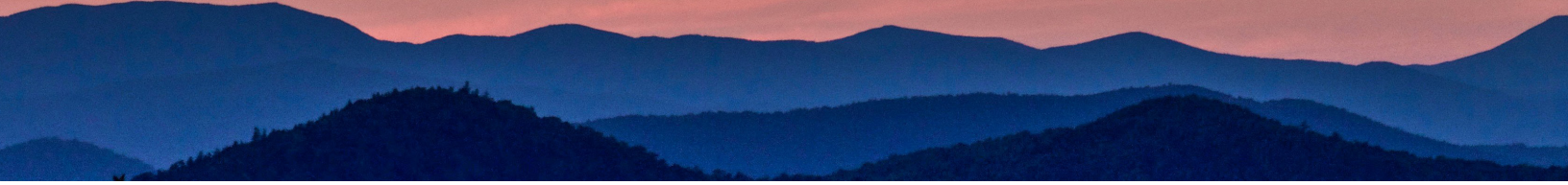

CHITTENDEN COUNTY RPC
Communities Planning Together

ECOS 2023

METROPOLITAN TRANSPORTATION PLAN

Prepared by
Chittenden County Regional
Planning Commission

Issued
March 31, 2023

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Introduction

The Chittenden County Regional Planning Commission (CCRPC) serves as the region's federally designated Metropolitan Planning Organization (MPO) and is responsible for comprehensive and collaborative transportation planning involving municipalities, state and federal agencies and other key stakeholders in Chittenden County. The CCRPC works to ensure implementation of the regional transportation plan and provides technical and planning assistance to its member municipalities, and the Vermont Agency of Transportation (VTrans).

As a designated MPO, the CCRPC oversees transportation planning and programming of the Federal-aid Highway Funds designated for the Chittenden County and is required to prepare and update the following planning documents that detail the investments and planning activities in the region. These include:

Metropolitan Transportation Plan (MTP): Updated every five years, the MTP sets out a vision for the development of the region's transportation

What is an MPO?

The U.S. Department of Transportation requires every metropolitan area with a population of over 50,000 to establish a designated Metropolitan Planning Organization (MPO) to qualify for the receipt of federal highway and transit funds.

infrastructure over the next twenty years. It includes goals and objectives, analysis of regional trends and planned improvement projects throughout the county in all modes of transportation. The MTP is the primary tool that the CCRPC uses to plan for transportation needs within the metropolitan area and recommend solutions based on anticipated funding availability over a minimum 20-year horizon.

Transportation Improvement Program (TIP): The TIP is a prioritized, fiscally constrained, and multi-year list of federally funded, multimodal transportation projects and operations in Chittenden County. The TIP must cover at least a four-year program of projects and be updated no less frequently than every four years. In addition, projects in the TIP must be prioritized at the regional level and have clearly identified funding sources. All transportation projects, programs, and operations receiving federal funds in Chittenden County must be authorized through the CCRPC TIP process. The exceptions are federal airport funds for Burlington International Airport, which are not subject to the CCRPC's prioritization process, but are listed in the TIP for information and coordination purposes.

Unified Planning Work Program (UPWP): Updated annually, the UPWP summarizes the transportation and other planning activities of the CCRPC Transportation planning staff, its member agencies and other transportation and planning agencies conducting work in the region.

Public Participation Plan (PPP): The PPP establishes a methodology for effective public involvement and lays out the steps the CCRPC will take to reach out and involve residents in decisions affecting land use and transportation policies and investments in Chittenden County. The latest PPP was adopted in 2014 and amended in 2017. The CCRPC is planning to update the plan in 2023/2024.

About the Metropolitan Transportation Plan

The MTP is the region's principal transportation planning document that sets the regional transportation vision and goals. It includes strategies and projects that address transportation needs that lead to the development of an integrated, intermodal transportation system that facilitates the efficient movement of people and goods; and support livable, equitable, and healthy communities.

As mandated by federal regulations, the MTP must both articulate and work towards the region's comprehensive long-range land use plans, development objectives, and overall social, economic, environmental, system performance and energy conservation goals and objectives. It should also be consistent with the statewide transportation plan. The MTP looks out a minimum of 20 years into the future and is updated every five years. Development of the MTP requires extensive outreach and engagement with partners, interested parties, and the public.

Federal regulations per 23 CFR 450.324(f) mandate that the MTP includes, at a minimum, the following:

1. The current and projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan.
2. Existing and proposed transportation facilities (including major roadways, public transportation facilities, intercity bus facilities, multimodal and intermodal facilities, nonmotorized transportation facilities (e.g., pedestrian walkways and bicycle facilities), and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions over the period of the transportation plan.
3. A description of the performance measures and performance targets used in assessing the performance of the transportation system.

4. A system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets.
5. Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.
6. Assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure, provide for multimodal capacity increases based on regional priorities and needs, and reduce the vulnerability of the existing transportation infrastructure to natural disasters.
7. Transportation and transit enhancement activities, including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner and strategies and investments that preserve and enhance intercity bus systems, including systems that are privately owned and operated, and including transportation alternatives and associated transit improvements, as appropriate.
8. A discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan. The discussion may focus on policies, programs, or strategies, rather than at the project level. The MPO shall develop the discussion in consultation with applicable Federal, State, and Tribal land management, wildlife, and regulatory agencies. The MPO may establish reasonable timeframes for performing this consultation.
9. A financial plan that demonstrates how the adopted transportation plan can be implemented.
10. Pedestrian walkway and bicycle transportation facilities in accordance with 23 U.S.C. 217(g).

The MTP is part of the overall metropolitan transportation planning process and therefore must provide for consideration and implementation of projects, strategies and services that will address the following factors:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation;
10. Enhance travel and tourism.

The 2023 MTP incorporates by reference two plans that were adopted by the CCRPC Board. These are: 1) Regional Active Transportation Plan adopted January 18, 2023; and 2) 2022 Regional Park and Ride Plan adopted October 19, 2022.

Our Region
at a glance

Founded in 1787, Chittenden County is located in northwestern Vermont between Lake Champlain to the west, and the highest peaks of the Green Mountains to the east, most prominently Mount Mansfield, Vermont's highest mountain.

Across nearly 350,000 total acres, Chittenden County offers a rich diversity of landscapes, including forests, farms, orchards, bodies of water, small cities and towns, suburban areas, and villages. The natural environment provides many year-round recreational opportunities, including bicycling, swimming, boating, hiking, skiing, and many other activities.

Chittenden County is nationally recognized for its outstanding quality of life. Nearly 169,000 residents live throughout 19 municipalities, with populations that range from as small as 43, to almost 45,000. Located in the heart of the Burlington/South Burlington Metropolitan Statistical Area, Chittenden County is the economic engine of Vermont, and home to the state's largest higher education institution, health care facility, and private sector employer.

Population & Diversity

From 2010 to 2020, the total population in Chittenden County grew from 156,545 to 168,323, an increase of 7.5%. The population of people who identify as white alone remained the largest race or ethnicity group, but increased by only 0.3% (32 people). The majority of people who moved into the county identified as Hispanic (of any race), Black or African American, Asian, American Indian, or Native Hawaiian (11,746 people, or 99.7% of the growth).

Smart Growth

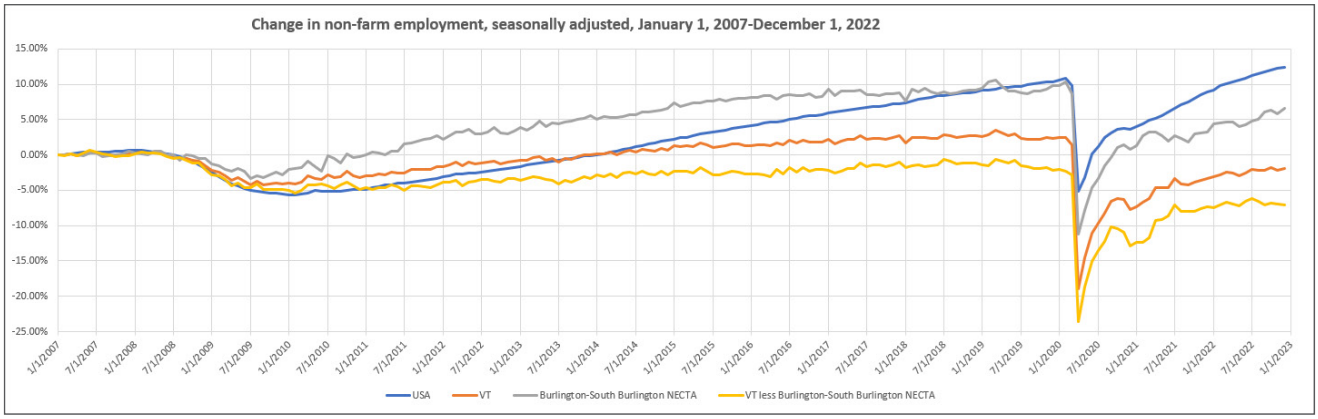
While development in existing communities can be difficult, infill in the right places can foster inclusivity, and contribute to economic strength. The most recent land use data (2016-2020) indicates that Chittenden County has exceeded its 2018 ECOS Plan goal of 80% of development occurring in planned growth areas, as 87% of new development has gone into these areas.

Employment

As of December 2022, fewer people worked in Chittenden County than before the COVID-19 pandemic (95.247 employees, compared to 98,208 as of February, 2020). Meanwhile, the labor force sits at 97,205 individuals (was 100,010 in February, 2020). The number of unemployed individuals has declined to a very low 2% unemployment rate (as of December 2022). These data reflect what has been deemed nationally as the "great resignation," with people leaving jobs to pursue new opportunities, or manage personal needs. See Local Area Unemployment Statistics, December 2022 Report for more information.

The following employment graph shows employment recovery from the lows of the pandemic, which is still returning to the level of pre-pandemic employment. The region and the state continue to lag behind the national recovery.

Figure 1: Change in non-farm employment 2007-2022



Source: All Employees, Total Nonfarm, Thousands of Persons, Monthly, Seasonally Adjusted; Federal Reserve Economic Data

Transportation
vision and goals

A regional transportation system that is safe, efficient, reliable, and resilient; provides for interconnected and sustainable mobility choices for livable, equitable, and healthy communities; supports regional and municipal land use goals; addresses the climate crisis; and strengthens the economy of the region.

GOALS & OBJECTIVES

Safety: Enhance safety for all who use the transportation system, and reduce the number of fatalities and serious injuries.

- ❍ Address safety issues at High Crash Locations (HCLs) in the county.
- ❍ Use a Safe System Approach to planning that considers all elements of a safe transportation system to addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes.

Livable and Healthy Communities: Promote compact growth, and invest in a multimodal transportation system that supports livable, equitable, vibrant, and healthy communities.

- ❍ Encourage smart growth, with 90% of new housing built in areas planned for growth (see Map 1).
- ❍ Improve transit services in the county, and encourage housing growth along transit trunk routes.

- Improve public health by implementing complete streets to provide for safe, interconnected, and efficient walking and biking networks, as well as viable and convenient transit options.

Mobility and Efficiency: Improve the efficiency, reliability, and connectivity of the transportation system for users of all ages and abilities, regardless of their mode of transportation.

- Create a safe and efficient multimodal network that supports a shift from single occupancy vehicle (SOV) travel to other modes, and an overall reduction in vehicles miles traveled (VMT) in the county.
- Expand walking and biking infrastructure, and provide interconnection with the region's transit system.
- Improve transit services in the county and beyond.
- Support Transportation Demand Management (TDM) programs and partners.
- Improve operational efficiency, manage recurring congestion, and maintain reliable travel times on our transportation system.

Equity: Incorporate equity in all aspects of transportation planning and programming in the county.

- Prioritize transportation investments and land use policy changes that benefit rather than burden Title VI and Environmental Justice (EJ) communities.

- Engage people from historically excluded and traditionally underserved populations in meaningful conversations, and facilitate their participation in transportation planning processes.
- Incorporate recommendations from the VTrans Transportation Equity Framework.

Environment and Resilience: Establish a resilient transportation system that minimizes climate impacts that result from the transportation sector.

- Reduce greenhouse gas emissions associated with fossil fuels used in transportation to meet state and regional targets by promoting a shift away from gas/diesel to electric vehicles and/or other low emission fuel options.
- Minimize the effects of transportation on water quality.
- Improve the ability of our transportation network to withstand and recover from extreme weather events.

Economy: Improve the transportation network to promote economic vitality in the region.

- Invest in the transportation system to support anticipated economic growth in the county.
- Accommodate the movement of freight and goods in identified freight hubs and intermodal facilities.
- Consider economic equity when making investment decisions.

Existing Transportation System: Preserve the condition and performance of the existing multimodal transportation network.

- Maintain the transportation system in a state of good repair.

Land Use

PLANNING AREAS

The Comprehensive Regional Plan (2018 ECOS Plan) uses the Planning Areas concept to identify places that share similar features and future planning goals, and reflect current municipal zoning. The Planning Areas aim to describe the appropriate type of future growth expected in each area. However, local zoning, and local and state permitting, determine the exact uses and densities allowable.

The six base Planning Areas depicted on the Land Use Plan Map (see Map 1) include **Center, Metro, Suburban, Village, Rural,** and **Enterprise.** A brief description of each follows.

Center Planning Areas are intended to be regional centers or traditional downtowns that serve the county and beyond. These areas contain a mix of jobs, housing, and community facilities, as well as the county's highest density and largest-scale developments. They may also contain a state designated New Town Center, Growth Center, Tax Increment Financing District, or high-density Village Center.

Metro Planning Areas are areas where local zoning authorizes places to accommodate jobs and housing in a compact development pattern that supports transit service, encourages pedestrian activity, and are within the sewer service area. Commercial land uses found in Metro Planning Areas are intended to serve nearby residential areas.

Suburban Planning Areas are areas near a Center Planning Area, Metro Planning Area, Village Planning Area, or Enterprise Planning Area. In Suburban Planning Areas, local zoning authorizes future development to occur at scales, densities, and uses compatible with existing development, and with generally low residential density.

Enterprise Planning Areas are areas where local zoning authorizes a future concentration of employment uses that attract workers from the county and multi-county region. Development in Enterprise Planning Areas should have adequate wastewater capacity, and access to transit. Typically, these areas encompass major employers, or a cluster of employers, and have current or planned transit services.

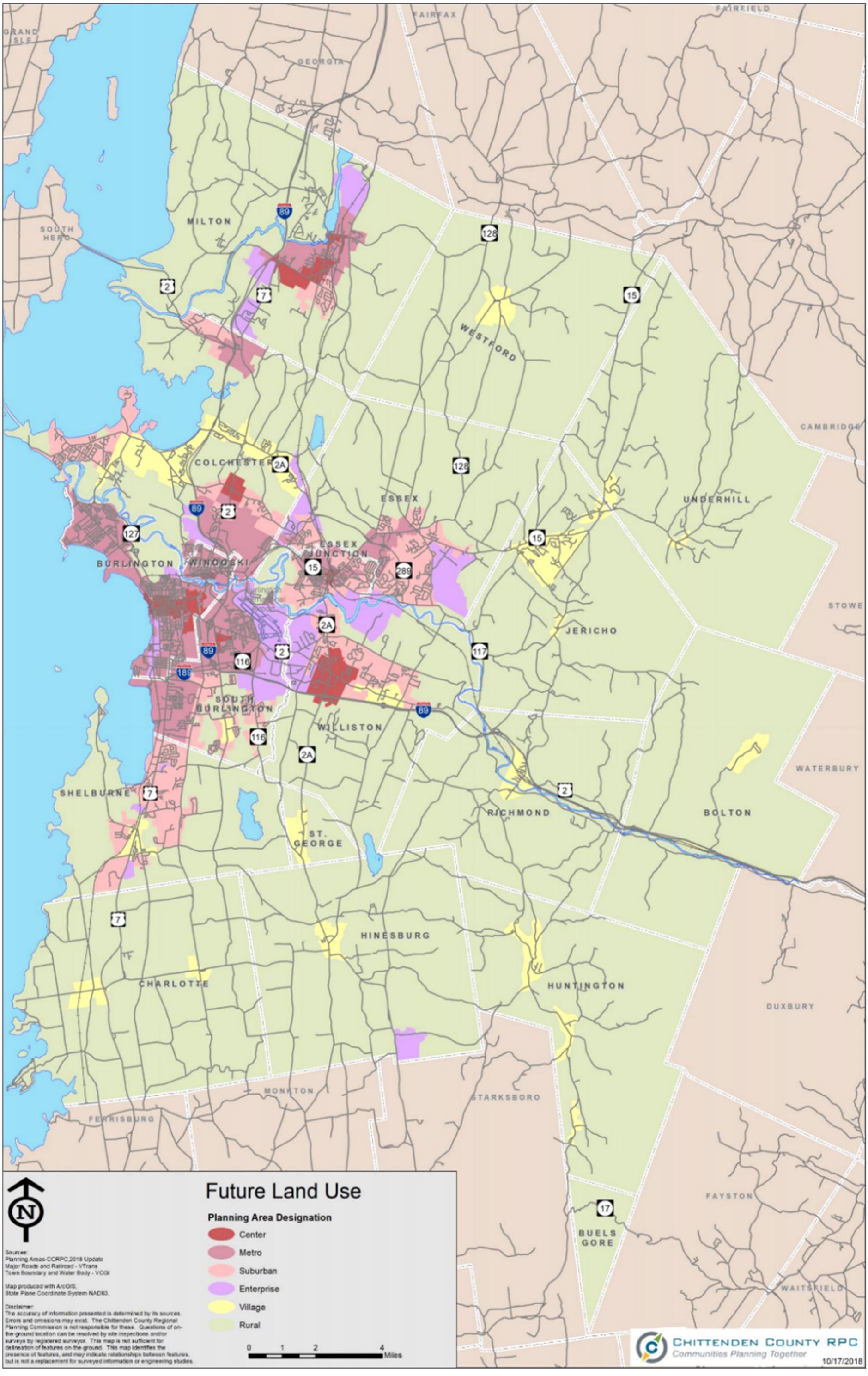
Village Planning Areas are areas where local zoning authorizes a variety of future residential and nonresidential development at densities and scales that keep with the character of a Vermont village. Village Planning Areas are intended to serve their local surroundings as places where people can live, work, shop, and enjoy recreation.

Rural Planning Areas promote the preservation of Vermont's traditional working landscape and natural area features. They provide for low density commercial, industrial, and residential development compatible with working lands and natural areas, so they may continue to highlight the rural character and self-sustaining natural area systems. Development in Rural Planning Areas typically occurs outside the sewer service area.

Land Use Goal

The major land use goal of the 2018 ECOS Plan was to strive for 80% of new development in areas planned for growth. This amounts to 15% of Chittenden County's land area. The most recent land use data (2016-2020) indicates that we are exceeding this target, with 87% of new development going into areas planned for growth.

MAP 1: Land Use (2018 ECOS Plan)



Metropolitan Transportation System

Chittenden County's Metropolitan Transportation System (MTS), a vast, multi-modal network, is critical to the movement of people and goods in the region. It includes highways, transit services, traffic signal systems, rail lines and stations, walk/bike facilities, park-and-ride facilities, the Burlington International Airport, and other intermodal facilities. This system is eligible for federal transportation funding investment. Map 2 depicts the existing Chittenden County MTS.

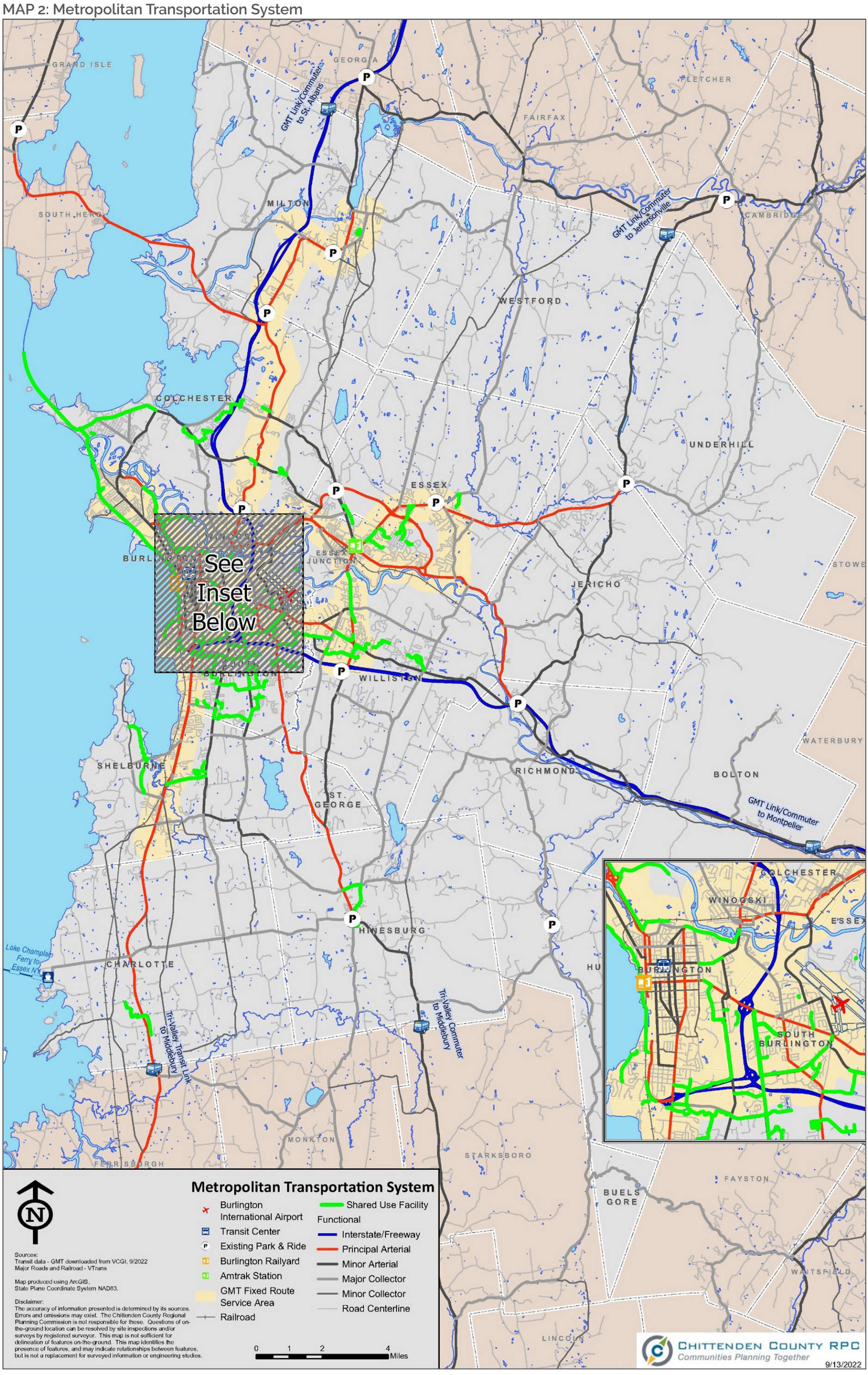
HIGHWAYS

Highways are classified under one of five distinctions: Interstate Highways, Principal Arterials, Minor Arterials, Major Collectors, and Minor Collectors. This system is organized as a hierarchy of facilities based on the degree to which a roadway facility serves mobility and access to adjacent land uses.

Interstates and Arterials make up less than 19% of county road mileage, yet carry 69% of all vehicle miles traveled (based on VTrans 2020 VMT data). While not addressed in this plan, local roads are also an important part of the road network in Chittenden County. Owned and maintained by the municipality in which they exist, local roads are generally not eligible for federal transportation funding investment.

The pavement conditions of Chittenden County's interstates and arterial highways have improved significantly in the last decade. In 2013, more than 50% of arterials received a poor or worse rating in terms of pavement condition. In contrast, only 26% of arterials received poor or worse ratings in 2021.

MAP 2: Metropolitan Transportation System



A total of 180 bridge structures of at least 20 feet in length exist in Chittenden County. Of these, the state owns 85, while local governments own 95. State and local municipalities also own and maintain many other bridges and structures that are less than 20 feet long. Nearly all state-owned bridges that exceed 20 feet in length exist on major highways (Principal Arterials and Major Collectors). The majority of municipally owned bridges that extend 20 feet or longer exist on less heavily traveled highways (Minor Collectors and local roads).

Every two years, VTrans evaluates the condition of all bridges that exceed 20 feet in length on public roadways. The latest evaluation shows that 3% (5 of 180) of Chittenden County bridges are in poor condition (a sufficiency rating below 50). This is a marked improvement from 2010, when 18 bridges were in poor condition. The most recent evaluation also shows that nearly half of all bridges (88 of 180) are in fair condition (a sufficiency rating between 50 and 80), while the remaining 87 bridges are in good condition (a sufficiency rating above 80). These findings indicate that rehabilitation may be necessary for 93 bridges that rated either poor or fair.

Even with substantial investments in the transportation system in recent years, and the significant increase in funding from the 2021 Infrastructure Investment and Jobs Act (IIJA), transportation funding remains overly reliant on state and federal gas taxes. These taxes are decreasing in value as inflation lowers purchasing power, while revenues decline on account of greater fuel efficiency, plus more electric and hybrid vehicles on the road. Going forward, the county will require more sustainable and dependable sources at federal and state levels to fund the preservation, improvement, and expansion of our multimodal transportation system.

ACTIVE TRANSPORTATION FACILITIES

Active transportation facilities create opportunities to increase physical activity, support healthy communities, enhance economic development, and promote environmental sustainability. Communities that support walking and biking provide transportation access to all residents, regardless of age, gender, or socioeconomic status.

Chittenden County has a range of dedicated transportation facilities to accommodate bicyclists, pedestrians, and other physically active forms of transportation. Sidewalks, bike lanes, and shared use paths are concentrated in and around the metropolitan core. Non-dedicated facilities for non-motorized and motorized users are located throughout the region as well. Dedicated and non-dedicated facilities can also be used by e-bikes and scooters, increasingly popular transportation options for all trip types.

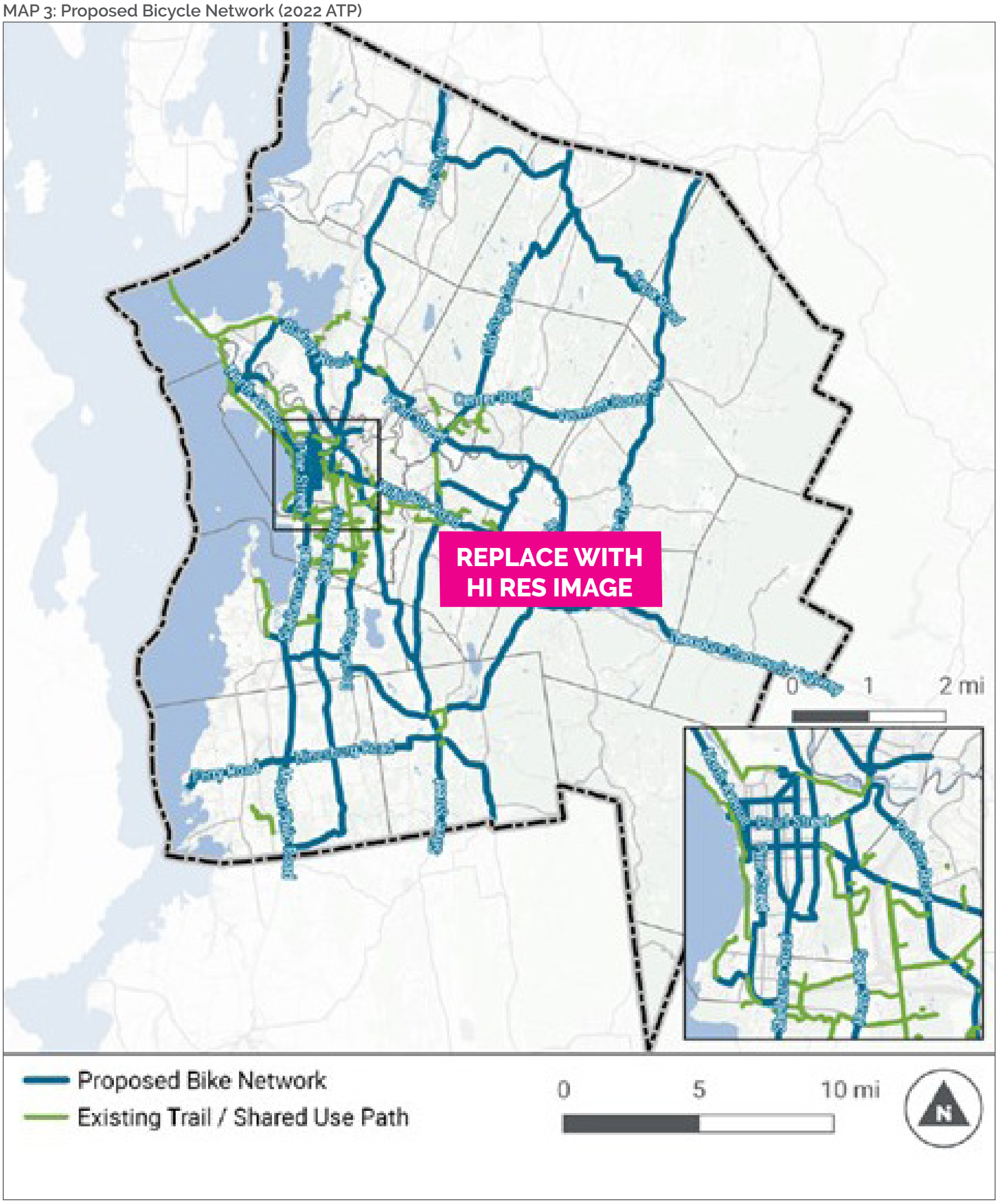
According to ECOS Scorecard data, since the last comprehensive inventory in 2008, there has been an increase in shared use path mileage. Most shared use paths were recently built, and remain in good condition. Plus, nearly 404 miles of sidewalks exist in Chittenden County. These mileage figures are expected to increase as planned bicycle and pedestrian projects continue toward implementation.

Since 2012, 14 Chittenden County municipalities have received more than $21 million for planning, design, and/or construction of nearly 60 new bicycle and pedestrian projects. The majority of funding came through two VTrans programs: Transportation Alternatives, and the Bicycle & Pedestrian Program.

Community support for non-motorized facilities remains substantial, per more than 20 years of survey data. In fact, these facilities have rated second highest, behind only transportation system maintenance, on the list of desired transportation improvements. The next iteration of this survey, planned in 2023, will evaluate transportation-related attitudes and opinions of Chittenden County residents.

The CCRPC has regularly updated its regional Active Transportation Plan (ATP). The most recent plan was adopted by the CCRPC Board at their January 18, 2023 meeting. The updated ATP identifies its goal as creating a safe, comfortable, and connected regional network of pedestrian and bicycle routes that appeal to all ages and abilities.

MAP 3: Proposed Bicycle Network (2022 ATP)



After a robust public input process, detailed conditions assessment, and a Level of Traffic Stress model analysis, the ATP outlines recommendations for non-infrastructure and infrastructure improvements that will enhance network connectivity for active transportation in the county. The ATP recommendations focus on priority corridors, as opposed to defining detailed facility types in specific places.

The proposed countywide bicycle network in the 2022 ATP includes approximately 200 miles of streets that would allow users of all ages and abilities to traverse the county on comfortable bicycle facilities (Map 3). It includes routes along specific roadways, and regional trails that create a logical and convenient network to improve connectivity across the county.

Education and encouragement are keys to getting more people walking and biking. CCRPC supports the work of Local Motion, a non-profit organization, to host public events, workshops, and trainings, and to provide technical assistance to businesses and municipalities to support and promote walking and biking as convenient, affordable, and safe transportation options.

PUBLIC TRANSIT OVERVIEW

In Chittenden County, Green Mountain Transit (GMT) offers fixed transit routes, local commuter routes, LINK Express routes, and ADA paratransit services. GMT currently serves the communities of Burlington, Essex, South Burlington, Shelburne, Williston, Winooski, Milton, Hinesburg, and a portion of Colchester. LINK Express routes serve commuters in Montpelier, Middlebury, and St. Albans.

GMT is considered a municipality, and is also the only transit authority in Vermont. It provides shuttles from senior housing complexes to local supermarkets, and neighborhood specials for student transportation to Burlington schools. It also provides Americans with Disabilities Act (ADA) paratransit services for persons unable to use the GMT fixed route bus system because of a disability.

These services are currently contracted out to the Special Services Transportation Agency (SSTA). Paratransit services are required to be provided for areas within three-quarters of a mile of each non-commuter fixed transit route. Following the development of GMT's 2017 NextGen Transit Development Plan, planning staff is working to update the Transit Strategic Plan (TSP).

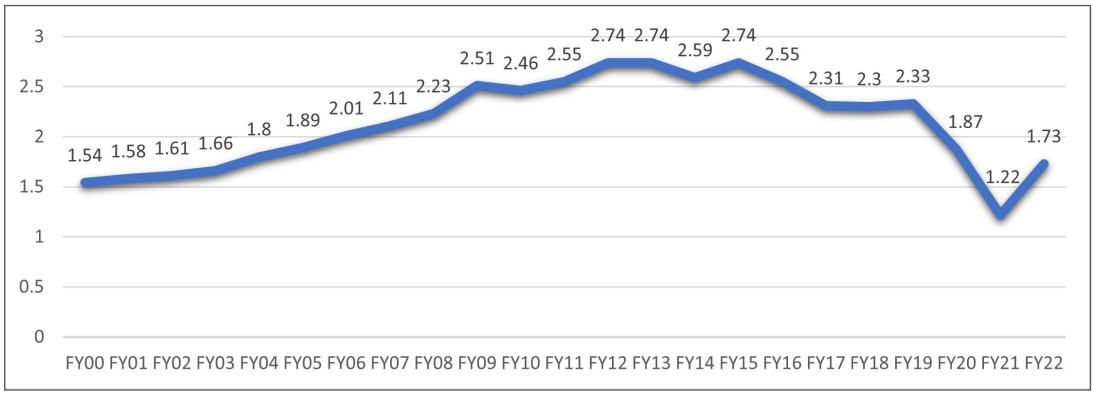
The updated TSP will set the groundwork for potential changes to procedures and policies that will guide long-range transit planning efforts in our region. The TSP will address a number of focus areas, including: service excellence; financial stewardship and cost-effective operations; public engagement and improved regional quality of life; fairness and inclusion; environmental sustainability; and a high-performing workforce.

Public Transit Ridership

According to the 2020 VTrans Public Transit Route Performance Report, 46% of all public transit trips in Vermont originated in Chittenden County. While access to public transit has improved in the greater Burlington area, some suburban, and most rural populations lack access to transit.

Figure 2 illustrates the steady increase in GMT ridership from 2000 to 2015, followed by the downward trend starting in 2015. This trend matches the overall national trend, due in large part to lower gasoline prices.

Figure 2: GMT Ridership in Chittenden County, 2000-2022 (millions)



Source: GMT

In the past, public transit service in Chittenden County had served mostly non-driving segments of the population, including low income, zero vehicle households, seniors, and children. The transit services were limited in their ability to attract people who had access to cars. In recent years, GMT has made significant strides to improve passenger amenities and services, such as onboard Wi-Fi, 20-minute frequencies at peak times on select local routes (e.g. VT 15, US 2, North Avenue, and Shelburne Road), and enhanced multimodal coordination. In addition, GMT's entire fleet is equipped with bike racks to encourage multimodal transit.

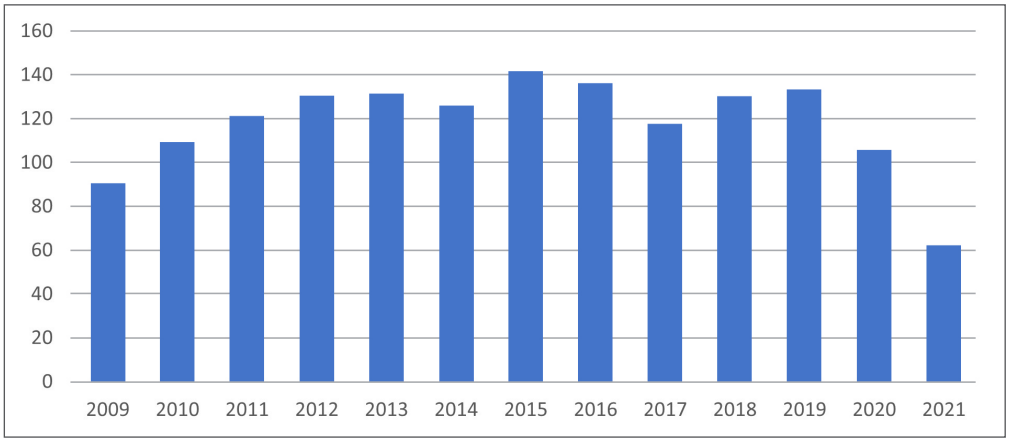
As with most national transit operations, the COVID-19 pandemic had a dramatic impact on GMT's operations. During the pandemic's peak, GMT provided 1.22 million trips in Chittenden County, a 48% decrease compared to the 2.33 million trips directly prior to the start of the pandemic (late 2019).

In response to the pandemic, GMT began to offer fare-free transit service to help members of the public access essential services. By 2022, GMT ridership bounced back from pandemic lows, with 1.73 million trips provided in Chittenden County. With the support of state and federal funding, GMT will continue to operate fare-free transit through at least June 2023, while avoiding major service cuts.

Special Transit Services

The Special Services Transportation Agency (SSTA), a private, non-profit organization, provides Americans with Disabilities Act (ADA) paratransit services, and Elders and Persons with Disabilities (E&D) transportation services for those who are unable to use the GMT fixed route bus system. Many individuals have difficulty using conventional modes of transportation, such as cars and buses, due to physical or intellectual disabilities. This critical service gives elders and persons with disabilities transportation they need for social interaction, job training and employment, medical services, therapy and more. SSTA also provides coordinated transportation service to many human service agencies in the area, including Visiting Nurse Association's Adult Day Programs, Champlain Senior Center (an important meal site for many Burlington elders), Howard Community Health Services, Age Well, and others.

Figure 3: Number of Trips Provided by the Special Services Transportation Agency (thousands)



Source: SSTA

Intercity Bus

Three carriers provide intercity bus services in Chittenden County, carrying passengers on fixed routes and schedules: Greyhound Lines, Megabus, and Vermont Translines. Greyhound runs two daily trips between Montreal and Boston, with stops in White River Junction, Montpelier, Burlington International Airport, and GMT's Downtown Transit Center. Megabus connects Burlington (at the Downtown Transit Center) to Montpelier and Boston with one trip daily. Vermont Translines is the most recent addition to local intercity bus options. Founded in 2013 by Premier Coach, and funded in part by VTrans, Vermont Translines offers a service along the Route 7 corridor to Albany, New York, and currently has three Chittenden County pickup and drop-off locations: Colchester, Burlington, and South Burlington.

RAIL

Passenger Rail

Passenger rail service available in Chittenden County consists of Amtrak's Vermonter, and Ethan Allen Express services. The Vermonter service runs daily between Washington, D.C., and St. Albans, with numerous stops (including Baltimore, Philadelphia, and New York City). In Vermont, it stops in Essex Junction, Brattleboro, White River Junction, Montpelier, Waterbury, Bellows Falls, and St Albans. Table 1 provides the most recent history of ridership on this service. Amtrak ridership increased steadily during pre-pandemic years (the exception being 2016). The COVID-19 pandemic resulted in a significant reduction in ridership; only 18,585 riders took the Vermonter in 2021. Ridership is expected to gradually return as the pandemic ends.

Table 1: Amtrak Vermonter Ridership

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
77,783	82,086	84,109	89,640	92,699	89,318	96,000	97,909	99,280	N/A (service suspended)	18,585

VTrans worked for many years to extend the Ethan Allen Express train, which had previously operated between Rutland and New York City, by way of Albany, north to Burlington. The state leveraged more than $115 million in state and federal funds to restore this Amtrak service to Burlington's Union Station, and completed this project in 2022, with daily service launching at the end of July. In addition to Burlington, the extended route also has stops in Middlebury and Vergennes.

Planning has been underway for several years to extend Amtrak's Vermonter service north to Montréal. While a number of obstacles remain, officials in Vermont and Quebec are optimistic that this service will be available within

the next few years. The 2021 Vermont Rail Plan detailed how the Amtrak connection to Montréal would have the largest potential positive impact on rail ridership of any of the passenger scenarios analyzed in the report. This rail connection is highlighted as a First Tier Priority amongst statewide passenger rail recommendations.

Commuter Rail

No commuter rail service operates within Vermont. Over the past decade, a number of studies have evaluated the feasibility of commuter rail systems in our region, and throughout the state as a whole. The Northern New England Intercity Rail Initiative produced a 2016 study that examined a rail connection between Boston and Montreal, via Springfield, MA. In 2017, VTrans conducted a commuter rail feasibility study for the corridor between St. Albans, Essex Junction, and Montpelier. This also included connecting service to Burlington.

In 2022, the CCRPC was awarded a $2.1 Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant. The purpose of the grant is to complete a multi-year planning study to develop a comprehensive plan for transit-oriented development, and explore the feasibility of commuter rail and/or new transit opportunities across northwest Vermont.

PARK-AND-RIDE FACILITIES

Beginning in 2021, the CCRPC began updating the Chittenden County Park-and-Ride Plan. This plan identifies opportunities to improve existing facilities, and evaluates the potential for new facilities that will benefit commuters and residents throughout the county and adjacent communities. This updated plan developed a new vision and goals, and proposed new park-and-ride facilities in the county, taking into account new demand for these facilities, due to remote work, changes in travel behavior, and other factors.

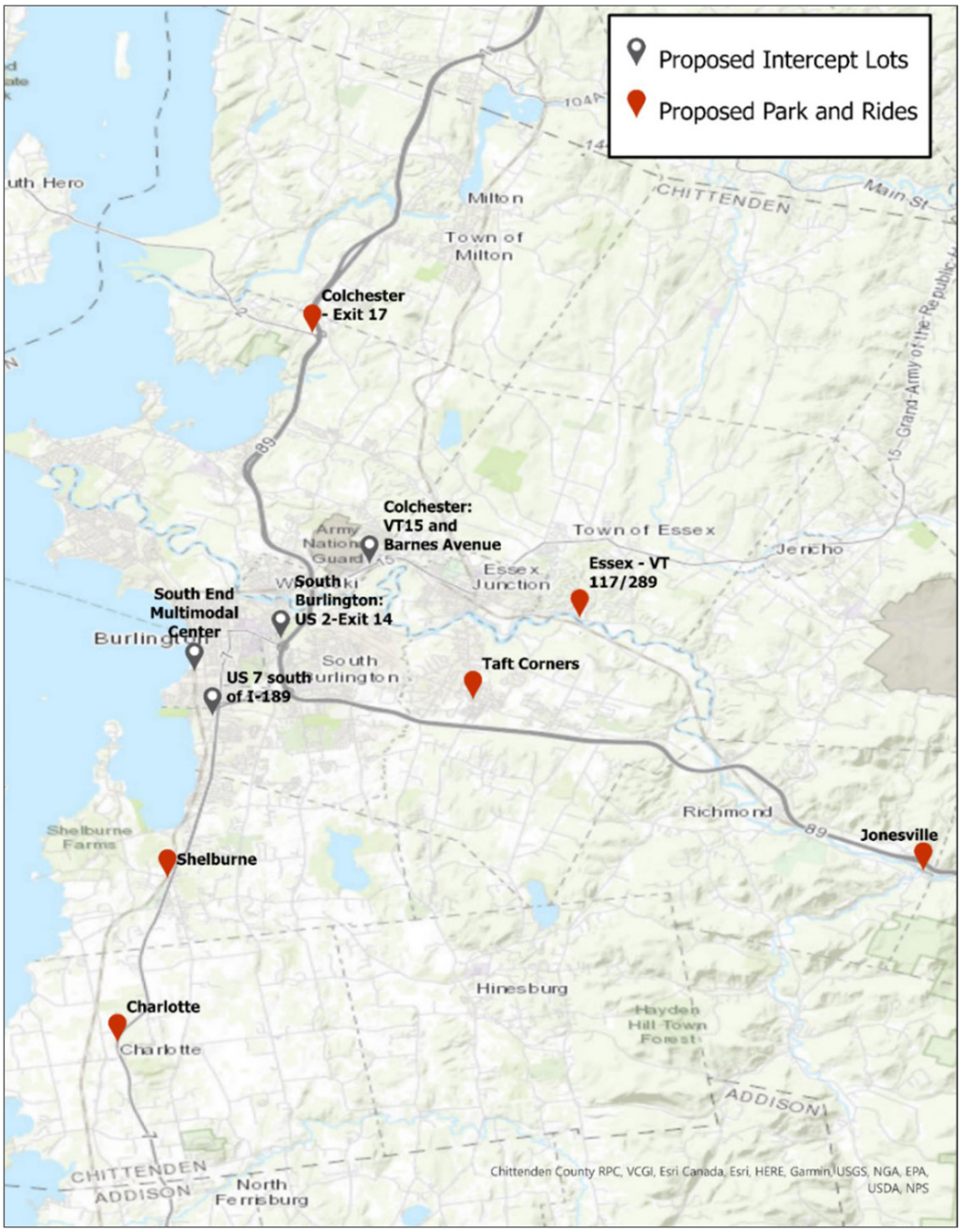
The vision statement of the 2022 plan calls for a comprehensive network of safe and accessible park-and-ride and intercept facilities that will allow for seamless, multimodal transportation connections, benefitting Chittenden County's residents, employees, and visitors. The network will enhance mobility for all users, support economic development, improve access to public transportation, and reduce single occupancy vehicle travel in support of transportation-related energy goals outlined in the 2018 ECOS Plan.

The plan considers facilities that are typically classified as park-and-rides or intercept facilities. Such facilities generally serve several different functions and types of users. While the terms "park-and-rides" and "intercept" are useful to explain facilities conceptually, individual facilities exist on a spectrum that includes elements of each type, shown in the figure below.

Park-and-rides are typically located closer to the origin of a trip (e.g. a home or residence), whereas intercept facilities are typically located close to the destination (e.g. employment center, shopping districts, etc.). Intercept lots are often located just outside an urban core, where parking is scarce. Users can leave their personal vehicles, and shift to high-frequency transit, bicycle, or even walking. A total of ten proposed facilities were identified in the plan, and are presented in Map 4.

The 2022 Park-and Ride Plan was adopted by the CCRPC Board at their October 19, 2022 meeting.

MAP 4: Proposed Park-and-ride Facilities



AIR SERVICE FACILITIES

Burlington International Airport (BTV) is the largest airport in the State of Vermont. Located in South Burlington, BTV is owned by the City of Burlington, and governed by an Airport Commission that oversees general airport operations and guides future development. Its major point of access is US 2 (Williston Road). Landside connections to the airport occur via private auto, taxi, rideshare services, a GMT fixed route service, and intercity bus via Greyhound Lines and Vermont Translines.

BTV is a vital link to the national air transportation system for the residents and businesses of northwestern Vermont, and northern New York State. A total of 93 aircraft are based at BTV, including general aviation and military aircraft, based on most recent data. According to the 2021 Airport Master Plan, multiple commercial airlines provide 31 daily departures directly serving 12 destinations from BTV.

The airport is home to UPS Air Cargo and FedEx Express commercial parcel carriers, two general aviation/fixed base operators, and two airframe and power plant maintenance facilities. BTV also hosts a unit of the Air National Guard fleet of F-35s, a National Guard Blackhawk helicopter air ambulance service, and a maintenance and repair facility for Blackhawks and F-35s.

Following a record high of 759,021 enplanements in 2008, BTV experienced a steady decline in passenger volumes through 2015. In 2016, enplanements gradually increased, reaching a peak of 705,165 in 2019. The COVID-19 pandemic contributed to lower enplanement numbers in the years that followed, with a total of 209,320 and 388,834 recorded in 2020 and 2021, respectively. As the pandemic ends, BTV expects a full recovery of enplanement numbers.

TRANSPORTATION DEMAND MANAGEMENT PROGRAMS

Transportation Demand Management (TDM) refers to a set of strategies that inform and encourage travelers to maximize the efficiency of the transportation system, leading to improved mobility, reduced congestion, and lower vehicle emissions.

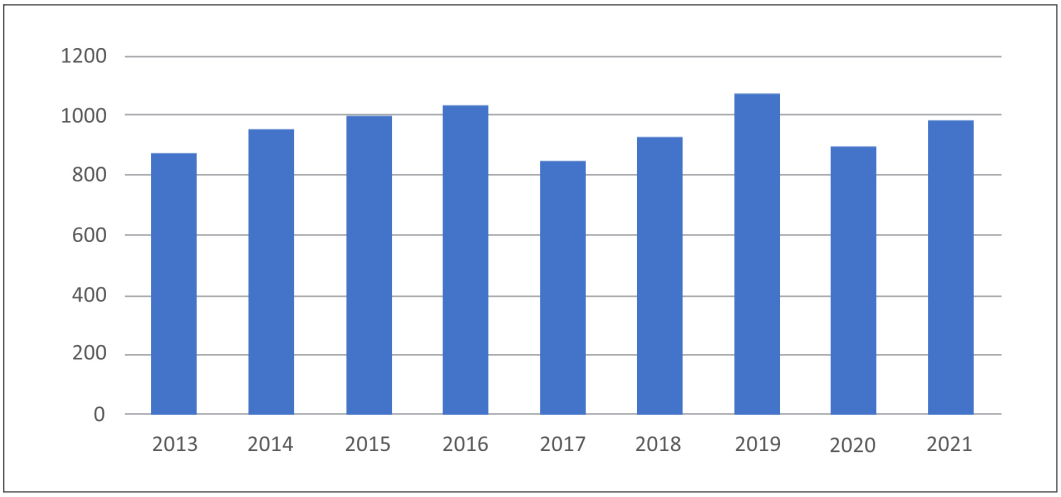
TDM programs could use tools such as planning, programming, policies, marketing, communications, incentives, pricing, and technology. Two organizations in the region have notable programs generally fitting this category: 1) CarShare Vermont, and 2) the Chittenden Area Transportation Management Association (CATMA). In addition, the Go! Vermont statewide program offers bus, train, ridesharing, ferry, and other information to help Vermonters and visitors plan trips in sustainable ways using non-single occupancy vehicles.

Beyond reducing roadway congestion, and providing multiple ways to get around, the impact of widespread TDM program implementation could significantly benefit Chittenden County municipalities by enhancing mobility, reducing dependence on fossil fuels, improving air quality, and supporting livable and healthy communities.

For instance, only 9.2% of Chittenden County workers currently work from home (2016-2020 American Community Survey). However, CCRPC's 2018 Transportation Survey revealed that more than 36% of Chittenden County employees work for employers that allow some level of working from home. Employers need encouragement and support to implement employee commute programs that influence individual transportation behavior and reduce SOV travel. This will subsequently help reduce congestion and parking demand, and minimize strain on our roadways.

CarShare Vermont, a non-profit organization founded in 2008, strives to provide an accessible and affordable carsharing service to reduce vehicle dependence and improve mobility. The organization's fleet of 22 vehicles exist at 22 unique locations throughout Burlington, near where its members live and work. Nearly half of this fleet includes electric and plug-in hybrid vehicles. These vehicles are available 24 hours a day, 7 days a week, and members can use them by the hour or day, paying based on time and mileage they drive. The organization provides comprehensive insurance, routine maintenance, roadside assistance, car washes, fuel (gas and EV charging), and parking.

Figure 4: Total Yearly Carshare VT Members, 2013-2021



CarShare Vermont helps hundreds of households reduce their vehicle ownership and vehicle miles traveled, save money, and lessen their impact on the environment. For every vehicle CarShare Vermont puts into service, 15 are removed from the road. In 2021, 76% of CarShare Vermont members reported shedding or avoiding purchasing a personal vehicle after joining. Carsharing is a mobility service that could benefit other Chittenden County communities. However, a lack of sustained funding to support operations makes it difficult for CarShare Vermont to expand its service area beyond Burlington.

CATMA is also a non-profit, membership-based organization. Formed in 1992, CATMA began as a joint effort between Champlain College, University of Vermont, and University of Vermont Medical Center. Their founding goal was to address, plan, and manage a viable, cost-effective, and sustainable transportation and parking network in and around Burlington's medical-academic campus district.

CATMA's joint structure provides coordinated land use planning, shared resources, and efficient delivery of a comprehensive transportation demand management program. CATMA's TDM program includes a number of perks, such as: bike-walk incentives; subsidized transit passes; membership discounts to shared mobility programs (e.g., CarShare Vermont); carpool and vanpool support; trip planning; guaranteed rides home (free taxi ride if needed); prize giveaways for participating in TDM programs; events; and educational activities.

CATMA regularly conducts employee and student transportation surveys to monitor trends, study program performance, and identify opportunities. In 2015, CATMA expanded to become a regional organization. Their mission is to work with members and community partners in planning safe, convenient, and economical transportation and parking, in order to minimize environmental impacts.

Go! Vermont, established in 2008 by VTrans, is a state-wide transportation demand management program that provides information about transit, carpooling, teleworking, bicycling, and walking. Go! Vermont has several programs designed to reduce single occupancy vehicle use through supporting and coordinating the use of other transportation options. Among these include the ride match program, which allows Vermonters to easily find rides and riders. The program had 7,350 members in mid-2022, up from 5,245 users in 2019. Commuters can also form groups, and have a van or SUV provided by Go! Vermont for a small monthly fee.

Additionally, the rides for veterans program specifically helps former service members find transportation, while the volunteer driver program coordinates volunteer opportunities for all transit agencies in the state. Go! Vermont's website provides access to the Go! Vermont trip planner. Users can explore routes to and from locations, carpooling options, and other types of transportation, including bus routes, bike paths, and walking paths.

Travel Trends
system performance, and issues

REGIONAL TRAVEL CHARACTERISTICS

Transportation planners and engineers often categorize travel as either peak or off-peak. Peak travel consists of trips that coincide with typical commutes (i.e. work in the early morning, or AM peak), and back home (PM peak), while off-peak trips occur the remaining hours of the day.

Peak period travel places the most strain on the transportation system, as high traffic volumes in shorter time periods result in greater congestion. While peak and off-peak trips put different demands on the transportation network, it is important to understand both conditions.

Chittenden County is the employment center of a larger area encompassing all of northwestern Vermont. Its economic and cultural impacts spread well beyond county boundaries. Data from 2019's U.S. Census Bureau's Longitudinal Employer-Household Dynamics show the following:

- An estimated 69,370 Chittenden County residents are employed within Chittenden County.
- Meanwhile, and additional 33,711 residents from neighboring counties come to Chittenden County for work.

Proximity and easy highway access to Chittenden County have long helped determined which towns in neighboring counties grow the fastest. For instance, Franklin County's fastest growing towns are those along the I-89 corridor, and/or bordering our northern municipalities; northern tier communities in Addison County have grown at faster rates than other towns; and in Lamoille County, the towns of Cambridge and Stowe have been two of the fastest growing communities.

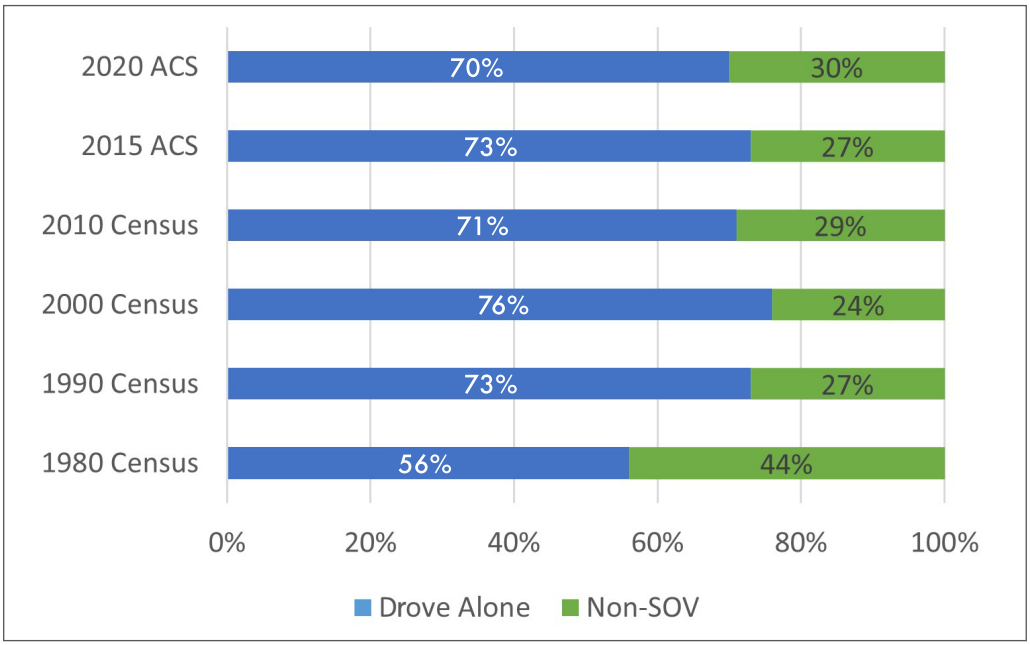
Figure 5 shows a slight increase over time in the number of people that work in Chittenden County but live elsewhere. This trend is based on various factors (housing affordability, highway accessibility, etc.) and directly impacts and exacerbates capacity issues on Interstate 89, especially between Exits 14 and 15, as well as other major highway arterials.

Figure 5: Where Chittenden County Employees Live

Source: LEHD

Between 1980 and 2020, the rate of driving alone to work (commuting in a single occupancy vehicle, or SOV) in Chittenden County increased from 56% to 70%, according to the latest American Community Survey (ACS) 5-Year Estimate. When comparing data from the 2015 and 2020 ACS 5-year estimates, the percent of workers commuting alone fell from 73% to 70%, primarily due to increased teleworking opportunities.

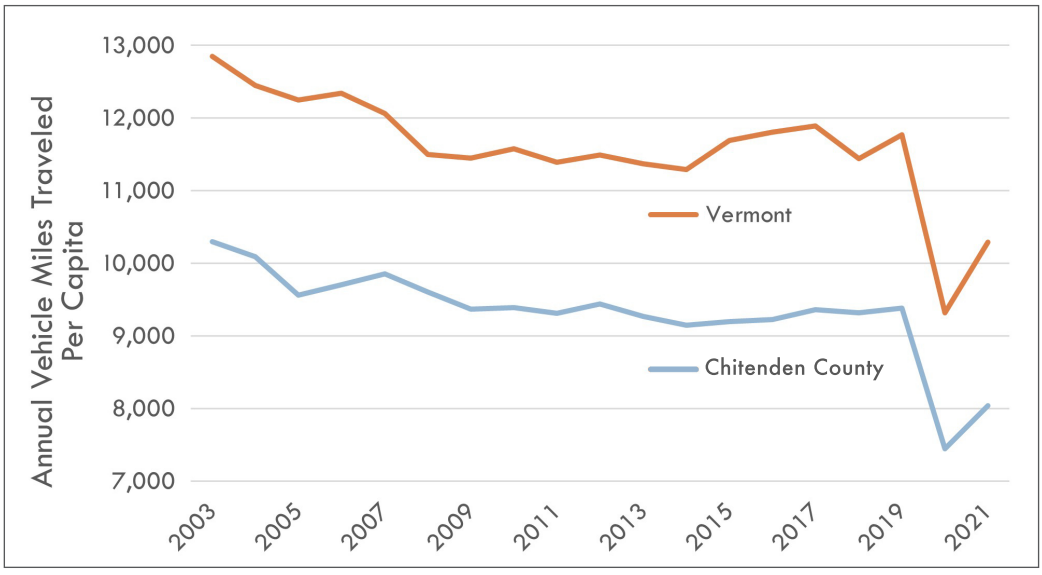
Figure 6: Percentage of workers commuting by SOV and non-SOV



Source: US Census

Vehicle Miles Travelled (VMT) per person in the county declined drastically between the early 2000s until 2009. Between 2010 and 2019, VMT leveled off, with only minor fluctuations. A number of factors may have influenced the VMT decline in the early 2000s, including increased safe and connected bike facilities and sidewalks; expanded transit services; increase in compact, mixed-use land use developments; and general economic conditions in the region and beyond. In 2020, VMT per capita collapsed as a result of the COVID-19 pandemic. Post-pandemic, we have seen a slow increase in VMT.

Figure 7: Vermont and Chittenden County VMT Per Capita



Source: VTrans and US Census Bureau

SAFETY

Improving safety for all transportation system users is a fundamental goal of the CCRPC. Through VTrans programs such as the Highway Safety Improvement Program (HSIP), Systemic Local Road Safety (SLRS), and Road Safety Audits (RSA), the CCRPC is assisting member municipalities in an effort to improve safety for High Crash Locations (HCLs), and exploring systemic approaches to reduce hazards.

VTrans collects crash data statewide and shares it with partners, regional planning commissions, municipalities, and the public. The historical crash data helps identify trends and risk factors VTrans, RPCs and municipalities use to develop alternatives that improve safety for all modes of transportation.

The dramatic increase in fatalities during the height of the pandemic (2020) follows national trends. A number of complex reasons exist behind this trend, including (but not limited to) empty roads that encouraged speeding; limited enforcement; and overall stress that intensified mental health and other societal issues. There is no discernible trend in the injury crash data over the last seven years.

Figure 8: Chittenden County Deaths and Injuries Due to Crashes, 2015-2021

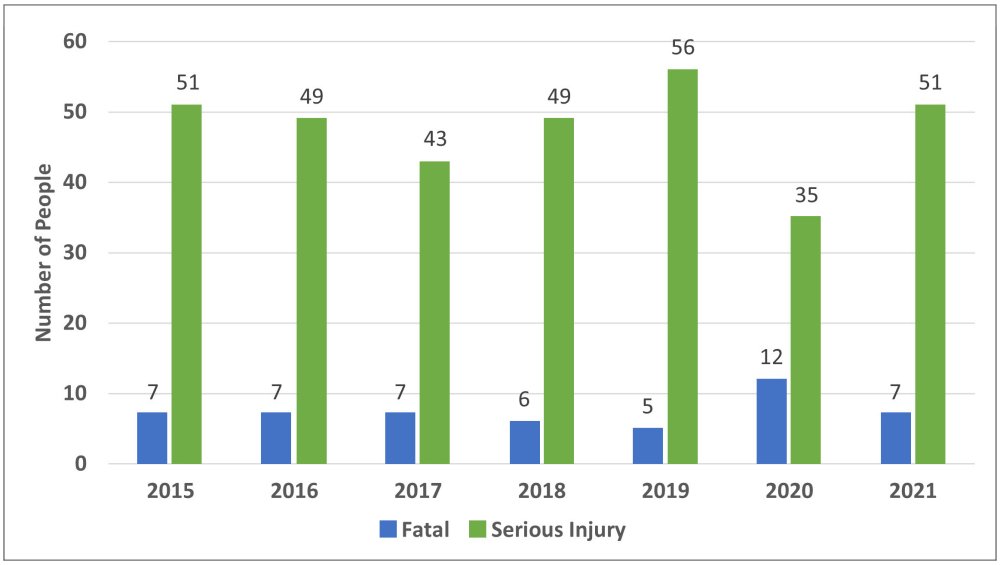
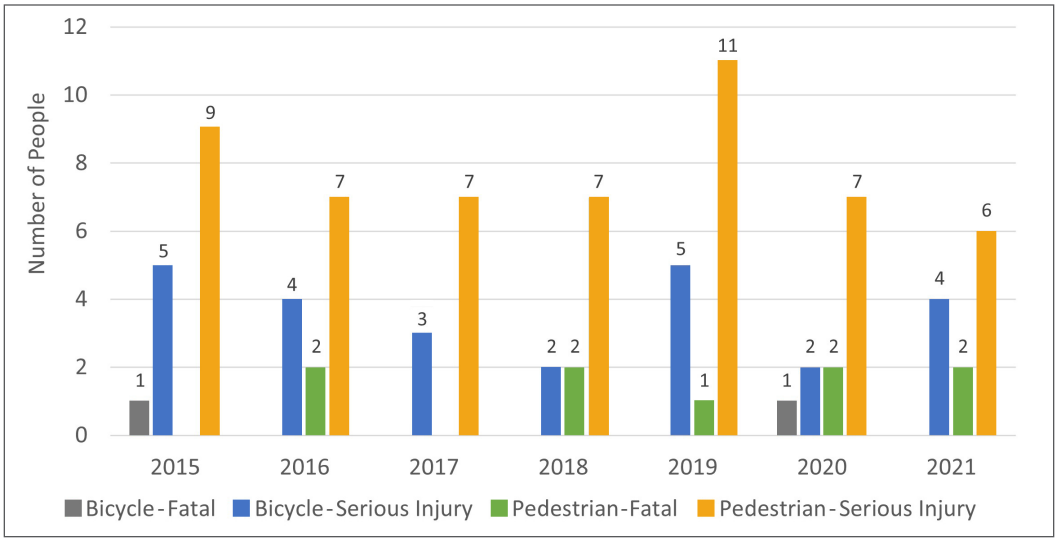


Figure 9: Chittenden County Bicycle and Pedestrian Deathsand Injuries to Crashes, 2015-2021



This data indicates no significant increases in reported fatal and injury crashes for vulnerable users during the pandemic. The biggest increase in serious pedestrian injury crashes occurred in 2019.

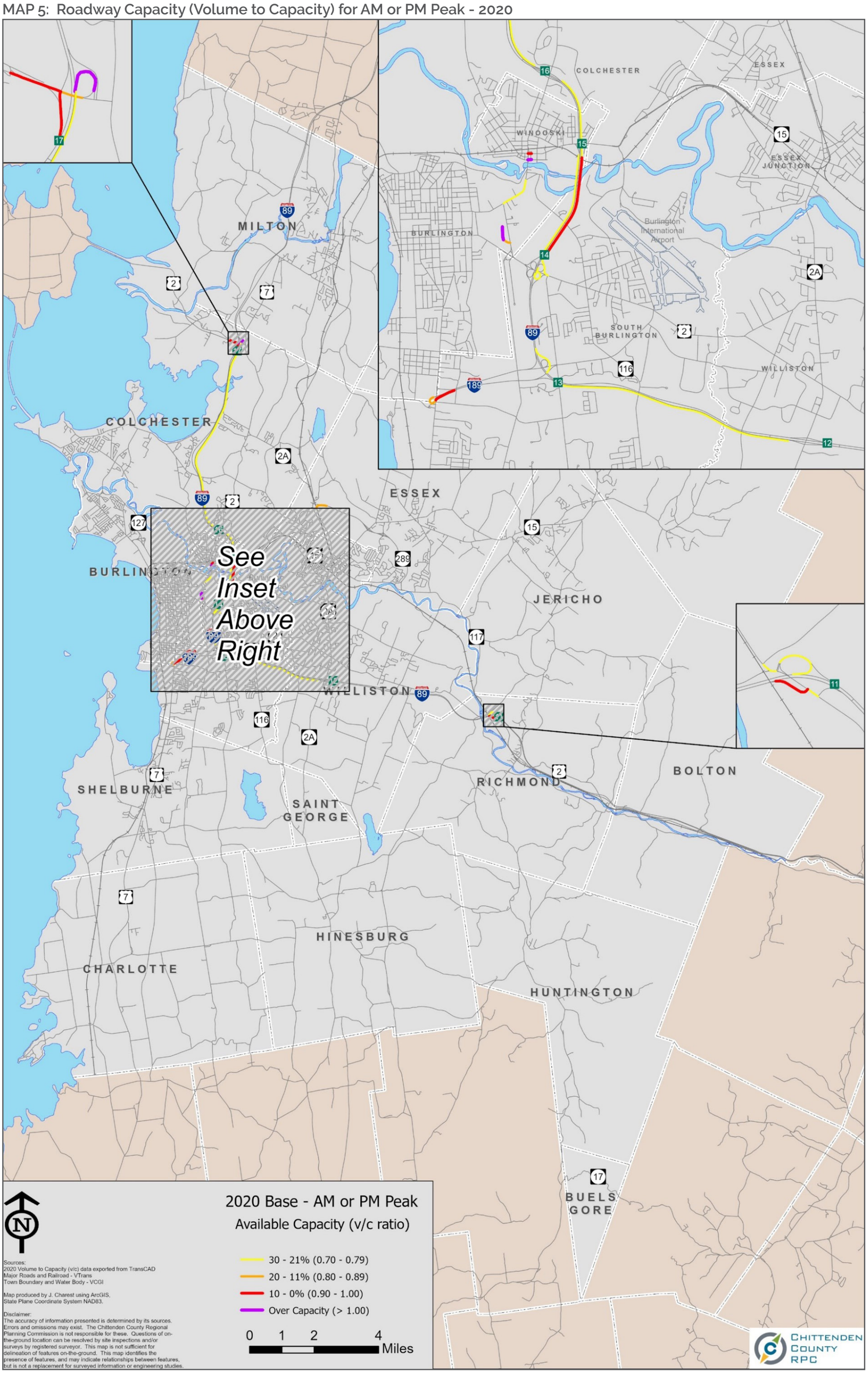
ROADWAY CAPACITY & CONGESTION

The roadway system in Chittenden County has enough capacity to handle the current traffic demand, except for specific segments of the interstate and arterial system during peak travel hours (see Map 5). Even with enough capacity, congestion exists on our roadways, mainly at intersections in urban and suburban areas during AM and PM peaks (see Map 6). This phenomenon worsens due to an increase in people who commute into Chittenden County for work (see Figure 5), and correlates with the increased costs and lack of available and affordable housing in the county. Post-pandemic, vehicle traffic and localized congestion retuned on most major roads in the county.

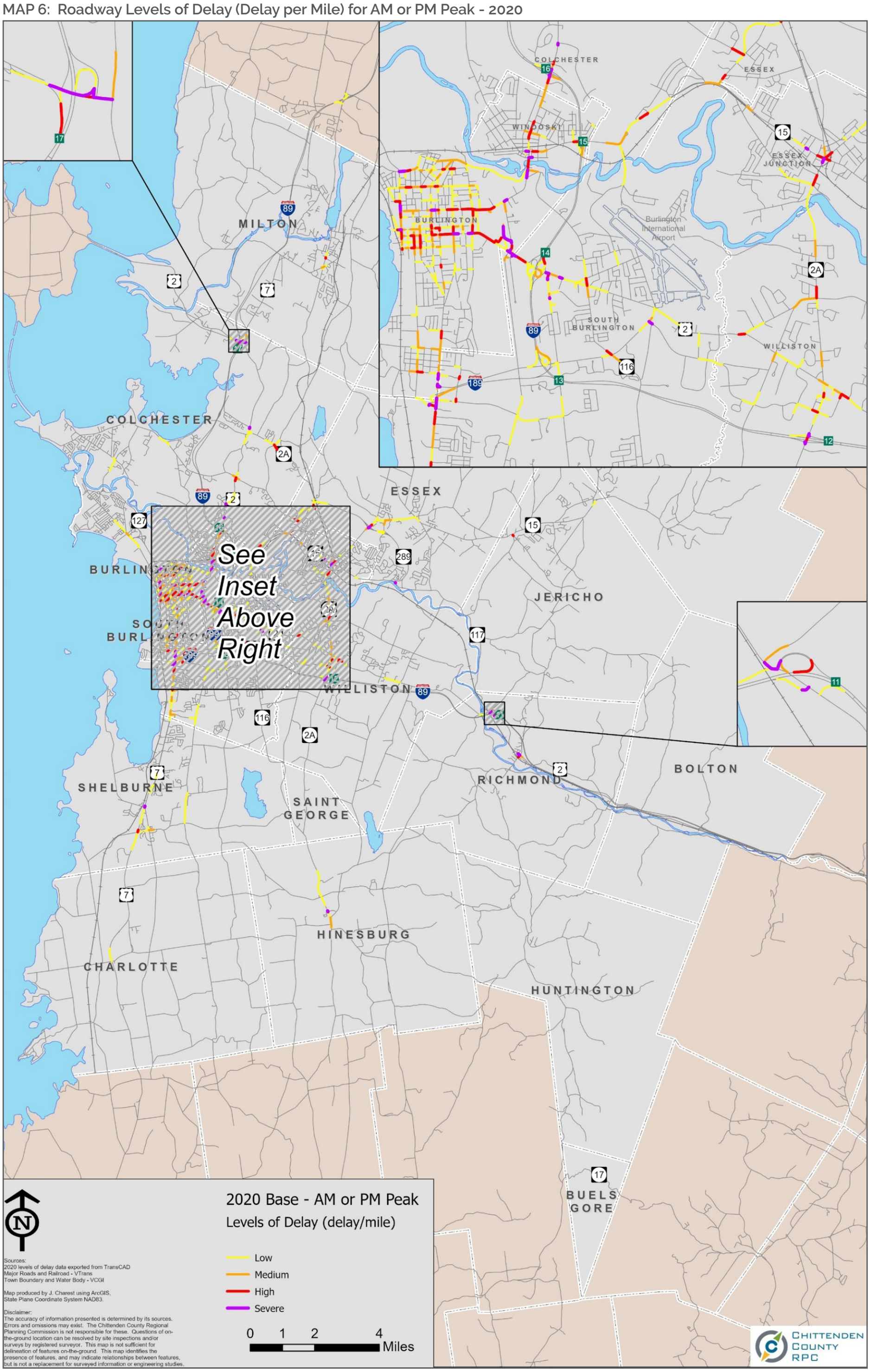
A recent Chittenden County I-89 2050 Study assessed the safety and capacity of I-89 and its Interchanges. The study provides the following insights:

- Identifies existing and future multimodal needs.
- Develops and evaluates improvements.
- Examines transportation and land use impacts of new and expanded interchanges.
- Determines asset management and maintenance needs.
- Develop a multiyear, multimodal implementation plan for making recommended improvements.

MAP 5: Roadway Capacity (Volume to Capacity) for AM or PM Peak - 2020



MAP 6: Roadway Levels of Delay (Delay per Mile) for AM or PM Peak - 2020



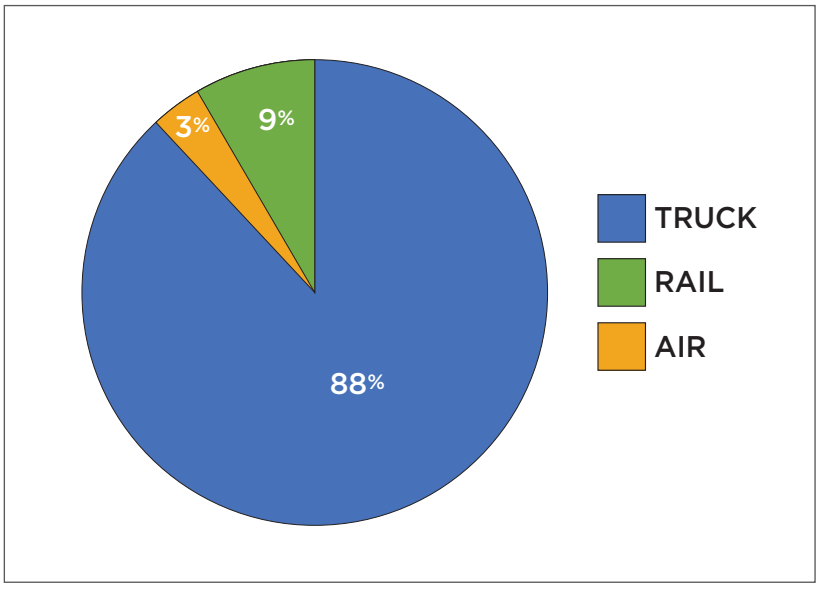
FREIGHT: RAIL AND TRUCK FACILITIES

Economic competitiveness is linked to the strength of a region's transportation network. Public and private sectors play a role in freight movement, and coordination must exist at regional, state, and national levels across rail, air, water, and highways.

Freight plays a large role in Chittenden County's economy, and the performance of Chittenden County's economy influences freight demand and output. Growth in population and consumer spending fuel demand for durable goods, consumer products, and construction materials. Consumer demand also contributes to growth in manufacturing, wholesale, retail, and other sectors that produce and distribute goods.

According to Freight Analysis Framework (FAF5) data, about 8.2 million tons of freight flow into, out of, or within Chittenden County each year. This is a growth of 1.9-million-tons compared to 2012 freight data from the Vermont Freight Plan. By 2045, the volume of freight (measured by weight) is expected to increase to 78.7 million tons.

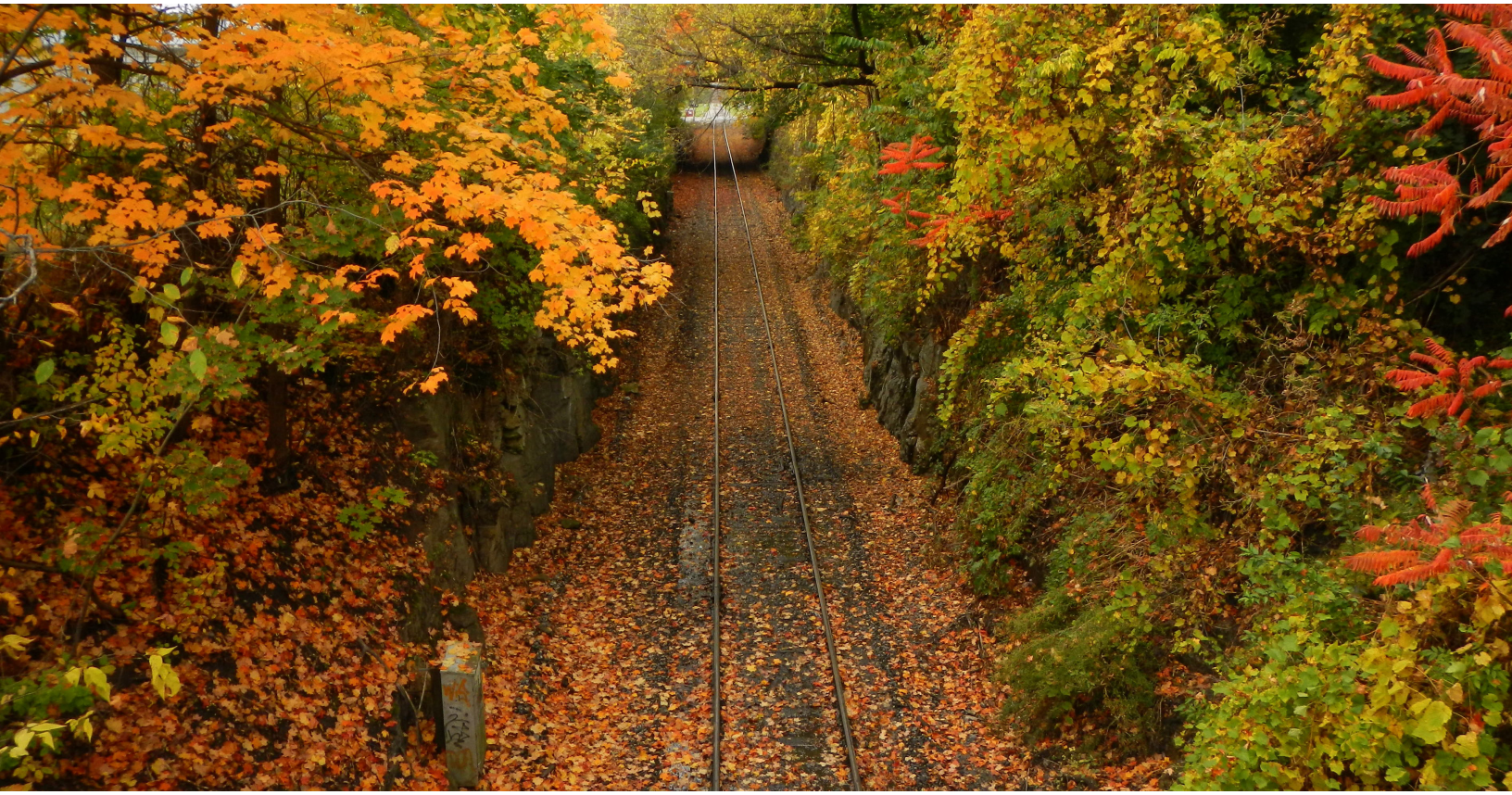
Figure 10: Chittenden County Freight Movement by Tonnage



Source: FAFS Data

Two rail freight operators exist in Chittenden County:

Genesee & Wyoming, Inc. (G&W), which maintains a base in St. Albans, purchased the New England Central Railroad (NECR)/RailAmerica. Prior to G&W's purchase, NECR was Vermont's largest privately owned and operated rail, operating freight service from Alburgh, VT to New London, CT. G&W also operates on the spur line that connects their mainline in Essex Junction to Burlington.



Vermont Railway, based in Burlington, operates on state-owned lines south to Bennington, branching off in Rutland, to Whitehall, NY, and Bellows Falls, VT.

The COVID-19 pandemic introduced several challenges to supply chain systems and freight logistics. Problems with production, plus shifts in demand, resulted in logistics challenges and major delivery delays. The pandemic also led to a decline in business for many goods-producing and freight companies in Vermont. Today, the post-pandemic economic recovery remains uneven, and high transportation costs are impacting the cost of goods.

New technologies are transforming the way goods are delivered, and the county's freight distribution system is adapting to a changing and more competitive marketplace. The freight sector is typically among the first to embrace changes in technology. Companies with goods to move are experimenting with a number of recent advances, including:

- Autonomous delivery vehicles
- Drones for front door delivery
- Self-driving trucks for long haul shipments

As demands grows, so too will the volume and value of freight that moves throughout the region.

TRANSPORTATION AND CLIMATE CHANGE

Transportation planning looks at climate change from two key perspectives:

1. How to mitigate climate changes through policies, programs, and technologies; and
2. How to adapt transportation infrastructure and services to the coming climate changes.

Climate change is one of many factors to consider as we plan the region's future transportation investments. Still, we need to carefully monitor its potential impacts while implementing programs that will slow its progress.

In Vermont, the largest contributor of greenhouse gas (GHG) emissions is the transportation sector. Most of this comes in the form of carbon dioxide (CO_2) from the combustion of petroleum-based fuels (gasoline and diesel) in internal combustion engines.

Transportation's 40% statewide contribution to GHG emissions is closely mirrored by our 48% Chittenden County estimate. This is substantially higher than the nationwide share of 27% from transportation (according to the 2020 EPA Greenhouse Gas Emissions data). Transportation's higher contribution in Vermont is mainly due to the rural nature of the state. According to the 2017 Vermont Transportation Energy Profile, Vermonters account for a higher annual vehicle miles traveled (VMT) per capita in the state (11,680) than the nationwide VMT per Capita (9,630). A number of steps are in play to help turn these numbers around:

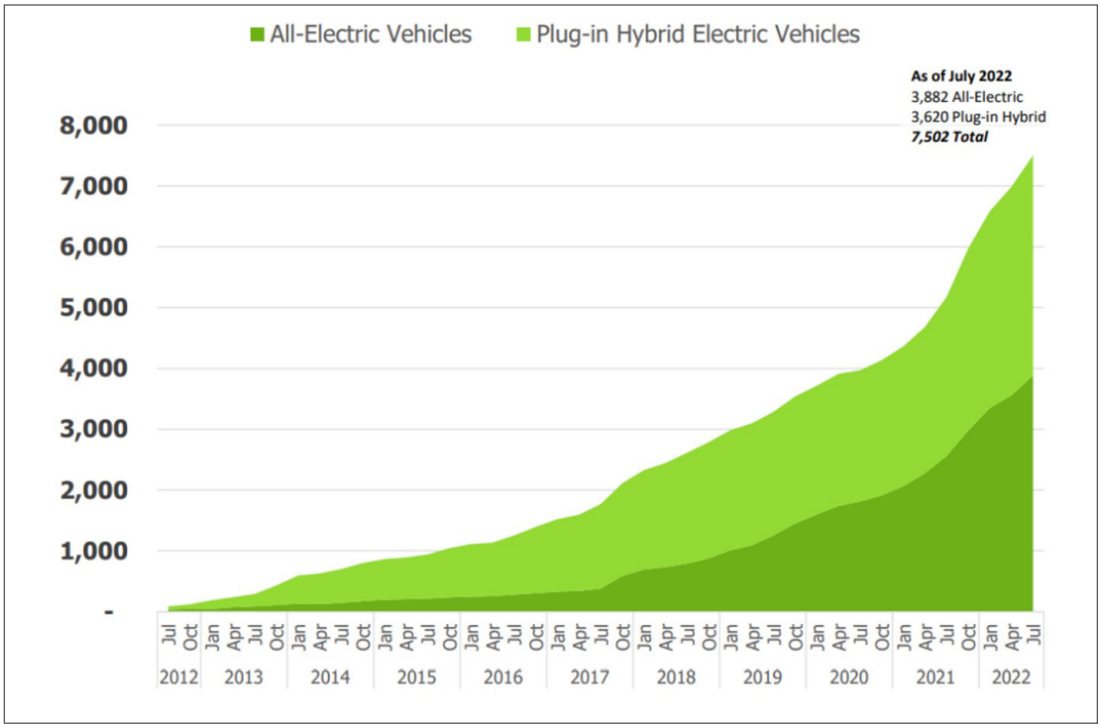
- In 2020 the Vermont legislature passed the Global Warming Solutions Act. This requires Vermont to reduce GHGs to 26% below 2005 levels by 2025; 40% below 1990 levels by 2030; and 80% below 1990 levels by 2050.
- The Vermont Comprehensive Energy Plan set a goal to meet 10% of transportation energy needs from renewable energy by 2025.

To meet climate goals such as these and others, it's critical to increase investments in transit, walking, biking, fleet electrification, and implement other policies to encourage non-SOV travel. Visit the air quality and climate sections of the CCRPC website for more information.

ELECTRIFICATION OF THE FLEET

Increasing the number of electric vehicles (EVs) is key to reducing the use of fossil fuels for transportation, as well as transportation energy use. Currently, EVs make up a very small part of Chittenden County's vehicles. In 2015, a total of 106,936 vehicles were registered in the county. As of July 2022, only 2,404 EV/plug-in hybrids were registered in the County.

Figure 11: Chittenden County Electric Vehicle Registrations



Source: VTrans

TRANSPORTATION AND PUBLIC HEALTH

Chittenden County has a very low percentage of days per year when the surface ozone level and concentration of ambient particulate matter register above National Ambient Air Quality Standards (NAAQS). In order to preserve air quality as the population of Chittenden County grows, it's imperative to find ways to bolster the transit system, create a contiguous infrastructure for active modes of transportation, and focus on dense development patterns that encourage non-motorized trips.

The impact of transportation on health is well established, particularly with regard to safety and injury, air quality, physical activity, equitable access to opportunities, and noise.

- The degree to which individuals in a community are physically active is directly related to transportation opportunities, infrastructure, and community design.
- The health benefits of physical activity, and its role in reducing the risk for chronic disease has a number of positive societal impacts.
- Most risk factors for chronic disease do not occur randomly. They are closely linked to the characteristics of neighborhoods in which people live, work, and play.

Walkable communities with a reliable transit network generally have a lower dependence on automobiles, and encourage physical activity. Hybrid commutes, (trips completed using several modes) are an effective option when distance and lack of transit service create barriers to a more active commute. With few exceptions, proximity to public transit stops is linked to higher transit use, and higher levels of physical activity among adults.

TRANSPORTATION EQUITY

Public housing and highway construction were the twin cornerstones of the racially motivated urban renewal that swept the country from the 1940s through 1970s. Unfortunately, this resulted in a devastating loss of urban housing stock, and created many hyper-segregated communities. While population loss wasn't severe in Burlington and surrounding Chittenden County during this time, it is important to recognize the significant and lasting impacts of transportation projects on people and neighborhoods.

Access to education, healthy food, healthcare, recreation, social interactions, and employment contribute to health and quality of life. The lack of safe and convenient alternatives to automobile travel disproportionately affects vulnerable populations, and limits personal options. This forces trade-offs in money or time, thereby compromising equitable choice. A number of population segments throughout Chittenden County, including youth, elderly, low-income, new American, and historically underserved and excluded populations, lack access to viable public and private transportation.

The high costs of owning and operating a vehicle also disproportionally affect low-income and rural Vermonters. They rely on vehicles to get to work, shop, follow through on medical appointments, and attend social gatherings. While high fuel prices can positively impact transportation behavior and choices, we should be cognizant that rising fuel prices disproportionately impact vulnerable populations.

Recognizing that nationwide investments (including transportation) have been traditionally unequal in distribution, application, benefits, and burdens, the federal government introduced the Justice40 Initiative. The initiative's major goal is to direct 40% of overall benefits of certain federal investments to communities that have been marginalized, underserved, and overburdened by pollution.

The US Department of Transportation (DOT) has also introduced an Equity Action Plan, which outlines specific actions to advance equity.

In 2021, Vermont's state legislature directed VTrans to undertake a comprehensive analysis of the transportation agency's existing transportation practices, and develop an equity framework to guide all future activities.

Section 41 of Act 55 (2021) states the following:

> "The Agency of Transportation, in consultation with the State's 11 Regional Planning Commissions (RPCs), shall undertake a comprehensive analysis of the State's existing transportation programs and develop a recommendation on a transportation equity framework through which the annual Transportation Program (the Agency Capital Program), and the Agency's Annual Project Prioritization Process, can be evaluated so as to advance mobility equity, which is a transportation system that increases access to mobility options, reduces air pollution, and enhances economic opportunity for Vermonters in communities that have been underserved by the State's transportation system."

The Transportation Equity Framework is currently under development. It will provide a tool to help decision makers plan for and prioritize projects, ensure accurate representation in decision making, and deliver services in a more equitable fashion.

2018 Chittenden County Transportation Survey

In 2018 CCRPC released an updated version of its Transportation Survey Report. Conducted in cooperation with Steadman Hill Consulting and WBA Research, the report helps guide short-term and long-term planning. The agency and their consulting partners invited more than 8,000 Chittenden County residents to participate in an online survey. They then grouped data from survey responses into four key areas: **Strengths, Weaknesses, Opportunities,** and **Obstacles.**

More than 500 residents completed the survey, with 71% answering "yes" when asked if they were satisfied with Chittenden County's transportation system. Approval varied when residents offered insights into specific aspects.

- Residents were most satisfied with opportunities the county has for walking (81% approving).
- They also said they wanted more investments in infrastructure to support walking (such as sidewalks).
- Approval of driving conditions was significantly lower (61%) when compared to their overall satisfaction.

- Many residents cited issues such as road quality, traffic congestion, and deteriorating bridges. (It's worth noting that since the time of this survey, a number of significant improvements to pavement and bridges have occurred.
- Satisfaction with public transit opportunities pre-COVID was significantly higher (70%).
- Residents also indicated they wanted to see other improvements, like access to real-time updates about bus locations and schedules, and more bus shelters.

Biking had the lowest satisfaction (59%). Common complaints included a perceived lack of supportive infrastructure (bike lanes), separate bike paths, and bike racks.

An upcoming survey (2023 or 2024) will evaluate the transportation-related attitudes and opinions of Chittenden County residents.

Performance Management

At the national level, Performance Management has become part of the Federal Highway Administration's (FHWA)Transportation Performance Management (TPM) program. The TPM program is a strategic initiative implemented to achieve national transportation performance goals. The intent is to measure progress against the national goals through a reliable data-driven process. FHWA has established measures in the following areas:

1. Safety
2. Infrastructure Condition
3. Congestion
4. System Reliability
5. Freight
6. Greenhouse Gas (GHG) Emissions

The established performance measures under each of these categories are:

1. Safety
    a. Number of Fatalities
    b. Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
    c. Number of Serious Injuries
    d. Rate of Serious Injuries per 100 million VMT
    e. Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

2. Infrastructure Condition
    a. Pavement
        i. Percentage of pavement on the Interstate in good condition
        ii. Percentage of pavement on the Interstate in poor condition
        iii. Percentage of pavement on the non-Interstate National Highway System (NHS) in good condition
        iv. Percentage of pavement on the non-Interstate National Highway System (NHS) in poor condition
    a. Bridges
        i. Percentage of NHS bridges in good condition
        ii. Percentage of NHS bridges in poor condition
2. Congestion - not required in Vermont, as the state does not exceed national air quality standards
3. National Highway System Reliability
    a. Interstate travel time reliability: Percent of the person-miles traveled on the Interstate that are reliable
    b. Non-Interstate NHS travel time reliability: Percent of person-miles traveled on the non-Interstate NHS that are reliable
    c. Freight reliability measure: Truck Travel Time Reliability (TTTR) Index
5. Greenhouse Gas (GHG) Emissions – Tailpipe CO_2 Emissions on the NHS – No targets to report as of Spring 2023.

Having established the measures, state DOTs and MPOs set quantifiable targets to gauge progress toward national goals. The schedule to establish targets varies by measure. Federal regulations generally have state DOTs set performance targets in the various categories and then give MPOs another 180 days to either adopt the state targets, or establish their own.

In addition to the FHWA, the Federal Transit Administration (FTA) has a performance management program as well. Their program establishes a system to monitor and manage public transportation assets for improved safety, reliability, and performance, with the goal of maintaining transit assets in a State of Good Repair (SGR). Under this program, Green Mountain Transit is tasked with developing a Transit Asset Management (TAM) Plan to include the following elements:

- An inventory of their capital assets
- Condition assessment of these assets
- Description of the analytic or support tool used to prioritize investments
- Investment prioritization

Lastly, the CCRPC has an agreement with VTrans and GMT (dated May 18, 2016) that describes our intent to work collaboratively in carrying out the performance based planning as outlined in the discussion above.

SAFETY PERFORMANCE TARGETS

Vermont Agency of Transportation (VTrans) in collaboration with the CCRPC establishes safety targets annually, based on data collected over the previous five years, for each of the safety performance measures. Table 2 indicates safety targets established by VTrans and accepted by the CCRPC Board for calendar years of 2021, 2022, and 2023.

Table 2: State and Metropolitan Planning Area Safety Targets

SAFETY PERFORMANCE MEASURES	ANNUAL TARGETS (FIVE-YEAR AVERAGE)		
	2021	2022	2023
Number of Fatalities	58	58	65
Fatality Rate (Fatalities per 100M VMT)	0.82	0.82	0.965
Number of Serious Injuries	275	260	258
Serious Injury Rate (Serious Injuries per 100M VMT)	3.65	3.7	3.746
Total Number of Non-motorized Fatalities and Serious Injuries	36	35	34

Infrastructure Condition Performance Targets

Pavement

Pavement condition targets for Interstate and Non-Interstate NHS were set for Vermont, including Chittenden County as listed below:

- Percentage of pavement on the Interstate in good condition: **28.0%**
- Percentage of pavement on the Interstate in poor condition: **4.9%**
- Percentage of pavement on the non-Interstate National Highway System (NHS) in good condition: **30.0%**
- Percentage of pavement on the non-Interstate National Highway System (NHS) in poor condition: **9.9%**

As of December 2021, pavement condition data indicated the following:

- The Interstate within Chittenden County (77.3 miles) exceeded the 28% target of pavement in good condition with 80.7% (62.4 miles) being classified as good. Pavement in poor condition was at 5.2% (4 miles) which falls short of the 4.9% target.
- Non-Interstate NHS within Chittenden County (47.97 miles) did not meet the target of 30% pavement in good condition, with only 23.8% (11.4 miles) being classified as good. The pavement in poor condition met the 9.9% target with only 6.8% (3.27 miles) classified in this condition.

Bridge performance measures

As of December 2021, bridge condition data in Chittenden County indicate the following:

- NHS bridges in good condition exceeded the target of **35%** with 52.5% being classified as good.
- There were no bridges in poor condition on the NHS (met the target of **6%**).

NHS RELIABILITY & FREIGHT MOVEMENT PERFORMANCE TARGETS

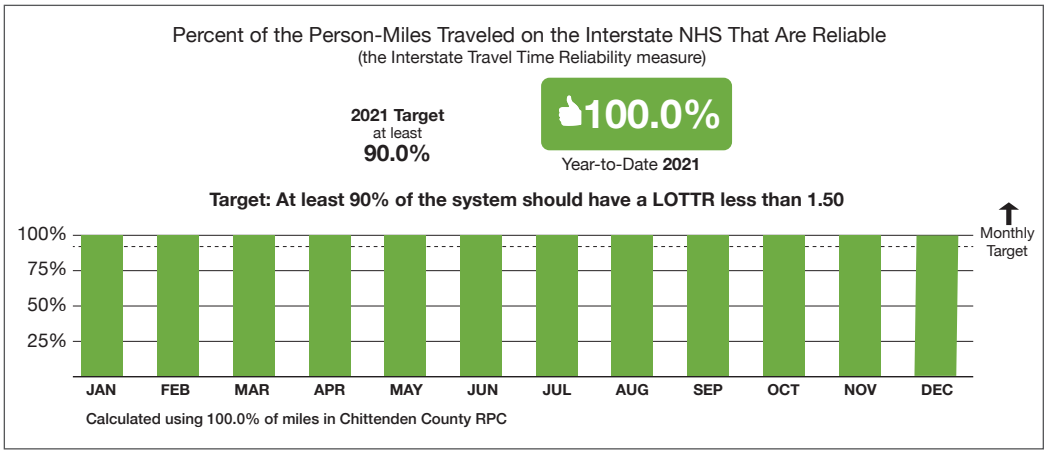
Travel Time Reliability is measured in terms of percentage of person-miles traveled that are reliable for the Interstate and Non-Interstate NHS system. A formal definition for travel time reliability is as follows: *The consistency or dependability in travel times, as measured from day-to-day and/or across different times of the day.*

The following Travel Time Reliability and Freight targets were set for Vermont, including Chittenden County, as of December 2021.

- Interstate travel time: **90%** of the person-miles traveled are reliable
- Non-Interstate NHS travel time: **80%** of person-miles traveled are reliable
- Freight reliability measure: Truck Travel Time Reliability (**TTTR)** Index less than **1.75**

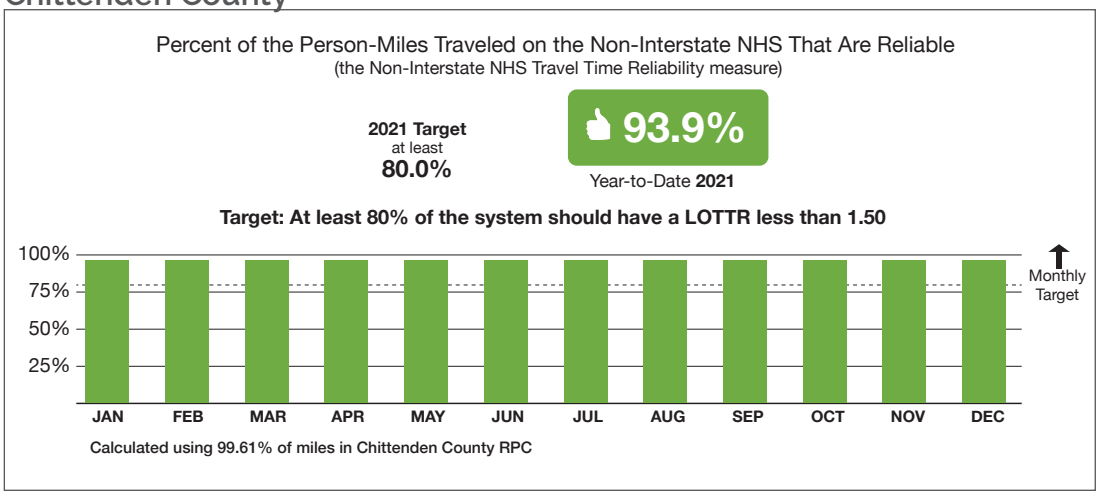
Graphs below indicate that targets were met for all travel reliability measures as well as freight in Chittenden County based on 2021 data.

Figure 12: Interstate Travel Time Reliability for Chittenden County



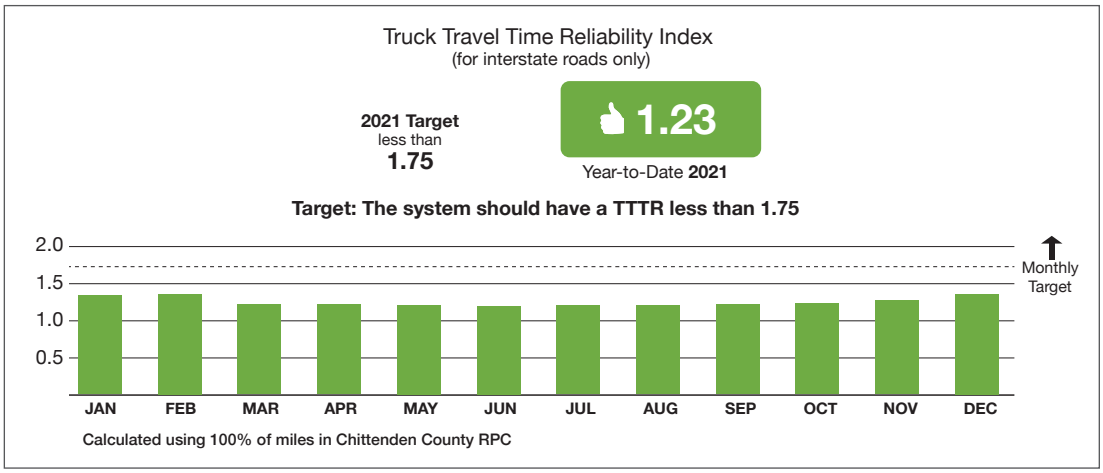
Source: NPHRDS Index (2017-2021)

Figure 13: Non-Interstate NHS Travel Time Reliability for Chittenden County



Source: NPHRDS Index (2017-2021)

Figure 14: Truck Travel Time Reliability Index for Chittenden County



Source: NPHRDS Index (2017-2021)

Financial Plan

INTRODUCTION

The CCRPC's long range transportation plan must incorporate a financial section that estimates how much funding will be needed over the life of the plan, how much will be available for the recommended transportation investments, and the costs to maintain and operate the existing system. The financial section must outline how the CCRPC can reasonably expect to fund all included projects and programs within a fiscally constrained environment, drawing on all anticipated revenues from federal and state governments, regional or local sources, the private sector, and user charges.

Federal regulations establish the requirement for the financial plan in 23 CFR 450.324(g)(11). The operative requirements of that regulation are summarized below. The adopted MTP shall include the following:

(11) A financial plan that demonstrates how the adopted transportation plan can be implemented. Key components of this plan to include:

i. System-level estimates of costs and revenues reasonably expected to be available to adequately operate and maintain Federal-aid highways and public transportation.
ii. Agreed upon estimates of funds that will be available to support plan implementation.
iii. Recommendations on any additional financing strategies to fund projects and programs with strategies for ensuring their continued availability.

iv. Funding to include all federally funded projects, both highway and transit. Projected funds to reflect "Year of Expenditure dollars."
v. For the outer years of the plan (i.e., beyond the first 10 years), the financial plan may reflect aggregate cost ranges/cost bands, as long as the future funding source(s) is reasonably expected to be available to support the projected cost ranges/cost bands.
vi. For illustrative purposes, the financial plan may include additional projects that would be included in the adopted transportation plan if additional resources beyond those identified in the financial plan were to become available.

The financial projections extend to the MTP planning horizon of 2050. The completed financial plan contains three parts:

1. The overall fiscal constraint amount including projection of future transportation funding in Chittenden County, and factors that are anticipated to affect this.
2. The base level of investment required for system operations and maintenance as called for under 23 CFR 450.324(g)(11)(i).
3. An estimate of the costs associated with MTP recommended improvements.

FINANCIAL PLAN PART 1: OVERALL CONSTRAINT

CCRPC MTP funds are limited to federal transportation funds allocated to the Chittenden County metropolitan area under federal transportation acts. The Chittenden County region does not currently access other sources of transportation funding, such as tolls or private contributions. The primary funding source for transportation projects eligible for federal aid is expected to be federal funds, plus state and local matches.

The Infrastructure Investment and Jobs Act (IIJA) (Public Law 117-58, also known as the "Bipartisan Infrastructure Law") governs the use of federal transportation funds. Signed into law on November 15, 2021, the IIJA is the largest long-term investment in our infrastructure in our nation's history.

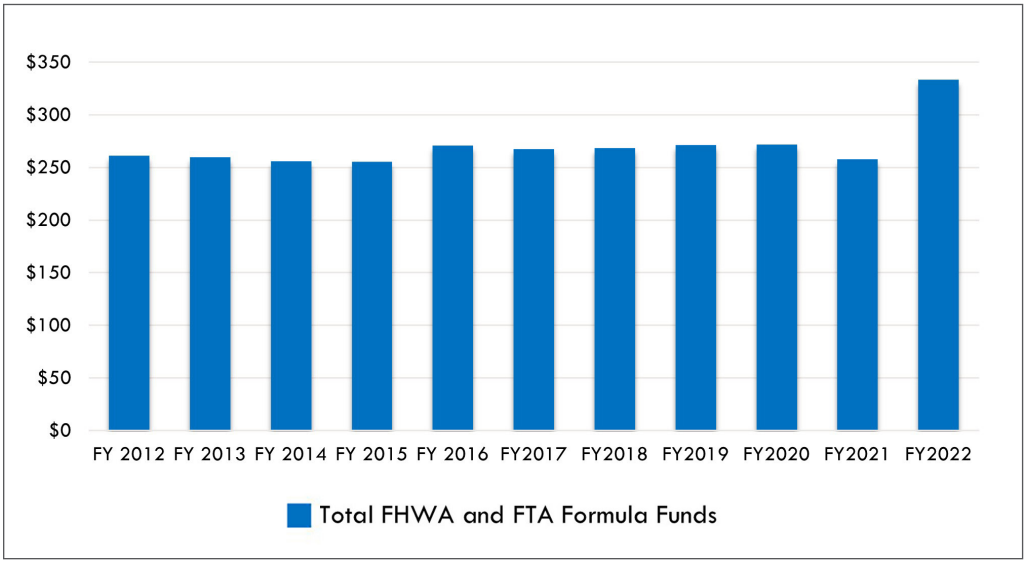
The most critical issue for establishing how much MTP funding will be available between 2023 and 2050 is the future availability of federal funds. For the purposes of this plan, we have included an estimate of available future funding below. This funding estimate comes from the following: funds expected to be allocated to Vermont under the IIJA (FY2023 - FY2026); a conservative estimate of funding to be allocated to the state after the IIJA under future transportation laws (FY2027 - FY2050); and the estimated percentage of statewide funding allocated to Chittenden County.

Funding Allocation under IIJA: FY2023-2026 – The IIJA is expected to bring an average of $348.6 million dollars per year to Vermont between federal fiscal years 2023 and 2026.

Future Funding Allocation: FY2027–FY2050 – During the 10 years prior to the IIJA, there was no discernable increasing or decreasing trend in constant dollar funding to Vermont (as shown in Figure 15). The average statewide FHWA and FTA funding between FY2012 and FY2021, in constant 2022 dollars, was $264 million per year.

As a conservative estimate of future funding for this plan, CCRPC applied the pre-IIJA average of $264 million, adjusted for inflation, per year from FY2027 to FY2050. Using the historical average funding amount beyond FY2026 acknowledges that the IIJA provides significantly more funding over the life of the bill; continued funding at this level may not be realistic.

Figure 15: Vermont Federal Transportation Funding History, 2012-2022 (in millions)

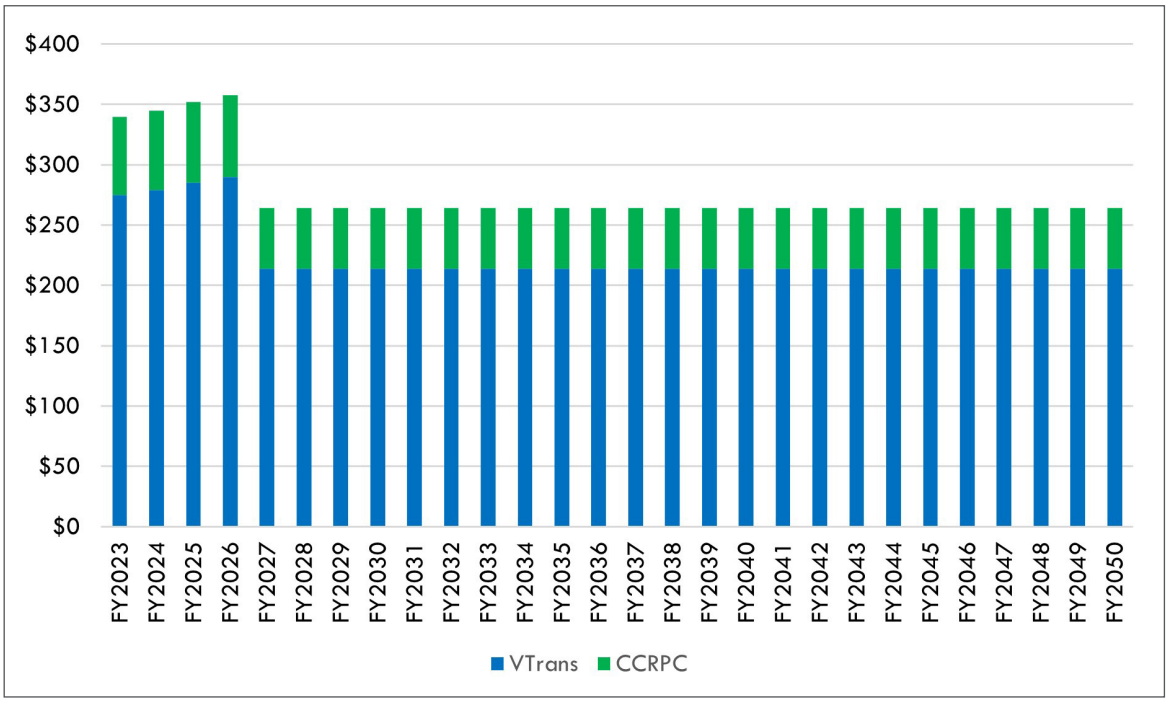


Source: FHWA/FTA Formula Funds provided by FHWA, FTA and VTrans, adjusted to 2022 dollars using US Inflation Calculator

Funding Allocation to Chittenden County – The amount of federal funds allocated to Chittenden County each year is based on projects that are ready to advance to design and construction. The federal amount has fluctuated year to year, from a low of 7.5% in FY2014, to a high of 40.6% in FY2005. The average proportion of statewide federal funds designated for CCRPC projects between FY1999 and FY2021 period was 19%. This percentage is intended to represent a best estimate of available funding and is in no way intended to be construed as a CCRPC "entitlement" or "rightful share" of statewide funds.

This is lower than Chittenden County's proportion of statewide population (26.2%, based on US Census, 2021 estimate) and Vehicle Miles of Travel (20.5%, based on VTrans data, 2021). However, it represents a reasonable funding level for planning purposes. As a result, CCRPC's annual funding is estimated to be 19% of the total FHWA and FTA formula funds coming to Vermont.

Figure 16: Federal Funds Estimated To Be Allocated To Vermont And Chittenden County, 2023-2050 (in millions)



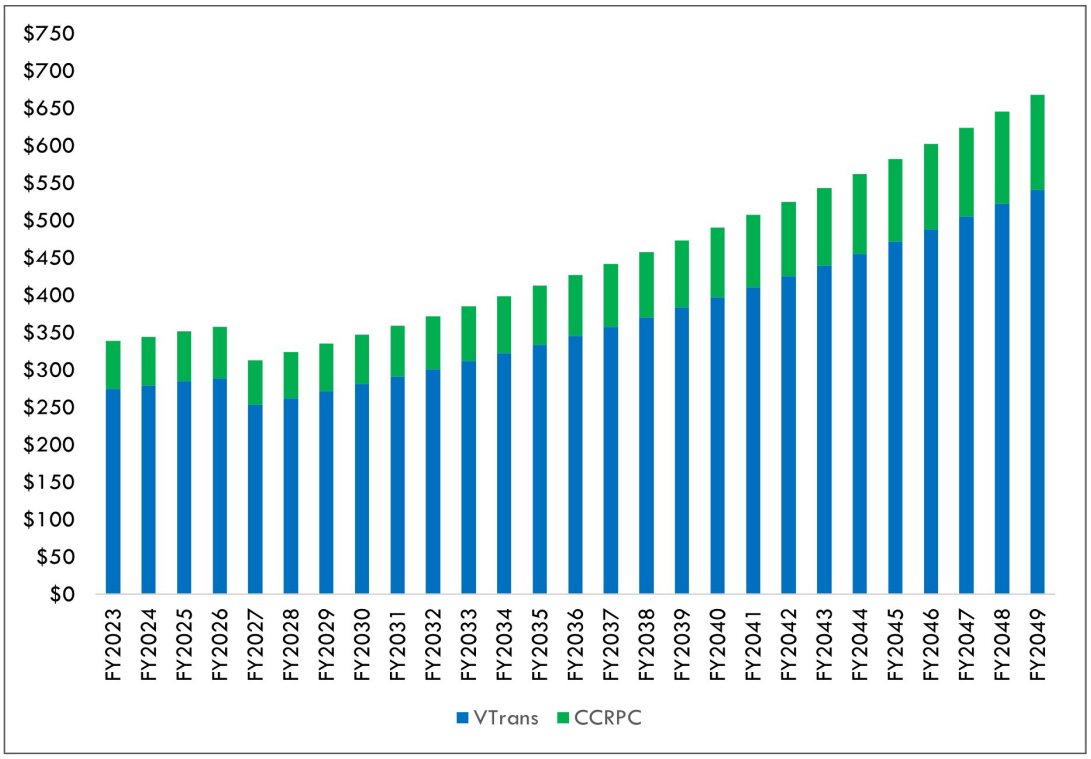
Source: IIJA amounts provided by FHWA, FTA and VTrans. Future funding levels calculated based on historic averages.

Summary – Figure 16 presents the estimated federal and CCRPC's annual funding, beginning FY2023, and extending to FY2050. This estimate is based on IIJA funding amounts for FY2023 to FY2026, as well as a flat statewide funding from FY2027 to FY2050, based on the average funding level for the 10 years prior to

the IIJA. CCPRC's funding is estimated to be 19% of the statewide total funding, based on the historic share of statewide funds.

The MTP is also required to adjust future funding levels for inflation. CCPRC used the average inflation rate over the past 10 years of 3.5% to escalate future funding amounts between FY2027 and FY2050 (3.3% is the most recent 10-year average inflation construction cost increase from the US Inflation Calculator). Funding amounts during IIJA years were not escalated, as these amounts have already been established. Adjusting for inflation, and compounding over 28 years, results in significantly higher annual amounts, particularly closer to 2050 when the compounding effect is more pronounced.

Figure 17: Federal Funds Estimated To Be Allocated To Vermont And Chittenden County, 2023-2050
(in millions, adjusted for 3.5% inflation Rate)



Source: IIJA amounts provided by FHWA, FTA and VTrans. Future funding levels calculated based on historic averages. Inflation rate of 3.5% is the 10-year average from US Inflation Calculator.

Potential Adjustments to Projected Funding

This discussion is intended to highlight some of the uncertainties that may affect CCRPC's ability to fund transportation projects into the future. Many factors can change projected levels of funding, but the likelihood of significant changes is low. Over the past 20 years, there have been a number of efforts, discussions, and initiatives on regional, state, and national levels, to increase transportation funding. During this time, the Vermont Legislature has made adjustments to transportation funding by allowing limited bonding and modest fuel tax increases. While such funding sources could lead to an increase in funding for the MPO region, they are too small and/or inconsistent to rely on for a 28-year planning horizon.

At the federal level, given the passing of the IIJA in 2021, it appears that funding from this source should remain stable for the near future. However, future federal funding levels are determined by the federal government, and may change over time.

In general, the above factors related to funding adjustments and potential uncertainty are too questionable or short lived to significantly impact the quantitative estimates of future transportation funding for Chittenden County.

Overall Funding Constraint Conclusion

Funding for CCRPC transportation projects depends on federal funding, which is generally matched on an 80% federal / 20% non-federal basis at state and local levels. Historically, CCRPC has received on average 19% of annual federal transportation funds available statewide. For the duration of the IIJA, Vermont is expected to receive an average of $282.6 million per year. A pre-IIJA, 10-year average ($264 million per year) was applied to determine funding levels after FY2026. The total funding to Chittenden County between FY2023 and FY2050, in constant 2022 dollars, is estimated to be $1.469 billion. Adjusting funding levels for an estimated 3.5% inflation results in $2.449 billion being available for Chittenden County through FY2050.

Table 3: Project Annual and Cumulative Funding for Vermont and Chittenden County Projects

	2022 CONSTANT DOLLARS		YEAR OF EXPENDITURE -- 3.5% ANNUAL INFLATION (FY27-FY50)	
	FHWA AND FTA FORMULA FUNDS TO VERMONT	FEDERAL FUNDS TO CHITTENDEN COUNTY (19%)	FHWA AND FTA FORMULA FUNDS TO VERMONT	FEDERAL FUNDS TO CHITTENDEN COUNTY (19%)
FY2023	$339.7	$64.5	$339.7	$64.5
FY2024	$344.8	$65.5	$344.8	$65.5
FY2025	$352.2	$66.9	$352.2	$66.9
FY2026	$357.6	$67.9	$357.6	$67.9
FY2027	$264.0	$50.2	$313.5	$59.6
FY2028	$264.0	$50.2	$324.5	$61.7
FY2029	$264.0	$50.2	$335.9	$63.8
FY2030	$264.0	$50.2	$347.6	$66.1
FY2031 - FY2035	$1,320.0	$250.8	$1,929.4	$366.6
FY2036 - FY2040	$1,320.0	$250.8	$2,291.6	$435.4
FY2041 - FY2045	$1,320.0	$250.8	$2,721.7	$517.1
FY2046 - FY2050	$1,320.0	$250.8	$3,232.5	$614.2
FY23-50 Total	$7,730.3	$1,468.8	$12,891.1	$2,449.3

Source: IJA amounts provided by FHWA, FTA and VTrans. Future funding levels calculated based on historic averages. Inflation rate of 3.5% is the 10-year average from US Inflation Calculator.

FINANCIAL PLAN PART 2: SYSTEM OPERATIONS & MAINTENANCE ELEMENT

The operations and maintenance element is a fundamental component of the MTP financial plan. The purpose of this element of the financial plan is to define the funding needed to operate and maintain facilities and services. As directed by federal regulations, the estimate of funds available to implement new plan initiatives is the total constraint amount as detailed in Part 1, minus the funds necessary to operate and maintain the existing investment in transportation infrastructure to an acceptable standard of service.

To calculate anticipated future maintenance and operations funding for the existing system, we have looked at historical expenditures in the relevant funding categories from annual Transportation Improvement Programs (TIPs). When reviewing the TIP funding history over the past 10 years (FY2012–FY2021) and using the categories of Bridge, Paving, Slope and Ledge Improvements, and Transit, the average percentage of the overall funding to those categories is just under 70%.

Table 4: Chittenden County Federal funding history by project use categories: FY2012 to FY2021 (in millions)

PROJECT USE CATEGORY	FY2012 - FY2021 OBLIGATIONS – (EXCLUDES EARMARKS) IN MILLIONS	PERCENT OF TOTAL
Paving	$96.0	28.1%
Bridge	$67.1	19.7%
Slope and Ledge Improvements	$1.4	0.4%
Transit Operations & Maintenance	$69.4	20.3%
Preservation Total	**$233.9**	**68.6%**
Roadway Corridor Improvements	$18.7	5.5%
Safety/ Traffic Operations/ ITS	$41.0	12.0%
New Facility/Major Roadway Upgrades	$17.4	5.1%
Bike & Pedestrian/ Enhancement	$16.5	4.8%
Intermodal	$6.8	2.0%
Stormwater/ Environmental	$3.6	1.1%
Rail Crossings	$3.2	0.9%
Other Total	**$107.3**	31.4%

Source: Obligation amounts reported by VTrans and GMT.

Operations and maintenance funding comes from a variety of sources, depending on the type of facility. Interstate highways and bridges receive federal funds through special programs; state highways receive funding through federal and state programs; and local highways and bridges on the federal aid system receive maintenance funding through local, state, and federal programs. Transit purchases of new and replacement rolling stock are often supported with federal funds through the Federal Transit Administration (FTA), and FHWA Congestion Mitigation & Air Quality (CMAQ) funds and earmarks. Municipal contributions and farebox revenues are also important sources of ongoing transit operations and maintenance costs.

Future funding for operations and maintenance was assumed to be 70% of the total funding anticipated to be allocated to Chittenden County. For the duration of IIJA, the average annual funding for system operation and maintenance is $46.4 million in 2022 dollars. For the period 2027 to 2050, the annual amount to operation and maintenance is $35.1 million in 2022 dollars.

After accounting for system operations and maintenance, the remaining funds expected to come to Chittenden County would be available for new projects. The estimated total for new projects would average $19.9 million per year for the duration of the IIJA (2023-2026), and $15 million per year after the IIJA (FY2027 to FY2050) in 2022 dollars.

The total funding available for new and already committed TIP projects is shown in Table 5 below. The estimated funding available for planned improvements and current TIP projects in the MTP is estimated at $440.6 million in 2022 constant dollars.

Table 5: Projected Annual funding to VTrans and CCRPC System Preservation, and for new and committed project (millions)

	2022 CONSTANT DOLLARS (MILLIONS)				YEAR OF EXPENDITURE (MILLIONS) 3.5% ANNUAL INFLATION (FY27-FY50)			
	FHWA and FTA Formula Funds to Vermont	Federal Funds to Chittenden County (19%)	System Preservation (70%)	New Projects (30%)	FHWA and FTA Formula Funds to Vermont	Federal Funds to Chittenden County (19%)	System Preservation (70%)	New Projects (30%)
FY23	$339.7	$64.5	$45.2	$19.4	$339.7	$64.5	$45.2	$19.4
FY24	$344.8	$65.5	$45.9	$19.7	$344.8	$65.5	$45.9	$19.7
FY25	$352.2	$66.9	$46.8	$20.1	$352.2	$66.9	$46.8	$20.1
FY26	$357.6	$67.9	$47.6	$20.4	$357.6	$67.9	$47.6	$20.4
FY27	$264.0	$50.2	$35.1	$15.0	$313.5	$59.6	$41.7	$17.9
FY28	$264.0	$50.2	$35.1	$15.0	$324.5	$61.7	$43.2	$18.5
FY29	$264.0	$50.2	$35.1	$15.0	$335.9	$63.8	$44.7	$19.1
FY30	$264.0	$50.2	$35.1	$15.0	$347.6	$66.1	$46.2	$19.8
FY31-35	$1,320.0	$250.8	$175.6	$75.2	$1,929.4	$366.6	$256.6	$110.0
FY36-40	$1,320.0	$250.8	$175.6	$75.2	$2,291.6	$435.4	$304.8	$130.6
FY41-45	$1,320.0	$250.8	$175.6	$75.2	$2,721.7	$517.1	$362.0	$155.1
FY46-50	$1,320.0	$250.8	$175.6	$75.2	$3,232.5	$614.2	$429.9	$184.3
TOTAL	**$7,730.3**	**$1,468.8**	**$1,028.1**	**$440.6**	**$12,891.1**	**$2,449.3**	**$1,714.5**	**$734.8**

CONCLUSION AND PROPOSED FUTURE ALLOCATIONS

This financial plan concludes that Chittenden County will have a total of $440.6 million in federal funds, in constant 2022 dollars, for current TIP projects and new transportation investments between 2023 and 2050. When factoring inflation into the calculation, the total cumulative funding amount is $734.8 million in year of expenditure dollars.

Maintaining and operating the existing transportation system is a critically important task. It is estimated that $1.028 billion, nearly three quarters of the total estimated funds available, will be required to accomplish this. The plan also identifies $168.2 million for projects listed in the current Transportation Improvement Program. The remaining funding available for new transportation needs is estimated at slightly more than $272.4 million.

Future Land Use and Transportation Scenarios

During the update of the 2018 ECOS Plan, the CCRPC worked with consultants to prepare a 2050 demographic and employment forecast, which estimates future household, population, and employment conditions for the county. Adopted by the CCRPC Board, the 2050 forecast helped in developing the Energy Plan and the MTP.

To prepare the 2023 plan update, staff first compared latest census data (2020), American Community Survey, and Bureau of Economic Analysis data to the 2020 base data (used for 2018 ECOS Plan forecast) to determine whether an update was needed.

Currently, the number of households and population in the county is 2% higher than the 2020 population and household forecast. Additionally, current total employment is 6% less than the 2020 employment estimate. Given the minimal differences between current demographic and employment data, and 2020 base data, staff recommended utilizing the 2018 ECOS Plan forecast for the 2023 ECOS Plan, including the MTP. The CCRPC Board approved this recommendation at their November 17, 2021 meeting. Table 6 tabulates the 2050 forecasts for population, employment, and households in the county.

Table 6: Chittenden County Demographics

DEMOGRAPHICS	2015	2050	2015 - 2050 % INCREASE
Population	161,382	183,172	14%
Employment	135,511	182,688	35%
Household	63,498	79,151	25%

FUTURE LAND USE

The 2018 MTP strived to increase the viability of walking, biking, and transit, by concentrating land use in all areas planned for growth, with increased density in the urban centers and villages (90% of new households). The 2023 MTP is adding a Transit Oriented Development Overlay (TOD) to the future land use map (see Map 7) to reinforce the need for more dense development around existing (primary) transit routes.

TOD Planning Areas are defined as generally being within a quarter mile from Green Mountain Transit's primary and commuter routes that also exist in areas within areas planned for growth. While the base planning areas reflect local zoning, the TOD Overlay Planning Areas are meant to emphasize the importance of locating new development in locations within walking distance to existing public transit routes.

Residential uses within the TOD Overlay Planning Areas are encouraged to be constructed at higher densities than in areas outside TOD Overlay Planning Areas. Commercial and industrial uses within the TOD Overlay Planning Areas are encouraged to be designed in a manner that promotes walkability from public transit, and creates a safe, pedestrian-oriented environment. The TOD Overlay Planning Area will not be used in regulatory proceedings (Act 250 and Section 248).

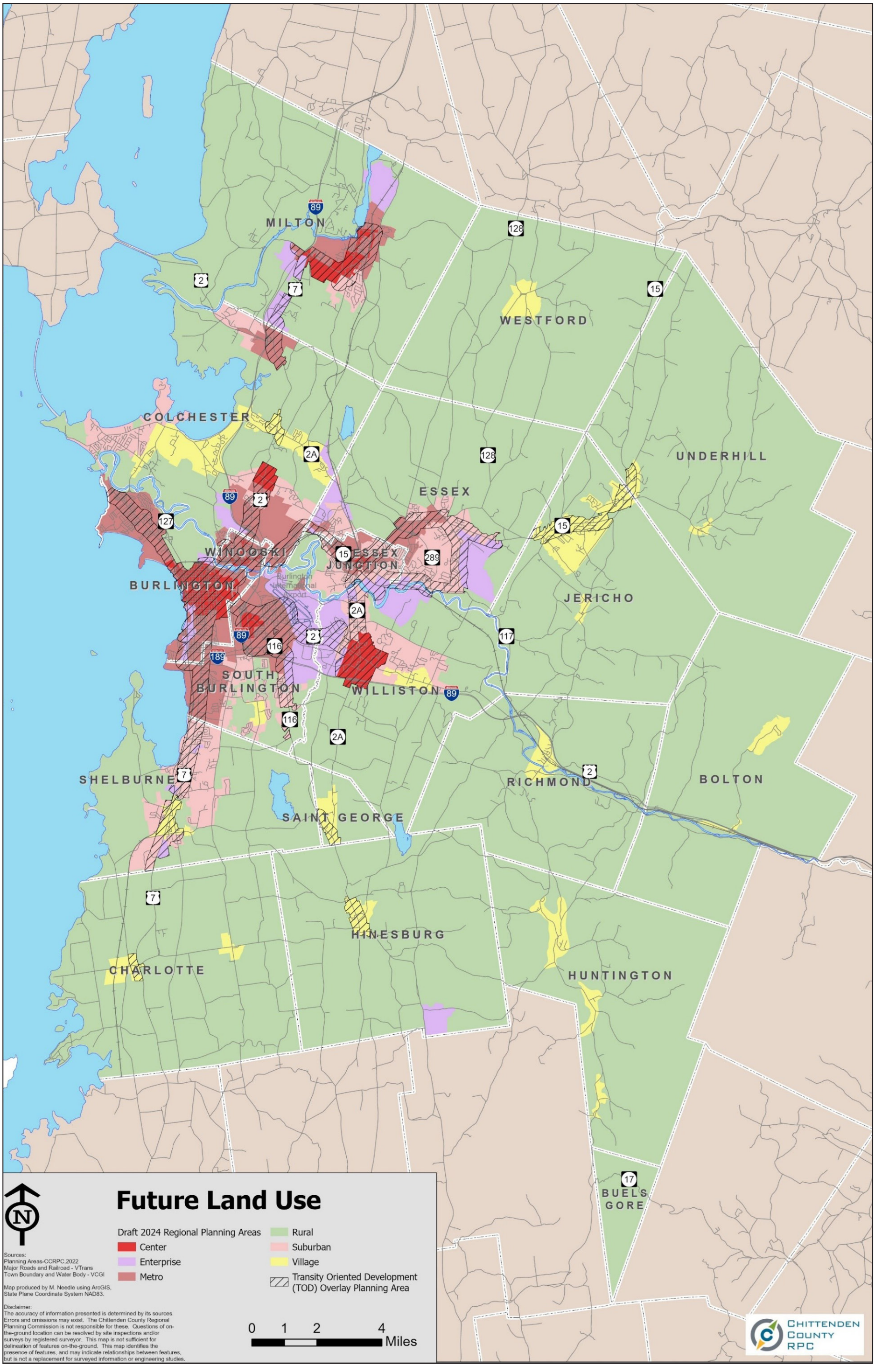
REGIONAL TRANSPORTATION MODEL

Chittenden County has used transportation models since the mid-1980s. The current model framework was developed in 1994, then updated and enhanced periodically through 2017. It uses custom designed computer software to examine travel impacts on roadway capacity and congestion in the county based on a number of scenarios, including land use, demographics, mode share, highway network, and others.

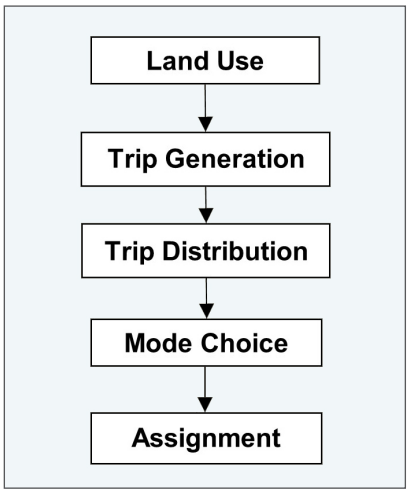
The model is a sophisticated tool that simulates the interaction of trips generated by households and employment, and evaluates their impact on the transportation system. It is sensitive to how congestion impacts trip-making decisions, and can analyze morning (AM) and afternoon (PM) peak hours, and other daily conditions.

For current MTP analyses, daily results of specific metrics helped gauge county-wide performance of each scenario relative to one another. The AM or PM peak hour results highlight specific network issues for each scenario, and represent

MAP 7: Future Land Use



the time in which the network exhibits the greatest levels of congestion. It is important to look at AM and PM peak hours to ensure that potential future problems are not overlooked. The model follows a five-step process, as shown at the diagram below.



First, this process replicates existing travel conditions, then simulates future scenarios. The five model steps break down the relationship between the land use, economic activity, and travel behavior. Trip generation estimates the total number of trips produced, and trip distribution estimates where these trips will go. Both of these steps are based on the locations of households and employment. Mode choice evaluates how people will travel (i.e., drive, bike, walk, or bus), and trip assignment estimates which route travelers will use. Find more information about the regional model on the Chittenden County RPC website.

The Chittenden County Transportation Model is a powerful and important analytical tool, but it is just that—a tool for helping us better understand transportation issues. The model does not make decisions. It is one of numerous resources the CCRPC calls upon to make more informed choices about how to invest limited resources to improve the region's transportation system.

SCENARIOS EVALUATED

The four scenarios evaluated for the development of the 2050 MTP Scenario are described in Table 7, and results from the evaluations are presented in Figures 18 to 21.

Table 7: MTP Scenarios Evaluated

SCENARIO NAME	SCENARIO ELEMENTS/ASSUMPTIONS /DESCRIPTION
2020 Base with Planned Transportation Projects	• 2025 housing and employment growth • 90% of households in existing areas planned for growth with concentration in the urban center and village planning areas.
2050 Base with Planned Transportation Projects	• 2050 housing and employment growth • 90% of households in existing areas planned for growth with concentration in the urban center and village planning areas. • 2023 – 2026 TIP projects that are also front of the book in VTrans' Transportation Capital Program
2050 MTP (2018 Plan)	• 2050 housing and employment growth • 90% of households in existing areas planned for growth with concentration in the urban center and village planning areas. • Substantial increase in walk/bike infrastructure in Villages and City/Town Centers. • Safety improvements at High Crash Locations. • 15-minute headways all day for the existing trunk routes in the county (US2, US7, VT15, and North Avenue); 20 min headways for all other routes; and a new *VT-127 to Colchester* transit loop service. • 2023 – 2026 TIP and Local projects identified by municipalities and the CCRPC through various planning studies and plans (see 2018 MTP project list). • Intelligent Transportation System investments and signal upgrades for major arterials in the county
I-89 2050 Study	• 2050 housing and employment growth • 90% of households in existing areas planned for growth with concentration in the urban center and village planning areas. • New Exit 14 Interchange (preferred alternative from the FY24 Scoping Study) • Safety improvements at High Crash Locations. • 2023 – 2026 TIP and Local projects identified by municipalities and the CCRPC through various planning studies and plans (see 2023 MTP project list). • Mileage-based fee (5 cents/mile) • Significant Transportation Demand Management Investments (will be further explored in a FY24 study to understand the feasibility and efficacy of these proposed investments) • Increase teleworking by 50% • Double trips made by bike • Triple transit services and improve frequencies • Double participation in TDM programs • Increase cost of parking

SCENARIO RESULTS

The following figures showcase how the four scenarios compare to each other against key metrics. Daily delay and VMT per capita follow a similar pattern. They increase in the 2050 Base and 2018 MTP Scenario future, and are substantially reduced in the 2023 MTP Scenario. Figure 18 shows that even though there were some modest gains in the non-auto mode share in the 2018 MTP, these gains increased significantly in the I-89 2050 Study Scenario. This is due to significant investments in TDM and non-auto transportation options. The increase share of non-auto modes, coupled with a reduction in vehicle trips due to teleworking and carpooling (Figure 20), explain the significant reductions in delay and VMT for the I-89 2050 Study Scenario.

Figure 18: Countywide Daily Delay per Capita

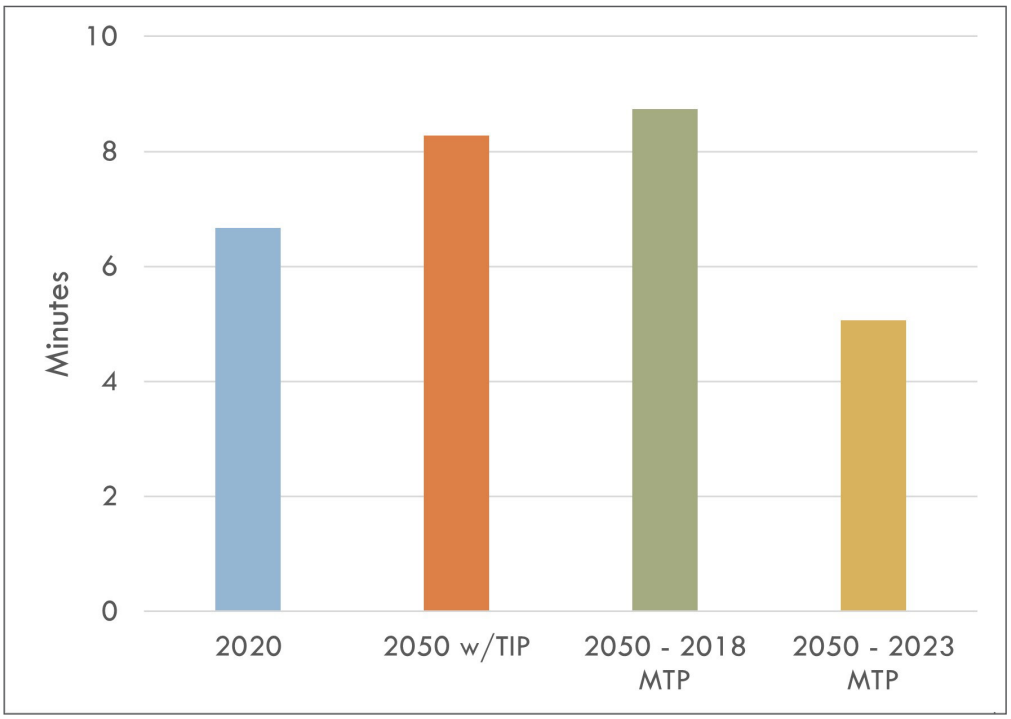


Figure 19: Countywide Daily Vehicle Miles Traveled (VMT) per Capita

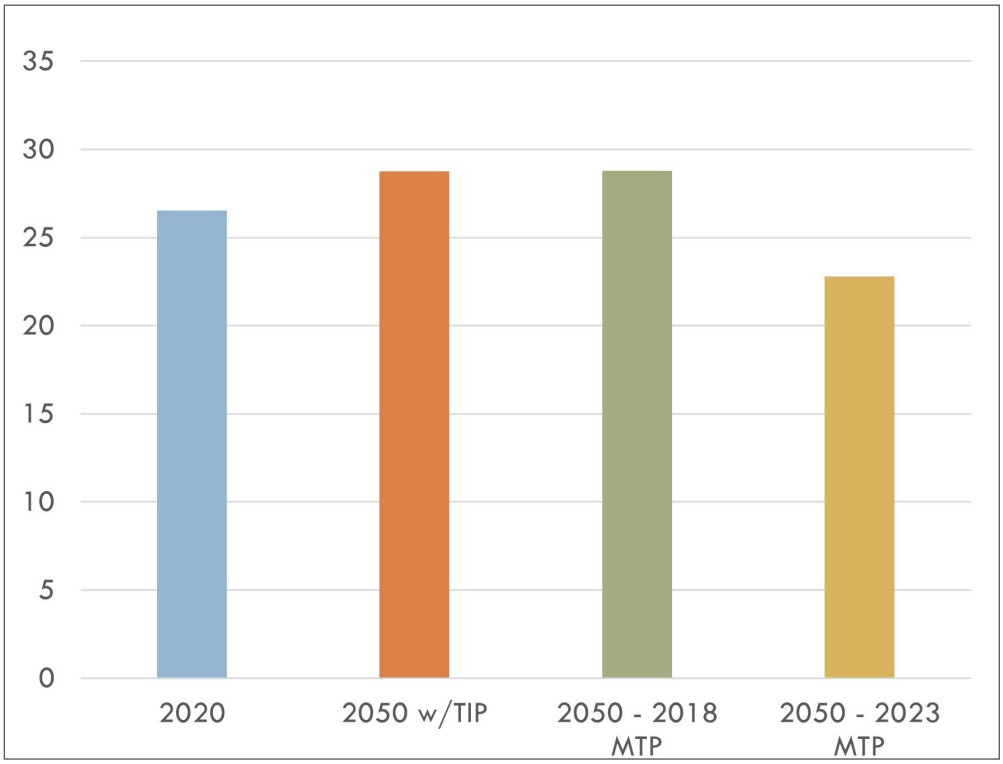


Figure 20: Countywide Daily Transit, Walking, and Biking Mode Split

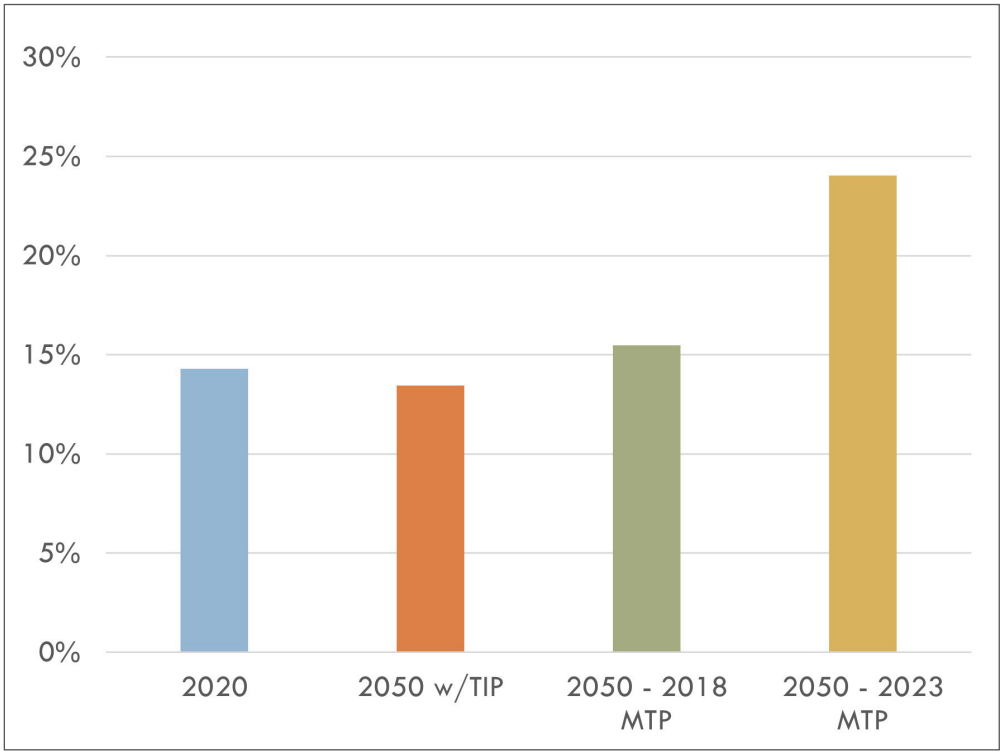
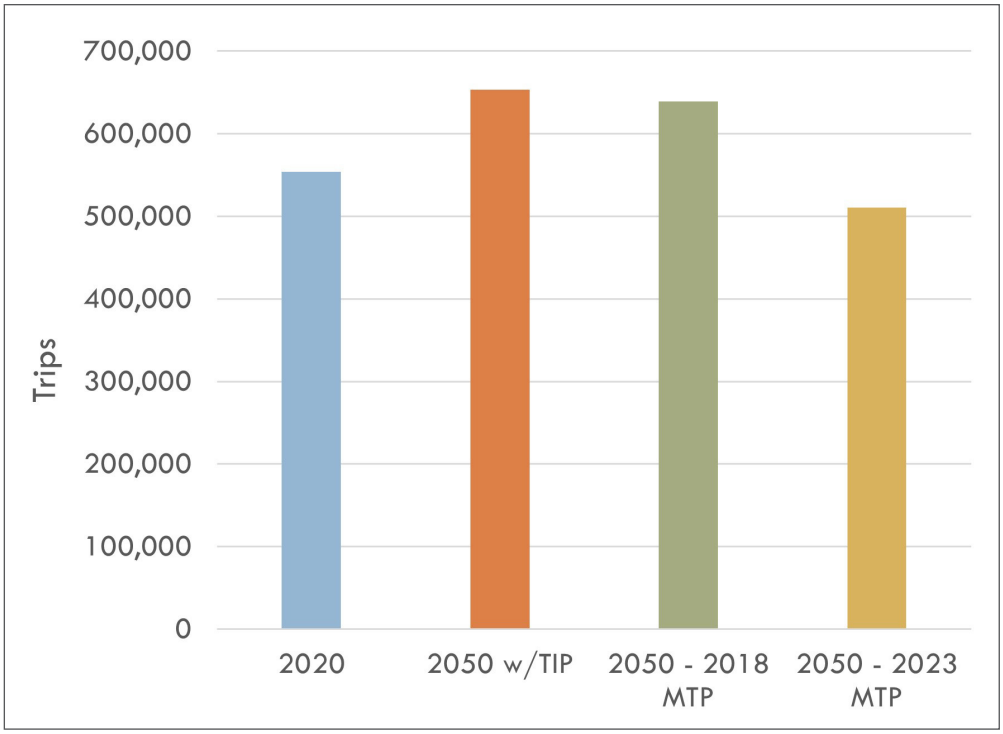


Figure 21: Countywide Daily Vehicle Trips



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2023 MTP SCENARIO FOR 2050 CONDITIONS

Meeting state and regional transportation and climate goals will require a multipronged approach. Five strategies to help achieve these goals include: 1) major shifts in transportation investments and policies to facilitate significant increases in people walking, biking, taking transit, and choosing other non-auto modes (thus reducing Vehicle Miles Traveled/VMT and Green House Gas/GHG emissions); 2) supporting compact developments (90% of new growth) in areas planned for growth; 3) electrifying the fleet (90% by 2050); 4) instituting a mile-age-based fee for all vehicles; and 5) increasing the cost of parking in Downtown and Village areas.

To meet these goals, the CCRPC proposes to adopt an aspirational 2023 MTP Scenario for Future Year 2050 that incorporates major transportation policies and investments from the recently completed Chittenden County I-89 2050 Study. The study yielded a suite of options to reduce vehicle miles traveled, and to improve the efficiency of our transportation system.

The proposed 2023 MTP Scenario was developed during the Strategic Model effort that the CCRPC undertook as part of the I-89 2050 Study. [STILL WAITING FOR URL] This effort focused on developing a comprehensive package of

improvements and policies (e.g., TDM, pricing, fees, etc.) that will help decrease VMT and SOV travel in Chittenden County to meet regional climate goals, and avoid expensive interstate capacity upgrades. By shifting the focus to managing congestion via flexible work schedules, increased transit and non-auto investments, addressing bottlenecks, and other means of managing transportation demand, rather than attempting to reduce congestion via large highway expansions, the region's finite funding can go further toward achieving our goals.

The proposed 2023 MTP Scenario also includes localized intersection and interchange improvements, specifically when it concerns safety for all modes, acute congestion, and improving mobility for non-auto modes. The CCRPC recognizes that the proposed 2023 MTP Scenario represents an aspirational future that will require major shifts in transportation policies and investments, and changes in the structure used to finance maintenance, improvements, and expansion of the transportation system. It will require actions from the state (executive and legislative branches) and municipalities, as well as behavioral changes from residents, employees, employers, and visitors.

MTP Elements

- 90% of households in existing areas planned for growth with concentration in the urban center/ village planning areas and higher density along major transit routes
- New Exit 14 Interchange (preferred alternative from a FY24 scoping study)
- Safety improvements at High Crash Locations
- TIP and local projects identified by municipalities and the CCRPC through various planning studies and plans (see 2023 MTP project list)
- Mileage-based fee (5 cents/mile)
- 2023 – 2026 TIP and local projects identified by municipalities and the CCRPC through various planning studies and plans (see 2023 MTP project list)

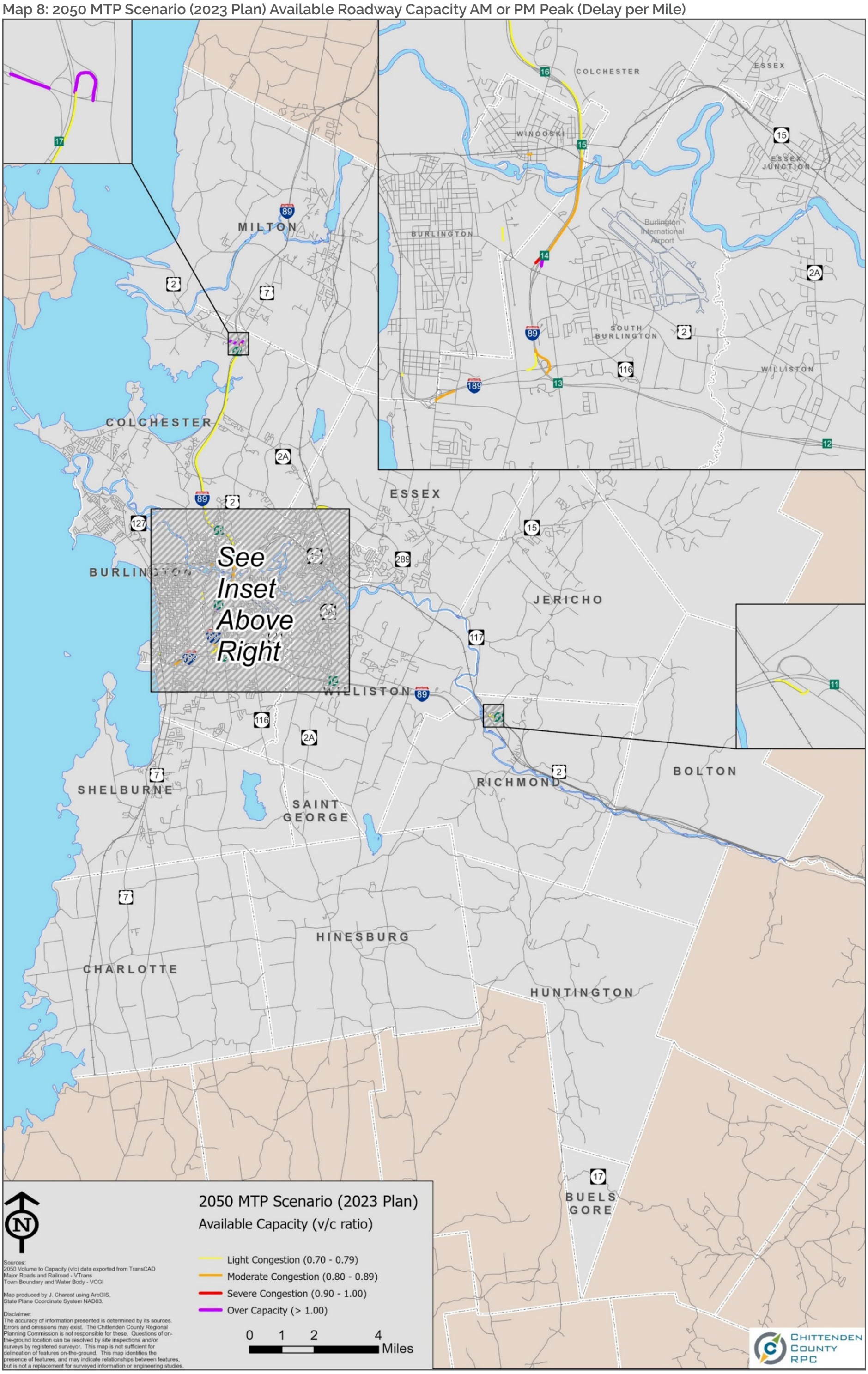
Significant Transportation Demand Management (TDM) investments that will be further explored in a FY2024 study to understand the feasibility and efficacy of proposed investments include the following:

- Increasing teleworking by 50%
- Double trips made by bike
- Triple transit services and improve frequencies
- Double participation in TDM and carsharing programs
- Increasing cost of parking in Villages and Downtowns

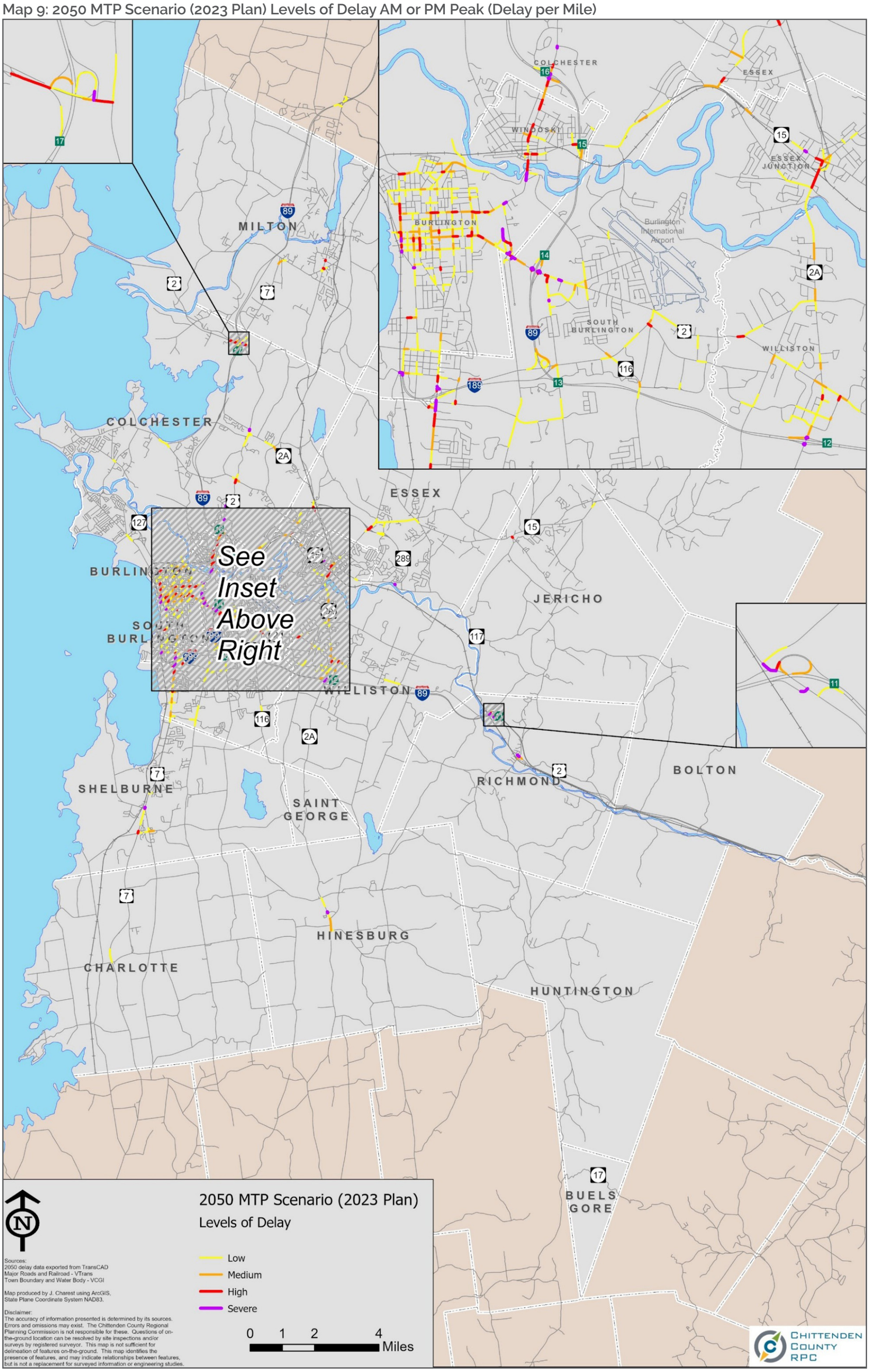
2023 MTP Scenario Results

As shown earlier in Figures 18 through 21, the 2023 MTP Scenario has significant potential to reduce delay and VMT, and increase non-auto modes of transportation. Maps 8 through 10 showcase the 2023 MTP performance throughout Chittenden County. All maps are hybrids of the greatest congestion or delay during AM or PM peak hours. Map 8 shows that segments of Interstate 89 should be monitored for potential capacity issues, especially the Exit 17 area (which might be over capacity in 2050). Map 9 illustrates where we expect people to encounter recurring congestion during AM or PM conditions in 2050 (mainly in Downtown areas, Villages, and major arterials). Map 10 highlights the extent and location where the 2023 MTP Scenario improves delay throughout the transportation network in the county, compared to the 2050 Base.

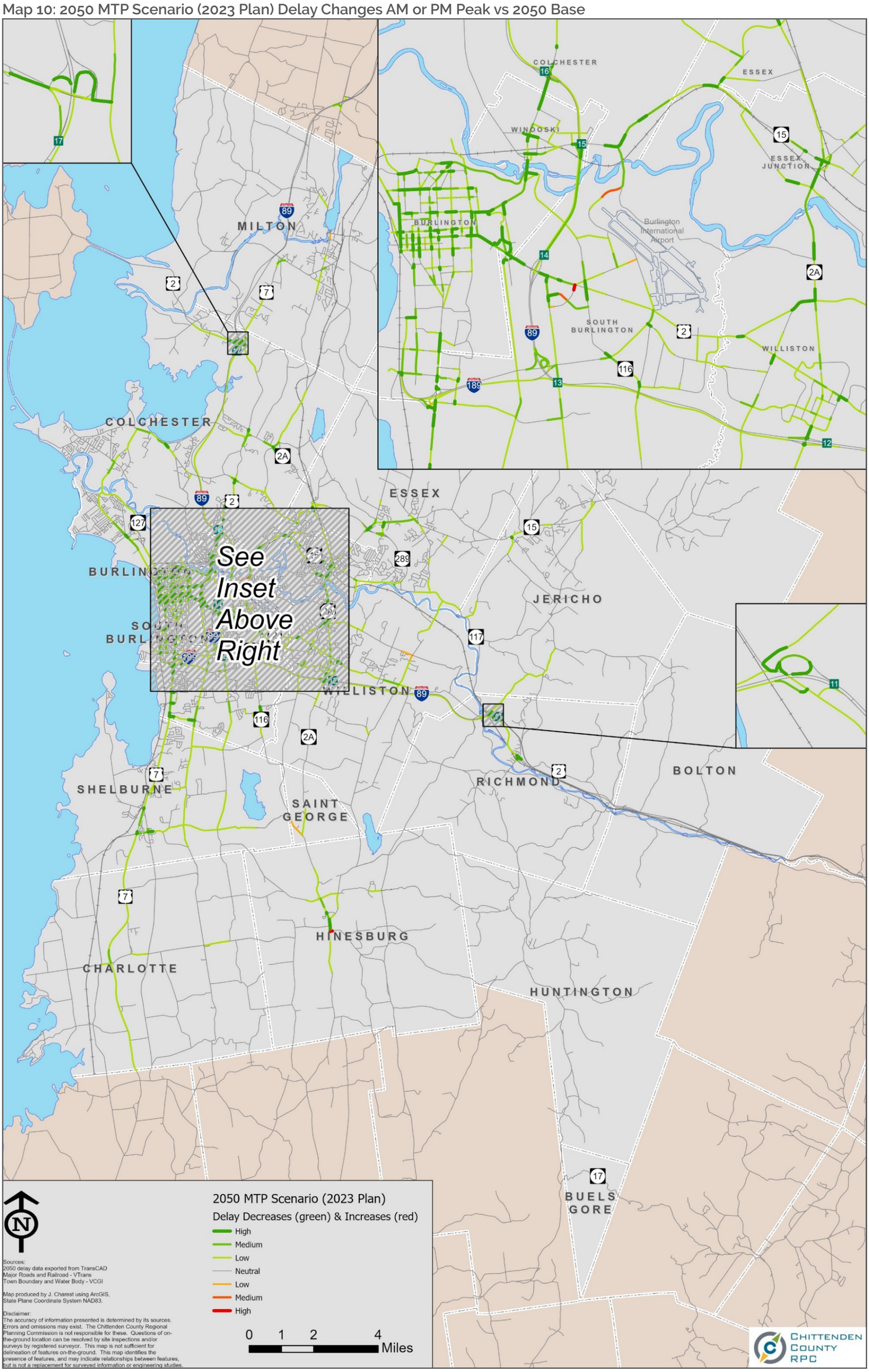
Map 8: 2050 MTP Scenario (2023 Plan) Available Roadway Capacity AM or PM Peak (Delay per Mile)



Map 9: 2050 MTP Scenario (2023 Plan) Levels of Delay AM or PM Peak (Delay per Mile)



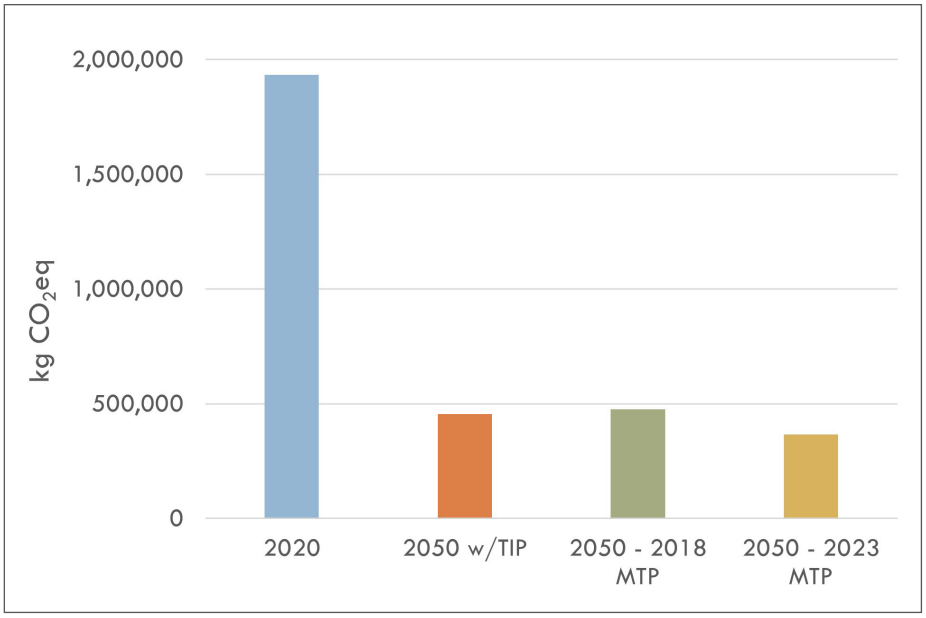
Map 10: 2050 MTP Scenario (2023 Plan) Delay Changes AM or PM Peak vs 2050 Base



2023 MTP Scenario GreenHouse Gas Emissions

The four transportation scenarios were also evaluated for their greenhouse gas (GHG) emissions using the Environmental Protection Agency's (EPA's) Motor Vehicle Emission Simulator (MOVES). GHG emissions included in this analysis were CO2, CO2eq, CH4, N2O, and total gaseous hydrocarbons. As seen in Figure 22 below, emissions decrease substantially in 2050 due to the anticipated electrification of the vehicle fleet as called for in theVermont Climate Action Plan. The 2023 MTP scenario reduces this further through decreases in vehicle miles traveled (VMT) via significant transportation demand management (TDM) investments.

Figure 22: Countywide Daily Greenhouse Gas Emission



Metropolitan Transportation Plan
Investments, Policies, and Projects

To meet the vision and goals articulated earlier in this plan, and to achieve the aspirational 2023 MTP Scenario, a number of major investments and policies are necessary to support a balanced, achievable, and sustainable transportation future for Chittenden County. These investments and policies are listed below.

MAJOR INVESTMENTS & POLICIES

- Adequately maintain and improve the existing transportation system, including roads, bridges, culverts, rail, transit, walking/biking, park-and-ride facilities, and transportation demand management (TDM) programs.
- Invest in our transportation system by addressing safety and localized congestion issues on our roadways.
- Work with federal, state, and local partners to find new sources for transportation funding, and shift from the gas tax to more sustainable sources, such as a mileage-based fee.
- Expand the deployment of Intelligent Transportation Systems (ITS) to facilitate efficient flow of traffic on roadways. This will improve safety, reduce delays and congestion, decrease transportation energy use, and minimize the need for major roadway expansion projects.
- Implement the identified MTP and Transportation Improvement Program (TIP) projects.
- Encourage higher density and mixed-use land development, as proposed by the MTP (90% of households in areas planned for growth and higher density along major transit routes). This will help improve the efficiency of transportation investments.

Future transportation investments will support areas planned for growth by facilitating a shift away from Single Occupancy Vehicle (SOV) trips, and by focusing on the following areas and programs:

- ❍ Triple transit use by 2050. The feasibility of this strategy will be explored in a FY24 study. To do so:
  - Increase investment in GMT transit services, and explore micro-transit opportunities in the county.
  - Identify new, sustainable, and stable sources to finance public transit.
  - Work with GMT to identify opportunities for transit expansion.
  - Integrate park-and-ride facilities with transit routes.
  - Invest in transit signal priority technology in partnership with GMT, VTrans, and municipalities.
  - Maximize ridership for public school buses and minimize use of private vehicles for student transport.
- ❍ Expand walking and biking infrastructure to support active transportation, and improve interconnection with the region's transit system. To do so:
  - Implement strategies, projects, and priorities identified in the 2022 Chittenden County Active Transportation Plan, to provide safe and efficient facilities that connect common origins and destinations.
  - Work with municipalities to update municipal road standards to reflect complete streets principles.
  - Review state and municipal transportation projects to ensure that complete streets principles are implemented.

- Ensure that site plans include adequate bike and pedestrian infrastructure and safety measures, via participation in the Act 250 hearing process.
- Assist municipalities with scoping future bike and pedestrian facilities to improve safety, accessibility, and continuity of the system. Municipalities can use the outcomes of the scoping studies to apply for various VTrans implementation grants.

❍ Promote Transportation Demand Management and Car Sharing programs. To do so:

- Promote and support the Go! Vermont program that links travelers to a variety of transportation resources and choices.
- Support the continued development and expansion of Chittenden County park-and-ride facilities (as recommended in the 2022 Regional Park-and-Ride Plan).
- Work with the Chittenden Area Transportation Management Association (CATMA) to support employer programs to encourage telecommuting, carpooling, vanpooling, walking, and biking for employee commute trips.
- Support CarShare Vermont's programs.

Promote a shift away from gas/diesel vehicles to electric/transportation options. To do so:

- Work with the Clean Cities Coalition and municipalities to encourage municipal fleets to switch to lower emission heavy-duty vehicles, and install charging for electric vehicles.
- Work with local employers, municipalities, and other energy advocates to encourage broader adoption of electric vehicles. For instance, provide free or reduced parking costs for EVs and fuel-efficient vehicle owners, and preferential access to parking spaces limited in supply.
- Promote the Drive Electric Vermont webpage, which connects users to financial incentives, types of available electric vehicles, and charging stations for EVs.
- Increase awareness of the benefits of and access to EVs and lower emission vehicles, in partnership with Drive Electric Vermont, Vermont Clean Cities Coalition, and other entities.
- Collaborate with electric utilities to educate and promote incentives to increase EV and hybrid adoption.
- Build awareness of charging opportunities as part of their strategy for complying with the state's Renewable Energy Portfolio Standard.
- Seek grants to fund the installation of DC fast-charging infrastructure at strategic locations along major travel corridors, in transit hubs, and along the Interstate 89 Alternative Fuels Corridor (I-89 from New Hampshire to the Canadian border).

- Collaborate with VTrans and Drive Electric Vermont to implement the Vermont 2022 State National Electric Vehicle Infrastructure Plan.
- Provide technical assistance to municipalities implementing the VT Department of Housing and Community Development Local Electric Vehicle Charging Station Regulation Guide, especially at multi-unit housing properties, businesses, and key public locations.

❍ Support and enhance our rail infrastructure for passengers and freight, and promote the upgrade of the Essex Junction to Burlington line (Winooski branch). Where needed, provide additional rail infrastructure to support efficient and safe movement, handling, and storage of goods.

IMPLEMENTATION OF 2018 MTP

Since the completion of the 2018 MTP, several investments, policies, and projects included in the plan have been accomplished. The 2018 ECOS goal of 80% of households going into areas planned for growth has been exceeded, with 87% of new growth located in these areas. Electrification of the fleet has accelerated in the last five years, though the pace of this shift must increase substantially to meet climate goals.

In addition, there has been significant progress on implementing the 2018 MTP project list. More than 150 transportation projects have been funded throughout Chittenden County, using $215 million in federal transportation funds. A number of specific accomplishments are listed below (summarized in Table 8):

❍ We have met the goal of using at least 70% of available federal funds on system preservation:
- Spent 60% of the total funding toward maintaining the existing transportation system (Paving, Bridges and Transit categories) in a state of good repair.
- Spent 17.5% of the total funding maintaining traffic signals and rail grade crossing equipment. A total of 24 intersections and 5 rail crossings have received improvements since 2018.

❍ Three capacity expansion projects (Champlain Parkway, Burlington; Crescent Connector, Essex Junction; and Market Street, South Burlington) accounted for 7.4% of funding.

❍ Two roadway corridor projects (US7 Reconstruction, Charlotte; and Pearl Street Improvements, Essex Junction) accounted for 4.9% of total funds.

- Upgrades are underway at three interstate interchange locations: Exit 12, Exit 16, and Exit 17. These upgrades will address safety, capacity, and asset condition issues.
- One park-and-ride facility included in the 2011 Park-and-Ride Plan (at Exit 16) was completed. A second facility (at Exit 12) is nearing completion.
- Sidewalks, crosswalks, and multiuse path projects were constructed in 36 locations throughout the county, accounting for 4.4% of total funds.
- Stormwater upgrades have taken place in 23 locations throughout the county.

Table 8: Transportation Funding to Chittenden County Since the 2018 MTP by Project Use Category

PROJECT CATEGORY	NUMBER OF PROJECTS	FUNDING AMOUNT IN MILLIONS	PERCENT OF TOTAL
Paving	20	$60.80	28.3%
Transit Capital and Service		$38.38	17.9%
Intersections, traffic signals, and rail grade crossing improvements	29	$37.60	17.5%
Bridge Projects	28	$29.71	13.8%
Capacity Expansion Projects	3	$15.80	7.4%
Roadway Corridor Improvements	2	$10.46	4.9%
Sidewalks, Crosswalks and Multiuse Paths	36	$9.41	4.4%
Interstate Interchange Improvements	3	$4.17	1.9%
Stormwater	23	$3.44	1.6%
Other	6	$3.04	1.4%
Park and Ride Lots	2	$2.09	1.0%
TOTAL	152	$214.92	100.0%

2023 MTP PROJECT LIST

The MTP project list (see Table 8) includes projects identified through various CCRPC and municipal planning processes, in coordination with VTrans, Chittenden County municipalities, GMT, and other partners, as appropriate. Through the planning process, the CCRPC and municipalities identify, evaluate, and develop alternatives to address transportation needs in various categories, including safety, bike and pedestrian, transit, multimodal connectivity, roadway congestion and capacity deficiencies, rail, and others.

The MTP project list proposes how federal transportation funds might be spent in Chittenden County over the next 27 years. However, almost all federal transportation funds received by Vermont flow through VTrans. How those funds are spent is detailed in the VTrans Transportation Capital Program, which is approved annually by the Vermont Legislature. The CCRPC and VTrans work closely on transportation planning in Chittenden County, and VTrans support is necessary to advance any future transportation projects.

The MTP project list identifies projects that are in the current Chittenden County Transportation Improvement Program (TIP), and on the VTrans Transportation Capital Program. These projects have had funding programmed, and are considered committed projects. The MTP list also includes projects that municipalities identified as future needs to improve the transportation system and address multimodal needs in their communities, but are not currently on any VTrans program.

The MTP project list includes a time frame (e.g., short, medium, long) which represents a preliminary estimate for when a project may be ready for construction. In addition, the short-medium time frame indicates that some elements of a project could move toward implementation in the short-term (by 2030), but the bulk of the project will most likely be implemented in the medium-term (2030 to 2040).

The MTP Financial Plan calculates funding availability, beginning in federal FY2023, which began on October 1, 2022. To be consistent with this approach, the MTP Project List includes projects expected to spend funds beginning on October 1, 2022, and does include projects constructed in 2022. The Estimated Project Cost is the cost estimate as of October 2022, and excludes any funds spent prior to the start of federal FY2023.

Table 9: MTP Projects by Municipality

PROJECT		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
BURLINGTON						
Capital Program - Front of the Book and on CCRPC TIP						
Burlington	Champlain Parkway	Short	$66,049,627	$56,612,998		New Facility
Burlington	Intervale Road Rail Crossing Improvements	Short	$675,000	$624,038		Rail Crossing
Burlington	Intervale Road Shared Use Path	Short	$1,452,500	$1,108,200		Bike/ Pedestrian
Burlington	Lake Street Sidewalk and Stormwater Management	Short	$405,000	$300,000		Bike/ Pedestrian
Burlington	Railyard Enterprise Project	Short-Medium	$16,500,000	$15,297,160		New Facility
Burlington	Schifilliti Park Shared Use Path	Short	$373,160	$258,528		Bike/ Pedestrian
Burlington	Shelburne Street Roundabout	Short	$12,176,529	$3,628,011		Safety/ Traffic Operations/ ITS
Burlington	Queen City Park Road Sidepath	Short	$1,035,000	$828,000		Bike/ Pedestrian
Capital Program - Development & Evaluation and on CCRPC TIP						
Burlington	Colchester Avenue/Prospect Street Intersection Improvements (VPSP2 Regionally Driven)	Short	$1,170,620		$936,496	Safety/ Traffic Operations/ ITS
Burlington	Colchester Avenue/ Barret Street/ Mill Street/ Riverside Avenue Intersection Improvements (VPSP2 Regionally Driven)	Medium	$3,989,700		$3,191,760	Safety/ Traffic Operations/ ITS
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Burlington	Austin Drive Bicycle and Pedestrian Improvements	Medium	$1,038,000		$830,400	Bike/ Pedestrian
Burlington	Battery Street Improvements ($3.5m funded at 50% federal)	Medium	$1,750,000		$1,750,000	Roadway Corridor Improvements
Burlington	Cherry Street Complete Street	Short	Federal Earmark		Federal Earmark	Roadway Corridor Improvements
Burlington	Colchester Avenue Bikeway and Intersection Safety	Medium	$8,000,000		$6,400,000	Bike/ Pedestrian
Burlington	Depot Street Improvements (Bike/ Ped) ($1.1m funded at 50% federal)	Short	$550,000		$550,000	Bike/ Pedestrian
Burlington	Main Street Complete Street - US2 Section	Medium	Further Planning Needed		Further Planning Needed	Roadway Corridor Improvements
Burlington	North Avenue Improvements ($16.35m funded at 50%)	Short-Medium	$8,175,000		$8,175,000	Roadway Corridor Improvements
Burlington	Pearl Street Complete Street ($3.3m funded at 50% federal)	Short	$1,650,000		$1,650,000	Roadway Corridor Improvements
Burlington	Shelburne Street Improvements - Complete Streets	Medium	$12,900,000		$12,900,000	Roadway Corridor Improvements
Burlington	Sherman Street Connection to Depot Street - Stairway Street (0.775m funded at 50% federal)	Short	$387,850		$387,850	Bike/ Pedestrian
Burlington	South End Multimodal Center		Further Planning Needed		Further Planning Needed	Park&Ride/ Intermodal
Burlington	Winooski Avenue Improvements ($12.9m funded at 50% federal)	Short	$6,450,000		$6,450,000	Roadway Corridor Improvements

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
CHARLOTTE						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Charlotte	Charlotte Village Parking	Medium	$200,000		$160,000	Park&Ride/ Intermodal
Charlotte	Town Link Trail - Phase 2 and 3	Medium	$500,000		$400,000	Bike/ Pedestrian
COLCHESTER						
Capital Program - Front of the Book and on CCRPC TIP						
Colchester	Exit 16 Improvements - CIRC ALT PHASE I	Short	$16,913,517	$19,191,000		Interstate/ Interchange
Colchester	Exit 17/US2/US7 Interchange Improvements	Medium	$28,088,272	$25,188,272		Interstate/ Interchange
Colchester	Severance Corners Improvements - CIRC ALT PHASE II	Short	$5,598,257	$5,215,778		Safety/ Traffic Operations/ ITS
Colchester	W Lakeshore Drive / Prim Road Intersection Improvements - CIRC ALT PHASE III	Short	$4,135,000	$2,697,400		Safety/ Traffic Operations/ ITS
Capital Program - Development & Evaluation and on CCRPC TIP						
Colchester	Bayside Intersection Roundabout and Stormwater Improvements (VPSP2 Asset Driven)	Medium	$4,001,790		$3,201,432	Safety/ Traffic Operations/ ITS
Colchester	VT2A Colchester Village and Mill Pond Road/East Road Intersection -CIRC ALT PHASE III	Medium	$5,450,000		$4,360,000	Roadway Corridor Improvement
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Colchester	Mill Pond Road/Severance Road Intersection Improvements	Long	$340,857		$272,686	Safety/ Traffic Operations/ ITS
Colchester	Severance Road Shared Use Path	Long	$2,290,065		$1,832,052	Bike/ Pedestrian
Colchester	VT127 Roadway, Bicycle/Pedestrian, and Intersection Improvements	Long	$29,608,038		Further planning needed	Roadway Corridor Improvements
Colchester	Exit 17 Park & Ride	Medium	$1,000,000		$1,000,000	Park&Ride/ Intermodal
Colchester	VT15 and Barnes Avenue Intercept Facility	Medium	Further Planning Needed		Further planning needed	Park&Ride/ Intermodal
Colchester	VT15/Lime Kiln Road Intersection Improvements	Medium	$1,215,400		$972,320	Safety/ Traffic Operations/ ITS
Colchester	West Lakeshore Drive Path - Prim Road to Blakely Road.	Medium	$6,540,690		$5,232,552	Bike/ Pedestrian
Colchester	West Lakeshore Pedestrian Tunnel at Bayside Park	Long	$2,360,000		$1,888,000	Bike/ Pedestrian
COLCHESTER/ESSEX/ ESSEX JUNCTION						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Colchester / Essex	VT15 Multi-use Path - Phase 2, I-89 Exit 15 to Lime Kiln Road	Long	$368,880		$295,104	Bike/ Pedestrian
Essex / Essex Junction	VT15 Multi-use Path - Phase 3, Susie Wilson Road to West Street Extension	Long	$2,666,800		$2,133,440	Bike/ Pedestrian

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
ESSEX						
Capital Program - Front of the Book and on CCRPC TIP						
Essex	VT15/Sand Hill Road Signal - CIRC ALT PHASE II	Short	$1,390,453	$1,141,340		Safety/ Traffic Operations/ ITS
Essex	Susie Wilson Road Improvements and Intersections including VT15 and Kellogg - CIRC ALT PHASE III	Short-Medium	$1,815,000	$1,451,122		Roadway Corridor Improvement
Essex	VT117/North Williston Road Intersection Improvements - CIRC ALT PHASE III	Medium	$2,104,774	$2,053,919		Safety/ Traffic Operations/ ITS
Capital Program - Candidate and on CCRPC TIP						
Essex	North Williston Road Flood Plain Elevation Improvements - CIRC ALT PHASE III	Medium	$829,575		$663,660	Roadway Corridor Improvements
Essex	VT15 Sidewalk - Old Stage Road to Essex Way - CIRC ALT PHASE III	Medium	$320,262		$256,209	Bike/ Pedestrian
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Essex	VT15 Bike/Ped Improvements, Athens Drive to VT289	Medium	$1,616,600		$1,293,280	Bike/ Pedestrian
Essex	VT117/ VT289 Park & Ride	Medium	Further Planning Needed		Further Planning Needed	Park&Ride/ Intermodal
Essex	Allen Martin Drive/ VT15 Intersection	Long	$1,982,760		$1,586,208	Safety/ Traffic Operations/ ITS
ESSEX JUNCTION						
Capital Program - Front of the Book and on CCRPC TIP						
Essex Junction	Crescent Connector Road - VT2A to VT15 - CIRC ALT PHASE I	Short	$13,750,000	$8,000,000		New Facility
Need Identified in a Scoping or Planning Study, not in Capital Program or on TIP						
Essex Junction	VT15/ West Street Extension Intersection - Additional NB Lane on West Street Ext.	Long	$243,080		$194,464	Safety/ Traffic Operations/ ITS
HINESBURG						
Capital Program - Front of the Book and on CCRPC TIP						
Hinesburg	Village South Sidewalk	Short	$352,625	$205,300		Bike/ Pedestrian
Hinesburg	VT116/ Charlotte Road Improvements to Facilitate Concurrent Signal Phasing	Short	$128,075	$90,460		Safety/ Traffic Operations/ ITS
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Hinesburg	Mechanicsville Road Sidewalk, West of Village Heights Road	Medium	$175,280		$140,224	Bike/ Pedestrian
Hinesburg	Richmond Road Shared Use Path, CVU Road to North Street	Long	$3,478,000		$2,782,400	Bike/ Pedestrian
Hinesburg	Richmond Road/North Road/Texas Hill Road Intersection Improvements	Medium	$288,540		$230,832	Safety/ Traffic Operations/ ITS
Hinesburg	Route 116 East Sidewalk -Commerce Street to Mechanicsville Road	Medium	$275,440		$220,352	Bike/ Pedestrian

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
HUNTINGTON						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Huntington	Huntington Lower Village Traffic Calming and Bike/Ped Improvements	Medium	$1,055,038		$844,030	Bike/ Pedestrian
JERICHO						
Capital Program - Front of the Book and on CCRPC TIP						
Jericho	Lee River Road Sidewalk	Short	$428,000	$264,000		Bike/ Pedestrian
Jericho	Riverside Village Sidewalk	Short	$750,000	$600,000		Bike/ Pedestrian
Capital Program - Development & Evaluation and on CCRPC TIP						
Jericho	VT117/Skunk Hollow Road Improvements (VPSP2 Asset Driven)	Medium	$1,298,000		$1,038,400	Safety/ Traffic Operations/ ITS
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Jericho	Browns Trace Multimodal Connection - MMU to Lee River Road/Ethan Allen Road	Medium	$616,356		$493,085	Bike/ Pedestrian
Jericho	VT15/Dickinson Street Modifications	Medium	$1,053,150		$842,520	Safety/ Traffic Operations/ ITS
MILTON						
Capital Program - Front of the Book and on CCRPC TIP						
Milton	US7/Middle Road/Railroad Street Safety Improvements	Short	$6,976,355	$6,091,392	$5,581,084	Safety/ Traffic Operations/ ITS
Capital Program - Development & Evaluation and on CCRPC TIP						
Milton	US7/Racine/Legion/Bartlett/ West Milton Road Improvements (VPSP2 Regionally Driven)	Medium	$1,500,000		$1,200,000	Safety/ Traffic Operations/ ITS
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Milton	US7/Main Street Intersection Improvements	Long	$1,215,400		$972,320	Safety/ Traffic Operations/ ITS
RICHMOND						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Richmond	US2 Path - VT117 to Richmond Village	Long	$7,400,000		$5,920,000	Bike/ Pedestrian
Richmond	Jonesville Park & Ride	Medium	Further Planning Needed		Further Planning Needed	Park&Ride/ Intermodal
Richmond	Cochran Road Improvements and Shared Use Path	Medium/ Long	$5,595,390		$4,476,312	Bike/ Pedestrian
Richmond	VT117 Shared Use Path	Long	$1,900,000		$1,520,000	Bike/ Pedestrian
Richmond	US2 Bike Lanes and Shoulder Widening to Consistent 5 ft Width - Park & Ride to Richmond Village	Medium	Further Planning Needed		Further Planning Needed	Safety/ Traffic Operations/ ITS
SHELBURNE						
Capital Program - Front of the Book and on CCRPC TIP						
Shelburne	Irish Hill Road Pedestrian Bridge and Sidewalk	Medium	$724,000	$466,678		Bike/ Pedestrian
Capital Program - Development & Evaluation and on CCRPC TIP						
Shelburne	US7/Harbor Road Improvements (VPSP2 Asset Driven Project)	Medium	$1,752,800		$1,402,240	Safety/ Traffic Operations/ ITS

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Shelburne	Bay Road Pedestrian Bike Safety Improvements	Medium	$2,418,000		$1,934,400	Bike/ Pedestrian
Shelburne	Shelburne Southern Gateway (South of Bostwick/Marsett)	Medium	$3,076,055		$2,460,844	Roadway Corridor Improvements
Shelburne	Shelburne Village Park & Ride	Medium	Further Planning Needed		Further Planning Needed	Park&Ride/ Intermodal
SOUTH BURLINGTON						
Capital Program - Front of the Book and on CCRPC TIP						
South Burlington	Bike/Ped Bridge over I-89 near Exit 14	Short	RAISE Grant	RAISE Grant		Bike/ Pedestrian
South Burlington	Dorset Street Shared Use Path, Old Cross Road to Sadie Lane	Short	$661,000	$564,000		Bike/ Pedestrian
South Burlington	Exit 14 Area Signal Upgrades	Short	SAFETEA-LU Grant	Grant		Safety/ Traffic Operations/ ITS
South Burlington	Spear Street Bike/Ped Improvements - Swift Street to US Forest Service	Short	$604,229	$236,000		Bike/ Pedestrian
South Burlington	Williston Road Bicycle and Pedestrian Improvements - Dorset Street to Midas Drive ($2,412,670 50% TIF funding)	Short	$800,000	$512,000		Bike/ Pedestrian
Capital Program - Development & Evaluation						
South Burlington	VT116-Cheesefactory Road (VPSP2 Asset Driven Project)	Medium	$714,500		$571,600	Safety/ Traffic Operations/ ITS
Capital Program - VPSP2 Selected Project -- not yet added to Capital Program						
South Burlington	Williston Road Intersection and Roadway Improvements - Dorset Street to VT116	Medium	$7,979,400		$6,383,520	Roadway Corridor Improvements
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
South Burlington	Airport Drive Extension to Airport Parkway	Long	Further Planning Needed		Further Planning Needed	Roadway Corridor Improvements
South Burlington	Airport Parkway Sidewalk, Kirby Road to Lime Kiln Road	Medium	$3,143,400		$2,514,720	Bike/ Pedestrian
South Burlington	Airport Parkway/ Lime Kiln Road Intersection Improvements	Medium	$906,750		$725,400	Safety/ Traffic Operations/ ITS
South Burlington	Allen Road Shared Use Path - US7 to Existing Facility	Short	$236,000		$188,800	Bike/ Pedestrian
South Burlington	I-89 Exit 14 Intercept Park & Ride Facility	Long	Further Planning Needed		Further Planning Needed	Park&Ride/ Intermodal
South Burlington	I-89 Exit 14 Reconstruction	Medium	$37,000,000		$29,600,000	Interstate/ Interchange
South Burlington	Queen City Park Road Bicycle and Pedestrian Connections - US7 to Central Avenue		$1,316,000		$1,052,800	Bike/ Pedestrian
South Burlington	Spear Street Bike/Ped Improvements - Allen Road to Swift Street	Long	Further Planning Needed		Further Planning Needed	Bike/ Pedestrian
South Burlington	Spear Street Shared Use Path, Davis Road to Jughandle	Short	$592,410		$473,928	Bike/ Pedestrian
South Burlington	Swift Street/Spear Street Intersection Improvements	Medium	$2,732,500		$2,186,000	Safety/ Traffic Operations/ ITS

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
South Burlington	US7/I-189 Intercept Park & Ride	Long	$6,585		$5,268	Park&Ride/ Intermodal
South Burlington	Boardwalk/Path Connection to City Center Park	Short	$1,000,000		$800,000	Bike/ Pedestrian
South Burlington	Exit 14 Mobility Connections	Medium	Further Planning Needed		Further Planning Needed	Bike/ Pedestrian
South Burlington	Kimball Avenue Recreational Path, Kennedy to Community Drive Including Crossing of Potash Brook		$1,210,000		$968,000	
South Burlington	VT116 Bike Path - US2 to Kennedy Drive	Long	$590,000		$472,000	Bike/ Pedestrian
ST. GEORGE						
Capital Program - Development & Evaluation and on CCRPC TIP						
St. George	VT116/VT2A Intersection Improvements (VSPS2 Asset Driven)	Long	TBD		TBD	Safety/ Traffic Operations/ ITS
WESTFORD						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Westford	Browns River Path Common to School	Short	Further Planning Needed		Further Planning Needed	Bike/ Pedestrian
WILLISTON						
Capital Program - Front of the Book and on CCRPC TIP						
Williston	Park & Ride South of I-89	Short	$7,197,785	$2,693,993		Park&Ride/ Intermodal
Williston	US2/Industrial Avenue Intersection	Short	$9,322,515	$2,343,434		Safety/ Traffic Operations/ ITS
Williston	US2/Trader Lane Signal - CIRC ALT PHASE II	Short	No Federal	No Federal		Safety/ Traffic Operations/ ITS
Williston	VT2A/Industrial Avenue Improvements and Improvements to VT2A to James Brown Drive - CIRC ALT PHASE III	Short	$9,266,919	$8,081,919		Roadway Corridor Improvement
Williston	VT2A Connector Path - Beaudry Lane to VSECU		$399,000	$244,000		Bike/ Pedestrian
Williston	Exit 12 Stage 1 - Shared Use Path and VT2A lane from Marshall to VT2A - CIRC ALT PHASE III	Medium	$2,265,624	$1,183,900		Interstate/ Interchange
Capital Program - Development & Evaluation and on CCRPC TIP						
Williston	Exit 12 Stage 3 - Diverging Diamond Interchange (VPSP2 Asset Driven)	Medium	$28,670,800		$22,936,640	Interstate/ Interchange
Capital Program - Candidate						
Williston	Mountain View Road Multimodal Improvements: Old Stage Road to VT2A -- CIRC ALT PHASE III	Long	$4,654,650		$3,723,720	Roadway Corridor Improvements
Williston	Exit 12 Stage 2 - New Grid Streets and VT2A Intersection	Medium	$11,643,600		$9,314,880	New Facility
Williston	Exit 12 Stage 4 - VT2A Boulevard	Long	$14,398,000		$11,518,400	Roadway Corridor Improvement
Williston	US2 - Taft Corners to Williston Village - Shared Use Path - CIRC ALT PHASE III	Medium	$3,497,775		$2,798,220	Bike/ Pedestrian

* DOES NOT INCLUDE FUNDS ALREADY SPENT

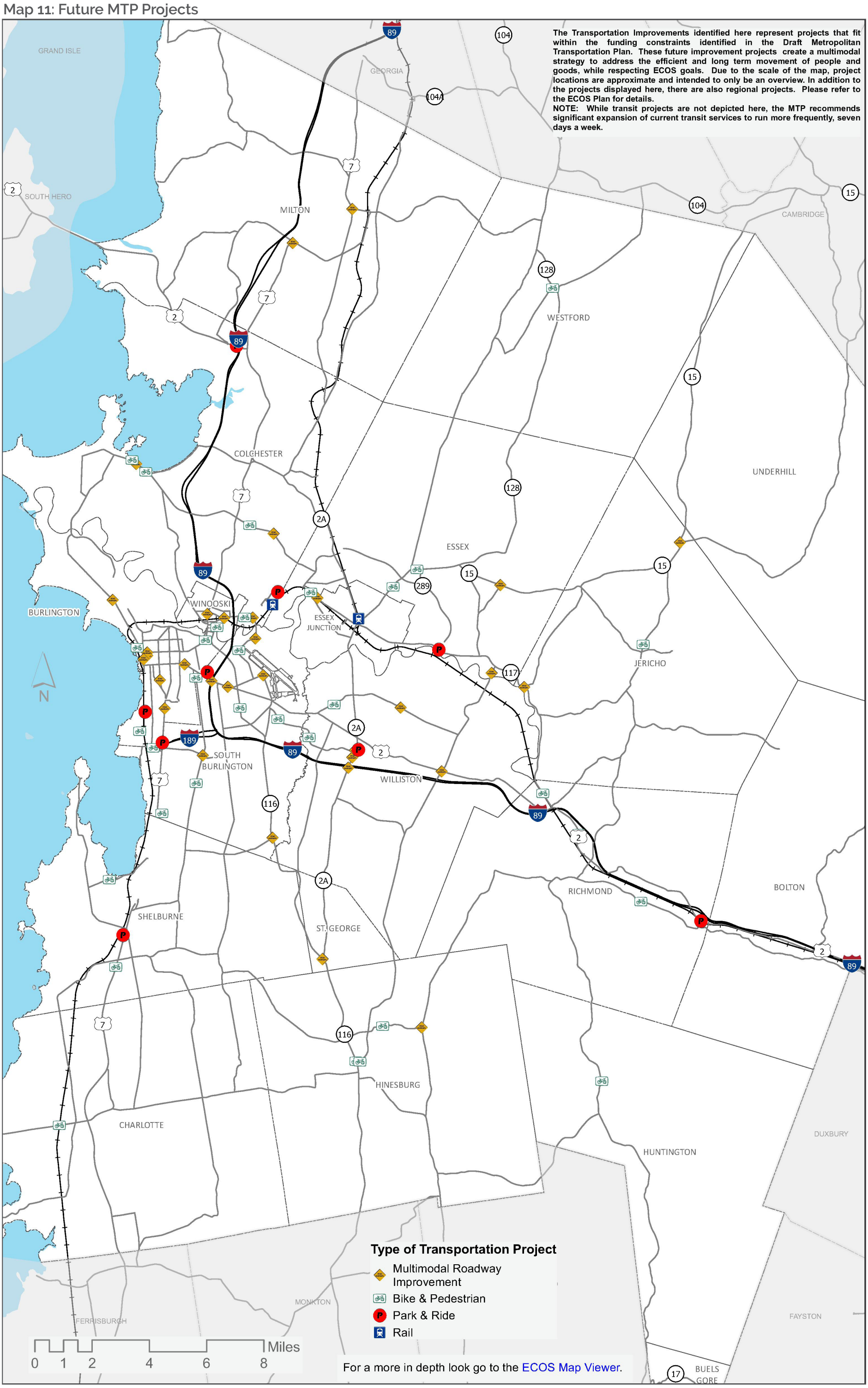
METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Williston	Taft Corners Park & Ride	Long	$316,080		$252,864	Park&Ride/ Intermodal
Williston	North Williston Road Improvements	Long	$326,435		$261,148	Roadway Corridor Improvements
Williston	US2/North Williston Road/Oak Hill Road Intersection	Long	$1,325,760		$1,060,608	Safety/ Traffic Operations/ ITS
Williston	Industrial Avenue Sidewalks	Long	$517,450		$413,960	Bike/ Pedestrian
Williston	Marshall Avenue Shared Use Path - Muddy Brook to South Brownell		$1,954,515		$1,563,612	Bike/ Pedestrian
WINOOSKI						
Capital Program - Front of the Book and on CCRPC TIP						
Winooski	Gateways Crosswalk Enhancements	Short	$425,484	$259,600		Bike/ Pedestrian
Winooski	Main Street Sidewalks and Bicycle Improvements			$380,000		Bike/ Pedestrian
Winooski	Malletts Bay Rail Crossing Improvements			$380,880		Rail Crossing
Capital Program - VPSP2 Selected Project -- not yet added to Capital Program						
Winooski	East Allen Street (VT15) Improvements, Weaver to Florida Avenue		$4,989,495		$3,991,596	Roadway Corridor Improvements
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Winooski	Riverwalk East	Long	$2,544,000		$2,035,200	Bike/ Pedestrian
Winooski	Main Street (US7) Revitalization - Transportation, Utility, Stormwater	Short-Medium	Earmark		Earmark	Roadway Corridor Improvements
REGIONAL STORMWATER						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Regional	Regional Stormwater Projects	Ongoing	$16,000,000		$15,000,000	Stormwater/ Environmental
REGIONAL BIKE/PEDESTRIAN -- IMPLEMENTATION OF 2023 ACTIVE TRANSPORTATION PLAN RECOMMENDATIONS						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Regional	Sidewalks/Path in Chittenden County	Ongoing	$15,000,000		$15,600,000	Bike/ Pedestrian
REGIONAL TRANSPORTATION DEMAND MANAGEMENT						
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Regional	TDM Projects to Support Goals of Reducing Vehicle Miles Traveled and Greenhouse Gases	Ongoing	$30,000,000		$15,000,000	TDM
REGIONAL TRANSIT						
On CCRPC TIP Projects						
Regional	Transit Projects in CCRPC TIP		Included in System Preservation Cost			Transit
Need Identified in a Scoping or Planning Study, Not in Capital Program or on TIP						
Regional	Transit Expansion		$25,000,000		$20,000,000	Transit

* DOES NOT INCLUDE FUNDS ALREADY SPENT

METRICS		TIME FRAME	COST ESTIMATE 2022	TOTAL TIP COMMITTED (FEDERAL)*	FEDERAL AMOUNT (ASSUME 80% OFCOST)	PROJECT USE CATEGORY
REGIONAL AVIATION						
Regional	Aviation Projects ad Burlington International Airport		FAA			Aviation
REGIONAL RAIL						
Regional Rail	Bring all Tracks in Chittenden County to Class 4 standard		FRA or FTA			
Regional Rail	Essex Junction to Burlington 286 Rail Upgrade		FRA or FTA			
Regional Rail	Essex Junction Train Station Upgrades		Earmark			
Regional Rail	Freight Improvements to bridges, sidings, railyards, crossings and clearance		FRA or FTA			
TOTAL PROJECT COSTS			**$571,723,221**	**$168,193,322**	**$272,434,840**	

TOTAL COST OF TIP COMMITTED PROJECTS AND NEW PROJECTS	**$440,628,162**
FUNDS EXPECTED TO BE AVAILABLE FOR EXITING COMMITTED AND NEW PROJECTS	**$440,630,000**
BALANCE OF FUNDING	**$1,838**

Map 11: Future MTP Projects



ENVIRONMENTAL CONSULTATION AND MITIGATION

The MTP recommends a series of multimodal transportation projects, programs, and initiatives to meet the current and projected future transportation demand in Chittenden County. These recommendations are designed to provide for a safe and efficient transportation system while limiting, to the degree possible, any negative cultural or environmental impacts.

The development of the MTP gives the CCRPC an opportunity to review and consult with state and federal agencies on the proposed transportation improvements and discuss potential environmental impacts. The focus of this section is to highlight and discuss ways to mitigate potential negative impacts as transportation projects move to implementation.

Federal regulations require the following:

The MPO shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. The consultation shall involve, as appropriate:

1. Comparison of transportation plans with State conservation plans or maps, if available; or
2. Comparison of transportation plans to inventories of natural or historic resources, if available. (23 CFR 450.322).

In order to meet this federal requirement, and to avoid adverse impacts on natural and cultural resources, the CCRPC solicited feedback on the development of the MTP from a wide array of resource agencies. On March 9, 2023, the CCRPC hosted a virtual meeting with state resource agency staff to review the draft 2023 MTP and discuss the mitigation of environmental and cultural resource impacts due to future transportation projects.

Mitigation can mean any of the following:

- Avoiding impacts altogether
- Minimizing impacts by limiting the extent of the action
- Repairing the impact through a restoration or rehabilitation process
- Reducing impacts through on-going preservation and maintenance operations
- Compensating for the impact by replacing or providing a substitute resource

Whichever option is used, the intent is the same: Restore, enhance, or preserve natural resources to compensate for impacts, and to ensure ecosystems remain sustainable and productive into the future.

The CCRPC does not anticipate significant impacts to cultural or environmental resources due to implementing MTP projects. Moreover, any impacts identified will be evaluated and mitigated following all applicable federal and state requirements.

Some improvements will likely have positive environmental contributions. Enhancing the bike and pedestrian infrastructure, improving the transit system, and investing in Transportation Demand Management (TDM) programs should facilitate the shift from Single Occupancy Vehicles, and reduce vehicle travel and congestion, thus minimizing Green House Gas (GHG) emissions and improving air quality. These transportation investments could mitigate or eliminate the need for major expansion of the roadway system, thereby reducing negative impacts to environmental and cultural resources.

The CCRPC uses Geographic Information System (GIS) resource inventory maps to identify possible impacts of planned transportation projects. Resources such as steep slopes, impaired watersheds, contaminated sites, and agricultural soils could also be considered in reviews.

The online mapping tool at the CCRPC can reveal potential impacts in considerable detail. Natural and cultural resource data layers included in CCRPC's map viewer include the following:

- Rare plant and animal communities
- Natural areas, parks and other conserved lands
- Floodplains, wetlands
- Streams, deer wintering areas, historic sites/buildings
- Historic districts

While the MTP can point out some resource conflicts early on, the ability to identify, evaluate, and mitigate environmental and cultural impacts of transportation projects begins at the project definition phase (scoping), and continues into the preliminary engineering/environmental permitting phase.

Depending on funding sources and other factors, a project can go through various reviews and permitting processes, including the National Environmental Policy Act (NEPA), the Federal Advisory Council on Historic Preservation's Section 106, FHWA's Section 4(F), and possibly Vermont Act 250. In these regulatory proceedings, the precise mitigation strategy, if needed, will be defined.

Table 10 identifies the organizations that need to be involved in the respective resource issues and identifies possible mitigation strategies and locations. Through project definition and the NEPA process, these parties and activities will become more prominent.

Table 10: Possible Mitigation Strategies

RESOURCE	REGULATORY AND INFORMATION CONTACTS	MITIGATION ACTIVITIES	MITIGATION AREAS
Cultural and Historic Resources	VTrans Historic Preservation and Archeology Officers, VT Agency of Commerce and Community Development Historic Preservation Office	Avoid or minimize impacts; appropriate landscaping; excavation for archeological sensitive areas; project design exceptions; environmental compliance monitoring	Preserve in place and on-site landscaping; on-site mitigation of archeological impacts
Water Resources, Wetlands, Rivers and Floodplains	VT Agency of Natural Resources: Dept. of Environmental Conservation Watershed Management Division, Dept. of Fish and Wildlife. US Army Corps of Engineers, US Fish and Wildlife Service, US EPA's Green Infrastructure Collaborative, Lake Champlain Basin Program, Winooski Valley Park District	Mitigation sequence: avoid, minimize, compensate (could include preservation, creation, restoration, riparian buffers); design exceptions; environmental compliance monitoring; floodplain management for eligible activities; stormwater system retrofits; application of Green Stormwater Infrastructure; low-cost, low-tech infiltration improvements	On site to the extent possible and appropriate; off-site through mitigation banking program as permitting requires
Parks/Recreation Areas	VT Agency of Natural Resources Dept. of Parks and Recreation, Winooski Valley Park District, Municipal Parks and Recreation departments	Avoidance, minimization, mitigation; design exceptions; environmental compliance monitoring	On site screening or facility replacement; offsite replacement adjacent to existing
Conserved Lands/ Natural Areas	Winooski Valley Park District, Nature Conservancy, Vermont Land Trust, Municipal Land Trusts, Dept. of Fish and Wildlife Natural Heritage Program	Avoidance, minimization; any replacement to be of equal value and of equivalent use-fulness; design exceptions; environmental compliance monitoring	Landscaping within existing rights-of-way; replacement property to be contiguous
Endangered Plants or Animals	VT Agency of Natural Resources: Dept. of Environmental Conservation, Dept. of Fish and Wildlife Natural Heritage Program	Avoidance, minimization; time of year restrictions, construction sequencing/ timing; design exceptions; environmental compliance monitoring	Species relocation to suitable habitat adjacent to project limits
Air Quality	VT Agency of Natural Resources Air Quality Division, Vermont Climate Collaborative, Vermont Energy Investment Corporation, VTrans Policy and Planning Division	Transportation Demand Management programs; ITS projects; No Idling ordinances	Throughout the region