minute service on Sunday base
- Future extension of service to midnight on weekdays and until 2:00 a.m. for Burlington routes on Friday and Saturday.
- Future extension of Sunday service until 10:00 p.m.
- Begin service at 5:00 a.m. on weekdays and 6:00 a.m. on weekends

Figure 4 Local Fixed Routes



COMMUNITY CONNECTORS
PARKING AND SPECIAL PURPOSE SHUTTLES
(Figure 5)

Service Statistics

Span:	Monday through Friday	Frequency:	10-15 minute headways
	All day	Vehicle:	Small to mid-sized buses

Primary Market

Commuters to the Hill institutions and airport travelers

Service Concept

- Connects satellite and intercept parking lots with downtown
- Existing parking and special purpose shuttles include PARC Shuttle and the College Street Shuttle
- Potential in future to establish additional parking lots; especially around the campus and other Hill locations. In addition to downtown, shuttle services could be provided directly to the Hill

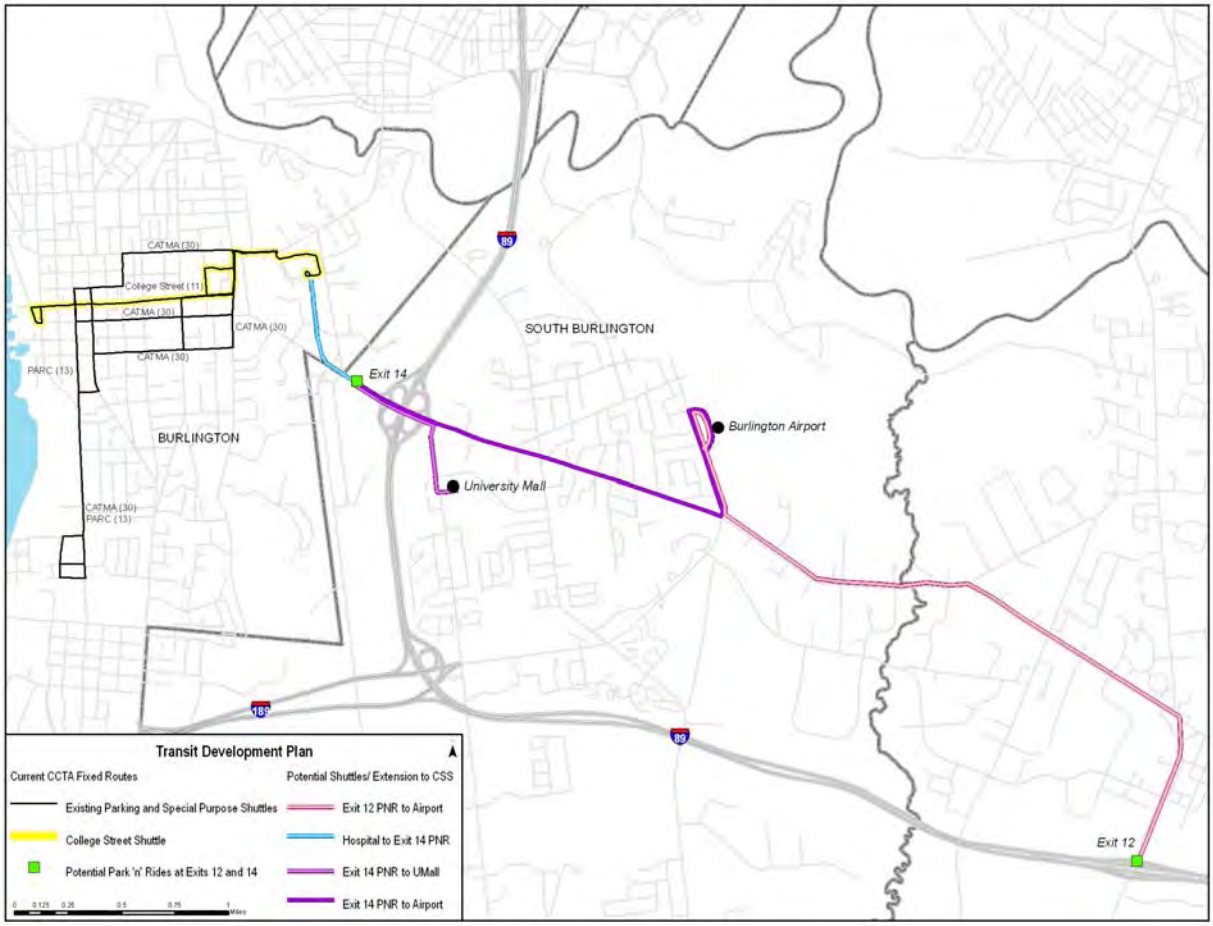
Potential New Parking Shuttle Services

- New intercept lot at Exit 14 to FAHC and downtown (possibly as extension of College Street Shuttle)
- New intercept lot at Exit 14 to airport
- New intercept lot at Exit 12 to airport
- New intercept lot at Exit 16 to FAHC/downtown (not shown on map, as it would be served by Severance Corners route in Figure 4)
- FAHC to University Mall (possibly as extension of College Street Shuttle)

Critical Issues

- Would need to work with the City, State, and/or local communities to establish new park and ride lots
- Extension of College Street Shuttle into South Burlington may have impacts on fare policy and funding by cities of Burlington and South Burlington.

Figure 5 Parking and Special Purpose Shuttles



COMMUNITY CONNECTORS
FEEDERS TO TRUNK LINES AND COMMUTER ROUTES
(Figure 6)

Service Statistics

Span:	Monday through Friday Peak Hours to Commuter Routes All Day to Trunk Lines	Frequency:	Demand-Responsive or 15-30 minute headways on Route Deviations
		Vehicle:	Small Buses

Primary Market

Commuters without convenient walk access to existing Commuter and Trunk routes

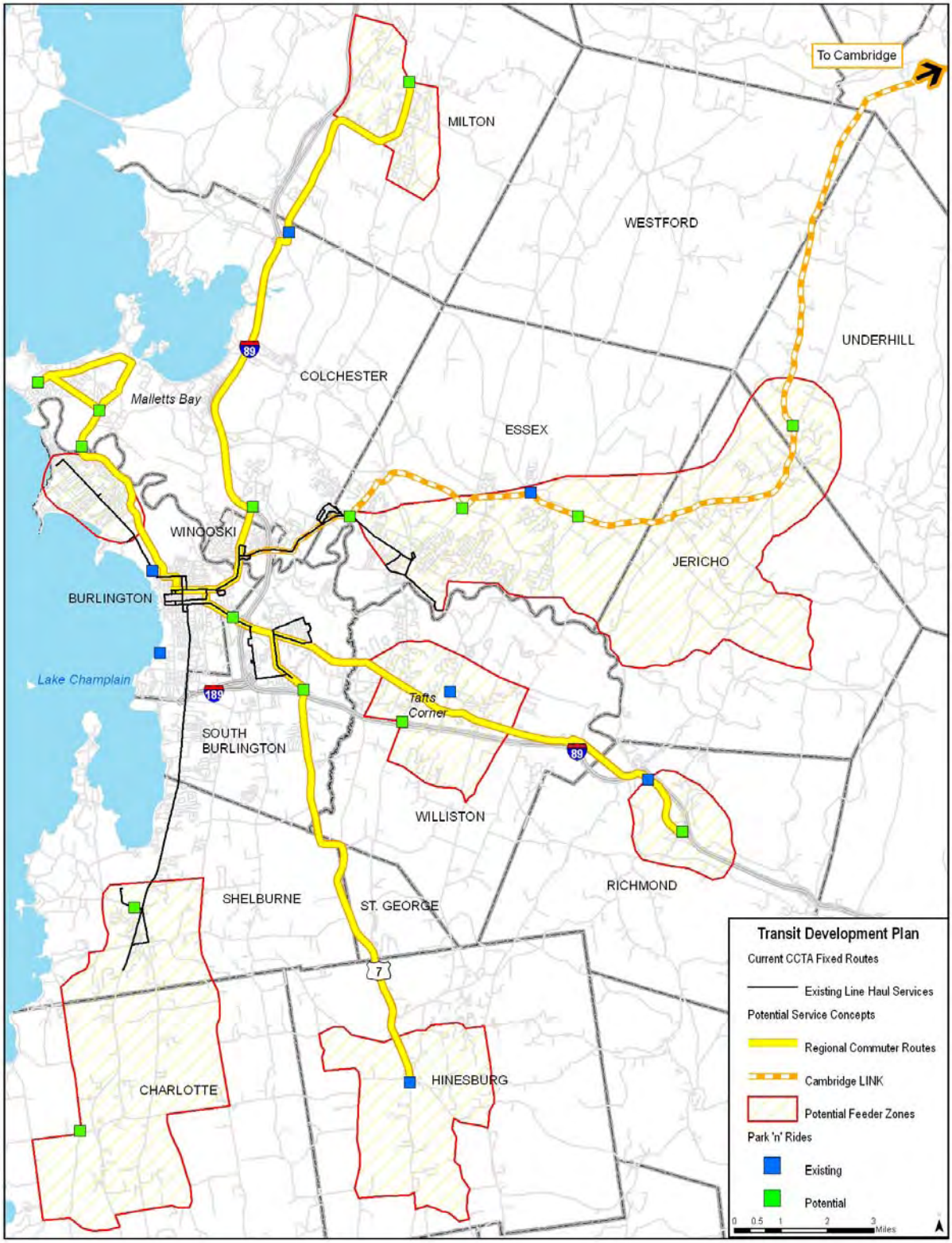
Service Concept

- Demand-responsive or route deviation service in zones around ends of commuter routes and trunk lines
- Serve village and town centers that have mixed-use development and a pedestrian friendly environment (see last section of Chapter 3)
- Buses doing commuter runs to Burlington could circulate in zones for 30 minutes prior to start of run if reverse commuting is minimal or unlikely
- Alternatively, area could be served with one small vehicle to connect with commuter route
- Feeder service would operate in peak hours to the commuter routes (when they are operated) and all day to the trunk or line haul routes

Potential Zones

- Feeder services to line haul services:
  - Shelburne/Charlotte
  - Essex
  - US 2/Williston
  - New North End
- Feeder service in zones around regional commuter routes:
  - Milton
  - Jericho/Underhill
  - Richmond
  - Hinesburg

Figure 6 Feeder Services



COMMUNITY CONNECTORS
ADA COMPLEMENTARY PARATRANSIT SERVICES
(Figure 7)

Service Statistics

Span:	Monday through Sunday Mirror Hours and Days of Non-Commuter Fixed-Route Services	Frequency:	Demand-Responsive
		Vehicle:	Small Buses, and sedans

Primary Market

People with disabilities who are eligible for ADA complementary paratransit service

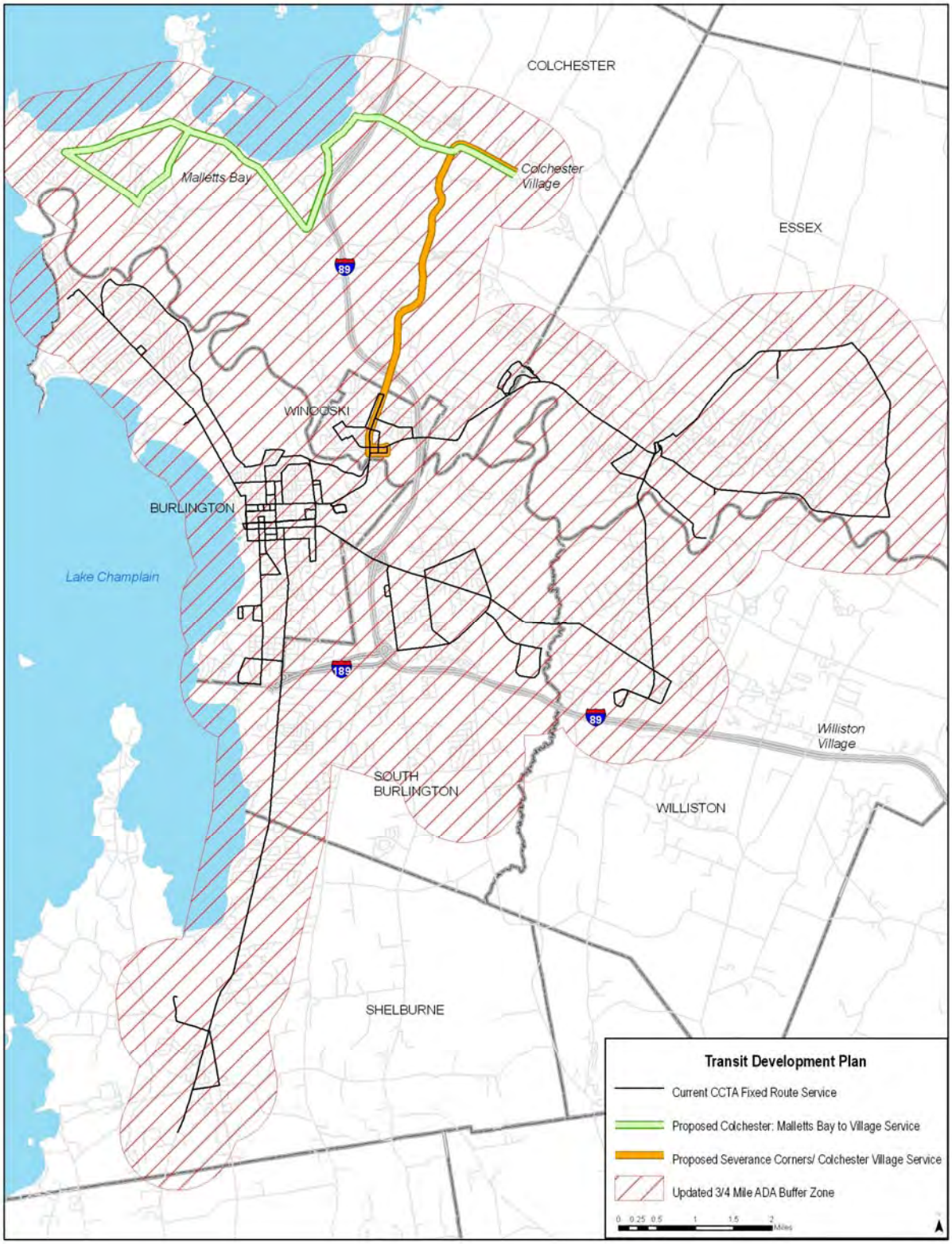
Service Concept

- Demand-responsive paratransit services for persons who are unable to used the fixed-route services and are eligible for the service under ADA rules
- Service area covers ¾ mile either side of the fixed routes – although commuter routes and route deviation services are exempt
- Service characteristics also mirror fixed routes in terms of time of day, day of week
- Requests for trips must be taken until close of business the day before
- There can be no capacity constraints or pattern of trip denials
- Currently this service is contracted to SSTA

Potential New Service Areas

- With the implementation of new or extended fixed routes, the ADA complementary paratransit service area will have to be expanded. Commuter routes are exempt from ADA service requirements.
- Alternatively, CCTA could serve persons with disabilities by allowing routes (particularly in outlying areas) to deviate
- Figure 7 presents the ¾ mile service area that would be created if all potential service improvements described in this plan were implemented

Figure 7 Future ADA Complementary Paratransit



COMMUNITY CONNECTORS
RURAL GENERAL PUBLIC DEMAND-RESPONSE

Service Statistics

Span:	Monday through Saturday	Frequency:	Demand-Responsive
		Vehicle:	Small Buses or Vans

Primary Market

Seniors, people with disabilities and anyone who is unable to drive in the rural areas of Chittenden County

Service Concept

- Demand-responsive paratransit services for persons who live outside the fixed-route service area – the more rural areas of the County
- County would be divided into three sectors and each sector would receive two days of service per week (e.g. Sector 1 served Monday and Thursday, Sector 2 served Tuesday and Friday, and Sector 3 served Wednesday and Saturday)
- Users request service in advance – could require longer advance reservation time compared to ADA
- Provides services for basic mobility to shopping, medical, social activities – probably not suitable for most work trips
- Volunteer driver programs, coordinated through SSTA, could provide some of this service.

Potential Service Areas

- Would cover unserved areas – as fixed-route CCTA services expand, residents in newly served areas would use the fixed-route services and the demand-responsive service could be decreased.
- Efforts made to complement rather than supplant existing human service transportation; should be coordinated with S.5310 program and existing human service transportation

OTHER SPECIALIZED SERVICES

Service Concepts – CCTA would continue the following specialized services

- **Senior Shuttles -** CCTA will continue to operate several specialized services to provide shopping opportunities for seniors and the general public.

- **School Trippers –** CCTA will continue to operate extra service in the City of Burlington during the morning and mid-afternoon periods to meet student ridership demand. They operate on school days only, and are open to the general public.

- **Medicaid -** SSTA is the Medicaid broker for all of Chittenden County (including those areas outside the CCTA service area). For Medicaid clients able to take the fixed routes, CCTA provides passes, and for those unable to use the fixed routes, SSTA uses volunteers, taxi operators, and its own vehicles.

- **Elders and Persons with Disabilities (E&D)** –This program funds demand response and volunteer driver trips for various purposes including medical trips, shopping trips, trips to meal sites, trips to adult day centers, and vocational trips. The total pool of funding is divided among thirteen agencies and communities, each of which decides how to spend the money with respect to the types of trips served and limits on the number of trips per month for any individual client. The overall goal of the program is to try to meet essential mobility needs for seniors and people with disabilities.

Vehicles

CCTA has established a vehicle replacement plan. All present and planned vehicles are ADA-accessible. Until recently, the CCTA fleet consisted exclusively of 29-40 foot standard transit buses and the ADA paratransit vehicles operated by SSTA. New 41-foot suburban coaches were acquired to operate the LINK Express routes. CCTA has also acquired sedans for use in ADA complementary paratransit (to be operated by SSTA). These sedans serve trips that had been handled by taxicabs in the past.

Additional expansion vehicles will be required as new services are implemented. The size and configuration of new vehicles purchased will be tailored to the services. Smaller vehicles would be more appropriate for demand-responsive services or lower density areas with lower peak loads. Larger or more comfortable over-the-road coaches may be more appropriate for long distance express commuter services.

All new vehicles purchased will employ clean engine technology to reduce harmful emissions. CCTA will also seek to acquire fuel-efficient and low-emissions buses. CCTA would like to begin operating hybrid buses which provide greater fuel economy and reduced greenhouse-gas emissions.

As CCTA grows and as its existing support vehicles and equipment age, CCTA will have to continue to program expansion and replacement equipment and parts into its annual capital budget.

Facilities

From the perspective of the passenger, the single most important facility in the CCTA system is the Downtown Transit Center (DTC). The current Cherry Street transfer station will be replaced by a new facility over the next few years. It will feature indoor, climate-controlled waiting areas; enhanced customer information and signage, including real-time bus arrival and departure information; comfortable seating; restrooms; and perhaps concessions. With nearly a quarter of CCTA's weekday boardings occurring at the DTC, a first-class facility will make a huge difference in the public perception of CCTA and make the system more attractive to choice riders. A transportation center in the South End of Burlington is also being considered as part of the city's transportation infrastructure plan. This transportation center is envisioned as a replacement for the current Gilbane surface parking area used by the PARC Shuttle and several commuter routes and privately-operated shuttles.

Outside of Burlington, there are several locations that could benefit from enhanced passenger facilities. These could be considered transit satellite stations surrounding the DTC and supporting the service along the transit corridors outlined in chapter 3. The satellite stations would be at locations where two or more routes come together and would include large shelters with lights, bike racks, real-time passenger information (in the future), and two bus berths to

allow for easy transfers. As a prerequisite to building these facilities, CCTA would obtain a long-term lease or license to operate from the landowner. The locations for these satellite stations include the following:

- Taft Corners/Maple Tree Place
- University Mall or South Burlington City Center (when developed)
- Essex Junction
- Winooski (Champlain Mill)
- US 7 at Burlington/South Burlington line (Price Chopper/Shaws or Lowes/Hannaford)

CCTA also has a bus shelter expansion and replacement program, a bus stop bench program and a bus stop signage update program that need to continue and grow in order to meet the needs of current riders and make transit more attractive to new riders. In addition to shelters and benches, in some instances, covered walkways linking parking or major employers and trip generators to transit corridors should be used to offer more pleasant, safe, and comfortable pedestrian connections to bus stops. Such walkways allow bus routes to stay on main corridors rather than diverting to these generators, saving on operating expenses and minimizing travel time for through passengers. Also, as new services in outlying areas are implemented, transfer points at these remote areas must also be designed to enhance rider convenience, including informational signing, shelters, seating, lighting, and other amenities. Village centers identified in Chapter 3 would feature large shelters with amenities as part of the effort to enhance the pedestrian environment.

CCTA's current operations and maintenance facility at 15 Industrial Parkway is in very good condition and was recently expanded to allow for indoor parking of more buses, but still requires parking of some transit vehicles outside and has little room for additional drivers to park their own vehicles. Indoor storage helps extend the life of transit vehicles and also makes them easier to start. As service expands, CCTA should explore and create additional indoor bus parking and additional car parking at or adjacent to this facility. CCTA should continue to maintain and update internal systems (such as, but not limited to, communications, maintenance equipment, and HVAC) at this facility as necessary. CCTA should also develop its facility to accommodate additional staff as necessary to support growth in operational departments.

Satellite garage facilities in Middlebury and St. Albans that are large enough to store 41-foot LINK buses indoors would improve operating efficiency. Currently, all LINK buses on the Middlebury and St. Albans routes operate out of Burlington. This reduces CCTA's ability to offer convenient departure times to passengers while also maximizing operational efficiency (limiting non-revenue mileage). For the Montpelier LINK, in contrast, CCTA is able to garage a LINK bus at GMTA's Berlin facility, enabling more convenient and efficient scheduling.

Intelligent Transportation Systems (ITS)

CCTA has been investigating technology enhancements to improve efficiency, convenience and customer service. An electronic information board has been installed at the Cherry Street transit center, and new scheduling software has been installed to increase the efficiency of driver scheduling. A clear short-term priority is to provide real-time bus arrival information to passengers, and CCTA is in the process of researching systems that could provide such information. In July 2010, the CCTA Board of Commissioners voted to move forward with funding and implementing a real time passenger information system and in August 2010, the Board approved developing and issuing an RFP to select a vendor for the project.

CCTA is considering the following ITS systems for implementation in the short term:

- Computer Aided Dispatch (CAD) software/hardware linked to the driver scheduling software,
- Advanced Vehicle Location (AVL) software/hardware linked to CAD
- Predictive capacity added to AVL with on-time performance reporting
- Real-time arrival data displayed at the current Cherry Street Sign System
- Real-time arrival info available via telephone and cell phone
- Real-time arrival info linked to web based traveler information system
- Real-time arrival info linked to interactive voice system
- Real-time arrival info linked to electronic signs at top ten ridership stops/stations
- Paratransit scheduling software to improve efficiency and productivity of demand response transportation

In the longer term, additional ITS investments are being considered. These would include an upgrade of the fare payment system to include smart cards and automated vending machines, wi-fi service on all buses (beginning with the LINK Express routes), wi-fi service at major transfer points, and an expansion of the number of locations where real-time electronic bus arrival signs would be installed. The AVL system planned for buses would be extended to paratransit vehicles in the future to provide better passenger information and improve the efficiency of operations.

Cost Effectiveness

Being a 10-year guidance document rather than a short-term implementation plan, this TDP does not contain detailed ridership and cost estimates on a recommendation-by-recommendation basis. Rather, this section provides an overview of the cost-effectiveness of various types of strategies. This is not intended to set priorities for one type of investment over another, since CCTA will likely need to pursue various types of projects and improvements simultaneously. Ultimately, short-term implementation decisions are made based on identified needs, funding, and local political support.

In a mature system, like CCTA's, the best markets for transit are those that already have service. In terms of strict cost-effectiveness—that is, the net cost per new rider—investing resources in areas with the highest density and greatest mobility needs is likely to produce the best returns in terms of ridership and revenue. As was seen in Chapter 3, these areas already have service, though the service level provided is, for the most part, mediocre.

The experience with the February 2008 service increase on the Essex Junction route, moving from 30-minute to 15-minute peak headways and then realizing a 30% jump in ridership, suggests that improving the frequency of service is likely to be the most cost-effective investment in new service that CCTA can make. As listed earlier in this chapter, the primary corridors for this type of investment are North Ave, Shelburne Road (US 7), and Pine Street. These three priority corridors will complement the 15-minute peak service in place on VT 15 and US 2.

After frequency improvements, expanding the hours of service on CCTA routes is likely to be the next most cost-effective investment. This is reflected in the survey responses among current riders who requested later hours on weekdays, service on Sundays, and more service on Saturdays. This type of service expansion is likely to attract additional trips from current riders and new trips from their friends and neighbors for whom the current service is not convenient.

New routes to previously unserved areas can sometimes be the most visible changes to a bus system. Depending on the service level, route structure, character of the area served, and park & ride access, such a new route can provide access to substantial numbers of people. These new riders on new routes may translate into additional ridership gains on existing routes as people make transfers to move throughout the urban core or take additional transit trips during the day to run errands. However, it is unlikely in a mature system that this newly served area will produce more riders per unit of service than more established services. Thus, in terms of strict cost effectiveness, new routes are likely to rate somewhat lower than improvements to existing services. Increased regional access to the transit system is, nonetheless, an important goal for CCTA, and promotes overall growth in the system.

In summary, better frequencies, spans of service, and days of service offered in the existing core service area will bring the greatest ridership gains for the least cost, due to the residential and commercial density in this area, while expansion to outer areas can help expand the future market for public transportation.

Alignment with Mission

Similar to the table provided in Chapter 1, Table 6-1 on the next page shows how the reommended service, facility and technology projects included in this chapter help fulfill the eight elements of CCTA's mission. The definitions/interpretations of these mission elements are as follows:

Definition of Elements

Safety	Security of passengers on-board and waiting for transit vehicles, and offering safe transportation options for travelers (e.g. late night service)
Convenience	Greater flexibility of travel times due to span increases, reduced waiting time due to more frequent service, and reduced travel time due to more direct service, plus greater reliability. Also easier fare payment (UA).
Accessibility	Geographic service expansion to increase access for more people, plus ADA-related improvements in vehicles and shelters (plus surrounding areas). Also widening the audience through UA program.
Innovation	Use of technology and new programs to improve reliability and efficiency and increase ridership.
Sustainability	Projects that promote public transit use among more populations and choice riders and that have a greater impact on the environment.
Congestion/ Pollution Reduction	Projects that are directly targeted at commuters in major congested corridors and that reduce emissions from CCTA vehicles.
Encouraging TOD/POD	Supportive of higher-density development and a lifestyle less dependent on automobile use. Includes capital investments and service increases to a level that makes transit an attractive option.
Enhanced Quality of Life	Various types of improvements which raise transit service to an attractive level, mitigate negative impacts of bus operations, and encourage a sustainable transportation system

Table 6-1: Comparison of Proposed Projects to Mission

Proposed Investments (for illustrative purposes)	Safety	Convenience	Accessibility	Innovation	Sustainability	Congestion/ Pollution Reduction	Encouraging TOD/POD	Enhanced Quality of Life
Cambridge LINK			*		*	*		
Waterbury LINK			*		*	*		
Swanton extension			*		*	*		
Grand Isle Intermodal			*		*	*		
Rutland Intermodal			*		*	*		
Colchester Commuter			*		*	*		
Hinesburg Commuter			*		*	*		
Richmond extension via US 2			*		*	*		
Trunk corridor 15-minute peak service		*			*	*	*	*
Trunk corridor Sunday service		*			*		*	*
BRT enhancements on US 2 and VT 15		*		*	*		*	*
Further frequency upgrade of trunk routes		*			*		*	*
Service span extension on trunk routes	*	*			*			*
South Burlington Southeast Quadrant			*					
South Burlington Lime Kiln Rd			*		*		*	
South Burlington City Center			*		*		*	*

Proposed Investments (for illustrative purposes)	Safety	Convenience	Accessibility	Innovation	Sustainability	Congestion/ Pollution Reduction	Encouraging TOD/POD	Enhanced Quality of Life
South-to-East Link via Swift or I-89		*						*
Winooski to Colchester Village			*					*
Malletts Bay to Colchester Village			*					*
Upgrade service to Essex Way		*					*	*
Susie Wilson to Essex Junction	*		*					
Frequency upgrade of all local routes		*			*			
Service span extension on local routes	*	*			*			*
Parking shuttle exit 14 to FAHC and downtown		*			*	*		
Parking shuttle exit 14 to airport		*			*	*		
Parking shuttle exit 12 to airport		*			*	*		
Shuttle connection FAHC to UMall		*			*			
Feeder services to line haul routes			*		*			*
Feeder services to regional commuters			*		*			*

Proposed Investments (for illustrative purposes)	Safety	Convenience	Accessibility	Innovation	Sustainability	Congestion/ Pollution Reduction	Encouraging TOD/POD	Enhanced Quality of Life
Expansion of ADA complementary service	*		*					*
Rural general purpose demand response			*					*
Other specialized services			*					*
Fleet replacement and expansion	*		*		*	*		*
Downtown Transit Center	*	*		*	*		*	*
CCTA Maintenance facility expansion				*				
Satellite station enhancement	*	*	*				*	*
Shelters and walkways	*	*					*	*
AVL/CAD		*		*				
Real-time information		*		*				*
Other ITS	*	*		*				*

Chapter 7

Costs and Funding

There are few, if any, recommendations in this Transit Development Plan that can move forward to implementation without additional funding. This chapter attempts to estimate the costs associated with operating the CCTA system in the future. The costs for individual route recommendations are not provided here, as these would be calculated in the process of detailed implementation planning.

Table 7-1 below presents an analysis of future system costs and ridership. The table assumes that funding and costs will increase 5% annually through 2015, and then 4% annually through 2020.

Three levels of expenditure are shown in the table for 2020 system costs. All of these are net of fare revenue, which is assumed at 23% of operating cost. The first column represents the cost to operate the system as it exists at the end of FY2010 (including the restructured US 2 and Williston service). The second column represents the cost to operate present routes, but at a higher level of service. This "build-out" level of service assumes the following:

- Regular line-haul routes will operate seven days per week, with 16 hours of service on weekdays (6:00 a.m. to 10:00 p.m.) and 15-minute headways during peak periods and 30-minute headways during the rest of the day.
- Weekday service as operated in FY2010 on these routes will be operated on Saturdays
- Saturday service as operated in FY2010 on these routes will be operated on Sundays
- The three LINK Express routes will operate 8 round-trips per day
- Special-purpose routes will continue to operate as they do today

Finally, the third column represents the cost to operate the full expanded system as presented in the TDP. This includes the build-out of existing services and all of the new bus routes. Net costs for ADA complementary paratransit are also included, under the assumption that demand for ADA trips will grow in proportion to fixed route ridership and the amount of service operated.

Future ridership is also shown on the table. Estimates for FY11-FY13 are based on an average growth rate of 3.9% per year—exclusive of major service increases or new routes—that CCTA has experienced since FY2001.

Table 7-1 Forecast of System Costs and Ridership

	Maintain Current System		Build-out of System		Expanded System	
Year	Net Cost	Riders	Net Cost	Riders	Net Cost	Riders
FY2011	$ 8,510,000	2,596,000				
FY2012	$ 8,936,000	2,698,000				
FY2013	$ 9,383,000	2,804,000				
FY2020 Steady State	$ 12,586,000	3,670,000	$ 18,533,000	5,321,000	$31,000,000	8,698,000
FY2020 Optimistic	$ 12,586,000	9,175,000	$ 18,533,000	13,505,000	$31,000,000	21,505,000

Notes:

1. Federal funding and costs are assumed to increase 5% annually through 2015 and 4% annually from 2016 to 2020.
2. All costs shown are net of fare revenue, assumed to remain constant at 23% of costs.
3. "Maintain Current System" is operation of the system as it exists in June 2010; "Build-out" represents a higher level of service on existing routes; "Expanded" means full implementation of all TDP recommendations.
4. Net cost of ADA complementary paratransit is included in estimates, assuming that demand for ADA trips grows in proportion to fixed route service.
5. Ridership on the current system is projected to grow at 3.9% annually, based on the experience of ridership change since 2001, excluding new routes and major service increases.
6. The "steady state" scenario assumes no major changes in transportation prices or land use policy. The "optimistic" scenario assumes that gasoline will retail for $10 per gallon in 2020 (more than triple the current price), that there will be an increase in parking fees of $5 per day at all locations that are within CCTA's service area, and that land use decisions are made to focus new development in transit priority corridors, and that the new development is designed in a way consistent with TOD/POD principles. See below for more discussion of this scenario.

Impact on Transit Mode Share

Table 7-1 demonstrates that significant monetary investments will need to be made just to maintain the current system, not to mention implementing recommendations of the TDP. By 2020, the cost to operate the current system will have increased by 50%. The "build-out" system cost will be more than double the 2010 system cost, and the "expanded" system will require a four-fold increase in funding.

While future ridership (as shown in Table 7-1) is an important figure, the statistic most relevant to measuring whether CCTA is achieving its mission is perhaps the percentage of trips in the region that is made on public transportation, also known as the transit mode share. In a growing economy, transit ridership may be increasing, but the transit mode share may actually be

dropping if overall travel is increasing at a faster pace. On the other hand, if transit mode share is increasing, then it is clear that the region is moving toward a more sustainable transportation system with less reliance on the private automobile.

There is no way to measure directly the transit mode share at any point in time, but it can be estimated using various data sources and assumptions. In 2000, the transit mode share was estimated to be 1.4% of all trips made within the six core communities of Chittenden County (Burlington, Essex, Shelburne, South Burlington, Williston, and Winooski).[1] By 2010, it is estimated that the transit mode share has increased to 2.4% based on the growth of CCTA ridership compared to overall traffic growth (calculated from VTrans and MPO traffic counts at nearly 130 locations in Chittenden County).[2]

Several factors will affect future transit mode share:

- **Transit service provided** – As CCTA increases its level of service and expands the system, more riders will be attracted.
- **Costs of automobile travel** – The two most obvious components of the cost of car use are the price of gasoline and the price of parking. To the extent that these rise relative to the cost of transit use (the fare), transit will become a more attractive option.
- **Land use and urban design** – Infill development and redevelopment according to TOD/POD principles (discussed in Chapter 5) will increase the market for public transportation.

It is important to note the rising automobile-related costs and TOD/POD will also promote the use of non-motorized travel modes. The mode share of bicycle and pedestrian transportation are not estimated here, but these would likely rise at least as fast as the mode share for public transportation.

There are two ways to consider the potential future transit mode share in the core of Chittenden County. Based on the experience of the past decade, we can extrapolate from the growth in mode share to calculate a year 2020 transit mode share. This extrapolation assumes that trends that occurred between 2000 and 2010 will continue at the same pace. These trends include the

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[1] This figure is in line with data from the 2000 Census, which shows a transit worktrip mode share of 1.87% for these communities. The overall transit mode share would be expected to be below the worktrip mode share since transit vehicles tend to carry a preponderance of commuters.

[2] The method for calculating the transit mode share for all trips and worktrips is documented in a memorandum dated September 10, 2009. It involves using traffic count data, CCTA ridership data, and mode share estimates from the CCMPO regional model and the US Census Journey-to-Work data to create an index that can allow the mode share to be updated annually based on available traffic counts and ridership data.

expansion of CCTA service, investments in CCTA capital facilities, increases in the price of gasoline (which rose from about $1.60 per gallon in 2000 to about $2.80 in 2010), and increased residential and commercial development within transit-served areas. Using this assumption, the future transit mode share in 2020 would be about 4.2%.

Within the context of the TDP, it makes sense to consider the potential impacts of the recommended services and facilities. While the "extended trend" forecast assumes that much of the TDP would be implemented, we can explicitly forecast the impacts of the "build-out" and "expanded" scenarios described above. Because external factors, such as gasoline prices and development trends, play an important role in determining mode share, we need to make assumptions about those as well.

For the purpose of this calculation, the TDP will make "optimistic" assumptions about future prices and policy decisions, at least with respect to transit's competitive position to the private automobile. Thus, it is assumed that gasoline will retail for $10 per gallon in 2020 (more than triple the current price).[3] It is also assumed that there will be an increase in parking fees of $5 per day at all locations that are within CCTA's service area. These two factors will make traveling by automobile much more expensive. Finally, it is assumed that land use decisions are made to focus new development in transit priority corridors, and that the new development is designed in a way consistent with TOD/POD principles.

Using a long-term cross price elasticity of 0.4 (from *Transit Price Elasticities and Cross-Elasticities*, by Todd Litman, VTPI, 2007), and CCTA's experience with ridership at the Shelburne Road at Farrell Street stop, where a significant residential development was built over the past few years, the following figures were calculated for potential future transit mode shares (see Table 7-1 for corresponding cost and ridership figures):

- Under the "build-out" scenario with all of the "optimistic" policy and pricing assumptions, the 2020 transit mode share for the core of Chittenden County is forecast at 8.9%, more than double the "extended trend" forecast and nearly quadruple the current mode share. This 370% increase in mode share can be compared to 230% increase in net cost to operate the build-out scenario in 2020.

- Under the "expanded" scenario with the same assumptions, the 2020 transit mode share is forecast at 14.2%, more than triple the "extended trend" forecast and nearly six times the current mode share. This 590% increase in mode share can be compared to a 380% increase in net cost to operate the expanded scenario in 2020.

[3] Between October 2006 and July 2008, the price of gasoline nearly doubled. The price of gasoline in 2020 is, of course, unknowable at this time, but a major price increase is not impossible. The purpose of the $10 assumption is to choose a price that is at the upper bound of expectations to see what the impacts would be.

Funding

CCTA has achieved system growth since the 2002 SRPTP, but it has been limited by the available funding and there is general consensus within the community that the amount of service offered today is not meeting the transportation needs of the community. Perhaps the most severe constraint on system growth has been the inability of member municipalities to substantially increase their contributions toward CCTA operations. Local and state contributions are needed to match the federal funding that is used to pay for service. However, local government's primary source of funding is property taxes, and that revenue source faces both severe limits on how much can be collected and tremendous demands for its use.

The Chittenden County MPO and its partners have studied this question for many years. Six separate documents have been published since 1998 that have considered this subject, analyzed the options available, and made recommendations. These documents are summarized below.

Funding Alternatives Report, 1998.

This report was an outgrowth of the CCMPO's 1997 Long Range Transportation Plan, which called for the development of alternatives to the local property tax for funding public transportation. The report begins by noting that funding public transportation by a revenue source other than the local property tax had already been "an issue of local and regional concern for many years." After some background on CCTA funding and the local share, the report provides a survey of funding mechanisms from around the country. These include transportation user fees and non-user feeds as well as broad-based taxes and allocations from the general fund. The specific funding sources include the following:

- Gasoline tax
- Sales tax
- Auto registration fees
- Auto purchase and use tax
- Toll revenue
- General Fund allocations
- Driver license fees
- Gambling/Lottery revenues
- Payroll tax
- Cigarette tax
- Mortgage recording fee
- Car/truck rental fees
- Alcohol tax
- Property tax
- Transit finance district
- Student transportation fees
- Transportation impact fees
- Transit advertising revenue
- Leasing of transit assets
- Leasing transit services
- Increase fares

The advantages and disadvantages of all of these strategies are described briefly in the report. It then proceeds to summarize a study of transit funding conducted by the State of Ohio in 1995

and develop a set of criteria for evaluating potential funding options, based on research by Ohio and Maryland. These criteria are shown in the following table:

CRITERION	DESCRIPTION
Produces sufficient and stable yields	Revenue generation will be sufficient to cover projected costs without resorting to other financing methods.
Public Acceptability	The alternative is shown to maximize public support and minimize opposition.
Political Feasibility	The relative ease at which the option can be legislatively approved; The level of acceptance of local elected officials.
Administrative simplicity	The ease and cost effectiveness of administering the alternative.
Equity	A demonstration that the alternative reflects peoples' ability to pay and does not unfairly burden lower income or fixed income citizens.
Flexibility	The alternative allows for investment across transportation modes and facilities.

From the long list of potential revenue sources shown above, the report then focused on five options and applied these criteria to each of them.

- **Increase the gas tax** – Adding one cent to the gas tax in Chittenden County would generate some $600,000 (in 1998), but is considered to be politically challenging at best and raises equity issues.

- **Regional sales tax** – Adding one percent to the sales tax in Chittenden County (raising it from 5% to 6% at that time) would generate more than $12 million, but it faces the same political and equity issues as the gas tax and it would face more competition from other public needs since it is further removed from transportation.

- **Auto/truck rental fees** – A 5% increase in rental fees would raise $400,000 to $650,000 in Chittenden County and is considered more politically feasible since much of the burden would fall on non-residents.

- **Student transportation fees** – Imposing a $30 per semester fee on college students in Chittenden County would raise $1 million, but it would also entail significant service changes to accommodate increased student demand. Note that since the report was written, CCTA has worked with local institutions to create the Unlimited Access program.

- **CCTA revenue enhancement initiatives** – These initiatives mainly involve increased advertising revenue.

After applying the criteria, the report concludes that the final three options should be the starting point for further explanation, but that the gas tax and the sales tax should not be taken off the table. The evaluation matrix from the report is shown below:

	CRITERIA					
ALTERNATIVES	Produces sufficient and stable yields	Public acceptability	Political feasibility	Administrative simplicity	Equity	Flexibility
Gas Tax	✓					✓
Regional Sales Tax	✓					✓
Auto/Truck Rental Fees		✓	✓		✓	✓
Student Transportation Fees	✓	✓	✓	✓		
CCTA Revenue Enhancement Initiatives		✓	✓	✓	✓	

Operational Analysis, System Plan, and Funding Alternatives for CCTA, 1999.

This report, prepared for CCMPO by a consultant, functioned as a miniature transit development plan, discussing existing services, performance, governance, needs, service concepts, and costs. The final section addresses the local funding issue. The report cites the 1998 Funding Study discussed above and estimates the amount of new funding that would be needed to implement the service increases recommended in the plan.

The primary recommendation made in this study is to increase the amount of state operating assistance that is provided to CCTA, as well as other transit agencies in Vermont. A portion of the state's Transportation Fund should be earmarked for public transportation. If necessary, the gas tax should be increased statewide to help fund public transportation. The report notes that state support of CCTA (15% of operations at the time) is well below that of peer agencies in the northeast, which averaged 47%.

The report briefly mentions other funding options such as local sales taxes, local fuel taxes, local registration fees or local short-term vehicle rental fees, but essentially dismisses them as they would all require legislative action to permit a local option tax.

Chittenden County Transit Funding Report, 2002.

In 2001, the Vermont legislature commissioned a report on financing transit services in Chittenden County; a consultant completed this report in December 2002. According to the report, "the General Assembly recognized that public transit operations in Chittenden County are an integral component of a balanced intermodal transportation system. Further, it was recognized that the current practice of funding local contributions for transit operations through the local property tax, presently utilized to its maximum, is not a viable long-term source of revenue."

The report actually had three separate goals:

(1) Alternative, sustainable, regional revenue sources to replace the local property tax to support operating expenses for public transportation.

(2) Improving the institutional relationships between public transportation providers in the region, which may include a proposal to integrate organizations or services, or both.

(3) An intermodal public transportation system in the region that optimally serves the needs of the public at large, including human service agencies, economic development, commuters, tourists, and other visitors to the state.

After discussion of a regional, intermodal system, the report began its analysis of funding options. Drawing from the 1998 Funding Alternatives Report, this study identified the following criteria for a new funding source:

- Make sense from a regional perspective
  - able to be collected on regional basis
  - not negatively affect the region's economy relative to rest of state (no border problems)
- Be able to produce the needed targeted local share for bus and paratransit – and be stable
- Be within the "taxing capacity" or tax levels of other states in New England
- Have public and political acceptability
- Be equitable to communities and taxpayers
- Be flexible as transit needs change.
- Ideally, be tied to the use of the automobile within the region.

The study then went on to discuss five options, though not the same five that were in the 1998 report.

- **Local dedicated sales tax** – Adding one percent to the sales tax in Chittenden County (raising it from 5% to 6% at that time). Advantages include sufficient revenue generation,

limited boundary issues, and ease of collection. Disadvantages include a disconnect from transportation and competition with other public needs such as education.

- **Sales tax on gas/motor fuels tax** – This tax was suggested as a percentage tax of the sales price, rather than a number of cents per gallon. Advantages include sufficient revenue generation, limited boundary issues, more local political support than a general sales tax, and a direct tie to automobile use. The only disadvantage identified was that a new mechanism for collection would be required and that money would pass through the state.

- **Regional short-term vehicle rental tax** – A 5% increase in the tax on car and truck rentals was estimated to raise about $500,000 in Chittenden County. Advantages include ease of collection, no border problems, and greater political feasibility since much of the burden would fall on non-residents. Disadvantages include a lack of sufficient revenue, no direct tie to transportation use by county residents, and the fact that these rental fees had already been increased recently.

- **Annual vehicle registration fee** – Imposing a $5 annual fee on top of the state fee would raise about $650,000. Advantages include ease of collection and a direct tie to automobile use by county residents. The main disadvantage is that it generates insufficient revenue unless the fee is raised by such an amount as to make it politically infeasible.

- **Driver license fee** – Imposing a $5 annual fee on top of the state fee would raise about $630,000. Advantages include ease of collection and a direct tie to automobile use by county residents. Similar to registration fees, the main disadvantage is that it generates insufficient revenue unless the fee is raised by such an amount as to make it politically infeasible. Also, license fees had recently been raised.

The report concludes that a sales tax on motor fuels is the best option since it "has the advantage of generating enough revenue, being linked to transportation, being easier to collect than the gas tax on a regional basis, and increasing when gas prices go up (gas tax revenues generally decline as gas prices increase due to a reduction in sales)." A combination of two or three of the fee increases could also achieve the goal of replacing local property taxes as a source of funding, but none of these would be sufficient on its own.

Report of the Public Transportation Task Force to the CCMPO Board, 2004

Following the completion of the CCTA Short Range Transit Plan and the legislative study summarized above, the CCMPO convened a task force in April 2003 to move the recommendations in these documents to implementation. The task force conducted its work in 2004, with subcommittees devoted to funding and governance, and a series of community

meetings to solicit input from selectboards and other organizations. More than 50 meetings were held to gather initial ideas and then later to review and comment on task force recommendations.

Unfortunately, other than agreement that public transportation should not be financed by local property taxes, there was no consensus on an alternative funding source. For every supporter of a particular option, there was also a strong opponent of that option.

The task force created draft legislation that could be used to establish a regional public transportation district and give it authority to levy regional taxes. Seven types of taxes were identified:

a) A five percent sales tax on motor vehicle fuel
b) Short term rental car tax
c) Vehicle registration tax
d) Driver's license fee
e) Vehicle excise tax
f) Purchase and use tax
g) Personal property tax on cars

The draft legislation also included a section on impact fees for public transportation, by which developers would contribute to fund that would support public transportation when new housing or commercial development occurs.

Ultimately, the task force recommended that another working group be established that would "help shape a policy plan that would limit the percentage of local property taxes required for match on certain routes."

CCMPO Policy Statement on Public Transportation, 2005.

In December 2005, the CCMPO Board issued a policy statement on the financing of public transportation.

> **Legislative action is needed to free CCTA from its funding constraints in order to meet the current and growing needs for public transportation service in Chittenden County.** This can be achieved by either:
>
> - Alternative methods to raise revenue locally/regionally and/or,
> - By additional state funding of public transportation.

This policy statement reflects the conclusions of prior studies. All of these studies have considered various options, but have not settled on one particular option, though a sales tax on motor fuels was the preferred option in the 2002 legislative report. The alternative of increasing state funding was the conclusion of the 1999 plan.

CCMPO Blue Ribbon Commission on Innovative Finance, 2008.

In 2008, the CCMPO Board convened a five-member "Blue Ribbon Commission" (BRC) to "provide recommendations…regarding innovative finance strategies to advance the region's transportation needs, including all modes…" Public transportation was just one of several topics addressed by the BRC. The Commission formed a working group on funding options which ultimately issued one recommendation:

> A sustainable source of additional funding should be developed for regional transportation needs.

In conjunction with other recommendations regarding the formation of a Regional Transportation District, state law would be changed to allow a regional tax or user fee to be levied to fund projects in the Metropolitan Transportation Plan, and to support public transit. The BRC recommended that two dedicated funding sources be identified: one for public tranportation and one for infrastructure development.

No specific type of tax or fee was identified, but the final report of the BRC did include a matrix that evaluated 17 types of funding sources. The sources were measured against six criteria including:

- Revenue adequacy/yield
- Stability/predictability
- Equity
- Ease of implementation
- Multimodal feasibility
- Relationship to economic efficiency

The results of this evaluation are shown on the next page in Table 6-2.

Other Regional and Local Funding Issues

Status of Colchester

The Town of Colchester currently receives transit service in the area of the town along Route 15 between Essex and Winooski, which is served by the Essex Junction route. The Essex Junction route connects three CCTA member municipalities, Burlington, Winooski, and Essex, and must travel through Colchester due to the configuration of Route 15, not because CCTA chooses to do so. Recognizing that they would receive service in this area whether or not the Town is a member of CCTA, Colchester elected not to join CCTA and has foregone the annual CCTA member assessment for over 30 years.

Table 6-2 Evaluation Matrix from Blue Ribbon Commission Report

Potential Funding Source	Revenue Adequacy / Yield	Stability / Predictability	Equity	Ease of Implement-ation	Multimodal Feasibility	Relationship to Economic Efficiency	Est. Annual Chit. Cty. Revenue (2008)	Assumptions/Calculation	State (S) or Regional (R) Implement-ation	Currently Authorized?
Gasoline Excise (per gallon) Tax	p	p	t	x	t	p	~$1 million	1¢/gallon	S	State level only
Diesel Excise Tax	p	p	t	x	t	p	< $0.5 million	1¢/gallon	S	State level only
Indexed Gasoline Excise Tax	t	t	p	x	t	p	~ $1 million +	1¢/gallon + CPI	S	No
Motor Fuel Sales Tax	t	p	p	x	t	p	~$3 million	1% on gas sales	S	No
Value Added Tax	x	t	t	t	t	p	Mid	Varies with industries covered	S/R	No
Registration Fee	x	t	t	x	p	t	$1-2 million	$5-$10 per year on each reg vehicle	S/R	State level only
Personal Property Tax on Vehicles	x	x	t	t	t	t	$9-10 million	$5,000/vehicle x 1% tax	S/R	No
Vehicle Sales Tax	t	t	x	x	t	p	$2-4 million	1% - 2% on each vehicle sold in CC	S/R	State level only
Tolling New Lanes / Facilities	x	t	x	p	p	x	Low-Mid	Minimal new highway lanes	S/R	No
VMT Fees	x	t	t	p	p	x	Mid-High	Significant VMT in CC	S/R	No
Local Option Sales Tax	x	x	t	x	x	p	$10-20 million	1% on retail sales in CC	R	Yes w/restrictions
Impact Fees	t	t	x	x	t	t	Mid-High	Regionalized fees > municipal fees	R	Yes w/restrictions
Innovative Financing - Debt	x	x	t	p	x	t	Mid-High	Regionalized debt capacity > mun capacities	S/R	Yes w/restrictions
Public-Private Partnerships	x	t	x	p	t	x	Low-Mid	Few CC projects approp for PPPs	S/R	Yes w/restrictions
Payroll Tax	x	x	t	t	x	p	$10-41 million	.25%-1% of total annual CC wages	S/R	No
Business Energy Tax Credit	t	t	x	t	x	x	Low-Mid	35% tax credit on eligible private spending	S	No
Special Assessment Districts	x	x	x	t	x	x	Mid-High	Similar to successful BID initiatives	R	?

KEY: x Excellent t Fair p Poor

The section of Colchester served by transit is dominated by large non-profit institutions, including Fanny Allen, Camp Johnson, and Saint Michael's College, as well as Fort Ethan Allen which includes a large amount of UVM student housing. From the Town's perspective, they do not receive a great deal of tax revenue from the institutions along Route 15, but those institutions generate the majority of transit demand for the transit service in this specific corridor. One option would be for Colchester to approach the institutions for initial payments to cover the cost of transit service along the Route 15 corridor.

Impacts on CMAQ Funding

New services in the CCTA service area are typically funded through a Congestion Mitigation/Air Quality (CMAQ) grant. These grants are three-year demonstration grants that provide 80% federal funding and require a 20% local match. During the three-year demonstration period, CCTA is responsible for the 20% local match and VTrans (using Federal Transit Administration money) provides the 80% federal funds. At the conclusion of the three-year demonstration period, VTrans has historically picked up the 80% cost of the route if the route has proven to be successful, and CCTA remains responsible for the 20% local match. This places a burden on VTrans to identify a source of the 80% funding.

If a regional funding source was available to CCTA, the burden on VTrans after the three-year demonstration period ends could be significantly reduced. For example after the conclusion of the three year demonstration project, VTrans share might be reduced to 40% of net cost rather than the current 80%. Additionally, CCTA would have a funding source that would be appropriate to support the 20% share of regional and inter-regional services, which might make more sense than attempting to create coalitions among very small municipalities along corridors. It may also avoid the regional equivalent of the Colchester syndrome (service without payment).

Another important consideration with regard to CMAQ funding is the possibility that Vermont will fall out of attainment of air quality standards as defined in the Clean Air Act. Currently in Vermont, the transportation sector contributes 44% of all greenhouse gas emissions. As long as all parts of Vermont are "in attainment," as they currently are, the State has full discretion on how to allocate its CMAQ grant from the federal government. Thus, a portion of CMAQ is used for paving and other projects not directly related to congestion mitigation or air quality. If a portion of Vermont was no longer in attainment of standards (most likely Chittenden County where the heaviest traffic volumes are), the State would be forced to spend all of the money in the non-attainment area on projects that would help the area get back into attainment. Rather than risk falling into non-attainment, investments in public transportation now, using CMAQ and other funding, as a hedge against non-attainment, will both enhance the sustainability of the transportation system in Chittenden County and preserve the freedom to use CMAQ funds statewide for the best available and most needed projects.

MPO Programming Discretion

Given the congestion, air quality, energy, and urban land use concerns in Chittenden County, there is a greater need for a more robust transit system than in other parts of the state. The market for transit service in Chittenden County is also significantly different due to its population and employment densities and traffic volumes. Therefore, productivity of transit service in Chittenden County is much higher than in other markets in Vermont. While Chittenden County does enjoy more transit service than elsewhere in Vermont and while VTrans has been awarding new service grants for our region, there are significant unmet local desires and need for more public transportation services, especially commuter services within the county.

The CCMPO develops a Transportation Improvement Plan (TIP) annually. The TIP is intended to program federal transportation projects for funding in our region. However, the CCMPO does not have complete autonomy on the transportation projects for which it plans and programs funding because VTrans has veto power over the TIP. This lack of autonomy dampens the service planning in the county and limits the region's ability to achieve its goals. The MPO's lack of autonomy over project programming and funding and the absence of non-property tax based operating funds are two of the larger impediments to transit growth within the county.

If the CCMPO were able to program a portion of its annual funding without approval via the capital program and the budget, more transit services as envisioned within this document would likely be implemented. At the least, the decisions pertaining to road capacity growth or transit improvements would be made in the area that is most affected by those decisions.

Benefits of Public Transportation

The discussion of costs and benefits of public transportation usually focus on the financial costs of operation, the number of riders, fare revenue and other easily calculated values. The impacts of transit, however, go well beyond these types of figures. Several sections of this TDP have highlighted the role of public transportation in the economic vitality and future sustainability of Chittenden County. The mobility afforded to all residents and workers is also a critical benefit offered by CCTA. While these types of benefits are difficult to quantify, it is possible to place some numbers on the environmental benefits of public transportation.

In FY2009, the LINK Express commuter routes operated by CCTA carried over 117,000 passengers. With an average trip length of roughly 30 miles, this bus ridership represents over 3.5 million miles not driven in cars. These saved miles translate into 193,545 pounds of carbon monoxide, and 2,815,200 pounds of carbon dioxide not being emitted. Carbon monoxide is a poisonous gas that is one of the main air pollutants controlled by the Clean Air Act, and carbon dioxide is the primary gas causing global climate change. Of course, the buses that CCTA

operates create emissions of these gases as well, but for the LINK routes, the net savings in carbon dioxide is over 1.2 million pounds. (Diesel engines emit very little carbon monoxide.)

Conclusion

It has been clear for many years that the current funding mechanism for public transportation is insufficient to support the expanded transit system that most Chittenden County residents believe is needed. Through expanded use of federal funds and diligent work at the local level to increase local contributions and membership, CCTA has managed to pursue its mission to the extent possible. However, the ambitious agenda in this TDP is impossible without a significant change in the funding structure. The imperatives of supporting economic vitality, reducing traffic congestion, improving air quality, mitigating the severity of climate change, and enhancing mobility for all citizens argue strongly for a much more robust public transportation system.

At the federal level, the imminent reauthorization of surface transportation funding for the next 5-6 years offers a major opportunity. SAFETEA-LU, the most recent federal law to provide transportation funding, lasted through FFY 2009, but was extended. It is not clear when Congress will pass a new reauthorization law, but there is a significant amount of work and lobbying going on.

At the state and regional level, it is clear that the recognition of the unsustainability of the current funding structure must be converted into action. There is no means of raising revenue that will be completely painless for all parties. Most economists and environmental scientists believe that increasing taxes on motor fuels is a necessary step toward curbing CO_2 emissions. One of the major barriers to this option is the lack of political support. Perhaps the multiple imperatives of lessening the burden on local property taxes, supporting public transportation and reducing carbon emissions will finally result in some action.

Chapter 8

Action Agenda

The Transit Development Plan is a central guidance document for CCTA investments over the coming decade. It also serves as the transit element of the CCMPO Metropolitan Transportation Plan.

If the other organizations, agencies, and municipalities want to accomplish the regional goals called for in numerous plans and studies, there are several specific actions that must be taken. CCTA needs other organizations, agencies, and municipalities to actively work with the agency on the following tasks:

- Municipalities should change their local zoning to more strongly support and incentivize transit oriented development—including higher density and mixed use projects—along transit corridors in their communities.
- CCTA, the municipalities of northwest Vermont, and the State of Vermont should work together to develop a regional funding mechanism for public transportation that relieves the burden on the property tax.
- The CCMPO must have greater autonomy and control regarding programming the region's federal transportation funding.
- CCTA and the CCMPO must have greater control to develop and implement transportation infrastructure projects, such as park and ride lots, in the region.

Next Steps

In addition to the four action items listed above, the CCTA Board of Commissioners and staff will move forward with initiatives to increase the awareness of CCTA's significant statewide role in the areas of sustainability, economic development, and mobility. These initiatives will assist with obtaining the public support necessary to implement improvements in the TDP which will further CCTA's ability to contribute towards sustainable lifestyles within a vibrant economy.

Funding

Once the TDP is adopted by the CCTA Board of Commissioners, the work of implementation begins. While CCTA's planning staff can continue to make progress on planning for new

services and restructuring and enhancing existing services, the major hurdle that must be overcome is the limitation on funding sources that is restricting the growth of CCTA services. Without a new funding source, such as those discussed in chapter 7, the only means to pay for service expansion is a New Start grant funded through the federal CMAQ program. CCTA has been successful at winning these competitive grants, but it is nonetheless a slow process and still requires that local communities allocate scarce property tax dollars to fund the 20% local match. In the 2010 legislative session, the merger of CCTA and GMTA was accomplished, essentially creating a regional transit authority for northwest Vermont. The primary initiative for CCTA in the 2011 legislative session needs to be a regional funding mechanism to support the growth of this regional entity.

During the next year, the PTPP will be updated, and a key element of that study will be an examination of funding. CCTA will need to work with VTrans to encourage new state policies to promote additional funding sources and flexibility for transit providers.

Funding at the federal level is also at a critical stage, with the impending reauthorization of surface transportation funding programs. Working with the American Public Transportation Association and other transit agencies across the country, CCTA is lobbying for the maximum possible allocation of dollars for transit capital investments and operations.

Planning

The TDP includes many service concepts and recommendations for capital investments. Before these can be implemented, more detailed planning must take place. Work is ongoing to prepare for bus procurements, technology investments for real-time passenger information, the design and construction of the Downtown Transit Center, and new services. This work requires coordination with local officials, CCMPO, and VTrans. CCTA is in the process of preparing grant applications to the federal government to help pay for some of these initiatives.

The merger of GMTA and CCTA will also require planning work, although the services are already reasonably well coordinated. Further cooperation with neighboring transit agencies (ACTR, RCT, Stagecoach) can increase the benefit of regional integration.

Marketing and Public Information

Raising the awareness of CCTA services among the traveling public and informing them of the recent enhancements in service (such as the US 2 corridor restructuring in June 2010) is essential to continued ridership growth. It is also important to disseminate the message about the vision for the future of CCTA in order to build public support for the direct investments that will be needed, as well as for the related land use and transportation policies (TOD/POD) that will be critical to the long-term success of the system.

The ridership growth of CCTA over the past decade and its successful ventures into commuter transportation (LINK Expresses, Milton Commuter, peak service upgrades on Essex Junction and US 2/Williston routes) have moved the authority from its former role as a "social service" agency, carrying mostly transit-dependent riders, into a position of a key player in the regional transportation system. The ongoing viability of the economy and the environment in Chittenden County depends on the success of CCTA. In order to grow the economy without sacrificing the land or the air, mass transit is essential. CCTA is now offering competitive service in two primary travel corridors and is poised to expand that service to all points of the compass. Commuter links to surrounding towns are feasible. The Chittenden County region has the capability of reducing reliance on the private automobile and thereby making a positive impact on the environment and quality of life. All that is needed is the commitment to making the vision of this TDP a reality.

Goals of Related Plans

The TDP is, in some part, a product of those plans which came before it, and it will have influence over related plans that are written in the future. There are four plans that are immediately related to the TDP in that they set out goals for public transportation in Chittenden County and the state as a whole. In order from most general to most specific, these plans are the following:

- Final Report of the Governor's Commission on Climate Change (2007)
- VTrans Long Range Transportation Business Plan (2009)
- VTrans Public Transportation Policy Plan (2007)
- Burlington Transportation Plan (2007)

As described below, without the growth and support of public transportation, the implementation of these plans and achievement of their goals would not be possible. The action items in the TDP are consistent with the policy directions of these plans.

Governor's Commission on Climate Change

The final report of this commission included six recommendations, of which number 3 was the most relevant to public transportation. It is quoted below:

> 3. <u>Reducing Emissions in a Renewed Transportation System Within and Between Vibrant Town Centers</u>
>
> Future development along the lines of Vermont's historic settlement pattern of compact town centers surrounded by open countryside will also provide multiple

benefits. Not only would it be consistent with Vermont's traditional character, it would reduce travel demand and create a more transit-oriented pattern of growth. In the long run, this will help bend the upward curve of Vehicle Miles Traveled (VMT), which is the most significant source of greenhouse gas production in Vermont.

At the same time, Vermont must invest more in its transportation infrastructure, including highways, railroads and park-and-ride facilities, so that the development of public transportation can be accelerated. Vermont should also encourage the purchase of fuel-efficient, low-emission vehicles through financial incentive programs. In order to take these steps, Vermont should consider ways of enhancing transportation revenues through non-traditional means that will not be affected by VMT reductions. The Commission is not recommending a specific approach to funding but, rather, making it clear that greater investment will be necessary to counter the increasing contribution of single-occupant vehicles (SOV) to the problem of climate change.

In particular, we urge the Governor to:

- Evaluate a number of potential new revenue enhancing options that simultaneously serve as incentives for reduced travel or low emitting vehicles, such as "feebates" for low mileage vehicles, a percentage-based sales tax on gas in place of the existing per-gallon approach, and restructuring of the current distribution of transportation funds;

- Develop and begin implementing a long-term plan to efficiently and effectively expand and improve inter-city bus and rail service, including both passenger and freight transport and inter-modal connectivity, such as bicycle, pedestrian, shuttle services, etc.;

- Promote planning efforts that adopt and embrace the concept of town centers

Most of the TDP recommendations are in line the the recommendation to invest more in transportation infrastructure and to accelerate the development of public transportation. These would help build ridership in the short term, which can have an immediate impact on greenhouse gas emissions. The recommendation's emphasis on a "transit-oriented pattern of growth" is fully consistent with the text of this TDP and will lead to greater emission reductions and a more sustainable transportation system in the future.

VTrans Long Range Transportation Business Plan

Several elements of the LRTBP are echoed in this TDP. One of the major goals of the LRTBP is preservation of the existing system. The most relevant objectives under that goal are the following:

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

All of these objectives are consistent with the recommendations of the TDP.

The LRTBP includes a section where it considers four possible future scenarios: Business as Usual (no significant change from the present), Environmental Change (non-attainment of air quality standards), Energy Crunch (significant increase in fuel prices), and Growth Scenario (large increase in employment). For the "response" to each of these scenarios, public transit has a role to play. The LRTBP highlights the following:

- Improving multimodal alternatives – transit, bicycles, pedestrians, and rail
- Emphasizing land use planing – smart growth and access management
- Prioritize energy and climate change – prepare for the "crunch" through more efficient travel.

There are three policy goals that relate directly to public transportation. Policy Goal #5 is to "improve and connect all modes of Vermont's transportation system to provide Vermonters with choices." Transit figures prominently in two strategies under this goal:

B. Plan and support intermodal transportation facilities to provide multimodal options that reduce personal vehicle use and reduce Vermont's reliance on fossil fuels for meeting transportation needs.

D. Conduct ongoing assessments of non-single occupant vehicle (SOV) modes to determine their economy, efficiency and effectiveness relative to other transit oppurtunities to ensure mobility and accessibility.

Policy Goal #6 is to "strengthen the economy, protect and enhance the quality of the natural environment, promote energy conservation, and improve Vermonters' quality of life." Under this goal, transit is specifically highlighted as one of the strategies: "H. Promote transit services as a tool to support tourism and economic development."

Finally, Policy Goal #7 is to "support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside." As discussed earlier in this TDP, this type of development is supportive of public transportation as it promotes walking and clustering of trip ends that can be served effectively by transit routes.

VTrans Public Transportation Policy Plan

The PTPP, which is due to be updated by the beginning of 2012, contained a range of policy statements and an implementation plan with recommended actions for VTrans. Among the 16 policy statements, the following are the most relevant to the TDP:

- The existing public transportation system in Vermont should be preserved and enhanced, provided that specific routes and services are well used by the traveling public.
- VTrans will continue to support Smart Growth and transit oriented development as it strives to improve mobility, maintain the rural character, and avoid sprawl in Vermont.
- VTrans will promote the use of public transportation as an energy-saving transportation alternative compared to single occupancy vehicle travel.
- VTrans will work to improve connectivity between public transit provider services and private-sector operations that serve markets outside Vermont, and to provide easy access to information about those services at intermodal facilities and via the Internet.

In the implementation plan, VTrans strongly endorses the concept of transit oriented development and investments in transit services and equipment that will lead to a more efficient and environmentally-friendly transportation system. The following three action items are especially relevant to the TDP:

- VTrans will revise criteria for new public transportation routes (New Starts) to reflect the benefit of services that promote or enhance TOD.
- VTrans will work with providers to enhance and expand public transportation services. Adding new services and improving the efficiency and convenience of existing ones could help attract and retain additional public transportation ridership.
- VTrans will promote use of low emissions technologies by public transportation providers.

The recommendations in chapter 6 for new services and investments in fleet, facilities, and technology are fully in line with the prescriptions of the PTPP. There is also full agreement on the importance of TOD and the cooperation needed from state, regional, and municipal governments to guide future development so that the future transportation system can be more efficient, rather than more costly.

Burlington Transportation Plan

The Burlington Plan, entitled *Moving Forward Together*, strongly endorses the upgrading of transit in the city of Burlington and the Chittenden County region. One of the primary goals for

transit is the enhancement of service on the trunk corridors. These are the same as the trunk corridors discussed in chapter 6.

> The near-to-medium term vision for public transportation service in Burlington is to provide a high level of service on primary trunk routes serving downtown from the north, northeast, east, and south, complemented by shuttle services and neighborhood feeder services. Trunk routes include:
>
> - North Avenue;
> - Essex Junction (service to Colchester Avenue/Winooski/Essex);
> - University Mall/Airport;
> - Shelburne Road; and
> - Pine Street.
>
> These trunk routes would run frequently during the day, and service would be provided evenings and weekends, and serve both walk-access transit riders and those parking at remote lots.

A set of new street design guidelines forms a central part of the Plan. Two classifications of streets place a significant emphasis on public transportation: the Complete Street, and the Transit Street. A Complete Street includes enhanced transit stops and a range of enhancements for pedestrians. A Transit Street has similar treatments as a Complete Street, but in this case, more pavement can be devoted to transit service because bicycle facilities are being provided on a parallel street.

The Plan also includes a list of capital projects it recommends for implementation. Among these are the Downtown Transit Center and the South End Neighborhood Transportation Center, both of which are included in this TDP. A final note about transit is that the Plan states that “the City will continue to push for a regional transit funding source.”

Appendix A - Previous Studies Related to the TDP

CCTA Short-Range Public Transportation Plan – 2003

The last Short-Range Public Transportation Plan (SRPTP) was funded by VTrans and drafted by its consultant but was edited heavily by CCTA staff to accommodate the current thinking of the Board and management. It included an identification of community transit needs, inventory and analysis of current transit services, and a series of organizational and service recommendations for meeting those needs, over a five-year time period.

The following goals were established

- Development of a broad-based source of local funding to decrease reliance on property taxes
- Expansion of public transit services to areas outside CCTA member towns
- Re-routing in downtown through a new multimodal center
- Meet the transit needs of suburban growth areas
- Assist in decreasing traffic congestion and parking problems in downtown and on the hill

Based on the analysis of transportation needs and transit services, various strategies were developed and presented to the study advisory committee, CCTA and SSTA staff, and the public for review and comment. With that feedback incorporated, the SRPTP made the following general recommendations:

- *CCTA, SSTA, and the CCMPO should coordinate to request that the State Legislature create a new kind of RTA for all of Chittenden County* – The RTA would be responsible for expanding bus and paratransit service to the entire County and would plan services cooperatively with the CCMPO. The Legislature would give the RTA authority to levy taxes, as needed to expand transit services.
- A new, downtown multimodal center
- Coordination of transit services with neighboring systems, including NVPTN and ACTR
- Update the 1999 Park and Ride study conducted by the CCMPO
- Review fare policy, especially for longer or premium trips

In addition to general recommendations, the SRPTP also made specific service recommendations for commuter, fixed-route, community, and paratransit service. Those recommendations were as follows:

- *Commuter Routes Inter-Regional* – Limited stop, express service from outlying communities such as Georgia/ St. Albans, Waterbury/ Sugarbush, or Vergennes into Burlington and Essex Junction to serve employment trips and reduce congestion

- *Commuter Routes/Regional Routes* - Limited stop, express service from regional communities such as Colchester/Milton, Underhill Flats/Jericho, or Hinesburg into Burlington and Essex Junction to serve employment trips and reduce congestion
- *Regional Line Haul Services Trunk Routes* – to connect high density areas such as Mallets Bay, Tafts Corners, and Williston Village to downtown
- *Community Connectors Local Fixed Routes* – Add frequency on routes that serve high density areas within or close to the urban core, such as Riverside/ Winooski, Essex Center, and the Old North End Loop
- *Community Connectors Parking and Special Purpose Shuttles* – Continue PARC north and south, College Street Shuttle, and CATMA shuttle, with potential for additional shuttle on the Hill
- *Community Connectors Cross County Direct Connections* – Connects suburb to suburb at a high level of service
- *Community Connectors Feeders to Trunk Lines and Commuter Routes* – Demand-responsive or route deviation service in zones around ends of commuter routes and trunk lines in areas around Shelburne, Essex, South Burlington, or Charlotte rail stations; University Mall, Malletts Bay, Tafts Corner, Milton, Jericho/ Underhill, Richmond, or Hinesburg
- *Community Connectors ADA Complementary Paratransit Services* – Expanded service required with institution of other service recommendations
- *Community Connectors Rural General Public Demand-Response* – Advance reservation, demand-responsive system covering the more rural areas of the County, as a compliment to existing human service transportation
- *Other Specialized Services* – Continue to operate senior shuttles, neighborhood specials, Medicaid service, and ridesharing

Vermont's Public Transportation Policy Plan – February 2007

Vermont's 2007 Public Transportation Policy Plan (PTPP) reviewed and updated past policies and goals and developed strategies to meet Vermont's public transportation challenges. The PTPP was intended to serve as the primary guidance document for a five year period, beginning in 2007. The report provided a list and description of transit stakeholders, as well as an inventory of public transportation services available in the state, and a detailed peer analysis, comparing Vermont's public transit services to similar services throughout the country. It also provided a demographic analysis, finding a high density of target populations in Chittenden County.

The Policy Plan provided a detailed Implementation Plan. Some of the recommendations provided were as follows:

- The existing public transportation system in Vermont should be preserved and enhanced, provided that specific routes and services are well used by the traveling public

- Additional public transportation funds should be used for services that support and promote the four goals stated in the 24 V.S.A., Chapter 126, § 5083
- VTrans will maximize the use of available federal funds in support of public transportation efforts in the state. State funds shall be allocated to public transportation providers for use in their operating budgets to the extent that funds are available.
- In support of Vermont's changing demographics and the state's "Age in Place" policy, VTrans will work with its partners to maintain the mobility of Vermonters without neglecting other essential needs met by the public transportation system
- VTrans, working with AHS, will continue to promote and enhance coordination of human service and general public transportation through the regional public transportation brokers when appropriate
- VTrans will promote the use of public transportation as an energy-saving transportation alternative compared to single occupancy vehicle travel
- VTrans will support a vital intercity bus network in Vermont, serving both intra-state travel and travel to other metropolitan areas in New York, New England, and Quebec by providing attractive and accessible facilities (park-and-rides with bus shelters) at convenient locations along major travel corridors

The Plan concluded that there are several areas of the state without transit service that could benefit from service, and other areas that have a low level of service that could benefit from higher levels of service.

Vermont Human Services Transportation Coordination Plan – March, 2008

The Vermont Human Services Transportation Coordination Plan (HSTCP) is the state's response to the planning requirements of the 2005 reauthorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Beginning in federal fiscal year 2007, projects supported by the Federal Transit Administration's (FTA) Elderly Individuals and Individuals with Disabilities (Section 5310), Job Access and Reverse Commute (Section 5316), and New Freedom (Section 5317) programs are required to be derived from a "locally developed, coordinated public transit – human services transportation plan."

In Vermont, the HSTCP was used as a statewide planning document, with distinct regional planning documents included, an implementation document, and a framework for the prioritization and selection of projects utilizing federal funding assistance.

Coordination of general public and human service transportation is already well established in Vermont, from policies and priorities established by the Vermont legislature and state agencies, to the delivery of transportation services to members of the public and human service agency clients at the regional and local levels. At the state level, 24 V.S.A. Chapter 126, Section 5090 requires state human service agencies to purchase transportation from public systems where appropriate.

State level strategies for improving coordination indentified in the Plan include:

- Encourage trip and vehicle sharing coordination between organizations providing transportation coverage to common areas
- Develop a consolidated information dissemination approach to promote transportation services
- Hold regular meetings with transportation providers and other affected parties
- Improve inter-regional coordination
- Provide technical assistance to providers to strengthen financial and administrative capacity

An inventory of transportation services conducted for Chittenden County identified CCTA as the primary public transportation provider in the county. In addition, a number of towns provide local matching funds to provide E&D service to their residents and the Town of Essex directly operates some E&D service. There are also numerous human services transportation providers, including Special Service Transportation Agency (SSTA), Milton Family Services, Spectrum Youth and Family Services, the Good News Garage, and others. Private operators, such as Amtrak, Vermont Transit (now Greyhound), and taxis were also identified.

The transportation service gaps and unmet needs in Chittenden County identified through the HSTCP included the following:

- Service outside current CCTA member towns, especially to new developments in Williston
- Institution of flexible routing
- Commuter service between Burlington and Bennington
- Service from more portions of Franklin County
- Increased E&D funding to meet the demand for service, especially ongoing medical trips
- Transportation to senior meal sites

US 2 Corridor Transportation Management Plan – August, 2007

The Transportation Management Plan for the US 2 corridor covers the area along US 2 from South Willard Street in Burlington, to North Williston Road in Williston. The Plan provides an inventory of highway, transit, and bicycle facilities; recommendations; and an implementation plan for those recommendations.

Six "goals and objectives" were developed by the project team, each with numerous sub-goals. The goals identified by the Plan are listed below, along with some of the sub-goals:

- *Develop transportation strategies consistent with the current and emerging function of US 2,* including improvement to local circulation and access and safe and efficient connections between various transportation systems

- *Provide travel options to serve the needs of a diverse population and both residential and non-residential land uses in the corridor*, including the creation of a bicycle and pedestrian network
- *Provide transportation improvements that support community character and develop goals*, such as the creation of new passenger facilities designed to enhance the transit riding experience
- *Improve safety by addressing deficiencies at high crash intersections, closing gaps in the existing bicycle and pedestrian system, providing safe connections and minimizing dangerous conflicts between modes*
- *Design and operate transportation facilities to protect and enhance the environment*, by reducing emissions and noise and using flexible design
- *Develop transportation projects and services cooperatively and implement projects cost effectively in time to meet immediate and long term needs*

Two CCTA routes currently serve the corridor: UMall/Airport and Williston. As of 2007, the UMall/ Airport route was CCTA's highest ridership route, with over 1,000 boardings per day (in FY2009, ridership exceeded 1,300 boardings per day), and the Williston route was one of CCTA's fastest growing.

With regard to transit, the short- (five years or less) and medium- term (five to ten years) recommendations included:

- Introduction of a new corridor service on US 2 between downtown Burlington and Williston, operating on 30-minute headways during the day and hourly service at night, with extensions to Williston Village during the peak
- Extension of the College Street Shuttle to UMall and Market Street, with extended days and hours of service
- Restructuring of the UMall/Airport route to a South Burlington local circulator
- Restructuring of the Williston route
- Future expanded US 2 corridor service, running at 15-minute frequency during morning and afternoon peak periods

Additionally, the study included recommendations for pedestrian and bicycle facility improvements such as enhancing existing roadway crossings, providing new crossings, and the addition of a bicycle lane and bicycle facilities in Williston Village.

In the long term, the Plan recommended implementation of Bus Rapid Transit (BRT) and its necessary components such as enhanced passenger facilities, transit signal priority (TSP), queue jump lanes, and dedicated rights-of-way along the US 2 corridor.

VT 15 Corridor Study – 2008

The goal of the VT 15 Corridor Study was to develop a comprehensive multi-modal transportation improvement plan for the VT 15 corridor from Main Street in Winooski through the towns of Colchester and Essex and the Village of Essex Junction, to the border of Essex and Jericho. The plan outlined a long-term vision for the corridor, as well as short-, medium-, and long-term strategies to achieve those goals.

CCTA operates two routes on the VT 15 corridor: Essex Junction and Essex Center. The Essex Junction route serves the major destinations of the Ambulatory Care Center (ACC) at MCHV/ Fletcher Allen, Fort Ethan Allen, Essex Junction, and the IBM campus. As of 2009, the Essex Junction route is CCTA's most heavily utilized route. The Essex Center route functions as a circulator within the Town of Essex and a feeder route to other CCTA trunk line service. Trips occur during the weekday morning and afternoon peak hours.

Public transit improvement strategies presented in the study included, in the short term (less than five years):

- Upgrading the Essex Junction route to 15-minute peak period service (already implemented by the time the study was completed)
- Expanding service on the Essex Center route to 30-minute headways, with all day service, Monday through Saturday

In the mid-term (less than ten years):

- Add evening and Sunday service on the Essex Junction route
- New LINK Express route from Cambridge to Burlington, via Underhill, Jericho, and Essex
- New local route in the neighborhood surrounding Susie Wilson Blvd.
- New park-and-ride at intersection of VT 289 and VT 2A
- New satellite or intercept parking lot in the Barnes Road area

And in the long-term (more than ten years):

- Upgrade the Essex Junction route to Bus Rapid Transit (BRT) service (earlier if funding is available)

Moving Forward Together – Transportation Plan for the City of Burlington – August, 2007

The Transportation Plan was drafted with the intent to promote three general themes: Strong and Healthy City, Transportation Choices, and Great Streets. The Plan acknowledged that transportation is vital to a strong and healthy city.

The plan says that *transit availability is critical, especially for the young, the old, and those without cars, and those who are otherwise dependent on transit.* In the near future, choice riders, or those who do not rely solely on public transportation, will also play a key role in increasing

the demand for services. These riders have indicated that the current level of service has been a deterrent to transit use.

In the future, primary trunk routes serving the downtown area on key arterials—including North Ave, Pearl St/Colchester Ave, Main Street, Shelburne Road, and Pine Street—should provide a high level of service, with frequent service during the day, and service provided on evenings and weekends. Currently, CCTA's ability to increase service is severely limited by its reliance on local property tax as a funding source. The City plans to continue to push for a regional transit funding source. Accessibility to public transportation is also critical.

Chittenden County Park and Ride Facility Prioritization – February, 2004

The report is an update of previous studies that identified potential locations for twenty new park and ride lots. Facility locations were prioritized based on ten criteria within three general categories: demand, location, and readiness, with the demand category accounting for 50% of a lot's total score.

In addition, potential lots were identified as Intercept/Satellite or Park and Ride. An Intercept/ Satellite lot is intended to provide a less expensive alternative to on-site parking facilities within activity centers or the urban core. A Park and Ride facility is generally for car and vanpooling, sometimes served by transit or a low frequency shuttle.

The top scoring Intercept/Satellite locations and accompanying recommendations, as listed by CCMPO, were as follows:

- Burlington: Lakeside Avenue and Champlain Parkway – Assist as needed City/ Private developer led effort to construct parking structure
- South Burlington: I-89, Exit 14 – Scope interchange improvements that will include park and ride facility. Partner with VTrans, two cities, and UVM on possible solutions
- South Burlington: US 7/ I-189 – no action recommended
- Colchester: VT 15/ Barnes Avenue – Seek earmarked funds for all recommended VT 15 improvements as identified in the VT 15 Corridor Study

The top scoring Park and Ride locations and accompanying recommendations were as follows:

- Burlington: North Avenue – no action recommended
- Williston: I-89, Exit 12 – Advocate to VTrans for expedited construction
- Colchester: I-89, Exit 17 – no action recommended
- Richmond: I-89, Exit 11 – CCMPO scoping priority

In addition to the sites listed above, the CCMPO recommended action on additional lots in Colchester, Essex, Jericho, Hinesburg, and South Burlington, as well as continued development

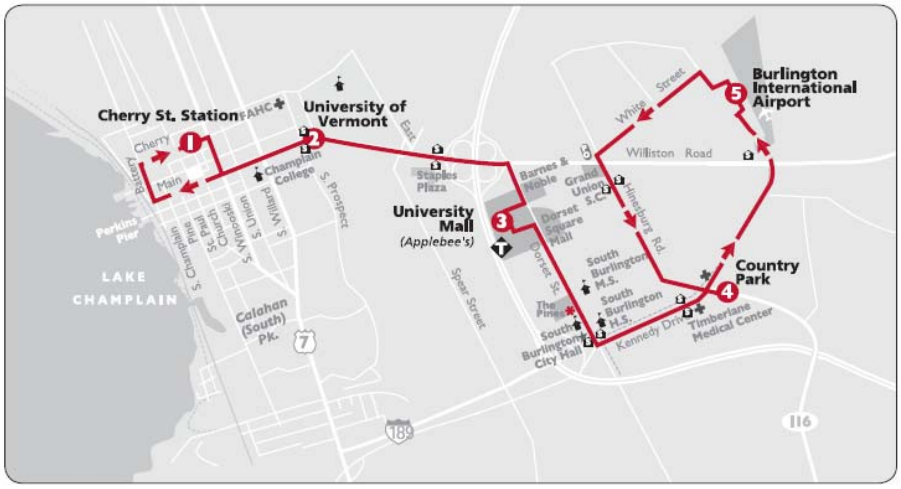
and expansion of facilities in Grand Isle, St. Albans, Enosburg Falls, Waterbury, Bristol, Ferrisburgh, and Middlebury.

Appendix B – Route Profiles

This appendix to the TDP contains route profiles of all routes in operation at the end of FY2010. Note that the restructuring of services in the US 2 corridor is presented as supplemental material to the profiles of the UMall/Airport route and the Williston route, both of which ceased to exist in June 2010.

ROUTE PROFILE: 1 UMall/Airport

Function: The UMall/Airport route was a primary line-haul service connecting South Burlington and Burlington, as well as providing neighborhood coverage in South Burlington and a connection to the airport.



Span: Weekdays 6:15 a.m. to 10:21 p.m.
Saturdays 6:15 a.m. to 8:06 p.m.
Sundays 8:45 a.m. to 6:35 p.m.

Frequency: 30-minute headway, except 15 minutes during one hour on weekday afternoons and 60 minutes during evenings (after 6:15), Saturday morning before 9:45, and Sunday all day.

Ridership: Weekday (FY09 Average): 1,286
Saturday (FY09 Average): 1,099
Sunday (FY09 Average): 336

Productivity: Weekday boardings per revenue hour: 44
Saturday boardings per revenue hour: 48
Sunday boardings per revenue hour: 34

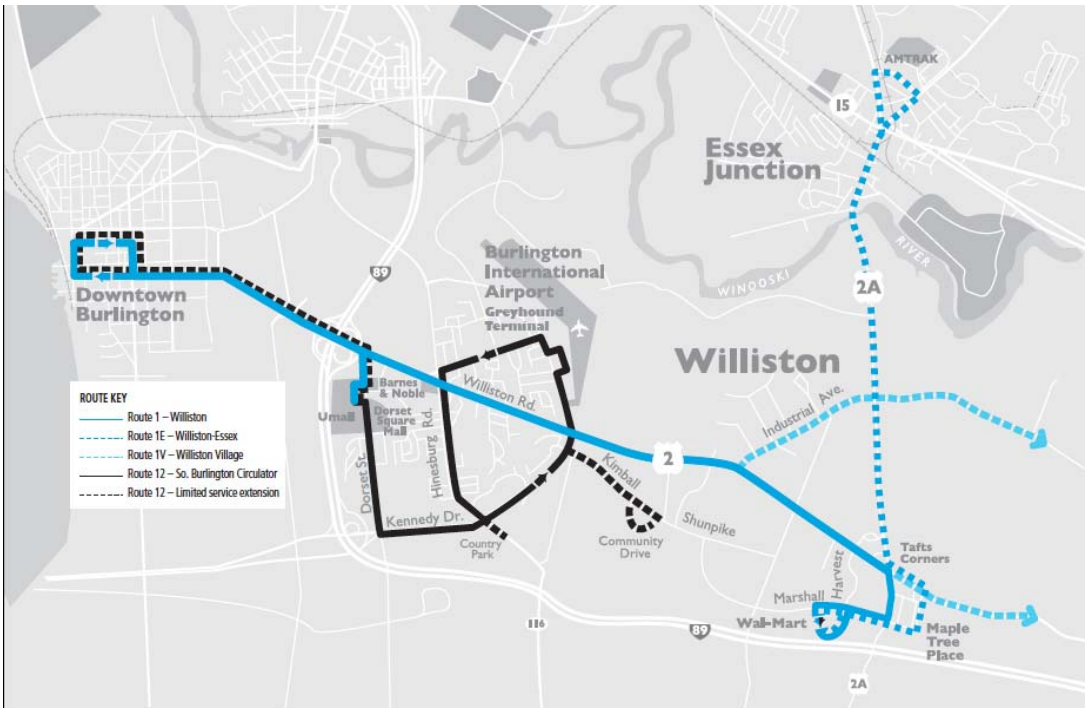
Top stops: Cherry Street (624 boardings)
University Mall (256 boardings)
Main St at University Heights (164 boardings across 2 stops)
Barnes & Noble (76 boardings)

Revenue: $342,000 (est.)

Gross Cost: $758,000 (est.)

Net Cost per passenger: $1.03

Notes: The UMall route no longer operates as of June 2010. It is replaced by direct service along US 2 between Burlington and Williston, and a South Burlington Circulator route (see below).



Service that was formerly provided by the UMall/Airport route is now provided by a combination of the Route 1 – Williston and Route 12 – South Burlington Circulator. For most of the day, passengers on Route 12 will need to transfer to Route 1 in order to reach Burlington, but weekday morning inbound trips, Mon-Sat evening service, and Sunday service will offer a one-seat ride to Cherry Street.

ROUTE 1 – Williston

Span: Weekdays 6:15 a.m. to 12:10 a.m.
Saturdays 6:15 a.m. to 12:10 a.m.
Sundays 8:15 a.m. to 6:55 p.m.

Frequency: 30-minute headway, except 15 minutes during peaks and alternating 30 and 40 on Sundays. Four round-trips to Williston Village offered on weekdays.

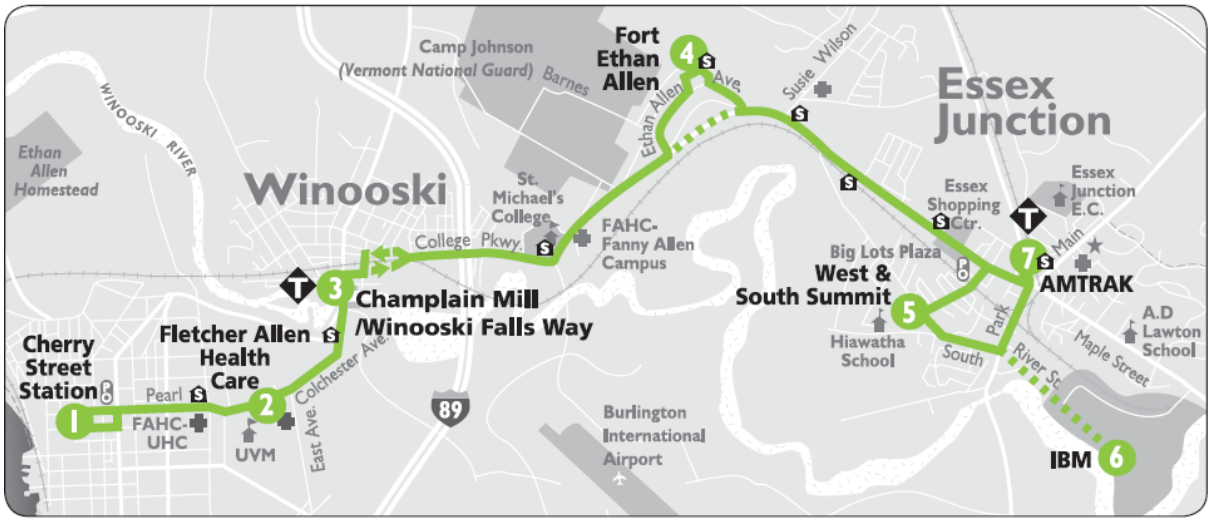
ROUTE 12 – South Burlington Circulator

Span: Weekdays 6:30 a.m. to 9:55 p.m.
Saturdays 6:30 a.m. to 9:50 p.m.
Sundays 8:45 a.m. to 6:55 p.m.

Frequency: 30-minute headway, except 60 minutes after 7:00 p.m. Mon-Sat and 70 minutes on Sunday all day.

ROUTE PROFILE: 2 Essex Junction

Function: The Essex Junction route is a primary line-haul service connecting Essex, Winooski, Colchester and Burlington



Span: Weekdays 5:55 a.m. to 10:00 p.m. (plus Friday late service through May 7 until 11:50 p.m.)
Saturdays 6:10 a.m. to 7:53 p.m. (plus late service through May 8 until 11:50 p.m.)
No Sunday service

Frequency: 30-minute headway, except 15 minutes during weekday peaks and 60 minutes during evenings (after 6:15) and Saturday morning before 9:45.

Ridership: Weekday (FY09 Average): 1,573
Saturday (FY09 Average): 835

Productivity: Weekday boardings per revenue hour: 25
Saturday boardings per revenue hour: 24

Top stops: Cherry Street (481 boardings)
Champlain Mill (289 boardings)
Fletcher Allen main entrance (244 boardings)
AMTRAK-Essex Junction (159 boardings)
Fort Ethan Allen (three stops with total of 111 boardings)

Revenue: $378,000 (est.)

Gross Cost: $1.5 million (est.)

Net Cost per passenger: $2.52

Notes: Ridership increased approximately 30% in response to the increase in peak period frequency from 2 trips per hour to 4 trips per hour in each direction.

ROUTE PROFILE: 3 Lakeside Commuter

Function: The Lakeside Commuter route is a peak period commuter shuttle between the Lakeside Community and downtown Burlington.

Span: Weekdays 6:05 a.m. to 7:15 a.m. and 4:15 p.m. to 6:55 p.m.

Frequency: Three trips are operated in the peak direction (northbound in the morning and southbound in the afternoon) in each peak period. These are generally spaced 30 minutes apart.

Ridership: Weekday (FY09 Average): 23

Productivity: Weekday boardings per revenue hour: 23

Top stops: Conger Ave at Harrison (5 boardings)
PARC lot (2 boardings)
Cherry Street (1 boarding)

Revenue: $5,000 (est.)

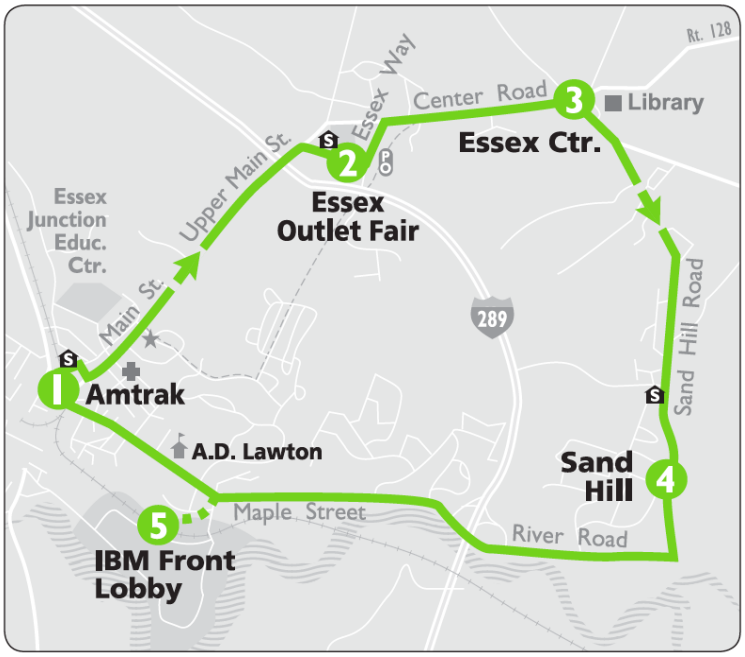
Gross Cost: $21,000 (est.)

Net Cost per passenger: $2.70

Notes: This route was created when the Pine Street service was restructured to allow for more direct trips on the Pine Street while maintaining a direct connection for Lakeside residents.

ROUTE PROFILE: 4 Essex Center

Function: The Essex Center route is a loop route in the Town of Essex, also serving Essex Junction. It provides coverage to Essex Outlet Fair and the historic center, as well as access to the IBM facility.



Span: Weekdays 6:00 a.m. to 6:38 p.m.

Frequency: 30-minute headway, except for a 3-hour break in service in the midday from 10:00 a.m. to 1:00 p.m.

Ridership: Weekday (FY09 Average): 108

Productivity: Weekday boardings per revenue hour: 12

Top stops: Amtrak station (39 boardings)
Essex Outlet Fair (12 boardings over 3 stops)
Sand Hill Rd (12 boardings over 2 stops)
River Rd at Greenfield Rd (9 boardings)

Revenue: **$23,000 (est.)**

Gross Cost: **$190,000 (est.)**

Net Cost per passenger: $6.04

Notes:

ROUTE PROFILE: 5 Pine Street

Function: The Pine Street route is a line-haul service connecting the Pine Street corridor and Lakeside community to downtown Burlington.

Span: Weekdays 6:15 a.m. to 6:40 p.m.
Saturdays 6:15 a.m. to 6:40 p.m.
No service on Sundays

Frequency: 30-minute headway at all times

Ridership: Weekday (FY09 Average) 439
Saturday (FY09 Average) 206

Productivity: Weekday boardings per revenue hour: 35
Saturday boardings per revenue hour: 16

Top stops: Cherry Street (180 boardings)
230 St. Paul (28 boardings)
Howard Center (27 boardings)
CCTA (24 boardings)
Champlain School (23 boardings)

Revenue: $104,000 (est.)

Gross Cost: $317,000 (est.)

Net Cost per passenger: $1.74

Notes: Additional evening southbound service is operated on this route as buses head back to the CCTA garage after finishing runs on other routes

ROUTE PROFILE: 6 Shelburne Road

Function: The Shelburne Road route is the primary line-haul service to the south of Burlington, connecting Burlington to South Burlington and Shelburne.

Span: Weekdays 6:10 a.m. to 8:28 p.m., with a late trip from 10:30 p.m. to 11:13 p.m.
Saturdays 6:15 a.m. to 8:23 p.m.
No service on Sundays

Frequency: 30-minute headway, except evenings after 6:15 p.m. and Saturday mornings before 9:45 a.m.

Ridership: Weekday (FY09 Average): 876
Saturday (FY09 Average): 572

Productivity: Weekday boardings per revenue hour: 31
Saturday boardings per revenue hour: 25

Top stops: Cherry Street (330 boardings)
Farrell St/Price Chopper (96 boardings)
Baldwin Ave (35 boardings)
Winooski Ave at King St (26 boardings)

Revenue: $215,000 (est.)

Gross Cost: $701,000 (est.)

Net Cost per passenger: $1.92

Notes: Service was increased in 2007 to extend to Shelburne all trips that had previously ended at the Short Stop.

ROUTE PROFILE: 7 North Avenue

Function: The North Avenue route is the primary line-haul service to the north of downtown Burlington, connecting the new North End to the old North End and the downtown area.

Span: Weekdays 5:45 a.m. to 10:05 p.m.
Saturdays 6:15 a.m. to 7:55 p.m.
No service on Sundays

Frequency: 30-minute headway, except evenings after 6:15 p.m. and Saturday mornings before 9:45 a.m.

Ridership: Weekday (FY09 Average) 1,125
Saturday (FY09 Average) 602

Productivity: Weekday boardings per revenue hour: 39
Saturday boardings per revenue hour: 26

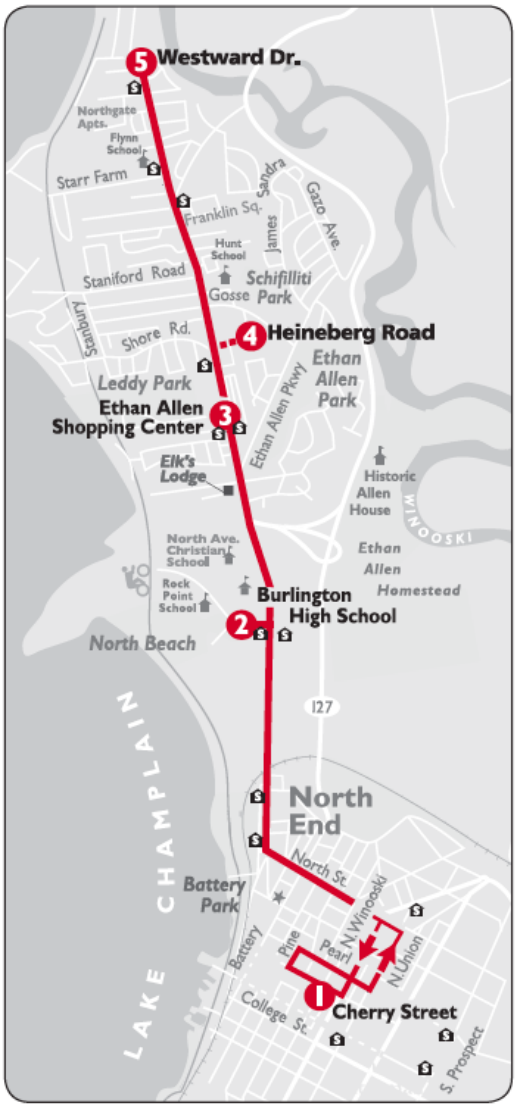
Top stops: Cherry Street (369 boardings)
Burlington High School (144 boardings)
Ethan Allen Shop Ctr (63 boardings)
Northgate Apts (53 boardings)

Revenue: $270,000 (est.)

Gross Cost: $710,000 (est.)

Net Cost per passenger: $1.38

Notes: The gross cost and net cost per passenger are relatively low on this route because it has a short running time compared to the allowed time for a round trip (40 minutes running time compared to one hour allowed). The calculation of cost considers only time in actual revenue service, not layover time at the end of the trip.



ROUTE PROFILE: 8 City Loop

Function: The City Loop is a circulator service in Burlington serving downtown, the old North End, the western edge of the UVM campus and the waterfront.

Span: Weekdays 6:45 a.m. to 9:50 p.m.
Saturdays 6:45 a.m. to 6:40 p.m.
No service on Sundays

Frequency: 30-minute headway at all times, except for 15-minute service between 7:30 a.m. and 9:00 a.m. on weekdays

Ridership: Weekday (FY09 Average): 346
Saturday (FY09 Average): 159

Productivity: Weekday boardings per revenue hour: 20
Saturday boardings per revenue hour: 13

Top stops: Cherry Street (141 boardings)
N. Union at N. Winooski (31 boardings)
N. Winooski at Archibald (20 boardings)
North St at Front (16 boardings)
North St at Murray (16 boardings)

Revenue: $82,000 (est.)

Gross Cost: $410,000 (est.)

Net Cost per passenger: $3.40

Notes: The gross cost and the net cost per passenger on this route are relatively high because almost all of the service time consists of running time in revenue service. This route used to be known as the Old North End Loop.

ROUTE PROFILE: 9 Riverside/Winooski

Function: The Riverside/Winooski route provides coverage and circulation through most of Winooski, connects it to Burlington and also serves the Riverside corridor and Intervale section of Burlington.

Span: Weekdays 6:45 a.m. to 7:04 p.m. with a late trip in the 11:00 hour
Saturdays 6:15 a.m. to 6:38 p.m.
No service on Sundays

Frequency: 30-minute headway during peak periods, 60 minutes at other times

Ridership: Weekday (FY09 Average): 501
Saturday (FY09 Average): 245

Productivity: Weekday boardings per revenue hour : 29
Saturday boardings per revenue hour: 26

Top stops: Cherry Street (229 boardings)
Champlain Mill (83 boardings)
Weaver St at Tigan St (19 boardings)
Elmwood at North St (16 boardings)
West Lane at Malletts Bay Ave (15 boardings)

Revenue: $119,000 (est.)

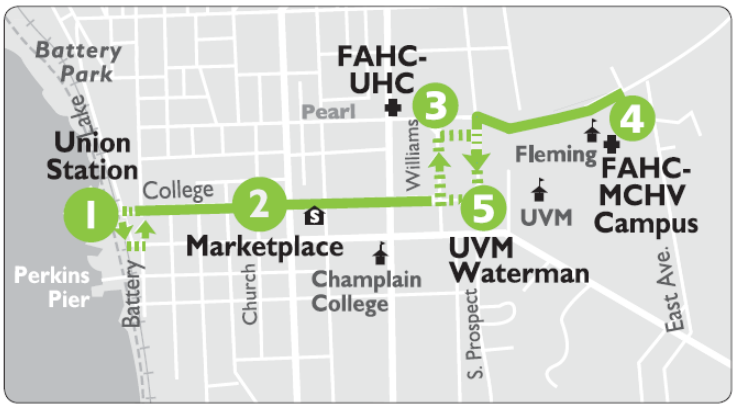
Gross Cost: $410,000 (est.)

Net Cost per passenger: $2.07

Notes: Some trips in the midday and all Saturday morning trips run only as far as Champlain Mill. The late night trip serves workers in Winooski.

ROUTE PROFILE: 11 College Street Shuttle

Function: The College Street Shuttle connects the waterfront to the Church Street Marketplace and the Fletcher Allen/MCHV campus.



Span: Memorial Day to mid October: Weekdays 6:15 a.m. to 9:00 p.m. and weekend days 8:45 a.m. to 9:00 p.m.
Rest of year: Weekdays only from 6:15 a.m. to 7:15 p.m.

Frequency: 15-minute headway from 7:15 a.m. to 6:15 p.m. weekdays and 11:00 a.m. to 6:00 p.m. weekends, with 30 minutes at other times

Ridership: Weekday (FY09 Average): 702
Saturday (FY09 Average): 432
Sunday (FY09 Average): 209

Productivity: Weekday boardings per revenue hour: 29
Saturday boardings per revenue hour: 22
Sunday boardings per revenue hour: 11

Top stops: Church Street (144 boardings)
Fletcher Allen Main Entrance (136 boardings)
Fletcher Free Library (122 boardings)
Union Station (61 boardings)
Waterman Building (32 boardings)

Revenue: $0

Gross Cost: $554,000 (est.)

Net Cost per passenger: $2.86

Notes: The City of Burlington reimburses CCTA for the forgone revenue on this fare-free route.

ROUTE PROFILE: 13 PARC Shuttle

Function: The PARC Shuttle route connects a parking lot in the South End (the General Dynamics/Gilbane lot) with downtown Burlington allowing downtown employees to avoid downtown traffic and parking charges.

Span: Weekdays 7:00 a.m. to 9:00 a.m. and 3:30 p.m. to 6:17 p.m. with additional trip between Bank St. and Pine & Howard at 6:30 p.m. No midday service.

Frequency: Every 15 minutes from 7:00 a.m. to 9:00 a.m.; 20-minute headway from 3:30 p.m. until 5:57 p.m.

Ridership: Weekday (FY09 Average): 100

Productivity: Weekday boardings per revenue hour: 25

Top stops: Bank at Pine St (45 boardings)
PARC Lot (40 boardings)
Bank at St. Paul (8 boardings)

Revenue: $32,000 (est.)

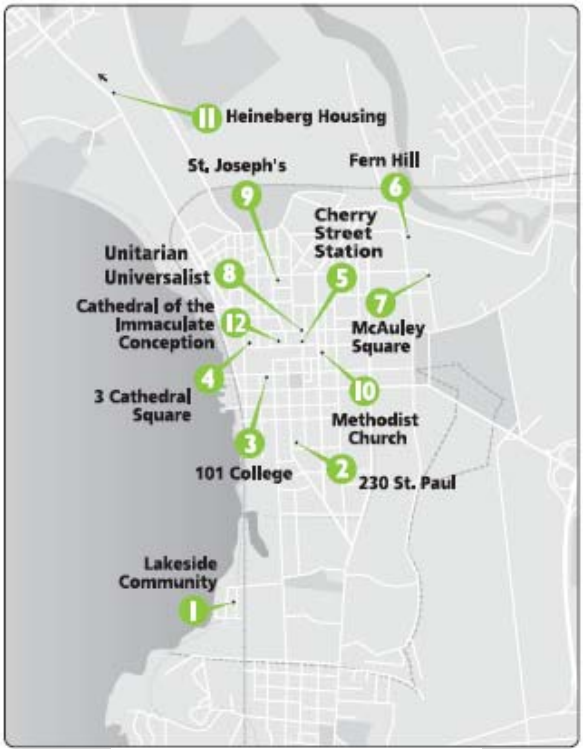
Gross Cost: $84,000 (est.)

Net Cost per passenger: $2.05

Notes: The CATMA shuttle, discontinued at the end of FY09 formerly provided midday service along the PARC shuttle alignment.

ROUTE PROFILE: 18 Sunday Service

Function: The Sunday Service operates as a fixed route in the late morning and afternoon hours and as a point deviation service in the early morning. It connects neighborhoods of Burlington to serve church and shopping trips, primarily for seniors.



Early morning service

Late morning and afternoon service

Span: Sundays 8:25 a.m. to 5:20 p.m.

Frequency: The late morning and afternoon service runs hourly

Ridership: Sunday (FY09 Average): 124

Productivity: Sunday boardings per revenue hour: 14

Top stops: Cherry St (33 boardings)
Price Chopper (21 boardings)
City Market (6 boardings)
Northgate Apartments (6 boardings)
Ethan Allen Shop Ctr (5 boardings)

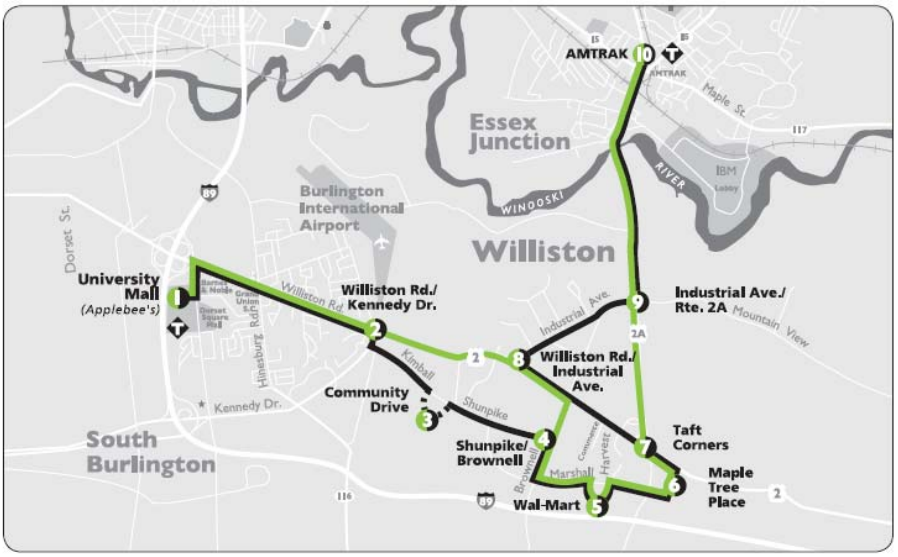
Revenue: $5,000 (est.)

Gross Cost: $38,000 (est.)

Net Cost per passenger: $5.07

ROUTE PROFILE: 23 Williston

Function: The Williston route connects South Burlington, Williston, and Essex Junction, serving major retail areas and other employment. The Saturday pattern is more focused on retail areas, bypassing Kimball, Shunpike and Industrial Avenue.



Span: Weekdays 6:30 a.m. to 7:41 p.m.
Saturdays 6:25 a.m. to 7:49 p.m.
No service on Sundays

Frequency: Alternating 30-and 60 minute headway on weekdays; 70-minute (irregular) headway on Saturdays

Ridership: Weekday (FY09 Average): 280
Saturday (FY09 Average): 199

Productivity: Weekday boardings per revenue hour: 11
Saturday boardings per revenue hour: 15

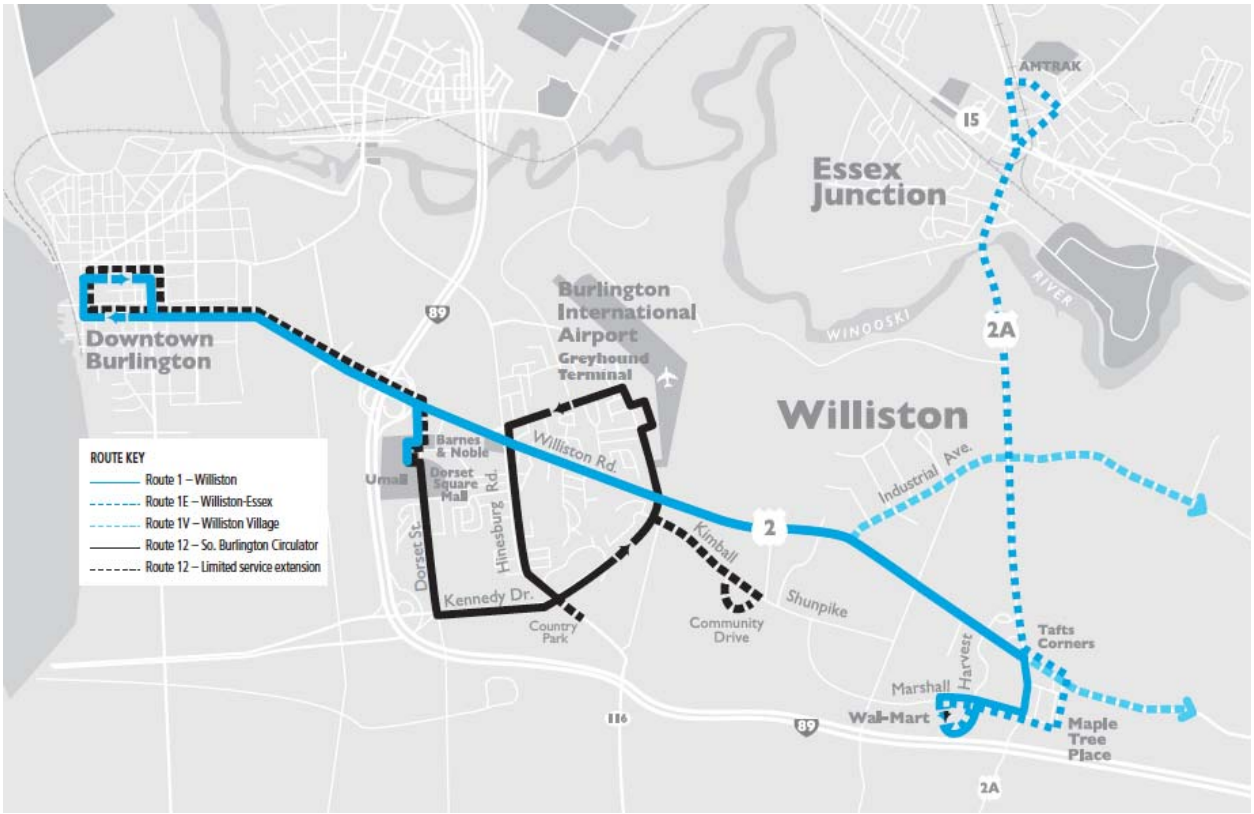
Top 5 stops: University Mall (91 boardings)
Amtrak (40 boardings)
Wal-Mart (14 boardings)
Park Terrace (11 boardings)
Maple Tree Place at Juniper Place (10 boardings)

Revenue: $70,000 (est.)

Gross Cost: $607,000 (est.)

Net Cost per passenger: $6.56

Notes: The Williston route no longer operates as of June 2010. It is replaced by direct service along US 2 between Burlington and Williston, and by a route between Williston and Essex Junction via VT 2A. Service along Industrial Ave is preserved for selected peak period trips, and certain trips extend east on US 2 to Williston Village (see below).



ROUTE 1 – Williston

Span: Weekdays 6:15 a.m. to 12:10 a.m.
Saturdays 6:15 a.m. to 12:10 a.m.
Sundays 8:15 a.m. to 6:55 p.m.

Frequency: 30-minute headway, except 15 minutes during peaks and alternating 30 and 40 on Sundays. Four round-trips to Williston Village offered on weekdays.

ROUTE 1E – Williston-Essex

Span: Weekdays 6:50 a.m. to 7:38 p.m.
Saturdays 6:50 a.m. to 7:28 p.m.

Frequency: 30-minute headway during peaks and 60-minute headway at other times.

ROUTE PROFILE: 56 Milton Commuter

Function: The Milton Commuter provides commuter service between Milton and Burlington via I-89 and US 7.

Span: Weekdays 5:55 a.m. to 10:40 p.m. with no service in the late morning, mid-afternoon, or early evening.

Frequency: 2 round-trips in each peak period (an hour apart) plus one midday round-trip and one evening round-trip

Ridership: Weekday (FY10 Average): 41

Productivity: Weekday boardings per trip: 7

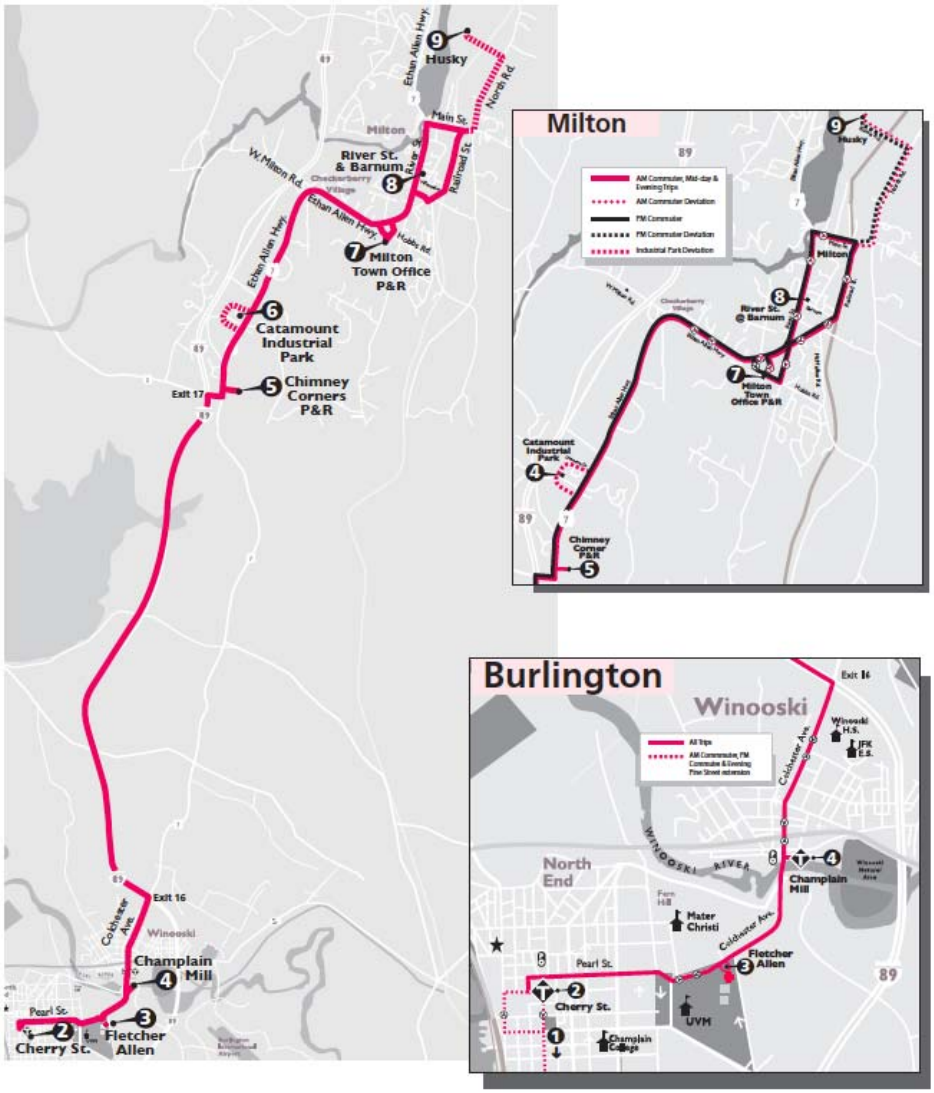
Top stops: Milton Town Office (12 boardings)
Cherry Street (10 boardings)
Fletcher Allen (6 boardings)
Chimney Corners (4 boardings)

Revenue: N/A

Gross Cost: N/A

Net Cost per passenger: N/A

Notes: This route was initiated in February 2010.



ROUTE PROFILE: 76 Middlebury LINK Express

Function: The Middlebury LINK provides commuter service along the US 7 corridor between Middlebury and Burlington.

Span: Weekdays 5:05 a.m. to 8:50 a.m. and 4:40 p.m. to 7:55 p.m.

Frequency: 2 trips in each direction in each peak period (an hour apart in the morning and 40 minutes apart in the afternoon)

Ridership: Weekday (FY09 Average): 90

Productivity: Weekday boardings per trip: 8

Top stops: Cherry Street (23 boardings)
Merchants Row (18 boardings)
Fletcher Allen (13 boardings)
Vergennes (9 boardings)
Ferrisburgh (8 boardings)

Revenue: $75,000 (est.)

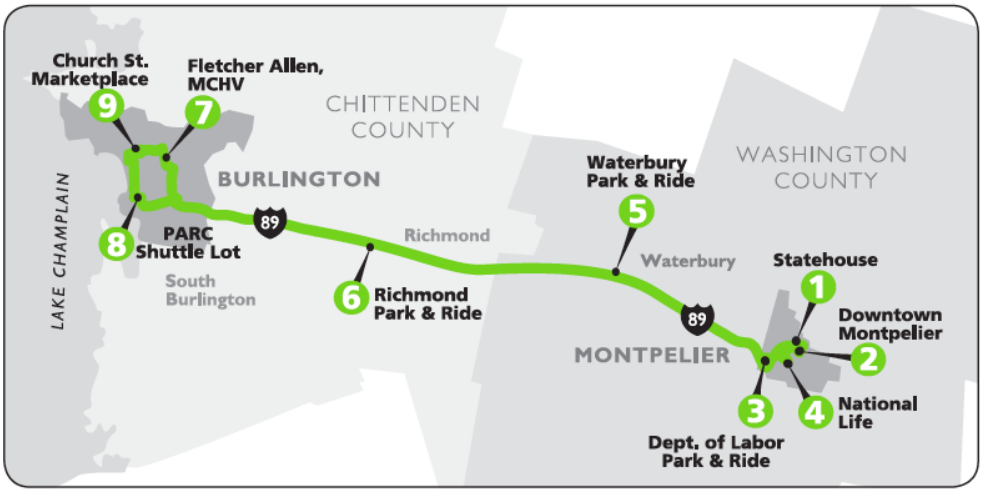
Gross Cost: $238,000 (est.)

Net Cost per passenger: $7.12

Notes: Addison County Transit Resources operates trips on Saturday on this route

ROUTE PROFILE: 86 Montpelier LINK Express

Function: The Montpelier LINK provides commuter service along the I-89 corridor between Montpelier and Burlington.



Span: Weekdays 5:42 a.m. to 8:55 a.m. and 4:02 p.m. to 7:30 p.m.

Frequency: 4 trips in each direction in each peak period (10-45 minutes apart in the morning and 30 minutes to an hour apart in the afternoon)

Ridership: Weekday (FY09 Average): 295

Productivity: Weekday boardings per trip: 20

Top stops: Fletcher Allen main entrance (70 boardings)
Cherry Street (61 boardings)
Waterbury Park & Ride (50 boardings)
Richmond Park & Ride (38 boardings)
Montpelier DET Lot (21 boardings)

Revenue: $176,000 (est.)

Gross Cost: $352,000 (est.)

Net Cost per passenger: $2.33

Notes: Service has been increased three times due to growing demand

ROUTE PROFILE: 96 St. Albans LINK Express

Function: The St. Albans LINK provides commuter service along the I-89 corridor between St. Albans and Burlington.

Span: Weekdays 5:45 a.m. to 8:35 a.m. and 4:50 p.m. to 7:20 p.m.

Frequency: 2 trips in each direction in each peak period (60 minutes apart in the morning and 40 minutes apart in the afternoon)

Ridership: Weekday (FY09 Average): 76

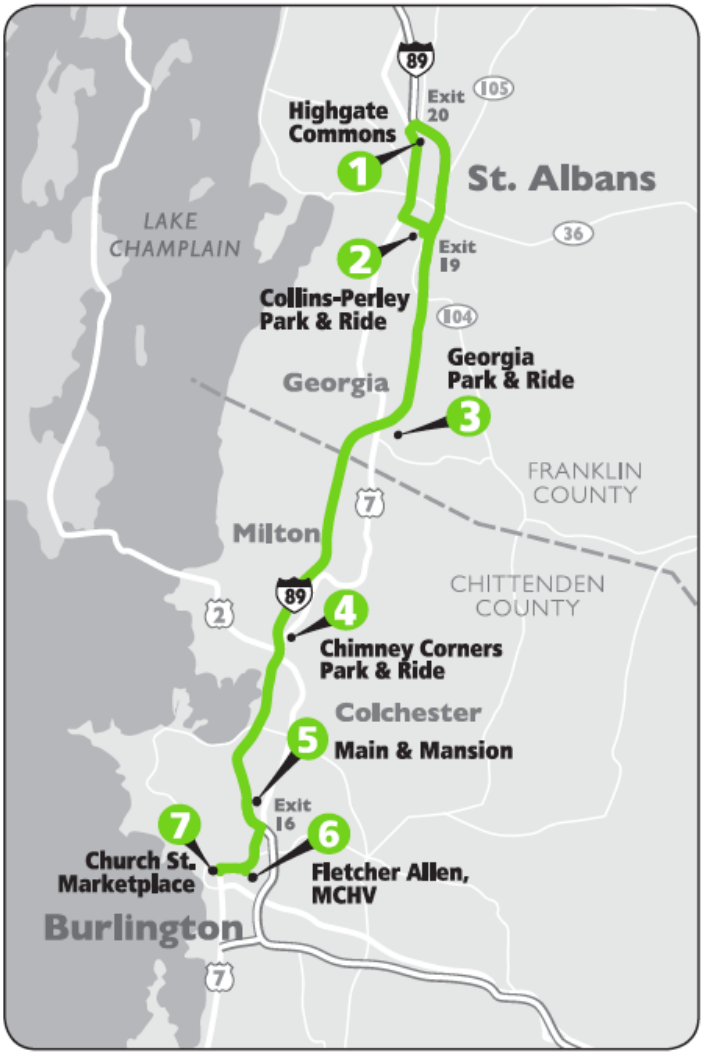
Productivity: Weekday boardings per trip: 9

Top stops: Cherry Street (18 boardings)
Fletcher Allen (17 boardings)
Collins-Perley Park & Ride (16 boardings)
Georgia Park & Ride (9 boardings)
Highgate Commons (8 boardings)

Revenue: $68,000 (est.)

Gross Cost: $187,000 (est.)

Net Cost per passenger: $6.15



ROUTE PROFILE: Neighborhood Specials

Function: CCTA operates a series of Neighborhood Special routes to transport students to and from school within its service area. These routes are also open to the general public.

Span: Weekday morning runs between 7:00 a.m. and 8:00 a.m. and afternoon runs between 2:00 p.m. and 3:30 p.m.

Frequency: One trip per Special in each direction

Ridership: All routes combined (FY09 Average) 707

Productivity: Boardings per revenue hour : 71

Top stops: n/a

Revenue: $108,000 (est.)

Gross Cost: $211,000 (est.)

Net Cost per passenger: $0.57

Notes:

ROUTE PROFILE: Shopping Shuttles

Function: CCTA operates three shopping shuttles on Tuesdays. These provide access to the Price Chopper to residents of Burlington and Winooski, and to the Hannaford for residents of South Burlington. This service is primarily intended for seniors.

Span: Tuesdays approximately 9:00 a.m. to 12:00 p.m.

Frequency: One round trip for each shuttle

Ridership: Price Chopper Burlington (FY09 Average): 64
Price Chopper Winooski (FY09 Average): 40
Hannafords (FY09 Average): 44

Productivity: Tuesday boardings per revenue hour : 48

Top stops: n/a

Revenue: $4,000 (est.)

Gross Cost: $40,000 (est.)

Net Cost per passenger: $5.99

Notes: Hannaford pays for 20% of its route cost with the rest paid for by federal E&D funds. Price Chopper pays for the cost of its shuttle.