

Metropolitan Transportation Plan

Long Range Transportation Plan for the Capitol Region, 2023-2050





Prepared in cooperation with the Connecticut Department of Transportation and U.S. Department of Transportation's Federal Highway Administration and Federal Transit Administration. The opinions, findings, and conclusions expressed in this publication are those of the Capitol Region Council of Governments and do not necessarily reflect the official views or policies of the Connecticut Department of Transportation and/or the U.S. Department of Transportation.

Cover image credits: Carl Talley, Chris Henchey, and Joseph Gaylor Photography

Table of Contents

Chapter 01	Introduction.....	01.1
Chapter 02	Transit and Rail System.....	02.1
Chapter 03	Highway System.....	03.1
Chapter 04	Complete Streets.....	04.1
Chapter 05	Airport System Ground Access.....	05.1
Chapter 06	Freight Transport System.....	06.1
Chapter 07	New and Emerging Technologies.....	07.1
Chapter 08	Transportation Performance Management.....	08.1
Chapter 09	Special Emphasis Areas.....	09.1
Chapter 10	Financial Plan.....	10.1
Chapter 11	Innovative Finance.....	11.1
Chapter 12	Environmental Justice.....	12.1
Chapter 13	Public Involvement.....	13.1

List of Figures

Chapter 01

Figure 01.1 — Connecticut County and COG Boundaries 01.3

Figure 01.2 — CRCOG Member Communities..... 01.4

Figure 01.3 — CRCOG Northeast Regional Context Map 01.5

Figure 01.4 — A Sustainable Future for the Capitol Region..... 01.6

Figure 01.5 — Mode Share within CRCOG Region 01.9

Figure 01.6 — Household Vehicle Availability within CRCOG Region 01.9

Figure 01.7 — Status of Federal Air Quality Districts in Connecticut 01.11

Figure 01.8 — Observed and Projected Temperature Change 01.12

Figure 01.9 — Sources of Greenhouse Gas Emissions in 2016..... 01.13

Figure 01.10 — Regional Population Trends 2019–2050..... 01.14

Figure 01.11 — Regional Employment Trends 2019–2050 01.15

Figure 01.12 — Regional Inflow and Outflow of Workers..... 01.16

Chapter 02

Figure 02.1 — New Britain CT**fastrak** station..... 02.4

Figure 02.2 — Windsor Locks Station Rendering..... 02.5

Figure 02.3 — Infrastructure upgrades to the New Haven–Hartford- Springfield line 02.6

Figure 02.4 — A CT**rail** Hartford Line train arriving at Berlin Station 02.6

Figure 02.5 — Passengers in line to board the local 39W bus to Westfarms Mall..... 02.7

Figure 02.6 — New Greater Hartford Transit District buses waiting for inspection..... 02.12

Figure 02.7 — CT**fastrak** ticket vending machines in downtown Hartford 02.14

Figure 02.8 — Passengers waiting for the CT**rail** Hartford Line on Track 1 02.15

Figure 02.9 — The 913 Express Bus heading to the Buckland Hills Park & Ride Lot..... 02.16

Figure 02.10 — Passengers waiting at one of the CT**transit** shelters with a bench..... 02.17

Chapter 03

Figure 03.1 — Nationwide Vehicle Miles Traveled Trend (Trailing 12 Month Total) 03.3

Figure 03.2 — Regional Roadway and Vehicle Miles Traveled, 2021 03.3

Figure 03.3 — National Highway System in Capitol Region 03.4

Figure 03.4 — 2019 PM Peak Hour Inbound Average Travel Speeds 03.7

Figure 03.5 — 2019 PM Peak Hour Outbound Average Travel Speeds 03.7

Figure 03.6 — Highway Diversion Plan 03.16

Figure 03.7 — Variable Messaging Sign 03.17

Figure 03.8 — Revised I-91 Northbound access to the Charter Oak Bridge..... 03.21

Figure 03.9 — CTDOT I-84/I-91 Study Interchange Concepts 03.24

Figure 03.10 — Route 5 Corridor Study Area 03.27

Figure 03.11 — The Bulkley Bridge between Hartford and East Hartford..... 03.28

Figure 03.12 — Founders Bridge between Hartford and East Hartford..... 03.29

Figure 03.13 — Glastonbury Roundabouts..... 03.33

Figure 03.14 — National Development at Rentschler Field..... 03.34

Figure 03.15 — Glastonbury & Rocky Hill Ferry..... 03.36

Chapter 04

Figure 04.1 — Walking on our nations roadways has become increasingly unsafe 04.7
 Figure 04.2 — People of color are disproportionately killed while walking 04.9
 Figure 04.3 — Walking in low-income areas is more dangerous 04.9
 Figure 04.4 — The CRCOG Complete Streets Network map for the region 04.12
 Figure 04.5 — Equity Map 04.12
 Figure 04.6 — Safety Map 04.13
 Figure 04.7 — Demand Map 04.13
 Figure 04.8 — Modal Hierarchy 04.13
 Figure 04.9 — Recommendation Frequency from RSAs 04.14
 Figure 04.10 — ActiveCT project location map 04.16

Chapter 05

Figure 05.1 — CRCOG Regional Airports 05.2
 Figure 05.2 — Rendering of the new Multimodal Facility at Bradley Airport. 05.2
 Figure 05.3 — Bradley National Service Improvements 05.3
 Figure 05.4 — Bradley Non-Stop Destinations. 05.3
 Figure 05.5 — Cargo and Mail Shipments at Bradley Airport, in Pounds. 05.4
 Figure 05.6 — Bradley Roadway Plan. 05.5
 Figure 05.7 — Bradley Flyer Bus waiting to depart from Hartford's Union Station 05.7
 Figure 05.8 — Buildout Estimate. 05.11
 Figure 05.9 — Draft Recommendation Plan for the Bradley Master Plan update. 05.12
 Figure 05.10 — Long Term – Departure Terminal layouts 05.12

Chapter 06

Figure 06.1 — Freight Tonnage by Mode, Connecticut. 06.2
 Figure 06.2 — Bridges with Inadequate Clearance (over) 06.3
 Figure 06.3 — I-84's Willington truck stop is privately-owned 06.4
 Figure 06.4 — Rest Stops Areas with Truck Parking in Connecticut 06.5
 Figure 06.5 — Freight Rail Network 06.7
 Figure 06.6 — Pipelines in Hartford County 06.11

Chapter 07

Figure 07.1 — Autonomous Vehicle Sales, Fleet, Travel, and Benefit 07.2
 Figure 07.2 — Visualization of connected/automated vehicle technologies. 07.3
 Figure 07.3 — SPaT Challenge Participants 07.5
 Figure 07.4 — U.S. Light Duty Plug-in Vehicle Sales by Type, 2011-2021. 07.6
 Figure 07.5 — Dynamic Wireless Power Transfer (DWPT), Arena del Futuro, Italy 07.9
 Figure 07.6 — Micromobility Ridership Chart. 07.10
 Figure 07.7 — Make-Up of Micromobility Programs in North America 07.11
 Figure 07.8 — Mobility as a service concept. 07.12
 Figure 07.9 — EV Charging Stations in Capitol Region 07.15
 Figure 07.10 — Micromobility Propensity Metrics. 07.16
 Figure 07.11 — Micromobility Propensity Map. 07.16

Chapter 08

Figure 08.1 — Historical Statewide Safety Trends 08.10
 Figure 08.2 — Bridges in Poor Condition 08.11
 Figure 08.3 — LOTTR on Interstate System 08.13
 Figure 08.4 — LOTTR on Non-Interstate NHS System 08.13
 Figure 08.5 — TTTR Index on Interstate System 08.13

Chapter 09

Figure 09.1 — Variable message sign used for transportation management and security . . . 09.2
 Figure 09.2 — Get Ready Capitol Region 09.3
 Figure 09.3 — 2015 CTfastrak emergency exercise 09.4
 Figure 09.4 — Flood Control Areas in Hartford and East Hartford 09.4
 Figure 09.5 — Statewide COG boundaries after 2015 reorganization 09.5
 Figure 09.6 — CRCOG Surrounding MPO's 09.6
 Figure 09.7 — New zero emissions hydrogen bus 09.12

Chapter 10

Figure 10.1 — Planned FY2023-2027 Connecticut Transportation Expenditures by Use 10.2
 Figure 10.2 — Planned 2023-2027 CT Transportation Expenditures by Funding Source 10.3
 Figure 10.3 — Expected Revenues and Expenditures for Highway and Transit 2023–2050 . . . 10.8
 Figure 10.4 — Expected Regional Highway Expenditures 2023–2050 (in 000,000s) 10.9
 Figure 10.5 — Expected Regional Transit Expenditures 2022–2050 (in 000,000s) 10.10
 Figure 10.6 — CTDOT Operations and Maintenance Budget – FY2022 10.11

Chapter 11

Figure 11.1 — Coordination of Major Regional Policies 11.2

Chapter 12

Figure 12.1 — Flyer for this MTP offered hybrid options - in-person and virtual opportunities in the Fall of 2022 12.2
 Figure 12.2 — Percent of TIP Funds in EJ Target Areas 12.6
 Figure 12.3 — Trend of Funds in Target Areas (%) 12.6
 Figure 12.4 — Environmental Justice Target Areas and TIP Projects 12.7

Chapter 13

Figure 13.1 — Route 5 pop-up event 13.4
 Figure 13.2 — Transit Priority Corridors Outreach Day Poster 13.6
 Figure 13.3 — Public Meeting Flyer 13.8
 Figure 13.4 — Survey respondents' funding priorities 13.9

List of Tables

Chapter 03

Table 03.1 — Federal-aid Highway National Goals 03.2

Chapter 08

Table 08.1 — Safety Measures and Targets..... 08.9
 Table 08.2 — Infrastructure Condition Measures and Targets 08.11
 Table 08.3 — NHS Performance, Freight, CMAQ Measures 08.12
 Table 08.4 — Transit Asset Management Measures 08.15
 Table 08.5 — Transit Safety Measures 08.16

Chapter 09

Table 09.1 — List of common issues, activities, and projects at MPO coordination meetings 09.7
 Table 09.2 — CROG and PVPC meeting items 09.9

Chapter 10

Table 10.1 — FHWA Formula Programs – Connecticut's FY2018 Apportionments..... 10.5
 Table 10.2 — FTA Formula Programs – Connecticut's FY2018 Apportionments..... 10.6

Chapter 11

Table 11.1 — Illustrative Estimate, Capitol Region Transportation Sales Tax..... 11.6
 Table 11.2 — Examples of Regional Transportation Sales Taxes 11.7

Chapter 01

Introduction

The Metropolitan Transportation Plan (MTP) is one of the three main guiding bodies of policy for the Capitol Region, with the other two being the Regional Plan of Conservation and Development (POCD) and Metro Hartford Future, the region's Comprehensive Economic Development Strategy (CEDs). The coordination of these three pillars of policy drives CROG's emphasis on creating a Sustainable Region. The MTP promotes sustainable development by encouraging the creation of a sustainable transportation system that integrates land use, economic development, and the preservation of the natural environment in the decision-making process to help shape a region with first class mobility.



Photo by Carl Talley

Purpose of the Capitol Region Council of Government's Metropolitan Transportation Plan

As the designated Metropolitan Planning Organization (MPO) for the Greater Hartford Metro area, the Capitol Region Council of Governments (CROCOG) is excited to present this update of its Metropolitan Transportation Plan (MTP). This plan identifies how the Capitol Region will manage and operate a multi-modal transportation system (including transit, highway, bicycle, pedestrian, and accessible transportation) to meet the region's economic, transportation, development, and sustainability goals, among others, within a planning horizon to 2050 and a fiscally constrained environment.

This document is required by federal code 23 CFR450.324(c), and per these procedures may be revised at any time without a requirement to extend the horizon year. The law requires that the MPO review and update its transportation plan at least every four years in air quality non-attainment and maintenance areas. CROCOG is within the Greater Connecticut Ozone Non-Attainment Area (levels rated moderate).

In conformance with the Federal guidelines identified above, this plan considers: economic vitality; safety; security; equity; accessibility and mobility of people and freight; the environment (including land use); enhanced connectivity; efficient

management and operations; preservation of the existing transportation system; resiliency; and a performance-based approach.

Much of this plan's focus is similar to the previous plan (CROCOG Metropolitan Transportation Plan Connect 2045), and like the previous plan, a Comprehensive, Cooperative, and Continuing (3-C) planning process was employed. Beginning in 2019, there were new areas of focus that were included in the MTP in order to comply with federal requirements for Performance Based Planning and Programming. In addition, chapters on Innovative Financing and Emerging Technologies address key elements related to financing strategies and future transportation development. The discussion regarding Bicycles, Pedestrians, and Sustainability has been updated to reflect CROCOG's implementation of a Complete Streets Policy since the last update.



Photo by Chris Henchey

Although Council of Governments (COG) boundaries in Connecticut have not changed since the last MTP update, as of June 2022, the federal government approved Connecticut’s request to use COG boundaries as county equivalents. The eight counties in Connecticut ceased to function as governmental and administrative entities in 1960 when Councils of Government COGs were established. There are currently nine COGs in Connecticut, and those boundaries are shown comparatively to the county boundaries in Figure 01.1. COGs serving as county equivalents will greatly simplify the collecting, tabulating, and disseminating of statistical data, improving CRCOG’s ability to use Census data for planning and decision-making. Previously, the lack of regional geographies being recognized as county equivalents by the Census Bureau would not allow cities and towns in Connecticut to be eligible to apply for many federal grants that are limited to counties. Additionally, the new planning region/county equivalency will allow municipalities to more easily collaborate

on federal grants submitted through their COGs, eliminating redundant grant administration, and potentially leading to more competitive applications.

Figure 01.1 – Connecticut County and COG Boundaries

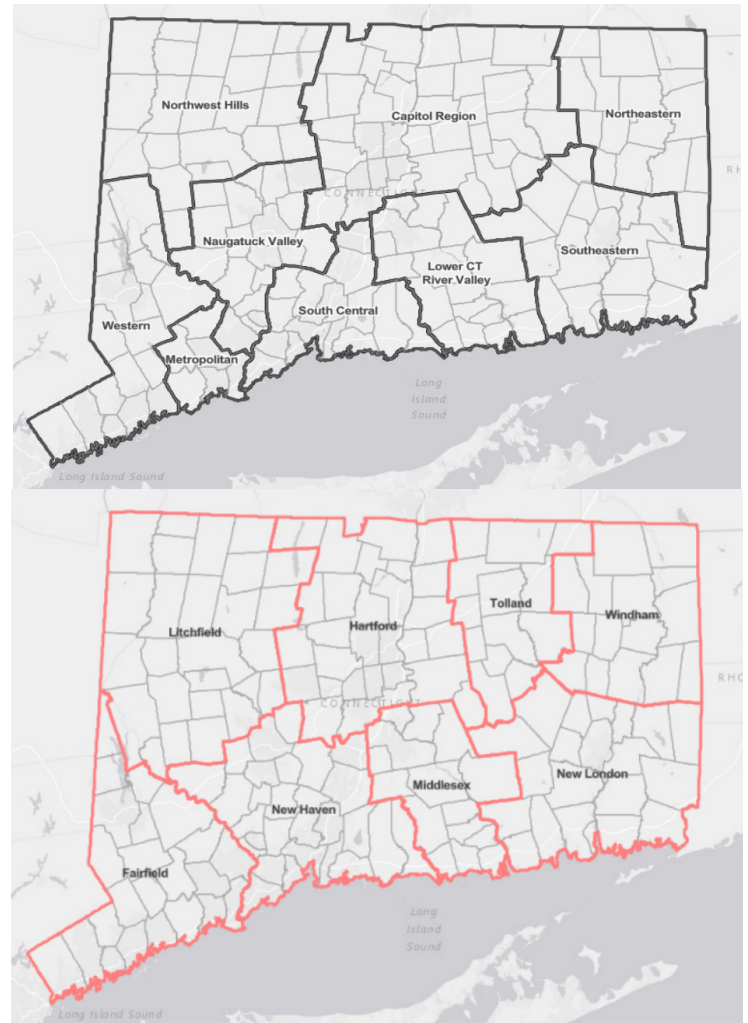


Photo by Chris Henchey

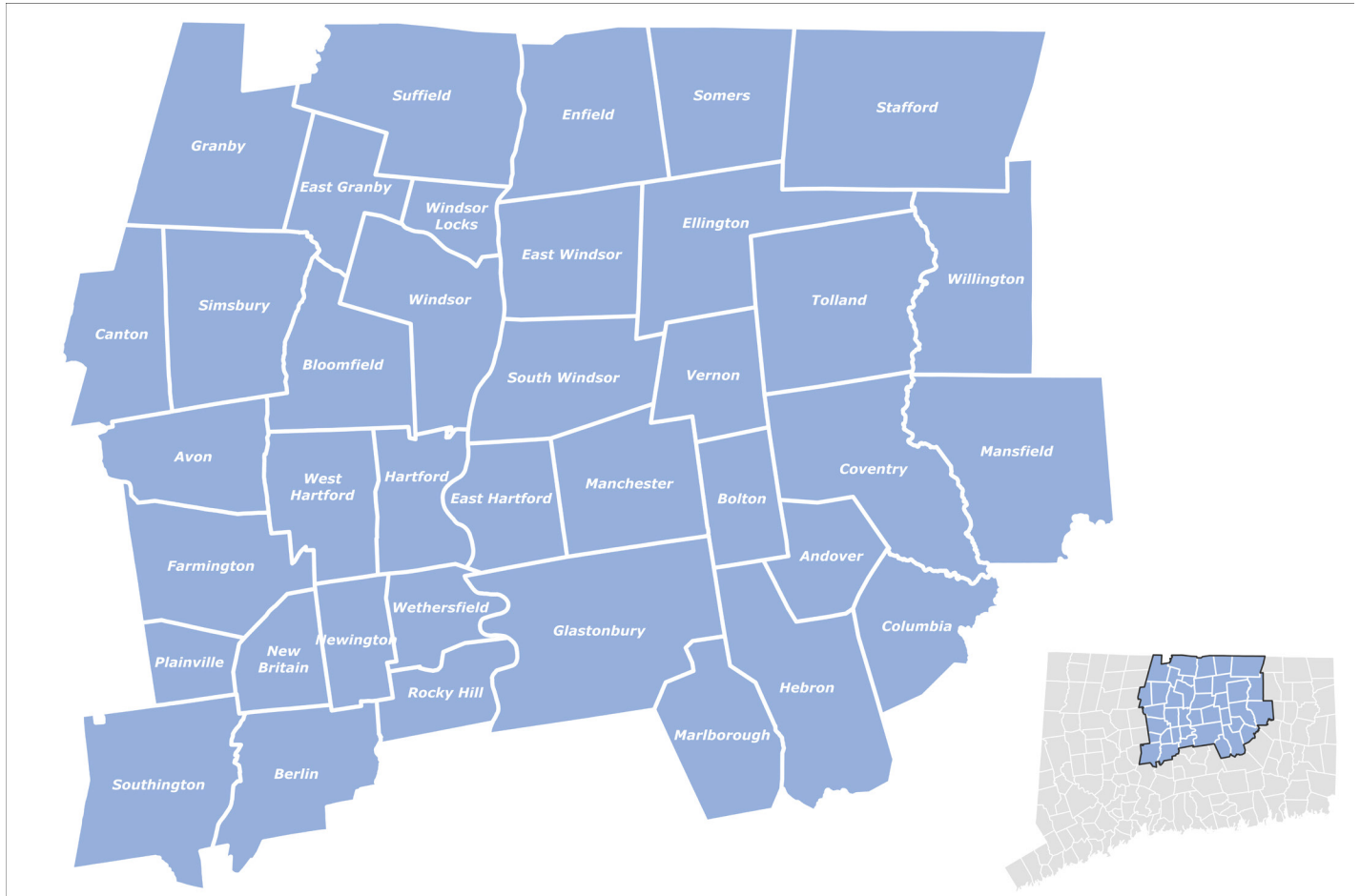
The CRCOG Region

CRCOG is located in north central Connecticut and is the largest of the MPOs in the state, with a population of approximately 970,000. It is bordered by the state of Massachusetts to the north and the metro area of Springfield. Running through the center of the Capitol Region from north to south, the Connecticut River forms a highly developed and densely populated river valley. This river valley region, along with the surrounding CRCOG suburban areas, the Springfield metro area and beyond, forms a major part of the New England Knowledge Corridor— an interstate partnership of regional economic development, planning, business, tourism and

educational institutions that work together to advance the region’s economic progress.

CRCOG lies within the northeast region of the U.S, comprised of the New England and the NY Metro Area, one of the most heavily populated regions of the U.S. The area is further part of a greater “mega” region stretching from Washington DC through Philadelphia, New York and Boston. Residents within the CRCOG region enjoy the benefits and challenges of being part of a region with continually improving and expanding transportation options. The map below shows CRCOG’s location relative to the adjacent major metropolitan areas of New York and Boston.

Figure 01.2 – **CRCOG Member Communities**

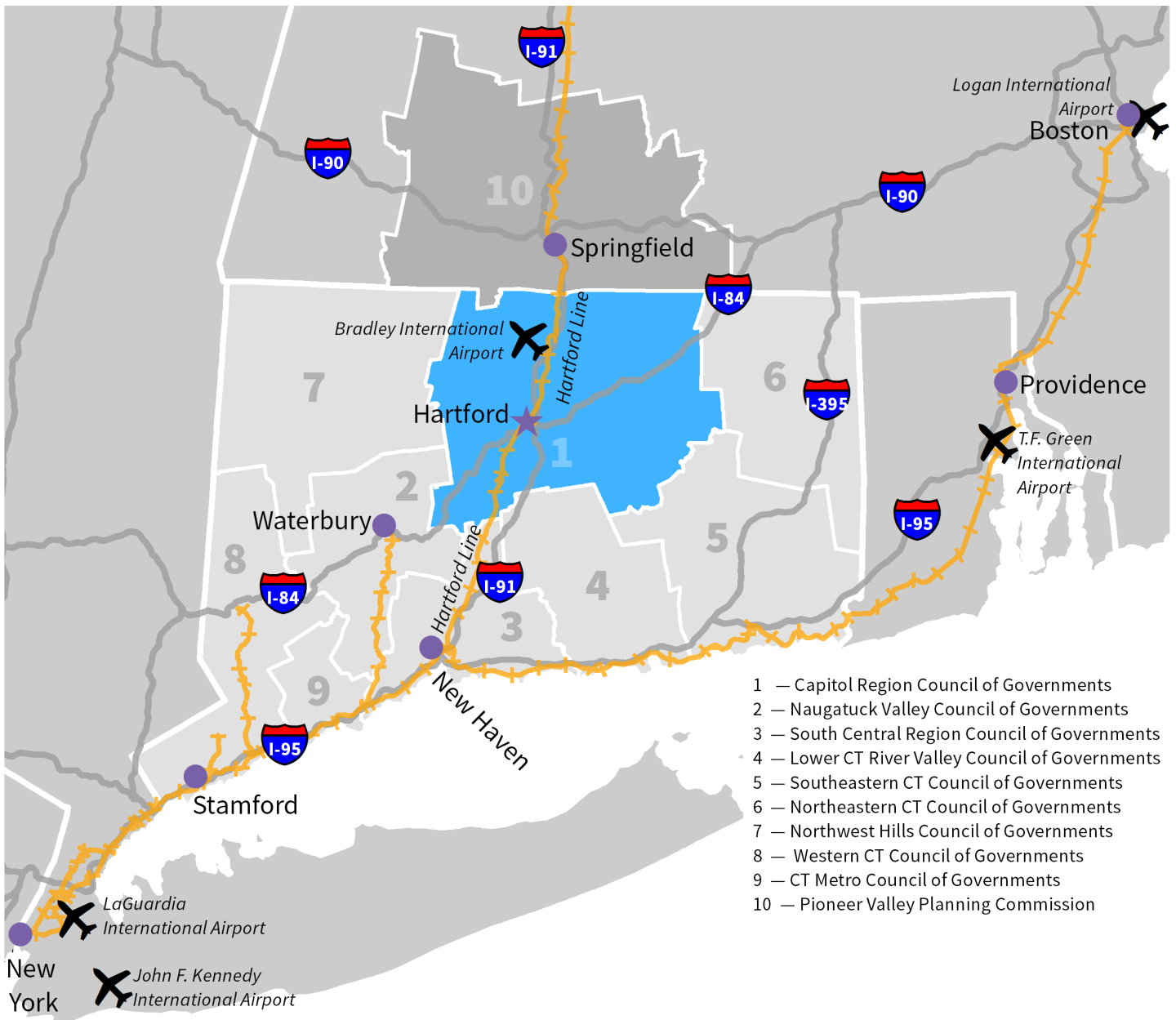


Plan Coordination

The MTP was developed through a comprehensive coordination effort aimed at integrating CRCOG’s key policy documents. The coordination of the MTP with CRCOG’s Regional Plan of Conservation and Development (POCD) and Metro Hartford Future, the region’s Comprehensive Economic Development Strategy (CEDS) drives CRCOG’s

emphasis on creating a Sustainable Region (Figure 01.4). The benefits of a coordinated approach to planning transportation, land use, and economic development are many, and they can help achieve the goals of the MTP.

Figure 01.3 – CRCOG Northeast Regional Context Map



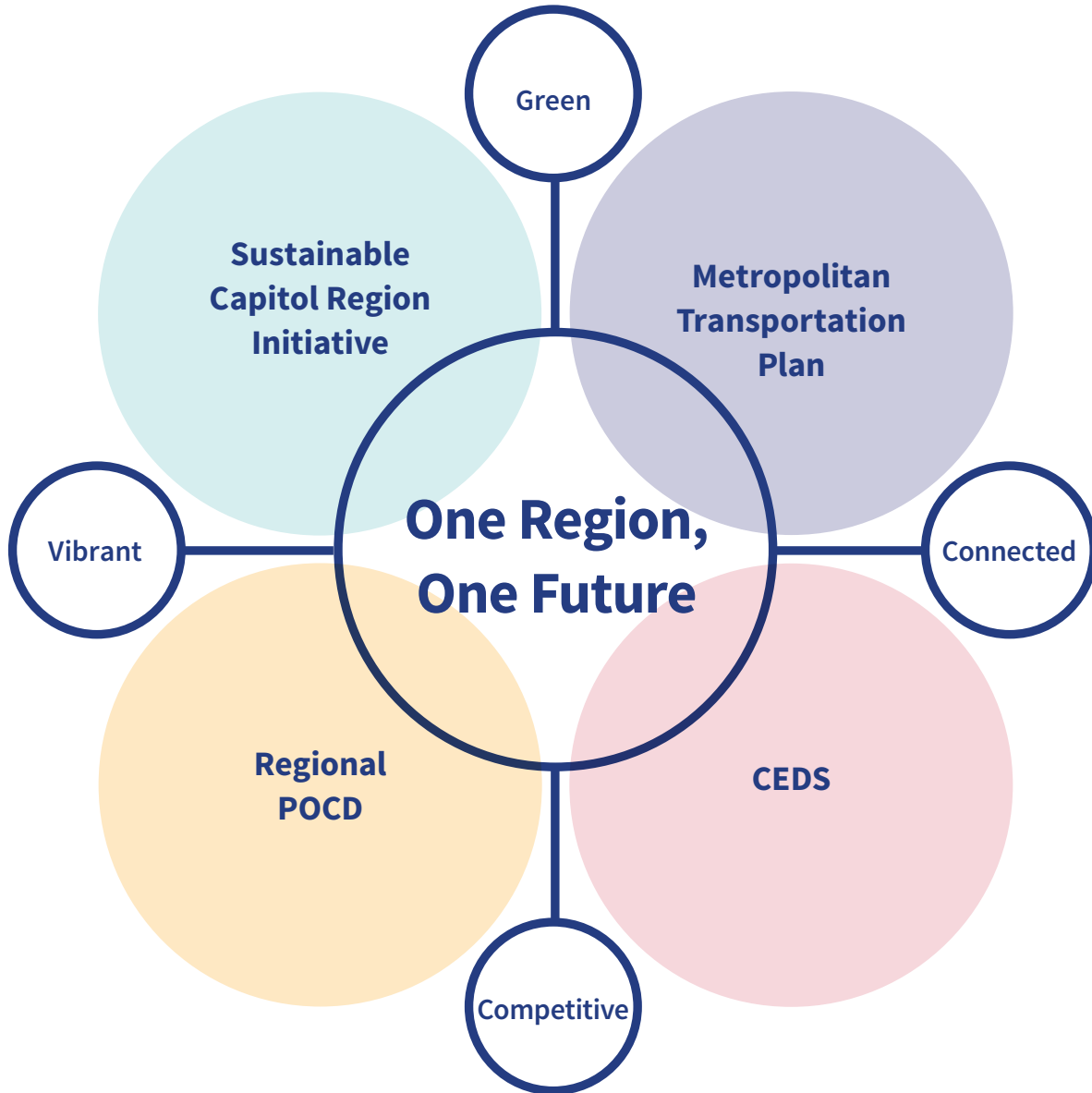


Figure 01.4 — A Sustainable Future for the Capitol Region
This plan was developed through a comprehensive coordination effort aimed at integrating CRCOG's key policy documents. The coordination of these pillars of policy drives CRCOG's emphasis on creating a Sustainable Region.

Economic Development Strategy

The transportation network impacts overall quality of life and economic development - influencing where people want to live, work, and play as well as where businesses want to locate to retain and attract their workforce. There continues to be an increased recognition that streets play a key role in either creating or detracting from a place due to the positive or negative impacts a street can have on a community; we need to continue to emphasize this in our transportation planning efforts.

Transportation infrastructure in the CROG region also needs to be ready to meet the needs of businesses that want to expand or locate in the region. For example, freight rail development is limited due to infrastructure constraints (such as rail track infrastructure that limits freight capacity and aging rail bridges). There is a continued need to improve connectivity between the Metro Hartford region, Boston, New Haven, and New York City by improving and expanding rail service. Additionally, although improvements have been made, congestion along I-91 and I-84 inhibits commuter and trucking operations within and through the region, making it less attractive for economic development. In 2022, according to the American Transportation Research Institute (ATRI), Connecticut has six of the top 82 bottlenecks in the country, including the interchange of Interstates 91 and 84, which is the worst bottleneck in Connecticut and ranks 24th nationally.

This transportation plan encourages development of seamless connections to

key destinations, like Bradley International Airport, as a priority for fostering regional economic growth. Megaprojects such as the reconstruction of I-84 in Hartford or the I-84/I-91 Interchange could reduce congestion for all vehicles traveling within and through the region, thereby improving traffic flow and truck freight delivery schedules.

Expansion of freight operations at Bradley International Airport could support regional economic development, as would development of public/private partnerships to attract Transit Oriented Development projects to existing and potentially new stations along the CT*rail* Hartford Line and CT*fastrak*.

Improvements in bus transit service could also greatly expand the pool of available talent and, more generally, increase access to jobs, including third shift opportunities. These are just some of the ways economic development and transportation strategies are interrelated and need to be coordinated.

Plan of Conservation and Development

In the absence of supportive land uses, provision of facilities for non-automotive modes will have limited success. Transportation and mobility themes cut across many goals and policies in CROG's Regional Plan of Conservation and Development (POCD). In the areas of Climate Change, Food Systems and Food Security, Sustainable Land Use and Zoning, Housing, and Transportation, the Regional POCD states goals related to the region's transportation system:

- Continue to work towards greater transportation options in the Capitol Region to mitigate the largest source of greenhouse gas emissions from fossil fuels in the state
- Guide growth to regional centers and areas that have already been established, therefore reducing sprawl and the need to expand infrastructure and services outwards
- Provide a range of viable transportation options within the region
- Improve interregional and interstate transportation system
- Coordinate land use, environmental, and transportation efforts
- Anticipate and plan for future transportation needs
- Continue improving the Capitol Region transportation system to better link housing, jobs, and services; thus, expanding housing choices
- **Innovative Funding:** Identify innovative funding mechanisms to help finance the region's important transportation priorities
- **Fiscally Constrained Priorities:** Develop a fiscally constrained implementation plan for the region's priority transportation projects
- **Safety:** Incorporate safety considerations into recommendations to mitigate recent troubling trends related to increasing crashes and fatalities
- **Equity:** Ensure that resources are evenly distributed to disadvantaged communities

Working toward and accomplishing these goals will ensure a sustainable future for the Capitol Region.

Goals of the MTP

The primary goals of CROCOG's Metropolitan Transportation Plan are:

- **Mobility and Access:** Identify key transportation investments and strategies to meet long-term (through 2050) access and mobility needs for the CROCOG Region
- **Performance-based Planning:** Incorporate a publicly transparent performance-based and data-driven process for selecting and implementing investments

Mobility and Access

At the heart of the CROCOG transportation planning process is a focus on improving mobility and access for CROCOG's nearly one million residents. In simple terms, CROCOG's MTP is focused on improving the ability to get people and goods from place to place within the CROCOG region while also offering connections to places outside the region. While the automobile remains the dominant transportation mode in the region, CROCOG's mobility focus addresses all modes and the region's transportation system in its entirety in order to determine how best to improve mobility for everyone.

According to the 2019, American Community Survey (ACS) data (Figure 01.5), the majority of the region's residents – 80.9% – travel to work via Single Occupancy Vehicles (SOV). An additional 7.6% travel in a non-SOV, such as a carpool or rideshare service. A small share of residents travel by public transit at 3.1% and biking or walking at 2.6%. Less

than 1% noted they travel by other means. Interestingly, 5% of residents work from home. Due to the COVID-19 pandemic, this number has likely increased since 2019 as more employers have begun offering hybrid or fully remote employment options.

The largest city in the region, Hartford, shows a much different mode split for daily commuters. Of those who live in Hartford, 13.6% commute by transit. Regionally, 3.3% of households have no vehicle (Figure 01.6), while 29.8% of households in Hartford have no vehicle. This is nearly ten times the regional average and demonstrates the need for Hartford residents to utilize alternative transportation options to the SOV.

Performance Based Planning

CRCOG supports CTDOT’s statewide performance measure targets and has developed this MTP using a performance-based approach. Details of this approach and results are presented in Chapter 8. These are focused on the Federal Highway Administration’s categories of Safety Measures, Infrastructure Conditions Measures, as well as National Highway System Performance, Freight, and Congestion Mitigation and Air Quality (CMAQ) measures. In addition, the Federal Transit Administration requires measures related to Transit Asset Management and Transit Safety. Performance-based planning provides CRCOG with the tools and mechanisms to prioritize transportation investment strategies more effectively for projects, programs, and policies. While the breadth of competing priorities and interests can sometimes be daunting,

performance measures effectively link goals and objectives to investments by providing methods to determine how investments meet the region’s and state’s goals and objectives.

Innovative Funding

Traditional sources of funding are critical to the region’s success in identifying and planning for funding in a fiscally constrained transportation plan. Long-term transportation planning for the Capitol Region can be enhanced by new and innovative financing strategies.

Figure 01.5 — Mode Share within CRCOG Region

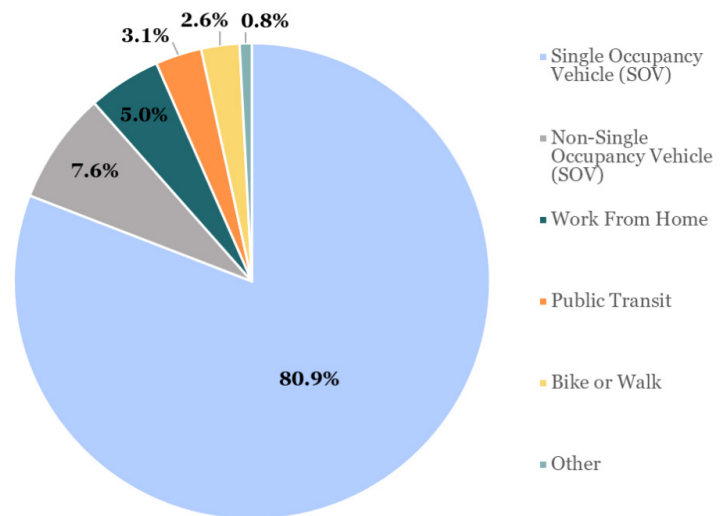
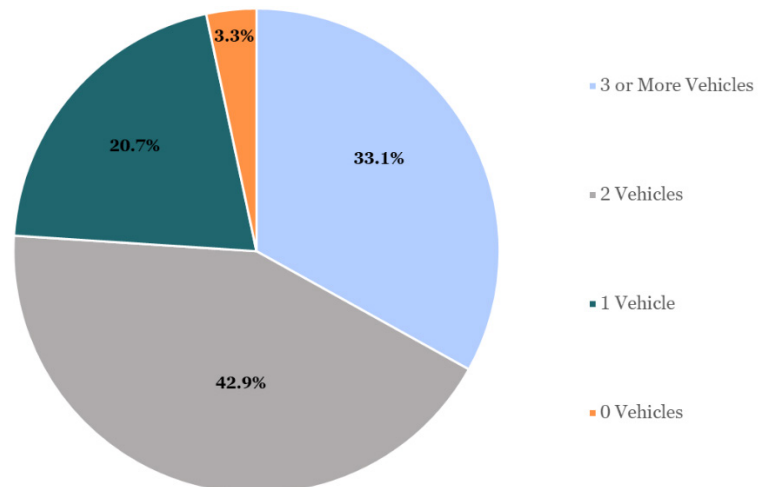


Figure 01.6 — Household Vehicle Availability within CRCOG Region



Sources for both: 2019 ACS

Strategies have been identified as potential options to expand funding sources for future transportation projects in the region, including:

- Debt financing through federal loan programs
- State legislation enabling regional transportation sales tax referenda
- Joint development at rail and bus rapid transit stations
- District value capture strategies, including tax increment financing
- Public-Private Partnerships to deliver specific transportation projects or components

This list is not exhaustive but is intended to outline alternative financing strategies that could enable expanded mobility options in the region.

Fiscally Constrained Priorities

CROCG has developed a fiscally constrained implementation plan for future transportation programs and projects in the MTP. The plan recognizes that there are multiple and competing priorities that feed into the development of a fiscally constrained plan. These include the need to maintain existing transportation assets and the recognition that congestion, capacity issues, and economic and population changes will require expanding mobility options in the future.

This plan includes mention of projects that are not currently part of the fiscally constrained plan. These projects are identified as ‘unfunded needs,’ where the need has clearly been identified but funding

sources have not yet been determined.

Safety

Nationwide there has been a trend of rising crashes and fatalities on our roadways, across all modes, and the State of Connecticut and the CROCG region are no exception. Fatalities in the United States have been increasing since 2014 after a downward trend since the 1970s. Nearly 43,000 people died on US roadways in 2021. In Connecticut, in just the last three years, fatalities have increased from 222 fatalities in 2019 to an estimated 387 in 2022, a 77% increase. For pedestrians in Connecticut, there were 55 fatalities in 2021, and in 2022 that number increased by 42% to 78.

It is also worth noting that though vehicle miles traveled decreased by 11% in the United States in 2020, traffic fatalities rose by 6.8%, according to the National Highway Traffic Safety Administration (NHTSA). Contributing factors include the need for infrastructure that better accommodates all transportation modes; an increase in speeding; increasing disparity in vehicle sizes; increasing vehicle heights that impede near-side sight lines and raise impact points with pedestrians and cyclists; and a decrease in enforcement.

The increasing number of traffic-related fatalities is sobering, and CROCG has identified safety measures and recommendations throughout the MTP to combat this trend across modes.

Equity

CRCOG is committed to fully integrating the principles of environmental justice (EJ) and equity into all its transportation planning programs and activities. These principles include outreach to minority and low-income populations; preventing “disproportionately high and adverse” impacts of transportation decisions on historically disadvantaged populations; and ensuring that these same groups receive a proportionate share of benefits from CRCOG’s transportation planning program.

Initiated in January 2021, the federal Justice40 Initiative seeks to “confront and address decades of underinvestment in disadvantaged

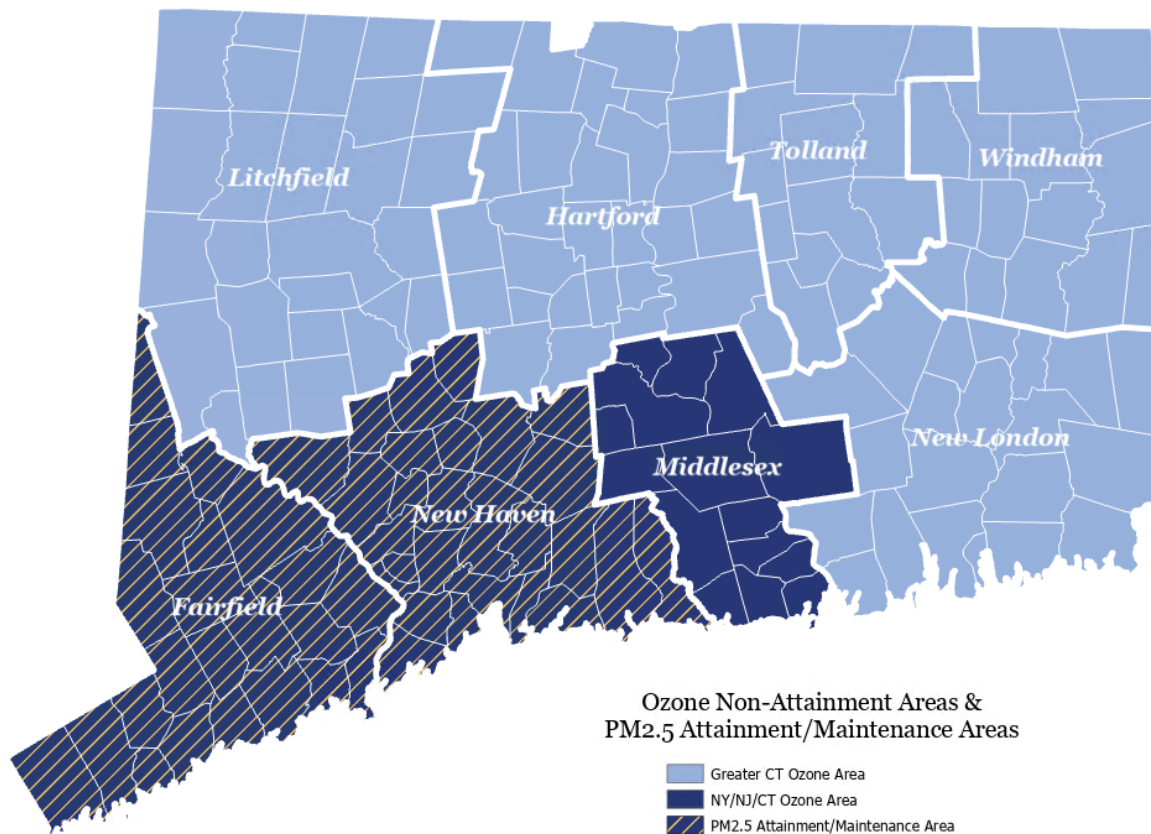
communities” and recommends that 40 percent of the benefits from federal investments should be dedicated to disadvantaged communities. CRCOG is reviewing the details of this initiative and its mapping tool to understand how to best reflect the goals of the Justice40 Initiative in future equity assessments of CRCOG’s transportation programs and projects.

Environmental Considerations

Air Quality Conformance

CRCOG is required to demonstrate that its MTP and Transportation Improvement Program (TIP) do not violate the federal Clean Air Act. Because air quality districts overlap many regional planning districts, the emissions analysis must be coordinated to include

Figure 01.7 –
Status of Federal Air Quality Districts in Connecticut



the TIPs and MTPs of several regions. The Connecticut Department of Transportation (CTDOT) performs this coordination role. Each region submits its draft TIP and MTP to CTDOT, and CTDOT in turn combines the TIPs and MTPs for all appropriate regions to analyze the emissions impacts on each air quality district. CRCOG received CTDOT's Air Quality Conformity determination in February 2023. The full report is included in Appendix A.

The air quality analysis includes an assessment of ozone precursors – volatile organic compounds (VOC) and nitrogen oxides (NOx) – as well as of particulate matter that is 2.5 microns or smaller (PM2.5).

The federal air quality districts, shown in Figure 01.7, utilize county boundaries. CRCOG is in an attainment area for PM2.5. CRCOG is part of the Greater Connecticut Ozone Area, which includes the following counties: Hartford, Tolland, Litchfield, Windham, and New London. The Greater Connecticut Ozone Area is classified as a "moderate" nonattainment area for 2015 National Ambient Air Quality Standards (NAAQS) and a "serious" nonattainment area for 2008 NAAQS.

Climate Change

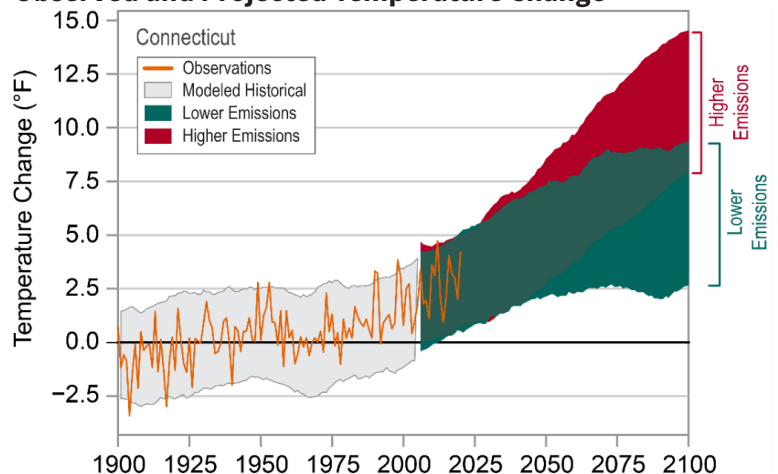
An important element of CRCOG's MTP is to be cognizant of climate change and how the region's transportation system can impact or be impacted by it. The MTP, Regional POCD, and CEDS, as well as CRCOG's Natural Hazard Mitigation Plan, work together to address the issue, while creating a more accessible, connected, equitable, and economically strong CRCOG region.

According to the Intergovernmental Panel on Climate Change (IPCC) report released in April 2022, global average temperature is likely to surpass preindustrial levels by 1.5°C (2.7°F) by 2040 if temperatures continue to increase at the current rate. This global temperature increase will mean long-term climate system changes and higher probability for climate-related risks for natural and human systems. Acknowledging regional climate vulnerabilities will be critical in working toward adapting to a changing reality and mitigating further impacts.

On a state scale, Connecticut has already made strides to reduce emissions. Along with eight other northeastern states, Connecticut is part of the Regional Greenhouse Gas Initiative (RGGI), which employs a market-based approach to tackling climate change through a cap and trade program for fossil fuel-fired power plants.

CRCOG's Capitol Region Natural Hazard Mitigation Plan (NHMP) offers detailed information about climate related risks to the region and its assets, including transportation infrastructure. Through the process of developing the Capitol Region NHMP, the cities

Figure 01.8 –
Observed and Projected Temperature Change



Source: NOAA technical report 2021, Connecticut state climate summary

and towns of the region identified dozens of mitigation actions to address transportation infrastructure. These actions include projects to address drainage issues impacting streets; replace bridges; raise road elevations to prevent flooding and reduce road closures and washouts; and provide additional access to vulnerable populations or areas.

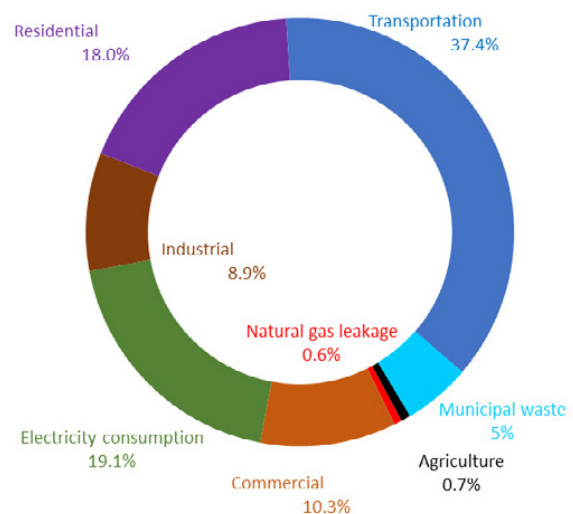
Climate change will impact individual transportation assets across all modes, with ramifications for economic vitality and mobility, particularly for vulnerable populations and urban infrastructures. For Connecticut, even in a lower greenhouse gas emissions scenario, the average temperature is projected to increase enough to affect the state's climate system, resulting in several potential impacts to assets in the CROG region. See Figure 01.8.

With its expansive fluvial system, the CROG region will be particularly susceptible to inland flooding due to projected increase in total precipitation and number of extreme precipitation events (e.g., storms). Additionally, extreme cold weather (below 0°F) is projected to decrease, which can prove beneficial since it would alleviate stress to roads from freeze-thaw cycles, and increase the number of days of ice and snow-free navigation. At the same time, heat waves are projected to become more intense, with a greater frequency of days above 90°F, which can cause rutting in roads and public transit delays, among other things. Chapters within this plan reflect efforts to reduce transportation related greenhouse gas emissions as well as prepare transportation systems for climate events such as flooding and extreme heat.

Climate change mitigation requires decarbonizing the transportation sector. As of 2018, the transportation sector remained the top greenhouse gas emitter in Connecticut (Figure 01.9). To do this, the MTP identifies opportunities to expand public transportation and, through strategies such as transit-oriented development (TOD), offer alternatives to the use of personal vehicles. The MTP also includes support for transportation demand management (TDM) strategies, improvements to bicycle and pedestrian infrastructure, vehicle electrification, and emerging technologies such as micromobility, smart cities, and connected and automated vehicles that have the potential to decarbonize the transportation sector.

In terms of adaptation, transportation assets consist of multiple components with unique vulnerabilities and are often codependent with other infrastructure like energy and water systems, making adaptation challenging as new designs need to work seamlessly with these other systems. To effectively respond to

Figure 01.9 —
Sources of CT Greenhouse Gas Emissions in 2018



Source: CT Department of Energy & Environmental Protection, CT GHG Emissions Inventory 2016 (2018).

climate change challenges for transportation, policy will likely be needed. An example of such policy is the emergence of climate resilience design guidelines in Connecticut. In 2015, for example, the CTDOT Office of Engineering put out a bulletin (number EB-2015-2) directing that updated precipitation frequency estimates from the National Oceanic and Atmospheric Administration (NOAA) be used in planning and design.

Many of the drainage systems in the CRCOG region were designed using outdated climate information. This means that culverts, drainage systems, and levees may not be able to protect against more intense future flooding events. Updating these systems using new design standards that account for climate change could reduce CRCOG’s vulnerability to future flooding events.

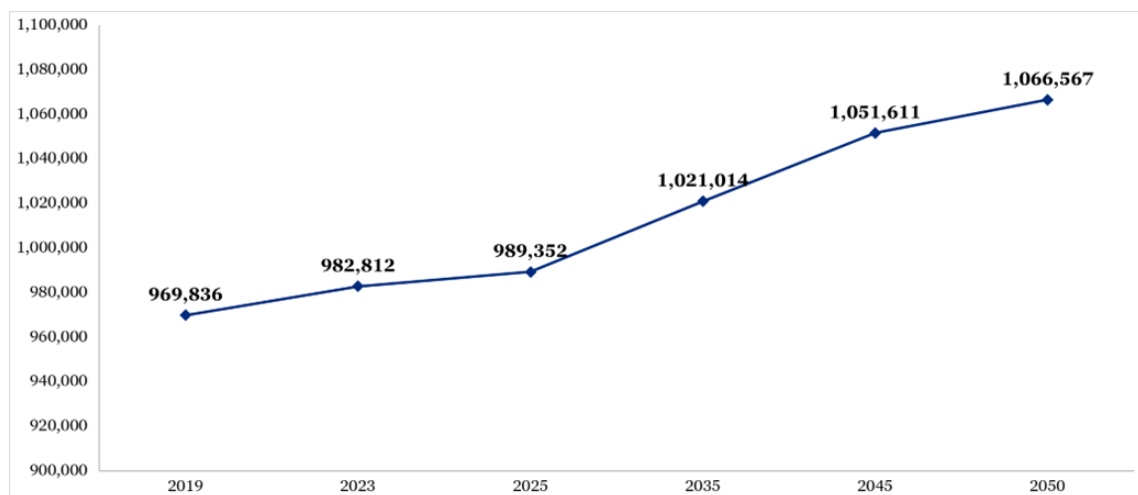
Green infrastructure and Low Impact Development (LID) could also help to reduce the region’s vulnerability to floods while also mitigating climate change. Some green infrastructure designs that CRCOG has been exploring are bioswales, pervious pavements,

rain gardens, and green spaces. These designs are often more sustainable and cost-effective than their hard infrastructure counterparts and work well with natural systems instead of working against them.

Key Demographic Assumptions for the Capitol Region’s MTP

Employment and population forecasts for CRCOG have been provided by the CTDOT Travel Demand and Air Quality Modeling Unit, which developed them using several data sources including the Connecticut Department of Public Health for population as well as the Connecticut Department of Labor and the US Census Bureau’s Longitudinal Employer-Household Dynamics program for jobs. These forecasts reveal a region that has been relatively flat in terms of population and jobs growth. However, while the average annual population growth rate is only projected to be approximately 0.3% through 2050, changes in the composition of the population are expected to be significant, requiring considerations when

Figure 01.10 — Regional Population Trends 2019–2050



Source: CTDOT Travel Demand and Air Quality Modeling Unit Forecasts (last updated in January 2023)

planning the region’s transportation future.

Between 2019 and 2050, the population is expected to grow by 96,731 or 9.9% (Figure 01.10). This rate is similar to the state projected growth of 9.5% over the same period. Amongst Connecticut’s nine COGs, CRCOG is projected to have the largest growth in population by count. Despite forecasted population growth, one area of concern continues to be an increasing elderly population within the region relative to other age cohorts. A more aged population will necessitate greater expenditure on social services, potentially including increased transportation options such as bus routes and paratransit. This will be funded by a reduced tax base of fewer working-age adults in the region relative to the elderly.

Currently available employment projections show a healthy 19% growth in the number of jobs by 2050 (Figure 01.11), with yearly growth slightly above 0.62%, notably exceeding population growth. However, these are only projections, and many factors can influence whether the

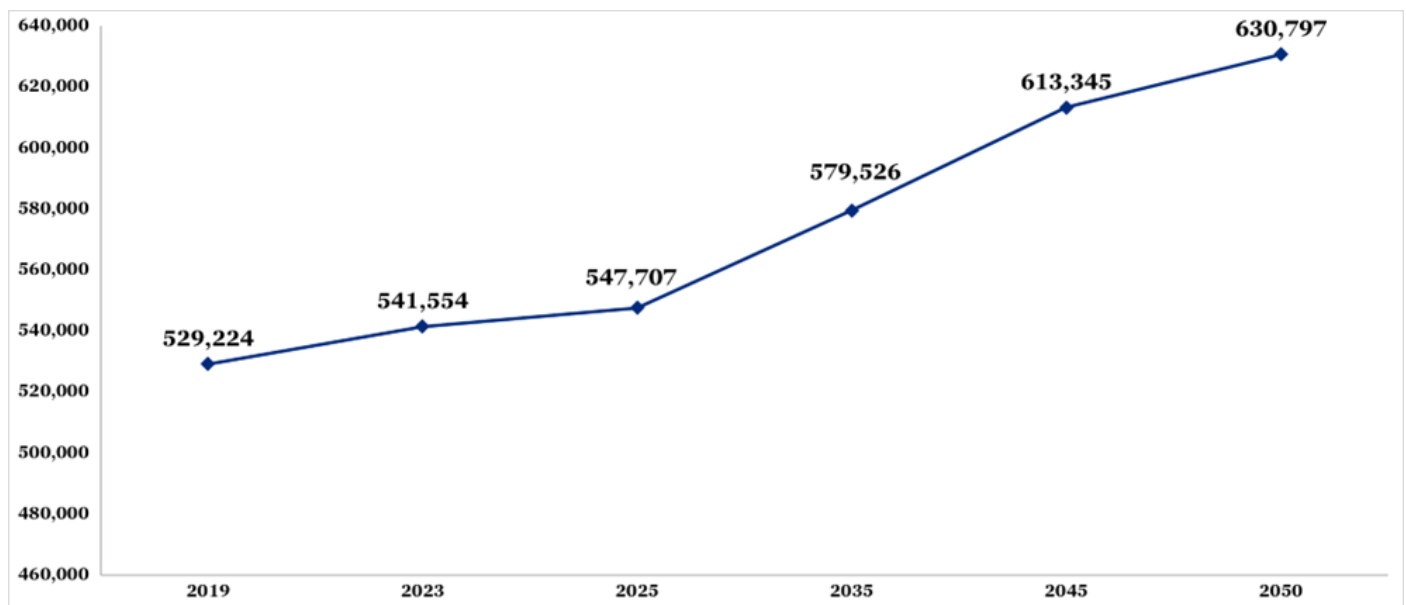
region closely adheres to them or not.

The region is currently a net importer of employees. There are nearly 71,000 more individuals commuting into the region for work compared to those residing here but working elsewhere (Figure 01.12). With employment projected to increase at a faster rate than population growth, it will put an even greater stress on the region’s transportation network as the region becomes a greater net importer of employees.

The MTP addresses these key trends in several ways:

- Overall improvements in mobility and access include increased transit services, better integration of shared rides, and implementation of mobility as a service (MaaS) into programmed transportation improvements.
- Implementation of public private partnerships in transportation, particularly transit-oriented development projects along the region’s rail and bus rapid transit corridors, to bolster economic development.

Figure 01.11 – Regional Employment Trends 2019-2050



Source: CTDOT Travel Demand and Air Quality Modeling Unit Forecasts (last updated in January 2023)

- Improve connections to other regions to support passenger and freight transportation.

MTP Implementation

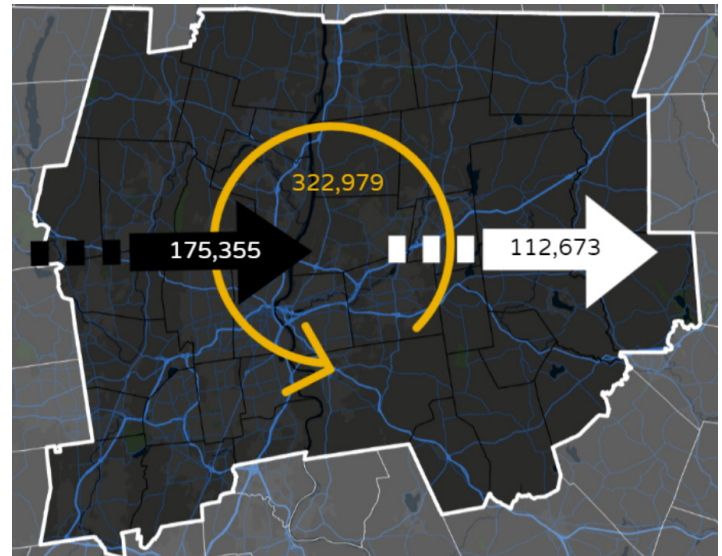
As a continuous planning process, the work of implementing this plan is already underway. Numerous construction projects listed in this document are being prepared for inclusion in the region's Transportation Improvement Program (TIP). Work is underway to better understand performance measure targets and respond to them. In some ways, the projects in this plan that are nearing construction were set in motion by previous iterations of the plan.

To achieve the broader vision for the CROCOG region in 2050, CROCOG can influence how infrastructure gets built in several interrelated ways, including planning studies, selection of projects for funding, and coordination with CTDOT.

Planning Studies

As the region's transportation planning agency, CROCOG undertakes studies to address regional transportation concerns. These studies are done in cooperation with CTDOT. Traditionally these efforts have taken the form of corridor studies, which usually examine transportation issues in a single road corridor, often in a single municipality. For example, CROCOG is currently conducting or initiating studies focused on Routes 20 and 75 in Windsor Locks; Routes 190 and 220 in Enfield; and Route 44 in Canton. Corridor studies have been a successful way of identifying localized transportation issues and innovative

Figure 01.12 — Regional Inflow and Outflow of Workers



Source: OnThe Map US Census Bureau 2019.

solutions. They can be limited, however, in their ability to address broader issues.

Broader topics have also been the focus of CROCOG studies. The Comprehensive Transit Service Analysis (2017, 2018), for example, reviewed existing transit services across a broad swath of the region in order to identify potential improvements that would benefit the region as a whole. CROCOG is also nearing completion on a Regional Roundabouts Screening Study. This effort reviewed all of the region's intersections to identify which intersections are most likely to see significant improvements to traffic safety and operations if converted to a single-lane roundabout. The result is a prioritized list of locations that could be considered for design and potential funding and construction.

Both kinds of studies, corridor-level and big-picture, are important for the region. They provide different information about conditions of the regional transportation

network and therefore identify different kinds of solutions. As new transportation concerns arise, CRCOG must determine which study approach is most fitting.

Project Selection

As the region's MPO, CRCOG has varying levels of control over certain federal and state funding sources. Selection of projects for state sources, such as the Local Transportation Capital Improvement Program (LOTICIP), is entirely at CRCOG's discretion. Other sources, such as the federal Congestion Mitigation and Air Quality (CMAQ) program and the state Transportation Rural Improvement Program (TRIP), are influenced by CRCOG. For such programs, CRCOG's Policy Board determines which projects to submit for consideration under the competitive funding process, and the decision as to which projects get funded lies with CTDOT.

Since every program has a different set of goals and eligibility criteria, it will continue to be important for CRCOG to carefully craft its ranking criteria for each program. This will not only allow CRCOG projects to be competitive on a statewide basis, but it will also help to ensure that CRCOG is prioritizing projects that will help to achieve the region's performance targets.

Coordination with CTDOT

Implementation of CRCOG's MTP recommendations will necessitate coordination with CTDOT with regards to selecting and prioritizing projects for funding. While CRCOG and CTDOT coordinate on project selection and advancement at various times in a project's lifecycle, some of the most critical points are during the annual creation of CTDOT's Capital Plan as well as during the creation of the Transportation Improvement Program (TIP) and MTP, both of which occur every four years.

In June 2022, CTDOT and the COGs participated in a LEAN process to streamline and improve coordination between these entities. Focus areas included progressing corridor study recommendations into projects, CTDOT's Capital Plan process, LOTICIP protocols, and MTP project identification. Refinement and implementation of recommendations from this process are ongoing. CRCOG should continue to coordinate with CTDOT and the other COGs to ensure that collaboration continues to be strengthened and standardized where possible.



Photo by Chris Henchey

Chapter 02

Transit and Rail System

While the private automobile remains the dominant mode of travel in the Capitol Region, alternative modes have continued to improve and take on greater importance for CROG's nearly one million residents. The primary alternative travel modes include local and express bus service; commuter and intercity rail service; bus rapid transit (BRT); paratransit services provided for the elderly and persons with disabilities; and rideshare services provided by Transportation Network Companies (TNCs). Active transportation modes, including bicycles, scooters, and pedestrian options, are also growing in popularity. This chapter focuses on transit and passenger rail options – two modes that have undergone major improvements through more than \$1.5 billion in investment over the last decade.



Photo by Chris Henchey

Existing Conditions

Transit services, which include local and express bus, bus rapid transit (BRT), and passenger rail, play an important role in meeting the travel needs of individuals who live and work in the Capitol Region. They serve the basic mobility needs of the region's transit dependent population: the elderly, persons with disabilities, and households that do not own a car, while also serving the commuting needs of a small but significant portion of the region's workers. According to recent data, only three percent of all workers in the region take the bus to work (2019 ACS 5-year estimates). Hartford residents commute by transit at a much higher rate of 13.6 percent.

In total in 2019, approximately 16.2 million trips were served by the region's primary bus system, 165,000 by the Windham Region Transit District, and 513,000 by the paratransit system (National Transit Database, 2019). Transit ridership was significantly impacted by the COVID-19 pandemic, as quarantine measures decreased overall travel, and choice riders opted out of using transit and instead shifted to traveling alone.

Ridership has, however, begun rebounding. The local system in Hartford has surpassed pre-pandemic ridership levels, in part due to CTDOT's fare-free policy, which is slated to come to an end in March 2023. Other services have not yet returned to pre-pandemic levels, likely due to the demographics of their riders and the fact that many employers have continued to offer remote or hybrid working arrangements.

Commutes to work within the CROG Region

3%



of all workers in the CROG Region commute by bus.

13.6%



of those who work in Hartford commute by transit.

In total, over 

16.2 million

trips a year are served by the region's primary bus system.

Sources (top to bottom): 2019 ACS 5-year estimates (top two), National Transit Database (2019)

While transit is a small part of a much larger transportation system, it is a critical component and there is a continuing need for improvement. CROG has increasingly sought to place more emphasis on transit improvements as a way to improve mobility for those who rely on transit, to provide viable travel choices for everyone, and to reduce congestion and emissions. CTDOT, in partnership with CROG, implemented CT**fastrak** BRT service in 2015 and the commuter rail service on the CT**rail** Hartford Line in 2018. Both of these services have been successful, however due to the COVID-19 pandemic, their ridership has not recovered as quickly as local bus service ridership. While the Hartford Line gained nearly 80,000 riders from 2020 to 2021, ridership remained about half what it was in the pre-pandemic year of 2019. CT**fastrak** ridership is approaching pre-pandemic levels as of Winter 2023.

Issues and Deficiencies

Technical analysis conducted for recent CROG transit studies, which are discussed in more detail below, as well as input from stakeholders and transit users that was gathered during these efforts, identified the following issues and deficiencies to be addressed in order to further improve transit in the region:

- Insufficient regional rail connectivity, especially to Boston
- Limited crosstown bus service and direct connections between suburban destinations
- Need for expanded service span, frequency,

and coverage

- Opportunities for flexible transit service within less dense areas
- Insufficient transit access to Bradley International Airport
- Need for focused improvements within key transit corridors

Recommended Transit Improvement Program

To develop recommendations to address the region's transit issues and deficiencies, CROG's recommended transit and rail improvement program is based on: CROG's Comprehensive Service Analyses (CSA) of the Hartford (2017) and New Britain/ Bristol (2018) Divisions of CTtransit, CROG's Transit Priority Corridors Study (2022), and recommendations from previous regional and statewide transportation plans.

Enhanced Transit Services

CT**fastrak** is a bus rapid transit (BRT) system connecting New Britain to Hartford along a 9.4-mile bus-only guideway. The service opened in March 2015. CT**fastrak** incorporates all seven elements of a BRT system, as established by the U.S. DOT Federal Transit Administration with 1) dedicated running ways; 2) 10 stations; 3) low-floor, branded, articulated vehicles; 4) off board fare collection; 5) Intelligent Transportation System (ITS) elements such as Transit Signal Priority (TSP), automatic vehicle location (AVL), computer aided dispatch, automatic passenger counters (APC), real-time vehicle arrival information at the stations, and

in-vehicle automatic annunciation of stops; 6) high level-of-service; and 7) unique branding.

CTfastrak has a broad geographic reach with two routes operating along the entire guideway, four commuter express buses using the system, five local routes which utilize the guideway for part of their alignment, and ten feeder routes which do not use the guideway but service at least one station. **CTfastrak** offers a high frequency of service – every 7-8 minutes during the peak commute times – and a 21-hour service span from 4:00 AM to 1:00 AM. Not only does CTfastrak provide mobility options for travelers and relieve congestion

along Interstate 84, but it has also spurred economic development along the corridor by encouraging Transit Oriented Development (TOD) and helping to transform the local economy and neighborhoods into more appealing places to live and work.

CTrail Hartford Line connects New Haven, Hartford, and Springfield with commuter rail and was launched in June 2018.

Service along the Hartford Line builds on existing Amtrak service and consists of 17 round trip commuter trains daily (five terminate in Hartford, the remaining 12 operate the full line). This level of service was made possible by the construction

Figure 02.1 – New Britain CTfastrak station



Photos by Carl Talley

of 27 miles of addition double-tracking and two miles of passing sidings.

In 2022, ground was broken on a new rail station in Windsor Locks. Located in the downtown area next to the historic rail station, the new station will complement the Town's ongoing economic development and transit-oriented development initiatives. The station will include a 520-foot high-level platform with a snowmelt system, guardrails, benches, emergency phones, lighting, and a parking lot. Roadway, drainage, and pavement improvements will be made along the adjacent section of Main Street, and a new pedestrian bridge will be built across the Windsor Locks Canal. The station is anticipated to open for operation in 2025, replacing the current station.

Station development is also underway in Enfield, where there is currently no rail service. Designs for this station are anticipated for completion in 2023, with construction initiating the year thereafter.

Part of the success of the system has been the collaboration with Amtrak. Amtrak

accepts all CTrail Hartford Line tickets onboard regional and shuttle trains between New Haven and Springfield except for the Vermonter, thereby offering more options for commuters. The launch of the service was part of a larger program to improve rail service in the region; work still needs to be done on key infrastructure elements north of Hartford. The major infrastructure pieces still requiring advancement are:

- Renovating and upgrading the Hartford Rail Viaduct and the Connecticut River Rail Bridge in Windsor Locks to modern design standards.
- Integrating rail freight into passenger rail operations.
- Increasing weight limits to 286,000 pounds

Figure 02.2 — Windsor Locks Station Rendering



Source: CTDOT

Improvements for a Regional Rail Network

Double tracking and station improvements along the Hartford Line portion [...] as well as improvements to the East-West Rail corridor between Boston and Springfield

per freight rail car and removing height restrictions to accommodate modern high capacity freight rail cars.

- Construction of the second track between Windsor and the CT/MA State Line
- New train equipment
- Additional long-term parking at stations
- Construction of stations and platforms in West Hartford, Newington and North Haven
- Completion of funded improvements to stations in Enfield and Windsor Locks

The rail infrastructure improvements implemented to date are one portion of a set of inter-related projects that seek to develop intercity highspeed passenger rail service throughout New England. CTDOT has been working closely with the Massachusetts Departments of Transportation and the Vermont Agency of Transportation to extend High Speed Intercity Passenger Rail service (HSIPR) northward to Montreal, Canada and eastward from Springfield to Boston. A 2030 Vision for High Speed, Intercity, and Regional Rail Service in New England is collectively being developed by the Departments of Transportation in the six New England states. This vision includes double tracking and station improvements along the Hartford Line portion of the rail corridor, as well as improvements to the East-West Rail corridor between Boston and Springfield, which would provide high quality rail service between Hartford and Boston. These improvements represent the foundation for a regional rail network.

CTfastrak Expansion Study – CTDOT

Figure 02.3 – Infrastructure upgrades to the New Haven–Hartford- Springfield line



Source: New Haven-Hartford-Springfield Rail Program, http://www.nhhsrail.com/info_center/improvements_map.aspx.

Figure 02.4 – A CTraill Hartford Line train arriving at Berlin Station



Photo by Chris Henchey

completed this study in 2016 to evaluate options for expanding bus rapid transit service east of Hartford. The recommendations are a two-phase approach to implementing the service. Phase 1 was completed in 2017 with enhancements to local bus service (expanded hours of service) and the creation of the Route 913 express bus between Hartford, Buckland Hills, and UConn. Phase 2 would create BRT service along Silver Lane and/or Burnside Avenue in East Hartford with limited stop service, branded vehicles, on-board Wi-Fi, enhanced shelters, real time bus arrival information, intersection and roadway treatments to speed up service, and off-board fare payment. CTDOT is advancing

bus stop improvements at two commuter parking lots in Manchester –Spencer Street and Buckland Street – that would be stops for future enhanced bus service.

Transit Priority Corridors – CRCOG’s Metro Hartford Comprehensive Transit Service Analysis (CSA) recommended creating Transit Priority Corridors along Albany Avenue, Farmington Avenue, Franklin Avenue, Main Street, and Park Street in Hartford as well as along Burnside Avenue in East Hartford. Due to the high concentration of bus routes operating along these corridors, they offer service every 5 to 10 minutes during the peak. High frequency service coupled with

Figure 02.5 – Passengers in line to board the local 39W bus to Westfarms Mall



Photo by Carl Talley

capital improvements such as transit priority treatments (TSP), stop consolidation, and passenger amenities would enhance the transit experience and reinforce the image of each corridor as an enhanced transit corridor. CROCG further advanced this recommendation into an actionable Implementation Strategy as part of its Transit Priority Corridors Study.

East-West Passenger Rail – In 2021, the Massachusetts Department of Transportation (MassDOT) completed a study to evaluate the feasibility of implementing increased passenger rail service connecting Boston to Springfield and subsequently to Hartford and New Haven via the Hartford Line. With improvements to this alignment, Hartford would become a major hub in New England for regional and long-distance passenger rail transportation with the opportunity to significantly improve access to the region and to the New York and Boston metropolitan areas.

Concurrently to MassDOT’s East-West Passenger Rail Study, CROCG, in coordination with the Pioneer Valley Planning Commission, conducted the Metro Hartford-Springfield Rail Improvements Economic Impact Study. This Study determined that completing construction of Hartford Line improvements and connecting the line to Boston via Springfield and Worcester would have a transformative effect on regional and state economies. The analysis projected that between \$47 and \$84 billion in new regional Gross Domestic Product over 30

The economic impact of restoring passenger rail service from Hartford to Boston via Springfield would be a payback of nine to ten times the investment. This would yield growth that the region has missed over the past decades.

years would result from the \$6 to \$9 billion rail investment. These benefits would be realized from the attraction of 20,000-40,000 “missing” professional service jobs and the construction of station-area development.



Photo by Chris Henchey

Short-Term Recommendations

1. **CTfastrak Expansion** Advance the second phase of CTfastrak expansion east of Hartford.
2. **Transit Priority Corridors** Support the implementation of capital improvements along six high-frequency transit corridors described in the Transit Priority Corridors Study, including transit signal priority, stop consolidation, and enhanced passenger amenities.

Long-Term Recommendations

3. **Upgrade the CTrail Hartford Line with infrastructure improvements from Windsor to Springfield** Support reinstating full double track alignment, remove height restrictions, and increase weight limits to accommodate 286,000 pound cars.

Ongoing Efforts

4. **Passenger Rail Stations** Support the development of new CTrail Hartford Line stations. Encourage the funding, design, and construction of stations in Newington, West Hartford, and Windsor while monitoring progress of ongoing station projects in Windsor Locks and Enfield.
5. **Coordinate with Massachusetts for a better rail connection between Hartford and Boston** Support efforts in Massachusetts to develop the East-West connection between Boston, Springfield, and Albany and coordinate service plans

to provide seamless connections between Hartford, Springfield and Boston.

6. **Expand Passenger Rail Services North and East** Building upon the vision for the New England High-Speed and Intercity Rail Network collectively developed with other New England states, work to support connections between Springfield and Boston and to Montreal.

Better Bus & Paratransit Service

Even with significant investments in enhanced transit services, local bus service and paratransit services will continue to provide the fabric that ties the transit system together. CROG has conducted several transit planning studies and participated in numerous regional transit efforts to ensure that the existing services are properly maintained and improved to meet identified needs.

Hartford Comprehensive Service Analysis (CSA) – This effort, which CROG completed in 2017, examined the effectiveness and efficiency of the existing system and inventoried the transit needs and potential within the service area of CTtransit’s Hartford Division. Its recommendations provide a blueprint to improve local bus service, complement enhanced transit investments (CTfastrak and the CTrail Hartford Line), and operate an efficient service. The CSA found that overall the “footprint” of the service is correct with most dense residential and employment areas having some level of service and transit dependent groups

having access to relatively extensive transit coverage. At the same time, however, gaps in the system were identified, as pockets of high transit need are without service. The CSA recommends that six existing strong transit corridors – Albany Avenue, Farmington Avenue, Franklin Avenue, Main Street, and Park Street in Hartford as well as Burnside Avenue in East Hartford – would benefit from enhanced service and complementary capital improvements. Recommendations for those priority transit corridors are discussed earlier in this chapter. The study further recommends increasing weekend service, restructuring the routes to create radial and crosstown routes, connector routes to provide “first mile/last mile” connections to transit hubs, regional loop service linking key destinations on the periphery, CT**fastrak** service to Bradley Airport, and improved circulation through the Buckland Hills retail area.

The study also recommends eliminating fixed-route service in some low-density residential areas where there is very low transit demand. To service these low demand areas and create first-mile/last-mile connections, subsidized flexible service options utilizing taxis, demand-response transit, and/ or transportation network companies (e.g. Lyft and Uber) could be implemented. Such flexible service is commonly known as Microtransit, and these models have continued to become more commonly utilized as a cost-effective way to offer transit service in areas that do not have the density needed to support traditional fixed-route service.

In 2023, CTDOT will be implementing a Microtransit Pilot Program to assess how well different approaches to microtransit work in communities throughout the state. CROCOG will monitor these selected projects during the duration of the pilot program.

New Britain-Bristol Comprehensive Service Analysis (CSA) – CROCOG also conducted a CSA of the New Britain-Bristol Division of CT**transit**, which was completed in 2018. Through analysis of the existing system, as well as a market analysis and public outreach, a preferred scenario was developed to identify opportunities for service improvements. Recommendations include simplifying duplicative and circuitous routes, creating crosstown service options, and introducing local bus service into Southington. The recommendations also include complementary ADA paratransit coverage areas, which would introduce a new mobility option for seniors and persons with disabilities within the study area.

Locally Coordinated Human Services Transportation Plan – In cooperation with CTDOT and various human services agencies and transportation providers, CROCOG provided input into the statewide Locally Coordinated Human Services Transportation Plan (LOCHSTP) in 2007 and in the subsequent 2009 and 2021 updates. This plan, overseen and managed by CTDOT with input from the MPOs, outlines how each region will seek to meet the transportation needs of low-income residents, the elderly, and persons with disabilities.

Recommendations within this Plan are eligible for federal funds from the following programs: Section 5310 (van purchase program), Section 5316 (Jobs Access Reverse Commute, JARC), and Section 5317 (New Freedom funding).

Windham Region Transit District – The Windham Region Transit District (WRTD) operates dial-a-ride and fixed-route transit in nine towns, including four in the Capitol Region. CROG’s 2018 Eastern Gateways Study recommended increasing WRTD’s service span and frequency; expanding existing express bus service; and extending existing services to underserved areas.

Other Services – Within the CROG region, additional transit services include CT*transit*’s dash shuttle through downtown Hartford and the Town of Enfield’s Magic Carpet Service. Such services offer additional mobility options for travelers.

UConn Transportation Services also moves many people in the CROG region. Branded as Husky Go, this service includes a network of shuttle buses, accessible vans, and small vehicles for UConn students, faculty, employees, and visitors on the Storrs campus and in surrounding areas. Collaboration between UConn Transportation Services and WRTD has increased in recent years, and WRTD now operates the Husky Go service.

Ongoing Efforts

- 7. Better Bus Service in the Hartford Division Area** Improve the existing bus system by working with CTDOT, CT*transit* and municipalities to implement the routing recommendations and capital improvements recommended in CROG’s Hartford CSA.
- 8. Better Bus Service in New Britain-Bristol Division Area** Improve the existing bus system by working with CTDOT, CT*transit*, and municipalities to implement recommendations from CROG’s New Britain-Bristol CSA.
- 9. Better Bus Service in Windham Region Transit District Area** Encourage implementation of the transit recommendations from CROG’s Eastern Gateways Study.
- 10. Flexible Service Models** Identify flexible service models to serve low density areas in the Capitol Region and create first-mile/last-mile connections.
- 11. Locally Coordinated Human Services Transportation Plan** Work with CTDOT to award funding to projects identified within the 2021 LOCHSTP.
- 12. Downtown Circulator** Continue to support the dash service in downtown Hartford.
- 13. Enfield** Continue to support operational funding for Enfield’s Magic Carpet Service.

Enhanced Transit Technology

The operational efficiency of existing transit, rail, and paratransit services can be improved by integrating advanced technologies into operations, maintenance, and management functions. Using technology to enhance local bus service can augment the transit experience of all transit riders, but especially the transit dependent. Technologies such as global positioning systems (GPS), advanced vehicle location systems (AVL), electronic fare payment, electronic next bus arrival signs, and next stop announcement systems can improve service reliability and make it easier for riders to use the bus. Transit priority added to traffic signals can help keep buses on schedule, and computer-aided dispatch can improve efficiencies for both fixed-route and dial-a-ride services. Many of these systems have already been introduced in the Hartford area, as described below.

Automatic Vehicle Location (AVL) and Automatic Passenger Counter (APC) –

Within the transit industry, AVL technology is an essential element of a quality transit system. AVL is used as a planning tool, to relay information to the public, and to monitor operations in real-time. By tracking buses using AVL along their routes, transit providers can analyze the data collected to monitor performance, improve service, adjust schedules, and create more reliable and convenient service. Within the CROG region, CT**transit** has completed deploying this technology.

WRTD utilizes Ride Systems for AVL. UConn Transportation services campus shuttles utilize Passio Technologies and TransLoc for AVL.

CTtransit finished deploying AVL technology on their entire fleet in late 2017. This technology provides real-time schedule information to passengers via mobile apps and dynamic station signs along the CTfastrak guideway. AVL technology also allows dispatch to monitor vehicle location to reduce bus bunching, observe on-time performance, and improve incident response time.

AVL technology integrated with Automated Passenger Counter (APC) systems accurately record where and when passengers get off and get on the bus. This data is used to monitor trends in ridership, improve scheduling, adjust bus service to meet actual demand, determine where to add or eliminate service, and to analyze data at finer levels of detail. CTtransit deployed APC technology at the same time they installed AVL, WRTD does not have APC technology. UConn deployed APC through Passio Technologies in 2019.

Figure 02.6 – New Greater Hartford Transit District buses waiting for inspection



Paratransit Bus Service – The Greater Hartford Transit District (GHTD) operates paratransit service for elderly and persons with disabilities in the greater Hartford area. GHTD uses a mobile computing and AVL system that is integrated with its scheduling and dispatch software system. With mobile computing, the drivers receive in-vehicle electronic manifests and get turn-by-turn navigational prompts to their destination. Automated data collection eliminates the need for manual data entry. Real-time status of vehicles allows dispatchers the flexibility to make last minute changes. Emergency alarms are also installed on all vehicles.

Since the last MTP update, GHTD added real time passenger information to their ITS program. This includes automated customer services, including trip confirmation, cancellation, and arrival alerts. In addition, GHTD installed the “Real Time Module” so that dispatchers know where vehicles are at all times.

WRTD utilizes Ecolane for facilitating its paratransit service. This program includes mobility computing and AVL that is integrated with its scheduling and dispatch software technology. It also has a customer facing component that includes booking, cancellation and arrival notifications via a website, app, and SMS.

Go CT Card – In Fall 2018, CT**transit** released the Go CT Card, a smart tap and go fare card that can be used on all CT**transit** and CT**fastrak** buses. The card is an account-based system that allows individuals to deposit funds

onto it. The card can be reloaded online or at a growing number of retail outlets including CVS, 7-Eleven, Stop & Shop, and Walgreens. CT**transit** was only the third system in the nation to adopt fare capping across all pass types (1-day, 3-day, 5-day, 7-day, and 31-day). This system tracks a card holder’s trips and guarantees the rider will not pay more than the lowest authorized fare for any period of travel, without having to pay the full cost of a pass in advance. By partnering with local retail outlets and introducing fare-capping, CT**transit** has removed the traditional barriers faced by individuals without bank accounts or with limited income.

In the response to the COVID-19 pandemic, CTDOT temporarily suspended transit fares in March 2020, predominantly to allow passengers to board via rear doors at a distance from the bus operator. Front door boarding and fare collection resumed in October 2020. The following summer, Governor Ned Lamont implemented a fare-free program for weekend rides between Memorial Day and Labor Day. In April 2022, Governor Lamont suspended all public bus fares in Connecticut as part of a program designed to lessen costs for Connecticut residents amid rising inflation and lingering pandemic economic challenges. This directive was originally slated to end on June 30, 2022, but it was extended twice: to November 30, 2022 and then to March 31, 2023. The final extension was the maximum date that complies with 12-month federal restrictions for temporary public transit pilot programs. Further extensions of free fares would require legislative action.

Figure 02.7 — CTfastrak ticket vending machines in downtown Hartford



Photo by Carl Talley

Capitol Region ITS Strategy – CROG has developed a strategic plan to advance transportation technology in the Capitol Region with goals to reduce congestion, stimulate economic growth, increase transit ridership, improve traffic signal management, operations and maintenance, advance sustainable transportation operations, and enhance roadway safety. The objectives related to public transportation include building on the success of CTfastrak, enhancing the seamlessness of the public transportation network, and increasing the user friendliness of the transit system. This Plan was last updated in 2015, and many of its recommendations have since been realized within the region’s transit system. CROG should initiate an update of this Plan and continue to support the recommendations that have not yet been implemented. These include:

- Include ITS capabilities in any expansion of the CTfastrak system
- Implement transit signal priority where appropriate
- Implement integrated fare payment system on transit systems within the state
- Implement Next Bus arrival signs at major transfer points

Short-Term Recommendations

14. Next Bus Arrival Signs at Major Transfer Points

Support implementation of Next Bus traveler information systems.

15. Implement Transit Signal Priority (TSP)

Support projects to upgrade and coordinate traffic signals within Transit Priority Corridors in Hartford and East Hartford.

16. Automatic Passenger Counters (APC)

Work with WRTD to deploy APC technology on their fleet.

Ongoing Efforts

17. Electronic Fare Collection Support the continued deployment of the Go CT Card while looking ahead to the adoption of mobile payment technology.

18. Support Maintenance for Implemented Transit ITS

Support the maintenance and upgrading of implemented transit ITS elements as needed.

Infrastructure and Capital Improvements

Union Station – GHTD completed a master plan for the Union Station Transportation Center Complex. The plan identified short, medium, and long-term opportunities to improve the station such as mechanical upgrades, building improvements, wayfinding, parking strategy, traffic improvements, marketing strategy, and aesthetic changes. The final plan includes a schedule for the improvements and estimated costs. CTDOT's Greater Hartford Mobility Study is identifying potential changes to the highway and rail that run near Union Station, and some recommendations would involve future train service operating out of a new multimodal

transportation center. In the event these recommendations are implemented, it will be important to ensure thoughtful repurposing of Union Station so that this historic building continues to be used and maintained.

Transit District Facilities – In September 2017 GHTD completed the construction of a new operations and maintenance facility. The 37,000 square foot facility consists of a training room, dispatch area, reservations area, scheduling area, conference room, server and communication rooms, quiet room for drivers, lunch room, restrooms/ locker room (with shower access), and a fitness room. The maintenance area consists of four maintenance bays, a storage area, parts room,

Figure 02.8 – Passengers waiting for the CTrail Hartford Line on Track 1



Photo by Carl Talley

mechanics room, wash bay with water/oil separator, vehicle parking, restrooms/ locker room (with shower access), and a fueling station. WRTD completed construction on their operations and maintenance facility in 2015. The facility includes a dispatch area, conference room, maintenance area and unheated bus storage area.

CTtransit Hartford Bus Maintenance

Facility – CTDOT received a \$7,000,000 grant under the FY18 FTA Buses and Bus Facilities Infrastructure Investment Program. The funding has been used to rehabilitate the Hartford bus maintenance facility’s mechanical and electrical systems that were at the end of their useful life. Additional upgrades will need to be made to this facility as CTDOT moves towards electrifying its bus fleet. CTDOT is undertaking the following projects as part of the Connecticut Electric Bus Initiative:

- Retrofit the existing hydrogen bus facility to charge six (6) battery electric buses
- Install one (1) DC Fast Charger to facilitate electric bus acceptance and testing at the facility
- Complete electrification study to 30% then 100% of the facility (300+ buses)

Transit Asset Management (TAM) – TAM Plans are mandated by the FTA and were first required to be completed by October 1, 2018 for agencies that own, operate, or manage capital assets used for public transportation and receive federal funding. The TAM Plan uses asset condition coupled with performance measures to guide how to

manage capital assets and prioritize funding to improve or maintain a state of good repair. TAM Plans must be updated every four years, and the performance measures must be accepted by the corresponding MPO. CTDOT prepares a Tier 1 TAM Plan for CTtransit and a Tier II group plan which includes WRTD. GHTD prepares their own TAM Plan.

Buckland Hills – The improvement of the Buckland Hills park and ride lot, located on Buckland Street in Manchester, to create a transit hub has been identified in several studies, including CROG’s 2017 Comprehensive Transit Service Analysis. CTDOT is advancing a project to make improvements to this lot. These improvements include a double-platformed bus stop, expanded bus layover area, sidewalks, electric car charging spaces, bicycle racks, and signage. The bus stop will include lighting, heated shelters, real-time information, benches, and trash receptacles.

Figure 02.9 – The 913 Express Bus heading to the Buckland Hills Park & Ride Lot



Photo by Carl Talley

Bus Shelters and Passenger Amenities – Bus stops with amenities such as shelters, benches, real-time passenger information, and easy access that integrates into the surrounding development can enhance the passenger experience and contribute to increased ridership. A challenge with such amenities is the need for ongoing maintenance. In general, municipalities are responsible for the maintenance of their shelters, but this can result in inconsistencies across the system as different Towns have different staffing levels and budgets. CROG has played an active role in trying to find solutions to this challenge. CTDOT is in the process of initiating a bus shelter assessment to better understand municipal needs and perspectives related to bus shelter maintenance. This is the first step in a broader Bus Shelter Enhancement Program, and CROG will support this effort and assist with municipal coordination.

Electric Buses – CTDOT has continually sought to decrease the diesel emissions from its CTtransit bus fleet. The Connecticut Electric Bus Initiative is a partnership between CTDOT, the Connecticut Department of Energy and Environmental Protection (CTDEEP), and CTtransit to transition the state’s transit fleet to battery electric buses (BEBs). Incorporating BEBs into the State’s transit bus fleet will be a lengthy process that requires substantial capital investment, dedicated planning, and strategic partnerships. Several transit operators across Connecticut have already obtained funding and have begun the process of incorporating BEBs into their fleet.

Figure 02.10 – **Passengers waiting at one of the CTtransit shelters with a bench**



Photo by Carl Talley

Short-Term Recommendations

- 19. Bus Shelters** Support CTDOT’s bus shelter initiative. Facilitate discussions between CTDOT, CT*transit*, and municipalities related to bus shelter maintenance.
- 20. Buckland Hills Park and Ride** Support the implementation of improvements to make the Buckland Hills Park and Ride a transit hub. Such improvements would support future enhancements to transit service, including the potential expansion of CTfastrak service.

Ongoing Efforts

- 21. Transit Facility Upgrades** Continue to support the planning and development of transit facility upgrades as needed to meet the changing needs presented by new vehicle technologies.
- 22. TAM Plan** Continue to review CTDOT’s and GHDT’s updated State of Good Repair Performance Targets to determine whether they should be adopted as the regional performance targets for the MPO.
- 23. Union Station Enhancement** Continue to support efforts to improve, upgrade, and enhance Union Station and to ensure its future maintenance.
- 24. Support Connecticut Electric Bus Initiative** CROCOG, CT*transit*, and CTDOT should continue to search for opportunities to support the state’s electric bus program.

Transit Oriented Development

If transit investments are to realize their full promise, they must be adequately funded, properly designed, and strongly connected to economic and community development. Proper station area planning and active encouragement of transit-oriented development (TOD) are needed to ensure success.

TOD means development that is not only close to transit, but “oriented” to it. TOD is relatively dense and compact in comparison to surrounding areas, and ideally includes a mix of uses. This mix is important, both for community vibrancy and for the efficient use of transit service. If a station area contains a range of housing options, jobs, and services, it will be both an origin and a destination, attracting transit riders in both directions in the morning and evening commutes and on weekends. TOD is located within walking distance ($\frac{1}{4}$ to $\frac{1}{2}$ mile) and bicycling distance (2 miles) of transit, and the public realm of streets, sidewalks, bike lanes, ground-floor businesses, wayfinding, and amenities are inviting to pedestrians and cyclists as well as drivers.

Highways and roadways have historically been the primary determinant of land use and urban form, which has resulted in dispersed development, displacement, and travel patterns that are difficult for transit to serve. CROCOG is committed to using transit as a tool to shape urban form and encourage land use planning that can support additional transit investments in the region’s transit corridors.

TOD is fundamentally important to Greater Hartford for six reasons:

1. It generates higher levels of ridership and farebox revenue for the transit services in question—rail and bus rapid transit, as well as the local bus lines connecting to those stations.
2. TOD enables the transit system to reduce congestion on the region’s roadways. For most people, the ability to commute by transit requires that at least their workplace, and ideally their home as well, have convenient access to the system.
3. TOD enables the transit system to provide affordable job access to the region’s workforce, especially those households that do not own cars or that have two working members but can afford only one car.
4. Transit-oriented, walkable communities, with a mix of everyday activities close at hand and convenient access to Downtown Hartford and other regional destinations, will tend to attract Millennial households and retiring Baby Boomers—the two age cohorts that are growing in most Northeastern cities and regions. Along with job access, this is a key factor in population growth, business recruitment, and regional economic competitiveness.
5. TOD is a core ingredient of smart, sustainable growth. It reduces vehicle miles traveled (VMT) and greenhouse gas emissions. Its compact footprint helps communities and regions grow

without continued sprawl and sacrifice of open space. Compact, walkable, mixed-use development can typically be built and operated with greater energy efficiency, lower infrastructure costs, and less parking (a key driver of land use and construction costs) than development in non-transit settings.

6. Finally, TOD can create real estate value around a station. That value can be “captured” to help pay for the station itself or other essential infrastructure in the station area. Beyond the intrinsic efficiency of TOD helping to fund its own platform, value capture is a major “plus” in several federal funding and finance programs.

“ CROCOG is committed to using transit as a tool to shape urban form and encourage land use planning that can support additional transit investments. ”

With funding from the HUD Sustainable Communities Regional Planning Grant mentioned previously, CROCOG undertook several projects to further TOD planning and implementation in the region. The report, *Making it Happen: Opportunities and Strategies for Transit-Oriented Development in the Knowledge Corridor*, identifies the types of businesses that can generally be attracted to the corridors and evaluates market conditions on a station by station basis. Another product of this funding was a Mixed Use/ Transit-Oriented Development Model Zoning Regulation for communities to utilize as they continue to prepare for future development opportunities in the region's transit corridors.

Several Knowledge Corridor communities with CTfastrak or CTrail stations have conducted TOD studies, laid the groundwork for, and begun to develop residential, commercial, and green space around the stations in line with TOD principles. Many of the development sites are mixed use and redeveloped unused industrial/commercial spaces.

As part of CROCOG's TOD Roles, Visioning, Viability, and Tools Analysis, which is anticipated for completion in 2023, CROCOG is assisting eight municipalities along CTrail and CTfastrak with identifying how much development can occur near stations within existing zoning parameters and current market conditions. The study also includes the preparation of a pro forma for each site's potential development in order to understand whether sites would require state subsidies or other funding to close

the gap between building costs and lease income. Additionally, the study is examining the roles and responsibilities related to TOD in the region. This will allow for a better understanding of the role of CROCOG, municipalities, CTDOT, and developers in facilitating TOD. This will identify existing impediments to advancing TOD in the region.

Short-Term Recommendations

25. TOD Strategy Develop a long-range strategy for the region that encourages both transit and transit supportive land use, and make station area and TOD planning a core element in the planning process for any rapid transit line or station.

Ongoing Efforts

26. General Support for TOD Support TOD along all transit lines, including traditional bus corridors, through coordinated action by CROCOG, the state, and affected municipalities.

27. Municipal Coordination Coordination Work with municipal officials and developers to integrate TOD into their plans and development projects through use of such tools as the Mixed-Use/ Transit-Oriented Development Model Zoning Regulation and the findings of CROCOG's TOD Roles, Visioning, Viability, and Tools Analysis.

Chapter 03

Highway System

Well over 90% of the region's people and freight goods travel along the region's roadway network. The main focus of this chapter is on the portion of the roadway network that is of regional significance – the freeway and arterial roadways. United States Code [§1203; 23 USC 150(b)] states that it is in the national interest to focus the federal-aid highway program on the following seven national goals: Safety, Infrastructure Condition, Congestion Reduction, System Reliability, Freight Movement and Economic Vitality, Environmental Sustainability, and Reduced Project Delivery Days. This Metropolitan Transportation Plan (MTP) outlines a plan to manage the system so that it will continue to function in a safe and efficient manner and serve future travel demand.



Photo by Carl Talley

The Current System

In this plan, the term Highway is meant to refer to its more generic definition of any public roadway. Since 1994, CROCG’s official policy is to first attempt to address highway issues by improving the operational efficiency of the existing system before resorting to building new or wider highways. Since then, the region’s roadway system has grown minimally while traffic volumes have grown significantly, albeit inconsistently. Decades long late 20th century growth trends of between one and two percent per year levelled off around 2005 and did not significantly increase again until a few years approaching 2020. This increase was promptly reversed by the COVID-19 pandemic, with region’s volumes initially

falling to a low of about half of pre-pandemic numbers as people adhered to the Governor’s stay at home order and consistently worked or attended class from home. Connecticut volumes have since rebounded and have begun to stabilize at about 90% of pre-pandemic levels. Consequently, it is estimated that the region’s roadway networks carried an annual vehicle-miles traveled (VMT) of about 8.4 billion in 2021, compared to over 9 billion estimated in 2018. Figure 03.1 shows VMT trends nationwide over the past 24 years, inclusive of the recent pandemic years.

Although traffic volumes have rebounded from initial pandemic lows, it is likely that the technology that helped facilitate these changes (work from home, on-line shopping, etc.) has and will continue to impact travel.

Table 03.1 — Federal-aid Highway National Goals

Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
Infrastructure Condition	To maintain the highway infrastructure asset system in a state of good repair
Congestion Reduction	To achieve a significant reduction in congestion on the National Highway System
System Reliability	To improve the efficiency of the surface transportation system
Freight Movement and Economic Vitality	To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
Environmental Sustainability	To enhance the performance of the transportation system while protecting and enhancing the natural environment
Reduced Project Delivery Delays	To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion

This will also impact how future travel demand is modeled, predicted, and calibrated.

Using historically accepted travel demand model methods and Connecticut Department of Labor population projections, CRCOG’s travel demand model predicts increased VMT demand of 14.5% in the region by 2050, or just under 0.5% annually. This is significantly less than national VMT growth projections, which per recent long-range forecasts is predicted to increase 22% by 2050. The difference is primarily the result of the slower projected population growth associated with Connecticut, and the northeast in general.

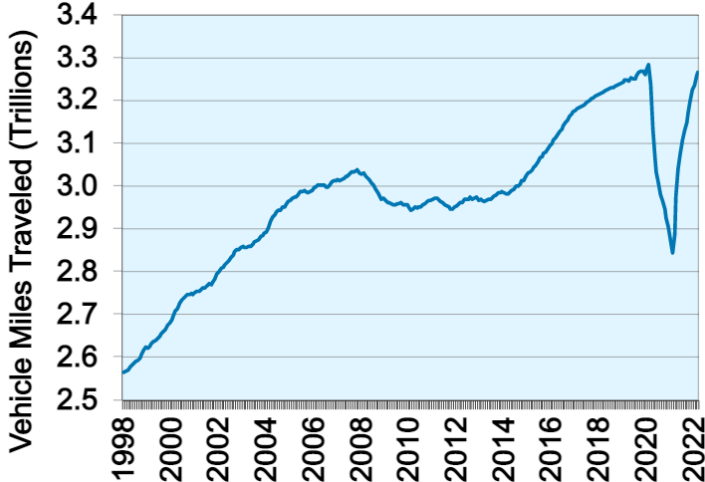
For MTP air quality analysis and conformity purposes, these traffic growth projections were applied to the higher, pre-pandemic volumes. This represents a conservative approach to air quality conformity and does not recognize the permanence of many post-pandemic travel changes. In determining future traffic demands on infrastructure, applying traffic growth

projections to current (instead of pre-COVID) traffic volumes may be more realistic.

It should be noted that these VMT projections are predictions and not CRCOG goals. CRCOG is interested in reducing VMT while maintaining mobility via several methods described throughout this MTP, including promoting transit-oriented development, multi-modal infrastructure, remote work, travel demand management, appropriate land uses, transit incentives, etc. If anything, the projections serve as an indicator that if laws, land use patterns, incentives, etc., remain consistent, VMT increases can be expected.

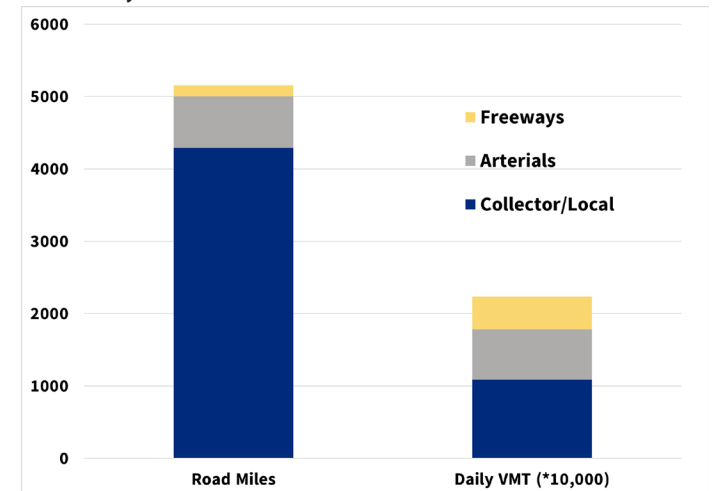
The roadway system comprises a hierarchy of road types, including freeways, major non-freeway roadways (arterials), collectors and local roadways. While the higher classification roads account for a small portion of total mileage, they carry the majority of roadway travel, as shown in Figure 03.2. The main roadway classifications are explained in greater detail as follows:

Figure 03.1 – Nationwide Vehicle Miles Traveled Trend (Trailing 12 Month Total)



Sources: U.S. Department of Transportation, Federal Highway Administration, March 2022 Traffic Volume Trends.

Figure 03.2 – Regional Roadway and Vehicle Miles Traveled, 2021



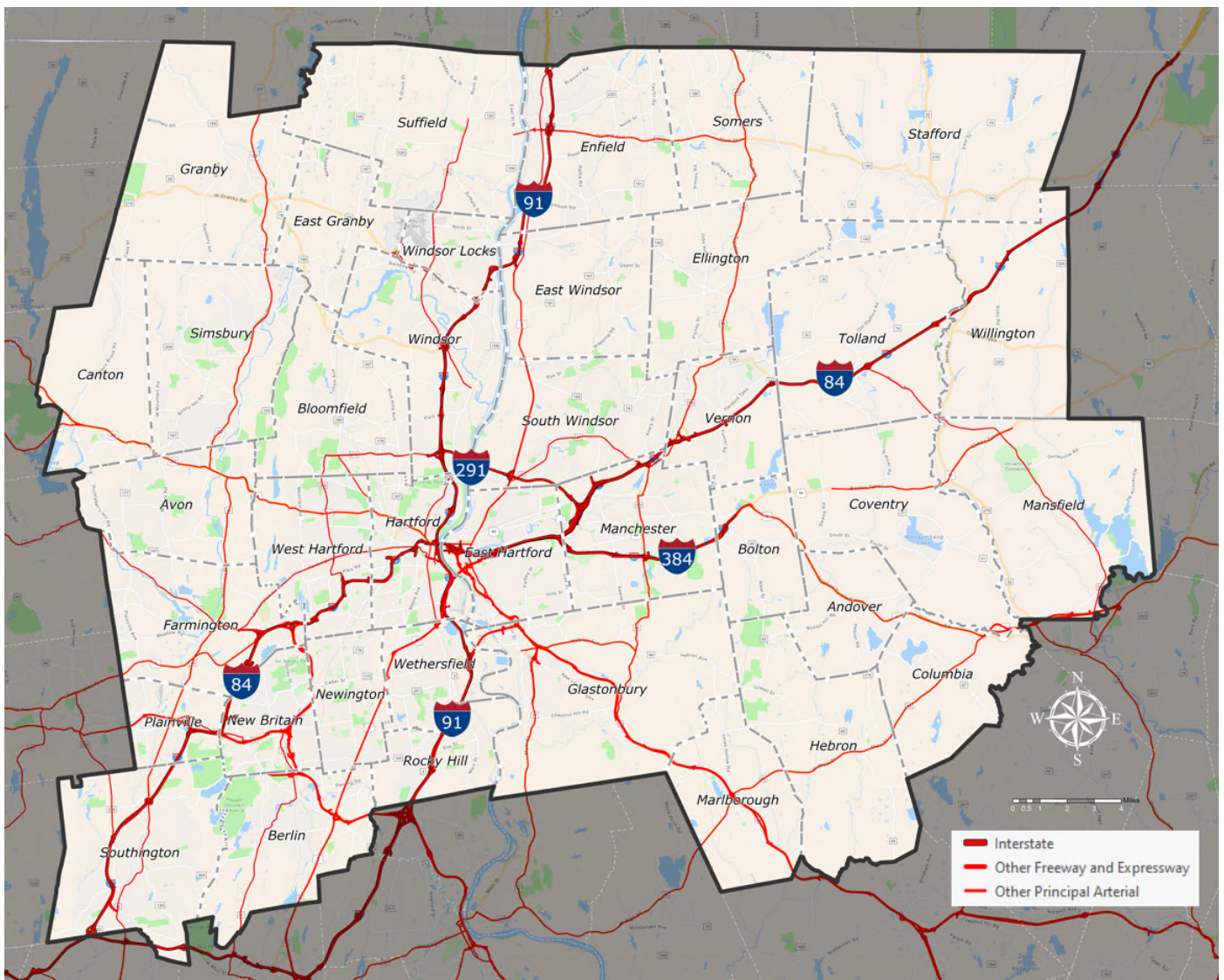
Source: CT Open Data Portal, 2021 Daily Vehicle Miles Traveled By Town and Roadway Classification.

- Freeways are limited access, grade separated facilities whose function is to serve longer distance trips and through traffic. Freeways are the most important part of the region’s roadway system. The region has 156 miles of freeways, which constitute only three percent of the total road miles, but these roads carry close to one-half of the total VMT. The region’s two most significant freeways are I-84 and I-91, which serve as the region’s main east-west and north-south routes, respectively. The region’s other freeways include I-291, I-384, Route 2, part of Route

20 (the Bradley connector), Route 9, Route 3 (from I-91 to Route 2), Route 72 (from I-84 to Route 9), and part of Route 15 (from I-84 to the Berlin Turnpike). These highways are critical for connecting to places outside the region, for commuting and other long-distance travel within the region, and for the region’s economic health.

- Arterials are the second most important part of the regional roadway network. Arterial roadways serve the multiple purposes of carrying longer distance trips while

Figure 03.3 – National Highway System in Capitol Region



also serving shorter trips and providing access to adjacent land uses. They are not limited-access facilities and have at-grade intersections. The arterial network comprises only 14 percent of the entire road network, but it carries just over 31 percent of the total traffic. In addition to many state-numbered routes, the most heavily traveled municipally owned roadways are typically classified as arterials. Examples of arterials in the region include Route 4, Route 6, Route 44, and Route 66.

- Collectors and Local Roads make up most roadways. Their primary function is to provide access to adjacent properties, homes, and businesses. These roadway types are typically municipally owned. They account for 83 percent of the total roadway network, but they serve a small volume of traffic, or about one fifth of the total regional travel.

The National Highway System (NHS) is a network of strategic highways, including the Interstate Highway System and other major arterial roads serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals and other strategic transport facilities. The NHS designation is intended to guide federal funding toward improving the efficiency and safety of the roads in this network. Figure 03.3 shows the NHS system in the Capitol Region.

A review of the figure shows a roadway system with major routes radiating out from the City of Hartford, including I-84 and I-91 which form an interchange within the city. These interstates are the region's two most

important routes for travel within the region, and the primary routes to and from locations outside of the region. West of Hartford, I-84 links to Waterbury and Danbury in Connecticut, the Hudson River Valley in New York, and northeastern Pennsylvania. To the east, I-84 links to I-90 in Massachusetts, which is a primary route to Boston. To the south, I-91 connects to I-95 in New Haven, and to the north, I-91 connects to I-90 in Springfield, Massachusetts, and is also a primary route for destinations further north in Vermont and New Hampshire.

System Conditions, Issues and Deficiencies

Along with analysis related to various CROCOG programs (Congestion Management, Safety, etc.), CROCOG regularly assesses the performance of its roadways for federally required performance measures. A summary is provided below, however additional details can be found in the Performance Management chapter:

Safety

The Connecticut Strategic Highway Safety Plan (2022-2026) includes a call to action by the Governor, toward zero fatalities and serious injuries on Connecticut's roads. CROCOG supports this call to action.

The CTDOT Safety Performance Target Report (April 2022) shows that annual fatalities on Connecticut roads over a period from 2011 to 2020, has ranged from a low of 221 to a high of 304. Similarly, the serious injuries range from a low of 1319 to a high of 1778.

The Connecticut Transportation Safety Research Center shows an alarming recent increase of deaths in Connecticut, rising from 303 in 2021 to 384 in 2022, an increase of 81 deaths. In 2022 there were a total of 104 fatalities in the CROG region (61 drivers/passengers + 22 pedestrians + 2 pedal-cycle + 19 motorcycle). These alarming recent increases in Connecticut and the CROG region are similar to nationwide trends.

Given a similar built environment, many research efforts seem to point to more “3 Ds” driving (distracted, drunk, and/or drugged) as a major cause. Highlighting this issue are 2019 National Highway Traffic Safety Administration statistics indicating that 28% and 38% of all national and Connecticut traffic fatalities, respectively, involved alcohol impaired driving. Additionally, the administration’s 2022 “Alcohol and Drug Prevalence Among Seriously or Fatally Injured Road Users” Report, studying over 7,000 incidents, showed that over 54.2% of those seriously or fatally injured in traffic incidents tested positive for one or more drugs, with that number climbing to 67.7% when considering only fatalities.

Additional contributing factors include the need for infrastructure that better accommodates all transportation modes, a recent rash of speeding, increasing disparity in vehicle sizes, and increasing vehicle heights that impede near-side sight lines and raise impact points with pedestrians and cyclists. The following recent statistics further illustrate these issues:

- Freeway monitoring stations indicate approximately double the number of vehicles traveling over 85 mph compared

to before the pandemic. Conversely, traffic enforcement efforts have diminished, with infraction citations decreasing from over 400,000 per year in 2010 to just over 100,000 in 2022.

- SUVs and Pickup truck sales recorded a new record market share, combining for a total of 72.9% of U.S. passenger vehicle sales in the first 4 months of 2022.

Safety remains a primary focus of the region, and the recent unfortunate fatality trends only amplify this focus. To attempt to address the issue CROG has undertaken a Safety Management Program consisting of a various pronged approach detailed later in this chapter under “Safety Management Program.”

Infrastructure Condition

Both the state’s and region’s 2022 pavement conditions exceeded the expectations set via 2022 performance measure targets set in 2018. Only 0.1% (interstate) and 2.7% (non-interstate) of the region’s pavement were determined to be in poor condition, far from levels that would trigger federal penalty. The region’s bridge conditions also improved, with the percentage of bridge deck areas in poor condition falling from 15.7% in 2018 to 3.0% in 2022, primarily the result of I-84 Hartford Viaduct repair work. This is not only lower than the state average of 7.9%, but also now well below the federal penalty threshold of 10%. However aging bridge infrastructure is an ongoing concern in Connecticut, and unfortunately the percentage of the region’s bridge deck area in good condition also fell, from 13.6% in 2018 to 10.7% in 2022. The remaining 86.3% of the region’s bridges fall into the remaining “fair condition” category.

Congestion Conditions

Significant freeway congestion is experienced in the region primarily in and around Hartford during peak commuting hours. I-84 west of I-91 has been, and remains, the region’s most congested corridor, followed by I-91 north of I-84. Interstate congestion during the AM peak commuter period is generally limited to in-bound traffic (towards Hartford), however during the PM peak both inbound and outbound traffic is heavily affected. CRCOG performs comprehensive reporting on the region’s congestion each few years. The most recent report was completed in 2020 and contains detailed analysis of congestion data throughout the 2019 calendar year. Figures from that report, showing inbound (towards Hartford) and outbound (away from Hartford) regional afternoon freeway travel speeds are shown in Figures 03.4 and 03.5.

CRCOG’s 2019 MTP indicated that, given anticipated programming levels, freeway congestion for both commuters and freight were anticipated to worsen slightly within the next four (4) years. However, since that prediction, the COVID pandemic has impacted travel volumes and patterns of both commuters and freight movement. According to the 2021 Urban Mobility Report, Hartford Urban Area saw a 41% drop in total annual delay between 2019 and 2020, which is attributed to COVID. However as of 2022, regional volumes had rebounded and begun to stabilize at about 90% of 2019 volumes, and congestion has returned almost to

Figure 03.4 – 2019 PM Peak Hour Inbound Average Travel Speeds

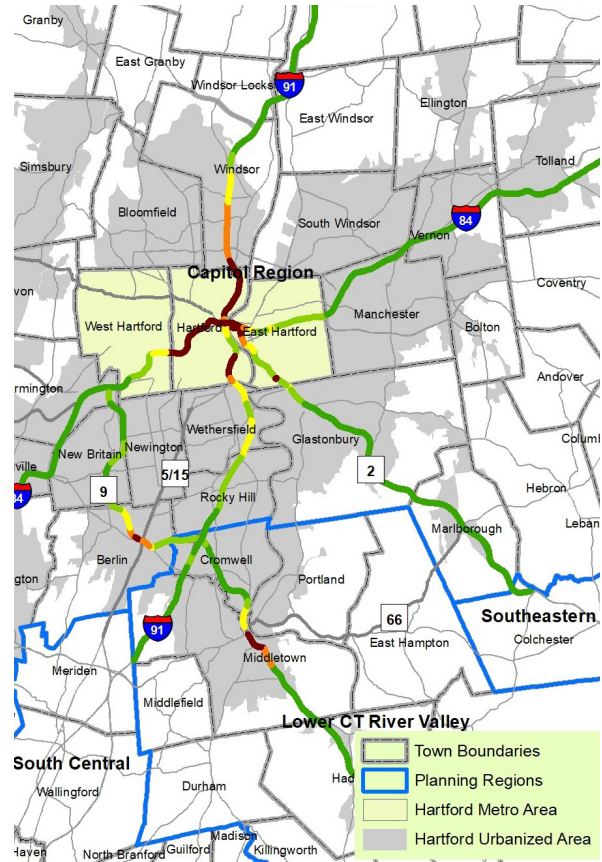
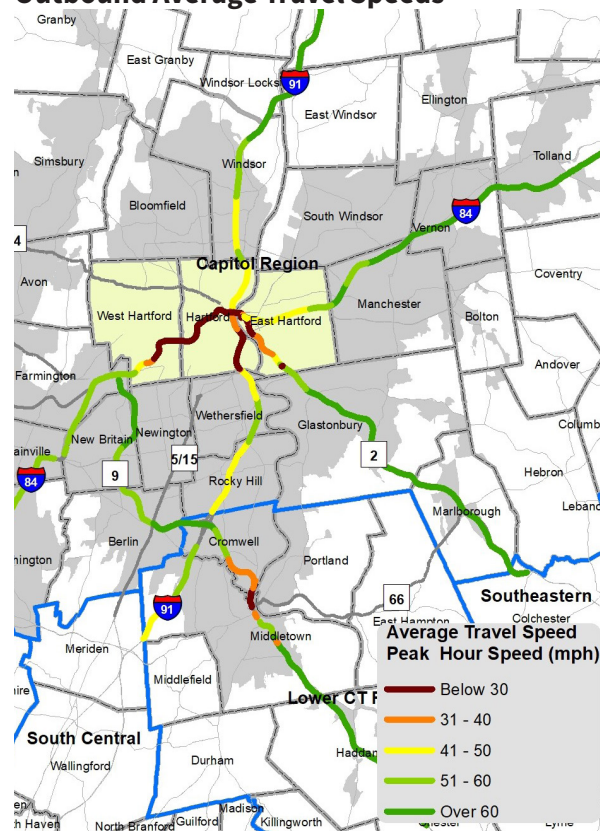


Figure 03.5 – 2019 PM Peak Hour Outbound Average Travel Speeds



Sources (top and bottom): Congestion Management Process, NPMRDS Update, May 2019.

pre-pandemic levels. CRCOG looks forward to performing another comprehensive congestion management report soon, assuming travel demand continues to stabilize.

Overview of Proposed Strategies and Actions

CRCOG has adopted an approach that relies heavily on managing existing freeway and arterial facilities to improve safety and reduce congestion. This approach reflects a longstanding policy (first adopted in the 1994 Plan) of first attempting to address highway issues by improving the operational efficiency of the existing system before resorting to building new or wider highways. This strategy relies significantly on identification of critical improvements needed along discrete sections of the system and on implementation of Transportation Systems Management and Operations (TSM&O) policies. The Federal Highway Administration defines TSM&O as “an integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system.” In this context, CRCOG strives to measure performance, actively manage the multimodal transportation network, and deliver positive safety and mobility outcomes to the public. The strategies and actions for addressing issues relating to highway safety and congestion can be grouped into the following categories:

- Safety Management Program
- Congestion Management Process
- Traffic Incident Management
- Intelligent Transportation Systems
- Freeway Improvements
- Arterial Improvements
- Bridge Infrastructure Improvements
- Municipal Road Management

The following sections provide a summary of proposed strategies and actions in each category.

Safety Management Program

The Regional Transportation Safety Plan – Capitol Region (RTSP) will serve as the safety action plan for the CRCOG region. CTDOT took a lead role in preparing the RTSP which was approved by CRCOG in 2020 and amended in 2022. CRCOG will continue to use and amend the RTSP as needed to serve as a viable safety action plan for the region. CRCOG will utilize elements of the National Roadway Safety Strategy (January 2022) that incorporates the Safe System Approach with the following principles.

1. Death and Serious Injuries are unacceptable
2. Humans Make Mistakes
3. Humans are Vulnerable
4. Responsibility is Shared
5. Safety is Proactive
6. Redundancy is Critical

Implementation of a safe strategy includes the following safe system approach elements

1. Safer People
2. Safer Roads
3. Safer Vehicles
4. Safer Speeds
5. Post Crash Care

As stated in the National Roadway Safety Strategy, zero is the only acceptable number of deaths on our highways, roads, and streets. CRCOG will continue to review past stated goals to reach zero transportation related fatalities in our region by 2045; and include any updated goals in the RTSP. CRCOG also annually reviews CTDOT’s five safety performance measures, and has supported CTDOT’s targets over the past years from 2018 to 2022.

To ensure a continuing and comprehensive approach to improving safety of travelers, CRCOG’s safety management program contains the general components and selected features are listed below:

- 1. Include Safety in All Studies** Safety will be an integral element in all CRCOG studies and continue to focus on the four E’s of transportation safety: engineering, enforcement, education, and emergency response.
- 2. Improve Safety for All Modes** Safety is a priority in all CRCOG programs regardless of mode. Mode-specific plans, such as the regional bicycle plan, contain safety recommendations relevant to that specific



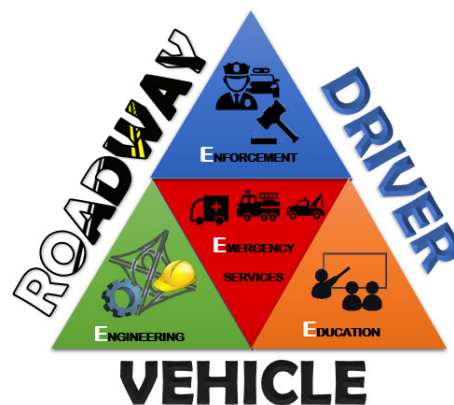
mode. More comprehensive efforts, such as corridor studies, address safety issues for all roadway users - motorists, transit users, pedestrians, and bicyclists.

3. Monitor Regional Safety Conditions & Trends

CRCOG will monitor safety conditions and identify emerging trends in the region. This will include regular reviews of Connecticut’s Crash Data Repository and a summary of findings for all modes. Analysis completed as part of setting annual FHWA safety performance measure targets will supplement this effort.

4. Support Traffic Incident Management as a Safety Tool

As detailed later in this chapter, CRCOG will continue to support traffic incident management as a valuable tool for reducing secondary crashes. CRCOG also supports procedures that ensure the safety of emergency service personnel who respond to highway incidents.



5. Collaborate with and Support CT

Safety Circuit Rider Program In 2014, Connecticut, in partnership with the University of Connecticut's Technology Transfer (T2) Center, established a Safety Circuit Rider position to assist municipalities with Local Safety planning. CROCOG has and will continue to work closely with the T2 Center and the Safety Circuit Rider, including continued program support and participation on its Advisory Committee.

6. Support the CT Strategic Highway Safety Plan

A major component of the regional safety management program is supporting the CT Strategic Highway Safety Plan (SHSP), updated to cover 2022-2026. CROCOG serves on the Steering Committee for the SHSP. Connecticut coalesced around three Emphasis Areas: Infrastructure, Behavior, and Pedestrian. The EAs were based on data analysis and stakeholder input. They were endorsed by both the SHSP Steering Committee and Executive Committee.

Additional Safety Areas were identified to ensure a comprehensive SHSP that addresses all system and user safety needs.

- *Infrastructure:* The EA focuses on reducing the number of fatal and serious injury roadway departure and intersection-related crashes.

- *Behavioral:* The EA focuses on reducing fatalities and serious injuries due to impaired driving, aggressive and speed related driving, unrestrained occupants, motorcycles, and distracted driving.
- *Pedestrian:* The EA focuses on pedestrians killed or seriously injured. Contributing factors include more walking for fitness or commuting, an increase in vehicle size from passenger cars to SUVs and pick-up trucks, additional pedestrian and driver distractions from smartphones, and increased incidence of impaired driving and walking.

The Additional Safety Areas represent fewer fatalities and serious injuries than EAs but require detailed analysis to identify effective strategies and continue on-going programs and initiatives as part of a successful Connecticut safety program. These areas include:

- Unlicensed Drivers
- Hit-and-runs
- Work Zones
- Commercial Vehicles
- Older Drivers and Older Pedestrians
- Pedal Cyclists
- Younger Drivers
- Railway-highway grade crossings
- Tribal owned roadways
- Wrong Way Drivers
- Traffic Incident Management

Crashes involving youth drivers (aged 20 or younger) are responsible for many fatalities and serious injuries.



7. Assist in development of a Regional

Transportation Safety Plan – A regional transportation safety plan was prepared by CTDOT, in coordination with the municipalities in the region to serve as a road map to reduce fatal and injury crashes. The plan was completed in 2020 using 2015 to 2017 crash data, and was amended in 2022. Crash statistics will be updated to include crash data from more recent years. This report is aligned with the Connecticut Strategic Highway Safety Plan (SHSP) which guides the State in obtaining the same objective. The regional plan differs from the SHSP because it identifies high frequency crash locations and countermeasures that can reduce crashes and improve overall safety for all roadway users in the region. The plan was completed and approved in 2020 and an update is scheduled to begin in 2023.

8. Vision Zero A Vision Zero Council was established in 2021 by the Connecticut General Assembly as part of Public Act 21-28, a landmark transportation safety bill. The Council is an interagency work group tasked with developing statewide policy to eliminate transportation-related fatalities and severe injuries involving pedestrians, bicyclists, transit users, motorists, and passengers. The VZC (Vision Zero Council) will build new and strengthen existing partnerships between state agencies and safety advocates who are committed to eliminating traffic crashes that cause death and serious injuries. Through policies that make roadways safer and through inclusive

community engagement VZC will achieve the goal of zero deaths from traffic fatalities.

Ongoing Efforts

- 1. Improve Safety Management** Improve safety management by practicing the eight principles described above.
- 2. Explore Potential Educational/Outreach Efforts** Coordinate with AAA, CTDOT, and the T2 Center to explore potential educational/outreach efforts promoting seat belt use, combating “3 Ds” driving, and advancing cyclist and pedestrian education.
- 3. Assist with Regional Transportation Safety Plan** Assist with ongoing development of the Regional Transportation Safety Plan, including continued attendance at related meetings with municipalities and analysis assistance.
- 4. Promote Intersection Conversions to Modern Roundabouts** Advance conversions of intersections to single lane roundabouts. CROCOG is completing a Roundabout Screening Study as described below under Unfunded Needs; and also supports development of roundabout projects using different funding sources such as LOTCIP and potentially future Safe Streets and Roads for All funding.
- 5. Support the State’s Vision Zero Council** Continue to participate on the four subcommittees: Engineering, Enforcement, Education and Equity; advocate and promote road safety in the region and across the State.

Congestion Management Process

A Congestion Management Process (CMP) is a systematic approach to measuring transportation system performance and developing proposals to manage traffic congestion. Each metropolitan area with a population over 200,000 is required to develop and implement a CMP as part of their metropolitan planning process. Hartford's metropolitan area population exceeds 900,000, and therefore CROG, in concert with adjacent regional agencies, has carried out a transportation monitoring and management program since 2005.

In both 2005 and 2010, CROG published CMP Reports for the Metropolitan Hartford Area, assessing traffic conditions and operations on both freeways and select arterial segments.



Photo by Peter Morenus

In 2015, CROG published an NPMRDS update, which utilized the National Performance Management Research Data Set (NPMRDS) to update the congestion monitoring and assessment report portions. The latest update was done in 2020, which utilized year 2019 NPMRDS to assess the congestion situation in the region. The report provides a snapshot of pre-pandemic congestion in the region. Of primary concern was the almost 15,000 hours of congestion delay on CROG's interstates and freeways within the 4 peak hours of the single average weekday. Much of this congestion was centered around the I-84 and I-91 interchange area, with I-84 west of I-91 being the region's most congested, followed by I-91 north of I-84. These findings were more recently echoed by a 2021 Urban Mobility Report from the Texas Transportation Institute (TTI), listing Hartford as 24th out of 101 of the most congested urban areas with an average of 31 hours of delay per auto commuter in 2020. This translates to 13 gallons in excess fuel per commuter and an estimated \$606 of congestion cost per auto commuter annually.

A critical component of the CMP's efforts is the discussion of mitigation strategies. Many of the recommendations made in previous CMPs have already been implemented. The recommendations below include both new and ongoing efforts, including many from the prior CMP.

Ongoing Efforts

6. Promote Congestion Mitigation

Projects Advance projects in the TIP (Transportation Improvement Program) that relate to congestion mitigation.

7. Plan for Variety of Travel Demand Scenarios

Ensure that CROCOG's travel demand model reflects growing transit service in region.

8. Expand Transit

Promote **CTfastrak** and NHHS Rail Service to expand transit options and connectivity.

9. Advance Transit System Enhancements

Work to advance Transit System Enhancements study findings identified in the Sustainable Communities Initiative projects conducted in Enfield, Manchester, and Windsor.

10. Assist in Advancing Park and Ride

Monitor Park and Ride lot usage and work with CTDOT on improvements such as expanding lots with high utilization rates, reviewing transit service access as part of Comprehensive Service Analysis, and providing/upgrading the amenities such as shelters and bike racks/lockers where appropriate.

11. Identify Improvements on CMS (Congestion Management System)

Corridors Partner with CTDOT to identify potential improvements at locations along the CMS corridors with a higher-than-expected crash rate.

12. Encourage Transit Oriented

Development (TOD) Encourage TOD including the development of model sustainable land use regulations.

13. Provide Multi-Modal Planning Support to Communities

Provide technical support to communities strengthening the multimodal network and continue to build upon the regional trail system.

14. Support educational initiatives that encourage safe bicycle and pedestrian transportation

15. Update Congestion Management

Process (CMP) Provide a CROCOG Update of the CMP in conformance with federal performance measure standards, and in coordination with the three other regions whose boundaries stretch into the Hartford TMA (Transportation Management Area).

16. Develop Additional Congestion

Management Strategies Establish further strategies to reduce congestion and evaluating their effectiveness.

17. Measure Impact of Transit Initiatives on

Congestion Mitigation Evaluate the impact of implemented transit initiatives on CMP reporting, and update reporting as necessary.

Traffic Incident Management

Since 1998, CROCOG has played a key role in Traffic Incident Management (TIM) activities not only in the Greater Hartford region but also statewide. TIM provides a systematic, planned, and coordinated multi-disciplinary approach to detect, respond and clear crashes to restore traffic capacity as safely and quickly as possible.

TIM is the primary tool for reducing highway congestion that occurs when crashes, breakdowns, or other incidents result in a full or partial blockage of the highway. According to FHWA, traffic incidents on U.S. roadways account for about 25 percent of all delays, and every minute a freeway lane is blocked due to an incident result in 4 or 5 minutes of additional travel time delay. The goals of TIM are to respond sooner to incidents, clear the incidents more quickly, and manage traffic better during the crash.

TIM programs also enhance motorist and responder safety during traffic emergencies. Properly employed practices can reduce time spent on-scene, and responder's exposure to on-scene hazards. The sooner motorists involved in the incident are removed from

the scene, the sooner they are moved out of harm's way and can receive needed treatment, if any. Also, shorter clearance times significantly reduce the likelihood of secondary crashes caused by slowed or stopped traffic, lane closures, and emergency vehicle movement. FHWA has determined that the likelihood of a secondary crash increases by 2.8% for every minute of roadway blockage.

A key to continuous effective TIM practices is creating and sustaining partnerships with law enforcement, fire and emergency medical services, transportation and environmental agencies, towing and recovery, drivers, the media, the insurance industry, and others.

To this end, CROCOG established the Greater Hartford TIM Coalition (GHTC) in January 2018. The GHTC is comprised of members that serve various stakeholder groups and has been tasked with providing guidance and direction to the TIM community to achieve new goals and strengthen the program. The program includes the development of a general framework and approach to defining and engaging regional planning organizations and municipalities, reinforce the organizational practices and requirements established within the National Incident Management System, and define the Coalition's role in Transportation Systems Management and Operations (TSMO). Focuses of the GHTC include:

- Training of responders, which is a key to providing funding resources, opportunities for responders to participate, and locations for multi-disciplinary training. The



Connecticut Department of Transportation is providing free TIM Training to increase the number of responders certified and knowledgeable in TIM best practices.

- Adopting and updating TIM policies and documents to reflect current regulations, laws, policies, and guidance. These include the Regional Unified Response Manual (RURM), Enhanced Accident Response Plan (Public Act No. 15-5, Senate Bill 1502 Sec. 164), Quick Clearance Policy, and State of Connecticut Highway Incident Management Policy.
- Supporting legislation to reduce the number of fatalities and serious injuries to incident responders.
- Producing a TIM field guide for traffic incident scene management. It is currently being distributed to emergency responder organizations across the State and is included in Connecticut's TIM training curriculum.
- Developing and applying TIM performance measures and targets. Although federal performance measures and safety management programs measure safety and congestion in general, data and performance metrics specific to TIM may prove valuable.



These measures may specifically deal with non-recurring congestion, responder safety, and incident response and incident clearance times. Critical to this implementation will be the availability of reliable data.

- Maintaining and updating diversion plans used to equip and guide state and local emergency responders as part of an effective TIM program. Diversion plans are critical when there is a need to implement detours during long term closures due to a traffic crash, planned events, and non-recurring incidents.

Another important TIM program has been the operation of The CTDOT Safety Patrol. The Connecticut Department of Transportation (CTDOT) Safety Patrol, currently sponsored by GEICO, is an integral part of the state's incident management program. Each year, the Safety Patrol responds to upwards of 15,000 service calls in Connecticut. Drivers can perform minor mechanical repairs such as changing a flat tire, jump start vehicles, taping a leaking hose, or providing fluids such as fuel, water, and motor oil. The drivers are often the first responder to traffic crashes, and they help remove vehicles from the travel lanes when possible and provide temporary traffic control until additional emergency responders arrive. The Safety Patrol drivers will also help motorists with travel information or directions and even push stranded vehicles out of harm's way and to the safety of highway shoulder areas. The service patrol operates each weekday from 5:30 AM to 7:00 PM throughout the Greater Hartford area, including sections of I-91, I-84, I-291 and Route 2.

Ongoing Efforts

18. Support Traffic Incident Management

Activities Continue the planning, implementation, and coordination of activities such as the adoption of a Unified Response Manual, updating of diversion plans, TIM training, and participation in the FHWA annual TIM Self-Assessment. Also work on the development and implementation of a public awareness campaign for motor vehicle laws relating to highway incidents such as the “Move It” and the “Move Over.”

19. Support Traffic Incident Management

Partnerships Continue to support governmental, private, and public stakeholders in cultivating best practices, legislation and policy, training, and performance measures. Some groups include the Greater Hartford TIM Coalition, the Capitol Region Emergency Planning Council (CREPC), and Strategic Highway Safety Plan Steering Committee.

20. Support the State-operated State Farm Safety Patrol Program

Continue support for this Highway Motorist Assistance Program.

21. Support Performance Measures

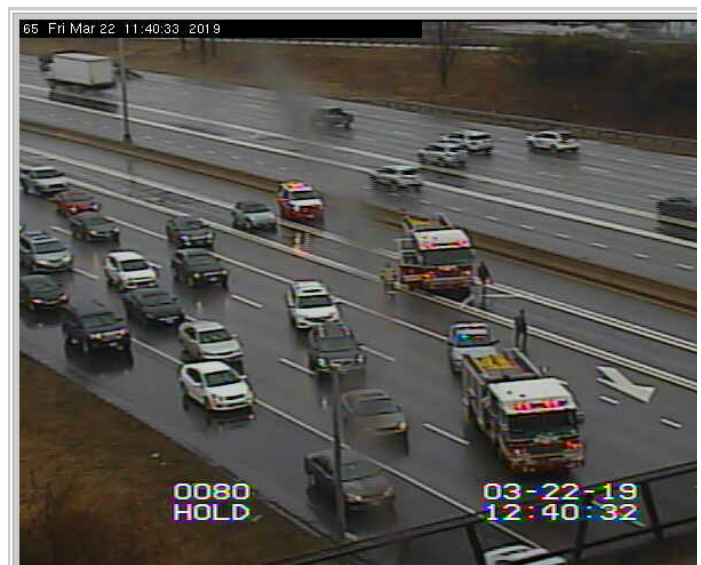
Continue working on data integration and collection as it relates to safety performance measures that focus on non-recurring delay/ congestion, reliability, quick clearance, and reduction in secondary crashes.

Intelligent Transportation Systems

CTDOT uses Intelligent Transportation System (ITS) technology to monitor traffic conditions on all major freeways with closed-circuit video cameras and special traffic flow monitors. Operators in CTDOT’s highway operations center check traffic flow and instantly report problems to the public, motorists, transit operators, emergency service agencies, and trucking businesses. Information is distributed via e-alerts, variable message signs, highway advisory radio transmitters, commercial radio and TV stations, and the Internet.

ITS / Operations In 1997, CROCOG adopted a strategic plan for the deployment of ITS systems in the Capitol Region. This Plan was updated in early 2015. Both ITS Plans identified applications for ITS that will benefit freeway operations, arterial road operations, and public transit operations.

Figure 03.6 — Highway Diversion Plan



ITS Architecture In 2017, with CROCOG's assistance, CTDOT updated the statewide ITS architecture. This architecture identified existing and planned ITS systems, and additional needed improvements; information interconnects between and among the existing, planned, and needed ITS systems; and any agreements or ITS-related standards required for ITS project interoperability. The ITS architecture meets the federal ITS architecture requirements for the region. CROCOG is currently involved in conversation with CTDOT on sunsetting the standalone Hartford area ITS architecture by incorporating it into the Statewide ITS architecture. In the future, any ITS initiatives in the greater Hartford area would be incorporated in the Statewide ITS architecture document.

The update of the ITS Strategic Plan for the Capitol Region harnessed the experience and energy of stakeholders from planning, design, and operational arenas. The result is a plan with the following five goals and action items:

Figure 03.7 – Variable Messaging Sign



Photo by Carl Talley

GOAL 1: Reduce Congestion and Stimulate Economic Growth by Moving Traffic More Safely and Efficiently

- Replace Aged ITS Investments
- Improve Incident Identification and Verification Capabilities
- Expand Traveler Information Accessibility
- Integrate Third Party Detection Data

GOAL 2: Stimulate Growth of Public Transportation Ridership by Enhancing the Users' Experience

- Build on the Success of CTfastrak
- Enhance the Seamlessness of the Public Transportation Network
- Increase User Friendliness of the Public Transportation System

GOAL 3: Improve Traffic Signal Management and Operations and Maintenance by Developing a Sustainable Computerized Traffic Signal System Program

- Strengthen Existing Practices (Stage 1)
- Create Collaborative Regional Group for Computerized Signal Systems (Stage 2)
- Leverage Advanced Signal Systems to Benefit the region (Stage 3)

GOAL 4: Achieve Sustainable Transportation Operations through the Use of Technology

- Implement Technology to Reduce Impacts of the Roadway Network on the Environment
- Enhance the Sustainability of ITS Deployments

GOAL 5: Enhance Roadway Safety through the Use of Technology

- Expand Roadway Weather Situational Awareness Capabilities
- Enhance Coordination of and Access to Roadway Incident, Emergency, and Weather Event Information Among First Response Stakeholders
- Reduce Secondary Incidents and Increase the Safety of First Responders in the Field

Ongoing Efforts

22. Update of Regional ITS Strategic Plan

Provide updates to the CROCOG regional ITS Strategic plan every 5 to 10 years.

23. Monitor Advancements in ITS Technology

Monitor advancements in ITS technologies and continue coordination and education efforts with CROCOG municipalities.

24. Ensure Modernization of the Regional ITS Architecture

Continue to coordinate with statewide ITS activities including participation in statewide ITS architecture updates.

25. ITS Implementation

Continue working with CTDOT to implement ITS, update the freeway traffic management system, and enhance incident management efforts.

26. Regional Traffic Signal Operations and Management

Continue to research the benefits and impacts of providing a regional approach to operating and maintaining local traffic signal systems.

Freeway Improvements

This plan highlights the major projects planned for the freeway system through 2050. The most significant freeway projects are being studied under the umbrella of the Greater Hartford Mobility Study (GHMS) launched in 2020 by CTDOT. The GHMS is holistically assessing long-term improvements for all transportation modes in the greater Hartford area, however its major freeway initiatives include:

- I-84 Hartford (Viaduct) Project
- I-84 / I-91 interchange improvements in Hartford
- I-84 / Route 2 / Route 5/15 interchange improvements in East Hartford

This study is being advanced adhering to the federal requirements of a Planning and Environment Linkages (PEL) study. A PEL represents a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process. Therefore, all of the freeway initiatives are being studied in concert with each other and with major bike, pedestrian and transit alternatives for the region. The study is in its second and final phase and is expected to be completed later in 2023. Following its completion, study results will be assessed and may alter the long-term CROCOG recommendation contained herein.

Outside the purview of the GHMS, other

notable freeway needs in the region involve the reconstruction of the interchange of I-84 with Routes 4, 6, and 9, and the replacement of the Putnam Bridge over the Connecticut River. Although recently rehabilitated, the Putnam Bridge is anticipated to need replacement by 2050. In addition, assorted studies have suggested the potential need for improvements in other areas including I-84 at the Buckland Development Area, I-84 in the Rentschler Development Area, and I-91 at the Day Hill Development Area.

It's important to note that these projects do not include construction of any new freeways. Nonetheless, alternatives for re-building interchanges in the Hartford area could lead to proposals for relocated portions of I-84 & I-91.

Interstate 84 Viaduct

Built in 1965, the I-84 Hartford Viaduct is a $\frac{3}{4}$ mile long section of elevated highway that extends from the Sisson Avenue interchange to the Asylum and Capitol Avenue interchanges. Serving as a major truck route, enduring harsh winters, and carrying up to 175,000 vehicles daily, the viaduct in Hartford is approaching the end of its useful life. Its age and condition have resulted in an unending string of maintenance and rehabilitation projects that aim to maintain minimum bridge conditions and carrying capacity. Recently

completed rehabilitation efforts have elevated many of its structures' rating from poor to fair condition, but these repairs are only anticipated to last approximately 20 years.

As challenging as the replacement of the viaduct is, it also presents a tremendous opportunity to mitigate or eliminate damage done to Hartford when the original viaduct was constructed. Built on an alignment directly through the heart of the city, the viaduct structure splits neighborhoods, disrupts the city street network, and dramatically alters the quality of life in residential and business districts alongside the highway. The need to rebuild or replace the viaduct offers the potential to re-knit the communities, open new parcels of land for development or an extension of Bushnell Park, bolster economic development, strengthen the transportation network, improve the adjacent Amtrak rail corridor, improve safety, congestion, and regional bridge conditions.

Community interest in how the viaduct structure gets rebuilt gave rise to the CROCOG I-84 Viaduct Study, completed in 2010. Led by the Hub of Hartford Committee, the planning study explored a broad range of project alternatives that would improve the I-84 infrastructure, while considering economic development opportunities, neighborhood connectivity, community cohesion, livability, and mobility. Study findings prompted CTDOT to kick-off the I-84 Hartford project in 2013 to create a

“ As challenging as the replacement of the viaduct is, it also presents a tremendous opportunity to mitigate or eliminate damage done to Hartford [...] ”

long-term solution. The project embarked on a significant environmental planning effort including a Needs and Deficiencies Phase, which culminated with the Analysis, Needs, and Deficiencies Report in July 2015. Those efforts were continued into the NEPA (National Environmental Policy Act) process, including working towards an anticipated release of a Draft Environmental Impact Statement anticipated in 2019. However, as that date approached it was determined that a more comprehensive analysis of the interactions between this and all other major projects in the Hartford area was merited.

In 2020 CTDOT launched the GHMS, a PEL Study that would holistically assess all major Hartford Area transportation initiatives in one overarching study. That study has not been completed, however similar to CROG's 2019 MTP, the project's previously estimated replacement costs of \$3.5 billion have been included in the fiscally constrained portion of this plan.

Short-Term Recommendations

- **I-84 Viaduct Reconfiguration Facilitation**
Continue aiding the GHMS study team by coordinating with and soliciting feedback from key affected municipalities and CROG's Transportation Committee on ongoing I-84 Viaduct Reconfiguration concepts.
- **I-84 Viaduct Implementation Planning and Funding Identification**
Following PEL completion, continue discussions with CTDOT, impacted municipalities, and CROG committees regarding developing an overall project implementation approach and associated timeline. Key near-term concerns will be the identification of funding for the next phases of project development.

Ongoing Efforts

- **Promote Economic Development Opportunities Associated with I-84 Viaduct Reconfiguration**
Advocate for appropriate planning and policies that will help encourage opportunities for development above the highway, including potential air-right value capture mechanisms.

Putnam Bridge Replacement

The Putnam Bridge carries Route 3 over the Connecticut River between Glastonbury and Wethersfield. It is one of eight crossings of the River in the Capitol Region. The current structure was built in 1959 and has been identified in many recent CROG Regional Transportation Plans as needing major repair.

In 2008, repairs were made to the bridge deck and the travel lanes were resurfaced. In 2015, a major rehabilitation project was completed consisting of structural steel repair, bearing replacement, and the addition of a sidewalk along the bridge's south side. This rehabilitation project is anticipated to serve the bridge's structural needs for 20-30 years, after which CTDOT staff has indicated that it will need replacement. Connections between the bridge's sidewalk and the multimodal networks in Glastonbury and Wethersfield are currently under construction.

Construction of a new bridge would take years of planning, design, and construction, with the current bridge needing to serve traffic until an adjacent new bridge is completed, and therefore its funding has been included in this plan.

Short-Term Recommendations

- **Monitor Completion of Multi-Modal Connections to Putnam Bridge Replacement** Multi-use trail connections in Glastonbury and Wethersfield to the bridge's sidewalk are under construction. Monitor their completion and their usage following completion.

Long-Term Recommendations

- **Replace Putnam Bridge**

Ongoing Efforts

- **Monitor Putnam Bridge Condition** Continue to monitor the condition of the current Putnam Bridge, including the likely timeline needed for its replacement.

I-91 at Charter Oak Bridge

The ramp from I-91 northbound to the Charter Oak Bridge and Route 15 eastbound previously experienced persistent congestion leading to numerous crashes. Recurring 1 ½ mile back-ups led to the location routinely being included in the American Transportation Research Institute's top 100 truck bottleneck routes in the country. To address these issues a major project involving the relocation of I-91 northbound at Interchange 29 in Hartford, and the widening of I-91 and Route 5/15 in both Hartford and East Hartford was undertaken. Construction began April 1, 2019, and was completed November 30, 2022.

Short-Term Recommendation

- **I-91 at Charter Oak Bridge.** Now that construction has recently been completed, monitor the project's success in addressing prior safety and congestion issues.

Figure 03.8 — Revised I-91 Northbound access to the Charter Oak Bridge



Source: Connecticut Department of Transportation

I-84 at Buckland Development Area

Access to and within the Buckland development area has gotten increasingly difficult with its continued growth as a retail destination. The problem was recognized in the 2004 Plan and a study was subsequently initiated by CTDOT at the request of CROG and the affected towns. The study evaluated operational improvements and demand management alternatives for this area that is considered one of six Economic Development Areas of Regional Significance in the Capitol Region. However, the 2020 COVID pandemic has impacted travel to many retail areas, and therefore further monitoring of the prior identified deficiencies and needs is warranted prior to implementation of the study's identified improvement strategies.

Short-Term Recommendation

- **I-84 at Buckland Development Area**

Work in partnership with CTDOT and municipal officials from Manchester and South Windsor to monitor the Buckland Development area and determine if the prior recommended freeway improvements continue to be warranted. Work to evaluate how an extension of CTfastrak to the east could assist in mitigating congestion.

I-84: Hartford to Farmington

More than half of the daily delay on freeways in the Capitol Region occurs in the I-84 corridor west of downtown Hartford. Major state transit initiatives and Transportation Demand Management (TDM) measures are being actively advanced to manage peak hour congestion and reduce vehicle miles traveled. However, even with full implementation of these initiatives, operational improvements will be necessary. Several studies have been completed to address the freeway's problems such as the Hartford West Major Investment Study, the West Side Access Study, and currently underway Greater Hartford Mobility Study. Key projects to study for further study and eventual advancement include:

- *I-84 at Routes 4, 6 and 9* – Reconstruct the interchanges of I-84 at Route 4, Route 6, and Route 9. Key elements include the elimination of the eastbound bottleneck near Route 9, elimination of left-hand ramps, better access to Route 6, and direct access from Route 4 to Route 9 southbound.
- *I-84 Viaduct* – Previously detailed

Long-Term Recommendation

- **I-84: Hartford to Farmington** Work in partnership with CTDOT and municipal officials to advance the above previously identified projects, along with any new projects that may be identified upon GHMS completion.

I-84 at Rentschler Development Area

Improve access to the Rentschler Field redevelopment area in East Hartford. An interchange improvement at I-84 & Silver Lane was recommended in the Rentschler Field Access Study. A modified version of the concept was evaluated and recommended as part of an environmental assessment of the Rentschler development plan.

Long-Term Recommendation

- **I-84 at Rentschler Development Area**

The proposed flyover connection should be assessed further as development occurs, to help facilitate redevelopment of this Economic Development Area of Regional Significance.

I-91 at Day Hill Development Area

Improve access to the Day Hill-Griffin Development Area in Windsor. Access problems to this area were identified in the Bradley Area Transportation Study and a technical study completed in 2005.

Ongoing Effort

- **I-91 at Day Hill Development Area** Work with CTDOT to provide a direct connection to northbound I-91 from Day Hill Road by the construction of spans over Route 75 and I-91; and by widening northbound Interstate 91 to provide an additional operational lane from the Route 75 interchange to the Kennedy Road interchange or to the Route 20 interchange. This additional northbound lane will require widening the existing bridge carrying Interstate 91 over the Farmington River.

Route 2 within the Region

The length of Route 2 within the region experiences safety and operational issues, particularly at its interchanges with I-84 and Route 3 and at multiple tightly spaced entrance and exit ramps with minimal acceleration/deceleration lane lengths.

Construction of a safety improvement project is ongoing and encompasses the entire length of Route 2 within East Hartford, similar to the recently completed similar project in Glastonbury. Improvements that address many of the above issues are being made, including:

- Widening of substandard shoulders
- Increasing ramp spacing and acceleration and deceleration lane lengths, including the elimination of interchange 5B
- Providing consistent roadside safety barriers
- Improving signage and pavement markings

Short-Term Recommendation

- **Route 2 within the Region** Work with CTDOT to provide safety improvements along Route 2 in East Hartford including ramp geometric improvements and roadside safety improvements.

Unfunded Need: I-84/I-91 and I-84/Route 2 Interchanges

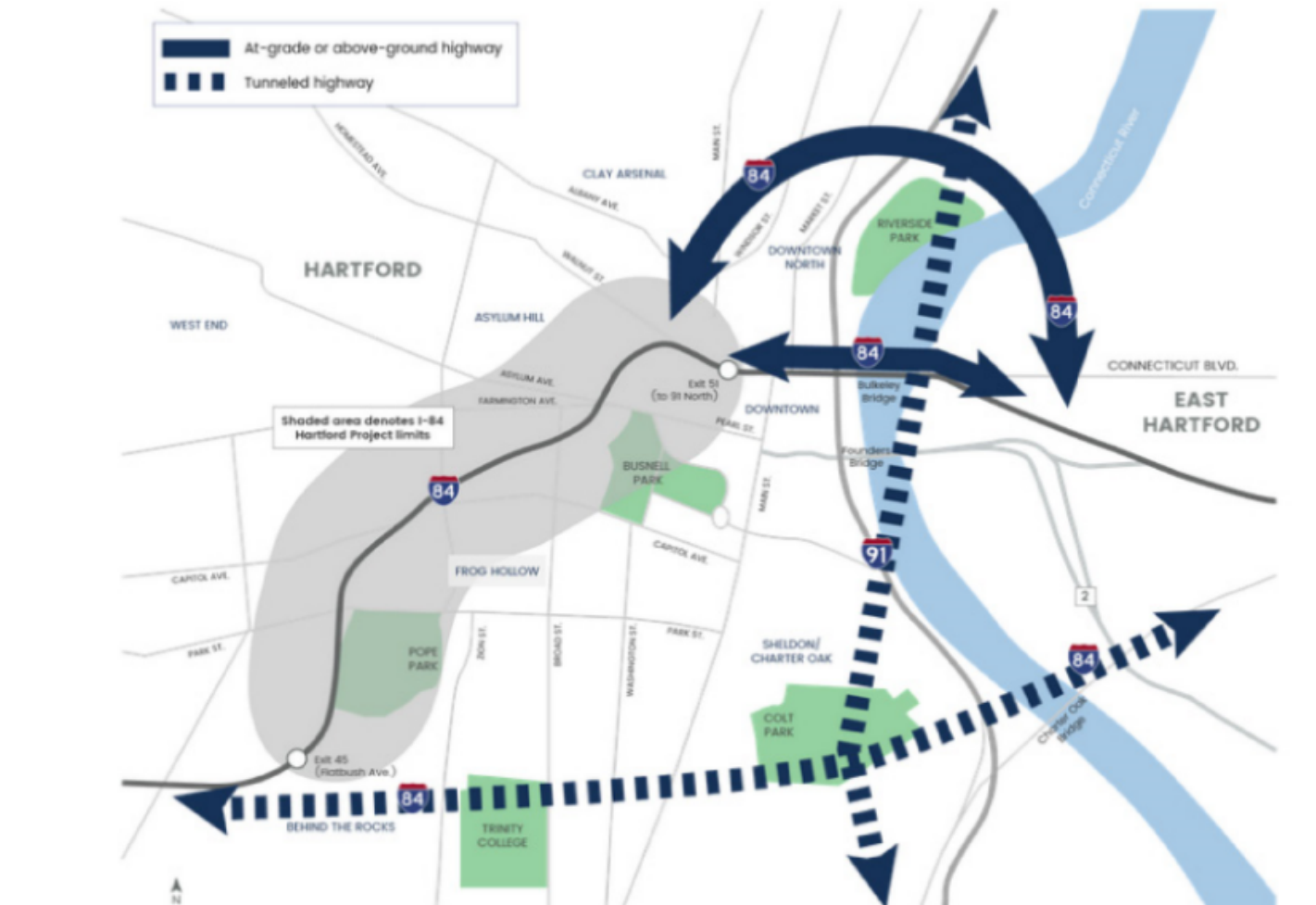
I-84 carries three lanes in each direction east and west of Hartford’s urban core. The highway, however, is limited to two lanes in each direction at the I-91 interchange and over the Bulkeley Bridge, causing

considerable congestion. Therefore, in 2016, CTDOT launched the I-84 / I-91 Interchange Study. The study's main objective was to seek out congestion relief improvements in this area. As shown in Figure 03.9, three general concepts are being studied:

- Modify the existing interchange
- Relocate the interchange to the north
- Relocate the interchange to the south

The concepts were studied at a broad level with the purpose of first determining if the concepts are feasible from an engineering perspective. Second, the study broadly assessed the benefits and impacts to

Figure 03.9 — CTDOT I-84/I-91 Study Interchange Concepts



residents, businesses, travelers, properties, neighborhoods, and the natural environment. CTDOT's analysis had shown that none of these three concepts they have studied would allow for the elimination of the need to complete the I-84 Viaduct project, as none of the concepts identified thus far would redirect enough traffic to allow for the elimination of a freeway in that area.

Various stakeholders had noted that, due to the costs associated with addressing both I-84/I-91 interchange congestion and the nearby I-84 Viaduct condition, studies related to these projects should continue to consider the following other issues associated with the current system:

- Reunite Hartford by removing much of the physical barrier currently created by I-84
- Open Hartford's riverfront by reducing the impediment of I-91 to the river
- Provide opportunities to reinforce the levee system, which in many areas supports I-91
- Reduce the footprint of the I-84/Route 2 Interchange in East Hartford
- Free up land for economic development and green space
- Relieve downtown congestion

In 2020 CTDOT launched the GHMS, a PEL Study that aims to holistically assess this and all other major Hartford Area transportation initiatives in one overarching study. The study is due to be complete later in 2023, and therefore has yet to publish costs associated with this (or other) initiatives. However, the cost of this item is anticipated to be significant

and possibly exceed \$10 billion. Therefore, a general placeholder for this and other GHMS identified projects (exclusive of the I-84 Viaduct which is included in the funded portion of this plan) has been included in this MTP as an order-of-magnitude unfunded need.

Short-Term Recommendations

- **I-84 Interchange Reconfigurations Facilitation** Continue aiding the GHMS study team by coordinating with, and soliciting feedback from, key affected municipalities and CROG's Transportation Committee on ongoing reconfiguration concepts for the I-84/I-91 and I-84/Route 2 interchanges.
- **I-84 Interchange Reconfigurations Implementation Planning and Funding Identification** Following PEL completion, continue discussions with CTDOT, impacted municipalities, and CROG committees regarding the development of an overall project implementation approach and associated timeline. Key near-term concerns will be the identification of funding for the next phases of project development.

Ongoing Efforts

- **Promote Economic Development Opportunities Associated with Interchange Reconfigurations** Advocate for appropriate planning and policies that will help encourage opportunities for development resulting from the relocation and minimization of interchange footprints.

Arterial Improvements

The arterial roadway improvement program is based primarily on recommendations developed through corridor planning studies completed by CROCOG. These studies involve detailed technical analysis and extensive community involvement to produce plans developed with an understanding of the context of the land use, cultural, historic, economic, and environmental context in which the roadway is located. The process includes the comprehensive study and evaluation of various alternate concepts, including no-build options and the application of other less disruptive improvements, such as access management and traffic signal optimization. The goal is to develop plans that both improve the traffic conditions and make the community a better place to live.

Below are brief summaries of major CROCOG corridor studies. These summaries illustrate the general nature of recommended improvements; however, each study contains a more comprehensive set of recommendations adopted by CROCOG's Policy Board.

Route 3: Rocky Hill

The Town of Rocky Hill is interested in addressing existing transportation safety, access, and operational issues within the Route 3 (Cromwell Avenue) / Route 411 (West Street) area, along with implementing transportation improvements to accommodate development at appropriately zoned locations. The "Route 3 Traffic and

Development Study" recommendations focus on accommodating transportation needs while maintaining and improving the character of nearby residential areas. Roadway-related recommendations are listed below.

Route 3 (Cromwell Avenue) Corridor

- Support construction of Elm Street to West Street Connector Roadway, parallel to Route 3, to help alleviate Route 3 traffic congestion.
- Improve operations and safety within the Route 3 corridor by implementing transportation recommendations, including traffic signal modifications and the addition of approach lanes at intersections with New Britain Avenue, Elm Street, West Street/France Street, Brook Street, and Inwood Road.
- Implement access management strategies and provide bicycle and pedestrian accommodations.

Route 411 (West Street) Corridor

- Improve operations and safety of intersections with I-91 Ramps, including the addition of intersection approach lanes and exclusive left turn phase.
- Improve signal operations at intersections with Main Street by realigning into a conventional 4-way intersection and providing turn lanes.

Route 6: Bolton, Andover, Coventry, and Columbia

Route 6 is an undivided arterial roadway serving a major travel corridor where local

access needs conflict with the needs of long-distance through traffic. Construction of a new freeway paralleling existing Route 6 and connecting I-384 in Bolton Notch to the Route 6 bypass around Willimantic has been a recommendation in CRCOG’s Regional Transportation Plan for many years. However, due primarily to unresolvable environmental issues the project reached an impasse in the mid-90’s, and shortly after the project was dropped from CTDOT’s Long Range Plans.

Even though multiple safety improvements have been completed along Route 6 over the past ten years, multiple safety issues remain along with the need to address connectivity, access management, and development potential. Therefore, in 2013 CRCOG completed a transportation study of the Route 6 Corridor that included the towns of Bolton, Andover, Coventry, and Columbia. This

“Route 6 Hop River Corridor Transportation Study” resulted in recommendations that complemented those made in a cooperative Economic Development Strategy and Master Plan Study, completed in October 2010 along the same corridor. Major roadway recommendations are listed to the right.

I-384 expressway/Route 6/

Route 44 interchange

- Improve connectivity and safety at the I-384 expressway/Route 6/Route 44 interchange, including addressing the safety concerns with and connectivity of Notch Road access.

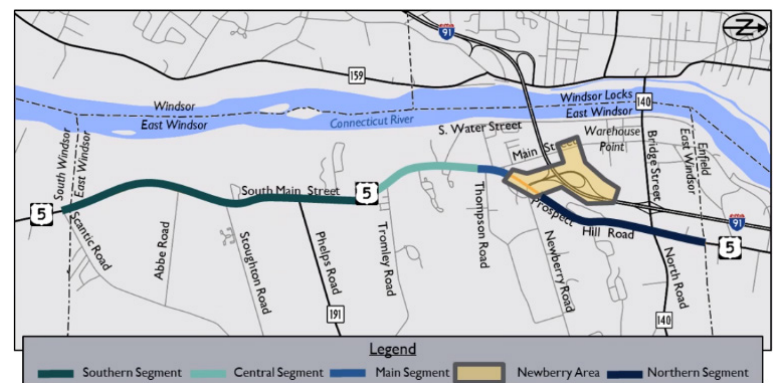
Route 6

- Support implementation of transportation improvements enabling the communities’ envisioned “village node” concepts along Route 6 at Bolton Crossroads (located near Bolton Ice Palace and Munson’s Chocolates), Coventry Ridge (west of South Street), Historic Andover Center (west of Long Hill Road), and Lighthouse Corners (at Route 66 in Columbia). Recommendations at each of these locations included measures to reduce Route 6 travel speeds, support bicycles and pedestrians, and improve access management.
- Implement access management, multimodal accommodations, traffic operations, and traffic safety improvements at critical locations throughout the corridor.

Route 5: East Windsor

In 2021, CRCOG completed a Corridor Study for Route 5 in the Town of East Windsor. The study recommended several roadways as well as transit and other multi-modal improvements recommendations that could be implemented in near-term, mid-term and long-term horizon, some of which are listed below.

Figure 03.10 – Route 5 Corridor Study Area



- Increase current express transit in the corridor and add bus stops with shelter. Additionally, explore a new local bus fixed-route service from Windsor Locks Station and establish a Town Demand-Response System to supplement other transit options.
- Implement access management, infrastructure improvements, multimodal accommodations, traffic operations, and traffic safety improvements.
- The study recommends improving traffic and safety at critical locations by upgrading traffic signals and coordinating the signal system, adding turn lanes as well as through lanes at some signalized intersections, reconfigure I-91 Exit 44 off-ramp to provide second right turn lane.
- To accommodate pedestrian and bicyclists, the study recommends adding concrete sidewalks and pedestrian crossing facilities at intersections, adding a 10-foot bituminous side path throughout the corridor, and exploring the potential expansion of the multiuse trail northerly to Enfield and southerly to South Windsor.

Route 10: Simsbury

In 2011, CROG completed a Route 10 Corridor Study for the portion of Route 10 in the Town of Simsbury. The study ran from Wolcott Road and Route 10 in the northern end of town to the southern municipal border of Avon and Simsbury on Route 10. The roadway recommendations are included in the improvements listed below.

Route 10

- Create an additional parallel roadway west of Route 10 south of the town's center to alleviate Route 10 congestion and provide opportunity in supporting potential future development.
- Implement access management strategies particularly in the North and South gateways to the Town of Simsbury where there is potential for major redevelopment. In the northern gateway, the recommendation is to seek access to new developments through existing driveways or create intersections opposite local streets where possible.
- Improve traffic and safety at critical locations by adding new traffic signals and coordinating the signal system; introduce new left turn lanes at all signalized intersections in the Town Center from Seminary Road to Wilcox Street; extend Wolcott Road from the intersection of Route 10 to Hoskins Road in

Figure 03.11 — The Bulkley Bridge between Hartford and East Hartford



the northern gateway; and, relocate Nod Road at the Route 185 intersection to create an opportunity for widening Route 185 from Route 10 to the two eastbound lanes ascending Simsbury mountain.

- Improve conditions for bicyclists and pedestrians by encouraging Complete Streets infrastructure throughout the corridor. Concepts include reducing pavement in key intersections; reducing speed limits; restriping travel lanes to 11' to help reduce travel speeds and increase the shoulder width to better accommodate

bicyclists; replacing pedestrian signals throughout the corridor; creating sidewalks and developing a sidewalk maintenance or enforcement program; and installing pedestrian scale lighting.

- Improving connectivity in Weatogue Village. Expand the commuter parking lot in Weatogue Village and redesign the Route 10 intersection at Stratton Brook Road. These improvements would also include the creation of a village green and multi-modal transit area where the Farmington Canal Heritage Trail and the commuter lot meet.

Figure 03.12 — Founders Bridge between Hartford and East Hartford



Photo by Carl Talley

Route 44: Hartford To Canton

Route 44 is the primary east-west route linking Farmington Valley with Hartford and West Hartford. In the commercial areas of Canton and Avon, safety problems related to left turns at driveways are the primary concern. Similar problems exist at Bishops Corner in West Hartford. Safety is a critical problem on Avon Mountain where steep grades, sharp curves, and high speeds result in frequent and severe crashes. In Hartford, problems include a high crash rate, speeding on residential side streets, insufficient parking, and inadequate drainage. The major roadway recommendations are listed below.

Route 44

- Avon Mountain: Continue to monitor the effectiveness of safety improvements completed in 2011.
- Avon-Canton Commercial Area: Relocate Dowd Avenue and correct left-turn crash problem by reconstructing Route 44 with a

median. A wide median will allow landscaping to create an attractive, “boulevard” type appearance.

- Bishops Corner, West Hartford: Correct safety problems by redesigning, relocating, or closing commercial driveways. Install a 4-foot-wide raised median to reduce left-turn related crashes.
- Hartford: Add streetscape, drainage, and signal timing improvements along Albany Avenue from Homestead Avenue to Main Street. Add traffic calming on nearby residential streets.

Route 175: Wethersfield & Newington

Congestion is the key problem in the west end of the corridor near Route 9. Speeding and safety are concerns on the remainder of the 4-lane section through Newington. There are major congestion and safety problems where Route 175 crosses under the Berlin Turnpike, at the Route 15 interchange, and at Fenn Road. In the residential sections through Wethersfield, there are some minor geometric and safety problems. Major roadway recommendations are shown below.

Newington

- Maintain current 4-lane cross section but provide improvements at key locations.
- Route 9 access: Realign Route 9 SB on-ramp.
- Access management & signal coordination.
- Newington Center: No improvements.
- Route 175/Route 15 Interchange: Reconstruct using an urban single-point design.

- Route 175 / Fenn Road and Fenn Road / Ella Grasso Turnpike intersection improvements.

Wethersfield

- Maintain as a 2-lane roadway but provide improvements at key intersections. Route 190: Enfield & Somers.

ROUTE 190: Enfield & Somers

Route 190 is the primary east-west roadway in Enfield and Somers. Although traffic is expected to increase in this corridor over the next twenty years, no major widening of the roadway will be required. Instead, improvements can be limited to intersections and short sections of road. The following projects will address safety and congestion problems, while preserving or enhancing the character of the four villages in the corridor. The major roadway recommendations are shown below.

Enfield

- Commercial area (I-91 to Palomba Dr.): Access management, minor improvements to Phoenix Avenue intersection, coordinate traffic signals, add or widen sidewalks, and construct multi-use trail.
- Transition area (Palomba to Hazardville): Access management, minor widening to allow a 3-lane cross section between Palomba Dr. & Enfield Professional Park, sidewalks, and 5-foot shoulders for bicycles.
- Hazardville: Streetscape improvements, and minor improvements to Maple Street intersection.

- Scitico: Streetscape improvements, operational improvements at Taylor Road and Broadbrook Road.

Somers

- Somersville: Operational improvements at Route 190/Shaker Road, traffic signal at Route 190/School Street, streetscape improvements, traffic calming on School Street, and other minor improvements
- Somers Center: Streetscape improvements, intersection realignment at Route 83, and sidewalks

Route 195: Tolland

The Tolland community has a strong interest in making transportation improvements to the area in and around the Historic Town Green. Recommendations focus on calming traffic and improving safety and operations within the Tolland Town Green area, including those shown below.

Route 195

- Create northern and southern gateways approaching the Green on Route 74 and Route 195, respectively. Gateway improvements include both textured and raised medians, and the introduction of a lateral shift to reduce speeds in the northern gateway.
- Reconfigure the Route 195/Route 74 intersection into two separated traditional intersections, reducing the amount of pavement utilized for the intersection and returning the balance to the Town Green.

- Intersection improvements at Route 195 and Old Post Road.
- Provide traffic calming visual cues on all roadways approaching and throughout the Town Green area including the use of period lighting, sidewalks, and special shoulder treatments.

With assistance from CROCOG, the town advocated for initiation of a project that would implement the improvements outlined above. Design has been underway and is nearing completion with the construction phase anticipated to be obligated 2020.

Route 305: Windsor And Bloomfield

The Route 305 corridor primarily serves east west mobility between Interstate 91, the center of Windsor to the east, and Blue Hills Avenue in Bloomfield to the west. The following projects address transportation issues along the 2.5mile segment of Route 305 from Route 187 to Interchange 37 with Interstate 91. Additionally, a Route 305 extension to Route 189 would provide additional economic development opportunities and an additional roadway link to the area network. Enhancements below consist of both localized improvements at individual intersections and longer-term regional capacity improvements.

Localized Improvements

- Reconstruct the following intersections to provide improvements including turn lanes on Route 305 and/or cross streets:
 - Route 305 from Interchange 37 to Brookview Road

- Route 305 at Sheffield Drive and Brewster Road
- Route 305 at Addison Road
- Route 305 at Marshall Phelps Road
- Route 305 at Mill Brook Crossing
- Realign the following intersections to provide for improvements including more standard geometrics:
 - Route 305 at East Newberry Road
 - Route 305 at Old Iron Ore Road
- Improve pedestrian accommodations throughout the corridor and specifically at the Route 305 intersection with Route 187 (Blue Hills Avenue).

Regional Capacity Improvements

- Monitor traffic growth and assess the need to reconstruct Route 305 to provide for two (2) eastbound and two (2) westbound travel lanes between Interchange 37 and Marshall Phelps Road.
- Work with the Town of Bloomfield and CTDOT to explore progressing an envisioned extension of Route 305 to Route 189 Bloomfield

Berlin Turnpike: Wethersfield & Newington

The Berlin Turnpike serves a long-established, but still growing commercial area. There are major safety and congestion problems at both the Route 175 interchange and the Prospect Street intersection. It is important to address these major problems as well as some minor problems related

to commercial driveways, while still maintaining good access to businesses.

Wethersfield

- Access management & minor traffic operational improvements
- Landscaped median

Route 175/Route 15 Interchange

- Reconstruct using an urban single-point design to improve traffic flow and safety

Newington

- Close or realign selected median breaks
- Improve landscaping in the corridor, particularly within the median
- Promote better access management

Unfunded Arterial Needs

The region's roadway needs are continuously evolving. Many associated projects have not been funded within this document, as the appropriate improvements have yet to be either fully identified, vetted, cost estimated, and/or endorsed by CROCOG committees. Consequently, the state, region, and municipalities routinely fund transportation studies to fully identify and vet new projects. CROCOG typically holds an annual solicitation for these studies, which vary in focus from corridor-specific to regionwide. Arterial projects that have demonstrated significant benefits, but are not yet fully vetted include:

Monteith Drive Extension, Farmington

The Town of Farmington has indicated its desire to prioritize a new arterial network connection by extending Monteith Drive from Route 4, with a new proposed bridge over the Farmington River, to New Britain Avenue. The new bridge would provide a more direct connection between the Town Hall, Town Library, and High School on the north side of the river to the Police Station, Community Center, Senior Citizen Center and Public Works Facility on the south side. Motor vehicles, buses, pedestrians, and bicycles would all be accommodated on the new bridge and roadway. CROG began the Farmington Area Connectivity Study in 2021 with tasks including traffic analysis, public outreach and stakeholder engagement, and development of a project purpose and need statement. Support for the project and potential funding opportunities have been discussed with CTDOT. In addition to normal requirements to comply with the National Environmental Policy Act if federal funds are used; a proposed new bridge would also need to comply with a Section 7 review of the Wild and Scenic Rivers Act.

Intersection Conversions to Roundabouts

CROG began the Capitol Region Roundabout Screening Study in 2021. The screening efforts will identify intersection locations where conversion of existing intersection configurations to a single lane modern roundabout will result in significant improvements to traffic safety and traffic operations. Intersections with a

Figure 03.13 – Glastonbury Roundabouts



Source: Google Maps

functional classification of minor roadway collector or higher on at least one leg of the intersection will be reviewed. The screening methodology will include the following criteria: number and severity of crashes, traffic volumes and right of way impact.

Silas Deane Highway, Wethersfield

The Silas Deane Highway (Route 99) in the towns of Wethersfield and Rocky Hill is a four-lane roadway, classified by the Connecticut Department of Transportation (CTDOT) as an urban minor arterial. This section of Route 99 runs approximately 5 miles from the intersection at Route 160 (Elm Street) in Rocky Hill at the south and continues north through Wethersfield to the City of Hartford line. The heavily developed land along the corridor features a mix of retail, office, and residential development. The four-lane configuration typically provides excess capacity for existing traffic volumes, and encourages excessively high travel speeds, often 10-15 mph more than posted limits.

While the Silas Deane moves traffic well (though at excessive speeds), it functions as an imposing barrier for many who live and work in the communities, especially pedestrians and bicyclists. The pavement width separates both

communities and makes it nearly impossible to achieve a pedestrian scale and sense of place. Both Wethersfield and Rocky Hill have long recognized the challenges presented to their communities by the presence and current design of the Silas Deane Highway. Enhancing the appeal of the Silas Deane Highway is a critical concern for both the Towns of Wethersfield and Rocky Hill. As a State-owned roadway, it is critical to include CTDOT as a partner in such efforts. CROG supports a collaborative, multi-jurisdictional effort to improve this important regional corridor.

Bradley Area Transportation Study

The Bradley Area Transportation Study evaluated current and future traffic conditions near Bradley International Airport. Recommendations focused on: (1) improving ground access to the Airport, and (2) correcting other traffic problems in the four towns adjacent to the Airport.

Airport Access (see Chapter 5 for details)

- Northside Access Improvements (Route 190 connector)
- Westside Access Improvements (Bradley Park Road extension)
- Route 75 Improvements

Improvements within Each Town

The study recommended numerous other improvements in the four towns such as traffic and streetscape improvements in Suffield center, similar improvements in East Granby's town center, and traffic

Figure 03.14 — National Development at Rentschler Field



improvements in the Day Hill area of Windsor. See the corridor study for details. Additionally, long-term improvements were identified for I-91 at Day Hill Road (see Freeway Operational improvements above).

Rentschler Field Access Study: East Hartford

The former Rentschler Airport is a 650-acre, prime development site located within two miles of downtown Hartford. It offers an excellent opportunity for in-fill development that supports regional 'smart growth' goals. Although development such as the UConn football stadium has opened on the site, plans call for most of the rest of the site to be developed to stimulate additional growth in the high-tech sector of the region's economy. To fully realize the economic benefits of the potential development, access to the site needs to be improved from I-84 and from Route 2.

Access from I-84

- Improve access to Rentschler site from I-84 by grade separating Silver Lane/Roberts Street intersection

Access from Route 2

- Improve access from Route 2 by reconstructing the Route 2/Main Street interchange to allow direct access from their trip.

Roadway through the Site

- Construct a new town-owned roadway through the site.

Eastern Gateways Study: Bolton, Coventry, Mansfield, Tolland

The purpose of this study was to develop an implementation and strategy plan to address current and long-range intermodal travel and community quality of life issues along the sections of the Route 195 and Route 44 corridors that lead to and from the UConn Storrs campus. This study presented an opportunity to build on the existing assets along the corridor while enhancing opportunities for economic vitality.

Intersection Improvements along Route 195 and Route 44

- Improve various intersections to benefit traffic operations, access management, and/or pedestrian safety
- Improvements vary by intersection and include roadway realignments, additional turn lanes, sidewalks, crosswalks, curb extensions, driveway relocations, and/or pavement markings

Signal Optimization

- Optimize signal timings at all signalized intersections
- Upgrade signal operations to include traffic signal preemption

Route 4 Transportation Safety and Improvements Study: Farmington

The purpose of this study was to develop a comprehensive transportation safety and improvement plan for Route 4 and the roadways surrounding the UConn Health Farmington campus. The recommendations included transportation system improvements to meet expected future development, address existing and future local and regional transportation needs, and support economic development goals.

Route 4 at Talcott Notch Road and Old Mountain Road

- Option 1: Replace existing five-leg signalized intersection with a multi-lane modern roundabout
- Option 2: Create two separate signalized intersections by realigning Talcott Notch Road and Old Mountain Road and widening Talcott Notch Road and Route 4

Additional Intersection Improvements

- Improve various intersections to benefit traffic operations and safety
- Improvements vary by intersection and include additional merge lanes, sidewalks, crosswalks, roadway realignments, additional turn lanes, and/or signal installation

Special Concern: Rocky Hill - Glastonbury Ferry

The Rocky Hill - Glastonbury Ferry is a unique element in the region's transportation system. It is the oldest continuously operating ferry in the United States, and the only ferry service within the region. As part of State Route 160, the ferry serves cars, motorcycles, cyclists, and pedestrians who want to cross the Connecticut River, the region's most prominent natural feature forming a 28-mile long north-south divide through its center.

Within the region, there are only eight highway bridges that cross the river. Due to the difficulty and cost of providing additional bridges, the ferry's importance as a ninth crossing opportunity cannot be understated. By using the ferry, motorists traveling between parts of southern Glastonbury and Rocky Hill can cut eight miles (one-way) off. More importantly, because bicycle access on the Putnam Bridge is not allowed, the ferry is the only crossing for cyclists in the 13 miles between Hartford and Middletown. But the ferry is not only a transportation asset. As one of the first river crossings in the region, the ferry reminds residents and tourists of its regional history and strong ties to the Connecticut River.

Ongoing Efforts

27. Continue Operation of Historic Ferry

The Capitol Region Council of Governments supports the continued operation of the historic ferry with adequate hours of operation and a reasonable fare structure.

Bridge Infrastructure Improvements

The Bridge Safety and Evaluation Section of CTDOT inspects all state bridges and all municipally owned bridges with spans greater than 20 feet on a regular basis (typically every 2 years). During the inspections, structural components, such as decks, superstructures, and substructures, are evaluated and assigned a numerical rating ranging from 0 to 9, with "9" being the best, and "0" being the worst. Based on these ratings a bridge is categorized as being in "good," "fair," or "poor" condition. If the rating of any major structural component receives a "poor" rating (a rating of 4 or less), the bridge is in poor condition. Bridges in poor condition may not be able to carry full legal loads and should be programmed for repair or replacement.

In addition, CTDOT applies a sufficiency rating to each bridge by evaluating its integrity based on its structural adequacy, safety, serviceability, and essentiality of public use. The result is a percentage with 100% representing an entirely sufficient bridge and 0% an entirely deficient bridge. The priority rating is based on the sufficiency rating as well as ratings of the main structural components

Figure 03.15 — Glastonbury & Rocky Hill Ferry



Photo by Chester Gehman

and the structure's load carrying capacity. The priority rating is used to prioritize bridge projects for funding purposes, with the lowest rating being the highest priority for funding. The prioritization, construction, and maintenance of the region's bridges along state roadways is primarily CTDOT's responsibility, with input from CROG.

CTDOT employs a sophisticated bridge management system that links investments to outcomes and prioritizes projects that maximize bridge conditions given assumed funding levels. This is valuable in setting, programming for, and achieving performance measure targets. Within the region, the most significant bridges affecting federal targets are those associated with the aging I-84 Viaduct in Hartford and 8 bridges over the Connecticut River. Of those bridges, the two in most need of improvement by 2020 include the I-84 Viaduct in Hartford and the Putnam Bridge carrying Route 3 over the Connecticut River. The GHMS is assessing long-term solutions to address the I-84 Viaduct and the Putnam Bridge's replacement is within the funded portion of this plan.

For bridges along town or city roadways, the governing municipality bears the prioritization, construction, and maintenance responsibilities. Recognizing the difficulty that municipalities have in meeting this responsibility, in 1984, Connecticut's General Assembly enacted a program that provides for state financial assistance to municipalities for the removal, replacement, reconstruction or rehabilitation of local bridges. Currently under this program, a municipality may qualify for a grant ranging from 15% to 50% to cover

eligible project costs. Additionally, federal funding (up to 100%) is currently available through CTDOT's Local Bridge Program for qualifying municipal bridge projects. Federal funding is limited to municipal bridges with spans greater than 20 feet. Typically these bridges need CTDOT sufficiency ratings less than 80% for rehabilitation, and less than 60% for replacement. To assist towns with the prioritizing and funding of the region's bridges, CROG regularly informs municipalities of both federal and state bridge program solicitations opportunities. Additionally, the region has dedicated portions of state funded program solicitations for bridges, with selection criteria aligned with sufficiency ratings.

Ongoing Efforts

28. Funding for Municipal Bridges Support funding initiatives that assist Municipalities in securing monies to address bridge repair, replacement, or removal on town roadways, while placing priority on bridges that most improve regional performance measures. Continue to keep municipalities apprised of bridge conditions and solicitation opportunities.

29. Funding for State Bridges Support funding for regional Bridges that assist in meeting Bridge Condition performance targets. This MTP identifies funding for replacement of two of the most significant highway bridges in the region by 2050: The I-84 Viaduct and the Putnam Bridge. The viaduct's size and poor condition make it the region's largest contributor to its number of bridges (by deck area) in poor condition.

Municipal Road Management

The Metropolitan Transportation Plan is a systems level plan that addresses problems on the major transportation systems: the regional transit system, the freeway system, and the arterial system. The focus on the higher-level systems is necessary, but problems on lower-level systems, such as collector roads, have not been identified as part of this plan. While the region has not identified specific problems on collector roads, they recognize that problems do exist and that municipalities sometimes need financial assistance to correct the more serious problems.

Most of the roads in the collector system are the responsibility of municipalities. They are maintained and improved through local operating budgets and capital improvement budgets. In some cases, the cost of major reconstruction or of correcting serious geometric and safety problems can exceed a town's capacity to finance the improvement. In the past, the region has recognized these problems and allowed towns to use federal funds to correct serious problems on town-owned collector roads. This policy of allotting lesser amounts of federal funds to solve selected problems on town-owned collector (or arterial) roads will continue within the limits of available funding and the competing need to address problems on higher level systems.

In 2012, FHWA issued a Local Agency Traffic Signal Operations and Maintenance Report aimed at enhancing traffic control systems and refining municipal

operations and maintenance plans. Since its publication CROCOG has worked with CTDOT and regional municipalities to foster awareness and training on traffic signals, incorporate traffic signals into ITS Strategic Planning and support a Traffic Signal Circuit Rider program throughout Connecticut.

Ongoing Efforts

- 30. Funding for Town Roads** Continue a policy of allowing federal funds to address serious problems on town-owned roads classified as collector or higher. Funding decisions will consider the limits of available federal funds and the competing need to address problems on higher level systems.
- 31. Traffic Signals** Support on-going efforts to work with municipalities on traffic signal operations and maintenance plans, including working with the Connecticut Traffic Signal Circuit Rider program.
- 32. Explore Regional Approach to Traffic Signal Management** Begin exploring the opportunities in establishing a regional traffic signal program.

Chapter 04

Complete Streets

More than anything, a street should be a safe space for all. The Capitol Region's streets are public space, and they should be more than just where we travel - they should be where we gather, play, socialize, celebrate, and trade. For most of history, streets had these multiple purposes. It wasn't until about one hundred years ago, we stopped prioritizing this variety of purposes, with people at the center, in favor of something more singular: the fast and uninterrupted movement of automobiles. This chapter discusses opportunities to rebalance the use of our streets for all users.



Volunteers painting the "bump out" on Main Street and Charter Oak Avenue in Hartford, CT as part of the State's Physical Activity and Nutrition (SPAN) program, the physical activity component is managed by CROG. (Image courtesy of Joseph Gaylor Photography)

While the private automobile continues to be the primary way of travel within the Capitol Region, alternative transportation modes continue to be emphasized in an effort to rebalance the use of our streets for all users. These alternative modes include public transportation options such as local and express bus services, bus rapid transit (BRT) provided by CT**fastrak** on a dedicated busway, commuter rail, paratransit services provided for the elderly and persons with disabilities, ride sharing services such as Lyft and Uber, and multiple active transportation options. As every individual traveling in the region is at some point a pedestrian, the role of active transportation and complete streets has been increasingly prioritized as, more than ever, it is critical to provide a safe means of travel for vulnerable users – our pedestrians, bicyclists, elderly, children, and persons with disabilities. This chapter focuses on the bicycle and pedestrian aspects of complete streets. Transit conditions and recommendations are discussed in Chapter 2.

CROCG continues to recognize the value of active transportation and is working to take steps towards improving pedestrian and bicycle access, and safety.

Active transportation is any self-propelled, human-powered mode of transportation, most commonly thought of as walking or bicycling but also includes in-line skating, skateboarding, and other similar modes.

Our region has made much progress over the last several years. At least 15 communities in the

CROCG region have developed committees to examine bike and/or pedestrian issues or have an advocacy or volunteer group committed to the same; at least 10 of our communities have adopted a complete streets plan, policy, or both; and of the 10 communities in Connecticut that have been designated a Bike Friendly Community by the League of American Bicyclists, nine are within the CROCG region.



CROCG's bicycle and pedestrian plan underwent a significant update in recent years, becoming the Capitol Region Complete Streets Plan in 2021. The plan includes three key components:

- Regional Complete Streets Network Map
- Regional Complete Streets Policy
- Action Plan

The vision from the Complete Streets Plan provides the underpinnings of the bicycle and pedestrian recommendations in this Metropolitan Transportation Plan and dovetails with the vision of CROCG's regional Plan of Conservation and Development. The

Complete Streets Plan describes this vision as one where:

*CRCOG will help the economy thrive by funding projects that make streets safer, more convenient, and well-**connected** for people accessing economic opportunity, whether by foot, wheelchair, bike, train, bus, car, or truck. CRCOG will also facilitate multi-jurisdictional coordination, recognizing that a region of complete streets can only happen through cooperation between member cities and towns, as well as the State of Connecticut.*

*Complete streets will provide the bones of a **competitive** region, one that connects residents to educational opportunities, attracts anchor institutions and employers, encourages smart and sustainable development patterns, and leads to the creation of strong, resilient, and diverse neighborhoods.*

*Through a transportation network that equitably accommodates all modes, our region will reap the benefits of livability, public health, safety, affordability, and overall **vibrancy**.*

*Complete streets will allow the region to maximize **sustainability** of both the built and natural areas by encouraging smart, compact development and shifting away from automobile dependence.*

The Complete Streets Plan broadened CRCOG's focus from the prior bicycle and pedestrian plan emphasis on trails to a greater inclusion of complete streets. The Complete Streets Plan sees non-motorized transportation as an integrated part of the region's transportation system. Instead of focusing on dedicated facilities, it promotes the integration of all modes into every transportation project. Also developed in concert with the Complete Streets Plan was the creation and adoption of a regional Complete Streets Policy, which requires that all projects receiving transportation funding through CRCOG include accommodations for all users. Exceptions are permitted, which align with best practices.

State of Connecticut

At the state level, there have been several statewide efforts to improve walking and biking. The latest effort, the Connecticut Active Transportation Plan, was adopted in 2019. This plan identified 12 locations statewide that were most unsafe for pedestrians and bicyclists, and five are now under further study or in design.



The Connecticut Department of Transportation's (CTDOT) vision for active transportation in Connecticut is:

The Connecticut Department of Transportation will encourage, promote, and improve walking, bicycling, and other forms of active transportation, so that any person, regardless of age, ability, or income will be able to walk, bicycle, or use other types of active transportation modes safely and conveniently throughout Connecticut. An integrated network of on-road facilities and multi-use trails will connect key destinations, municipalities, and regions, while strengthening Connecticut's links to neighboring states.

The three goals to support the vision include:

Goal #1 – Improve Pedestrian and Bicyclist Safety

Goal #2 – Enhance Mobility for Pedestrians and Bicyclists

Goal #3 – Utilize Resources to Achieve Meaningful Improvements

CTDOT has also completed the following plans, studies, and design guidance with sections relevant to improving walking and biking:

- **Community Connectivity Program.** Since 2018, the Community Connectivity Grant Program has awarded 104 grants, 34 of those to CROG towns. These grants total nearly \$12 million in commitments, of which over



Complete Streets as seen in Downtown New Britain.
Photo by Carl Talley.

\$5 million has been obligated for completed projects and those in construction. Over \$4.8 million was awarded to 10 communities in 2021 alone, and to date, 19 projects have been completed with 23 more under construction. This program also includes funding for Roadway Safety Audits (RSAs). Since 2016, RSAs have been completed in most CROG communities, including :

Avon, Berlin, Bloomfield, Bolton, Canton, Columbia, Coventry, East Hartford, Ellington, Enfield, Glastonbury, Manchester, Mansfield, New Britain, Newington, Plainville, Simsbury, South Windsor, Southington, Tolland, Vernon, West Hartford, and Windsor.

- **Connecticut's Strategic Long-Range Transportation Plan 2018-2050** (2018)
- **CTDOT Highway Design Manual, 2003** (revised June 2020)
- **CTDOT Strategic Highway Safety Plan 2017-2021** (2017)
- **CTDOT ADA (Americans with Disabilities Act) Transition Plan** (2019) – all curb ramps will be compliant by 2035
- **CTDOT 2021-2024 Statewide Transportation Improvement Program – STIP** (2021)
- **CT Trail Finder.** CTDOT worked jointly with the Connecticut Department of Energy and Environmental Protection (CTDEEP) to contract with UConn Extension to publish an online guide and collective database of all trails in the state, which is now live at www.cttrailfinder.com.

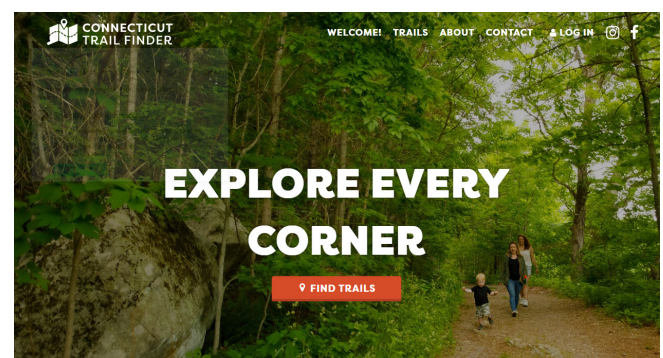
CT Trail Finder is a free, interactive mapping site designed to help Connecticut residents and visitors find hiking, walking, snowshoeing, mountain biking, cross-country skiing, and paddling trails across the state (right).

Continuing to build on previous successes, the following statewide legislation has been passed:

Public Act 21-28 addressing a variety of traffic safety issues was enacted. Amongst its provisions, this statute:

- clarifies when a motorist is to yield to pedestrians crossing a roadway;
- establishes a Vision Zero Council with a goal of reducing traffic fatalities to zero;
- requires that the Office of State Traffic Administration (OSTA) consider bicycle and pedestrian safety when reviewing major traffic generators;
- requires that motor vehicle operators exercise a degree of care when opening doors into traffic;
- increases from \$20 to \$25 the amount of moving violation fines that are returned by the state to municipalities;
- allows municipalities, rather than OSTA, to set speeds upon local roadways; and
- allows municipalities to establish pedestrian safety zones, where speeds may be set as low as 20 mph.

Budget Implementer Bill includes a pilot for the use of cameras to enforce speeding in work



zones. Enforcement of speeds using cameras has been shown to have a very positive effect upon speeds in other states, particularly in school zones. This first pilot may pave the way for broader implementation in the future.

Public Act 21-29 addresses land use. This statute establishes a Commission on Connecticut's Development and Future, which, among other things, is charged with the development of a design manual for context-appropriate streets and procedures to expedite the approval of such streets. This manual must be completed by 2023. Contingent on the outcome, such a manual may address the longtime need for engineering guidance appropriate for neighborhood streets beyond that contained in the state's current Highway Design Manual.

The Vision Zero Council, as previously mentioned, was established through Public Act 21-28 in 2021. The Council is an interagency work group tasked with developing statewide policy to eliminate transportation-related fatalities and severe injuries involving pedestrians, bicyclists, transit users, motorists, and passengers. In December of 2022, the four subcommittees of Education, Enforcement, Engineering, and Equity presented their final policy proposals to the Vision Zero Council with the goal of moving those policies through the 2023 legislative session. A *non-exhaustive* list of some of the policies being proposed related to complete streets included:

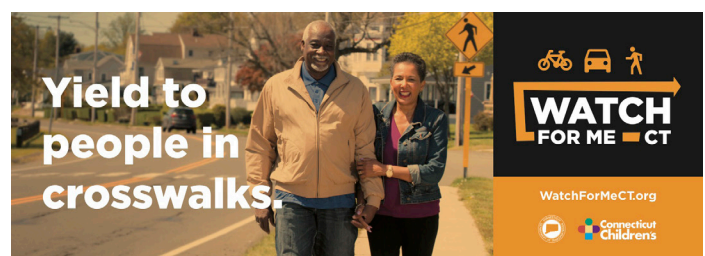
- Create a Vision Zero Schools program (Education)
- Implement automated speed enforcement

cameras (Enforcement)

- Require each municipality to have a Complete Streets Plan (Engineering)
- Clarify CTDOT's authority to acquire land for trails (Engineering)
- Establish a Fatal Crash Team (Equity)
- Annual report by the Department of Public Health to assess crash-related injuries by race, age, and gender to explore trends and disparities (Equity)
- Develop targeted safety campaigns for populations most impacted by fatalities (Equity)
- Increase funding for Community Connectivity Program (Equity)

Executive Order 21-3, issued by Governor Ned Lamont in December 2021, requires the CTDOT to set goals for vehicle miles of travel (VMT) reductions by 2030 and to develop a plan of investments to contribute to and encourage the achievement of such targeted reductions.

Watch for Me CT is a comprehensive program that began in 2018 and is run by CTDOT in partnership with Connecticut Children's Injury Prevention Center. Its purpose is to reduce the number of pedestrians and bicyclists struck and injured in crashes with vehicles.



Existing Conditions

Over the last decade, the region and the state have made significant progress in implementing bike and pedestrian projects. However, the horrific trend of rising fatalities on our roadways, across all modes, reminds us how much more needs to be done. This is a trend that we are seeing nationally, and the State of Connecticut and the CRCOG region are no exception. It would be remiss to discuss our accomplishments without first discussing the issues we are facing.

Safety

Fatalities in the United States have been increasing since 2014 after a downward trend since the 1970s. Nearly 43,000 people died on US roadways in 2021. In Connecticut, in just the last three years, fatalities have increased every year – from 222 fatalities in 2019 up to an estimated 387 in 2022, a 77% increase. It is also worth noting that though vehicle miles traveled decreased by 11% in the United States in 2020, traffic fatalities rose 6.8%, according to the National Highway Traffic Safety Administration (NHTSA).

Driving went down in 2020, but deaths of people walking increased 4.7%
2021 deaths will likely represent a historic one-year increase

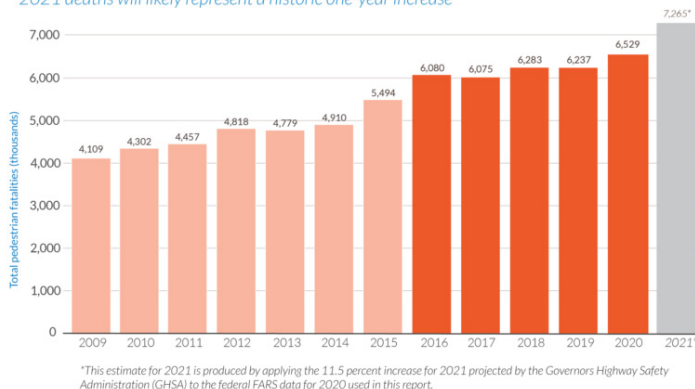


Figure 04.1 — Walking on our nations roadways has become increasingly unsafe. Image source: Smart Growth America, "Dangerous by Design."

For bicyclist and pedestrians in Connecticut, there were 55 fatalities in 2021, and in 2022 that number increased by 42% to 79 according to official counts from the UConn Transportation Safety Research Center. Within the CRCOG region in 2022, there were 23 pedestrian deaths and two bicyclist deaths. The City of Hartford had the most pedestrian fatalities with six deaths. Additionally, three fatalities were the result of crashes that occurred in New Britain and in West Hartford, two fatalities in Wethersfield, and at least seven other CRCOG communities had pedestrian fatalities as well. Two other CRCOG communities each had a bicyclist fatality.

There are a number of contributing factors related to the rise in fatalities. What follows is a brief overview of some of those issues. CRCOG will be using federal Safe Streets and Roads for All (SS4A) funding to update our Regional Transportation Safety Plan and will include a more thorough discussion on these contributing factors.

A lack of infrastructure for all modes. National data from 2020 shows that three out of five people killed by cars die on multi-lane, higher speed arterials. So much of our roadway infrastructure for so many years has been built to prioritize the vehicle – moving them as efficiently as possible and even focusing on keeping the driver of vehicles comfortable with wide, straight lanes and vast space beside the roadway to accommodate mistakes. It is ingrained into nearly every aspect of roadway design and decision making, resulting in roadways that do not equally focus on moving or protecting other modes.

Impairment. Connecticut trends notably higher than the national average for fatalities that involve Driving Under the Influence (DUI). In 2019, 38% of fatalities involved DUI in Connecticut, compared to 28% nationally.

Technological distractions. Whether in our vehicles or in our hands, technology is readily available to all roadway users. Distracted driving and walking can both have devastating impacts.

Vehicle factors. Notably in the US, vehicle sales for trucks and SUVs increasingly dominate the market; eight of the top ten selling vehicles in 2022 were either large trucks or SUVs. The trend towards larger, heavier vehicles with limited sightlines as well as the growth in electric vehicles, while incredibly beneficial overall, pose several safety concerns worth monitoring.

Driver behavior. Recent research suggests that risk-taking behaviors (speeding, irresponsible lane changing, “beating” the light, etc.) increased during the COVID-19 pandemic. “Road rage,” or aggressive driving, would also be included in this category.

Speed. Notable increases in vehicles speeds have been observed, particularly during the pandemic. Over the last three years, the percentage of Connecticut drivers traveling in excess of 85 mph has approximately doubled. This increased speed is typically tied to decreased levels of enforcement and fewer vehicles on the road. Enforcement by state troopers in Connecticut decreased from a peak of 235,000 stops in 2014 to 75,988 in 2020.

A multitude of issues are creating deadly roadways for all users. Addressing this reality



The hood heights of modern trucks can often obscure children and shorter adult pedestrians from the view of the driver. (Image: Consumer Reports, The Hidden Dangers of Big Trucks)

will require a coordinated, multi-disciplined approach in the areas of education, enforcement, encouragement, and evaluation. A **focus on equity** will need to guide these interventions to ensure that disadvantaged populations that have historically been disproportionately

impacted by transportation decisions do not bear the negative impacts of new capital

“ A multitude of issues are creating deadly roadways for all users. Addressing this reality will require a coordinated, multi-disciplined approach... ”

improvements. Targeted, sensitive investment in complete streets is also needed for these same communities as pedestrian fatalities disproportionately impact low-income and BIPOC (Black, Indigenous and people of color) communities, see Figures 04.2 and 04.3.

Despite the sobering reality of how much more work needs to be done to expand safe transportation network options for all users, the situation is not all bleak. CRCOG and its communities have made much progress over the last few years. The following is a summary of major accomplishments some key areas:

Trails

The focus of CRCOG’s prior regional bike/ped plan was on trails and specifically, completion of the East Coast Greenway (ECG). Our MTP continues to identify full completion of the ECG as a regional priority. CRCOG initiated the Capitol Region East Coast Greenway Study in 2022. This study is going to examine and identify the preferred ECG route for the remaining gaps in the communities of East Hartford, Bloomfield, Hartford, and Simsbury. This effort is anticipated to be completed by Summer 2024.

With the ECG route nearing finalization with construction to follow, CRCOG is now working with its municipalities to identify the next priority focus area for multi-use trails.

Funding

Up until recently, funding for complete streets and trail projects was limited to a few key sources. For the most part, funding came from the Recreational Trails Program, Transportation

People of color, particularly Native and Black Americans, are more likely to die while walking than any other race or ethnic group
 Pedestrian deaths per 100,000 by race & ethnicity (2016-2020)

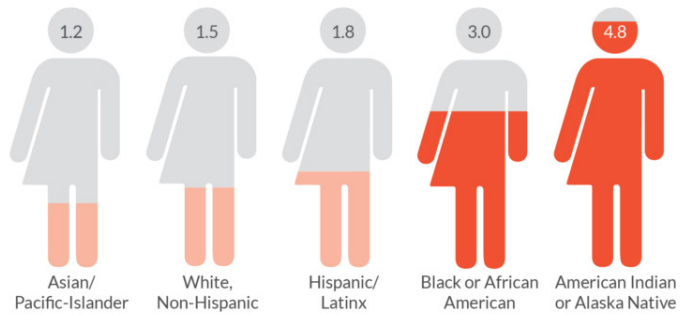


Figure 04.2 — People of color are disproportionately killed while walking. Image source: Smart Growth America, "Dangerous by Design."

People walking in lower-income areas are killed at far higher rates
 Pedestrian fatalities per 100k people by census tract income

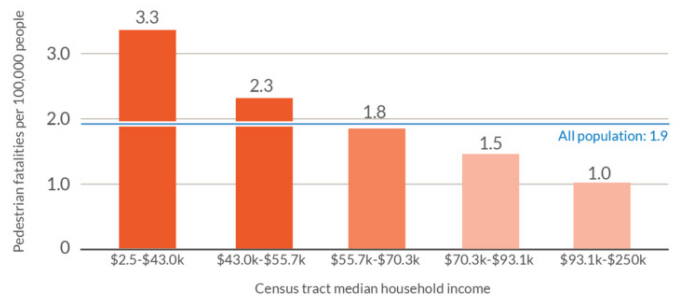


Figure 04.3 — Walking in low-income areas is more dangerous. Image source: Smart Growth America, "Dangerous by Design."

“ With the ECG route nearing finalization with construction to follow, CRCOG is now working with its municipalities to identify the next priority [...] for multi-use trails. ”

Alternatives (or Enhancements in previous years), and municipal funds. In recent years, the State of Connecticut has dedicated significant state resources to closing gaps in trails and building more complete streets. The infusion of resources has led to completion of the Farmington section of the ECG which included a bicycle and pedestrian bridge over Route 6; extension of the ECG to Bolton along Interstate 384; and implementation of complete streets projects throughout the region.

In 2021, Congress passed the Investment in Infrastructure and Jobs Act (IIJA). A more comprehensive discussion of this funding source is provided in Chapter 10, but in summary IIJA allocated \$6 billion of formula funding to Connecticut for investing in transportation over a period of five years (FY 2022-2026). This includes funding for bridges, public transportation, expanding the electric vehicle (EV) charging network, providing broadband coverage, drinking water, resiliency and cyberattack efforts, and airports. Complete Streets and trail-related funding is not included in the formula funds; rather these types of projects could receive funding through IIJA grant programs. In 2022 and 2023, approximately \$1.5 billion in grants have been or will be awarded, some of which can be used for complete streets and trail-related work, i.e. Rebuilding American Infrastructure with Sustainability and Equity (RAISE), Reconnecting Communities, and Safe Streets and Roads for All (SS4A).

Of note, CROG successfully applied for and received over \$16 million of funding through RAISE for the Plainville – New Britain multi-use trail connection as well as \$958,000 of SS4A

funding to update its Regional Transportation Safety Plan.

Complete Streets Work in Municipalities

As pedestrian fatalities continue to increase in the region, state, and nationally, municipal efforts to improve streets for all modes and for users of all abilities become even more important. Many of the region's municipalities have begun implementing complete streets in earnest, although only a handful have created an official complete street or bike/ped plan. Some examples of municipal complete streets efforts include:

Bloomfield completed a complete streets master plan in 2019. The plan includes a complete streets policy and a prioritization plan.

Hartford completed their complete streets plan in 2022, their Bicycle Master Plan in 2019, and integrates bike/ped accommodations in many of their planning efforts. The city has included a Street Types chapter in their zoning



Rendering from the City of Hartford Reimagining Main Street: A Complete Streets Plan.

regulations with the intention of creating “complete streets that address all modes of travel,” eliminated parking minimums for cars, and added requirements for bike parking. Additionally, Hartford has increasingly been utilizing lower cost quick-build projects to test complete streets and traffic calming interventions.

Manchester has prepared the Downtown Manchester Improvements Project, a complete streets comprehensive design for Main Street between Charter Oak and Center Streets. The design includes traffic and bike/ped safety improvements such as roundabouts and a cycle track, additional public gathering spaces, and enhanced streetscape. The project is not currently funded, but the town prepared the concept plan in anticipation of potential state and/or federal grant funding opportunities.



Rendering from the Downtown Manchester Improvements Project idea gallery on the town's story map website.

New Britain previously completed a downtown complete streets plan (2013) that identified \$26.8 million in complete streets projects and improvements in the downtown area. More recently in May 2022, New Britain finished their Complete Streets Roadmap, which lays out a

plan to implement complete streets city-wide. In less than a decade, the city’s commitment to complete Streets has resulted in more than \$30 million in competitive grant awards that have transformed the city.

Simsbury completed their Pedestrian and Bicycle Master Plan in December 2018 and their Sidewalk and Curb Ramp Assessment Plan in 2019 with a goal of 100% ADA ramp compliance in 15 years. Simsbury also began exploring the use of quick-build demonstration projects.

West Hartford adopted a complete streets policy and implemented a road diet on North Main Street in 2021. The road diet anecdotally appears to have reduced the number and severity of crashes and has received community support. Additionally, earlier this year (2023), West Hartford’s Town Council unanimously adopted a Vision Zero Initiative in Support of Safe, Health and Equitable Mobility with the goal of eliminating fatalities and severe injuries on West Hartford streets by 2033.

The Complete Streets Network Map

Much of the backbone of the region’s trail system has been completed, and remaining gaps are designed, in construction or being studied. As previously mentioned, the focus of CROG’s Complete Streets Plan has shifted to include not just trails but complete streets as well; connecting trails to the local network and connecting regional centers to each other.

The regional Complete Streets Plan defines a network of regional complete streets corridors. This network was developed using

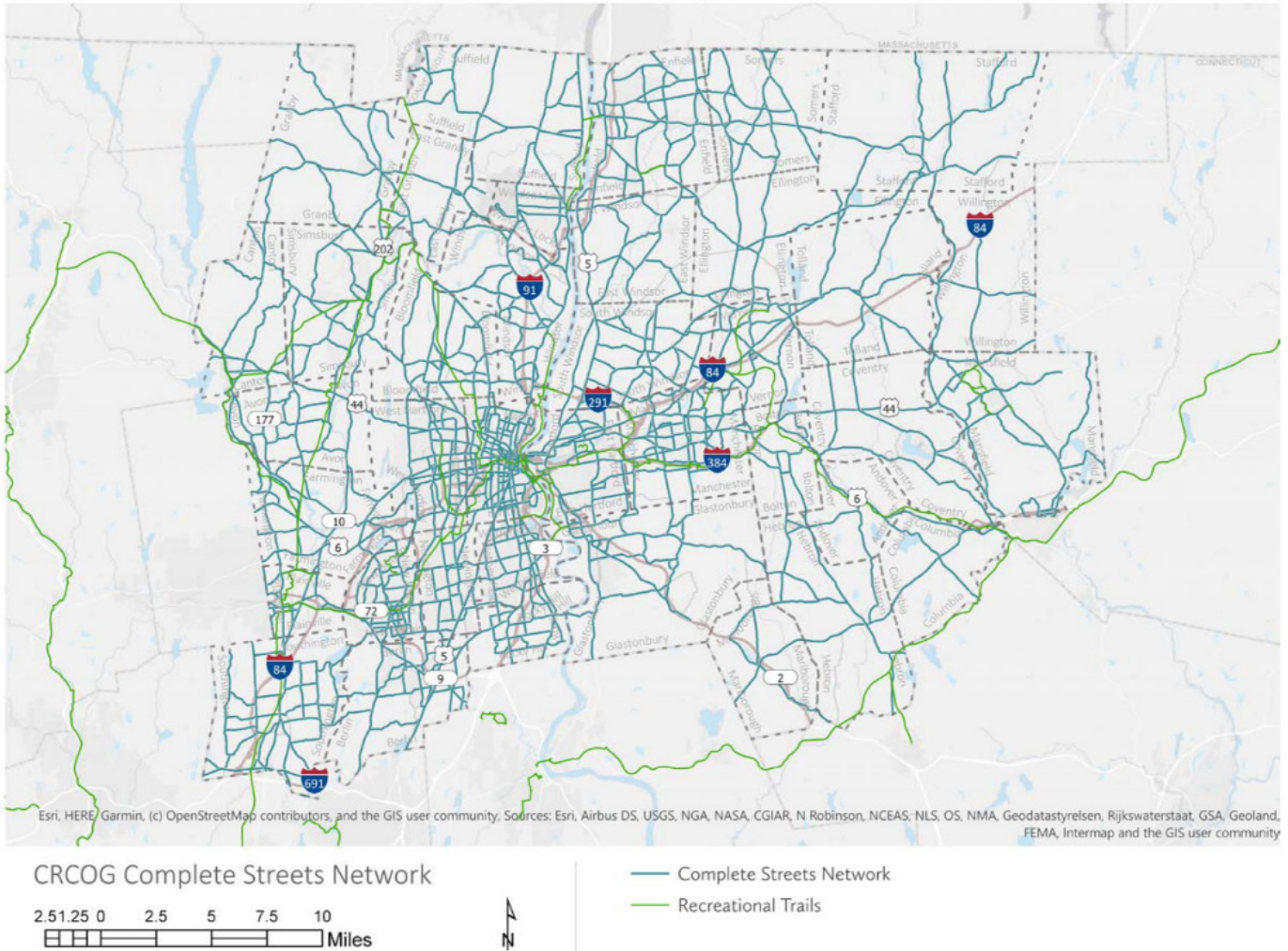
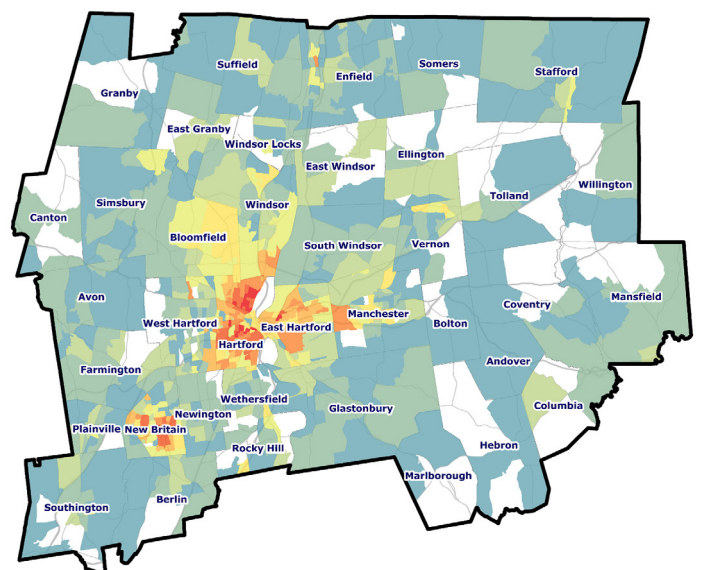


Figure 04.4 – The CRCOG Complete Streets Network map for the region.

a combination of data, municipal plans, and public input (See Figure 04.2). The process of defining the network started with a prioritization exercise that asked people which elements of a complete streets network were most important. The top elements were **equity** (that the network serve those most in need), **safety** (that it provide safe travel for vulnerable users), and **connectivity** (that it increase mobility and access).

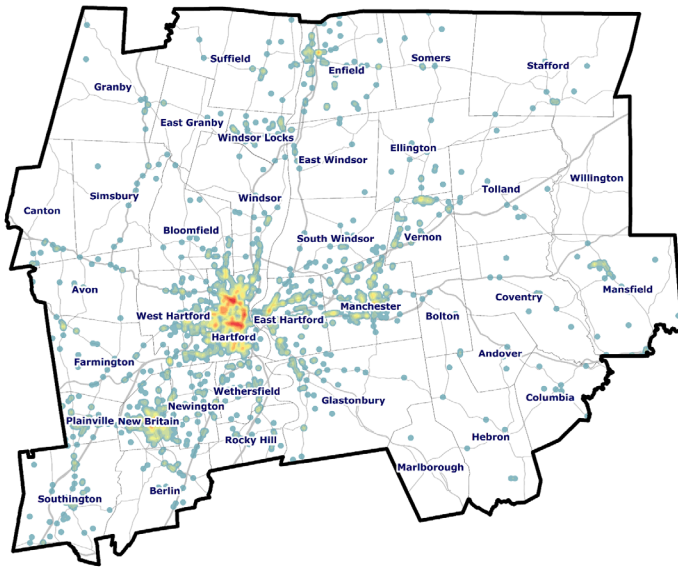
A series of maps with key indicators for these elements was created to define the nodes that needed to be connected (see Figures 04.5, 04.6, 04.7). CRCOG also used an interactive web

Figure 04.5 – Equity Map



Source: CRCOG—data includes % people with disabilities, % over age 64, % children, % zero-car households, % in poverty, % minority.

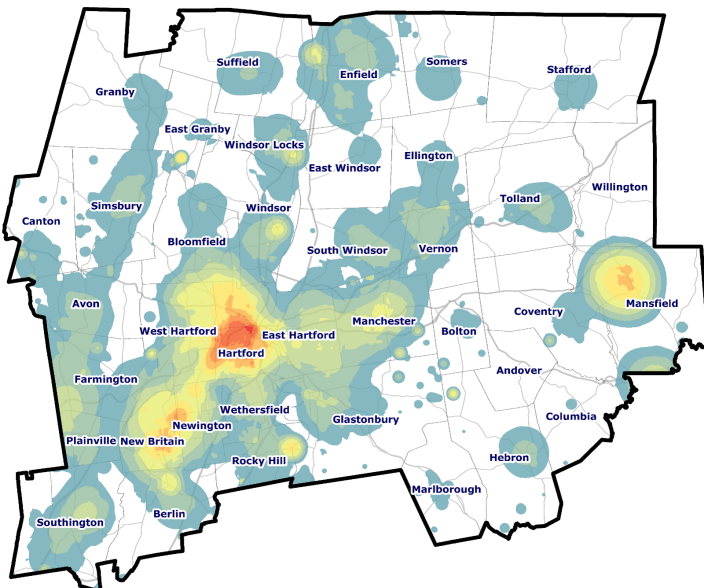
Figure 04.6 — Safety Map



Source: CRCOG

In conjunction with the plan, a regional complete streets policy was adopted by the CRCOG Policy Board in 2020. The policy establishes a modal hierarchy for roadway users (see Figure 04.8) and requires that all projects receiving funding through CRCOG, or submitted as candidates for State funding, must adhere to the policy. Exceptions to the policy are permitted on a case-by-case basis for projects that meet the established criteria. This flexibility allows the policy to apply fairly to all 38 municipalities in the region. The policy also offers guidance on design standards that are applicable to complete streets infrastructure.

Figure 04.7 — Demand Map



Source: CRCOG—data includes population density, employment, bus stop ridership, proximity to amenities.

map to get input from the public as well as municipal officials. That process led to a first draft of the network map. The map was then refined through additional municipal input to adjust routes based on local knowledge and priorities.

Figure 04.8 — Modal Hierarchy

CRCOG Complete Streets Modal Hierarchy

1. People walking, in wheelchairs, or using other assistive devices
2. People taking transit
3. People biking
4. People moving goods for local delivery
5. People in personal automobiles accessing local destinations

Issues and Deficiencies

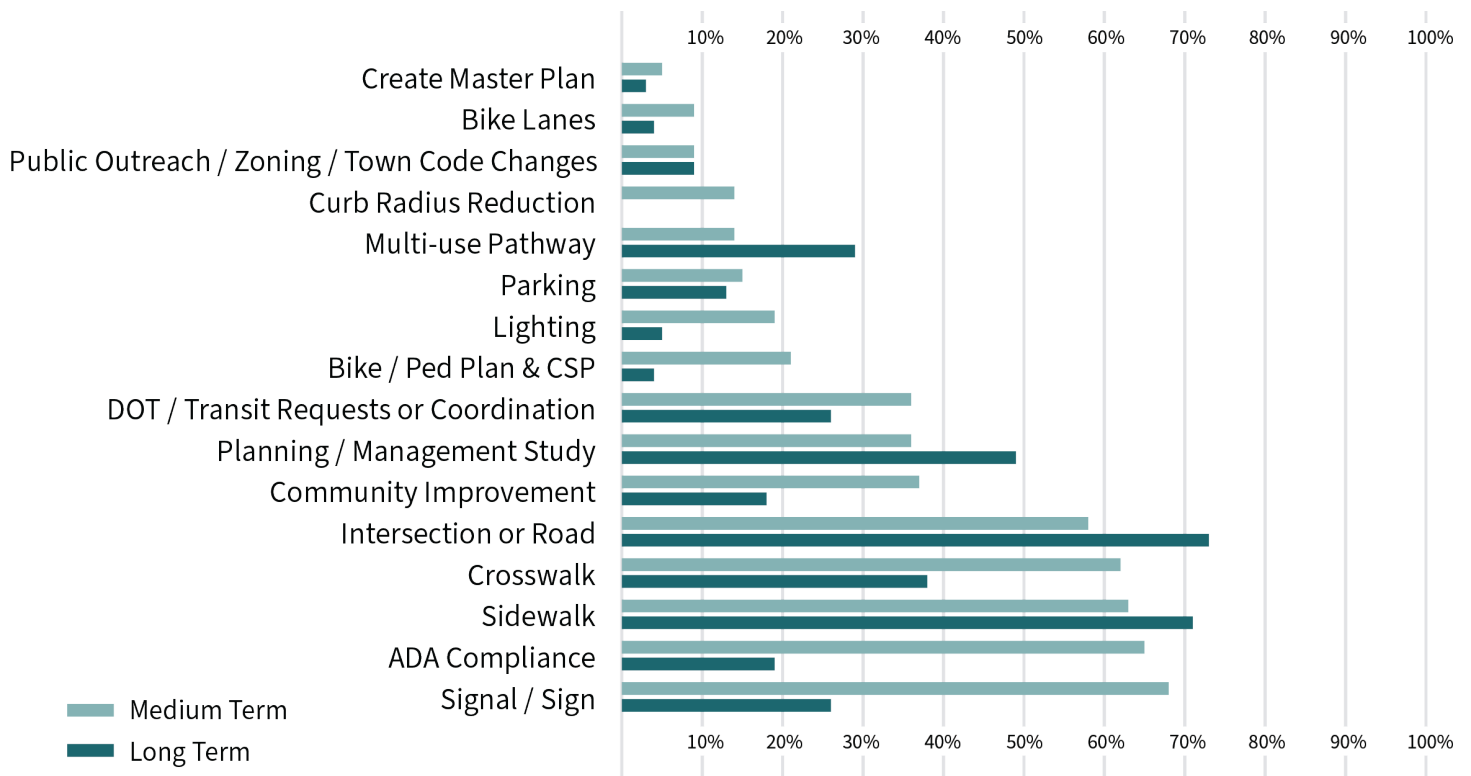
Input from stakeholders and cyclists and pedestrians in the region was collected as part of the CRCOG Complete Streets plan to identify a desired network that outlines key areas of concern and need. Additionally, the technical analysis conducted for CRCOG

communities that participated in Road Safety Audits (RSA) from the CTDOT Community Connectivity Grant Program (which focused on non-motorized user safety and connectivity) identified the following issues and deficiencies in the regional network:

Signal and sign improvements and ADA compliance were recommended most frequently within the CRCOG region; however, communities could benefit from incorporating these facets into broader improvements. There were also recommendations for sidewalk repair, expansion, or improvements along 63% of corridors, and crosswalk realignment, expansion, or removal was recommended along 62% of corridors.

Alterations to intersections or road designs were recommended along 73% of RSA corridors within the CRCOG region, and sidewalk expansion/ improvements were recommended in 71% of RSA audits. Poor pedestrian connectivity was identified regardless of density, and this can result in pedestrian behaviors that are unsafe. The RSAs identified that State, regional and local coordination efforts are needed to plan, design, and implement pedestrian gaps with particular emphasis at intersections as well as mid-block crossings.

Figure 04.9 – Recommendation Frequency from RSAs



Source: CRCOG

Recommended Complete Streets Improvements

Continue To Develop Complete Streets Policies

A strong complete streets policy is necessary to ensure that infrastructure projects consistently include accommodations for all users. As previously mentioned, CROCOG adopted its own regional complete streets policy that applies to its own funding decisions.

While CROCOG can adopt policies related to its funding programs, the region's roads are owned and maintained by either CTDOT or municipalities.

CTDOT adopted a Complete Streets Policy (No. Ex.O.-31) in 2014. The policy was developed in accordance with Connecticut General Statutes, particularly the Accommodations and Provision of Facilities for All Users, which requires that Complete Streets must be considered as a condition of funding in adherence with Public Act 09-154. This policy further lays out how CTDOT will integrate complete streets into its work and implement complete streets solutions in Connecticut communities. Key points of the policy include:

- Adherence to the Complete Streets Law throughout the Department
- Establishment of a Department-wide Complete Streets Standing Committee
- Ongoing training on complete streets for CTDOT staff and partners
- Revisions to eligibility criteria to make

complete streets easier to fund

- Improved design, construction and maintenance guidelines that are supportive of pedestrians and cyclists
- Measurement of pedestrian and cyclist use and needs

At this time, however, only a handful of municipalities in the region have formal complete streets policies. Many other municipalities have not yet started to develop a policy. Ultimately, CROCOG would like to see every municipality adopt a complete streets policy that fits with its local context.

Expand Complete Streets Efforts

In 2019, CROCOG was subcontracted by the CT Department of Public Health (DPH) to implement "Active CT," the physical activity portion of the State's Physical Activity and Nutrition (SPAN) grant program. Since then, CROCOG has contracted with complete streets experts, consultants, speakers, advocacy organizations, all eight other Connecticut COGs, and various communities across the state to complete streets-related projects.

CROCOG and its consultants have completed 42 projects in 25 different communities across the state (see Figure 04.10), including nine quick-build projects, installation of 63 bike racks across nine communities, six small area plans, two design/implementation guides, two web/digital tools, and 13 workshops and trainings. Several of these workshops feature CROCOG's partnership with Bike Walk CT to offer "train-the-trainer" opportunities for schools that have teachers and administration interested

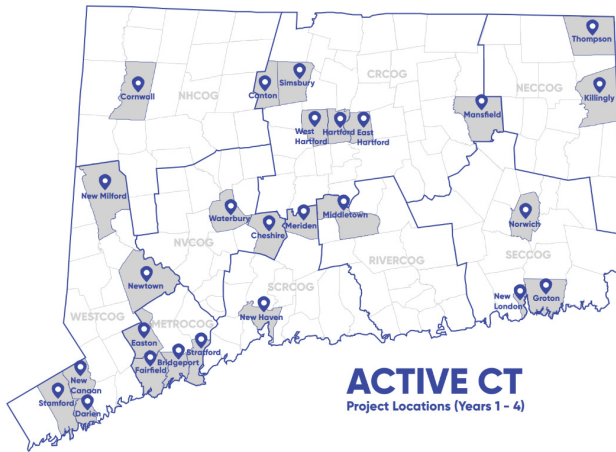


Figure 04.10 — ActiveCT project location map

Middletown schools bike program teaching kids fundamentals from young age

Adam Hushin
Updated: Jan. 20, 2022 4:41 p.m.



Successful "train-the-trainer" opportunity led by Bike/Walk CT as part of the "ActiveCT" project, leads to implementation of bike ed curriculum in Middletown elementary school. (Image credit: Hearst Connecticut Media)



Volunteers painting the "bump out" on Main Street and Charter Oak Avenue in Hartford, CT, an "ActiveCT" project.. (Image credit: Joseph Gaylor Photography)

in learning how to teach and implement bike education curriculum in their elementary schools.

CRCOG intends to partner again with DPH for another five years of funding in order to continue doing this work across the state.

Continue to Promote and Expand Regional Micromobility

Previously, CRCOG committed to developing a regional request for proposals (RFP) for bikeshare services. An RFP was issued in 2019 and resulted in the 2021 award of a contract to Superpedestrian to operate Link scooters in the City of Hartford. The program has been incredibly successful and has seen over 337,000 rides and more than 700,000 total miles traveled in its first 20 months of service. Additionally, more than 600 individuals have signed up for the LinkUp discount fee program. These riders qualify for a 70% discount if they receive any State or Federal assistance, and program data has demonstrated that these riders are avid users of the scooters. LinkUp users account for an even larger share of riders during the winter months, making the case for micromobility not simply as an amenity but a viable, equitable, and needed form of transportation.

In 2022, CRCOG completed a Regional Micromobility Feasibility Study. Building off the results of that study, CRCOG is currently working to expand shared scooters and/or bikes to other interested communities in the region. In addition to exploring the potential for a new governance structure for a regional

micromobility system – a Mobility Collective – CROCG is looking to offer existing Hartford program users the ability to cross the city borders to reach destinations in adjacent communities, offer pilot program options for interested communities, and explore the potential to add bikes, most likely e-bikes, to the system with the current or other vendor.



CTDOT, CROCG, and municipal representatives riding Link scooters in Hartford.

Support Education Programs

Building bike lanes, trails, sidewalks, and other facilities is important, but providing facilities alone will not cause people to change their travel mode. A challenge in encouraging individuals to try bicycling and walking for regular transportation is that they feel very vulnerable to motor vehicle traffic, even with facilities provided. Furthermore, many pedestrians, bicyclists, and motorists do not have a clear understanding of their respective rights and responsibilities on the streets and highways. Therefore, educational programs

targeting all three user groups are needed.

Efforts designed to educate system users about basic traffic laws need to be offered regularly and would require ongoing collaboration between citizens, interest groups, and government agencies. Getting the public to safely use the facilities by teaching safe user skills and demonstrating that walking and biking provides real benefits are equally important and could support behavior change.

CROCG is supportive of an education strategy that builds upon existing programs and develops coalitions where possible. CROCG hopes to continue its partnership with Bike Walk CT to fund “train-the-trainer” opportunities and bike fleet rental for implementation of bike education curriculum through our CDC/DPH “Active CT” work. CROCG also will continue to encourage the incorporation of bike/ped education into school curriculum.

Mode Shift

One of the desired outcomes of greater availability of bicycle, pedestrian, and transit infrastructure is that travelers will have less reliance on personal automobiles. While infrastructure is necessary to support mode shifts, driving has been culturally ingrained.

Programs designed to encourage people to try other modes of transportation can be effective methods of shifting people’s preferences. Examples of this include transportation demand management (TDM) programs that provide travelers with travel choices, such as work location, route, time of travel, and

mode. In Connecticut, CTrides is a CTDOT-funded program that offers a number of free TDM resources to travelers and employers. The implementation and expansion of the Link scooters program in Hartford also has the potential to shift mode share.

Identify and Prioritize Safe Bicycle Infrastructure

To encourage mode shift, infrastructure is needed to allow more individuals to feel comfortable walking or biking. Sharrows or widening shoulders can be an improvement where appropriate, but in many locations they are not adequate or safe enough. Traffic and vehicle speeds on many roadways are increasingly necessitating the identification of appropriate routes for and prioritization of physically separated bicycle infrastructure. Complete streets need to consider not just all modes but all users of all abilities – build a place that is great for an 8-year-old and an 80-year-old, and you’ll build a place that is great for all.

While CROCOG’s Complete Streets Plan includes identification and prioritization metrics, more prioritization is needed.



Identifying critical regional routes, key routes that serve underserved populations, and routes that are critical but are complicated and may require additional regional assistance to complete are ways in which CROCOG can continue to prioritize complete streets in the region.

Continue to Collect and Evaluate Data

The ongoing collection and analysis of bicycle and pedestrian data is critical for benchmarking continuing efforts to improve facilities and encourage use of active transportation modes. That said, the current program does not provide the level of consistency that CROCOG believes will be most beneficial to its communities. CROCOG will continue to explore ways to improve

the existing Bike/Ped Count program as well as explore other methods and partnerships.

Additionally, origin/destination and routing data from Superpedestrian’s Link scooter program can be used to identify and prioritize routes for added infrastructure, as bike lanes benefit both bicyclists and scooter users.

Ongoing Efforts

1. Evaluate the Regional Complete Streets Policy

Continue working with the Transportation Committee to ensure that CROCOG's complete streets policy is flexible enough to work for all 38 municipalities and is having the desired results. Continue to assess opportunities where the policy can be improved and respond to new best practices. Revisit selection criteria during new solicitations for relevant funding programs to ensure the goals of the policy are being met.

2. Implement the Regional Complete Streets Network

The regional complete streets network represents the key linkages between regional centers of activity. CROCOG will continue working towards prioritization of complete streets improvements on roadways within this network.

3. Complete Multi-Use Path System

Conduct Capitol Region East Coast Greenway Study to identify the preferred route for the remaining ECG gaps in the Capitol Region. Work with municipalities to identify the next priority focus areas for multi-use trails.

4. Support Education Programs

Support the efforts of various organizations throughout the region to provide educational resources to various users of transportation facilities.

5. Data Collection

Continue to explore ways to improve the existing Bike/Ped Count program as well as explore other methods and partnerships. Consider data from Superpedestrian's Link scooter program to identify potential routes for added infrastructure.

Short-Term Recommendations

1. Continuation of ActiveCT Partner with DPH

Continue working with DPH on another five years of funding in order to continue implementing quick-build complete streets demonstration projects and education activities across the state.

2. Promote and Expand Regional Micromobility

Continue to work with municipalities to implement the vision for regional micromobility, the potential for which has been highlighted by the Regional Micromobility Feasibility Study.

3. Demonstrate Progress

Explore the development of an online interactive map to show progress toward completing the regional complete regional complete streets network.

4. Best Practices Guidance

Continue development of best practices guidance to assist municipalities with creating their own complete streets policies.

5. Technical Assistance

Offer technical assistance to municipalities wishing to create their own local complete streets and/or vision zero policies.

Chapter 05

Airport System Ground Access

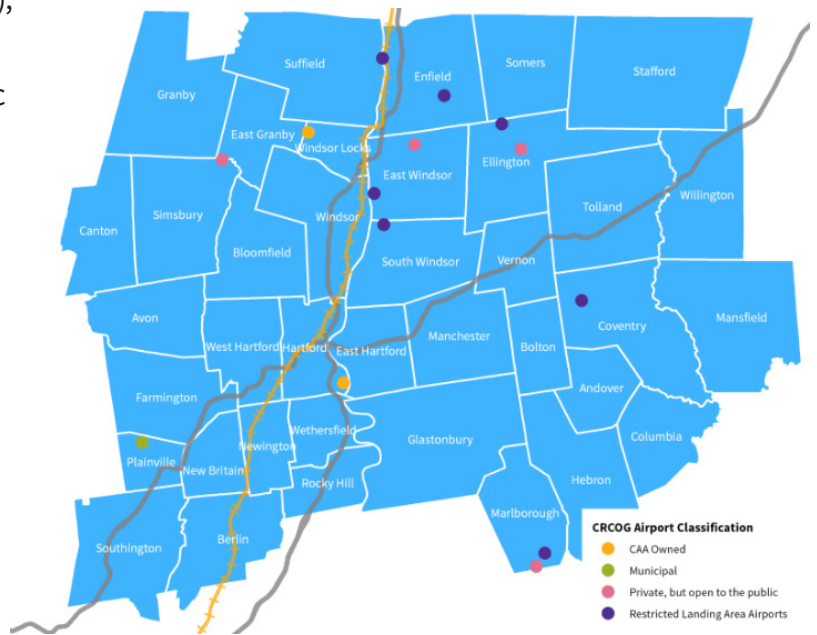
While the CROCOG region includes 14 airports, of primary concern in the Metropolitan Transportation Plan (MTP) is access to the region's primary airport, Bradley International Airport. This includes both passenger and freight (rail and truck) movement into and out of this regional transportation hub.



Photo: Shutterstock

Within the CRCOG region there are 14 airports, including Bradley International Airport (Bradley), two commercial reliever airports (Robertson Field and Hartford-Brainard Airport), four public use airports, and seven restricted landing areas (RLAs) (See Figure 05.1). Two of the 14 airports in the region are owned by the Connecticut Airport Authority (CAA), a quasi-public agency created in 2011 to own, improve, and operate Bradley along with five other state-owned airports. The primary focus of the MTP is surface transportation/ground access to the region’s primary airport, Bradley. This includes both passenger and freight movement into and out of this regional transportation hub.

Figure 05.1 – CRCOG Regional Airports



CRCOG considered the following transportation assets when investigating how to improve ground access to Bradley International Airport: bus service, shared rides through Transportation Network Companies (TNCs) like Uber and Lyft, and potential passenger rail station connections from Hartford Union Station and Windsor Locks station on the CTrail Hartford Line, both to

Bradley Airport and the new 1.4 million sq ft Ground Transportation Center (Figure 05.2). The \$210 million Ground Transportation Center opened in 2022 and is a state-of-the-art facility that provides users access to car rental companies within walking distance, an additional 900 public parking spaces, as well as access to public transportation.

Figure 05.2 – Rendering of the new multimodal facility at Bradley Airport



Source: Hartford Courant

Existing Conditions

Bradley Airport is an important transportation facility and an engine of economic growth for the Capitol Region and the State of Connecticut with approximately 2.6 million people living within a 60-minute drive. In 2019, Bradley reported that it handled nearly 6.8 million passengers, including both enplanements and deplanements.

Compared to other airports nationwide, Bradley ranked 55 out of 553 total commercial airports in the U.S. in volume of passengers

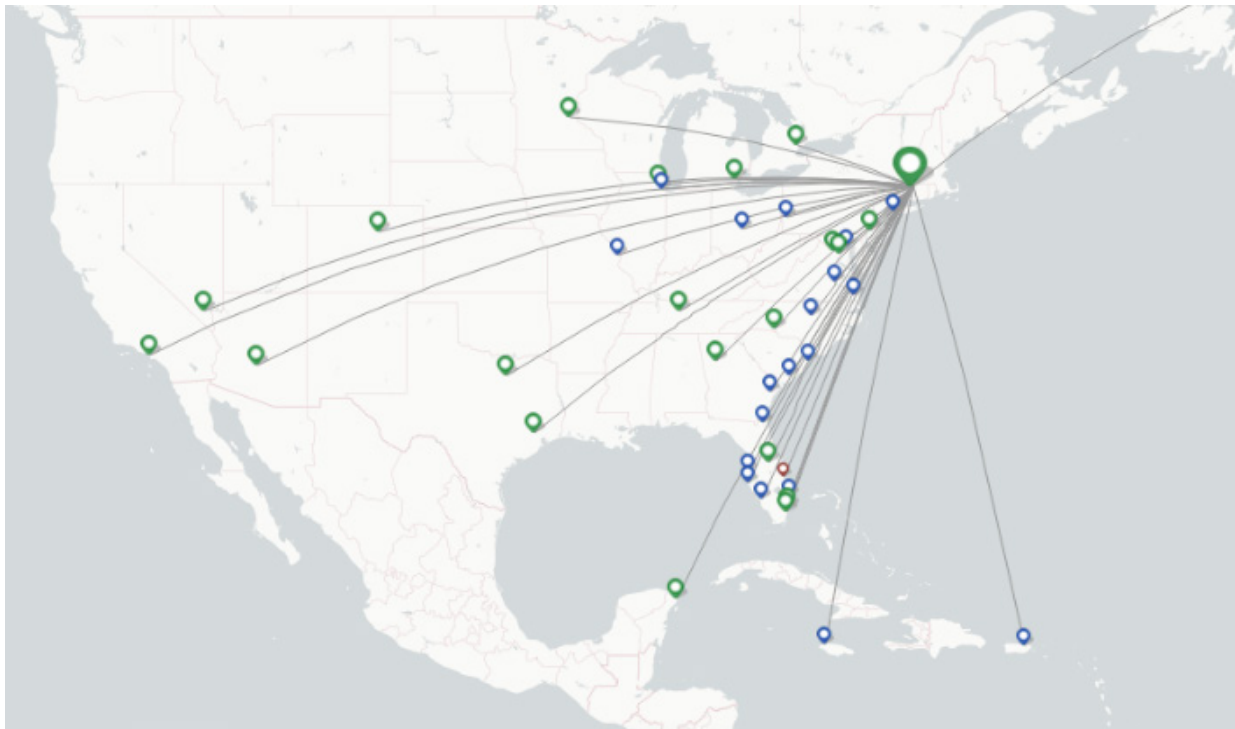
enplaned and 26 out of 137 qualifying air cargo hubs in the tonnage of air cargo landed. According to a 2022 Conde Nast Traveler survey of airports, Bradley was rated the second-best airport in the country.

Among the reasons for its high ranking include “convenient on-site parking, plentiful charging stations and free Wi-Fi, decent restaurant options, and an overall relaxed atmosphere.” Bradley, a mid-sized airport as defined by the Federal Aviation Administration (FAA), serves major U.S. markets as well as Mexico,

Figure 05.3 – Bradley National Service Improvements



Figure 05.4 – Bradley Non-Stop Destinations



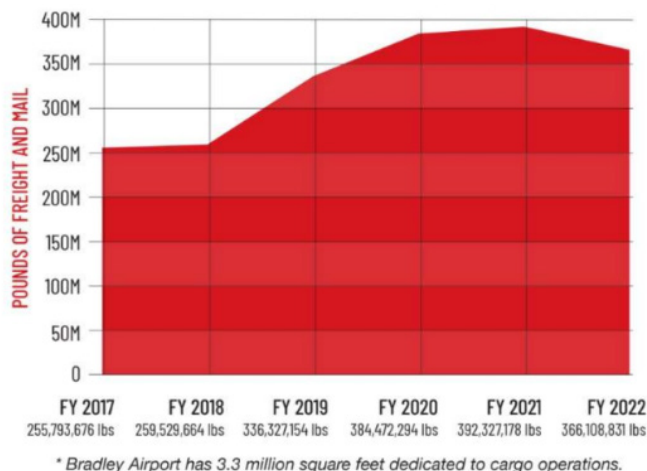
Canada, Jamaica, Puerto Rico, and Ireland. Passenger service options have increased substantially in recent years, growing from six airlines servicing 25 destinations to nine airlines servicing 41 different airports in 39 destinations, as shown in Figures 05.3 and 05.4.

The nine airlines that now service Bradley include six low-fare carriers and three international carriers. Currently, Bradley operates 82,837 annual flights, an average of 227 daily flights. In 2019, Bradley served over 6.7 million passengers. That number dropped by approximately 65% in 2020 with the onset of the COVID-19 pandemic. Although numbers have been climbing, passenger counts remain 30% lower than they were pre-pandemic. According to Kevin Dillon, the Executive Director of the Connecticut Airport Authority, “passenger traffic is showing promising signs of recovery.” Most of the increased traffic can be associated with passengers traveling for leisure, however, business travel is recovering at a slower pace, likely due to the adoption of remote and hybrid options for meetings and conference events.

In FY2022, Bradley handled more than 366 million pounds of cargo. According to an article in the Hartford Business Journal in November 2022, the Connecticut Airport Authority (CAA) believes that there has been a shift in consumer buying tendencies, bolstered by the pandemic, to more online shopping and e-commerce which will continue to boost the airports cargo business which saw revenues rise from \$6.8 million in FY2020 to \$9.4 million in FY 021. Currently, Bradley has approximately 3.3 million square feet dedicated to cargo operations, headlined by Amazon and Pinnacle Logistics. That footprint is expected to grow in in the coming years as additional distribution facilities around the airport could more than double.

In addition to Bradley, Hartford is also home to 13 smaller airports. Of these, Brainard Airport in Hartford and Robertson Airport in Plainville are considered regional and local relievers, respectively. Both facilities are used mostly for general aviation, with a small amount of air taxi and military operations. There have been recent discussions related to closing Brainard Airport. Operations have declined significantly over the past decade, and the facility has high annual operating losses. In 2021, the Hartford City Council passed a non-binding resolution calling for the closure and redevelopment of the site. A 2022 study by the City of Hartford outlined four alternatives for the future of Brainard: keeping the existing airport; building a logistics and distribution center; creating a center for mixed-income housing, office, retail and entertainment venues; and developing

Figure 05.5 — Cargo and Mail Shipments at Bradley Airport, in Pounds



Source: Hartford Business Journal

a hub for advanced manufacturing, research and development and aviation technology, including drone testing. Additionally, per Public Act 22-118, the State of Connecticut is assessing the current and alternative uses of Brainard Airport and has commissioned the Hartford Brainard Redevelopment Study. This study is beginning February 2023 and will synthesize 1) a decision pathway for continued use or redevelopment of the airport following federal and state regulations and 2) a preferred development scenario with a clear regulatory pathway for redevelopment. CAA plans to keep Brainard open for time being.

Issues and Deficiencies

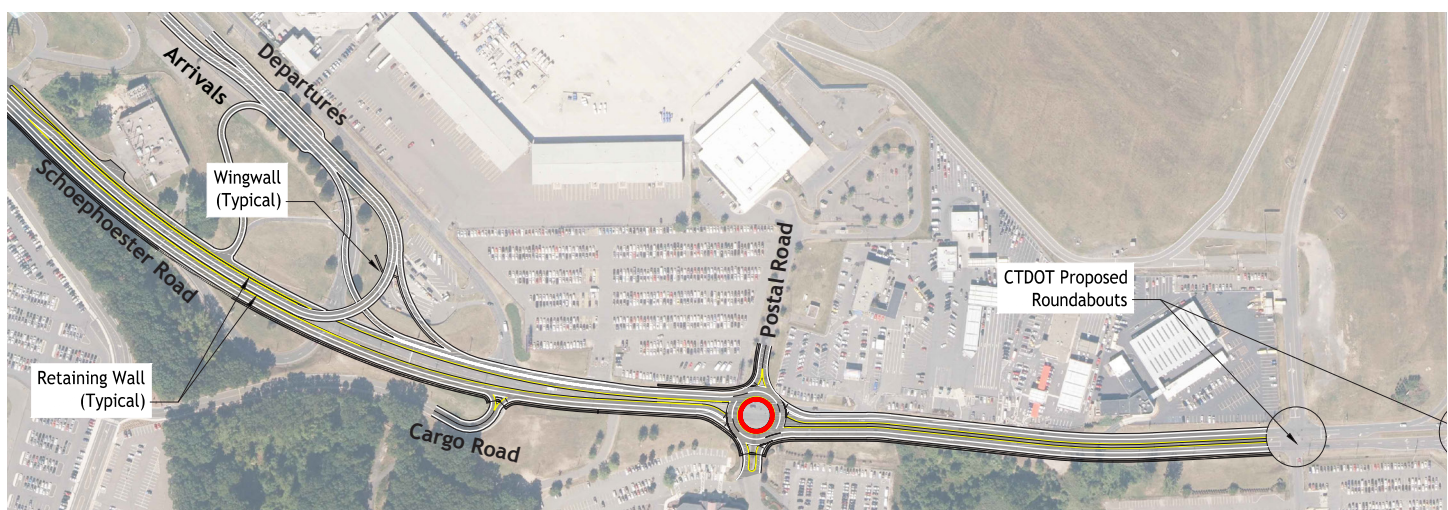
Bradley currently enjoys good roadway access and convenient parking (as noted in the Conde Nast survey), however, there is currently limited transit access. Route 20 and Interstate 91 offer access to most parts of the airport for automobile users. To support anticipated development at and near the airport, it will be necessary to continue to improve roadway access and to develop better transit access to

and from the airport. To this end, the Town of Windsor Locks and CROG have initiated a study along Routes 20 and 75 to identify current operational and connectivity concerns and recommendations for improved roadway and multimodal access. Such improvements would help support future economic growth within and adjacent to the corridor.

Input from stakeholders in the region as well as the technical analysis conducted for CAA's 2016 Strategic Plan, which looks 20 years into the future, has identified the following issues and deficiencies to be addressed in order to further improve Airport System Ground Access in the region:

- Roadway access needs continued improvements to support ongoing development surrounding the airport.
- Improved transit service to Bradley is needed, including: more frequent Bradley Flyer service and a transit link between the Windsor Locks rail station.
- Growing demands for cargo require additional investments in new facilities.

Figure 05.6 — Bradley Roadway Plan



Source: Bradley Airport Master Plan Update (2019)

Recommended Airport Improvements

CAA released a Strategic Plan in 2016. The CAA Strategic Plan was a comprehensive review of what they do, how they do it, and what changes are needed for the future. The objectives, reflected in many of the recommendations, are governed by the following five goals:

- **People:** Attract & Develop the Best, Most Customer-Oriented Employees
- **Customer Service:** Streamline and Improve the Home-to-Plane Experience
- **Air Service:** Increase Non-Stop Routes and Passenger Traffic
- **Finance:** Achieve a Financially Healthy System of Airports
- **Economic Impact:** Increase the Value Generated by the CAA's Airports

The most important goal of the CAA Strategic Plan related to ground access for passengers is focused on customer service and the “Home-to-Plane” experience – to provide better ground access and a seamless experience for passengers. For freight movement, the primary goal is to provide better cargo service, through facility improvements such as a new on-airport cargo facility.

The Bradley International Airport Master Plan, completed in 2019, outlines \$1.4 billion in improvements to take place over the 20 years. The first phase of these improvements was the recently completed Ground Transportation Center, which opened in 2022. Additional improvements will include facilities upgrades to make the terminals modern and enjoyable for customers and to accommodate the projected increase in passengers and additional airlines. An Environmental Assessment was completed in 2021 to study the impacts of further airport expansions and removing physical obstacles such as trees near the end of runways.

Ground Access

Roadway

To help facilitate economic development in the area in and around the airport, roadway access needs to continue to be supported and improved. To improve traffic flow from Route 75 to the new Ground Transportation Center, the Bradley Master Plan calls for updates along the remainder of Schoephoester Road. Two alternatives have been developed: a flyover ramp connecting Route 20 to terminal A or a roundabout at Cargo Road. In both alternatives, roundabouts are proposed at Postal Road Light Lane and Route 75. CROCG's ongoing Route 20 Corridor Study will also examine improved ground access on Route 75 and surrounding corridors.

Transit

Two bus routes provide service to Bradley.

The Bradley Flyer (CT**transit** Route 30/30X) provides semi-express bus service from downtown Hartford including stops at Union Station, the Connecticut Convention Center, and the Poquonock Park and Ride Lot in Windsor. This route operates approximately hourly between 4:00 am and midnight, and the trip between downtown and the airport takes about 30 minutes. This route was originally designed to serve employees at the airport and has not attracted substantial ridership among airport passengers.

CT**transit** Route 24 is a recently introduced crosstown route that operates between the Windsor Rail Station, Bradley, and the Windsor Locks Rail Station on weekdays. Route 24 also serves nearby park and ride lots where connections are available with CT**transit** local, limited-stop, and express routes serving many surrounding communities including Hartford, East Windsor, and Enfield. This route offers 37 trips each weekday, which means that a bus connection to and from Bradley is provided at the Windsor Locks Rail Station with all CT**rail** and Amtrak trains to/from Springfield and points north.

With the opening of the new Ground Transportation Center, it was anticipated that the bus stop would be relocated to this facility. However, due to unforeseen circumstances, the CT**transit** bus stop at Bradley did not move to the Ground Transportation Center as previously planned. Buses continue to pick

up and drop off at Terminal A on the lower level. CROG continues to encourage the integration of bus service into the Ground Transportation Center to offer a more seamless, multimodal experience for passengers.

CROG's Comprehensive Transit Service Analysis (2017) identified opportunities for improved transit service to Bradley. The study recommends extending the Bradley Flyer to New Britain along the CT**fastrak** guideway but recognizes the concern of limited parking availability at the stations. Solutions to help alleviate these concerns could include encouraging long-term airport parking at the underutilized Szczesny Garage in New Britain, charging for parking at CT**fastrak** stations, and/or increasing parking capacity at CT**fastrak** stations.

Figure 05.7 — Bradley Flyer Bus waiting to depart from Hartford's Union Station



Short-Term Recommendations

1. Bradley Flyer Expansion Support the extension of Bradley Flyer service to New Britain along CT**fastrak** in order to increase ridership by attracting more riders coming from areas around the guideway.

Ongoing Efforts

2. Improved Roadway Access Identify roadway access options as part of the Route 20 Corridor Study and support the implementation of roadway improvement recommendations from the Bradley Master Plan.

3. Integration of Bus Service into the Ground Transportation Center Work with CTDOT, CAA, and CT**transit** to relocate the bus stop from Terminal A to the Ground Transportation Center as originally envisioned. This will offer a more seamless, multimodal experience for passengers.

Harness New Technologies to Improve Ground Access

Transportation Network Companies (TNCs)

In 2014, Uber and Lyft began operations in Connecticut. In the years since, they have become a popular option for airport travelers to and from Bradley Airport. Much of the population in the Capitol Region does not have transit access to the airport, and by using TNCs to access Bradley, travelers who might have chosen to drive in the past avoid paying parking fees at the airport's lots.

Mobility as a Service

To improve travelers' experience to and from Bradley Airport, implementation of Mobility as a Service (MaaS) could provide customers with a one-stop shopping approach to their trip, linking travel from their point of origin to the airport and even their final destination. The growing popularity of TNCs demonstrates a desire for alternate modes of travel. While most people are familiar with Uber and Lyft, they may be unaware of other travel options available to and from the airport, like the Bradley Flyer and the CT**rail** Hartford Line (via a connection on CT**transit** Route 24). Travelers for whom the Capitol Region is their destination might want to avoid renting a car but might be unaware of alternative modes of travel in the Capitol Region. MaaS, through a custom trip planning app available on the



Bradley Airport website, for download, at airport kiosks, and through a team of trip planners employed as concierges at an airport call center, could provide a single interface for the broad array of travel options in the Capitol Region. The trip planning service could also include the development of an integrated payment system which would package the region's rapidly expanding mobility options into different plans, ranging in mode types and duration. Travelers could load money onto an app which could be used to pay for services like TNCs, the Hartford Line, *CTtransit*, and LINK Scooters. Additional information about MaaS can be found in Chapter 7 – New and Emerging Technologies.

Short-Term Recommendations

4. MaaS Pilot Program at Bradley Airport

Support the implementation of Mobility as a Service (MaaS) to provide customers with a coordinated approach to completing their trip to and from Bradley Airport.

Competitive Cargo Service

According to CTDOT's 2022 Draft Statewide Freight Plan, air cargo accounts for 0.1% of freight tonnage moved in Connecticut. The value of the freight transported via this mode, however, is 8%, an increase from 4.5% in 2016. This indicates that freight shipped by air in the state primarily consists of small, high value objects. Air cargo is handled through Bradley's three cargo complexes: Roncari Freight Facility, Aviation Facilities Complex, and UPS Air Express sorting Hub. The airport is serviced by the following air cargo airlines: Amazon Air, DHL Aviation, Fedex Express, UPS Airlines, and Wiggins Airways.

Bradley has demonstrated great potential as an air cargo facility because of its easy ground access, uncongested airport facilities, and proximity to New York and Boston.

According to Transearch forecasts, air tonnage at Bradley is expected to increase from 170,000 tons in 2019 to 286,000 tons in 2040, an increase of 69%. To meet these growing demands, a new on-airport cargo facility at Bradley is needed and would position the airport to meet future air cargo demands. Ideally this cargo center would be located to allow for multimodal freight access from the highway and rail systems.

The ease of getting in and out of Bradley, combined with a good regional highway system, makes it attractive to air cargo handlers seeking to serve not only the Hartford-Springfield area, but also other parts of New England. While Bradley's air cargo

services cannot compete with New York and Boston on price, they can offer faster delivery times in most parts of New England, and often can offer faster delivery times into New York City and Boston as well. The continued improvement of air cargo capabilities at Bradley will ensure that it maintains its position as a cargo hub for New England.

Short-Term Recommendations

5. Cargo Expansion Support efforts to consolidate cargo at Bradley and support development plans for the growth of cargo.

Long-Term Recommendations

6. Multimodal Cargo Center Evaluate making Bradley a true multimodal freight facility by improving rail freight access to the airport and developing trucking support facilities.

Ongoing Efforts

7. Capitalize on Air Cargo Potential Continue to support efforts to improve Bradley's air cargo capabilities and services, making it an attractive alternative to New York and Boston airports that are experiencing increasing ground and air congestion.

Regional Economic Development

From a regional perspective, Bradley International Airport provides a critical link to the nation's air transport system and the nation's economy. The presence of accessible, quality air service gives the region a competitive advantage in those economic sectors and industries that rely on fast and convenient delivery of people and goods. These advantages can help stimulate a substantial amount of economic growth.

Bradley continues to be a catalyst for economic growth for the region, and for airport-related development within the immediate vicinity of the airport itself. Annually, the airport contributes roughly \$3.6 billion in economic activity while producing \$1.2 billion in wages and 18,000 full-time jobs. It has been estimated that over a 20-year period, the airport could create more than 140,000 jobs and \$34 billion in economic output.

Bradley also realizes significant competitive advantages such as having nearby developable land; 100 million potential customers within a 500-mile radius (representing 1/3 of the US economy); top tier corporate neighbors; and more than 2,000 hotel rooms and conference facilities within a 60-mile radius. To capitalize on these advantages, the State of Connecticut created the Bradley Airport Development Zone. The Zone includes land in Suffield, East Granby, Windsor, and Windsor Locks and provides property tax exemptions and

corporate business tax credits for air cargo, aerospace, manufacturing, and transportation related services. A Buildout Analysis found that the Bradley Airport Development Zone could support an additional 20.2 million square feet of development.

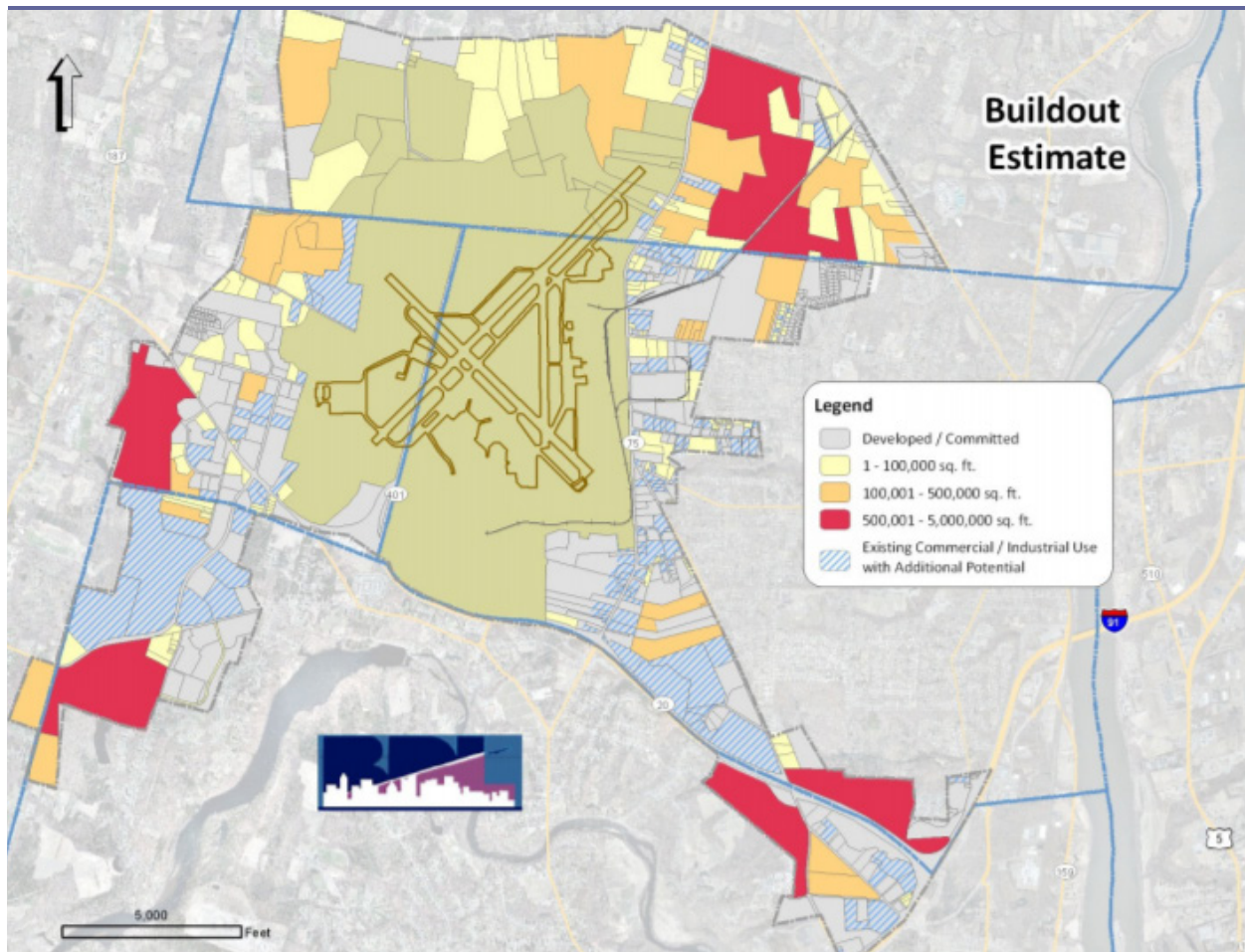
In order to realize the airport’s full economic potential, appropriate land use regulations, good road systems, adequate infrastructure, and full consideration of the potential impacts on adjacent communities will be needed. Proper planning is necessary to ensure not only that the maximum growth potential from the airport is realized, but also that the growth occurs in a manner maximizes benefits with minimum disruption

to the environment and neighborhoods in the general vicinity of the airport.

Ongoing Efforts

8. Support planning efforts that maximize economic development potential of the airport Support planning efforts (state, regional, and local) including land use regulations, good road systems, and adequate infrastructure that help achieve the airport’s economic development potential in a manner that has minimum impact on the environment and on neighborhoods in the general vicinity of the airport.

Figure 05.8 – Buildout Estimate



Source: Buildout Analysis for the Bradley Airport Development Zone (2012), Bradley Development League.

Figure 05.9 – Draft Recommendation Plan for the Bradley Master Plan update

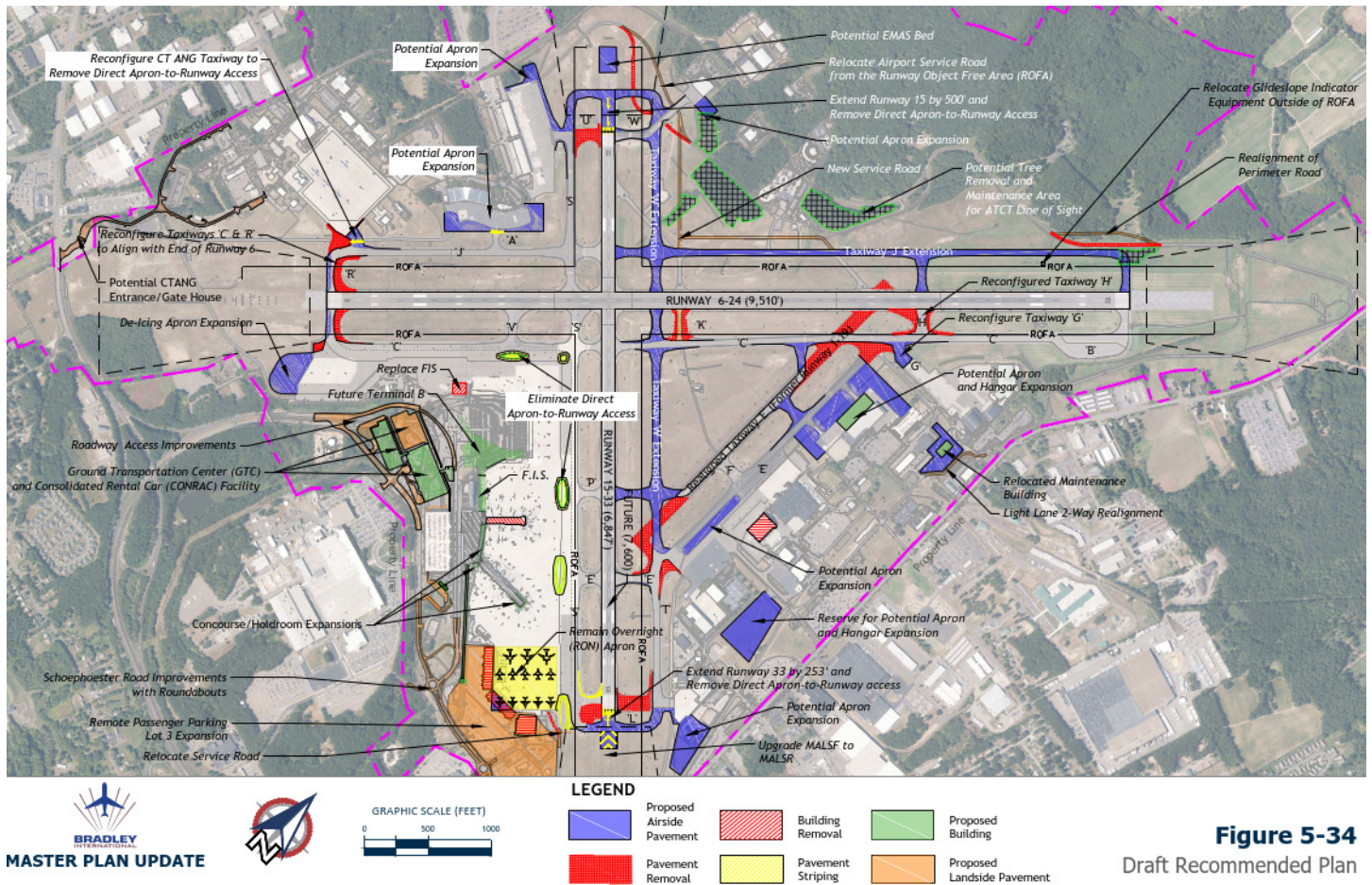
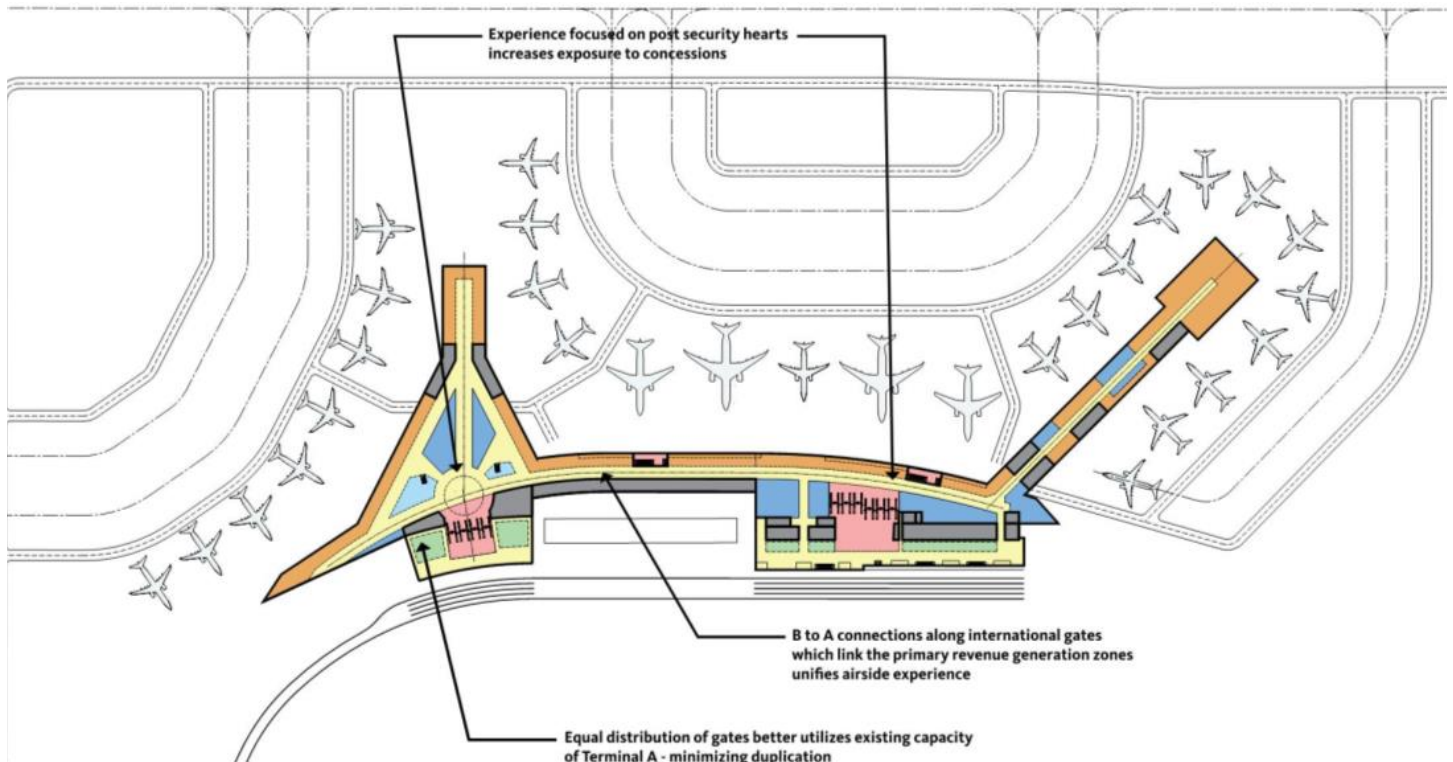


Figure 5-34
Draft Recommended Plan

Figure 05.10 – Long Term – Departure Terminal layouts

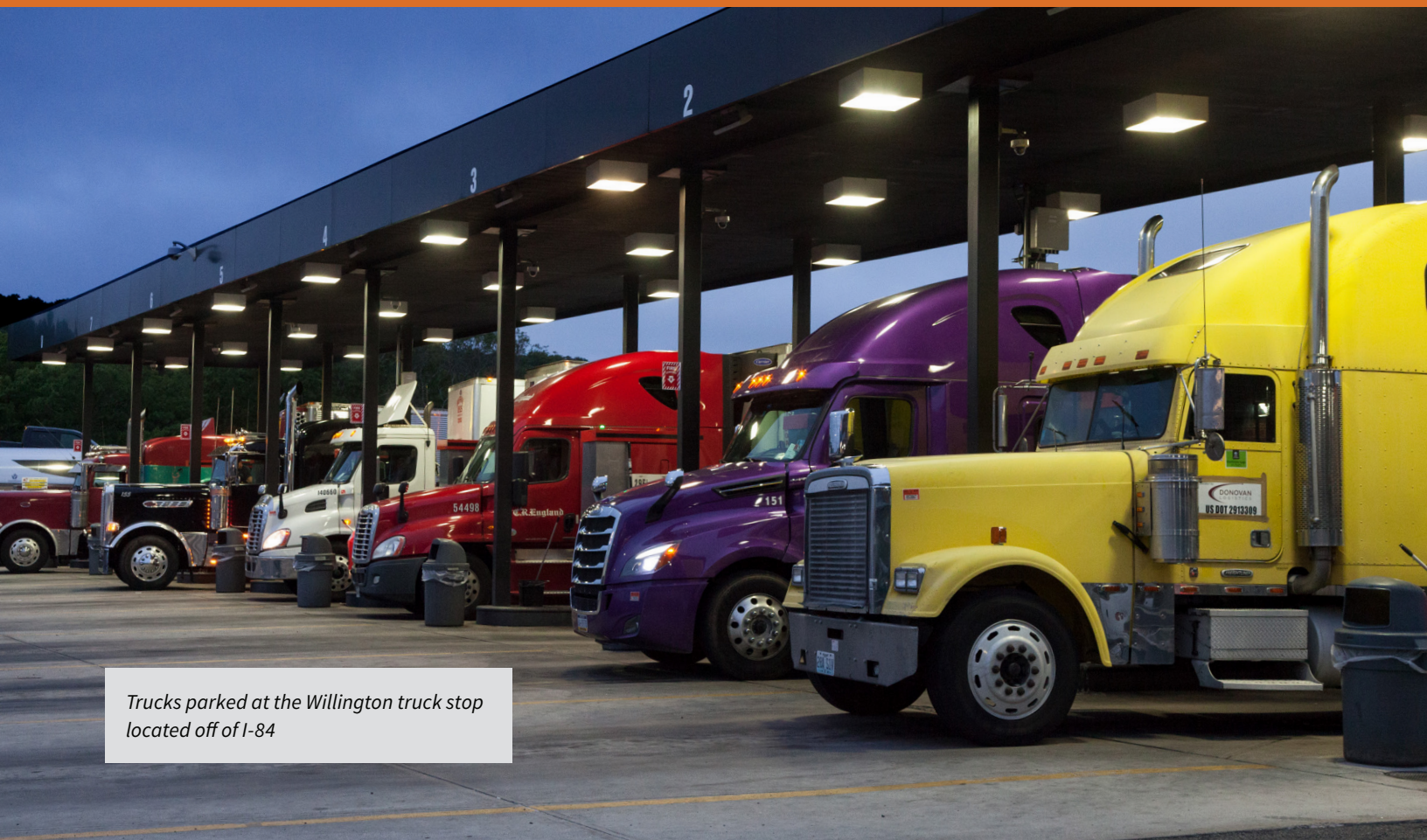


Sources (top and bottom): Bradley Airport Master Plan Update (2019)

Chapter 06

Freight Transport System

Goods movement plays an important role in economic growth. The importance of freight transport is obvious in economies dominated by industries that ship massive quantities of heavy and/or bulky materials, but even in economies dominated by financial, insurance, and service industries, efficient movement of goods is still vital. Freight transport is required to import finished products and basic commodities used by both businesses and consumers, as well as for the export of some of the specialized products produced within the region.



Trucks parked at the Willington truck stop located off of I-84

CROCOG’s freight planning process includes an inventory of freight-relevant infrastructure and a stakeholder outreach program. This freight planning program is summarized in a regional Freight Fact Sheet that CROCOG staff developed in 2020. CROCOG also coordinates its freight planning efforts with CTDOT and neighboring planning agencies. This coordination included CROCOG’s support of the development of CTDOT’s Statewide Freight Plan, which was drafted and submitted for federal approval in 2022. Based on this continuous planning effort, opportunities to improve freight transportation infrastructure have been identified. This section describes the region’s freight transportation system and goods flows, identifies issues and opportunities, and proposes potential strategies and actions for maintaining and improving goods movement in the region.

Existing Conditions

The volume of goods moving to, from, and through the region continues to increase. The tonnage of freight is projected to increase 20%, or 0.95% annually between 2019 and 2040, and the value of these goods is projected to increase 40%, or 1.9% annually.

The primary modes of goods movement are trucks, rail, air, water, and pipelines. In Connecticut, trucks carry more than 90% of goods. Figure 06.1 shows the statewide freight volumes by mode. About 39% of truck traffic in the region is through traffic, and inbound freight exceeds outbound freight by approximately 75%.

Issues and Deficiencies

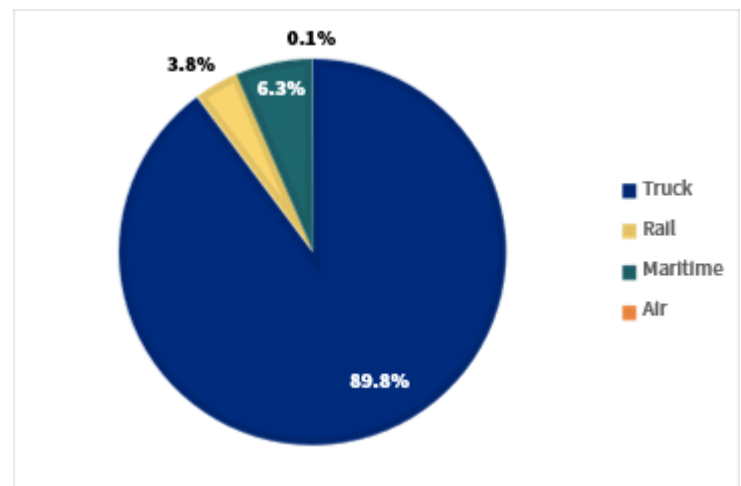
The Capitol Region’s highway congestion issues affect truck travel. Roadway congestion results in increased costs to the trucking industry in terms of hours of delay, lost productivity, and wasted fuel costs.

Inadequate infrastructure also hinders truck travel in the region. CROCOG analysis has identified bridges with inadequate clearances (see Figure 06.2), bridges with weight restrictions, and roads with through-truck restrictions.

Previous studies also have identified a shortage of rest areas, service plazas, and other areas that could meet the demand for truck parking. The Capitol Region currently has only three of the state’s 20 state-owned public traveler roadside facilities (rest areas or service plazas). The region also contains four privately owned truck stops and service centers.

Truck congestion could be eased without affecting the volume of goods moved by expanding the use of rail freight. CTDOT

Figure 06.1 — Freight Tonnage by Mode, Connecticut



Source: Data from Connecticut Draft State Freight Plan (2022), CTDOT.

owns substantial contiguous rail rights-of-way in the western and eastern sections of the Capitol Region where rail service could be initiated in the future. However, potential rail freight expansion opportunities are limited by various factors, including Amtrak’s management of the Hartford Line and physical constraints in the form of weight, height, and width limits on the region’s rail lines.

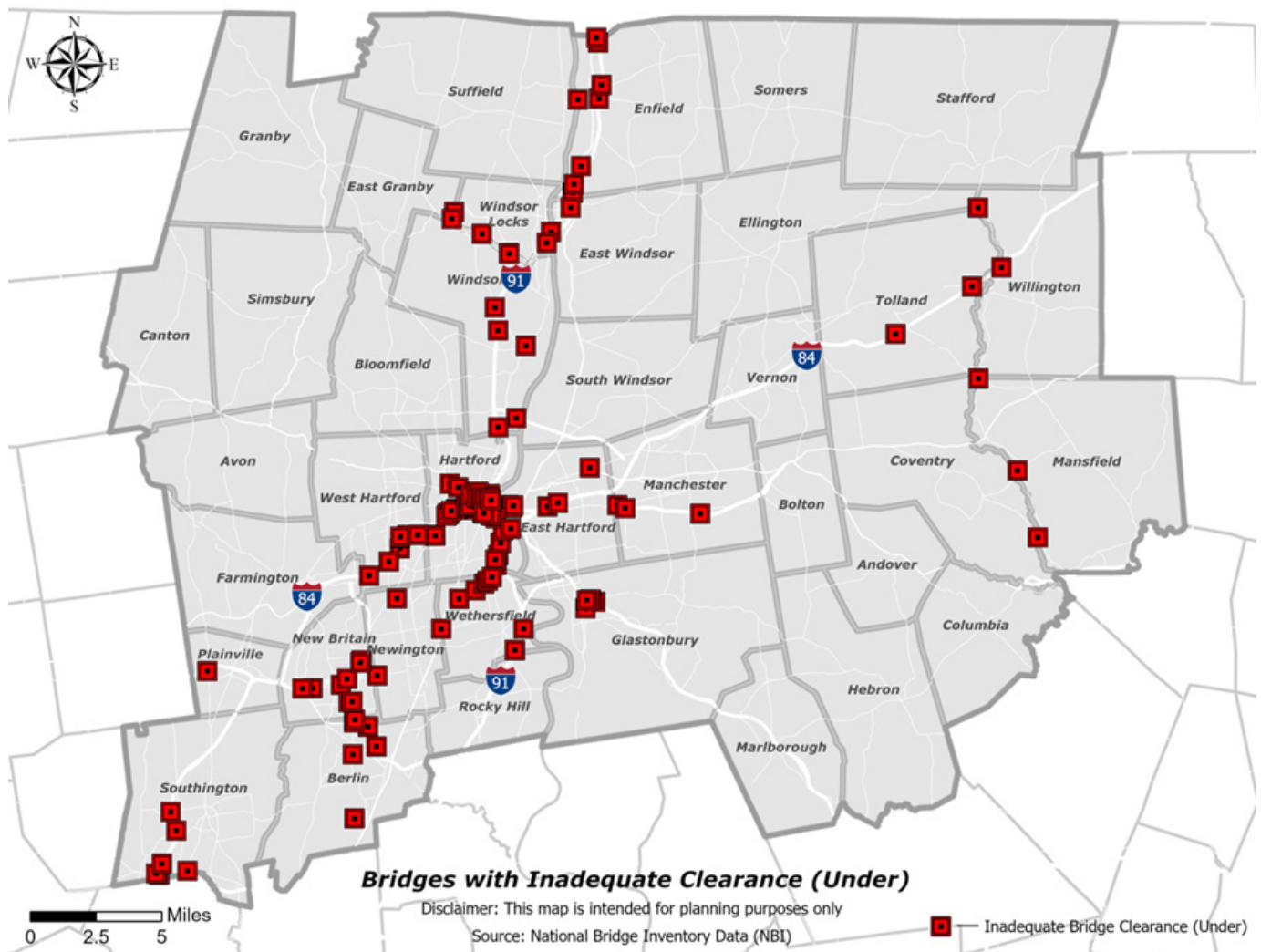
Bradley Airport is another regional freight asset that is not being fully utilized. The airport currently has limited space for storing trailers and limited capacity for truck and freight rail

access and support facilities. The state is working to maximize the economic potential of the airport through incentives and land use policy.

Input from stakeholders in the region identified the following issues and deficiencies to be addressed in order to further improve freight transport in the region:

- The regional highway system has significant truck bottlenecks.
- Rail facilities have constraints that limit expansion.
- Truck parking and service facilities are lacking in the region.

Figure 06.2 – Bridges with Inadequate Clearance (over)



Source: CRCOG

- A shortage of trailer storage space and scheduling difficulties are present at Bradley Airport.

Highways / Trucks

Interstate highways are the main channel for truck traffic, with an estimated 80% of truck freight moving on Interstates. The National Network for trucks requires states to allow conventional combinations of trucks along key routes. More recently, the FAST Act authorized the National Highway Freight Network in order to provide strategic direction to federal policy and funding to improve truck freight flows. This network is comprised of the Primary Highway Freight System (PHFS) and other Interstate portions not on the PHFS. In the Capitol Region, this network includes I-84, I-91, I-291, and I-384. The network also includes any Critical Urban Freight Corridors or Critical Rural Freight Corridors that states may designate.

Within the Capitol Region, CTDOT's Critical Urban and Rural Freight Network includes Routes 20 and 75 near Bradley International Airport; Route 44 through Hartford, West Hartford, Avon, and Canton; and Route 6 through Bolton, Andover, Columbia, and Mansfield.

There is one main truck traffic bottleneck in the region: I-84 at its interchange with I-91. This location is listed as the 24th most congested site in the American Transportation Research Institute's (ATRI) Top 100 Truck Bottleneck List (national survey). The I-84/I-91 interchange has an average peak speed of 36 miles per hour. The interchange between I-91 and US-5/SR-15 at the Charter Oak Bridge used to be included on ATRI's list, but it was removed following the completion of the interchange's reconstruction in 2021.

Federal performance management regulations require using a Truck Travel Time Reliability (TTTR) index for Interstate highways to assess the impact of roadway congestion on goods movement. CTDOT calculates the TTTR index as the ratio of longer travel times (95th percentile) along a roadway segment to a "normal" travel time (50th percentile), with reliability defined as a TTTR of less than 1.5. The TTTR's of interstate segments are used to create the TTTR Index for the entire Interstate system using a weighted aggregate calculation for the worst performing times of each segment. For this indicator, CROCG has adopted the CTDOT target, which is 2.02. For reference, the current regional value is calculated at 1.42, which falls within attainment. It should be noted that this figure was calculated by CROCG staff and may have small differences from CTDOT's calculation.

Figure 06.3 —
I-84's Willington truck stop is privately-owned



Photo by Carl Talley

Investments in infrastructure are needed to improve truck travel. Trucks are limited by low clearances and weight and truck travel restrictions. The lack of truck parking is also a long-standing issue, which leads to highway safety and operational concerns due to illegal truck parking. Figure 06.4 shows the existing supporting facilities for trucks such as rest areas and parking areas. CTDOT will be undertaking a statewide study on truck parking which will provide guidance for new and updated facilities across the state.

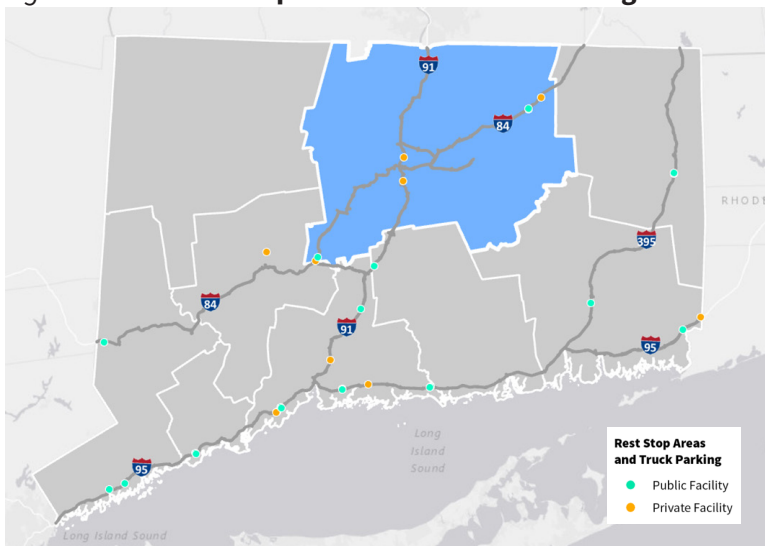
While the highway system serves long-haul trucking needs, in recent years there has been a growing demand for short-haul trucking services, particularly due to the growth of e-commerce during the COVID-19 pandemic. Such service emphasizes the importance of “last mile” connections, which may be difficult for some trucks because of vehicle size versus local road restrictions, road conditions or constraints, lack of signage, and navigation difficulties. Further, truck traffic in downtown areas or residential neighborhoods may generate

concerns about congestion, pollution, noise, and curbside management. The pandemic has also led to the growth of last-mile distribution centers, fulfillment centers, and warehouses. While these facilities are important for e-commerce, their increasing prevalence has made it difficult for towns to regulate this use from both a traffic and a land use perspective.

Intelligent Transportation System Technology

Trucks experience the same roadway congestion that cars do. Recurring and non-recurring congestion result in travel delays that increase shipping time and costs, which may result in higher consumer costs. The implementation of Intelligent Transportation System (ITS) technology, aimed at providing traveler information and managing congestion, has been increasing in recent years. The region’s roadways currently have a range of ITS devices including fiber optic cable, computerized advanced signal systems, closed circuit TV cameras, variable message signs, and highway advisory radio.

Figure 06.4 — Rest Stops Areas with Truck Parking in Connecticut



Source: Data from *Freight Management and Operations (2019)*, Federal Highway Administration .

Short-Term Recommendations

- 1. Support CTDOT's Statewide Truck Parking Study** Support CTDOT's Statewide Truck Parking Study. Consider the potential development of a truck parking facility between Hartford and the Massachusetts State Line on I-91.
- 2. Identify Improvement Opportunities for I-84/I-91 Interchange** Coordinate with the Greater Hartford Mobility Study to identify how best to improve the I-84/I-91 interchange.
- 3. Undertake Regional Warehousing Planning Study** Work with CTDOT to analyze the impact of increased warehousing and distribution centers and to identify best practices to help member municipalities plan for, mitigate, and regulate warehousing.

Long-Term Recommendations

- 4. Improve I-84/I-91 Interchange**
Advance construction of an improved I-84/I-91 interchange.

Ongoing Efforts

- 5. Increase Deployment of ITS Technology and Increase Traveler Information**
Coordinate with CTDOT on allowing freight companies access to RTMS information to make better routing decisions and reduce shipping delays.

6. Explore Improving Parking and Rest Stop Facilities in the Region

Seek to improve the functionality at existing stops by making available travel information and electrification to stop diesel idling through the use of heating and cooling hook-ups/cable hook-ups.

7. Coordinate Short-Haul Trucking Deliveries

Study issues related to short haul trucking demand and last-mile delivery needs, including the location of freight facilities. In concentrated service centers, recommendations for consolidating frequent pickups and deliveries could be made.

8. Maintain Truck Weight and Safety Enforcement Activities

Work with CTDOT to explore the possibility of installing Virtual Screening Facilities (VSF) in the region and to expand the use of Weigh-In-Motion (WIM) technology to increase mobility for compliant trucks and allow enforcement officers to spend resources on those in violation of safety laws.

- 9. Ensure Equity** Consider potential impacts to environmental justice populations when developing freight improvements and ensure improvements would not disproportionately impact these populations.

Rail

Statewide, freight rail carries about 6.6 million tons per year, or about 4% of total goods movement.

The Hartford Line between New Haven and Springfield is the primary route for moving rail freight to, from, and through the Capitol Region. The Connecticut Southern Railroad (CSO) carries freight for the national rail freight carrier CSX over this line. Other rail freight routes in the region include the following (see Figure 06.5):

- Connecticut Southern Railroad — operates several short routes including the Manchester Secondary, the Windsor Branch, the Wethersfield Branch, and the Suffield Branch / Bradley Spur
- Central New England Railroad — operates the Griffin Industrial Track and the Armory Branch
- Providence and Worcester Railroad — operates the Wethersfield Secondary route
- Pan Am Southern/Berkshire and Eastern Railroad — operates the Terryville Secondary and the Canal Branch
- New England Central Railroad — operates one line crossing the northeastern portion of the region

Increasing rail freight would help to mitigate some of the demand for and impacts of truck traffic. An average rail car carries about as much as four trucks; thus, increased rail freight activity would help to reduce truck trips, roadway congestion, and air pollution. Rail typically is best-suited for bulky, low-value commodities such as lumber, paper, and fuel oil, but rail shipping can serve other markets through intermodal service (trailer

on flat car and container on flat car) under certain conditions. Generally, rail intermodal is viable only for freight shipments of 750 miles or longer in trucking corridors with relatively high demand or annual volume.

CTDOT owns substantial contiguous rail rights-of-way in the western and eastern sectors of the Capitol Region where rail service could be initiated in the future. There also may be opportunities for intermodal or transloading activity. For example, the CSX intermodal terminal in West Springfield, MA may provide an opportunity to reduce through truck traffic in the Capitol Region. The potential expansion of rail freight will also depend largely on identifying businesses that can utilize rail shipping services. The 2005 study, Freight Movement in the Hartford Metropolitan Region, conducted by Global Insight, estimated the maximum truck-to-rail mode shift potential in the region is about 12 percent. Going forward, efforts need to be made to

Figure 06.5 – Freight Rail Network



Source: Valley Railroad Company, TIGER Discretionary Grant Application (2009), CTDOT.

realize this increase in rail freight's share of goods movement in the Capitol Region.

Potential rail freight expansion opportunities may be limited, however, by various factors. Freight rail on the Hartford Line is limited by time restrictions and high fees imposed by Amtrak. CROCOG's freight infrastructure assessment also identified physical constraints to the rail network. For example, the national rail industry standard requires the capability to handle cars up to 286,000-pound gross vehicle weight (286k), but most lines in the region currently only have capacity for 263,000 pounds (263k). In addition, there are height restrictions at the Albany Avenue bridge in Hartford, the I-91 overpass in Windsor Locks, and at the location of overhead power lines in Windsor. There is also a width restriction at the Asylum Bridge abutment in Hartford. In addition, potential freight rail expansion may need to address issues such as at-grade road crossings, noise, and environmental impacts.



Photo by Chris Henchey

Short-Term Recommendations

10. Coordinate Current and Potentially Expanded Operations with Passenger Rail Schedules

Long-Term Recommendations

11. Advocate for Upgrades of Rail Bridge

Along Knowledge Corridor Support reconstruction of the Windsor Locks-Enfield Rail Bridge to allow for improved freight rail movement north and south along the Knowledge Corridor.

12. Address Constraints to Expanding Service

Advocate for line upgrades to 286,000-pound capacity (national standard for rail freight cargo) and address clearance limitations.

Ongoing Efforts

13. Explore Expansion Opportunities

Where appropriate, work with stakeholders to preserve previous rail freight corridors for potential future use.

14. Consider Intermodal / Transload Opportunities

15. Identify Potential Customers Along or Near Rail Freight Corridors

Air

While air freight accounts for a relatively small portion of total goods movement, it typically carries higher-cost, time-sensitive goods. Bradley International Airport (Bradley) has several types of air cargo activities including small freight operations, dedicated freight operations, airmail, and other freight forwarding services. The U.S. Postal Service has a post office and mail sorting facility at Bradley, and dedicated cargo airlines with regular operations include UPS, FedEx, and DHL Express. UPS also has a large package sorting facility. Bradley handles high-value goods such as aircraft components, electrical and machine parts, and other consumer goods. Air cargo carriers at the airport currently ship more than 170,000 tons of cargo each year, and demand for air cargo and mail service has been increasing. According to the 2019 update of the Bradley Airport Master Plan, Bradley is expected to experience continued growth in air cargo, with a projected increase of about 33% in annual volume by 2037. It is likely that this increase could even be greater as a result of the growth of e-commerce during the COVID-19 pandemic.

Previous and current planning initiatives provide support for expanding air freight and related commercial activity at Bradley. The Bradley Development League, a consortium of the four surrounding towns (East Granby, Suffield, Windsor, and Windsor Locks), markets the airport and region for economic development.

In 2010, the state established the Bradley

Airport Development Zone (BADZ), which extends tax incentives to companies that develop or acquire property in the zone and engage in manufacturing, manufacturing related research and development, warehousing and distribution, and/or other airport-related commercial activity. A 2012 build-out analysis for BADZ identified the potential for an additional 20 million square feet of commercial or industrial use. More recently, the airport's 2019 Master Plan provides a planning and development framework to address landside and airside facilities and land development considerations for the next 20 years and beyond. CROCOG's Route 20 Corridor Study, which was initiated in 2022, will analyze potential future uses along Route 75 in the area of the airport.

Increasing Demand for Air Cargo and Mail Service

Air cargo carriers at the airport currently ship about 170,000 tons of cargo and mail each year. According to the 2019 update of the Bradley Airport Master Plan, Bradley is expected to experience continued growth in air cargo, with a projected increase of about 33% in annual volume by 2037.

Challenges regarding potential air freight expansion opportunities include providing adequate space for storing trailers, accommodating freight carrier schedules, and identifying specific commodities as niche markets. There is also potential to make Bradley a true multimodal freight facility by improving rail freight access and developing support facilities for trucking. This multimodal approach could also lend itself to the development of a “freight village” in the Bradley area.

A freight village is a complex characterized by the following:

- Goods move between two or more forms of freight transportation
- Active distribution centers and industrial activities are located adjacent to the modal shift facilities
- Supporting uses may include truck stops/rest areas, office space, retail, and hotels
- The village is often under the management of a single entity

CROCOG should work with stakeholders to advance the following recommendations:

Short-Term Recommendations

- 16. Address Constraints** Address shortage of space for trailer storage and scheduling difficulties.

Long-Term Recommendations

- 17. Pursue Airport Area Development** Explore and pursue airport area development opportunities, including the development of a “freight village.”

Ongoing Efforts

- 18. Maintain and Improve Groundside/ Intermodal Connections**

- 19. Create a Niche Market** Consider targeting specific commodities rather than pursuing general freight.

- 20. Continue to Improve Bradley’s Air Cargo Capabilities and Services** Evaluate making Bradley a true multimodal freight facility by improving rail freight access and developing support facilities for trucking.

Maritime

The Capitol Region has no major ports, and the Connecticut River is not a year-round shipping option because it freezes in winter. Nonetheless, improved and increased maritime shipping at Connecticut coastal ports and along the coastline (particularly of petroleum products) may be significant because it could help to mitigate truck traffic in the region.

Ongoing Efforts

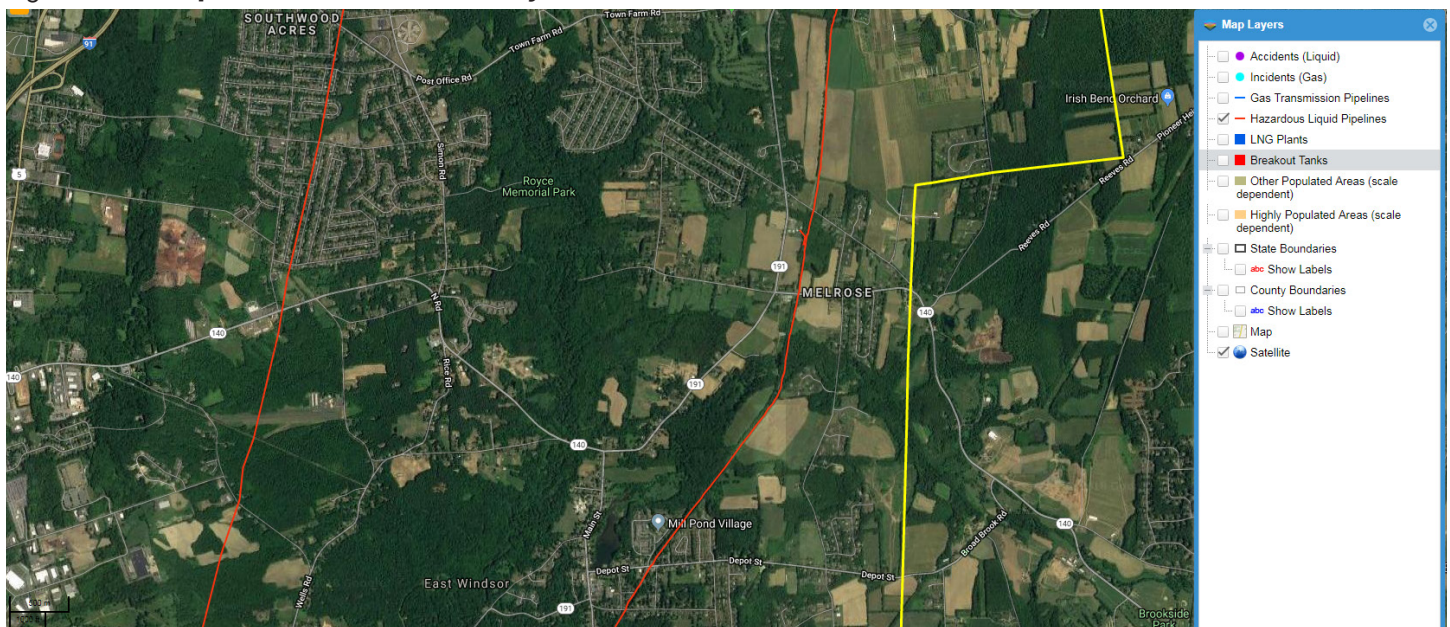
21. Explore opportunities to divert freight from truck to water transport

Coastal barges could divert through shipments of petroleum, relieving truck traffic on I-91 and I-84.

Pipelines

Some pipelines carry petroleum products into and through the region. One major line is an approximately 100-mile pipeline that carries refined petroleum products from New Haven through central Connecticut and into Massachusetts. Running north from New Haven, the pipeline has Connecticut delivery locations in Middletown, Rocky Hill, East Hartford, Hartford, Bradley International Airport, Melrose (East Windsor), and Enfield. A pipeline terminal with a 345,000-barrel capacity is located in Wethersfield. It handles ultra-low sulfur diesel, gasoline, ethanol, and heating oil. Such terminals receive products from pipelines and distribute them to third parties, who in turn deliver them to end-users and retail outlets. In addition, portions of two interstate natural gas pipelines run through the region. The Tennessee Line runs north-south, and the Algonquin Line runs east-west with a few north-south spurs.

Figure 06.6 — Pipelines in Hartford County



Source: National Pipeline Mapping System, USDOT.

Chapter 07

New and Emerging Technologies

Transportation is undergoing a number of concurrent transformations that are changing opportunities and expectations for how people move. This chapter presents an overview of four major trends (vehicle electrification, connected and autonomous vehicles, micromobility, and shared mobility) as well as the underlying concept of smart cities; highlights case studies that demonstrate how national and regional cities are leveraging new technologies; summarizes key takeaways; and presents recommendations for incorporating new and emerging technologies to advance mobility goals in the CROCG region.



Smart and connected streets

Trends Overview and Case Studies

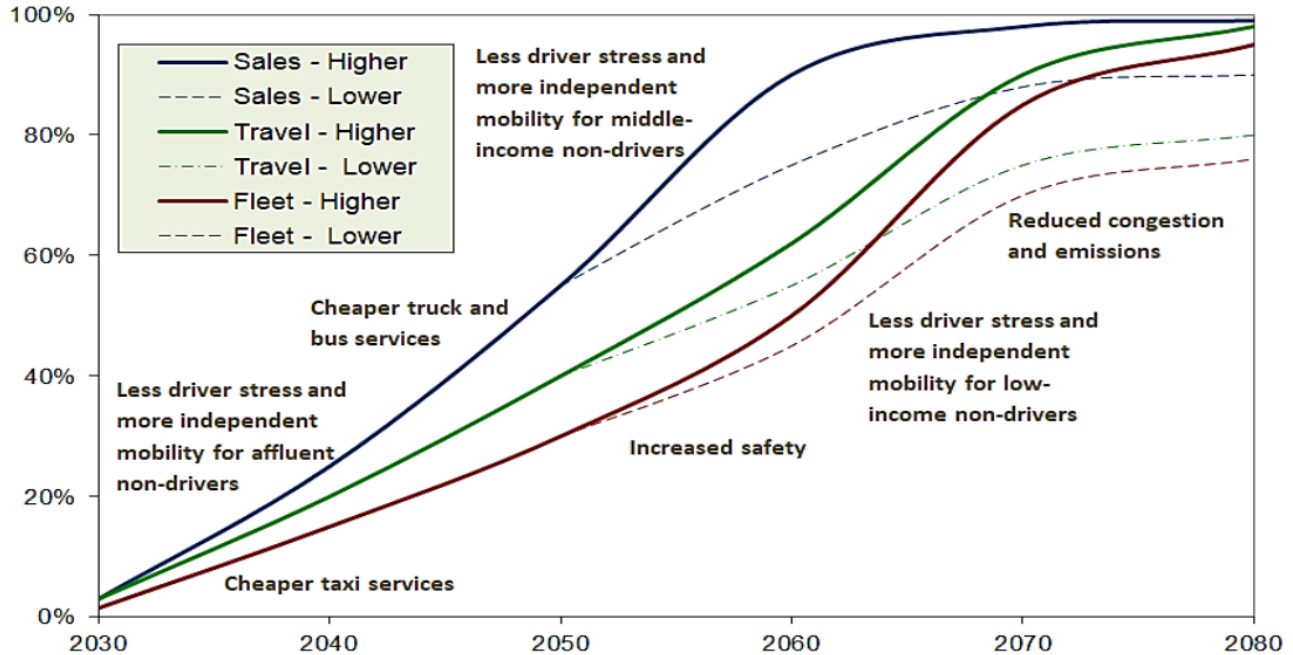
Connected and autonomous vehicles (CAVs), vehicle electrification, micromobility, and shared mobility are expanding options for how people move. Each of these technologies offer possibilities for addressing current transportation challenges including improving safety, reducing environmental impacts, and assisting with transportation equity. Also, each can elevate traveler expectations around the customer experience, and provide new opportunities for partnerships and services to public agencies.

Connected and Automated Vehicles

Connected and Automated Vehicles Trend Overview

Connected Vehicles (CVs) have the ability to communicate with other vehicles, infrastructure, or other connected devices via short-range radio signals, enabling roadway users to be aware of their ever-changing surroundings in real time. Automated Vehicles (AVs) automate at least some aspects of driver function. These vehicles are operated using sensors, cameras, radar, and software to continuously collect data and respond

Figure 07.1 — Autonomous Vehicle Sales, Fleet, Travel, and Benefit



This analysis suggests that it will be at least 2045 before half of new vehicles are autonomous, and 2060 before half of the vehicle fleet is autonomous. Significantly faster deployment will require scrapping many otherwise functional vehicles that lack self-driving ability. Some benefits, such as reduced driver stress and independent mobility for affluent non-drivers, can occur when autonomous vehicles are relatively costly and rare. However, most benefits, such as independent mobility for moderate-income non-drivers and affordable taxi and micro-transit services, can only be significant if they become common and affordable, and some benefits, such as reduced congestion, will require dedicated lanes to allow platooning.

to ever-changing surrounding conditions. Today's AVs are able to detect traffic lights, read road signs, track other vehicles, and scan for both bicyclists and pedestrians.

CV technologies use mainly two types of communications: cloud-based technology and two-way network data transfer between devices. The developing CV technologies can be summarized as: Vehicle-to-Infrastructure (V2I), Vehicle-to-Vehicle (V2V), and Vehicle-to-Everything (V2X). The United States Department of Transportation's (USDOT) National Highway Traffic Safety Administration (NHTSA) has adopted the six level definitions of autonomous vehicles as published by the Society of Automotive Engineers (SAE International). The six levels (designated 0 through 5) are No Automation, Driver Assistance, Partial Automation, Conditional Automation, High Automation, and Full Automation.

Various levels of connectivity and automation have been incorporated into new vehicles on the road today. Tesla, for example, has made self-parking and lane assist technology available to consumers. Automakers like Ford are planning to aggressively elevate vehicles' automation levels in the near future.

Figure 07.2 — Visualization of connected/automated vehicle technologies



Source: Shutterstock

Fully autonomous vehicles could be available to consumers in a few years. According to Reuters, Ford and GM recently asked U.S. safety regulators to grant exceptions which would allow the automakers to deploy limited numbers of self-driving vehicles without human controls such as steering wheels and brake pedals. These vehicles would solely be used for ride sharing and delivery services. While neither of these automakers are currently seeking the approval to sell self-driving vehicles, GM may roll out options for consumers by the mid 2020s, though there is still much uncertainty surrounding the timeline. In January 2023, Mercedes became the first automaker to offer Level 3 (Conditional Automation) self-driving in the U.S., and its

“ [...] the National Highway Traffic Safety Administration notes that 94% of serious crashes are due to error, and that automation has the potential to remove human error to protect drivers, passengers, cyclists, and pedestrians.”

Drive Pilot system has been approved by the state of Nevada. The automaker is also optimistic that California will “follow soon” in approving the automation for its roads.

While the autonomous vehicle landscape is ever changing, a November 2022 study by the Victoria Transport Policy Institute (VTPI) estimates that optimistically, by 2025, Level 5 (Full Automation) AVs will become safe and reliable and by the late 2020s, some of these AVs may be commercially available. They estimate that in the 2030s, some affluent non-drivers could see some benefits of fully autonomous AVs, with these vehicles becoming more affordable and common sometime in the years between 2040 and 2060. VTPI also believes that in the 2030s and 2040s, fully autonomous freight trucks and long-haul buses may become common place due to predictable routes and high operating costs. Proactive planning is needed now to channel technologies to policy objectives in the CROG region.

Connected and automated vehicle technologies have potential societal and physical implications. The USDOT estimates that over a thousand lives per year could be saved by implementing just two of the many connected vehicle safety applications the agency is developing. Similarly, the NHTSA notes that 94% of serious crashes are due to error, and that automation has the potential to remove human error to protect drivers, passengers, cyclists, and pedestrians.

Automated and connected vehicle technologies also have implications for land use patterns. McKinsey estimates that automated vehicles will reduce the need for parking space in the United States by more than 2,200 square miles (for reference, the State of Delaware is 1,982 square miles) as they don’t need space for people to enter and exit when parked and can utilize spaces that are 15% smaller. This land can be repurposed for public serving uses like housing, active transportation, or other uses as communities see fit. Conversely, there is concern that automated vehicles may contribute to sprawl as their automation may make long distance travel more palatable. It is anticipated that continued observation and responsive regulation will be needed if these technologies are to be deployed in a responsible manner that prioritizes sustainability.

Connected and automated vehicle technologies can be applied across multiple vehicle types and industries, including privately owned vehicles, shared vehicles, construction vehicles, and freight trucks. These technologies could enhance transit networks by providing first/last mile connectivity to existing transit service. Connected and automated technology could also be used on transit vehicles to improve service, for example automated bus rapid transit or use of connected and automated technologies to lower operating costs and improve safety through object detection and avoidance on rail systems.

Connected and Automated Vehicles Case Study

Current AV deployments in the United States mainly consist of small, automated shuttles operating in limited or semi-controlled environments. The first vehicle to operate on California’s roads without a driver behind the wheel was an EasyMile shuttle in March 2018. The goal of the shuttle is to encourage commuters to take transit by providing frequent and convenient connections from Bay Area Rapid Transit (BART) to employment in Bishop Ranch in Contra Costa County.

CV infrastructure in the United States is occurring both on interstate highways as well as arterials. Colorado DOT is deploying hundreds of roadside units on I-70. Cities all over the United States are participating in American Association of State Highway and Transportation Officials’ (AASHTO) SPaT (Signal Phase and Timing) challenge, deploying roadside units at signalized intersections (see Figure 07.3).

Figure 07.3 — SPaT Challenge Participants



Source: National Operations Center for Excellence, <https://transportationops.org/spatchallenge>.

Vehicle Electrification

Electric vehicles (EVs) have been an emerging technology for several decades and are now on the cusp of widespread adoption. Tesla, Volkswagen, and other EV market leaders now offer vehicles in all shapes and sizes from compact cars to full-size trucks. Today's market also provides hybrid, plug-in hybrid, and full battery electric options. Hybrids are vehicles that use both a gasoline engine and electric motor for increased fuel economy. Plug-In Hybrid vehicles also utilize both types of engines, however, they have a more powerful electric motor capable of running independently after being plugged in and charged. Lastly, Battery Electric Vehicles run 100% on battery packs and do not have an internal combustion engine, and need to be plugged in to charge. According to EV-Database, as of December 2022 the average range for market available Battery EVs was 211 miles.

Although EV adoption rates have steadily increased, their high prices, the lack of consistent charging infrastructure, and “range anxiety” stemming from limited battery range have limited purchases and market saturation. However, each of these issues is steadily improving. Today, the average battery range is around 200 miles per charge, and 200,000 miles for the life of the battery, with technology continuing to improve each. In addition, the network of charging stations continues to become more robust, and incentive programs have helped reduce the cost of EVs purchases.

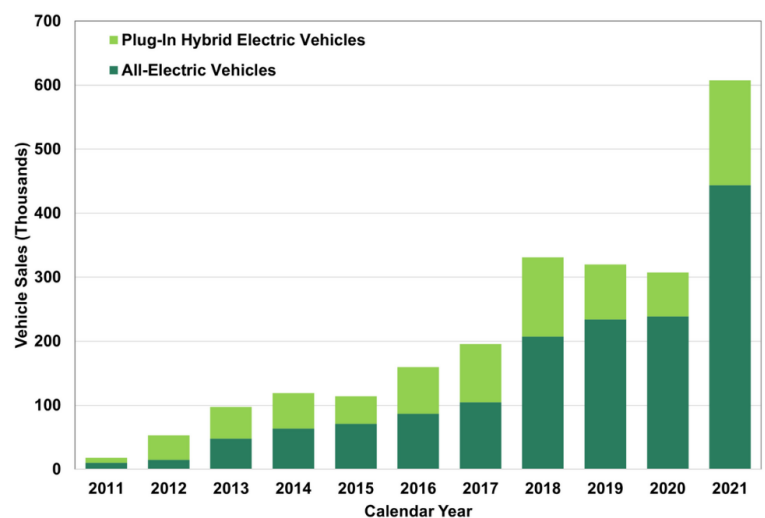
Additional policy changes that further reduce barriers to EV adoption continue to be explored and implemented.

Vehicle Electrification Trend Overview

While conditions are improving, EV ownership rates are still quite low. As of July 1, 2022, there were 25,444 EVs registered in Connecticut, a small percentage of the 2.9 million registered passenger vehicles in the state, according to state data. That said, electric vehicle sales have been increasing rapidly (see Figure 7.4) with implications for environmental benefits and demand for charging infrastructure. According to the Bureau of Transportation Statistics, there has been a 340% increase in EV sales and a 120% increase in hybrid electric vehicle sales from 2017 to 2021 in the United States.

Growth in EVs has the potential to drastically minimize the environmental impacts of the transportation system and vehicle fueling infrastructure. According to the United States Environmental Protection Agency (EPA), as recently as 2020, the transportation sector

Figure 07.4 — U.S Light-Duty Plug-in Vehicle Sales by Type, 2011-2021



Source: US Department of Energy

accounts for around 27% of greenhouse gas emissions in the US. Per the EPA, EV's typically have a smaller carbon footprint than gasoline cars, even when accounting for their manufacturing and the electricity used for charging. This difference is widening as electricity on the power grid continues to be produced more efficiently and sustainably. In an attempt to reduce greenhouse gas emissions, the Connecticut General Assembly committed in 2019 to electrify 50% of the State of Connecticut's light-duty fleet purchases and 30% of the heavy-duty fleet purchases, including transit buses, by 2030. Additionally, programs aiding with EV costs have helped accelerate EV adoption.

Future possibilities also exist for electric powered low speed vehicles (LSVs), such as golf carts and similar size vehicles. These LSVs, which commonly currently operate in areas closed to full sized vehicles, could potentially fill gaps for local transportation and first/last mile connections. There are many varieties of these vehicles available that can transport more than two people and have lower purchase and maintenance costs than gasoline powered automobiles. Regulations would need to be crafted to allow these vehicles to operate on roadways, but LSVs present an opportunity for lower cost EV transport in urban and suburban environments.

EV Infrastructure

Increased use of electric vehicles requires increased charging related infrastructure. A robust network of fast charging stations will

be necessary to foster "range confidence" and significantly increase the number of electric vehicles on the road. To this end, under the Infrastructure Investment and Jobs Act (IIJA) the federal government established the National Electric Vehicle Infrastructure (NEVI) formula program. The purpose is to provide funding to States to strategically deploy EV charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability. NEVI's initial, and current, focus is on planning.

In September 2022, the Federal Highway Administration (FHWA) approved for implementation Connecticut's Electric Vehicle Infrastructure Deployment Plan required under NEVI, titled Connecticut's Charging Ahead Plan: A Strategy to Expand Public Electric Vehicle Charging. As indicated in the NEVI guidance, states are required to fully build out their FHWA designated Alternative Fuel Corridors (AFCs), referred to as NEVI Phase 1, before funding EV charging in other locations across the state. Therefore, the current Connecticut plan focuses largely on NEVI Phase 1, which prioritizes ensuring residents and travelers are always within range of a charging station while traveling along the state's interstate highways.

Future updates of the NEVI plan will aim to plan for Phase 2, which can only start after FHWA certification that the AFCs have been built-out in accordance with NEVI requirements. As of February 2023, detailed federal guidelines for Phase 2 have yet to be finalized. Depending on the scope of this and potential other future state NEVI

phases, there could be a role for MPOs to play in planning for ensuring adequate charging infrastructure, especially in more disadvantaged and remote areas.

In addition to providing typical EV charging infrastructure, the public sector will likely need to play a role in ensuring larger scale electrical infrastructure is sufficient. This includes ensuring large vehicle charging technology is readily available as freight trucks and buses commonly require overhead charging at transit stations, overhead catenary systems, or static charging at maintenance facilities. Additionally, increased EV adoption could put a substantial strain on the electrical grid, and therefore effective coordination and planning with electricity producers and transmitters will be critical to ensure continued grid adequacy.

Equity Concerns

It is important to emphasize that EVs, their charging equipment, and related power grid improvements must be distributed in an equitable manner. Low-income households are expected to experience the greatest impact from tailpipe emission reductions. However, these communities have the highest barriers to entry because even with subsidies, electric vehicles are still cost prohibitive. Programs for low-income communities to access EVs and household charging equipment could aid in their equitable adoption. In addition, sufficiently siting charging stations in low-income communities would avoid “charging deserts”, areas where there are no publicly

accessible EV charging stations. Additionally, the infeasibility of efficient and frequent transit service heightens the importance of providing sufficient stations coverage in rural areas.

Finally, low-speed vehicles can be an equitable method for families of all income levels to gain access to EVs because of their low purchase and maintenance costs.

Vehicle Electrification Case Study

Researchers at Cornell University are working to develop a technology called inductive charging, that has the ability to charge EVs while continuing to drive. Similar to placing a cell phone on a wireless charging pad, the technology can be embedded in the pavement, while transmitting electricity through the air as a magnetic field, without the need for the battery to be in physical contact with the charging station. Khurram Afridi, an associate professor of electrical and computer engineering at Cornell stated, "Highways would have a charging lane, sort of like a high occupancy lane. If you were running out of battery you would move into the charging lane. It would be able to identify which car went into the lane and it would later send you a bill." Researchers say that the technology is able to charge vehicles up to seven inches off the ground. With current technology, it would take four to five hours to fully charge a Nissan Leaf, while larger vehicles, such as a Tesla sedans, would require longer charging times.

The origins of this technology have been

around for over 100 years with Nikola Tesla using alternating electric fields to illuminate unplugged florescent lamps in the 1890s. The idea to power cars using this technology dates back to the 1980s when California began researching it for its Partners for Advanced Transit and Highways (PATH) program. A recent pilot study in Italy was carried out at the “Arena del Futuro” by Stellantis, an international automobile company utilizing an innovative system of coils that are installed beneath the pavement and transfers energy to the vehicles, allowing vehicles to charge while driving in designated lanes.

Micromobility

Micromobility Trend Overview

The definition of micromobility has evolved over time with the introduction of new modes and technology. Micromobility can be broadly defined as any small, low-speed, human- or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bikes), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances. These may be privately owned by individuals or part of a shared micromobility system.

Purchase incentive programs have emerged as a popular technique to promote the purchase of electric bikes (e-bikes) in order to meet vehicle miles traveled (VMT), emissions, and/or

Figure 07.5 — **Dynamic Wireless Power Transfer (DWPT), Arena del Futuro, Italy**



Source: A35 Brebemi Aerial view of the Arena del Futuro; Stellantis.com .

mode share objectives. Due to the higher retail price of e-bikes, many consumers, especially those in lower income brackets, may be priced out of the market. Many programs address this issue through income-qualification or benefits targeted to specific income levels.

The State of Connecticut is working to roll out a new e-bike rebate program. Signed into law May 2022, section 7 of Public Act 22-25, An Act Concerning the Connecticut Clean Air Act, required DEEP to establish and administer a program to provide rebates and/or vouchers to residents who purchase e-bikes. Per the Act, any such rebate and/or voucher must be:

At least \$500

Limited to an eligible e-bike with an MSRP of \$3,000 or less

Designed to maximize the air quality benefits associated with the deployment of e-bikes and prioritize providing vouchers to residents of environmental justice (EJ) communities and/or residents having household incomes at or below three hundred percent of the federal poverty level, and residents who participate in certain state and federal assistance programs (LMI).

Best practice suggests that “high incentive” programs (offering larger rebates) see higher rates of participation because they induce new purchases, especially when set aside for low-income groups as opposed to low-value incentives that go to less price-sensitive consumers. Other best practices include

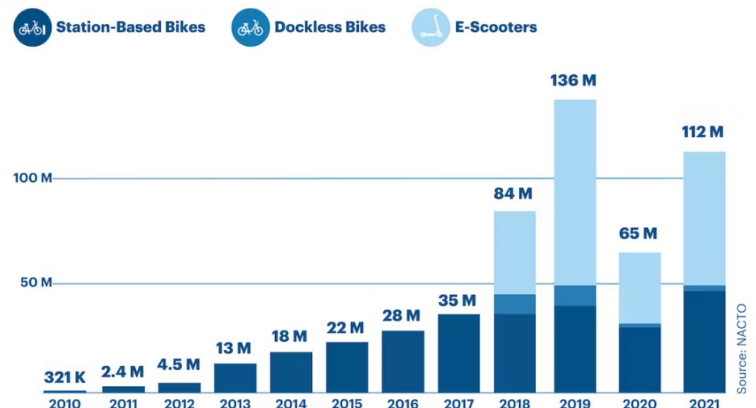
partnerships with academic institutions for tracking and data collection, partnerships with other organization and bike shops for outreach and connecting with participants, and making the application process as simple as possible. DEEP released a Request for Proposals (RFP) in November 2022 to eligible contractors for the development of the statewide E-Bike Incentive Program. It is anticipated that project design will be developed by early January and the program will be launching in late winter/early Spring 2023. It remains to be seen what the final CT program will look like.

While programs like shared bikeshare have been around since the 1960s, modern shared micromobility services rely on a few key innovations such as automated management of vehicles, most notably unlocking and locking of vehicles; user account management, including automated payment and linking trips to discourage theft; and real-time tracking of vehicles through

Figure 07.6 – **Micromobility Ridership Chart**

Shared Micromobility Ridership in the U.S. from 2010-2021

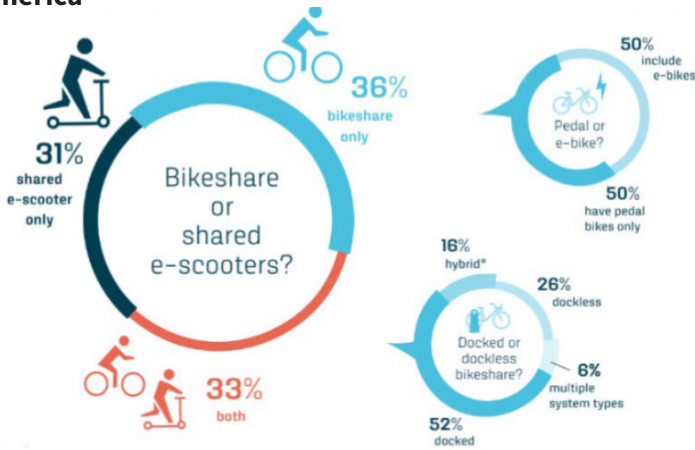
IN MILLIONS OF TRIPS



Since the introduction of the country's first bike share system in 2010, people in the U.S. have taken half a billion trips total on shared micromobility

Source: NATCO

Figure 07.7 — Make-Up of Micromobility Programs in North America



Source: NABSA

GPS. Transitioning from person-powered vehicles to ones assisted or powered by electric motors has spurred tremendous growth of these transportation modes since 2018, with a lot of the development occurring in the area of e-scooters.

In some markets, the ability to offer both e-bikes and e-scooters has given consumers different options, allowing users to make decisions depending on cost, trip type, or trip length. Improved battery technology, and bikes/scooters that are easily located via GPS linked phone apps. has made using this travel mode relatively affordable. In addition, most service providers offer some version of a reduced fare program for qualifying individuals, such as the LINK-Up program in Hartford that offers a 70% discount on rides to individuals who qualify for any local, state, or federal assistance program (SNAP, Husky Health, Medicaid, reduced fare card, etc.).

Within a relatively short timeframe, these providers have created a new mobility option for many people in cities nationwide. According to the National Association of City Transportation Officials (NACTO), the number of shared bike trips in the top 100 largest U.S. cities has increased from 320,000 in 2010 to 84 million in 2018 to 136 million in 2019. The bike and scooter share company Lime announced that globally, it had surpassed 250 million rides in 2021. More locally, as of November 2022, in just the year and a half that Superpedestrian has offered e-scooters to Hartford residents, it has had more than 320,000 individual trips accounting for over 690,000 miles traveled.

According to NACTO’s 2020-2021 Shared Micromobility report, other modes of shared mobility have continued to struggle with reduced ridership since the outbreak of the

Quick Fact

According to the US Department of Energy, more than 50% of vehicle trips in 2021 were less than three miles. Shifting some of these trips to bikes or scooters could help reduce transportation related emissions.



pandemic; however micromobility ridership in the U.S. had nearly rebounded to pre-pandemic levels in 2021 with 112 million trips.

While not suitable for very long trips or all trip types (for example for those needing to transport other passengers or baggage) micromobility has the potential to serve a large portion of trips in a sustainable, on-demand fashion. According to the U.S. Department of Energy, in 2021, 52% of all trips, including all modes of transportation, were less than three miles, with 28% of trips less than one mile. Shifting some of these trips to bikes or scooters could help reduce transportation related emissions.

Micromobility Case Study

E-scooters have been launched in numerous cities across the United States, including Atlanta, Austin, Denver, Chicago, Washington DC, Los Angeles, San Jose, Seattle, New York City, and San Francisco, as well as several in Connecticut, most notably Hartford and Bridgeport. Most e-scooter trips are one to two miles long. While some of these trips may otherwise have been made by walking, some likely would have been made using a vehicle, while others are enabling new connections to transit. Public perception of e-scooters is also highly favorable. A Populus survey of over 7,000 individuals across ten major US cities found that 70% of respondents favored e-scooters. Support for scooters was generally higher for lower income individuals, indicating that e-scooters can provide an affordable transportation option.

Shared Mobility/ Mobility as a Service

Shared Mobility/ Mobility as a Service Trend Overview

Shared mobility and mobility as a service (MaaS) is a move from commodity-based consumption of transportation (owning a car, bike, etc.) to a service-based model (consuming a trip on a shared service) that relies on a digital platform to integrate end-to-end trip planning, booking, ticketing, and payment services across all modes of transportation, public or private. Shared mobility/MaaS includes car and ride share, like transportation network companies Uber and Lyft, as well as bikeshare and on-demand shuttle services. The idea behind MaaS is that it allows the user to customize their trip using their preferred transportation modes, based on cost, time, and convenience. MaaS should also allow users the ability to use the same app regardless of city, without the need to become familiar with a new app or having to sign up for new services. Although the U.S.

Figure 07.8 — Mobility as a Service (MaaS) concept



Source: Mikko Lemola, Shutterstock

trails Europe in terms of shared mobility/MaaS, these services have grown rapidly throughout the country in recent years.

When the COVID-19 pandemic hit in March 2020 resulting in mass worldwide shutdowns, car manufacturers expected a huge decrease in demand for new cars. As a result, microchip manufacturers scaled back automobile related chip production and were unable to meet the demand upon a rebound in automobile demand. Similarly, initial reduced demand prompted rental car companies to sell large portions of their fleets. When demand rebounded, the reduced supply resulted in prices that were 75% higher than pre-pandemic levels. The resulting high cost and lack of new and rental car availability, coupled with improved carsharing business models and technologies, has resulted in a booming carsharing market.

According to Susan Shaheen of UC Berkeley, even prior to the pandemic, global membership in carsharing services had grown tremendously from around 350,000 in 2006 to 15 million in 2016. This growth trend has continued despite the pandemic, with Carsharing Telematics Market – 5th Edition, estimating that at the end of 2021, there were 86 million carsharing memberships worldwide, with that number expected to increase to over 224 million by 2026. According to Global Market Trends, the carsharing market size exceeded \$2 billion in 2020 and could reach \$9 billion by 2026, as approximately 10% of the population is expected to use carsharing as their primary mode of transportation by 2025. Companies such as Zipcar, Turo, Car2go,

and Getaround continue to gain more users as they provided a convenient and economical alternative to traditional rental options.

Shared Mobility/ Mobility as a Service Case Study

An article published by Giuseppe Musolino in August 2022 titled *Sustainable Mobility as a Service: Demand Analysis and Case Studies* describes a study from Sydney, Australia, that was carried out with its objective being to investigate the role of MaaS and improving travelers' experience using multiple integrated transport services. At the onset of the study, surveys were distributed to gather information from five separate categories: 1. Current travel behavior; 2. preferences for on-demand transport services; 3. MaaS scheme preferences; 4. attitudes towards cars, public transportation, MaaS, and new technologies and services; 5. socio-economic conditions. These scenarios included an extended set of transport modes: local public transportation, long distance public transportation, taxis, car rentals, carshare, rideshare and bikeshare models. Researchers also created a model called a Latent Class Choice Model (LCCM), that was based on random theory to estimate travelers' preferences for MaaS. The model had two different components. The first was a class membership model, which expressed the probability that a traveler belongs to a specific segment, or class. The second component was a class-specific choice model, which showed the probability that a traveler chooses a specific alternative, or MaaS scheme, that was identified in terms of the

availability of transportation modes and fares. The results of the model identified five classes of users. First, individuals in class 1 (14% of the population) had the greatest propensity (87%) of purchasing MaaS, while individuals in class 5 (41% of the population) had a near zero propensity to purchase any MaaS scheme. The survey and model depicted that the highest demand for MaaS was generally among young, middle-aged individuals and those who live in low-income suburban areas and depend on public transportation. The demand for MaaS was lower among older individuals and among individuals who lived in wealthy car-dependent suburban areas. Local public transportation, taxis, and long-distance public transportation were the most popular transportation services, followed by car rentals and rideshare services.

Smart Cities

Smart Cities Trend Overview

Underlying all of the above is a move towards smart cities. Smart cities are defined broadly as urban areas that use sensors as well as different types of electronic methods to collect specific real-time data. That information is then used to manage city assets and services more efficiently. The data collected is then processed and analyzed

allowing the monitoring and management of traffic and transportation systems as well as various other community services. As the production of transportation related data increases (through people's uses of connected devices as well as sensors on vehicles and in infrastructure), there is an opportunity to leverage this data to provide enhanced services that better meet constituents' needs.

One example of a smart city application is traffic signal performance measure technology. Here, a small computer is installed in a traffic signal cabinet to collect, analyze, and transmit information to a website about the number of vehicles passing through and the associated signal timings. Consecutive traffic signals can all be connected on one corridor to derive a more comprehensive analysis. Analyses are created automatically and include percentage of arrivals on green, queue length, delay, time space diagrams, and more. Traffic signal performance measure technologies are currently operational in Norwalk and Danbury, CT.

Smart Cities Case Study

Kansas City created a digital roadmap to enable smart city solutions. The roadmap outlines ways to collect, analyze, share, and leverage data across city departments to enable leaner and more efficient governance.

“ Smart cities are defined broadly as urban areas that use sensors to collect real-time data that is used to manage city assets and services more efficiently.”

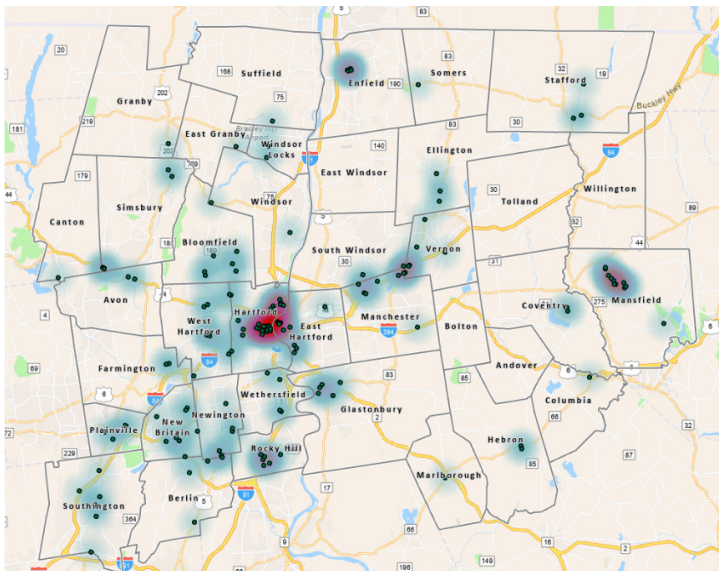
Smart city approaches are also being deployed specifically in the transportation sector. The Colorado Department of Transportation is currently developing a Smart Mobility Plan that will serve as a blueprint for deploying connected, automated, and smart technologies statewide. The intent of the plan is to identify technology solutions that can advance the State's transportation equity, accessibility, and maintenance goals in addition to traditional physical infrastructure solutions.

State of Trends in CROG Region

Connected and Automated Vehicles

Connecticut, like the rest of the world, is grappling with how to respond to the rapid rise and evolution of CVs/AVs. In order to keep pace with more than 20 other states that have greenlighted legislation related to testing AVs, the state passed a law in 2017 establishing a pilot program to test AVs and also formed

Figure 07.9 — EV Charging Stations in the Capitol Region



Source: Electric Vehicle Charging Stations, CTDData

a 15-member task force to study AVs.

In 2018, Stamford and Windsor Locks were the first to apply for the State's new Fully Autonomous Vehicle Testing Pilot Program, which is administered by the Office of Policy and Management (OPM) with assistance from CTDOT, Department of Motor Vehicles (DMV), Department of Emergency Services, and Connecticut Insurance Department. In 2021, the State published its first ever, statewide CAV strategic plan

Over the next few years, CTDOT will begin testing AVs on a 10-mile stretch of the Berlin Turnpike. To enable this, CTDOT is currently in the process of replacing and upgrading 28 signalized intersections near CTDOT's headquarters. These projects will serve as early adopters for testing and deploying emerging traffic signal technologies including Vehicle to Infrastructure (V2I) applications, traffic signal priority, adaptive signal control, and automatic traffic signal performance measures (ATSPM). Signal system construction is ongoing with operations expected to begin following construction completion.

Vehicle Electrification

Connecticut, through EVConnecticut (a partnership between the state's Department of Energy and Environmental Protection and Department of Transportation), has implemented policies that provide financial incentives to buy electric vehicles, and to build and host EV charging stations. The growing number of charging stations in the state are currently primarily located

in urban areas along major highways. Figure 07.9 shows charging station locations within the Capitol Region.

CTDOT has also released Phase One of its National Electric Vehicle Infrastructure plan to implement fast charging stations every 50 miles and within five miles of major highway corridors, particularly interstate highways. This initial network will provide the basis for a robust statewide EV charging network. Pending initiation and scoping of CTDOT's Phase Two planning work, CRCOG is envisioning undertaking a regional EV study to complement CTDOT's NEVI plans.

Micromobility

The CRCOG region gained its first micromobility asset in June 2018 with the arrival of the dockless bikeshare company LimeBikes. The pilot ended in February 2019.

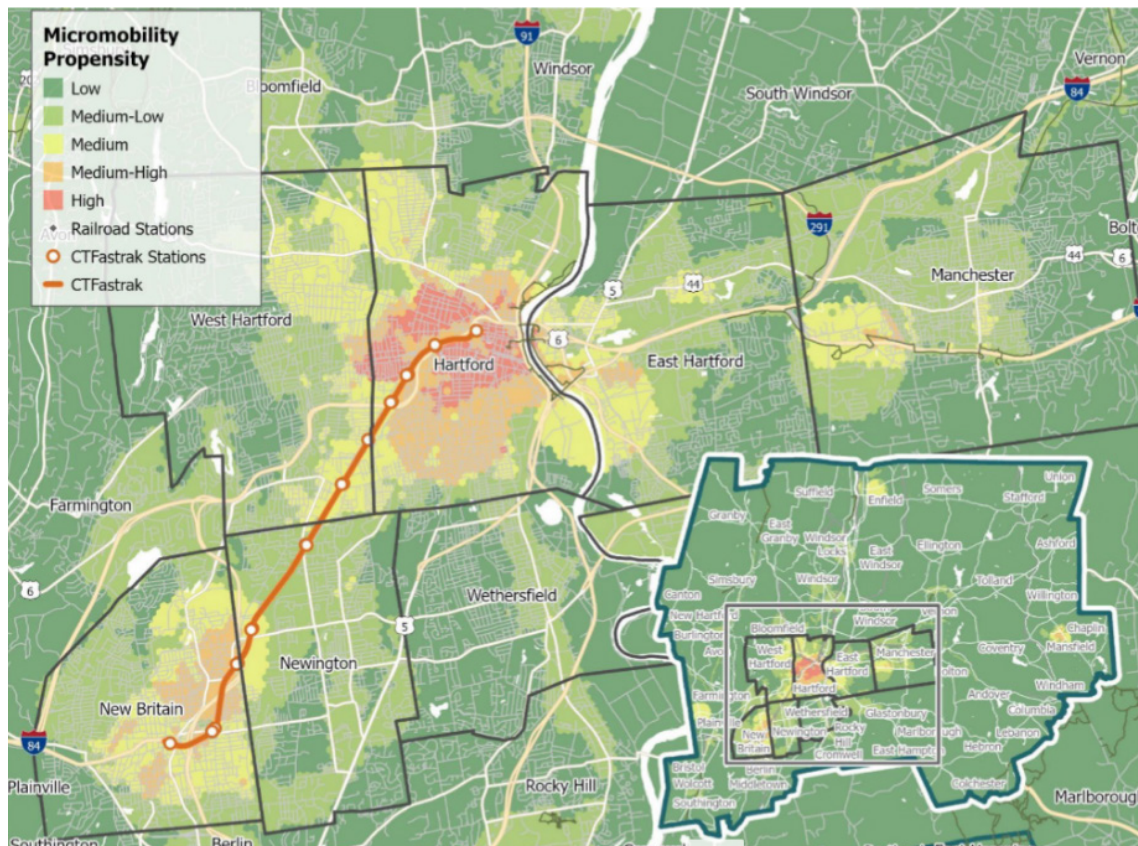
Figure 07.10 — Micromobility Propensity Metrics

Metric	Measure	Source	Weight
Population	Density	American Community Survey (ACS) 2019 5-year averages	2
Population 150% of federal poverty line*	Density	ACS 2019 5-year averages	1
Non-White Population	Density	ACS 2019 5-year averages	1
Employment	Density	Longitudinal Employer-Household Dynamics (LEHD) 2018	2
Retail and Hospitality Employment**	Density	LEHD 2018	1
Bicycle Commuters	Density	ACS 2019 5-year averages	1
Points of Interest	Count	Connecticut Open Data Website	1
Colleges & Universities	Count	Connecticut Open Data Website	2
Parks	Count	Connecticut Open Data Website	1
Bicycle Trails	Density	Connecticut Open Data Website	2
CTfastrak Station & Commuter Rail Elevation	Distance	Connecticut Open Data Website	1
	Delta	United States Geological Survey	-1

Source: CRCOG

Data shared by LimeBikes showed that 92% of the 25,000 trips taken in the first 100 days ended in Hartford with nearly 1,000 trips ending within 40 feet of a city bus stop. It wasn't uncommon to find bikes in other towns in the region, signaling a desire in the CRCOG region for micromobility options. Currently, Hartford is served by Superpedestrian, which is the only large scale micromobility system

Figure 07.11 — Micromobility Propensity Map



Source: CRCOG

in the region. The success of that system has generated renewed interest in revisiting the feasibility of establishing a regional system. In the fall of 2022, CROG completed a Regional Micromobility Feasibility Study in which the viability of a multi-jurisdictional micromobility system expanding out from the City of Hartford was studied. The vision of this study was to provide residents and visitors of all incomes and physical abilities, a way to travel in a convenient and sustainable manner that benefits both the environment and personal health.

As part of the study, a micromobility index was developed to outline the most suitable areas for micromobility in the region. This method included a variety of metrics as shown in Figures 7.10 and 7.11. The results were then mapped to highlight areas with the highest and lowest micromobility propensity. Areas with the highest propensity are downtown Hartford and New Britain, with propensity generally declining as one moves away from these centers. Notably, there is also medium to medium-high propensity along the length of CT **fastrak**, as well as in East Hartford, West Hartford, Manchester, Wethersfield, and the Storrs section of Mansfield. These results echo national trends in micromobility usage, as micromobility riders tend to be younger and more transit-dependent, and usage is higher in areas of higher job and population density and with higher-quality transit.

Smart Cities

The Capitol Region has not yet implemented technology associated with Smart Cities. As

mentioned earlier in this section, Norwalk and Danbury have implemented traffic signal performance measure technology. In the summer of 2022 it was announced that a potential 105-acre site at UConn's Mansfield campus had been identified for the proposed Connected and Autonomous Vehicle test track and research center.

In June 2017, Connecticut passed a law that established a pilot program allowing manufacturers and fleet service providers to test AVs in up to four municipalities. The law outlines the requirements for testing and requires participating municipalities to enter into agreements with AV testers. The law established a 15-member task force to study AVs and develop legislative recommendations for regulating AVs. The task force also evaluated the pilot program established under the law. The task force consisted of six legislative appointees, three legislative transportation committee appointees, two governor appointees (one with insurance expertise), and four ex-officio members representing the DMV, CTDOT, state police, and the Office of Policy and Management. The task force convened for the first time in June 2018. In addition to the inter-agency taskforce, CTDOT formed an internal working group to build their knowledge base and expertise in CV/AV related issues.

CTDOT's Traffic Signal Management Plan and Strategic Plan for Implementing CVs/AVs highlight the current status of CV/AV technologies and justify next step strategies, investments, and partnerships. The plan outlines CV/AV interests and needs by bureau/office, identifies Connecticut's mission, vision,

goals, and objectives, presents an internal organizational structure for the implementation of CV/AV in the state, and provides an action plan with roles and responsibilities separated into four time frames (immediate, near term, mid-term and long term). CTDOT is also looking to update its existing statewide ITS Architecture to include CV/AV applications.

Short-Term Recommendations

1. Priority areas for CV/AV/EV infrastructure

CV/AV/EV technologies are being developed rapidly by private automakers. While the timeline for widespread adoption is uncertain and likely several decades out, now is the time to identify priority locations to deploy such technologies to best meet the CROCOG region's specific needs through advance planning, pilot projects, and infrastructure investments.

2. Regional EV Study CROCOG should undertake a regional EV study to prioritize local EV charger locations, grid infrastructure, and equitable access to vehicles and charging equipment. This study should complement the state's NEVI Phase 1 and 2 plans

Ongoing Efforts

3. Interoperability and integration

Several new and emerging technology trends are occurring concurrently. Even as private companies advance their own technologies and services, CROCOG and the region's local governments have a role to play in fostering an interoperable

and integrated transportation system that puts people's needs first.

4. Incentives/disincentives (VMT, ZOV, Congestion) While new technologies have the potential to foster more sustainable, efficient transportation, their impacts on traveler choices and behaviors are unknown. For example, with inexpensive automated vehicle trips people may opt to take more or longer trips, or to shift trips from fixed route and schedule transit to on-demand automated vehicles. This behavior could result in more vehicle miles traveled and congestion. CROCOG has a role to play in incentivizing behavior that contributes to a more sustainable, efficient transportation system and disincentivizing behavior that creates the opposite outcome. Several policy options exist for this, including congestion or cordon pricing, vehicle mile traveled pricing, or fees for zero occupancy trips and discounts for higher-occupancy shared trips.

5. Supporting infrastructure for micromobility Micromobility devices are currently being deployed on existing streets, sometimes resulting in conflicts with pedestrians, vehicles, and cyclists. The proliferation of these new devices provides an opportunity to rethink street design and consider what the complete street of the future may look like, and where and how they can be safely integrated to maximize travelers' choices.

Chapter 08

Transportation Performance Management

Transportation performance measures and targets describe how well the transportation system is functioning in quantitative terms and then set future targets for system performance based on calculated values, recent trends, and assumed future funding levels. Both states and Metropolitan Planning Organizations (MPOs) are now required to incorporate Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) performance measures and targets into their planning practices. However, an MPO may either support statewide targets set by the state or set its own, along with assuming the responsibility of achieving them.



Greater Hartford Transit District vehicle being serviced at their new operations and maintenance facility

For its first round of target setting (2018-2022), the Connecticut Department of Transportation (CTDOT) set statewide performance measure targets that assume a continuation of 2017 state and federal transportation funding levels. CROCOG has chosen to support these statewide targets. This chapter summarizes performance trends and targets for the three FHWA categories of Safety, Infrastructure Condition, and National Highway System Performance as well as the two FTA categories of Transit Asset Management and Transit Safety. The set of performance targets used in the 2019 update of the MTP are included for reference in Appendix B. As the national highway system (NHS) features prominently in FHWA performance measures, a map can be consulted in Chapter 3. The application of transportation performance-based management with respect to FHWA and FTA mandated performance measures and targets can also be found in Chapter 2 on Rail and Transit, Chapter 3 on the Highway System, and Chapter 6 on the Freight system. CROCOG is committed to continuing advancing the practice in performance-based management in transportation planning by incorporating targets and tracking progress through measures. Additionally, CROCOG is contemplating creating an annual standalone performance measures report to monitor progress towards adopted targets.

Safety Measures (PM1s)

Long-term trends towards fewer crashes and increased safety, at first helped by improved

roadside and vehicle safety features as well as seatbelt usage, began to reverse before the 2020 COVID-19 pandemic and accelerated after the pandemic. Decreased traffic volumes due to economic slowdown and remote work as well as more aggressive and distracted driver behavior led to an upshot in traffic fatalities and serious injuries. Although, traffic fatalities had begun to increase again immediately before the pandemic, this unfortunate trend accelerated during COVID at both a state and national level. Additionally, there has been an increase in the number of non-motorized fatalities and serious injuries, likely partially due to the increased bicycle usage nationally and within the region. The increased volatility in yearly crash fatalities and serious injuries has led to CTDOT to use alternative methods of setting targets instead of historical five-year moving averages. The new trendline approach better mitigates the impact of more extreme yearly swings in fatalities and serious injuries in establishing targets based on recent measures of performance. While immediate targets are based on an expected number of crashes, the ultimate goal remains to eliminate all fatal and serious injury crashes.

Infrastructure Conditions Measures (PM2s)

The condition of highway pavement and bridges are covered by the infrastructure measures. Both highway pavement and bridges can be rated as either “good”, “fair”, or “poor”, with the performance measures/targets centering around the proportion of

highway pavement or bridges (by deck area) that are in “good” and “poor” condition, from which the remaining proportion is rated as “fair”. Pavement conditions have improved and targets have become more aggressive statewide between 2018 and 2022. Within the CRCOG region, the proportion of pavement in poor condition has held steady, but several sections of highway have gone from “good” to “fair. At the state level, bridge conditions have worsened as more have moved from “good” to “fair” and some from “fair” to “poor”. CRCOG, in contrast, saw its proportion of “poor” condition bridges sharply decrease with completed repairs made to the Hartford I-84 Viaduct. However, in the same timeframe, the proportion of “good” condition bridges decreased slightly. Ongoing and planned repairs can work to improve these numbers and stay ahead of the curve on aging bridge infrastructure repairs.

National Highway System Performance (PM3s)

Congestion on the National Highway System (NHS) and the resulting impacts on the natural environment are major policy concerns. While CRCOG’s Congestion Management Process (CMP) covered in Chapter 3: Highway System of the MTP provides the most detail on congestion issues facing the region. The more succinct Federal measures and targets for travel time reliability and related environmental impacts are discussed here. Between 2018 and 2022, the general level

of travel time reliability (LOTTR) for all vehicles on the NHS improved, helped in part by travel behavior changes beginning in the COVID pandemic. Truck travel time reliability (TTTR), important for the movement of commercial freight, also saw similar improvement during this timeframe. However, it is unclear whether these positive trends will continue in the future if travel behavior returns to the pre-pandemic norm.

The emissions-based targets have generally increased or in the case of VOC and PM2.5. However, in the case of NOx, they have decreased. It should be noted that these emissions-based targets are based on rates of reduction and therefore benefit from large transit projects being counted towards one year, usually at the beginning. As these new transit services become operational, their “benefit” to the rate of emission reduction (as calculated here) decreases. Two new measures: the percentage of non-single occupancy vehicles (Non-SOV) and peak hour excessive delay (PHED) measures were not implemented in the last major target setting effort in 2018 as neither CRCOG nor any other COG in Connecticut met the population threshold that required action beginning in 2018. Non-SOV and PHED are computed for urbanized areas (UZAs) as opposed to MPO boundaries. As such, CRCOG must consider targets for two UZAs: one for the Hartford UZA and the other for the Springfield, MA UZA, which includes several communities in the north of CRCOG such as Enfield and Suffield. While CRCOG will give

full consideration and move to adopt the targets set by CTDOT for the Hartford UZA, the Springfield UZA targets were set by a taskforce of Massachusetts MPOs and MassDOT and will be duly noted and considered by CROCOG but do not have to be formally adopted.

Transit Measures

Transit performance management currently covers two sets of targets: transit asset management (TAM) and public transit agency safety performance (PTASP). TAM targets were first implemented in 2018 whereas the implementation of PTASP targets was repeatedly delayed until 2020. While CROCOG does not control or have any direct influence on transit providers within the region, it can still play a role in advocacy, coordination, and planning of public transportation policy. In Connecticut, targets are set by individual transit services or by CTDOT for specific services under its direct control. The relevant six services for CROCOG include CTtransit – Hartford Division, Arrow Line Acquisition, Collins Bus Service, DATTCO, New Britain Transit, and the Greater Hartford Transit District (GHTD). The associated transit service areas do not necessarily correspond to CROCOG’s borders. For TAM targets, key concepts include the useful life benchmark (ULB) for rolling stock and the transit economic requirement model (TERM) scale for facilities. TAM targets relate to rolling stock, facilities, and infrastructure (in the case of rail service) for six transit services.

The more recent PTASP targets measure fatalities, injuries, safety events both in terms

of counts and events over a set unit of VMT, as well as system reliability for the same six transit services. All transit services covered by CROCOG are targeting zero (0) fatalities, and minimal injuries and safety events. They also seek to minimize disruption through system reliability, which is reported in the form of vehicle revenue miles per mechanical issue.

Performance Management Requirements

According to the FHWA, Transportation Performance Management (TPM) is a “strategic approach that uses system information to make policy and investment decisions to achieve national performance goals.” The TPM approach ensures that investments in transportation infrastructure are performance-driven and outcome based. Transportation planning agencies also apply TPM principles when making decisions about where to invest resources.

The MAP-21 federal funding legislation of 2012 established a performance and outcome-based program with the main objective to invest resources in projects that collectively lead toward achieving seven national goals: safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, and environmental sustainability.

MAP-21 required states and MPOs to establish performance measures in key areas related to the above mentioned seven national goals, and it required states to set performance targets in support of those measures. States were to coordinate with

MPOs in setting the targets, and MPOs were required to either support the statewide targets or set their own. It also required the following plans to include State targets (and/or MPO targets, as appropriate):

- Metropolitan Transportation Plan
- Transportation Improvement Program (TIP)
- Statewide Transportation Improvement Program (STIP)
- State asset management plans under the National Highway Performance Program (NHPP)
- State performance plans under the Congestion Mitigation and Air Quality Improvement program

Additionally, MAP-21 required reporting on progress in achieving set performance targets. It required states to report on the condition and performance of the National Highway System (NHS); the effectiveness of the investment strategy document in the State asset management plan for the NHS; and the ways in which the State is addressing congestion at freight bottlenecks.

In 2015, MAP-21 was superseded by the FAST Act federal funding legislation, which continued MAP-21's overall performance management approach. The FAST Act made only a few changes to MAP-21's performance management provisions. Congressional legislation in this area was codified in 23 C.F.R. (Code of Federal Regulations) Part 490, where the description, composition, and calculation methodologies for these performance measures are detailed. The Infrastructure Investment and Jobs Act

(IIJA) of 2021 provided a larger new pool of funding for supporting transportation infrastructure, and TPM will play a major role in prioritizing projects.

Goals and Objectives of Existing and Future Plans

For over a decade, CROCOG's Long Range Transportation Plan (LRTP) from 2011 and LRTP Update in 2015 have put forth a number of commitments to good planning outcomes on behalf the Council of Governments:

- Developing a transportation system that offers more and better travel choices
- Developing a good regional transit system as an alternative to the automobile
- Developing a bicycle and pedestrian system
- Create a sustainable transportation system by linking land use and transportation
- Emphasis on environmental justice
- Better systems operation and management

The future role of performance management in transportation planning was first mentioned in the 2015 LRTP Update and was finally implemented in the 2018 Metropolitan Transportation Plan (MTP) Update (the LRTP process was renamed MTP). The goal of the 2018 MTP Update as it relates to performance measures was to be informed by local experience and expertise and create a more fully institutionalized process of Transportation Improvement Program development shaped by long-range plan goals, measurable objectives and performance targets.

As of the 2022 MTP Update, there are seventeen (17) FHWA and nine (9) FTA performance measures actively required of CRCOG. FTA performance measures are listed in their basic form, although they can be further subdivided into more specific vehicle and facility types by provider. Two environment and congestion related measures along with four transit safety measures are applicable to CRCOG for the first time this year. Their inclusion in this document reinforces that CRCOG’s MTP is performance-based and conveys CRCOG’s efforts in implementing

a transportation planning program that is focused on achieving performance targets.

Systems for Measuring Performance

CRCOG and CTDOT have collaborated with one another to advance the practice of monitoring performance measures in Connecticut. One area of cooperation has been in the preparation and implementation of systems for measuring and monitoring the performance of transportation facilities and services. Such systems require identifying data sources and

FHWA Performance Measures

Safety Measures

- Number of Fatalities
- Rate of Fatalities per 100 Million Vehicle Miles Traveled
- Number of Serious Injuries
- Rate of Serious Injuries per 100 Million Vehicle Miles Traveled
- Number of non-Motorized Fatalities and non-Motorized Serious Injuries

Infrastructure Conditions

- Percentage of Pavements on the Interstate System in Good Condition
- Percentage of Pavements on the Interstate System in Poor Condition
- Percentage of Pavements on the non-Interstate NHS in Good Condition
- Percentage of Pavements on the non-Interstate NHS in Poor Condition
- Percentage of NHS Bridges Classified as in Good Condition (by Deck Area)
- Percentage of NHS Bridges Classified as in Poor Condition (by Deck Area)

System Reliability

- Percentage of Person-miles Traveled on the Interstate System that are Reliable
- Percentage of Person-miles Traveled on the non-Interstate System that are Reliable
- Truck Travel Time Reliability Index on the Interstate System
- Total Emissions Reduction for Volatile Organic Compounds (VOC), Nitrous Oxides (NOx), and Particulate Matter (PM2.5)
- Percentage of Non-Single Occupancy Vehicle Use (Non-SOV) for the Urbanized Area
- Peak Hour Excessive Delay per Capita for the Urbanized Area

FTA Performance Measures	
TAM	Percentage of (Revenue-Generating) Buses Past Their Useful Life Benchmark
	Percentage of Rubber Tire Vehicles Past their Useful Life Benchmark
	Percentage of Automobiles Past Their Useful Life Benchmark
	Percentage of Sports Utility Vehicles Past Their Useful Life Benchmark
	Percentage of Facilities Past Their Useful Life Benchmark
Safety	Fatalities per Hundred Thousand (or per one Million) Vehicle Revenue Miles
	Injuries per Hundred Thousand (or per one Million) Vehicle Revenue Miles
	Safety Events per Hundred Thousand (or per one Million) Vehicle Revenue Miles
	Vehicle Revenue Miles per Mechanical Failure

available data, considering and establishing target values for the required indicators, and determining methods of assessing the impact of investment strategies upon indicator values. CTDOT’s pavement and bridge management system provides a possible prototype for establishing performance management in other areas (for more information, see Best Practices Section at the end of this chapter). This system provides advanced analytical capabilities that integrate strategic planning with capital investment decision making and performance outcomes.

CTDOT has also advanced its target setting methodology beyond the using the most recent year’s data as a target for the next, instead relying on trendline and regression analysis informed by desired policy outcomes which sometimes result in slightly more aggressive targets. Some of the challenges in setting up performance management systems continue to include a lack of historical data to establish trend or baseline indicator values and difficulty in assessing the actual or projected impact of strategies or projects upon indicator values.

This work provides the basis for recommending further enhancements to CRCOG’s performance management system. In particular, CRCOG is seeking to integrate performance management information into its capital programming processes in order to help to evaluate and prioritize candidate transportation investment projects by their potential effectiveness in improving system performance.

Current Performance

CROCOG has assessed the region's current performance in attaining the federally required performance targets using available data resources. Although CROCOG has traditionally adopted statewide targets set by CTDOT and affiliated institutions rather than setting its own regional targets, regional-level measures give an indication of how CROCOG is doing relative to the rest

of Connecticut. Performance measures results are summarized in the table below.

The following sections provide a more detailed summary of the region's performance under each goal area and performance area, as well as the statewide targets it has supported.

Safety (FHWA)	Fatalities and serious injuries have begun to increase again during the COVID 19 pandemic.
Infrastructure Conditions (FHWA)	Pavement conditions have improved overall, as the proportion of pavement in poor condition has held steady or slightly improved. Bridge conditions have improved considerably owing to completion of I-84 Viaduct repairs.
System Performance of NHS (FHWA)	Travel time reliability for general traffic and trucks improved considerably during pandemic.
Transit Asset Management (FTA)	TAM targets continue to show improvement, although meeting the targets set has not yet occurred.
Transit Safety (FTA)	Transit safety targets are newly implemented, and the providers covered within the CROCOG region are aggressive in their goals of minimizing fatalities and injuries.

Safety Measures (PM1s)

Traffic crashes, fatalities, and injuries generate substantial costs in terms of property damage, lost productivity, medical costs, insurance costs, and legal costs, not to mention loss of life or drastic changes in quality of life.

The federally required measures involve fatalities, fatality rates, serious injuries, serious injury rates, and fatalities and serious injuries involving non-motorized travel.

The CRCOG and State actual measures of performance, as well as the statewide targets are given in Table 08.1 below.

Since the population of CRCOG comprises slightly less than one-third of Connecticut’s population, it can be seen in Table 08.1 that it has a roughly proportional number of fatalities and serious injuries as a percentage of the

state total. CRCOG has chosen again to support the state safety targets in 2022 rather than set its own. CRCOG will continue to focus its efforts on reducing fatalities and serious injuries within its region both on its own initiative and with the help of existing state programs.

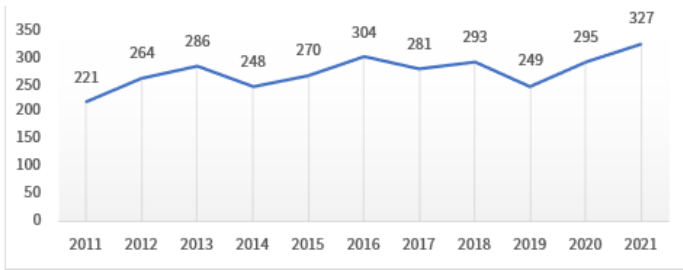
Figure 08.1 illustrates trends in safety performance across four measures throughout the state of Connecticut. As can be seen, fatalities and the fatality rate per 100 million vehicle miles traveled (VMT) have been increasing in recent years. The number of serious injuries as well as the rate of serious injuries per 100 million VMT have also seen a rise in recent years since the pandemic began. Non-Motorist Fatalities and Injuries had finally begun to decrease right before the pandemic but began increasing again in 2021.

Table 08.1 – Safety Measures and Targets

Performance Indicator	CRCOG Measure (2023)	State Measure (2023)	State Target (2023)
Number of Fatalities	104	327	270
Fatality Rate per 100 million VMT	1.03	1.064	0.85
Number of Serious Injuries	369	1521	1300
Serious Injury Rate per 100 Million VMT	3.66	4.951	4.3
Number of Non-Motorized Fatalities and Serious Injuries	68	296	280

Figure 08.1 – Historical Statewide Safety Trends

a) Fatalities



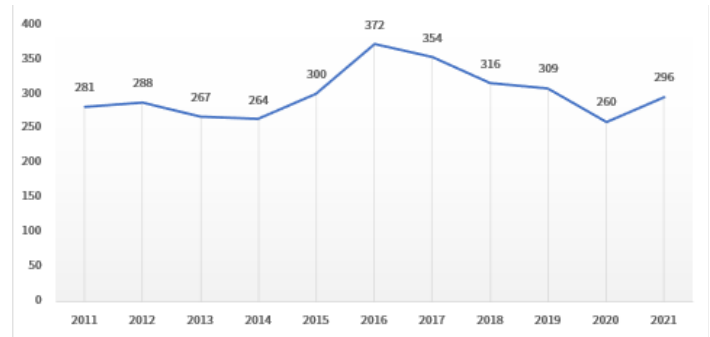
d) Serious Injury Rates



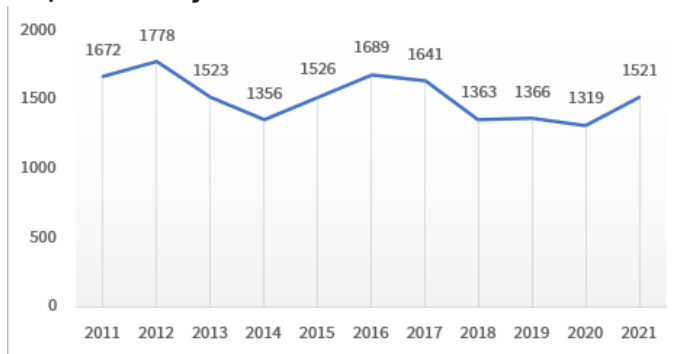
b) Fatality Rate



e) Non-Motorist Fatalities & Serious Injuries



c) Serious Injuries



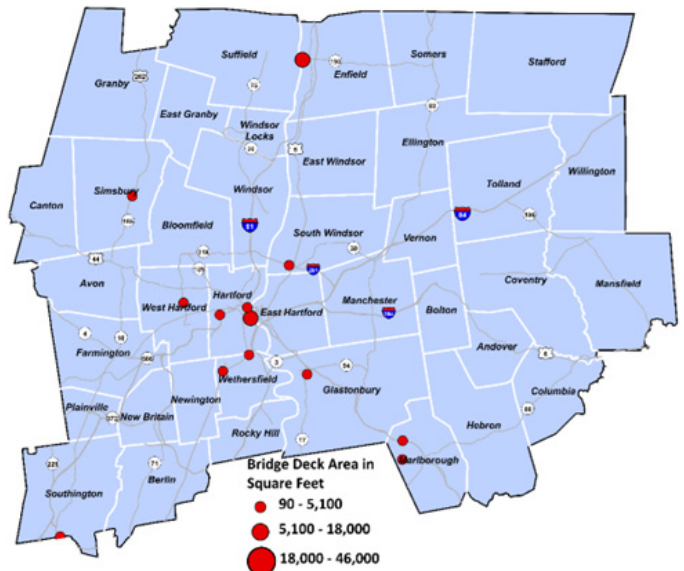
Data Sources: CTDOT and UCONN Data Repository

Infrastructure Condition Measures

Roadway travel and deferred maintenance have accelerated the deterioration of roadway pavement and bridges, which have resulted in increased costs attributable to travel delays, safety hazards, fuel consumption and emissions, and vehicle operating costs. Deterioration ultimately requires increased maintenance of these infrastructure facilities. There are four targets for pavement conditions and two for bridges along with actual measures CRCOG and state performance found in Table 08.2. CRCOG has again chosen to support the statewide targets set by CTDOT for 2023. Conditions are generally improving both in CRCOG and statewide, and targets have become more aggressive. It should be noted however, that in addition to “good” and “poor” conditions, there is an intermediate “fair”. While “poor” condition infrastructure has held steady, “fair” condition has also grown, meaning that many infrastructure facilities are aging to the point that they are no longer considered to be in “good” condition. This reinforces the need for a forward-looking program of continuous and proactive maintenance, something already implemented by CTDOT with CRCOG’s full-fledged support. It should be noted that bridge conditions improved considerably in CRCOG when the I-84 Viaduct repairs in Hartford were completed, lengthening their useful life as facilities. Bridge conditions are measured by the percentage of bridges (by deck area) in “good” and

“poor” condition. Aggregating the measure by total deck area and not the number of bridges ensures that large bridges receive proportionately larger amount of attention. Figure 08.2 show the location of National Highway System (NHS) Interstate bridges in poor condition, indicating that these areas require significant investment for repairs.

Figure 08.2 – Bridges in Poor Condition



Sources: CRCOG

Table 08.2 – Infrastructure Condition Measures and Targets

Performance Area	System	Performance Indicator	CRCOG Measure (2023)	State Measure (2023)	State Target (2023)
Pavement	Interstate	Percent Lanes Miles in Good Condition	67.5%	76.6%	70.0%
		Percent Lanes Miles in Poor Condition	0.1%	0.2%	1.3%
Bridges	Non-Interstate NHS	Percent Lanes Miles in Good Condition	38.5%	39.6%	35.0%
		Percent Lanes Miles in Poor Condition	2.7%	2.1%	3.5%
	NHS	Percent Deck Area Good Condition	10.7%	13.6%	14.2%
		Percent Deck Area Poor Condition	3.0%	7.9%	6.0%

NHS Performance, Freight, Congestion Mitigation and Air Quality (CMAQ) Measures (PM3s)

Roadway congestion causes travel delays and generates costs due to lost time, decreased productivity, increased fuel consumption and emissions, and increased operating costs. Both passenger vehicles and commercial freight movement are affected. Efficient traffic flow is important for people as they travel to destinations for work, school, healthcare, and shopping. Congestion also affects truck traffic, increasing the time and costs of goods movement, which may result in higher consumer costs. Closely tied to

congestion is the issue of air quality, which can be a major issue for human health. Air pollution can have short-term and long-term health impacts, which result in increased health care costs, lost economic productivity, and decreased quality of life.

The PM3s are largely calculated using the National Performance Measurement Research Data Set (NPMRDS) with the exception of the Percentage Non-Single Occupancy Vehicle usage which comes from US Census Bureau Data. There are seven (7) PM3s: two for NHS performance for general traffic, one for NHS performance for freight traffic, congestion-related CMAQ measures PHED, and Non-SOV (but for both Hartford and Springfield

Table 08.3 — NHS Performance, Freight, CMAQ Measures

Performance Area	System (or UZA)	Performance Indicator	CRCOG Measure (2023)	State Measure (2023)	State Target (2023)
NHS Performance	Interstate NHS	Percent of Reliable Person Miles Traveled	95.0%	86.2%	78.6%
	Non-Interstate NHS	Percent of Reliable Person Miles Traveled	90.4%	90.0%	84.9%
Truck Travel Time Reliability	Interstate NHS	Truck Travel Time Reliability Index	1.42	1.56	2.02
CMAQ Congestion	Hartford UZA	Peak Hour Excessive Delay (PHED)	---	11.40	9.80
	Hartford UZA	Percentage of Non-Single Occupancy Vehicles (Non-SOV)	---	19.80%	20.20%
	Springfield UZA	Peak Hour Excessive Delay (PHED)	---	5.67	6.00
	Springfield UZA	Percentage of Non-Single Occupancy Vehicles (Non-SOV)	---	22.24%	22.24%
CMAQ Environmental Sustainability	Regionwide	Change in kg/ day for VOC	---	---	87.346
	Regionwide	Change in kg/ day for NOx	---	---	81.978
	Regionwide	Change in kg/ day for PM2.5	---	---	6.290
	Regionwide	Change in kg/ day for PM10	---	---	0.000
	Regionwide	Change in kg/ day for CO	---	---	0.000

“---” indicates that the target is either not applicable or that CRCOG currently does not compute the measure for itself.

urbanized areas), and two pollution-related CMAQ measures. One CMAQ measure has three parts covering various pollutants.

Travel time Reliability on the NHS compares days with high delay to days with average delay using road segment data. To determine the reliability of a road segment, a Level of Travel Time Reliability (LOTTTR) is calculated as the ratio of the longer travel times (80th percentile) to a “normal” travel time (50th percentile), with reliability defined as an LOTTTR of less than 1.5. Conversely, unreliable segments have an LOTTTR of 1.5 or greater. Figure 08.3 and Figure 08.4 highlight the unreliable segments along the region’s portion of the NHS. CRCOG supports the CTDOT targets for these indicators.

The Truck Travel Time Reliability (TTTR) Index focuses on the Interstate component of the NHS only. The composite index for this indicator is calculated in a similar manner as with the LOTTTR. To determine the reliability of a segment, a Truck Travel Time Reliability (TTTR) measure is calculated as the ratio of

the longer travel times (95th percentile) to a “normal” travel time (50th percentile), with Reliability defined as a TTTR of less than 1.5. The TTTR’s of interstate segments are then used to create the TTTR Index for the entire Interstate system using a weighted aggregate calculation for the worst performing times of each segment. See Figure 08.5 for geographic distribution of slower Interstate segments based off TTTR. CRCOG supports the CTDOT target for this measure.

Figure 08.4 – **LOTTTR on Non-Interstate NHS System**

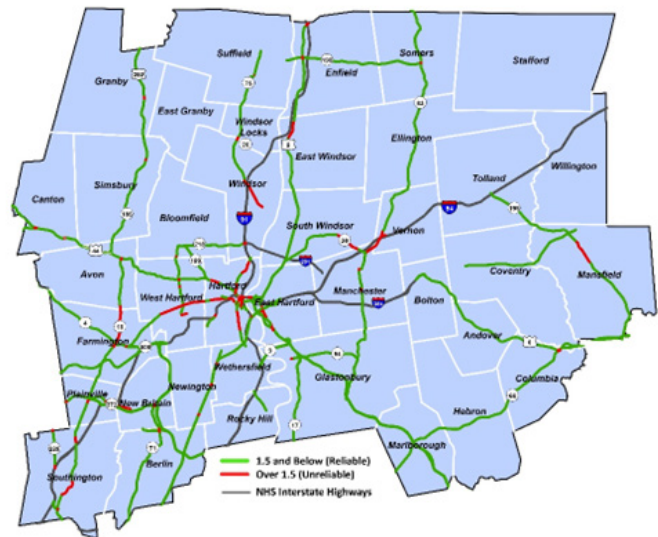
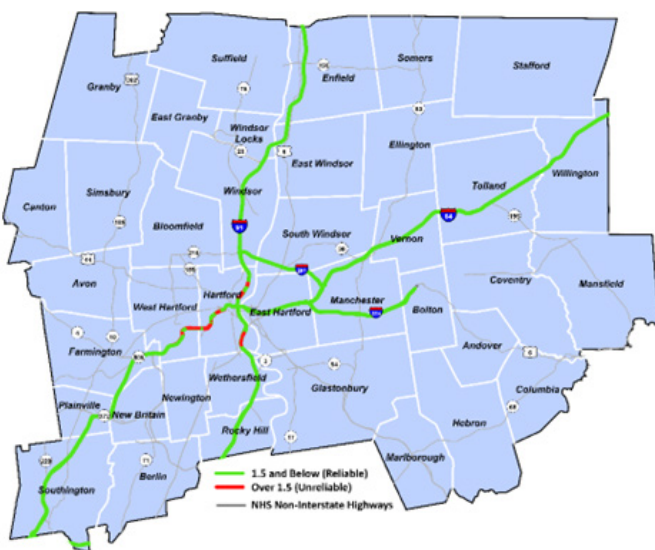


Figure 08.5 – **TTTR on Interstate System**



Figure 08.3 – **LOTTTR on Interstate System**



Sources: CRCOG

The second set of measures belonging to the PM3 group are the Congestion Mitigation and Air Quality (CMAQ) measures, all of which are now required of CROG. The two congestion related measures Peak Hour Excessive Delay (PHED) and Percentage Non-Single Occupancy Vehicles (Non-SOV) are set for urbanized areas (UZAs) as opposed to the boundaries of the federally designated metropolitan planning organization (MPO), the role fulfilled by CROG. In addition to the Hartford UZA, CROG also covers part of the Springfield, MA UZA. Thus, CROG must contend with two sets of PHED and Non-SOV targets, one for each UZA. However, the focus remains on contributing towards attaining the CTDOT set targets for the Hartford UZA. Nevertheless, CROG and CTDOT will cooperate closely with our Partners in the Massachusetts MPOs and MassDOT in this area. CROG's policy goals will be to decrease PHED as well as increase the percentage of Non-SOV vehicles used for commuting purposes through promoting carpooling, transit use and non-motorized means of transportation. CROG aims to reduce traffic related pollutants affecting air quality. Specifically, particulate matter 2.5 (PM2.5) is a major concern and is addressed in both air quality measures. CROG supports the targets set by CTDOT and MassDOT (where applicable).

Transit Asset Management Measures

At public transit agencies, the condition of revenue generating vehicles at public transit affects their reliability and on-time performance, which in turn greatly influences customer satisfaction and the attractiveness of transit as a travel option. Additionally, vehicles in poor condition may have greater fuel consumption and emissions and incur higher maintenance costs. Transit agencies also utilize other vehicles for service and administrative purposes. As with revenue vehicles, the condition of service vehicles will affect their reliability, maintenance needs, and costs. The condition of various types of transit facilities is also important for the safety and convenience of passengers, as well as the efficient operations of maintenance and administrative functions. Furthermore, the condition of passenger facilities can bolster the attractiveness of public transit as a travel option.

Measures / Indicators

Because CROG does not operate transit services itself, it instead reports on indicators from the six providers in its area (See Table 08.4 on the next page). Reliability of revenue-generating vehicles, i.e. buses and other vehicles that carry passengers, is assessed with an indicator that measures

the percentage of these vehicles that exceed the useful life benchmark (ULB).

- **Revenue-generating buses (5-year ULB)**

While the indicator may be calculated for different types of vehicles; for the region it currently has been calculated only for cutaway buses. The TAM indicator for nonrevenue vehicles is a three-part measure that reports the percentage of vehicles exceeding ULB for the following:

- **Rubber tire vehicles (14-year ULB)**
- **Automobiles (4-year ULB)**
- **Sport Utility Vehicles (4-year ULB)**

The indicator covering transit facilities is a two-part measure assessing the percentage of facilities falling below a 3.0 on the Transit Economic Requirement Model (TERM) scale. The two classes of facilities covered are:

- **Passenger and parking**
- **Administration and maintenance**

Transit Safety Measures

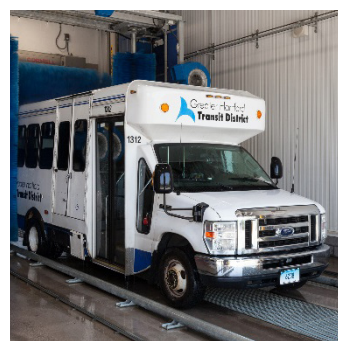
Transit safety measures did not come into force as a planning requirement for MPOs until 2021. They are primarily concerned with both the count of fatalities, serious injuries, and safety events as well as their rate per hundred thousand (or sometimes million) vehicle revenue miles (VRM). System reliability for each service is also measured in terms of the number of VRM per mechanical failure. The policy goal is to see the measures for the first three (fatalities, serious injuries, and safety events) decrease while the VRM between mechanical failures should ideally increase. Transit safety measures are updated yearly by the transit service providers (or on their behalf by CTDOT), but CRCOG is only required to update its targets for the transit service providers when updating major plans. CRCOG supports the new targets for 2023 presented in Table 08.5 on the next page.

Table 08.4 – Transit Asset Management Measures

FTA Goals for Transit Asset Management (TAM)	Rolling Stock/Equipment		Facilities	Infrastructure
	FY2020 Target Percentage of Vehicles Meeting or Exceeding Useful Life Benchmark (ULB)		Rated below 3 on TERM	
TAMP Tier II*	Bus	14.0%	0.0%	N/A
	Cutaway, Minivan/Van, Automobiles, Sports Utility vehicles	17.0%		
	Trucks/Rubber Tire vehicles	7.0%		
CTDOT**	Over the Road Bus	14.0%	0.0%	2.00 % Commuter rail segments w/ performance restrictions
	Commuter Locomotive, Passenger coach and self-propelled passenger rail car	17.0%		
	Steel Wheel Vehicles	0.0%		
CTtransit New Britain	Bus	14.0%	0.0%	N/A
	Cutaway, Minivan/Van, Automobiles, Sports Utility vehicles	17.0%		
	Trucks/Rubber Tire vehicles	7.0%		
CTtransit NB, DATTCO	Over the Road Bus	14.0%	0.0%	N/A
	Bus	14.0%		
CTtransit Hartford Division (HFTD)	Articulated Bus, Over-the-Road Bus, Bus	14.0%	0.0%	N/A
	Automobiles	17.0%		
	Trucks/Rubber Tire vehicles	7.0%		
Greater Hartford Transit District (GHTD)	Cutaway	17.0%	0.0%	N/A
	Automobiles, SUVs	20.0%		
	Trucks/Rubber Tire vehicles	7.0%		

Table 08.5 — Transit Safety Measures

Service Entity	Transit Mode	Fatalities		Injuries		Safety Events		System Reliability
		Total	per 100 thousand VRM	Total	per 100 thousand VRM	Total	per 100 thousand VRM	VRM / mechanical failures
CTtransit-Hartford Division	Motorbus (MB)	0	0	61	0.7	315	3.6	69,774
	Bus Rapid Transit (RB)	0	0	26	3.8	82	12	22,092
		Total	per 1 million VRM	Total	per 1 million VRM	Total	per 1 million VRM	VRM / mechanical failures
Arrow Line Acquisition	Commuter Bus (CB)	0	0	0	0	0	0	217,801
Collins Bus Service	Commuter Bus (CB)	0	0	0	0	1	1	12,041
DATTCO	Motorbus (MB)	0	0	0	0	0	0	38,445
	Commuter Bus (CB)	0	0	0	0	1	1.3	84,721
New Britain Transit	Commuter Bus (CB)	0	0	2	2.2	1	1.9	22,069
GHTD-Administered Safety Performance Targets*								
		Total	per 1 million VRM	Total	per 1 million VRM	Total	per 1 million VRM	VRM / mechanical failures
GHTD	Motorbus (MB)	0	0	26	6.3	23	5.7	50,000



Photos by Carl Talley

Review of Best Practices

The performance measures discussed in this chapter are still relatively new as the first four year performance period started January 1, 2018 and ended December 31, 2021. Therefore, there is not yet a large, developed body of best practices from which to draw. However, this is beginning to change and some examples of emerging best practices found at other MPOs and state departments of transportation that can serve as guidance. Additionally, some best practices developed around early sets of performance measures which shaped current practice new measures.

Communication and Stakeholder Input

MPOs and state DOTs are increasingly focused on communicating performance targets and progress being made towards them to the public and other agency partners on a regular basis. This often takes the form of data dashboards on their websites, where the current system performance is not only communicated but also the background and logic of the performance measures. The clear and simple communication of these targets is an effective strategy for engaging the public.

FHWA and State Departments of Transportation Resources

The Federal Highway Administration has an extensive webpage (<https://www.fhwa.dot.gov/tpm/>) dedicated to Transportation Performance Management with links to many examples of efforts around the country. Many state DOTs have also made more information available on their websites as they have gained greater experience and practice has begun to mature around the country, and a larger and more current body of best practices develops. CTDOT now has a website to summarize the State's Performance Measures and also includes data visualization tools through PowerBI.

Predictive Capability

Within Connecticut, the Connecticut Department of Transportation has developed mature software and planning systems for bridge and pavement conditions throughout the state. This gives the state great capabilities to strategically plan repairs and maintenance in such a way as to directly affect the performance measures in these areas in a predetermined way. Using these systems, it can be estimated fairly confidently how much investment is needed to achieve a desired

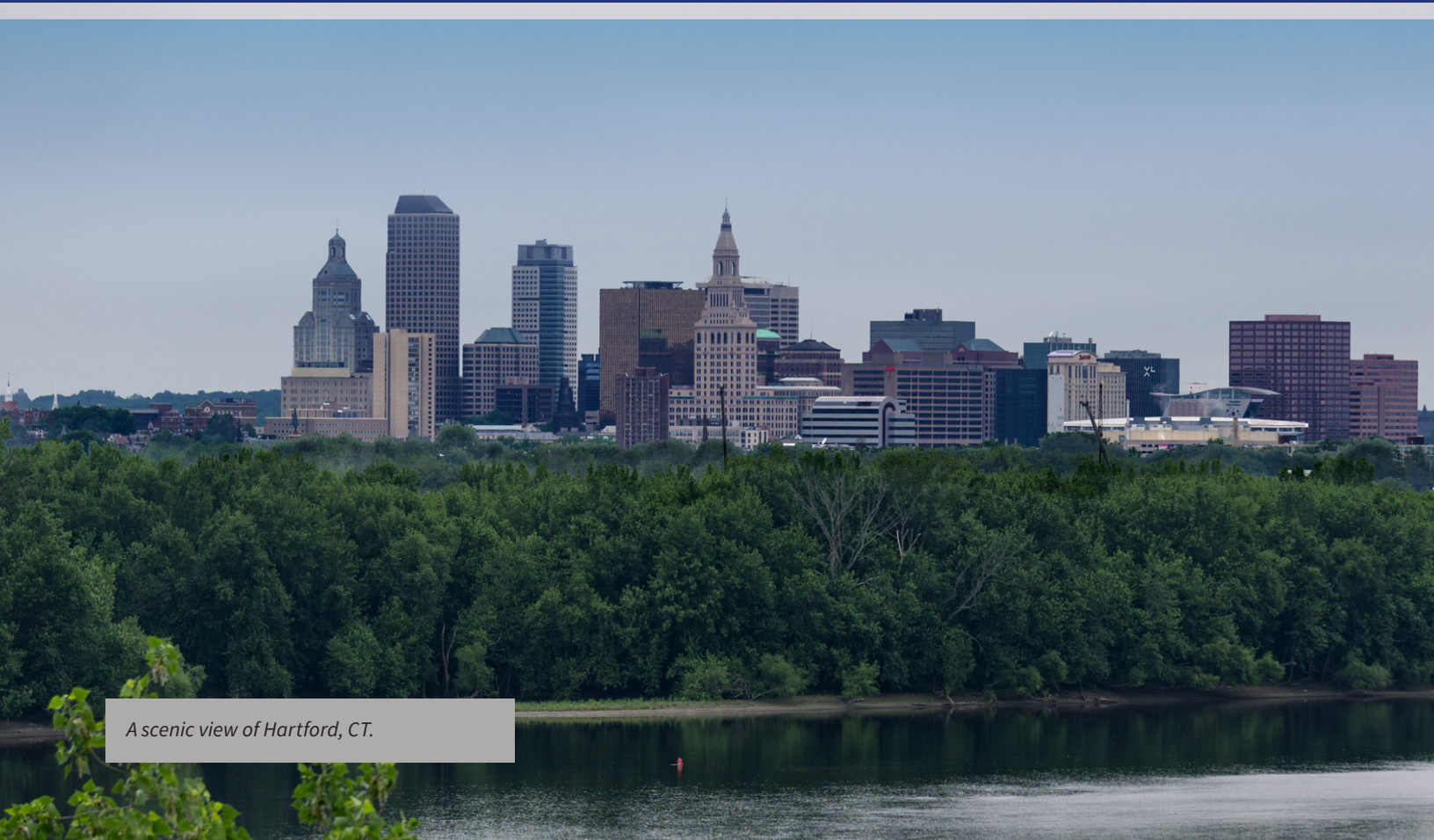
and measurable outcome, meaning that true predictive ability on the part of analysis tools has been developed. This is far ahead of any other area of performance measures. However, it serves as a challenging but highly desirable level of expertise and analytical maturity towards which to strive in the long term for other areas of performance measures, including safety, system performance and freight. Already, new methods of target setting have been implemented that should be more effective than past practice.

As states' and MPOs' experience with the federal performance measures matures, priorities will ideally be clearly reflected in the selection of targets, which will then guide the MTPs and TIPs more directly. Improved capabilities that better link projects and programs to outcomes can assist in MPT and TIP development and optimize transportation system performance. CROCOG continues to review the practices of several prominent MPOs around the country as well as participate in discussions with CTDOT about the future of performance-based planning. Transportation performance management is a new and evolving practice, and CROCOG will continue reviewing, developing, and employing performance measure best practices as they emerge.

Chapter 09

Special Emphasis Areas

There are specific emphasis areas that influence the Transportation Planning program that CROG has adopted. These emphasis areas are described in this section. They include: Transportation Security; MPO Coordination; Air Quality – Transportation Policy; and Demand Management Policy.



A scenic view of Hartford, CT.

Transportation Security

CROG's transportation and public safety planning departments administer programs and develop actions that will enhance the operational readiness for responding to incidents that may affect the security of the region's transportation systems and its users. CROG is committed to facilitating communication and coordination among its collective municipalities, as well as local, regional, and state partners. Areas of priority are transportation issues, and activities resulting from major disasters, biohazards, threats, and security breaches. CROG has assisted the Transportation Safety Administration (TSA) and CTDOT (Connecticut Department of Transportation) by providing role players for several drills and exercises related to transportation safety. Law Enforcement Active Shooter Response Training for the Collaborative Operation By Response Agency (COBRA) Collective member agencies where the scenario was an active shooter on a ferry, a train derailment exercise in Windsor Locks and various DARE (Detect and Response) exercises at Bradley. Systems and programs that include Traffic Incident Management (TIM), coordinated traffic signal systems, Intelligent Transportation Systems (ITS), diversion planning, evacuation routing, and access management on arterial roads are critical elements in providing a secure transportation system. The expansion, maintenance and updating using newer technologies that will provide a more robust Intelligent Transportation Systems (ITS) network is vital as well. ITS has the capability to assist in routing of evacuations, monitoring

road network conditions, diversion routing for unplanned events, and assisting in the coordination of transportation resources and emergency response activities. A variety of traffic management assets are used to assist in moving the public in and around incidents or planned events. For example, the use of variable message signs, traffic signal system coordination, and travel information alert systems are used to detour traffic around a major crash, road closure or disasters. Transit vehicles can be used to transport people from an affected area and provide respite for response personnel.

“Preparedness and response to events that may compromise the security of an ever-growing diverse transportation infrastructure network are critical.”

Figure 09.1 — Variable message sign used for transportation management and security



Photo from Shutterstock

Incident and Emergency Management

Public and private sector partnerships in the areas of incident and emergency management are vital in providing an effective approach to transportation security planning. Efforts to support this are noted below.

Capitol Region Emergency Planning Council (CREPC) Officially adopted in 2001, the Capitol Region Emergency Planning Council (CREPC) is an organization comprised of 41 municipalities in the Connecticut Department of Emergency Services and Public Protection/Division of Emergency Management and Homeland Security (DESPP/DEMHS) Region 3. CREPC serves as the Regional Emergency Planning Team (REPT) and is committed to serving the communities in DEMHS Region 3 by promoting the active participation of representatives from all 41 municipalities, including other Regional Planning Organization members within Region 3. The goal of CREPC is to provide the framework for emergency preparedness, response, recovery, and mitigation through collaborative planning and mutual aid.

The Greater Hartford TIM Coalition (GHTC) was founded in 2018 to restore a former incident management program administered by CROG. The Coalition has public and private stakeholders that represent the responder community along with representatives from towns, planning regions and state and federal emergency management agencies. More on the TIM Coalition can be found in Chapter 3 of this document.

Figure 09.2 — Get Ready Capitol Region



Regional Emergency Support Function

Transportation (RESF 1) The Greater Hartford TIM Coalition acts as the RESF 1 for the region. RESF 1 addresses transportation issues and how to incorporate them into the greater emergency response effort for the region. RESF 1 coordinates with local municipalities and agencies within the Capitol Region and DEMHS Region 3. The RESF 1 function is intended to focus on disruptions of the regional transportation system requiring interjurisdictional coordination and information sharing. Transportation disruptions can occur because of direct impacts upon the transportation infrastructure (e.g., disasters and evacuations) or from surges in requirements placed on the system by emergencies in other functional areas.

Transit Role in Emergency Planning

CT *transit* that includes Connecticut's regional bus rapid-transit system, CT *fastrak*, plays an important role in emergency planning. It is important that a relationship among responders and transit providers be maintained because of the significant role that transit vehicles can have in any emergency. Transit vehicles can be used for:

Figure 09.3 — 2015 CTfastrak emergency exercise



Source: CROG

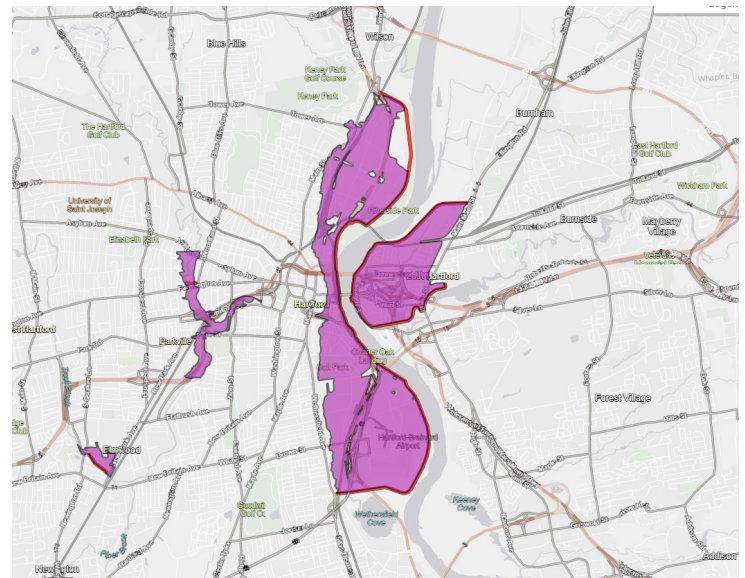
- Respite for emergency responders
- Temporary shelter for displaced citizens (heat/air condition, seating, water/food transport, etc.)
- A mobile incident command center
- Mobile triage units for injured citizens, during disaster or attack
- Mass evacuation (buses can seat 35+ to 57 passengers, upwards of 60+ for standing/seating combined)
- Mobile street and block detours; during a disaster or emergency, a 25- to 40-foot bus can block off streets and intersections freeing up emergency vehicles such as police or fire vehicles traditionally used to perform these tasks

In addition to CT*transit*, more than a dozen public and private companies operate multi-passenger vehicles within the region, including school buses, city buses, wheelchair vans, and smaller vehicles. These transit providers need to be encouraged to play a role in local and

regional emergency planning. An aggressive response to any extreme emergency will require the mobilization of the region's vehicles to save lives and preserve equipment.

Evacuation Planning Following the hurricanes that hit the Gulf Coast in 2005, the federal government directed all states to develop emergency evacuation and sheltering plans. Connecticut had already begun work on evacuation planning, traffic management and mass sheltering. The state addresses the three most probable evacuation-planning scenarios, which are outside the Capitol Region but impact the region by virtue of its role in accepting evacuated persons from other parts of the state. The Capitol Region emergency planners have completed a Regional Shelter and Evacuation Guide as part of the state's overall approach to evacuation and mass care operations, in collaboration with state and intra-state regional partners.

Figure 09.4 — Flood Control Areas in Hartford and East Hartford



Source: National Levee Database

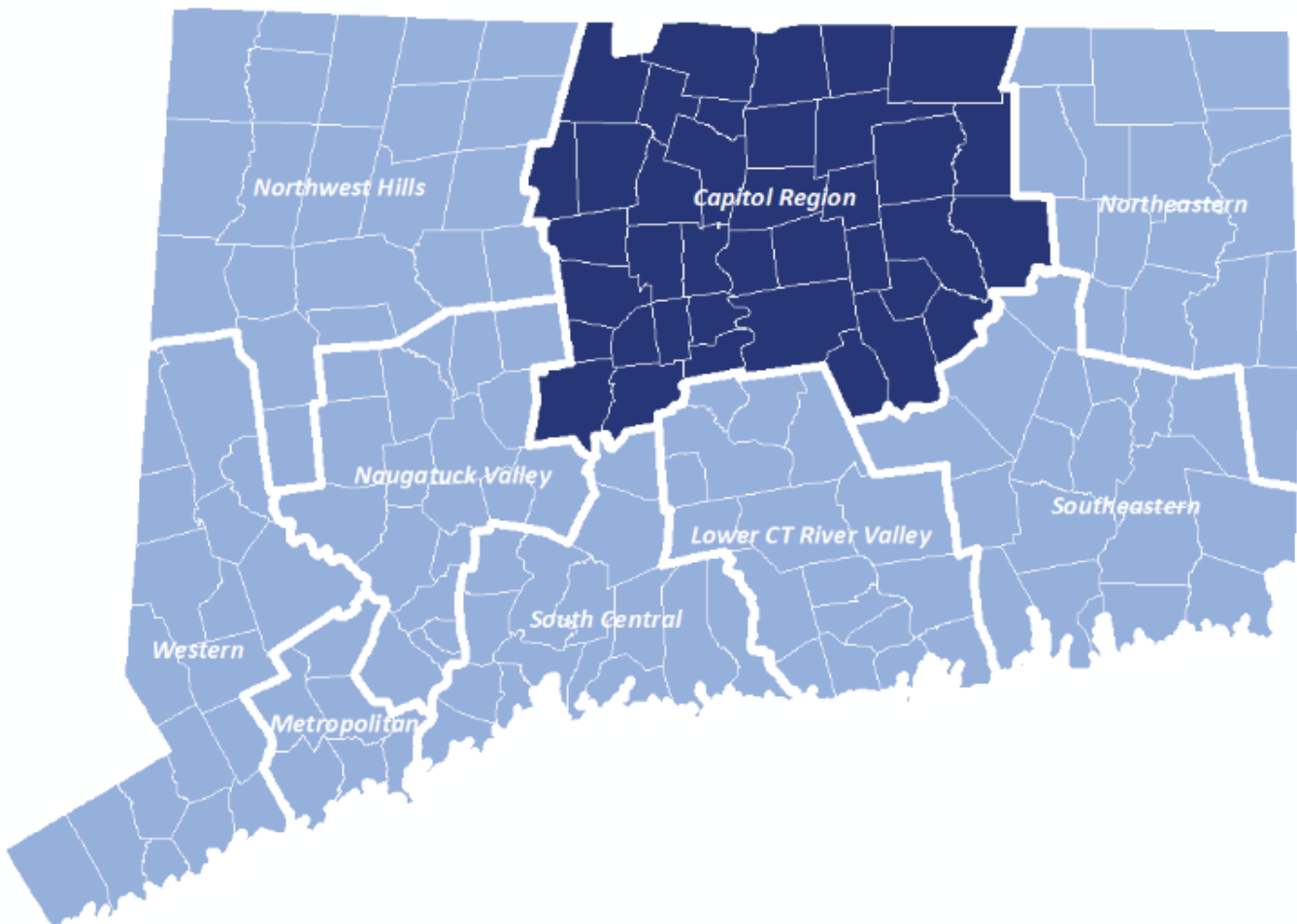
Metropolitan Planning Organization Coordination

CRCOG serves as the main Metropolitan Planning Organization (MPO) for the Hartford Transportation Management Area (TMA). Prior to a 2015 Regional Planning Agency (RPA) consolidation that reduced the number of regions from fifteen (15) to nine (9), the Hartford TMA extended beyond CRCOG’s boundaries and into the

neighboring Central Connecticut Regional Planning Agency (CCRPA) and Middlesex Regional Planning Agency (MRPA). This consolidation resulted in the elimination of CCRPA and MRPA and the expansion of CRCOG’s boundaries to encompass most of the Hartford TMA. However, other regions also expanded, and portions of the TMA still stretch beyond CRCOG’s borders and into the bordering RPAs of the Naugatuck Valley Council of Governments (NVCOG), Lower Connecticut River Valley Council of Governments (RiverCOG), and Northwest Hills Council of Governments (NHCOG).

1 Metropolitan Planning Organization (MPO) is a federal term used to designate the regional planning agency responsible for approving the use of federal transportation funds within a given metropolitan area.

Figure 09.5 – Statewide COG boundaries after 2015 reorganization



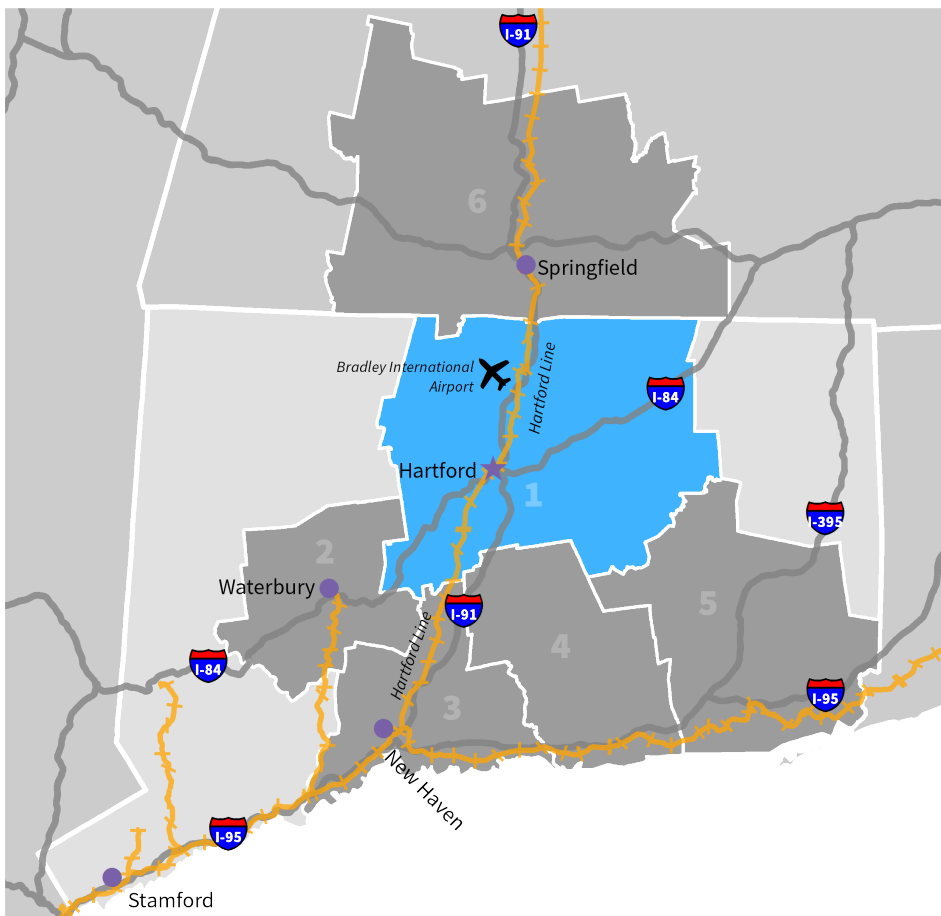
NVCOG serves as the MPO for the Waterbury urbanized area and RiverCOG serves as the MPO for the Lower Connecticut River Valley area. NHCOC is not a designated MPO.

CRCOG is committed to working cooperatively with all its neighboring regional planning agencies in the Hartford metropolitan area, as well as the planning agencies in the Springfield and New Haven areas. Since major transportation projects often extend across multiple regions, or even multiple metropolitan areas, it is important that the affected planning agencies work cooperatively to ensure inter-regional needs are met. It also ensures that proposed improvements are not duplicative or conflicting. See Appendix C for all Memoranda of Understanding with other planning agencies.

Hartford MPO Coordination

Since the political boundaries of the regional planning agencies do not coincide with the functional limits of the Hartford metropolitan area, it is important that the regional agencies within the metropolitan area coordinate their planning efforts. In May 2018, the four COGs that share some portion of the Hartford metropolitan area – CRCOG, NVCOG, and RiverCOG, and NHCOC – executed an agreement to do so. Also signing onto the agreement were CTDOT and three affected transit agencies: the Greater Hartford Transit District (GHTD), the Middletown Area Transit (MAT), and Estuary Transit District (Estuary TD). The agreement established a common goal to conduct the transportation programs in a manner that ensures that plans are mutually supportive of major projects and programs to improve the transportation system in the

Figure 09.6 – **CRCOG Surrounding MPO's**



1. Capitol Region Council of Governments (CRCOG)
2. Naugatuck Valley Council of Governments (NVCOG)
3. South Central Region Council of Governments (SCRCOG)
4. Lower CT River Valley Council of Governments (RiverCOG)
5. Southeastern CT Council of Governments (SECOG)
6. Pioneer Valley Planning Commission (PVPC; MA)

to improve the transportation system in the Hartford urbanized area. The agreement also required agency activities be coordinated in several specific planning and programming areas. The coordination efforts include the exchange and review of annual work programs, regional transportation plans, and transportation improvement programs (TIPs).

MPO coordination is achieved primarily through periodic meetings of the Hartford Urbanized Area agencies to discuss ongoing or scheduled planning activities. A list of common issues, activities, and projects discussed at these meetings or addressed through other means are listed below in Table 09.1

Table 09.1 — List of common issues, activities, and projects at MPO coordination meetings

Item or Project in Common	Affected MPOs/ COGs	Ongoing Efforts
Intelligent Transportation Systems (ITS)	CRCOG, NVCOG, RiverCOG	<ul style="list-style-type: none"> The three agencies support a common program for ITS In 2015, CRCOG completed an update to the ITS Strategic Plan and continues to work on the ITS Architecture; NVCOG and RiverCOG have been stakeholders in this process.
Congestion Management Process (CMP)	CRCOG, NVCOG, RiverCOG, NHCOG	<ul style="list-style-type: none"> A CMP is a systematic approach to measuring transportation system performance and developing proposals to manage traffic congestion. Metropolitan areas with a population over 200,000 are required to develop and implement a CMP as part of the metropolitan planning process. CRCOG developed the first Hartford Transportation Management Area (TMA) CMP report in 2005. The report was updated in 2010, 2015 and the most recent was completed in November 2020 The four agencies support a common CMP for the Hartford metro area. The four agencies worked together to collect data, review, and update the congestion management reports, including the latest 2020 NPMRDS (National Performance Management Research Data Set) Update.
Traffic Incident Management (TIM)	CRCOG, NVCOG, RiverCOG, NHCOG, PVPC	<ul style="list-style-type: none"> CRCOG established the Greater Hartford TIM Coalition (GHTC), to rebuild the incident management program. The Coalition comprises members serving various stakeholder groups involved in incident and emergency management. Five planning organizations are part of the Coalition and represent towns within the Hartford urbanized area. The Coalition will provide guidance and direction to the TIM community to achieve new goals and strengthen a program to reach higher levels of service. The Coalition represents the RESF-1 Transportation role in the Capitol Region Emergency Planning Council (CREPC) for emergency management in the region.

Table 09.1 (continued) – List of common issues, activities, and projects at MPO coordination meetings

Item or Project in Common	Affected MPOs/ COGs	Ongoing Efforts
Emergency Management	CROCOG, NVCOG, RiverCOG	<ul style="list-style-type: none"> • The Capitol Region Emergency Planning Council (CREPC) works with 41 communities located in the Department of Emergency Management and Homeland Security (DEMHS) Region 3. CREPC member communities and agencies collaborate in planning, communication, information sharing, and coordination activities before, during, or after a regional emergency. • The Regional ESF (emergency support function) facilitates communication and coordinates among regional jurisdictions and agencies concerning transportation issues and activities during a major disaster or incident.
Locally Coordinated Human Services Transportation Plan	CROCOG, CCMPO, RiverCOG	<ul style="list-style-type: none"> • The three agencies continue to support a single plan for the Hartford urbanized area, which was developed as part of CTDOT's statewide LOCHSTP, which was developed in 2007 and updated in 2009 and 2021.
The Hartford Line	CROCOG, SCRCOG	<ul style="list-style-type: none"> • CROCOG established a Corridor Advisory Committee (CAC) to assist municipalities in coordinating shared resources and development plans. Municipalities that have either Hartford Line rail or CTfastrak stations participate in the CAC, including towns in the South Central Region Council of Governments and the Pioneer Valley Planning Commission. • CROCOG has coordinated with SCRCOG to spearhead issues important to towns in both regions such as revisions to parking regulations at stations.
STP Urban & Transportation Alternatives Program	CROCOG, RiverCOG, NHCOC, NVCOG	<ul style="list-style-type: none"> • The agencies coordinate the use and expenditure of STBGP funds and Transit Alternative Set-Aside funds for the Hartford Urbanized area.
Farmington Canal Multi-Use Trail	CROCOG, NVCOG, SCRCOG	<ul style="list-style-type: none"> • CROCOG, SCRCOG, NVCOG, and PVPC all work with affected towns to advance funding for completing trail gaps and other improvements on this multi-use route from New Haven, CT to Northampton, MA.

Springfield MPO Coordination

CRCOG also coordinates regularly with the Pioneer Valley Planning Commission (PVPC). PVPC is the designated MPO for the Springfield, MA Transportation Management Area whose limits extend within CRCOG’s northern border. Most recently, in October of 2020 the two agencies executed a Memorandum of Understanding formalizing this cooperation (see Appendix C). The two regions share

several common transportation assets and concerns, including the Bradley International Airport, ITS and incident management on I-91, transit services for Enfield, the CTrail Hartford Line, the study of Interstate 91 in Springfield, and the Farmington Canal Trail. As detailed in Table 9.2, the two regions meet annually to review the status of planning programs, and as required for studies of transportation systems that impact both MPOs.

Table 09.2 – **CRCOG and PVPC meeting items**

Item or Project in Common	Affected MPOs	Ongoing Actions
Southern New England Transportation Issues	CRCOG, PVPC	<ul style="list-style-type: none"> The executive directors of both agencies regularly consult with one another regarding transportation issues of importance to both regions and all southern New England. CRCOG and PVPC signed its most recent MOU (Memorandum of Understanding) in October 2020. The MOU facilitates mutual exchange of information and expertise such as UPWP (Unified Planning Work Program), Long Range Transportation Plan, GIS (Geographic Information System), and regional transportation model data. The PVPC is a member of the Greater Hartford Traffic Incident Management Coalition that represents the Hartford Urbanized area and a portion of the Springfield Urbanized Area. PVPC and CRCOG along with NVCOG, NHCOG, and RiverCOG serve various stakeholder groups involved in incident and emergency management.
Bradley International Airport	CRCOG, PVPC	<ul style="list-style-type: none"> CRCOG regularly consults with PVPC regarding International Airport ongoing projects and improvements at Bradley.
Commuter Rail	CRCOG, PVPC	<ul style="list-style-type: none"> CRCOG regularly consults with PVPC regarding the Hartford Line and expansion of rail service to Springfield and Boston. CRCOG coordinates with PVPC on the FRA plans for the NEC Future corridor.

Table 09.2 (continued) — **CRCOG and PVPC meeting items**

Item or Project in Common	Affected MPOs/ COGs	Ongoing Actions
Farmington Canal Trail	CRCOG, PVPC	<ul style="list-style-type: none"> • CRCOG and PVPC both endorse this trail, and both work with their affected towns to advance funding for improvements to and completion of this trail that
Freight	CRCOG, PVPC	<ul style="list-style-type: none"> • CRCOG regularly consults with PVPC regarding freight planning initiatives, including the recent updates to the State Freight Plans in Massachusetts and Connecticut.
Regional Planning		<ul style="list-style-type: none"> • CRCOG and PVPC meet regularly for continuing implementation of the Sustainable Knowledge Corridor study recommendations. Some of the projects include development of knowledge corridor sustainability dashboard, development of metrics, update and integrate existing regional plans, etc. • CRCOG & PVPC are working together in CT River Bi-state Partnership as a part of the partnership between four regional planning agencies located along the CT River for purposes of collaborating more effectively to improve the environment, water quality, recreation, and public access on the Connecticut River.

Air Quality – Transportation Policy

Many metropolitan areas of the nation, including the Capitol Region, have serious air pollution problems. These problems are caused largely by automobile emissions. Because of the automobile's key role in the air pollution problem, the federal Clean Air Act of 1990 requires metropolitan areas to develop transportation plans that help reduce vehicle emissions that contribute to air pollution.

Our plans and programs are regularly evaluated through the air quality conformity process conducted by CTDOT in cooperation

with the regions and with the Connecticut Department of Energy and Environment Protection (CT DEEP). These evaluations have always shown that CRCOG plans support the state air quality programs and goals.

Air Quality Supportive Policies & Practices

In addition to the conformity process the region must conduct, CRCOG has examined air quality issues and options for reducing emissions. The findings and conclusions from this work have helped us formulate much of the current transportation plan and programs in a manner that promotes better air quality.

This current transportation plan reflects the region’s strong desire to reduce regional

reliance on automobiles by developing travel alternatives such as transit, traveling by bicycle, and walking. The Plan also includes demand management and land use policies that support practices to reduce exhaust emissions by reducing travel demand.

Diesel Reduction This plan continues CROG's decade-long commitment to the reduction of diesel exhaust emissions. CROG's Environmental Justice Advisory Board (EJAB) identified diesel emissions as an air quality issue that disproportionately affects low-income urban neighborhoods. The issue was raised because there is a high incidence of asthma in these neighborhoods, and evidence suggests that diesel emissions, especially particulates, are part of the cause of this urban health problem. To address the problem, the EJAB suggested that CROG incorporate the goal of reducing diesel emissions into its various transportation plans and policies. CROG continues to support that goal, and much has been done to address the issue, as described below.



Source: Greg Patton/Shutterstock

Transit Buses CTDOT has continually sought to decrease the diesel emissions from its CT**transit** bus fleet. The Connecticut Electric Bus Initiative is a partnership between CTDOT, the Connecticut Department of Energy and Environmental Protection (CTDEEP), and CT**transit** to transition the state's transit fleet to battery electric buses (BEBs). Incorporating BEBs into the State's transit bus fleet will be a lengthy process that requires substantial capital investment, dedicated planning, and strategic partnerships. Several transit operators across Connecticut have already attained funding and have begun the process of incorporating BEBs into their fleet. Within the Hartford Division of CT**transit**, CTDOT is undertaking the following projects as part of the Connecticut Electric Bus Initiative:

- Retrofit the existing hydrogen bus facility to charge six (6) BEBs
- Install one (1) DC Fast Charger to facilitate electric bus acceptance and testing at the facility
- Complete electrification study to 30% then 100% of the facility (300+ buses)

Construction Equipment - The EJAB also suggested that the Plan's recommendation for clean diesel buses be expanded to include clean diesel construction equipment used on highway projects. While expanding the recommendation to include highway construction equipment is reasonable, it must be focused on policy initiatives rather than project-based or funding initiatives. Highway construction equipment is owned by private companies, so change must be

achieved by modifying the construction bid documents. CTDOT is already implementing these requirements on its largest construction projects by requiring contractors to use clean diesel equipment. In these cases, larger diesel-powered construction vehicles operating for long durations are typically required to use Clean Fuels or Retrofit Emission Control Devices. The requirements also include guidelines for the idling and staging of vehicles and thresholds for a contractor prepared Diesel Emission Mitigation plan.

Ongoing Efforts

- 1. Support Alternate Travel Modes** Support projects recommended in the Transit and Complete Streets chapters of this Plan.
- 2. Reduce Diesel Emissions** CRCOG supports the reduction of diesel emissions from all sources. CRCOG recognizes CT*transit*'s efforts to reduce emissions from public transit vehicles, and CRCOG continues to support these efforts. CRCOG continues to encourage CTDOT to include clean diesel equipment on state transportation construction projects as part of bidding requirements.
- 3. Support Electric Bus Program** CRCOG, CT*transit*, and CTDOT should continue to search for opportunities to support an electric bus program.

Environmental Mitigation

In reviewing CRCOG's proposed transportation projects for consistency with State and regional land use plans (see discussion above), we determined that the proposed projects in this Plan generally avoid areas of environmental concern. Most of the projects proposed in this long-range plan are just that: long-range conceptual proposals, without specific details as to location and design. As projects are funded and move into the design stage, however, a closer look is taken at any potential environmental impacts and necessary mitigating solutions are taken.

To ensure that the environment is considered in our transportation planning process, CRCOG will consult with representatives of appropriate Federal and State agencies to review issues related to land use management, natural resources, environmental protection, conservation, and historic preservation. These issues will be considered within specific planning studies such as corridor studies, mode specific transportation studies, and future editions of the Regional Transportation Plan.

Figure 09.7 – **New zero emissions hydrogen bus**



Source: CRCOG

Ongoing Efforts

4. **Consult with Officials** Consult with representatives of appropriate federal and state agencies about issues of land use management, natural resources, environmental protection, conservation, and historic preservation.
5. **Avoid Environmental Disturbances**
When Possible As projects are funded and move into the advanced planning and design stages, strive to identify alternatives that avoid environmental impacts
6. **When Environmental Impacts are Unavoidable, Work to Minimize and Mitigate Impacts** Favor alternatives and treatments that minimize environmental impacts. Work with appropriate federal and state agencies to determine appropriate environmental mitigation activities for any project that impacts environmentally sensitive areas.
7. **Support Green Streets Advancement**
Momentum is gathering in support of streets that incorporate sustainable design elements, including green infrastructure. CROCOG will support the inclusion of green infrastructure elements by:
 - a. Encouraging the implementation of green infrastructure elements into corridor studies and roadway reconstruction projects working with partners such as the Metropolitan District Commission (MDC) and DEEP.
 - b). Educating communities in latest “Green Streets” design and maintenance requirements.

- c. Researching funding opportunities for green transportation implementation.
- d. Include rating incentives within CROCOG funding solicitations for projects that incorporate green infrastructure elements.

Transportation Demand Management

Many options for reducing congestion focus on increasing the capacity of the transportation system (or transportation supply). An important alternative approach is to reduce, or otherwise modify, the demand for transportation. In 2020, many employers shifted to teleworking arrangements in response to the COVID-19 pandemic. As of 2023, employers in many industries have continued to allow, or even require, their employees to work in a hybrid or fully remote arrangement. Such arrangements have resulted in fewer car trips, thereby reducing congestion and emissions.

However, Transportation Demand Management (TDM) does not necessarily mean getting people to make fewer trips. More often TDM is focused on getting people to use an alternate form of transportation (bus or carpool), or to shift their travel to off-peak periods when there is excess capacity.

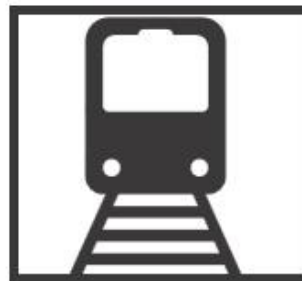
Examples of TDM include:

- Teleworking to eliminate commuting trips
- Staggered work hours to spread peak demand

- Flexible work hours to allow more use of transit or ridesharing
- Reduced bus fares to encourage use of transit
- Elimination of employee parking subsidies to encourage transit use
- 4-day work weeks to eliminate commuting trips

Within Connecticut, the primary resource related to TDM is **CTrides**, a service of CTDOT. **CTrides** helps employers and employees reap the financial, environmental, and productivity benefits of reducing single-rider commuting. By promoting public transit, teleworking, and carpooling, **CTrides** strives to reduce congestion, improve air quality, and make Connecticut a healthier place to live and work. No-cost services from **CTrides** include:

- Worksite assessments to identify commuting challenges
- Customized TDM plans for employers
- On-site information sessions
- Customized trip planning for employees
- Trial transit passes
- Commuter reward programs
- Emergency ride home program



Ongoing Efforts

8. Encourage Transportation Demand Management Programs

CROG should consider demand management strategies within its transportation programs and studies whenever possible.

9. Support Rideshare Programs and **CTrides** Initiatives

CROG should continue to support rideshare programs and **CTrides** initiatives that encourage alternatives to driving alone to work, including continued telework and hybrid work arrangements that originated during the COVID-19 pandemic.

Chapter 10

Financial Plan

This chapter identifies prioritized transportation investments and the revenue sources available to fund them. Since this is a long-range plan, many of the revenue and project/program cost estimates are inexact. However, given reasonable assumptions, the intent is to produce a financially constrained plan with costs that can be accommodated by the anticipated revenue stream.



*Capital construction
of Charter Oak Bridge*

Photo by Carl Talley

Prior to detailing the region’s financial plan, it is important to understand how regionally significant surface transportation (arterials, freeways, and transit) has been, and currently is, funded in Connecticut. These facilities and programs are funded almost exclusively with state and federal funding. As detailed further within this chapter, the main sources of funding are the state’s Special Transportation Fund (STF), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). Within the CRCOG region, any transportation project receiving FHWA or FTA funds must be included in the four-year Transportation Improvement Program (TIP) developed and adopted by CRCOG. The TIP document also includes additional details regarding these agencies’ various funding programs and does not typically include investments on non-federal aid eligible roadways (categorized as

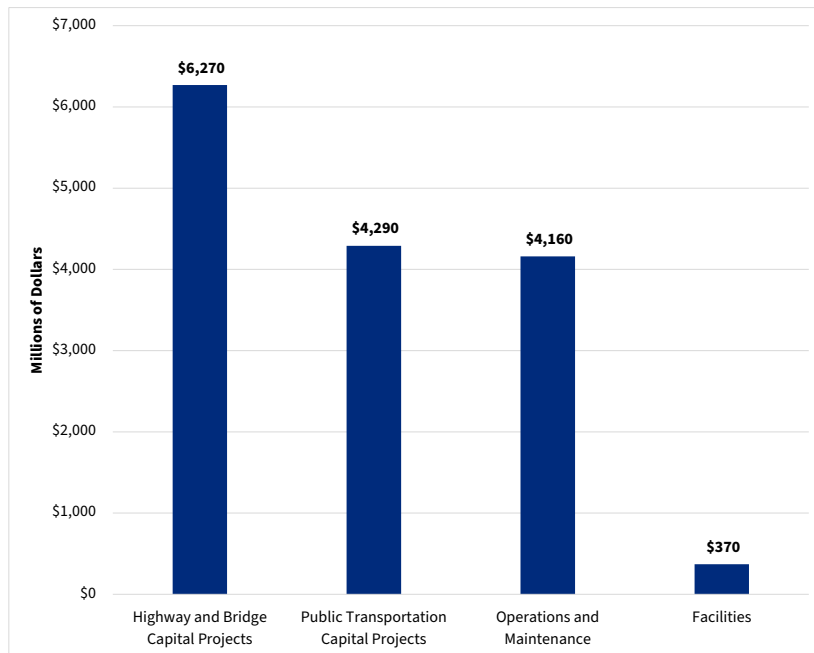
minor collectors or local roads), which are largely the responsibility of the municipalities.

Transportation expenditures can be generally grouped into two categories: 1. Capital Improvements and 2. Operations and Maintenance. Capital improvements can be funded with either Federal or State funds (or a mix of both), but operations and maintenance are almost exclusively State funded.

For capital Improvements, CTDOT, in coordination with the MPOs, annually publishes a 5-year Capital Plan. The plan is primarily divided into two categories: highways (including all public roads, bridges, bike, and pedestrian improvements) and transit, with recent allocations approximating 60% and 40%, respectively, with a relatively small amount dedicated to maintenance facilities. With growing availability of federal funding through the Infrastructure Investment and Jobs Act (IIJA), the five-year plan’s capital expenditures are anticipated to exceed \$2 billion annually, of which approximately 54% is expected from federal sources and 46% from state sources. This is a reversal of consistent state share increase trends that recently resulted in state capital investments exceeding federal investments. However, the current federal share is still far less than experienced in the late 20th century when federal funding accounted for 70-80% of CTDOT’s capital program.

For a full picture of transportation funding, Operations and Maintenance needs to be considered. These are state funds required to operate and maintain the

Figure 10.1 – Planned FY2023-2027 Connecticut Transportation Expenditures by Use



Source: CTDOT FY2023-2027 Capital Plan, Operations and Maintenance based on CRCOG projection of information from Connecticut’s FY 2022-2023 Biennial Budget

* Facilities refers to structure with a roof

transportation system, currently in the amount of approximately \$800 million annually. The majority of this funding is utilized to operate Connecticut’s transit systems, but it also funds CTDOT and Department of Motor Vehicles (DMV) operations, equipment, various maintenance and planning and research efforts, etc.

Figure 10.1 shows these estimated statewide capital plan amounts for 2023–2027, and a CRCOG estimate 2023-2027 operations and maintenance expenditures based on current allocations. Figure 10.2 breaks down the 2023–2027 statewide capital plan and operation and maintenance needs by funding source. See Appendix D for expected revenue for transit projects in Connecticut's Councils of Governments.

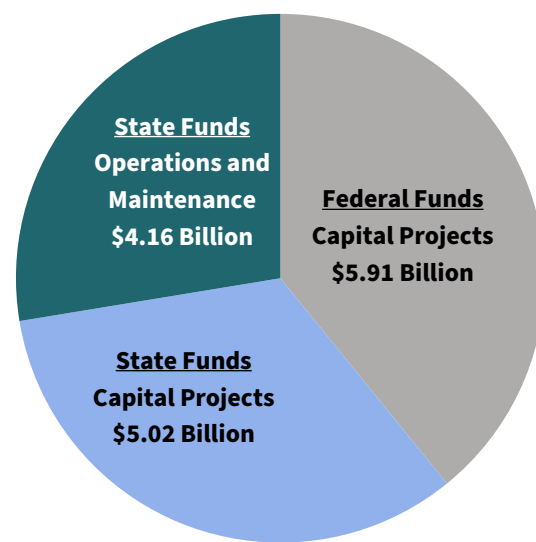
The Connecticut Special Transportation Fund

The state side of transportation funding in Connecticut resides in the Special Transportation Fund (STF), established by the Legislature in 1983. The STF funds the state match on federally assisted projects, the full cost of 100% state-funded projects, and the operating costs of the state DOT and DMV. In recent years, the STF has issued bonds in the range of \$700-\$850 million per year and manages its debt to attract favorable interest rates.

The level of incoming revenues is the limiting factor on the issuance of bonds and hence on the size and pace of the capital program. The principal sources of STF revenues are the motor fuel tax, motor vehicle receipts, a

petroleum products gross earnings tax, and two portions of the state sales tax. In 2018, the Legislature addressed the near-term solvency of the STF by increasing the amount of sales tax revenues dedicated to it. Also, in 2018, voters approved a constitutional amendment imposing a “lockbox” on any revenue source statutorily dedicated to the STF. This allows legislators and the public to be confident that STF revenues— including any potential new sources— cannot be diverted to other purposes. According to a December 2021 forecast from the Office of Policy and Management, the STF was projected to end FY2022 (June 30, 2022) with an operating surplus of \$255 million and a fund balance of \$496 million. In late 2022, the motor fuel tax was suspended to help quell rising fuel costs. The tax is anticipated to be fully restored in May 2023. The STF is anticipated to remain solvent through

Figure 10.2 — Planned 2023-2027 CT Transportation Expenditures by Funding Source



Source: CTDOT FY2023-2027 Capital Plan, Operations and Maintenance based on CRCOG projection of information from Connecticut’s FY 2022-2023 Biennial Budget

this tax suspension, however a continued suspension could hamper the state's long-term transportation funding abilities.

The Infrastructure Investment and Jobs Act

The national system of highway, transit, and rail programs is authorized by Congress in a multi-year Surface Transportation Act, which is commonly renamed (and given a new acronym) at each iteration. The current version of the act—the Infrastructure Investment and Jobs Act, or IIJA—was signed into law in late 2021. It is a five-year authorization, scheduled to expire at the end of FFY2026 (September 30, 2026). IIJA allocates \$1.2 trillion nationwide to improve infrastructure, generate good-paying jobs, confront the climate crisis, grow the economy equitably, and create a transportation system that works for every American. Connecticut's estimated formula based share for surface transportation is over \$5 billion (or just over \$1 billion annually) for Federal Fiscal Years 2022-2026, with an anticipated additional \$1 billion (\$200 million annually) of expected discretionary grant awards, assuming Connecticut secures its fair share of nationwide opportunities.

Federal Highway Administration Formula Programs

The FHWA's contribution to state, regional, and local highway and bridge investments occurs primarily through a series of formula grants, apportioned to the states (and in some cases to their Urbanized Areas) by

statutory formula. The principal FHWA formula programs include the following:

- The National Highway Performance Program (NHPP) is the largest of the FHWA formula programs and covers a wide range of highway and bridge investments on the National Highway System (NHS) and, in limited cases, federal-aid highways not on the NHS. Eligible activities include construction, reconstruction, resurfacing, restoration, rehabilitation, preservation, or operational improvements; some bicycle transportation and pedestrian walkways; and highway safety improvements.
- The Surface Transportation Block Grant (STBG) is the broadest and most flexible of the core FHWA programs. STBG funds projects that preserve and improve any federal-aid highway; bridge and tunnel rehabilitation projects on any public road; pedestrian and bicycle infrastructure; transit capital projects; and several other project categories.
- The Congestion Mitigation and Air Quality (CMAQ) program can fund a variety of highway, transit, and technology projects that support the state's conformance with federal Clean Air Act standards. Projects must meet specific eligibility requirements and undergo an air quality benefits evaluation. Funding is apportioned to the state, which selects some projects directly and solicits others on a competitive basis from the MPO regions.
- Highway Safety Improvement Program (HSIP) funds projects that provide specific improvements designed to correct identified highway safety problems.

Table 10.1 — FHWA Formula Programs – Connecticut's FY2022 Apportionments

National Highway Performance Program	\$350.8 million
Surface Transportation Block Grant	\$170.6 million
Congestion Mitigation & Air Quality	\$48.2 million
Highway Safety Improvement Program	\$38.4 million
National Highway Freight Program	\$17.4 million
PROTECT Formula Program	\$17.3 million
Carbon Reduction Program	\$15.2 million
Metropolitan Planning Program	\$6.1 million
Railway Highway Crossings Program	\$1.4 million
Connecticut Total	\$665.4 million

Table 10.1 summarizes Connecticut's share of the FHWA formula programs for FY 2022. The statewide total for all programs was \$665.4 million. Because most of these funds can be spent anywhere in the state, the region's share over time can only be estimated. The CROCG region has a population of roughly 1.0 million, or 28% of the state's population of 3.6 million. If the region's projects were proportionately allocated based on population, its estimated annual FHWA formula funding would be under \$150 million, assuming today's authorization levels.

Federal Transit Administration Formula Programs

Similar to FHWA, the Federal Transit Administration (FTA) funding allocations to Connecticut have increased under IIJA from about \$200 million annually to over \$250 million. Unlike most FHWA programs, which are apportioned to the state, the FTA programs are based on Urbanized Areas and apportioned to them. The portion of this funding reserved for the Capitol Region is summarized in Table 10.2. The funding is then assigned to transit agencies operating within the Urbanized Area; in CROCG's case, these include the Greater Hartford Transit District (GHTD), CTDOT (operating as CT*transit* and CT*fastrak*), and others.

The Section 5307 Urbanized Area Formula Grant Program is the FTA workhorse, providing capital funding for planning, design, construction, acquisition, maintenance, replacement, and other investments in bus and rail transit systems (Section 5307 funds are generally not eligible for operating expenses in Urbanized Areas with a population of 200,000 or more). The other FTA formula programs include: Section 5310, Enhanced Mobility of Seniors and Individuals with Disabilities Program, which includes both capital and operating assistance; Section 5311, Capital and Operating Program for public transportation systems in non-urbanized and small urban areas with populations of less than 50,000; Section 5337, State of Good Repair, which provides capital assistance for maintenance, replacement, and rehabilitation projects of high-intensity fixed

guideway and bus systems; and Section 5339, Bus and Bus Facilities, which provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. As detailed in Table 10.2, the Capitol Region’s FTA apportionments total over \$40 million annually.

Discretionary Grant Programs

The IJJA structure also provides for several discretionary, highly competitive grant programs, which can fund larger, less routine projects. These include but are not limited to the following:

- FTA’s Section 5309 Capital Investment Grants is commonly known as New Starts/ Small Starts. The CRCOG region is home to a

significant New Starts project, the CT**fastrak** guideway from Hartford to New Britain. The New Starts contribution was \$275 million, or 48% of total project costs, which was combined with flex funding, several smaller FTA contributions, and the matching 20% local share.

- FTA’s Section 5339 Bus and Bus Facilities Program includes a discretionary component (alongside the formula program mentioned previously).
- RAISE (Rebuilding American Infrastructure with Sustainability and Equity) is the new name of the decade-old TIGER/BUILD program. This program funds projects that enhance economic competitiveness, environmental sustainability, livability, state

Table 10.2 — FTA Formula Programs – Connecticut's FY2022 Apportionments

Program	Hartford UZA Apportionment	Springfield UZA Apportionment (CT portion)	Total CRCOG Apportionment
Section 5307 General Purpose Capital Grant	\$32.8 million	\$2.8 million	\$35.6 million
Section 5310 Enhanced Mobility for Seniors, etc.	\$1.3 million	\$0.1 million (approx.)	\$1.4 million (approx.)
Section 5311 Rural Capital & Operating Grant	N/A	N/A	A portion of \$3.5 million funds available statewide*^
Section 5337 State of Good Repair	\$1.7 million	N/A	\$1.7 million^
Section 5339 Bus & Bus Facilities	N/A	N/A	A portion of \$11.4 million funds available statewide

* to Windham Regional Transit District, ^ for FY21

of good repair, and other statutory goals. Connecticut won three awards in the fiscal year 2022 award cycle, ranging from \$2 to \$23 million range. The administration appropriated \$1.5 billion for the RAISE program in FY 2023.

- The Multimodal Project Discretionary Grant Program (MPDG) includes three separate grant programs: Mega, INFRA, and Rural. Mega, also known as the National Infrastructure Project Assistance Program, funds large, complex projects that are likely to generate national or regional economic, mobility, or safety benefits but are difficult to fund by other means. INFRA, fully known as the Infrastructure for Rebuilding America program, funds multimodal freight and highway projects of national or regional significance. The program serves to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas. This program is statutorily reserved for highway and rail freight projects. Unlike the TIGER/BUILD/RAISE program, INFRA consists principally of large grants, with a minimum award of \$25 million and some much larger. Rural, also known as the Rural Surface Transportation Grant, supports projects that improve and expand the surface transportation infrastructure in rural areas to increase connectivity, improve the safety and reliability of the movement of people and freight, and generate regional economic growth and improve quality of life.
- The Safe Streets and Roads for All Grant Program (SS4A) serves to significantly reduce or eliminate fatalities and serious injuries on roadways for all users by supporting planning, infrastructure, behavioral, and operational initiatives through two grant types. Action Plan Grants are for developing, updating, or supplementing a comprehensive safety action plan, while Implementation Grants are for implementing projects or strategies identified in an Action Plan to address road safety issues.
- FHWA's Bridge Investment Program (BIP) seeks to reduce the number of existing bridges in poor condition, or in fair condition at risk of falling to poor condition. Grant applicants can use up to 5 percent of BIP funding for eligible projects that consist solely of culvert replacement or rehabilitation.
- The National Electric Vehicle Infrastructure Formula Funding Program provides funding to state governments to build a safe, reliable, accessible, and equitable electric vehicle fast charging network. This funding continues a commitment to clean transportation, reducing greenhouse gas emissions, and creating a reliable charging network to promote widespread EV adoption.

Regional Funding Allocations

This MTP outlines a plan for major investments for surface transportation modes within the CRCOG region through 2050. In general, these investments fall into three categories: Highway Capital Projects (including improvements for bridges, bicycles, and pedestrians), Transit Capital Projects, and Operations and Maintenance. As detailed later in this chapter, expected funding of \$22.3 billion has been identified for the region through 2050, consisting of \$11.0 billion for highway capital improvements, \$2.9 billion for transit capital improvements, and \$8.1 billion for operations and maintenance expenditures.

CRCOG and the region’s other transportation agencies (including CTDOT and GHTD), identified, assembled, and prioritized an extensive list of needed capital projects. This list of the region’s projects, including a timeline for funding obligation, can be found in Appendix E. The list’s first five years is very refined, identifying even the smallest of projects. In later years the

plan strives to mainly identify the region’s major investment needs. Additionally, the list contains many projects (especially transit projects) that span multiple regions, whose costs CRCOG portioned between regions based on regional population.

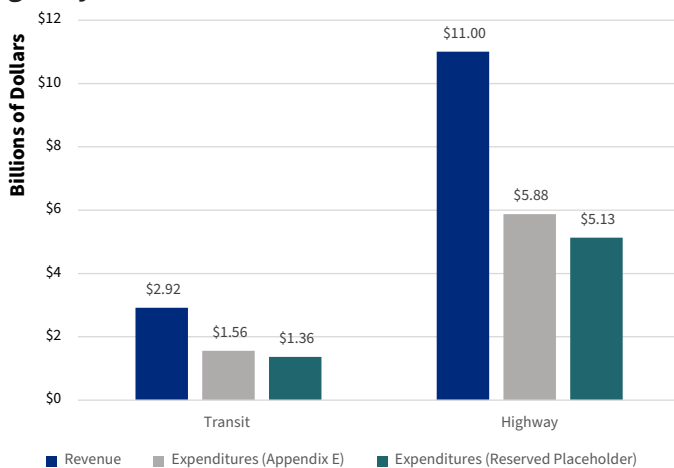
As seen in Figure 10.3, the specific capital project costs found in Appendix E, although exceeding federal revenues, fall short of combined anticipated Federal plus State revenues, therefore maintaining fiscal constraint. The excess funding has been identified in the figure (and later in this plan) as reserved for placeholder projects, with much of it anticipated to go towards Transportation Asset Management (TAM) projects and other projects that maintain a state of good repair.

Regional Capital Funding Allocation and Projects - Highways

CTDOT has estimated the anticipated FHWA and state highway funding allocations through 2050 at almost \$53.6 billion statewide. This was determined by compounding estimated federal and state funds of almost \$1.6 billion for fiscal year 2023 (about 50% federal, 50% state) at 1.5% to the year 2050. As shown in Appendix D, CRCOG’s equitable regional distribution was determined via formula to be just over \$11.0 billion. This formula, agreed upon by both the regions and CTDOT, considered each region’s volume/capacity ratio, vehicle miles traveled, roadway lane miles, and needs for major projects of statewide significance.

As mentioned, highway capital improvements

Figure 10.3 — Expected Revenues and Expenditures for Highway and Transit 2023–2050



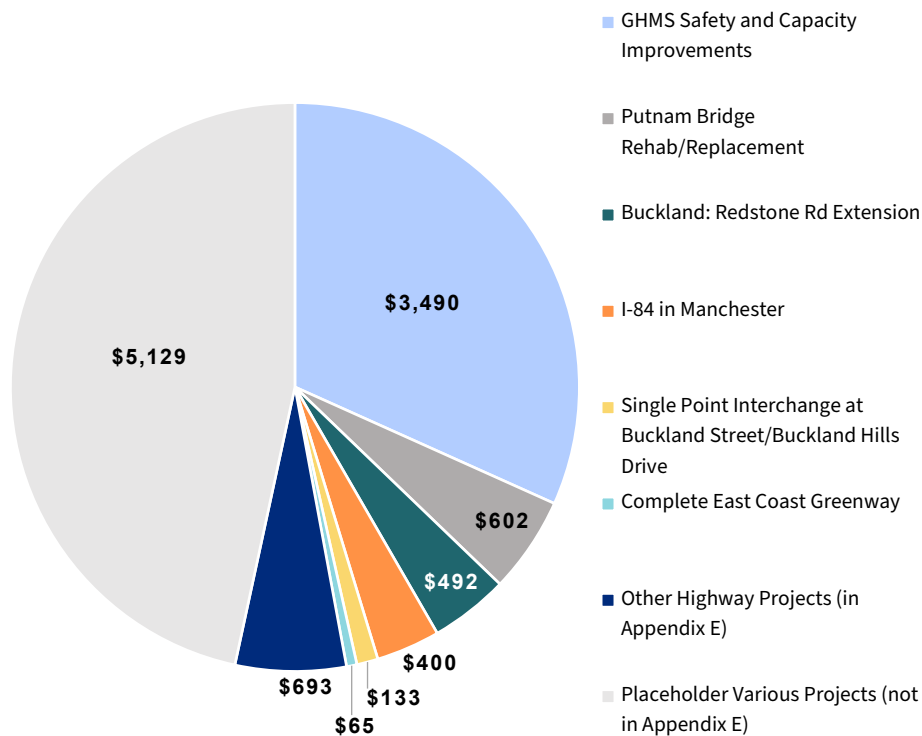
are included in the project listing in Appendix E. The list contains \$5.9 billion in highway investments that can be attributed to the CRCOG region. It is estimated that an additional \$5.1 billion will be needed for yet to be identified highway, bridge, bicycle, and pedestrian projects resulting in \$11.0 billion of regional highway investments to match expected revenues.

By far the plan’s largest highway investment is the \$3.5 billion I-84/I-91/Greater Hartford Area - Safety and Capacity Improvements project, formally the I-84 Hartford project. Significant investments are also included for the Putnam Bridge, I-84, and the Buckland Street area in Manchester. Other notable investments include completing the East Coast Greenway within the CRCOG region along with various bicycle and pedestrian

projects. Figure 10.4 shows expected CRCOG highway expenditures, including a breakout of some of the major projects (“GHMS Safety and Capacity Improvements” referring to the I-84/I-91/Greater Hartford Area project).

Not included in the fiscally constrained portion of this plan are other Greater Hartford Mobility Study (GHMS) recommendations, including the I-84/Route 2 Interchange Project in East Hartford. The GHMS is progressing through a Planning and Environmental Linkage (PEL) process, and projects emanating from that study may utilize a large portion of the \$5.12 billion reserve highway placeholder. However, it is anticipated that costs associated with all PEL recommended projects will far exceed available funding. Therefore its additional projects have been identified in this plan as “Unfunded Needs”.

Figure 10.4 – Expected Regional Highway Expenditures 2023–2050 (in 000,000s)



Regional Capital Funding Allocation and Projects - Transit

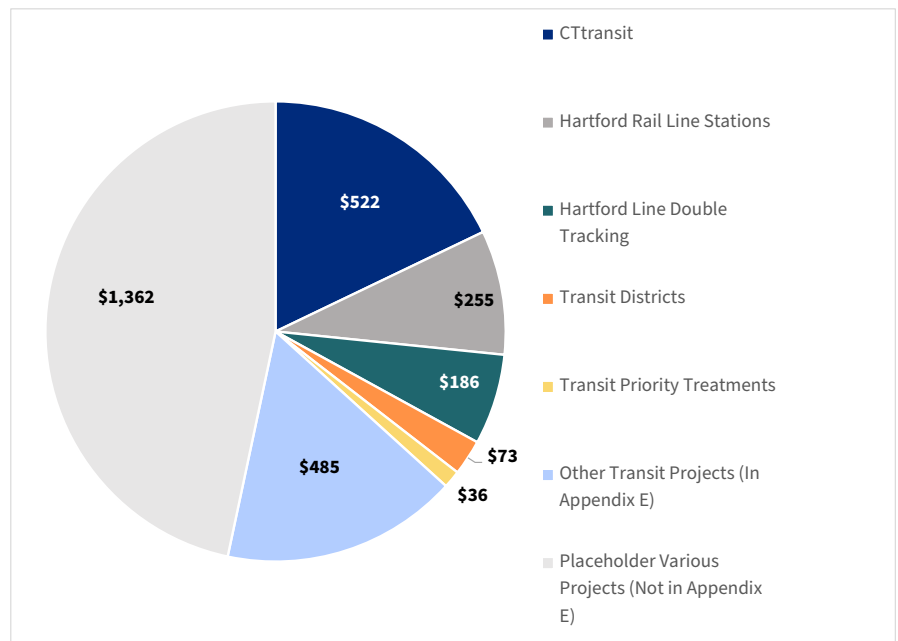
For transit, CTDOT has estimated total FTA and state funding allocations through 2050 at just over \$17 billion statewide by projecting an anticipated \$500 million of annual funding (about 50% federal, 50% state) by 1.5% per year. However due to the multi-regional nature of most transit projects, funding allocations were not determined on a regional basis. Instead, projects were initially identified by CTDOT that fulfill transit needs throughout the state and reviewed by the regions for comment and editing. Through the process, transit expenditures of over \$12.1 billion were identified statewide, with almost \$1.6 billion being within the CRCOG region. Proportioning the remaining \$4.9 billion in statewide funding to regions by population results in an additional \$1.3 billion for CRCOG, and a total CRCOG share of \$2.9 billion for transit capital improvements. Statewide, it has been determined that to maintain the transit system in a state of good repair and implement the TAM plan, all the anticipated

\$17 billion in transit funding will be needed, and therefore it is likely that the entire CRCOG funding level (beyond projects identified in Appendix E) will be needed for future state of good repair and TAM activities.

As mentioned, transit capital improvements are included in the project listing in Appendix E. Many of the biggest investments span multiple regions, are statewide, or are sometimes hard to attribute to an area (such as the procurement of rolling stock).

Some of the more major regional investments include \$255 million for multiple new Hartford Line rail stations in Enfield, West Hartford and Newington, \$186 million towards the double tracking of the Hartford Line, \$36 million for a half dozen transit priority corridors leading to and from downtown Hartford, and various investments in rolling stock for CT*rail* and CT*transit*, including electric buses. Figure 10.5 shows the expected CRCOG transit expenditures, including a break out of some of the major projects.

Figure 10.5 — Expected Regional Transit Expenditures 2022–2050 (in 000,000s)



Operations and Maintenance Program Funding

CTDOT funds its operations and maintenance programs almost entirely with state funds. As a multimodal agency, this includes funding to maintain highways and bridges, and funding for operating and maintaining bus transit, rideshare, rail, and ferries. CTDOT’s FY2022 budget for these items is approximately \$808 million statewide. Figure 10.6 shows a summary breakdown of CTDOT’s FY2022 budgeted operations and maintenance items. The two most significant portions of these costs are 53% for public transit and almost 24% for personal services (which funds the majority of CTDOT’s payroll costs).

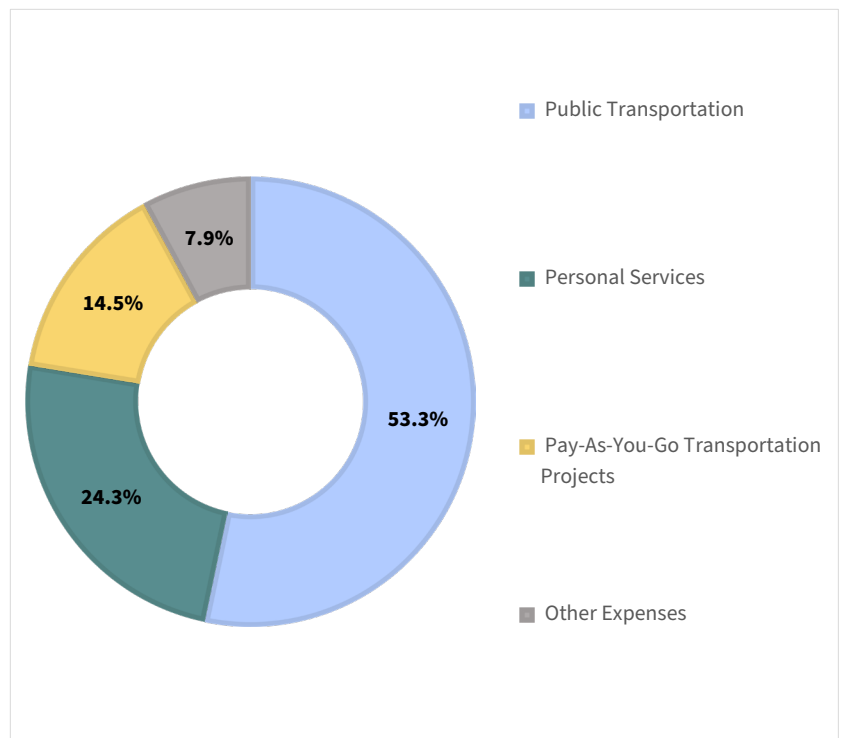
Assuming an increase of 1.5% annually through 2050, the expected operations and maintenance investments total \$29.1 billion. These statewide expenditures were proportionately estimated by population to be just over \$8.1 billion for the CRCOG region.

Timetable for Implementation

The project list appearing in Appendix E also includes rough timeframes for the expected implementation of each project. This implementation timeframe is generally constrained to match funding availability and has resulted in prioritization within three categories: funding obligation within 5 years, within 10 years, and by 2050. This schedule is merely a financial planning tool that can be revised to reflect changing conditions. Factors such as delays in acquiring environmental permits, priorities elsewhere in the state, and availability of special discretionary funds could alter the schedule substantially.

Figure 10.6 — CTDOT Operations and Maintenance Budget – FY2022

Source: CRCOG projection of Connecticut’s FY 2022-2023 Biennial Budget



Chapter 11

Innovative Finance

The Capitol Region's existing transportation funding resources, consisting largely of federal grants and the state's Special Transportation Fund, are described in the Financial Plan chapter. Those traditional sources, while obviously critical, fall short of the region's long-term needs and reinforce short-term thinking and strategies. This chapter explores how long-term transportation planning in the Capitol Region can be bolstered by new and innovative financing strategies, of which five are identified for further exploration:



Transit assets, like the newly refurbished Hartford Line and Amtrak train station in Windsor, are opportunities to attract private investment in the form of TOD and other value capture tools .

- Debt financing through the federal TIFIA and RRIF loan programs
- State legislation enabling regional transportation sales tax referenda
- Joint development at rail and bus rapid transit stations
- District value capture strategies, including tax increment financing
- Public-private partnerships to deliver specific transportation projects or components

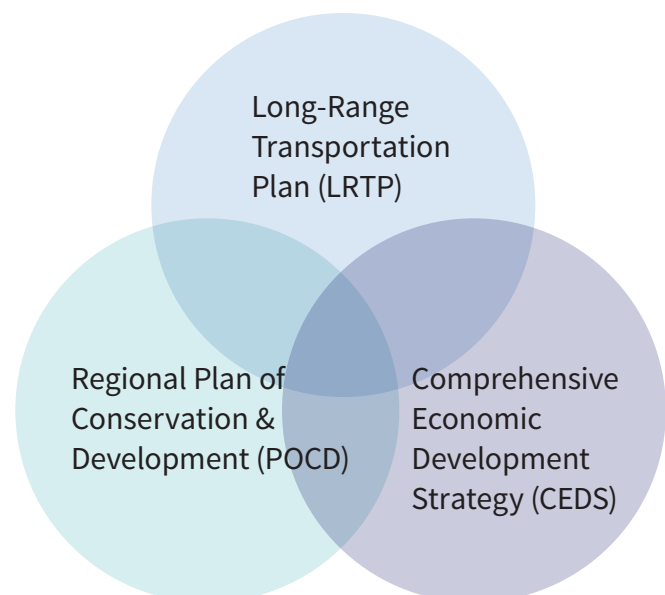
As evident by this Metropolitan Transportation Plan's (MTP's) large "Unfunded Needs" projects (such as the I-84/I-91 Interchange Reconstruction), the region's needs exceed traditional funding allocations. CRCOG's role in evaluating such projects and influencing their direction remains critical; but their scale, cost, and breadth of impact require that the decision to undertake them, as well as the great majority of their funding, will occur at the state and federal levels. Within this current framework, the strategies identified in this chapter could contribute to overall project costs and feasibility. There are other major regional projects, however, that could fall mostly, or completely "within CRCOG's reach"- projects like some of the station work on the Hartford Line, elements of the proposed CTfastrak expansion, or the half-dozen priority bus transit corridors that CRCOG has identified for improvements. These projects have traditionally been implemented by CTDOT, but with new funding sources they could be driven by CRCOG on behalf of CTDOT and other regional stakeholders.

Innovative Funding Vision

In developing its MTP, CRCOG recognizes the need not only to identify additional funding, but to address the relationship between transportation funding, economic development, and institutional roles.

There is currently limited history in the Capitol Region (or in any of Connecticut's planning regions) of utilizing innovative financing methods to develop, advance, and fund regionally significant projects. One hurdle is the relatively flat trajectory of the Greater Hartford economy. An absence of steady growth depresses the yield of existing revenue sources, makes it more difficult to raise new revenues, and limits the scope of value capture financing methods. Innovative financing methods are mere concepts without the revenues to use them. There is also relatively little explicit linkage between transportation investments and economic development. That linkage is widely understood in the abstract,

Figure 11.1 — **Coordination of Major Regional Policies**



but there is no concrete “business case”.

In this plan, CRCOG explicitly links the MTP to the regional Plan of Conservation and Development (POCD) and the region’s Comprehensive Economic Development Strategy (CEDS). CRCOG has previously identified transit-oriented development (TOD) and support for Economic Development Areas of Regional Significance as priorities. Making such coordination more programmatic and place-specific and having the relevant state agencies as partners in that process, would help generate better real world outcomes, including more revenues.

To aid in such coordination, CRCOG envisions exploring the need for a Transit Oriented Development (TOD) focused agency, perhaps via a state-level “development cabinet”. The need for a TOD agency is reflected in the current absence of robust coordination between the planning/design of regional transit stations (on the Hartford Line and CT**fastrak**) and the potential for transit-oriented development. This problem has also been brought to light with our ongoing TOD Study, which demonstrated a lack of successful coordination between state, regional and municipal levels of government. With such coordination, transit stations could

become growth and revenue generators, potentially even contributing to station design and costs. Union Station could be positioned as the hub of a future Hartford economy connected to Boston and New York by fast and frequent rail service. Windsor Locks Station could be positioned as a hub of bi-state economic development activity drawing on the synergy of Bradley Airport and the nearby downtowns of Hartford and Springfield.

The five strategies outlined below have the potential to support future transportation investments in the Capitol Region, either by raising new revenues, by attracting private capital to implement certain outcomes, or both. These strategies are by no means mutually exclusive, and some or all of them could be implemented in parallel over time. Each of them requires further technical, legal, and financial analysis, not to mention public policy debate, to be adopted.

Federal Credit Programs: TIFIA and RRIF

In addition to the array of formula and discretionary grants described in the Financial Plan chapter, the federal structure also includes two credit programs, whose role in national transportation policy is

“The need for a TOD agency is reflected in the current absence of robust coordination between the planning/design of regional transit stations (on the Hartford Line and CT**fastrak**) and the potential for transit-oriented development.”

slowly expanding. These programs were originally created in 1998, as part of the TEA-21 reauthorization bill, and were most recently reauthorized in IJA.

TIFIA

The Transportation Infrastructure Finance and Innovation Act provides three types of financial assistance: direct federal loans to project sponsors; loan guarantees by the federal government to private lenders; and standby lines of credit that may be drawn on to supplement project revenues. At TIFIA's main borrowing window, project sponsors secure a direct loan from the US Treasury, at the Treasury's cost of money, for terms of up to 35 years and with a potential front-end grace period of up to five years. Eligible applicants include state DOTs, local governments, transportation authorities, public-private partnerships, or any legal entity approved by the Secretary of Transportation. Eligible projects include virtually any highway, transit, or rail project that would be eligible under the corresponding grant programs. Except as noted below, a project must be reasonably anticipated to cost at least \$50 million.

TIFIA is not a source of funds; it is a borrowing program. To use it, projects must have their own dedicated revenue streams. TIFIA loans may be repaid with annual state or local appropriations, private lease payments, transportation sales tax proceeds, tolls, user fees, tax increment or special assessment district

revenue streams, or any other non-federal revenues pledged to pay the debt service and adequate to do so. Creditworthiness is a primary evaluation criterion.

RRIF

The Railroad Rehabilitation and Improvement Financing Act makes direct Treasury loans for freight and passenger rail projects (including both intercity and regional or commuter services). While broadly similar to TIFIA (35-year loans at the Treasury's cost of money), RRIF is by definition more narrowly targeted and less versatile. Unlike TIFIA, RRIF has no appropriation for Credit Risk Premium; the borrower must pay that significant cost. On the other hand, RRIF can finance up to 100% of project costs, rather than 33% or 49% as in the case of TIFIA. RRIF has a statutory cap of \$35 billion in outstanding loan but is well below that ceiling.

Both Congress and the US Department of Transportation have sought to expand the use of TIFIA and RRIF. The programs are now administered side-by-side in the Department's Build America Bureau. For a public agency, a TIFIA or RRIF loan is an alternative to conventional tax-exempt bond issuance—trading the traditional tax exemption for the exceptionally low interest rate, long amortization term, and, in the case of TIFIA, the five-year grace period. Neither TIFIA nor RRIF has yet been used in Connecticut, but they could be used in conjunction with the other innovative strategies discussed below or

with an appropriation or pledge of traditional revenues. A range of opportunities could emerge, in the Capitol Region and statewide.

A Regional Sales Tax Measure

In many states outside the northeast, sales tax ballot measures constitute the principal method of funding regional or county-level transportation programs. Many successful referenda address a combination of highway and transit needs, while some are transit-only. In the last quarter-century, transportation sales tax measures have received bi-partisan support from voters and politicians. The revenue these tax streams generate are typically used to support large-scale revenue bond issues that enable the affected DOTs, counties, or regional transit agencies to provide matching funds for federally-assisted projects and to fund additional projects on their own. Because percentage-based sales taxes are spread across the entire territory of the affected region or jurisdiction, they grow with the regional economy.

Under existing Connecticut law, there is no such thing as a regional transportation sales tax and no ability to create one. For CROCOG to advance a transportation sales tax initiative, it would require enabling legislation—presumably a statewide law allowing any MPO to undertake such an initiative at its option. This would be a complex undertaking, not only because it would ultimately involve asking a regional electorate to approve a tax, but because counties—the unit of government most commonly associated with regional

sales tax referenda in other states—have no substantive role in Connecticut. The counties as historic geographic groupings do not correspond to the state’s MPOs or transit districts, as they often do in other parts of the country. Consequently, a transportation sales tax referendum in the Capitol Region would be organized around CROCOG municipalities—either all of them, or (if the enabling legislation allowed) a subset of them, banding together to form a regional sales tax district.

Using sales tax revenues to fund transportation projects has a precedent in Connecticut: as noted previously, two slices of the existing statewide sales tax are dedicated to the Special Transportation Fund. Extending the idea to regional transportation programs would rely on two arguments:

- The new regional tax would be used for regional projects that voters see and experience in their daily lives. Successful referenda generally include a formally adopted list of projects that have been vetted and justified through a public process. Voters know which projects they are voting for, and the mobility, economic, and environmental benefits associated with the program.
- The dedicated sales tax revenues would be protected by a lockbox mechanism similar to that of the STF, and the tax would sunset at a specific date following the term of the revenue bonds.

Transportation Sales Tax Measures: Case Studies

In the last quarter-century, there have been numerous local-option sales tax referenda at the MPO, regional transit agency, county, or big-city level. An illustrative subset of such measures, with emphasis on recent examples, is summarized in Table 11.2. While these case studies represent ballot box victories, not all referendum initiatives end that way.

This sampling of regional sales tax measures provides several important lessons. First, with the exception of the ST3 referendum in Greater Seattle, all of these measures have involved the sales tax only. The inclusion of motor vehicle “car tab” increases in ST3 has created a political and fiscal vulnerability. ST3’s inclusion of a property tax increase has not been replicated elsewhere, and given the sensitivity of property tax rates in Connecticut, would not seem advisable.

Second, some ballot measures have been transit-only, others a mix of highway and transit, and the track record is mixed—both types have won, both have lost, sometimes in the same jurisdiction. Third, while the give-and-take of creating an official, vetted program of projects is invariably controversial, having such a program has been essential in the winning campaigns. That said, the

formal program—“what the voters were promised”—contains the seeds of future controversy if real-world events merit a change in plans, or if cost and schedule issues threaten timely completion of some projects.

Finally, it is important to get the sunset issue right. With the exception of Los Angeles County’s Measure M (and the Northern Virginia Transportation Authority sales tax, which was not voter-approved), the case studies summarized here all have sunset dates. In the case of the original Georgia T-SPLOSTS, the expiration was only ten years out, making the issuance of longterm bonds impossible. In the other cases, the sunset date ranges from 20 years to 40. From a program standpoint, the longer the better, provided the voters agree. It is also advisable to be conservative in estimating the long-term yield of the sales tax, because if it grows more slowly than assumed, there will be a shortfall relative to expectations.

Hypothetical Capitol Region Transportation Sales Tax

Connecticut currently levies a 6.35% sales and use tax throughout the state, with no provision for a local-option increment. A Capitol Region transportation sales tax, while affected by greater Hartford’s relatively flat economic trends, would still generate

Table 11.1 — Illustrative Estimate, Capitol Region Transportation Sales Tax

Total Annual Yield 2023			
Alternative 1	Alternative 2	Alternative 3	Alternative 4
Additional .20%	Additional .25%	Additional .50%	Additional 1.00%
\$139,763,871	\$174,704,838	\$349,409,676	\$698,819,353

Table 11.2 — Examples of Regional Transportation Sales Taxes

Metro Region	Description
Salt Lake City	<ul style="list-style-type: none"> • 2000, a regional sales tax referendum to fund the TRAX light rail system. • 2015-2018: new 0.25% local option sales tax increment in several of the region’s counties.
Denver	<ul style="list-style-type: none"> • 2004: regional sales tax approved to fund the FasTracks regional transit expansion program. • The referendum was conducted in the eight-county RTD District. It raised the sales tax in the RTD District from 0.6% to 1.0%, projected to fund approximately \$4.7 billion in capital.
Phoenix	<ul style="list-style-type: none"> • 2015: voters in Phoenix approve city sales tax increase and extension. • Will fund \$31.5 billion, including six new light rail corridors, new BRT, street improvements.
Los Angeles	<ul style="list-style-type: none"> • A history of transportation sales tax wins dating back to 1980, combining roads and transit. • 2016: voters pass Measure M, the largest regional transportation sales tax measure in US history. It removes prior sunset and adds a ½ cent, estimated to generate \$120 billion.
Seattle	<ul style="list-style-type: none"> • A transit-only example. Sound Transit tax measures approved by voters in 1996 and 2008. • 2016: voters approve “ST3”, including sales, motor vehicle excise, and property tax increases, projected to generate \$54 billion in capital.
Atlanta and GA Statewide	<ul style="list-style-type: none"> • 2010: Legislature enables referenda on 1% sales tax in each of 12 regional planning districts. In 2012, nine of the 12 regions vote against, including the 10-county Metro Atlanta region. • 2016: three sales tax referenda approved (Atlanta, transit only and combined roads/transit; Fulton County, combined).
Tampa	<ul style="list-style-type: none"> • Hillsborough County: transit-only referenda defeated in 2010 and 2014. • 2018: 1 cent sales tax approved, projected to raise \$30 billion, split transit and roads.
Northern VA	<ul style="list-style-type: none"> • A different model: a legislatively mandated regional sales tax, rather than voter-approved. Northern Virginia Transportation Authority created by the General Assembly in 2002, including four and five independent cities. Both an MPO and a transportation provider. • In 2013, the General Assembly imposed a sale tax increase in the NVTA district, generating \$250 million annually for transportation.

significant revenues. Table 11.1 summarizes the results of a high-level, illustrative estimate of the potential revenue yield under different sales tax rate scenarios. This exercise assumes that all 38 municipalities in the CROCG region would be covered, rather than a subset.

The Connecticut Department of Revenue provides data on retail sales of goods by municipality. The total retail sales of taxable goods in the CROCG region in 2019 was \$62.4 billion. Assuming retail sales kept pace with historical inflation at 3% we can expect this value grew to roughly \$70 billion in 2023. The result is an annual sales tax revenue increase, in 2023 dollars, ranging from over \$100 million a year to nearly \$700 million a year.

Another potential use of the regional sales tax funds could be used to transform the Greater Hartford Transit District (GHTD) into a more robust transit agency. GHTD is a regional governmental unit formed under Chapter 103a of the Connecticut General Statutes. There are sixteen member municipalities; each appoints one to four members of the Board of Directors based on population. GHTD has broad powers to acquire, operate, finance, plan, develop, maintain and otherwise provide land transportation services, including transportation centers and parking facilities. It has the statutory power to issue revenue and general obligation bonds. GHTD owns and operates Hartford Union Station and provides Paratransit service to the Greater Hartford and Greater New Britain regions. GHTD does not have a dedicated source of funding aside from revenues that come from

operating and capital grants (see the earlier discussion of FTA grant programs in the CROCG region). As part of a regional sales tax initiative, the state could decide to use the GHTD organization and bonding authority to house an enhanced regional transit program.

Joint Development

There are two broad strategies for turning transit-oriented development into a transportation revenue source. One is joint development, which is described here; the other is district value capture, which is addressed in the next section. Joint development is the subset of TOD in which a transportation agency is directly involved in the development transaction and derives in cash or in-kind revenues directly from it. This can occur in either of two ways:

On-Site Joint Development

The transportation agency invites development to occur on its own property. Such development can occur on surplus land parcels (such as park-and-ride lots or station construction staging areas), as ancillary commercial development within the four walls of a station, or on air-rights above tracks, busways, or ramps. The developer, which is usually chosen through a competitive procurement, may pay the transportation agency in cash (by buying or leasing the development rights), in-kind (by

funding, building, or maintaining station-related facilities or even the station itself), or a combination of the two. Most of the major rail transit agencies in the US have undertaken joint development of this type and have established formal joint development policies. Several agencies—BART in the Bay Area, LA Metro, WMATA in Greater Washington, MARTA in Metro Atlanta, the MBTA in Greater Boston—have delivered multiple projects and have large portfolios of sites in reserve.

Off-Site Joint Development

An adjacent developer funds and/or delivers station improvements, a replacement station, or a new station entirely. Such projects are often developer-initiated, and their viability depends on the economics of the particular site. This is an emerging business model in Greater Boston's MBTA system, where two new stations (Assembly Square on the Orange Line and Boston Landing on the Worcester commuter rail line) have been funded and delivered in whole or in part by adjacent developers. Lansdowne Station, on the same commuter rail line, is being significantly improved by the adjoining developer.

Joint Development Versus P3S

In colloquial usage, joint development is often conflated with public-private partnerships (P3s), especially if the developer builds the station. While joint development might loosely be considered a form of P3, it is not what the

infrastructure industry and finance industries normally mean by that term. P3 has no single, universally accepted definition, but it generally indicates a longterm, performance-based contract in which a private partner designs, builds, finances, operates, and maintains a traditionally public asset or service—a highway, transit line, wastewater treatment plant, port terminal, or even a dormitory or prison. The potential use of transportation P3s in the Capitol Region is explored in a later section of this chapter.

Joint development and P3s represent two distinct specializations in the private market. Moreover, P3s have transaction costs, procurement costs, and risk factors that often dictate project cost thresholds far in excess of a \$25 or even \$50 million transit station. For a TOD developer, on the other hand, the transaction costs and risk factors lie primarily in the development itself; the smaller the required contribution to the station, the better.

Joint Development Potential in the Capitol Region

Joint development is potentially relevant to locations in the Capitol Region where there are transit stations and developable land.

Publicly owned land adjoining existing rail stations could be made available for on-site joint development through the issuance of developer RFPs, as could the park-and-ride lots associated with CTfastrak stations. In order to undertake such an initiative, however, several hurdles would need to be overcome. First,

CTDOT as owner would need to establish a joint development process, create (or obtain through contract) a joint development analytic capacity, and determine, through market outreach and consultation with CROG and the affected municipalities, which sites are potentially ripe for development. There is potentially a land assembly hurdle as well, since the CTDOT land at a given station may lack sufficient area, contiguity, or station access to be developable on a standalone basis. And station-area development sites may be brownfields, making them priorities for the state's significant array of brownfields redevelopment resources.

A strategy for addressing some or all of these challenges may lie in partnering with the Capital Region Development Authority (CRDA). Created by the Legislature in 2012, CRDA has extensive project development and implementation powers within a designated district covering much of Downtown Hartford. It also encompasses a CRDA Regional District including all of Hartford and thirty seven contiguous municipalities, where it is authorized to participate in project implementation if requested by local government.

The CRDA Board includes ex officio the Commissioner of CTDOT as well the Commissioner of Economic and Community Development, the Commissioner of Housing, and the Secretary of the Office of Planning and Management. CRDA could thus bring a development cabinet-like set of state program and policy interests. If CTDOT, CROG, and CRDA chose to explore a joint development implementation role, a detailed

analysis of CRDA's enabling legislation (PA 12-147) would be needed to determine if its existing powers are sufficiently aligned with the land assembly and project implementation needs of projects throughout its eight-municipality regional district.

The Capitol Region's most strategic joint development opportunities likely lies in the future phases of the Hartford Line project. The Hartford Line's current stations are to be complemented by three entirely new stations (Newington, West Hartford, and Enfield), and the replacement of two existing shelter stops with full-service, high-platform stations (Windsor, and Windsor Locks). These stations should be planned with joint development in mind to help fund the stations themselves and their related infrastructure.

To test this concept, a joint development RFP could be issued for one of the new stations, with the developer who gains the TOD rights required to build the station and to fund some or all of its cost. If there is a major adjacent, off-site land owner, they could be encouraged to bid on the project and deliver the station, as in the MBTA examples cited above. If successful, the joint development model could be replicated at each of the remaining stations, or for all of them as a package.

The existing and expanded Hartford Union Station and the new TOD in its immediate walkshed could become a multi-modal, mixed-use transportation and development hub, similar to Denver Union Station (which opened in 2014) or Amtrak's legacy stations in Chicago, Baltimore, and Philadelphia, which

are at varying stages of the joint development process. These four iconic downtown hubs include commuter rail, Amtrak, local rail transit, and bus terminals. Their designated developers pay for the land parcels, interior commercial space, and air rights, and are responsible for delivering and maintaining portions of the station improvements.

District Value Capture

While joint development captures value from a specific real estate project, district value capture does so from a defined area surrounding a transportation investment. There are two broad categories of district value capture: tax increment financing (TIF) and special assessment districts.

Tax Increment Financing

TIF is legislatively allowed, and is used to varying degrees, in 49 states and the District of Columbia. While state TIF statutes vary in important details, the model consists generally of drawing a defined district around the proposed public improvements and measuring the tax yield in a pre-project Base Year (or “year zero”). The tax yield in subsequent years is then divided into the “base” (which continues to flow in its entirety to applicable taxing jurisdiction) and the “increment”—some or all of which is set aside in a dedicated fund to help pay for the public improvements. In most states, this can be done either on a pay-as-you-go basis or, for major projects, by using the TIF revenue stream to support TIF revenue bonds. TIF districts typically

subset once the TIF bonds have matured, and from that point on 100% of the district’s revenues flow to the taxing jurisdiction. Most TIF statutes involve local government only (municipalities, school districts, and counties) and address only the local property tax; this is the case in Connecticut.

TIF is attractive to the real estate market because it is not a new tax; it is merely an alternative way of spending taxes that would be collected anyway. For the municipality, on the other hand, TIF revenues may be seen as a diversion of resources from other public priorities; local officials must weigh the likelihood that without the TIF-financed public improvements, the increment would not have occurred. An equally fundamental concern is whether the TIF will generate enough revenue to achieve its objective, especially in a relatively flat local economy. If the TIF district consists largely of built-out areas with modest infill opportunities, the incremental uplift may not be substantial. Success is more likely if the district consists mostly of vacant or underutilized properties with a very low base yield, so that most or all of the future revenue is incremental—provided, however, that the site is ripe for development, and that the revenue increment materializes in time to meet the TIF bond debt service obligations.

One strategy to mitigate this risk is to use the federal TIFIA program as the borrowing vehicle for TIF debt. This would take advantage of TIFIA’s five-year front-end debt service grace period and 35-year amortization term. The 2015 FAST Act changes to TIFIA to

allow project costs as low as \$10 million for local infrastructure or TOD infrastructure. Also, the RRIF program can be used as the TIF borrowing vehicle for passenger rail stations; this was a key feature of the Denver Union Station financing package.

Connecticut lacks a strong history of using TIF, largely because its original TIF enabling law was complex and narrow. However, legislative changes enacted in 2015 have made the Connecticut TIF law more flexible and robust, providing terms of up to 50 years terms; local control and approval, which had been lacking previously; the explicit ability to finance public infrastructure as well as private development; the ability to use planned TOD or downtown revitalization rather than a traditional blight finding in justifying a TIF district; and the discretion to capture some or all of the TIF revenues. Under the 2015 law, TIF districts in a municipality cannot exceed, in the aggregate, 10% of the municipality's total valuation.

Providing the numbers work, a Connecticut municipality could use TIF as it exists today to finance a local transportation project, including streets, sidewalks, local shuttles, and other infrastructure components integral to TOD. On the other hand, to use TIF in support of a CTDOT project, especially a corridor-scale project spanning multiple municipalities, would be more complex, requiring intergovernmental agreements that may not be explicitly contemplated in the 2015 TIF statute. Potential amendments could be considered, using examples from other states:

- **Texas** allows municipalities and counties to create special TIF districts known as

Transportation Reinvestment Zones. The TIF revenues must be used for specific transportation projects, and the municipality is explicitly empowered to enter into an agreement with another public entity (including the state DOT) to transfer the TIF funds to them for implementation of the project.

- In **California**, an Enhanced Infrastructure Finance District (EIFD) can finance a variety of public improvements (including highways, streets, and transit) as well as certain private development (such as TOD and affordable housing). An EIFD can be created by a single municipality, multiple municipalities joining together for this purpose, or a county, and an EIFD can enter into a Joint Powers Agreement with the state DOT or a regional transit authority to undertake a project.

Special Assessment District

Special assessment districts (SADs) are the mirror-image of TIF districts. They are established for the same purpose: to generate an annual stream of revenues that can be used to finance a set of value-generating public improvements. In an SAD, however, rather than divert the incremental portion of local taxes that would have been paid anyway, a new surcharge is levied. Usually this surcharge is an addition to the property tax, assessed on an ad valorem basis and collected on the municipal tax bill, but state enabling laws vary. Depending on the state, the surcharge may apply to all property, new development, or a combination of the two; some states, but by no means all,

exempt existing residential properties.

The establishment of a SAD typically requires the approval by the owners of a majority of the affected classes of property. At least for those owners opposed to the creation of a SAD, it is less desirable in principle than a TIF. From the municipal perspective, on the other hand, a SAD may be preferable, since it avoids the issue of diverting regular property taxes from the general treasury. Financially, if a SAD includes existing properties, it may provide a revenue stream that is more predictable than that of a TIF and more immediate, since it does not depend on the pace of new development.

Connecticut's 2015 TIF enabling law, described previously, allows a municipality that creates a TIF district the option of also creating, by municipal action, a coterminous SAD. This option might be exercised for two reasons: to hedge the cost of financing the new public projects between the tax increment and a tax surcharge; or to create a reliable revenue stream in the early years of the district—before the anticipated new development has fully materialized—so that the ability to pay TIF bond debt service is assured.

There are interesting examples in several states of robust SAD mechanisms that can be used to finance major transportation improvements. Replicating this concept in Connecticut, particularly in situations unrelated to the 2015 TIF law, would require legislative changes. Virginia, for example, allows the creation of a Transportation Improvement District (TID) to fund transportation projects upon petition by the

owners of at least 51% of taxable property in the proposed district. Single-family homes are excluded. The law specifies a statutory maximum rate of up to \$0.40 per \$100 assessed value. To cite two prominent examples, one transit and one highway:

- In 2004, Fairfax County created a TID to levy a special assessment on commercial and industrial properties to help bond-finance the Dulles Metrorail Phase I extension. Landowners representing a majority of the relevant valuation in the Tyson's Corner and Reston-Herndon commercial areas petitioned in favor of the TID.
- Fairfax and Loudon Counties, in conjunction with the Virginia Transportation Board, created the State Route 28 Highway TID. Revenues supported a bond issue to cover about 75% of the costs of this major highway project.

California's Mello-Roos Community Facilities Act allows any county, city, special district, school district, or joint powers authority to create a Community Facilities District (CFD), requiring a two-thirds vote of residents in the proposed district. Because the special tax cannot be based on assessed valuation, it is based on a mathematical formula that takes into account property characteristics such as use, square footage, and lot size. CFDs are allowed to issue debt.

District value capture and joint development are not mutually exclusive. On the contrary, they can be, and often are, used in tandem. An iconic national example is Denver Union Station, where TOD effectively paid nearly

\$200 million of the \$489 million cost of the rail, bus, and public realm improvements. On the joint development side, five on-site parcels were sold to the master developer, generating \$38 million in real estate proceeds. On the value capture side, somewhat larger tax increment and special assessment districts were formed (including the onsite joint development as well as several adjacent blocks), generating sufficient annual revenues to support a \$155 million RRIF loan.

In the CROCG region, rail and CTfastrak stations could be fitted with value capture districts, covering any joint development that might occur as well as the surrounding properties. To the degree that TOD occurs, the joint development contribution and the district's annual revenue stream could combine to fund the new or replacement station as well as the surrounding streets and sidewalks.

Public-Private Partnerships

Public-Private Partnerships (P3s) are long-term, performance-based contractual arrangements between a public sponsor and a private entity (often a consortium of firms) to deliver facilities and services traditionally provided by the public sector. P3 is sometimes referred to as “project finance”, because it involves creation of a Project Company/Special Purpose Vehicle to deliver the project. P3 procurement is frequently applied to projects that are capital-intensive, highly specialized, or both,

requiring risk sharing, technical acumen, and innovation on the part of the private partner.

In a P3, the public sponsor typically allows the private entity to collect any relevant user fees (tolls, fares, water bills, dorm rents). For projects that are inherently cash-negative (like US transit lines), the sponsor compensates the private partner through a specialized model, such as availability payments.

Specialized Transportation Elements

There are several examples of specialized procurements that lend themselves to the P3 model and could potentially be replicated in the Capitol Region:

- **Highway or Streetlight LED/SMART Lighting.** P3s have been introduced in recent years to convert fluorescent lighting to SMART LED lighting on both city streets and highways. The Michigan Freeway Lighting project is a 15-year contract to install and maintain 15,000 energy-efficient LED lights, with about \$145 million in capital and maintenance costs. The contractor brings private equity and financing and will increase lighting availability from 70% (operational prior to P3) to 95% (target) and invest in upgrading of old poles.
- **Broadband in DOT right of way.** The Pennsylvania Turnpike Commission is procuring fiber optic cable along the 550-mile Pennsylvania Turnpike and its extensions. The private partner will design, build, finance, operate, and maintain

broadband infrastructure over a 30-year period. The project will support the expansion of cashless toll collections, as well as provide connectivity for the agency's administrative buildings, maintenance sheds, tolling systems, traffic cameras and dynamic message signs. Similarly, the Virginia DOT is procuring a private partner to develop statewide fiber optic and wireless broadband system.

- **Bus-shelters.** In 2005, the Washington, DC DOT entered a 20-year Bus Shelter Franchise agreement with Clear Channel to enhance the safety and convenience of bus transportation and provide bus shelters at no cost to the District. Clear Channel provides and maintains the new bus shelters and generates revenue from the sale of advertising on the bus shelters.

Rail Transit Corridors

At least three corridor-scale rail transit lines in the US have been developed as P3s:

- **Denver Eagle Partnership**, which designed, built, financed, operates, and maintains three commuter rail lines emanating from Union Station and operates the Union Station train shed
- **Maryland's Purple Line**, a 21-mile circumferential light rail corridor in Montgomery and Prince George's County in the DC Suburbs
- **Florida's Brightline**, a wholly private rail service from Miami to Orlando combines intercity rail with joint development

Each of these P3 rail corridors interfaces with, but is financially and operationally separate from, other rail transit services. For CTDOT to consider using the P3 model at corridor scale—for example, to complete the double-tracking, new stations, and rolling stock acquisitions on the Hartford Line, or to create the proposed expansion of CT**fastrak**—the threshold question of a stand-alone entity would have to be solved. In theory, a P3 procurement could include operation of the existing Hartford Line or CT**fastrak**, respectively, but CTDOT would have to determine whether operations could be separated, realistically and practically, from the larger rail and CTtransit systems.

As part of their finance packages, the Denver Eagle, Purple Line, and Brightline projects each took advantage of Private Activity Bonds (PABs), a federally-enabled mechanism that allows tax-exempt bond financing for certain P3 projects as if they were being built by public agencies. Access to PABs, and other technical support for P3s, is provided by the Build America Bureau of the US DOT, the same Bureau that manages the TIFIA and RRIF programs.

Ongoing Actions

1. Further explore implementation of the innovative funding strategies

Review the benefits and challenges of implementing the following:

- Debt financing through the federal TIFIA and RRIF loan programs
- State legislation enabling regional transportation sales tax referenda
- Joint development at rail and bus rapid transit stations
- District value capture strategies, including tax increment financing
- Public-private partnerships to deliver specific transportation projects or components

2. Promote Innovative Financing

Pilot Projects Identify and advocate for innovative financing pilot projects that test their viability and the regional market for them

3. Advance the Idea of a Transit Oriented Development (TOD)

Focused Agency Highlight the need for a Transit Oriented Development (TOD) focused agency, perhaps via a state-level “development cabinet”

Chapter 12

Environmental Justice

The Capitol Region Council of Governments is committed to fully integrating the principles of environmental justice (EJ) into all its transportation planning programs and activities. These principles include:

- 1. EJ Outreach** – Reaching out to involve minority groups and low-income groups in the planning process
- 2. Addressing EJ Transportation Concerns** – Preventing “disproportionately high and adverse” impacts of transportation decisions on minority groups, low-income, and transit dependent groups
- 3. Equity Assessment** – Ensuring these same groups receive a proportionate share of benefits



Transit stop in Hartford, CT

Since the early 2000s, CROG has made substantial progress in advancing its commitment to the core principles of equity and environmental justice. This chapter highlights CROG's recent efforts, policies, and opportunities in each of these areas.

EJ Outreach

In 2017, CROG integrated its Public Involvement Plan, Title VI Program, and Environmental Justice and Limited English Proficiency (LEP) Policies into a single, overarching Public Participation Plan. While EJ focuses on minority and low-income populations, Title VI is more comprehensive and prohibits discrimination on the basis of race, color, or national origin. The Public Participation Plan outlines CROG's commitment to involving all of these protected – and historically underserved – populations in its transportation planning process and programs. CROG updated its Title VI documents in 2019, and a 2022 review by the Connecticut Department of Transportation (CTDOT) found that CROG's Title VI Program remained fully compliant. CROG expects to update its Public Participation Plan in 2023.

To help ensure appropriate outreach at a policy level, CROG's Transportation Committee includes a representative from the Connecticut Coalition for Economic and Environmental Justice (CCEEJ). This provides an ongoing opportunity for environmental justice communities to be involved in the transportation planning process. Additionally, CROG is committed to

customizing its outreach efforts to reach underserved populations, including the significant populations of Spanish and Polish speakers within the region. While scoping its transportation studies, CROG performs an EJ assessment of the study area to determine any specialized outreach approaches that may be needed to best involve potentially impacted populations. CROG also routinely publishes legal notices, meeting notices, study summary documentation, and other relevant information in various formats and publications that target all major affected populations. These notices are provided in alternative languages if such populations are being affected. For this MTP, CROG published meeting notices in Spanish and Polish and offered language assistance at public meetings

Figure 12.1 – Public meeting flyer for this MTP offered hybrid options - in-person and virtual opportunities in the Fall of 2022.



CONNECT2050

CROG METROPOLITAN TRANSPORTATION PLAN

Let's plan the transportation future of our region together!

The Capitol Region Council of Governments (CROG) is hosting two public meetings about the update to our Metropolitan Transportation Plan (MTP). This plan establishes the vision for the region's transportation system - highways, local roads, bicycle, pedestrian, and more - for the next 25 years.

Join us at one of our kick-off meetings. We are offering two opportunities for participants to learn about the plan and begin to provide input.

For the latest information and to join our mailing list, visit www.crocg.org/mtp or call 860-724-4293.

CROG does not discriminate on the basis of disability or language. Individuals may request auxiliary aids and/or language assistance by contacting (860) 724-4293 as soon as possible.

Un intérprete estará disponible para esta reunión si usted lo solicita al (860) 724-4293, lo más pronto posible.

Jeśli potrzebujesz tłumacza na język polski, zadzwoń (860) 724-4293 jak najszybciej.

PUBLIC MEETINGS

Wednesday, November 16
6:00-7:30 PM

Thursday, November 17
12:00-1:30 PM

Offering HYBRID meetings

To attend in-person:
CROG Offices
251 Main Street, 3rd Floor
Hartford, CT

REGISTER to attend virtually:
Register at www.crocg.org/mtp to receive the Zoom meeting link.

CROG offices served by CTransit routes 43, 31, 33, 32, and other nearby routes. For driving and parking information visit www.crocg.org.

CROG
CAPITOL REGION COUNCIL OF GOVERNMENTS

upon request. The MTP’s public outreach survey was also available in Spanish and Polish to provide opportunities to LEP populations to participate and provide their opinions and concerns. All meeting notices were published in hardcopy and online versions of local Spanish and Polish newspapers.

Ongoing Actions

1. **EJ Analysis** Continue to conduct an EJ analysis during the scoping process of all CROCOG studies to identify necessary outreach activities.
2. **EJ Representation** Continue the involvement of an Environmental Justice representative on the Transportation Committee.

Addressing EJ Transportation Concerns

The Capitol Region is home to approximately 377,000 households, about ten percent of which are without access to personal vehicles and are therefore dependent on public transit, biking, and/or walking for their transportation needs. Most of these households are concentrated in and around urban areas and therefore access to reliable public transportation as well as safe bicycle and pedestrian facilities are vital to the economic well-being of this population. CROCOG believes the following transportation

improvements are crucial to addressing EJ concerns and is committed to supporting efforts which lead to their implementation.

Better Transit Service

The region’s bus system is a necessity for transit-dependent residents who require the service for virtually all their transportation needs. This became very apparent during the COVID-19 pandemic. While ridership on express bus and rail service plummeted, a substantial amount of ridership remained on the local bus system. Local services have also since recovered their ridership, demonstrating the importance of the service to its riders. CROCOG, in partnership with CTDOT and CTtransit, completed a Comprehensive Service Analysis of bus service in the Hartford (2017) and New Britain/Bristol (2018) Divisions of CTtransit. This study included a detailed review of the existing CTtransit service and provided recommendations for improving service to meet the region’s needs. Based on recommendations from this effort, CROCOG completed a Transit Priority Corridors Study in 2022. This study developed an actionable implementation strategy for improving transit service on six of the primary transit corridors in the Metro Hartford area.

Another asset to the Capitol Region’s transit system is CT**fastrak**, Connecticut’s first bus rapid transit system, which opened in March 2015 and operates along a bus-only guideway between Hartford and New Britain. CT**fastrak** also provides connections to many local and express bus routes. Additionally,

the CT**rail** Hartford Line began providing commuter rail service in June 2018 between New Haven and Springfield, MA. These transit services have been extremely successful at attracting riders. These services, however, saw dramatic ridership drops during the COVID-19 pandemic, suggesting that their ridership demographics differ from the local bus system in terms of transit-dependency and employment type. Ridership has begun recovering on CT**fastrak** and the Hartford Line, with CT**fastrak** recovering more fully to date. Neither, however, has recovered at the rate of the local bus system.

Recommended improvements to the transit system are discussed in Chapter 2 of CROG's MTP.

Clean Fuel Vehicles

Diesel emissions can pose a health hazard in urban neighborhoods where asthma rates are often higher than in suburban neighborhoods. Reducing diesel emissions in the region continues to be a priority. To address this, the current CT**transit** vehicle fleet relies on biodiesel fuel and hybrid electric powered buses. CTDOT, in partnership with the Connecticut Department of Energy and Environmental Protection, has also initiated the Connecticut Electric Bus Initiative, which is focused on moving CT**transit** towards a fully electric vehicle fleet.

Pedestrian & Bicycle Safety in Urban Areas

Pedestrian and bicycle safety is an important issue that disproportionately affects minority, low-income, and transit-dependent households living in more urbanized communities. More than ten percent of the residents in the region do not own an automobile, and for many of them, walking and riding a bicycle is an important means of travel. However, pedestrians and cyclists face many safety hazards in urban areas where traffic volumes are high. Data from the UConn Crash Repository shows that nearly half of the pedestrian crashes in the Capitol Region from 2019-2021 occurred in either Hartford or New Britain. Within each of these cities, approximately 8.5% of all crashes involved a bicycle or pedestrian. This rate is higher than the regional average of 5.5%. This demonstrates that bicycle and pedestrian safety is even more of a serious concern in urban areas of the Capitol Region.

Nearly half of the pedestrian crashes in the Capitol Region from 2019 to 2021 occurred in either Hartford or New Britain.

Ongoing Efforts

1. Transit Service Improvements

Continue to support improvements to transit services as part of a regional environmental justice program.

2. Support Clean Fuel Vehicles

Support CTDOT's efforts to reduce transit-related emissions of all types and support efforts to electrify the CTtransit vehicle fleet.

3. Pedestrian and Bicycle Safety

CROCOG's transportation plans, policies, and programs should continue to work toward the goal of improving pedestrian and bicycle safety, especially in urban areas of the region.

Equity Assessment

CROCOG reviews its plans and projects to ensure that there are not any disproportionately high or adverse impacts on minority, low-income, and/or transit-dependent populations; and to ensure that these same populations receive a proportionate share of benefits. For corridor studies, recommendations are made to better integrate land use and transportation planning in order to mitigate potentially adverse effects on minority, low-income, and/or transit dependent populations. CROCOG also conducts an equity assessment for each major update of the Transportation Improvement Program (TIP). CROCOG's goal is to ensure an equitable process that does not result in a distribution of benefits that is discriminatory.

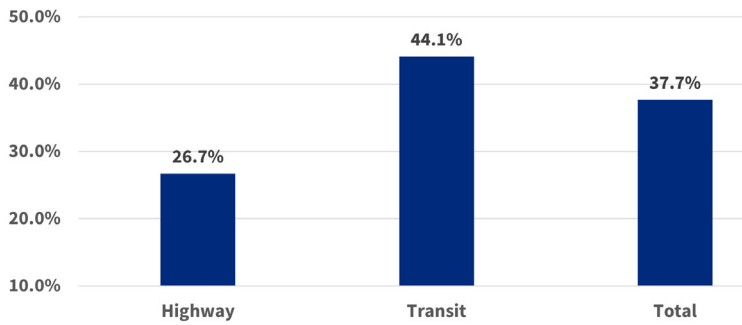
CROCOG's TIP equity assessment determines whether minority and low-income

communities are receiving a fair share of funding and benefits from CROCOG's transportation programs. This analysis first identifies "target areas" with large concentrations of low-income or minority populations. Data from Census 2010 and American Community Survey (2014-2018) showed approximately 30.5% of the region's population lives inside the minority and low-income target areas. This proportion serves as a general benchmark for the equity assessment, and it is therefore expected that a similar percentage of the region's transportation funds would be spent in the target areas. While this might not be the case for any single TIP, over the long-term, the distribution of funds should be roughly proportionate to the distribution of the population.

FFY 2021-2024 TIP

CROCOG most recently prepared an equity assessment for the FFY 2021-2024 TIP in October 2020. Based on the results of the equity assessment, there did not appear to be any bias in the distribution of transportation funds and projects in the TIP. As illustrated in Figure 12.2, about 26.7% of highway and 44.1% of transit funds are being invested in the target areas. This equates to 37.7% of total funding, whereas only 30.5% of the region's population live in the target areas. Therefore, CROCOG is investing a higher proportion of transportation funds in the target areas than would be expected based on the size of the population in those areas. Since the communities in the target areas are more likely

Figure 12.2 – Percent of TIP Funds in EJ Target Areas



Note: In FY2021, 30.5% of the region's population lived in an EJ Target Area
Source: CRCOG

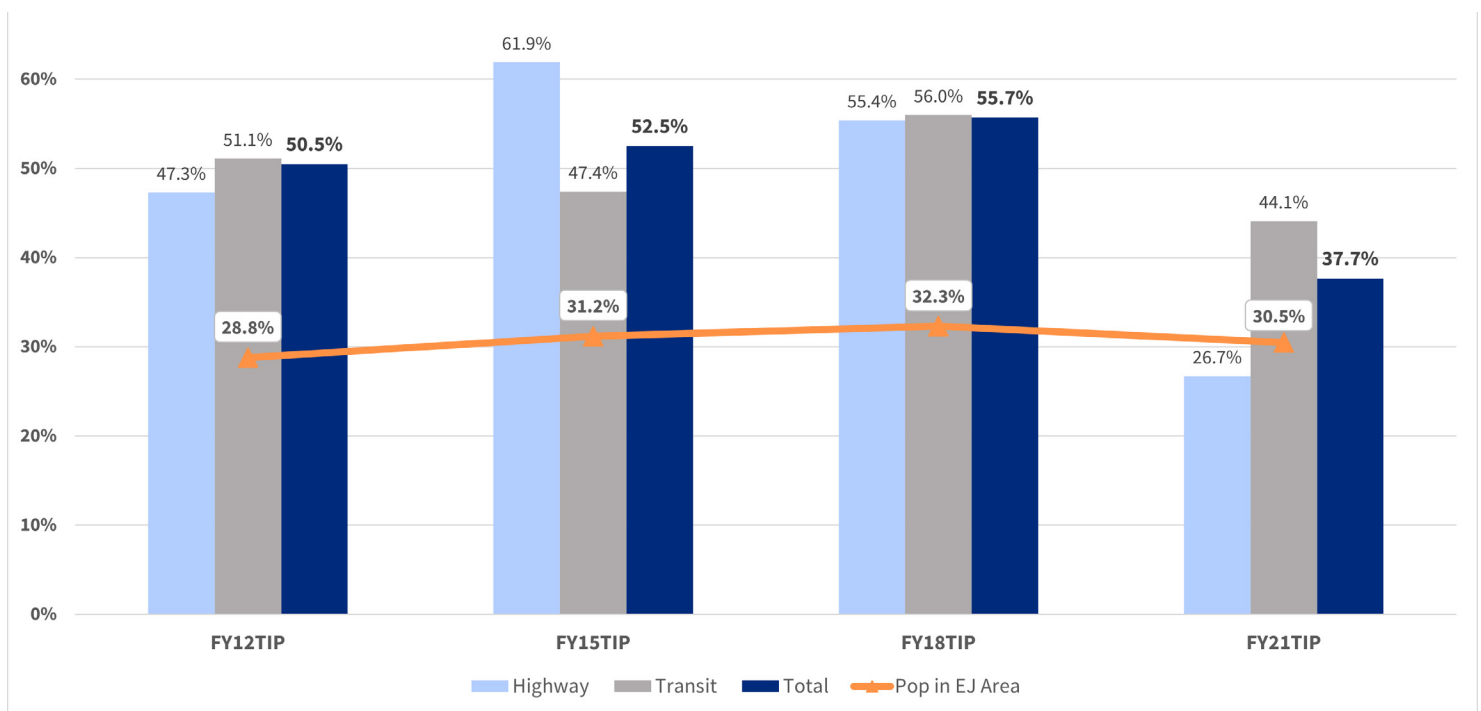
to depend on transit, the higher proportion of investment in transit is likely more meaningful in terms of transportation equity.

Longer Term Trend

As mentioned previously, the four-year TIP is only a snapshot of projects programmed for that specific period. Figure 12.3 shows a consistent trend of equitable investment in the target areas when compared to the percentage of people living in those areas. As of 2019, 30.5% of Capitol Region residents live within the EJ target areas, which is a decrease from 32.3% in 2017.

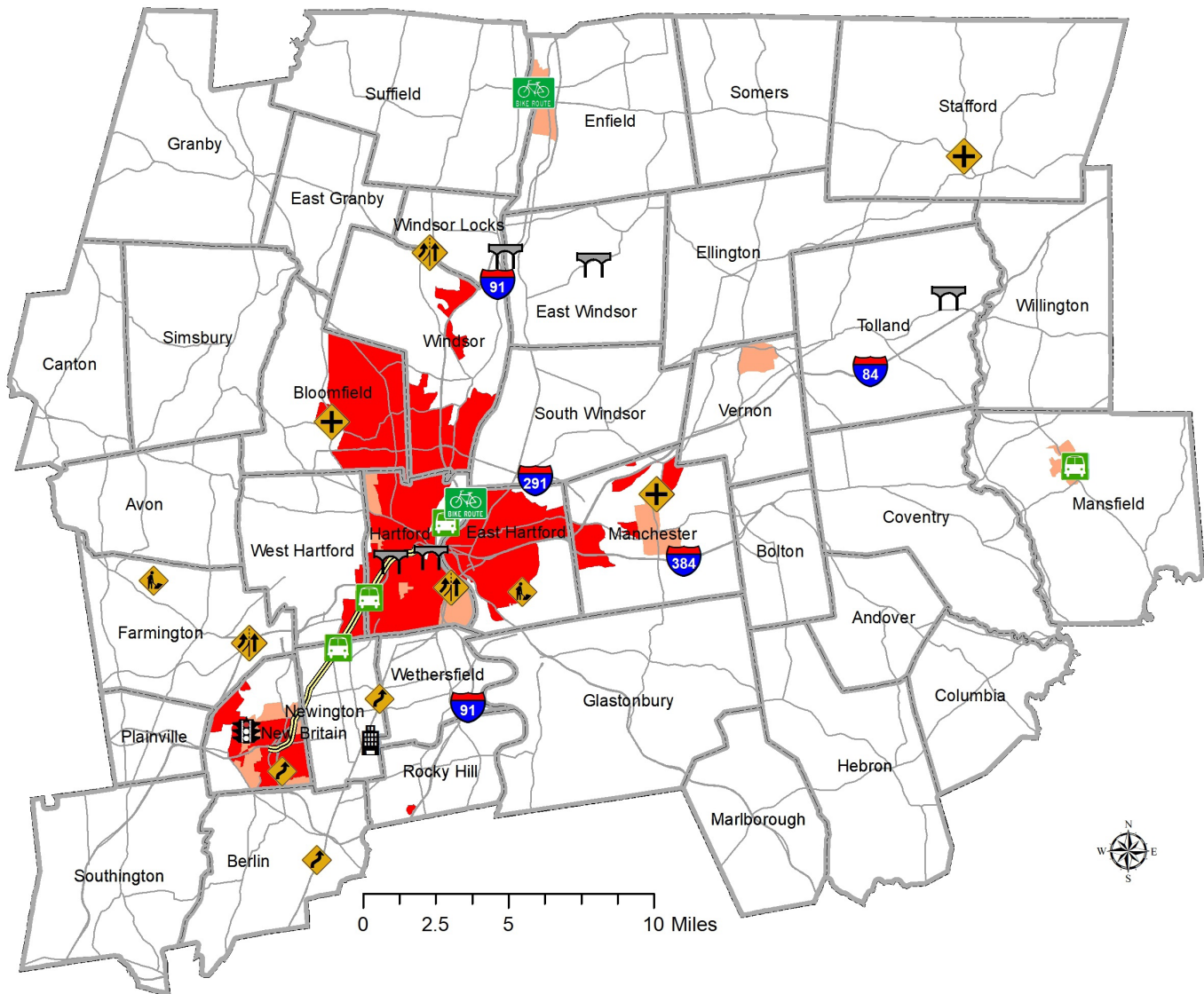
When comparing the previous TIP and the current TIP, the total share of funding in

Figure 12.3 – Trend of Funds in Target Areas (%)



Source: CRCOG

Figure 12.4 – Environmental Justice Target Areas and TIP Projects



Source: CRCOG

the EJ target areas dropped from 55.7% in FY18 to 37.7% in FY21. Although the FY21 investment in the targets area looks lower when compared to previous TIPs, this is likely due to not being able to geographically assign district level projects, the majority of which fall in the Capitol Region. Additionally, recent large capital investment projects such as CT**fastrak** (2015) and the CT**rail** Hartford Line (2018) have been completed and only received operational funding in the current

Projects		EJ Target Area	
	Transit-Operation		Primary Target Area*
	Bridges		Secondary Target Area**
	Freeway-operational	* Primary includes any block group that has at least 50% minority population according to the 2010 Census.	
	Roadway-safety	** Secondary includes additional census tracts that has at least 20% low-income population (household income 150% or below the Census poverty threshold, by family size) according to the ACS 2014-18 estimate.	
	Roadway-signals	Prepared by the Capitol Region Council of Governments September, 2020	
	Roadway-reconstruct	Source: Census2010 SF3 P042 ACS 2014-2018 5 year estimate Tele Atlas Road Network	
	Roadway-intersection	FOR REFERENCE ONLY	
	Railroad crossing		
	Bike Ped		
	Highways Operations		

TIP. Despite the lower overall funding amount in FY21, the assessment concluded that over the long term there continues to be no bias in the distribution of transportation funds and projects listed in CROCOG's TIP. Figure 12.4 shows the projects from the FFY 2018-2021 TIP overlaid on the region's EJ target areas.

Justice40 and Future Equity Assessments

In January 2021, the Justice40 Initiative was created under Executive Order 14008: Tackling the Climate Crisis at Home and Abroad. The Justice40 Initiative is intended to “confront and address decades of underinvestment in disadvantaged communities” and recommends that 40 percent of the benefits from federal investments should be dedicated to disadvantaged communities. The recommendations focus on investments in the areas of clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of critical clean water infrastructure. As part of this initiative, the federal government developed an interactive EJ mapping tool to identify and understand disadvantaged communities throughout the United States. The EJ mapping tool utilizes various socio-economic, demographic, and environmental attributes to identify disadvantaged communities that are in need of investment under the Justice40 Initiative. CROCOG is currently reviewing the details of this initiative and

its mapping tool to understand how to best reflect the goals of the Justice40 Initiative in future equity assessments of CROCOG's transportation programs and projects.

Ongoing Efforts

- 1. Equity Assessment** Continue to perform Equity Assessments on each major TIP update.
- 2. Justice40** Continue to assess how to update CROCOG's benefits and burdens assessment methodology to reflect Federal equity efforts as identified in Justice40.

Short-Term Recommendation

- 1. MTP Equity Assessment** Apply updated benefits and burdens assessment methodology to analyze the benefits and burdens of projects included in future MTP updates.

Chapter 13

Public Involvement

This chapter summarizes three specific public involvement efforts:

- Public outreach opportunities and challenges identified during the COVID-19 pandemic
- Public Outreach Efforts completed on studies and plans since the publication of the 2019 Metropolitan Transportation Plan; and
- Public Involvement activities conducted specifically for this Plan Update.

The following summarizes these efforts.



Public outreach during the
Transit Priority Corridors study

CRCOG's Public Participation Program

CRCOG conducts an extensive multi-modal transportation planning program that is guided by federal regulations and its Public Participation Plan. This Plan was most recently updated in 2017 and explains the methods CRCOG uses to provide open and inclusive public participation in its transportation planning process, allowing individuals who are affected by transportation decisions a say in how decisions are made. The Plan describes CRCOG's goals, policies, and procedures to ensure that all members of the public, including underserved populations, have access to information and opportunities to participate in the transportation planning

process for the Hartford metropolitan area. CRCOG's intent is to provide reasonable access to information, timely public notice, and support for early and continued involvement of the public in the regional transportation planning process. The Public Participation Plan serves as a guide for citizens to understand CRCOG's public participation approach and how to get involved in shaping the future of transportation for the 38 communities in the Capitol Region. CRCOG will be updating its Public Participation Plan in 2023 and will incorporate lessons learned from public outreach during the COVID-19 pandemic.

COVID-19: Opportunities and Challenges for Public Outreach

The COVID-19 pandemic heavily shifted how public agencies like CRCOG have undertaken public outreach since 2020. Prior to the pandemic, in-person outreach was a primary component of CRCOG's transportation planning program. However, because of government stay-at-home orders, in-person outreach was eliminated entirely in 2020. Virtual public forums, such as Zoom web-conferences, became the tool for meetings and allowed for the continuation of public involvement. While some in-person public outreach resumed in 2021 and 2022, virtual options have remained a prevalent method for members of the public to participate and offer their feedback.

This shift has allowed for new opportunities and in some cases has resulted in increased



public involvement. Virtual meetings allow members of the public to access a meeting through their phones or computers. This allows for greater reach and flexibility for scheduling and attending meetings. There are, however, important equity considerations related to virtual-only meeting options.

Such meetings require computers, phones, and internet access, which precludes anyone who does not have access to these technologies. This could include low-income households or those living in rural areas.

While virtual options have been needed to allow public outreach to safely continue during the pandemic, it cannot be the only method for outreach going forward. Hybrid meetings, which include both virtual and in-person options, can be a way to involve a broader range of people. Looking ahead, a shift back to more in-person public meetings and outreach events should be a focus, as this method for soliciting feedback can allow for more personal connections and broader conversations. In-person outreach also provides a more equitable approach for gathering feedback from people who may not own or have access to the technology needed to participate in virtual meetings.

Related Public Outreach Efforts Since 2019 MTP Update

FFY2021-2024 Transportation Improvement Program

In 2020, CROG and the Connecticut Department of Transportation (CTDOT) developed the FFY2021-2024 Transportation Improvement Program (TIP) for the Capitol Region. A draft of the document was released on September 10, 2020, and legal notices appeared in four local publications, including two notices in Spanish and one in Polish. Virtual public information meetings about the TIP were held in the daytime and in the evening on September 30, 2020, and the public was also invited to provide comments through email, mail, or over the phone. At the same time, CROG provided an updated Air Quality Conformity Assessment for review and comment. Both documents were adopted by the CROG Policy Board on October 28, 2020.

CROG also continued to maintain its online interactive TIP map. This webpage presents the TIP in a graphical format with lines and dots representing regional TIP projects. Pop-up boxes and linked PDF files provide all the same detail that is provided in the TIP, but in an easier to use, project-focused format. CROG maintains a similar website for the non-federal Local Transportation Capital Improvement Program (LOTICIP), which is funded by the State of Connecticut.

Route 5 Corridor Study, East Windsor

This study focused on the Route 5 corridor in East Windsor. The study examined transportation and land use issues throughout the corridor. Stakeholder meetings were held with various municipal departments as well as major businesses within the corridor. Two pop-up events and three public informational meetings were held. A public survey was distributed at locations throughout the community and garnered 182 responses. Additionally, Advisory Committee meetings were open to the public and included participation from a broad spectrum of public officials and private citizens. The study was completed in November 2021.

Metro Hartford Rapid Routes: Transit Priority Corridors Study

CROG's Transit Priority Corridors Study, also known as Metro Hartford Rapid Routes, had extensive public outreach that met the challenges posed by the COVID-19 pandemic,

which limited in-person public outreach options. A public engagement program for this study was designed to share information and to understand community priorities. The stakeholders in this study included: public transportation users, residents, neighborhood associations, transit providers, municipal staff and elected officials, major employers and small businesses, community-based associations, medical and educational institutions, and social service providers.

Public outreach activities were conducted online and in-person. The project website featured a Virtual Meeting Room that was used to post study documents, share videos and recordings of public meetings, collect feedback, and advertise upcoming engagement activities. This online portal was an important medium to reach people when in-person engagement was unavailable. An online survey was also used to collect feedback from the public. The survey was advertised on CT **transit** buses as was available in English and Spanish. The survey received 80 responses.

Figure 13.1 – Route 5 pop-up event



Photo by CROG

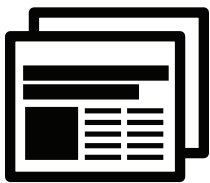
Virtual public meetings were held early in the study, and recordings were posted online so that people who were not able to participate in real-time were still able to access the information and provide feedback. Once in-person outreach could safely resume, an all-day in-person series of four pop-up outreach events was undertaken in March 2022. This allowed the study team, in partnership with **CTtransit** and the CTDOT Customer Experience Unit, to engage with transit riders who may not typically participate in an online outreach process or attend public meetings. The locations and timeframes were selected to correspond with high-traffic hours at major bus stops within the corridors. The study team utilized the **CTtransit** project bus, which offered high visibility for the events. The project bus also included a television screen and tables so that presentation materials could be easily shared. The team printed postcards with the study website and a QR code inviting people to provide additional

feedback on the recommendations. These postcards were handed out to individuals who may not have had time to engage with the team, in many cases because they needed to board a bus. The study team presented findings and recommendations at stakeholder and neighborhood association virtual meetings in February and March 2022. Presentations were given to the Hartford Planning and Zoning Commission and City Council during Summer 2022, and the study was finalized in September 2022.

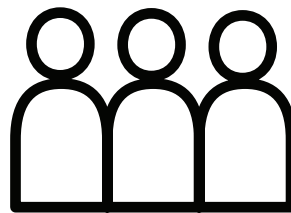
Route 190 & 220 Traffic Impact Study, Enfield

This study involves analyzing the traffic impacts on Routes 190 and 220 and multiple intersections surrounding the Enfield Square Mall related to potential redevelopment of the mall. Public outreach to date has included a visual preference survey for the community’s desires for retail, parking, housing, and multimodal access for any future

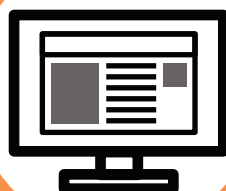
Outreach methods used in the Transit Priority Corridors Study



- CRCOG newsletter
- Informational posters on buses

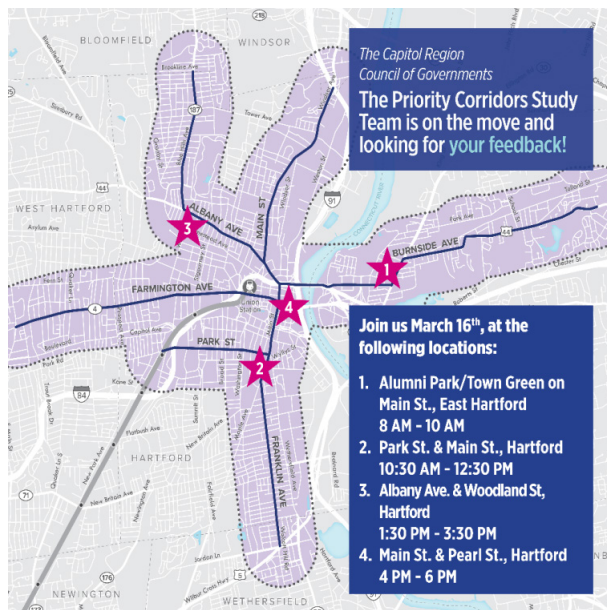


- Virtual public outreach meetings
- Four in-person outreach events at bus stops
- Neighborhood group meeting presentations
- Hartford City Council meeting presentation



- Study website
- Online Survey
- Virtual Meeting Room
- Social media posts

Figure 13.2 — Transit Priority Corridors Outreach Day Poster



site redevelopment. The survey was advertised in both English and Spanish on Enfield's and CROG's social media and websites; flyers were displayed on local microtransit buses; and printed surveys in both languages were provided at several locations in Enfield including Town Hall and the North Central Connecticut Chamber of Commerce. Participation was incentivized with a gift card to a local restaurant. This survey received nearly 1,200 responses, including 37 in Spanish. A televised, hybrid public meeting was held to inform the public about the study progress and allowed participants to vote on their preferred access alternatives. The posted video from this meeting has since received more than 340 views on YouTube. Additionally, two presentations have been made to Enfield's Planning & Zoning Commission, one on the study status and findings to date (Summer

2022) and a second on the selection of access alternatives for the study (Winter 2022). There will be a future public meeting to discuss the outcomes of the traffic impact study and future mitigation strategies.

Farmington Area Connectivity Study

The Farmington Area Connectivity Study looks to improve both connectivity and resiliency for residents living and traveling in and through the Farmington Valley. The Study focuses on the construction of a bridge in Farmington connecting Route 4 at Monteith Drive on the north bank of the Farmington River and New Britain Avenue to the south. Not only would a new bridge create a direct connection between the Town Offices, Library, and High School and the Police Department across the river, but it would also offer redundancy to the bridge at Route 177 in Unionville which has been susceptible to flooding in the past. CROG and its consultant worked with Town staff and presented the study to the Town Council and the public in Fall 2022. CROG and the Town of Farmington have also collaborated with numerous Federal, State, and local agencies including the National Park Service, CTDOT, Lower Farmington River and Salmon Brook Wild and Scenic Committee, and Farmington River Watershed Association as well as surround towns. CROG, its consultant, and the Town of Farmington will continue to coordinate with these groups and involve the public as the study proceeds.

East Coast Greenway Gap Closure Study

The East Coast Greenway (ECG) Gap Closure Study will identify one constructible preferred alignment for each of the last remaining route uncertainties in the Capitol Region within the communities of East Hartford, Hartford, Bloomfield, and Simsbury. There are very active bike/ped groups and advocates in these communities, and large portions of the study area include disadvantaged populations. As such, public outreach was identified as a key component during the consultant selection process. A range of techniques, public involvement events, and involvement tools will be utilized as part of the public involvement effort for this study. In addition to newsletters, surveys, an interactive web mapping tool, and a project webpage, the following additional opportunities have been included in the scope and are expected to begin Spring 2023:

- Host stakeholder and/or Community Ambassador meetings for targeted outreach to special interest groups (e.g., Neighborhood Revitalization Zones, trail users, bicycling groups, elected officials, etc.). These meetings may occur in the field in the form of a walk-audit to review and discuss potential shortlist alternative concepts.
- Participation in pop-up events during the Alternatives Analysis phase in order to obtain public feedback of shortlisted alternatives. It is anticipated that the study team will have a booth at preplanned

community events, such as farmers' markets and festivals, with the goal of supporting, informing, and engaging local constituents of the study process and ensuring their opinions are represented.

- Conduct public design workshops, ideally one in each municipality, during the screening analysis portion of the Study.
- Conduct final public meetings, ideally one in each municipality. The purpose of these meetings will be to share the results of the study with the public and to obtain feedback on the recommendations developed.

For advertising events such as workshops and public meetings, the study team will do so in each community per the results of an EJ and LEP screening that has been completed (e.g., Hartford will require English, Spanish, and Portuguese advertising). Advertising will include a mix of approaches to reach as many individuals as possible and may include but not be limited to yard signs along existing trails, flyers at businesses, website announcements, social media advertisements, and more. Specific outreach to groups, organizations, or businesses will be further prioritized to include minority and low-income populations in the study area. Translation services at each meeting, as well as translations of meeting minutes or recordings, will be offered upon request.

Public Involvement – Outreach to the Community for This Plan

Public Notices

CRCOG staff followed guidelines set in CRCOG's Public Participation Plan when posting public notices for outreach activities related to this MTP. Notices were produced in English, Spanish and Polish that were widely distributed throughout the Capitol Region by email and newspaper as well as through CRCOG's website, newsletters, and social media. It was noted on the postings that language translation or other accessibility services would be provided if requested. Other stakeholders, including the City of Hartford and Transport Hartford,

also shared the meeting information via their social media and newsletter.

Meetings

CRCOG held Public Meetings to gather input during the development of the MTP. These meetings were held on November 16, 2022 and November 17, 2022, with a virtual option and the ability to attend in person at CRCOG's offices in Hartford. One meeting was held in the evening, and the other was offered at lunchtime.

Recordings and presentations from both meetings were posted on the CRCOG website. Comments received during these meetings can be found in Appendix F.

Survey

An online public survey was advertised and available for nearly two months during the drafting of plan.

The survey received 2,840 initial responses. However, it became quickly apparent on inspection of the data that many responses were fake, most likely created by bots. In an initial data cleaning, CRCOG staff narrowed down responses to only Connecticut and Hampden County, MA zip codes. Further data cleaning removed additional responses based on the following:

- Extremely short timestamps between responses
- Identical language to open-ended answers
- Suspicious e-mail addresses with spelling errors and/or randomly generated numbers and letters

Figure 13.3 – Public Meeting Flyer

CONNECT2050
CRCOG METROPOLITAN TRANSPORTATION PLAN

Let's plan the transportation future of our region together!

The Capitol Region Council of Governments (CRCOG) is hosting two public meetings about the update to our Metropolitan Transportation Plan (MTP). This plan establishes the vision for the region's transportation system - highways, local roads, bicycle, pedestrian, and more - for the next 25 years.

Join us at one of our kick-off meetings. We are offering two opportunities for participants to learn about the plan and begin to provide input.

For the latest information and to join our mailing list, visit www.crcog.org/mtp or call 860-724-4293.

CRCOG does not discriminate on the basis of disability or language. Individuals may request auxiliary aids and/or language assistance by contacting (860) 724-4293 as soon as possible.

Un interprete estará disponible para esta reunión si usted lo solicita al (860) 724-4293, lo más pronto posible.

Jeśli potrzebujesz tłumacza na język polski, zadzwoń (860) 724-4293 jak najszybciej.

PUBLIC MEETINGS

Wednesday, November 16
6:00-7:30 PM

Thursday, November 17
12:00-1:30 PM

Offering HYBRID meetings

To attend in-person:
CRCOG Offices
241 Main Street, 3rd Floor
Hartford, CT

REGISTER to attend virtually:
Register at www.crcog.org/mtp to receive the Zoom meeting link.

CRCOG offices served by CTTransit routes 43, 31, 33, 37, and other nearby routes. For driving and parking information visit www.crcog.org.

CRCOG
CAPITOL REGION COUNCIL OF GOVERNMENTS

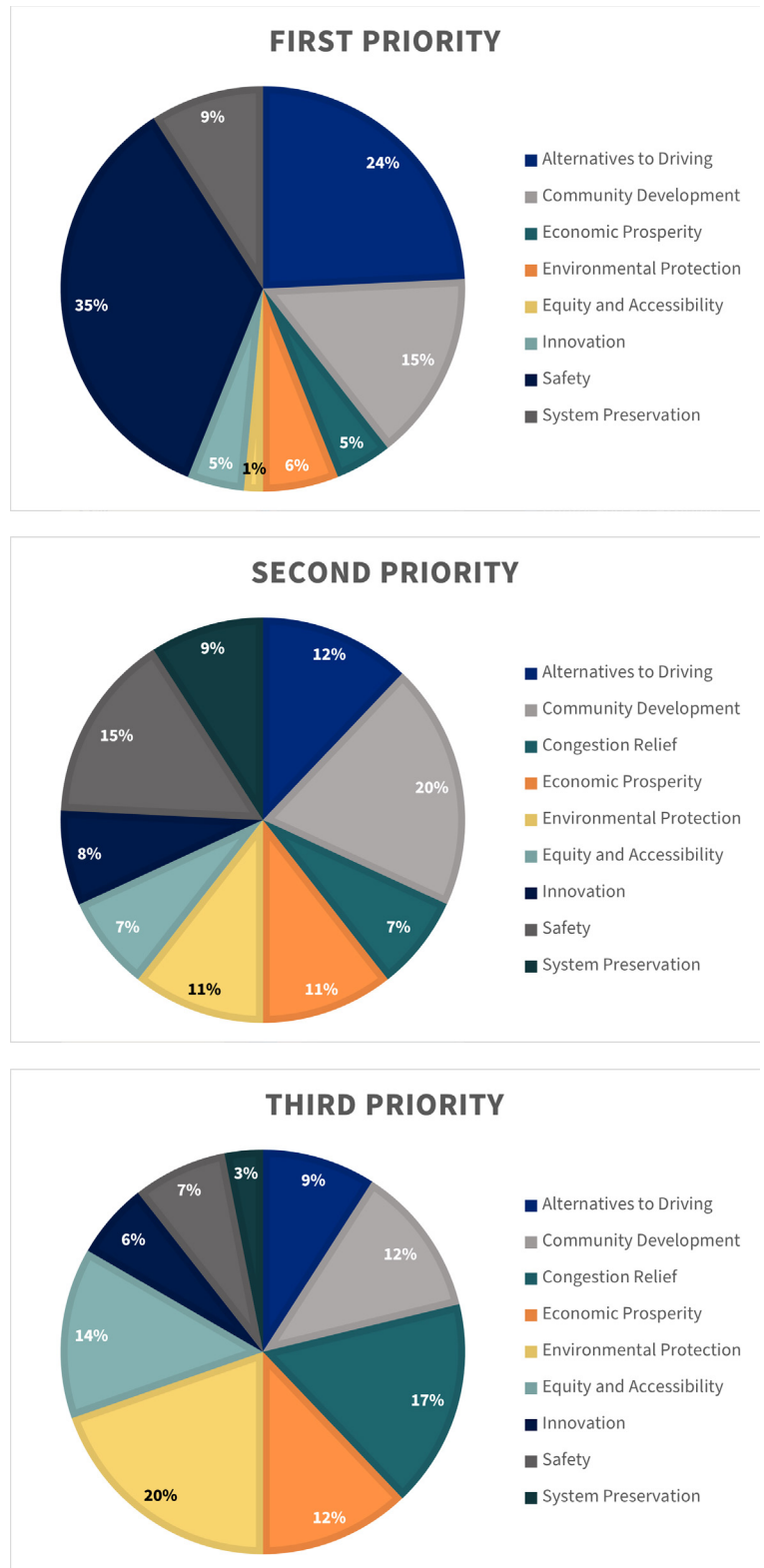
Using this methodology, 66 responses were identified as being legitimate human responses.

Roughly one-quarter of the respondents indicated they lived in Hartford. West Hartford had the most respondents after Hartford, but the rest of the respondents were evenly distributed throughout the CRCOG region, with some stakeholders coming from outside the region. Most of the respondents (47%) indicated that they primarily travel to work by privately-owned vehicle. Biking or using a scooter was the second most popular mode of travel to work (14%), followed by public transit (12%) and work from home (9%).

The majority of respondents (70%) were ‘very supportive’ or ‘supportive’ of implementing tolling as a transportation funding source. Increases in the state gas taxes were even more popular among respondents (80% ‘very supportive’ or ‘supportive’). Local gas taxes were far less popular, but still found support amongst the majority of the respondents.

When asked how money should be distributed across the transportation system, 35% of respondents believed that the top priority for funding should Safety. ‘Alternatives to Driving’ and ‘Community Development’ followed in popularity with 24% and 15%, respectively. The survey results can be viewed in full in Appendix G.

Figure 13.4 – Survey respondents' funding priorities



Public Comment Period

Following the release of the draft MTP on February 23, 2023, a comment period ran through March 26, 2023, adhering to the requirement that such comment periods must last at least 30 days. Comments were accepted via email, phone, mail, or during public meetings. Two of those meetings were regularly-held CRCOG meetings:

- March 20, 2023 at noon (Transportation Committee)
- March 22, 2023 at noon (Policy Board)

Two additional meetings were held solely for the purpose of collecting feedback on the MTP. These meetings, which were held in a hybrid format, included a presentation of the

main elements of the MTP followed by a discussion. The in-person option was held in the CRCOG Board Room in Hartford, and the virtual option was offered through Zoom:

- March 8, 2023 from 6:00pm-7:30pm
- March 9, 2023 from noon-1:30pm

See Appendix F for a list of comments received during the public comment period and CRCOG's responses.



Photo by Chris Henchey



