LOWER CONNECTICUT RIVER VALLEY
COUNCIL OF GOVERNMENTS

2023- 2050

REGIONAL METROPOLITAN TRANSPORTATION PLAN

LCRVCOG
145 DENNISON ROAD
ESSEX, CONNECTICUT 06426
WWW.RIVERCOG.ORG

ADOPTED
DATE TBD

PHOTO CREDIT: Ilirjan Rrumbullaku, 2014

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as of 2/06/2023

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RIVERCOG STAFF

Samuel Gold, AICP, Executive Director
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John McDonald, Planning Intern
Paula Fernald, Financial Administrator
Eliza LoPresti, Regional Communications Liaison

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WHEREAS, the metropolitan transportation plan serves as a guide for the development and improvement of the transportation network in the Lower Connecticut River Valley Region;

NOW, THEREFORE, BE IT RESOLVED BY THE LOWER CONNECTICUT RIVER VALLEY COUNCIL OF GOVERNMENTS:

To endorse the FY 2023 revisions to the Long Range Metropolitan Transportation Plan. This endorsement by the Lower Connecticut River Valley Council of Governments constitutes the Metropolitan Planning Organization adoption of these revisions contingent upon no major adverse comments are received during said period.

CERTIFICATION

The undersigned and duly qualified Secretary of the Lower Connecticut River Valley Council of Governments certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the Lower Connecticut River Valley Council of Governments on March 22, 2023.

_____
Robert McGarry
Secretary

_____
Date

WHEREAS, The Lower Connecticut River Valley Council of Governments is required to submit an Air Quality Conformity Statement to the US Federal Highway Administration (FHWA) and to the US Environmental Protection Agency (EPA) in accordance with the final conformity rule promulgated by EPA (40 CFR 51 and 93) when adopting an annual Transportation Improvement Program or when effecting a significant revision of the Region's Transportation Plan; and

WHEREAS, Title 42, Section 7506 (3) (A) states that conformity of transportation plans and programs will be demonstrated if:

1. the plans and programs are consistent with recent estimates of mobile source emissions;

2. the plans and programs provide for the expeditious implementation of certain transportation control mea sures;

3. the plans and programs contribute to annual emissions reductions consistent with the Clean Air Act of 1977, as amended; and

WHEREAS, It is the opinion of the Lower Connecticut River Valley Council of Governments that the plans and programs approved today, March 27 2019 and submitted to FHWA and EPA conform to the requirements of Title 42, Section 7506 (3) (A) as interpreted by EPA (40 CFR 51 and 93); and

WHEREAS, The State of Connecticut has elected to assess conformity in the Connecticut portion of the New York-Northern New Jersey ¬Long Island, NY-NJ-CT Ozone Marginal Nonattaiment area (Fairfield, New Haven and Middlesex Counties) and the Greater Connecticut Ozone Marginal Nonattainment Area (Hartford, New London, Tolland, Windham and Litchfield counties), and the Connecticut Department of Transportation has jointly assessed the impact of all transportation plans and programs in these Nonattainment areas (Ozone Air Quality Conformity Report MONTH 2023); and

WHEREAS, The Connecticut Department of Transportation's assessment (above) has found that plans and programs jointly meet mobile source emission's guidelines advanced by EPA pursuant to Section 7506 (3) (A).

Now, THEREFORE BE IT RESOLVED by the Lower Connecticut River Valley Council of Governments,

That the Lower Connecticut River Valley Council of Governments finds that the LCRVCOG 2019-2045 Long Range Regional Transportation Plan and the FFY 2018-2021 Transportation Improvement Program conform to air quality requirements of the U.S. Environmental Protection Administration (40 CFR 51 and 93), related U.S. Department of Transportation guidelines (23 CFR 450) and with Title 42, Section 7506 (3) (A) and hereby approves the existing MONTH 2023 Ozone Air Quality Conformity Determination contingent upon no major adverse comments are received during said period

CERTIFICATION,
The undersigned duly qualified and acting Secretary of the Lower Connecticut River Valley Council of Governments certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the Lower Connecticut River Valley Council of Governments on March 22, 2023.

_____

Robert McGarry Date
Secretary

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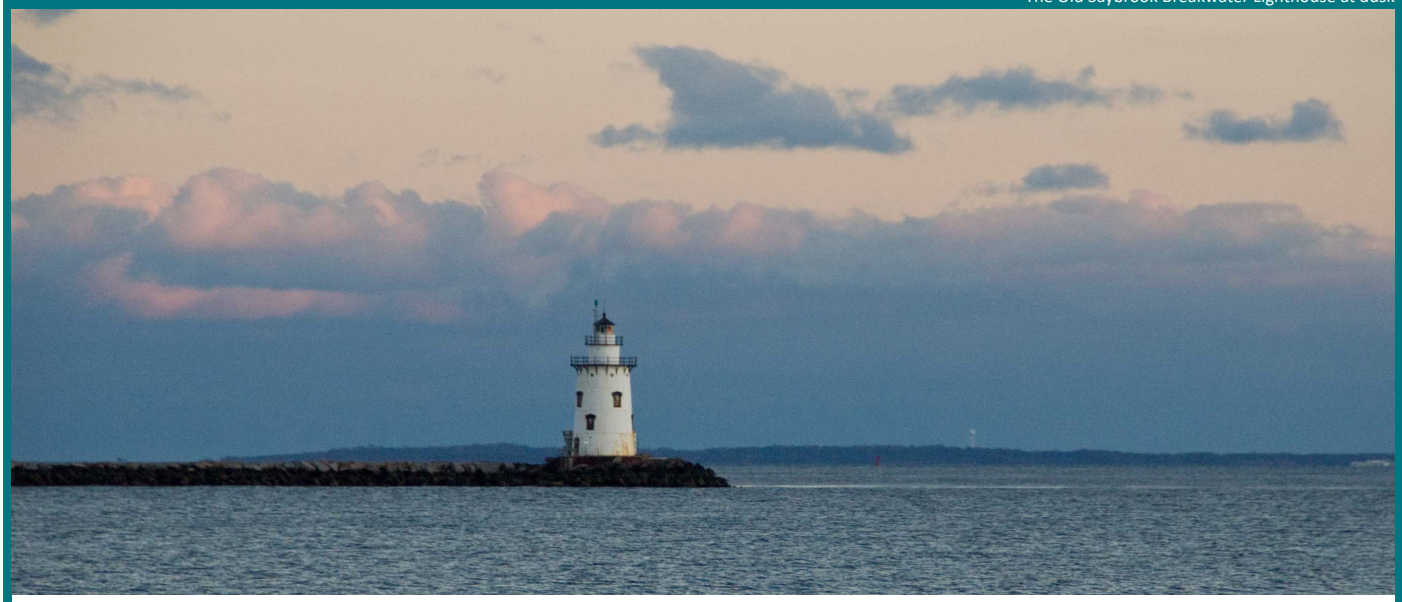


The Old Saybrook Breakwater Lighthouse at dusk

Chapter 1.

INTRODUCTION

A. INTRODUCTION

The Metropolitan Transportation Plan (MTP) for the Lower Connecticut River Valley (LCRV) region defines the region's future transportation vision and outlines regional transportation funding priorities. The MTP also establishes goals, policies, and steps to help achieve that vision. The twenty-seven year scope of the plan gives the MTP a broad perspective of the region's future transportation needs. Although new infrastructure is an important component of the MTP and the future regional transportation system, most future funding will be focused on projects that maintain, operate, or make better use of existing transportation facilities. These, as well as other projects which may be selected for funding in the region's Transportation Improvement Program (TIP), will be chosen based upon their relation to the metropolitan transportation plan. The TIP is a detailed, multimodal list of projects that are programed to receive federal funding over a four-year period and is essentially the short-range implementation plan for the region.

RiverCOG, as well as all MPOs, must prepare a MTP with respect to the development of the metropolitan area's transportation network. The plan identifies how the metropolitan area 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. The MTP, or plan, includes long-range and short-range strategies based on a minimum twenty year planning horizon and is updated every four years in air quality nonattainment and maintenance areas. It is based on the most current plans, data, and information available at the time of endorsement. RiverCOG consults with federal, state, and local agencies when developing the MTP and provides the public with a reasonable opportunity to comment on the plan. RiverCOG may revise the plan at any time using the procedures in 23 CFR Part 450§324. Both this plan and the prior 2019 and 2015 plans can be viewed at RiverCOG's website, http://www.rivercog.org/ An air quality conformity determination is made when the MTP is updated.

MAP 1.1 LCRV Region Member Municipalities

Source: RiverCOG

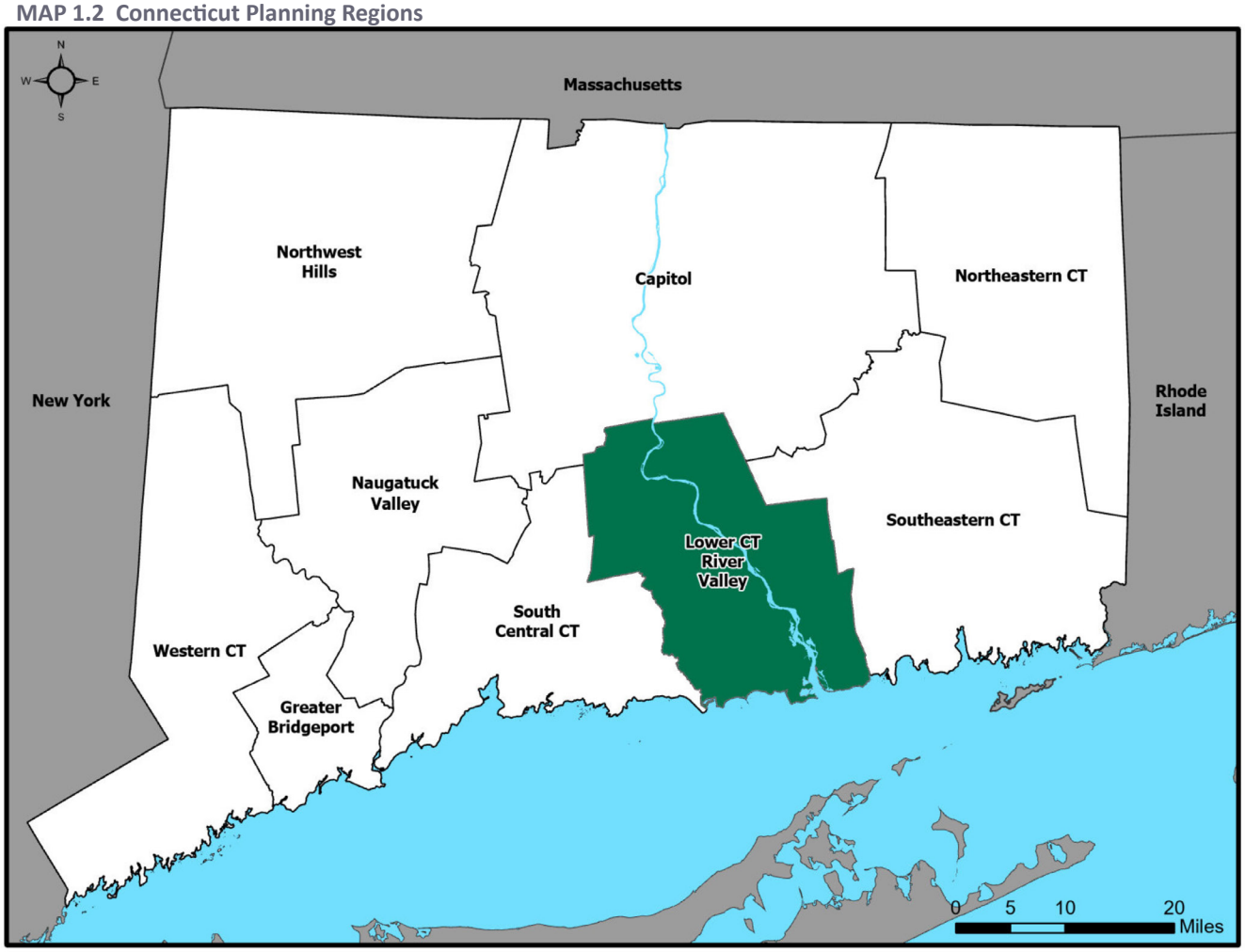
B. THE LOWER CONNECTICUT RIVER VALLEY REGION

The LCRV region consists of the municipalities of Chester, Clinton, Cromwell, Deep River, Durham, East Haddam, East Hampton, Essex, Haddam, Killingworth, Lyme, Middlefield, Middletown, Old Lyme, Old Saybrook, Portland and Westbrook. These seventeen municipalities collectively occupy an area of approximately 443 square miles with a population of 174,225 according to the 2020 U.S. Census. Much of the land area is rural, with Middletown, Cromwell, and Portland comprising the region's urban core.

C. THE LOWER CONNECTICUT RIVER VALLEY COUNCIL OF GOVERNMENTS

The Lower Connecticut River Valley Council of Governments is one of nine regional planning organizations in Connecticut, as seen in Map 1.2. The chief elected officials (CEOs) of the region's seventeen municipalities sit on the LCRVCOG board. The LCRVCOG board also serves as the region's

MAP 1.2 Connecticut Planning Regions



Source: RiverCOG

Metropolitan Planning Organization (MPO) policy board along with the regional transit district, chamber of commerce and CTDOT. The MPO approves the MTP, TIP, and amendments to the TIP. The board also discusses issues of common concern and receives staff reports at monthly meetings. Additional planning groups within LCRVCOG include the Regional Planning Committee, Regional Agricultural Council, and Land Trust Exchange. The LCRVCOG also hosts the operations of the Connecticut River Gateway Commission and the Lower Connecticut River Valley Land Trust.

Connecticut's planning regions provide a geographic framework within which municipalities can jointly address common interests, and coordinate such interests with state plans and programs. On June 6, 2022, the final Federal Register Final Notice for the change to county-equivalents was published serving as a final response to all comments received to the Proposed Notice published in the Federal Register on December 14, 2020. The Final Notice is the Census Bureau's final announcement that Connecticut's request will be implemented and urges all stakeholders to immediately prepare for any impacts related to the adoption of planning regions as county-equivalents on data collection.

It is the MPO that is responsible for development of the region's Metropolitan Transportation Plan. The MPO conducts transportation planning for the region and all transportation facilities. Along with the board members mentioned above, the MPO engages legislators, representatives from federal, state, regional and local entities, and the public in an effort to make transportation decisions based on the diverse interests found in the region.

The Bipartisan Infrastructure Law (BIL) also known as the Infrastructure Investment and Jobs Act (IIJA) (PL 117-58) was signed into law in 2021. It funds surface transportation programs for $567 billion in federal fiscal years 2022 through 2026 for highway and programs for safety, bridges, climate change, resilience, workforce, freight, research, planning, project delivery , and others. An estimated allocation for the State of Connecticut for fiscal years 2021 through 2026 is $6 billion. BIL and IIJA are the same and either may be referenced

on federal, state and other websites. The IIJA short title was placed on the bill by Senators Sinema and Portman when they introduced their substitute amendment version of the bill.

The IIJA maintains a focus on safety similar to prior legislation since 1991, keeps intact the established structure of the various highway-related programs, and furthers efforts to streamline project delivery. Since the enactment of the IIJA, states and local governments are moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

23 CFR § 450.306 outlines "10 Factors" that an MPO must consider in its transportation planning activities in cooperation with state and public transportation operators. The metropolitan transportation planning process shall be continuous, cooperative, and comprehensive, and provide for consideration and implementation of projects, strategies, and services to:

(1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;

(2) Increase the safety of the transportation system for motorized and non-motorized users;

(3) Increase the security of the transportation system for motorized and non-motorized users;

(4) Increase accessibility and mobility of people and freight;

(5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns;

(6) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;

(7) Promote efficient system management and operation;

(8) Emphasize the preservation of the existing transportation system;

(9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and

(10) Enhance travel and tourism.

Considering these ten broad focus areas and the importance of transportation to all facets of life, a high quality transportation system is vital to maintaining the economic competitiveness and quality of life of the region. Yet at the same time, the facilities required for transportation have a substantial impact on the environment and are expensive to build and maintain. Consequently, the goals of this plan are to:

- Provide a strategy for capital and planning resources for both motorized and non-motorized transportation modes and infrastructure improvements;
- Ensure that people and goods move effectively, efficiently, and safely throughout the region while addressing social, economic and environmental needs;
- Address the transportation issues in the region through both specific and general recommendations;
- Provide an overall view of the regional transportation system to place these recommendations in perspective.

Aerial view of the Baldwin Bridge and the Amtrak Old Saybrook—Old Lyme Bridge spanning the Connecticut River

Chapter 2.

DEMOGRAPHICS

A. DEMOGRAPHIC CHARACTERISTICS

Population statistics should be considered when planning for transportation purposes, since population changes influence regional development. Factors such as housing, infrastructure, utilities, and economic development in turn affect the regional transportation system.

The total population of the Lower Connecticut River Valley (LCRV) region was 174,225 based on the 2020 Decennial Census conducted by the U.S. Census Bureau. This is a decrease of 0.83% from the 2010 Decennial Census. According to the 2010 and 2020 Decennial Censuses, the State of Connecticut's population increased slightly (0.89%) from 2010 to 2020. Ten of the seventeen municipalities in the LCRV region recorded a decline in population during this same time. The estimated decline ranged from 6.13% in Chester to 0.57 % in Clinton. The populations of six municipalities increased from 2010 to 2020. These include Old Saybrook (2.33%), Cromwell (1.57%), Haddam (1.27%), Essex (0.75%), Old Lyme (0.33%), and Middletown (0.14%).

The Connecticut State Data Center (SDC) at the University of Connecticut produced population projections for all municipalities in the state in 2015, forecasting until 2040. The projections used vital statistics, net-migration, and other variables to project the statewide populations. Physical factors such as land use limitations, changes in the transportation system, and economic conditions were not factored into municipal projections. For these reasons, there is no exact standard of comparison between SDC projection statistics and those recorded by the Census Bureau. CTDOTs Travel Demand and Air Quality Modeling Unit uses the SDC projections and forecasted out to 2050 the horizon year of the MTP for AQC purposes for both population and employment

According to these figures the LCRV region population was to have increased 14.3% by 2050. Statewide population is projected to increase by 9.7% by 2050. Municipalities range from a low of 5.% in Old Saybrook to a high of 26.3% in both East Haddam and Killingworth.

B. ELDERLY & MOBILITY IMPAIRED POPULATION

The elderly and disabled populations have been identified due to their mobility limitation and special transportation

TABLE 2.1 Municipal Population Projections

Geography	Total Population					
	2019	2023	2025	2035	2045	2050
Connecticut	3,565,285	3,611,026	3,634,171	3,746,581	3,856,272	3,910,067
LCRV region	172,060	175,296	176,928	184,920	192,761	196,620
Chester	4,213	4,318	4,372	4,633	4,889	5,014
Clinton	12,925	13,084	13,164	13,558	13,946	14,137
Cromwell	13,839	14,168	14,334	15,149	15,949	16,342
Deep River	4,443	4,486	4,507	4,608	4,708	4,757
Durham	7,165	7,353	7,447	7,908	8,360	8,583
East Haddam	8,997	9,310	9,466	10,235	10,990	11,364
East Hampton	12,800	13,191	13,386	14,349	15,295	15,763
Essex	6,669	6,815	6,889	7,251	7,607	7,782
Haddam	8,192	8,360	8,445	8,857	9,261	9,461
Killingworth	6,364	6,584	6,695	7,240	7,774	8,038
Lyme	2,317	2,362	2,385	2,497	2,607	2,662
Middlefield	4,374	4,425	4,454	4,587	4,715	4,777
Middletown	46,259	46,925	47,260	48,905	50,523	51,315
Old Lyme	7,307	7,413	7,467	7,729	7,983	8,109
Old Saybrook	10,060	10,132	10,169	10,347	10,521	10,604
Portland	9,267	9,349	9,390	9,591	9,788	9,885
Westbrook	6,869	6,869	7,098	7,476	7,845	8,027

Sources: CTDOT's Travel Demand and Air Quality Modeling Unit, 2023

needs. Based on the 2016-2020 American Community Survey, the LCRV region was home to an estimated 35,752 individuals over 65 years of age. The elderly population is expected to increase by another 3,700 individuals by 2040.

Historical, current, and projected population age distributions show evidence of an aging population in the LCRV region. In 2020, 20.5 % of the population was age 65 or older. By 2030, it is projected that 22.8 % of the region's population will be age 65 or older. By 2040, the SDC projects 39,431 individuals 65 years of age or older will be residing in the area, or 22.9 % of the total population of the region.As shown in Table 2.2, Middletown is home to the most residents age 65 or older, followed by Cromwell and Clinton. The elderly account for more than 20 % of the total town population in Chester, Clinton, Cromwell, Deep River, Durham, East Haddam, Essex, Killingworth, Lyme, Middlefield, Old Lyme, Old Saybrook, and Westbrook. Middletown, Portland, Haddam, and East Hampton have the lowest percentage of elderly individuals.

The elderly and disabled populations have been identified due to their mobility limitation and special transportation needs. Based on the 2016-2020 American Community Survey, the LCRV region was home to an estimated 35,752 individuals over 65 years of age. The elderly population is expected to increase by another 3,700 individuals by 2040. Approximately 10.8% of the region's non-institutionalized population was classified as disabled according to the 2016-2020 American Community Survey (Table 2.3). Of the disabled residents, nearly half (48.7 % or 9,008 persons) were elderly and the remaining 51.3% were younger than 65.

There will be an increase in the need for para-transit services as the population continues to age over the next few decades. Transportation needs must meet the needs of the elderly and disabled who have difficulty using public or private transportation services. Public programs and policies must address the transportation needs of the elderly and disabled, not just as drivers, but also as passengers and pedestrians. Current policies that provide aid to reduce fares, subsidies for transit operators, FTA's Section 5310 and other programs must continue to be funded at all levels of government, and legislative requirements such as those of the Americans with Disabilities Act must remain implemented.

Future highway design must accommodate the transportation needs of older drivers by increasing the safety and usefulness of the highway system. Driving conditions require speed-distance judgments under time constraints.

TABLE 2.2 Regional Elderly Population

	2020*	2025**	2030**	2035**	2040**
Connecticut	615,466	620,873	650,209	653,333	633,098
LCRVR	35,752	38,085	40,152	40,798	39,431
Chester	1,047	1,212	1,268	1,238	1,151
Clinton	2,732	2,990	3,095	3,103	2,932
Cromwell	2,933	2,929	2,999	3,039	2,995
Deep River	900	965	1,001	1,027	994
Durham	1,513	1,407	1,482	1,512	1,438
East Haddam	1,898	2,071	2,311	2,413	2,352
East Hampton	2,441	2,975	3,390	3,658	3,739
Essex	1,819	1,915	1,991	1,978	1,849
Haddam	1,609	1,816	1,910	1,933	1,902
Killingworth	1,338	1,677	1,782	1,804	1,625
Lyme	673	820	858	868	844
Middlefield	961	887	970	1,021	1,012
Middletown	7,511	7,628	8,047	8,176	7,933
Old Lyme	1,952	2,146	2,187	2,117	1,947
Old Saybrook	2,636	2,720	2,726	2,620	2,403
Portland	1,662	1,996	2,105	2,222	2,262
Westbrook	2,127	1,931	2,030	2,069	2,053

Sources: * 2016-2020 American Community Survey 5-year Estimates
** CT State Data Center 2015-2040 Population Projections

TABLE 2.3 Non-institutionalized Disabled Population in the LCRVR, 2020

Geography	Total Disabled Persons (non-institutionalized)	Disabled Persons over 65 (non-institutionalized)	Disabled Persons under 65	% Disabled over 65
LCRV Region	18,480	9,008	9,472	48.7%
Chester	654	296	358	45.3%
Clinton	1,357	749	608	55.2%
Cromwell	1,728	806	922	46.6%
Deep River	576	253	323	43.9%
Durham	628	319	309	50.8%
East Haddam	724	415	309	57.3%
East Hampton	895	352	543	39.3%
Essex	656	327	329	49.8%
Haddam	828	540	288	65.2%
Killingworth	703	380	323	54.1%
Lyme	206	159	47	77.2%
Middlefield	377	156	221	41.4%
Middletown	5,142	2,213	2,929	43.0%
Old Lyme	660	402	258	60.9%
Old Saybrook	1,339	671	668	50.1%
Portland	1,085	508	577	46.8%
Westbrook	922	462	460	50.1%

Source: 2016-2020 American Community Survey 5-year Estimates

Although not unique to older drivers, many studies have shown aging often decreases drivers' ability to read signs, follow pavement markings, respond to traffic signals, and maneuver through intersections. The Older Driver Highway Design Handbook published by the U.S. Department of Transportation, provides various recommendations regarding the design of at-grade intersections, grade separation interchanges, roadway curvature and passing zones, and construction/work zones. Many of the recommendations should be considered when facility improvements are planned.

C. SOCIO-ECONOMIC CONDITIONS

Certain socio-economic characteristics of the population related to general demographic factors also affect the regional transportation system, and can create specialized demands on the planning process. These characteristics are persons and vehicles per household, median household income, number of single occupancy vehicle trips to work, and others. These variables influence travel modes and patterns. Households with a greater number of persons generally have access to more vehicles. Likewise, households with higher incomes are more likely to possess a greater number of vehicles than those households with lower incomes. As a result, lower income households are more likely to be dependent on public transportation than personal vehicles. Table 2.4 shows the relationship between persons and vehicles per household, and the number of households without a vehicle.

Of the region's seventeen towns, Durham has the highest vehicle to household ratio with an average of 2.67 vehicles per household. Middletown has the lowest vehicle to household ration with an average of 1.64 vehicles per household. Old Lyme has the lowest proportion of zero vehicle households at 0.98% (31 total households) and Lyme has the lowest number of zero vehicle households at 27 total. The towns with the largest number of zero vehicle homes are Middletown (1,957), Cromwell (270), and Old Saybrook (266).

Households without cars, as well as households with only one car, must be afforded convenient access to public transportation. Table 2.4 indicates of the number of vehicles in relation to the number of licensed drivers in each town. The total number of registrations includes commercial, combination, motorcycles, campers, and other vehicles, all of which have been registered for roadways by the State DMV.

Regional and municipal household, family, and per capita

TABLE 2.4 Regional Household Vehicles, 2020

Geography	Households	Persons per Household	Mean Vehicles per Household	Zero Vehicle Households	Percentage of Zero Vehicle Households
LCRVR	71,915	2.4	1.98	3,449	4.8%
Chester	1,724	2.45	2.01	91	5.3%
Clinton	5,299	2.44	2.03	173	3.3%
Cromwell	5,706	2.43	1.76	270	4.7%
Deep River	1,987	2.25	1.86	112	5.6%
Durham	2,932	2.45	2.67	55	1.9%
East Haddam	3,813	2.36	2.24	52	1.4%
East Hampton	4,879	2.63	2.15	80	1.6%
Essex	2,907	2.27	2.01	57	2.0%
Haddam	3,070	2.68	2.33	34	1.1%
Killingworth	2,353	2.72	2.39	28	1.2%
Lyme	988	2.45	2.39	27	2.7%
Middlefield	1,842	2.38	2.22	37	2.0%
Middletown	19,876	2.33	1.64	1,957	9.9%
Old Lyme	3,162	2.33	2.19	31	1.0%
Old Saybrook	4,218	2.39	2.02	266	6.3%
Portland	3,674	2.53	2.11	120	3.3%
Westbrook	3,485	1.98	2.02	59	1.7%

Source: 2016-2020 American Community Survey 5-year Estimates

TABLE 2.5 Regional Income, 2020

Geography	Median Household Income	Median Family Income	Per Capita Income
United States	$64,994	$80,069	$35,384
Connecticut	$79,855	$102,061	$45,668
Middlesex County	$84,907	$111,117	$46,846
New London County	$75,831	$94,894	$40,995
Chester	$87,717	$108,649	$41,045
Clinton	$90,332	$110,375	$46,835
Cromwell	$89,562	$110,152	$47,638
Deep River	$80,495	$110,179	$47,196
Durham	$130,635	$134,712	$61,200
East Haddam	$95,685	$107,022	$51,773
East Hampton	$95,663	$114,180	$43,715
Essex	$102,243	$139,245	$60,415
Haddam	$107,073	$116,290	$50,584
Killingworth	$104,462	$133,516	$48,583
Lyme	$106,667	$138,625	$79,113
Middlefield	$79,042	$121,900	$44,539
Middletown	$62,022	$85,807	$38,345
Old Lyme	$105,417	$141,643	$72,875
Old Saybrook	$86,802	$118,060	$55,191
Portland	$97,754	$121,903	$47,819
Westbrook	$73,988	$125,881	$59,116

Source: 2016-2020 American Community Survey 5-year Estimates

incomes are outlined in Table 2.5. These factors provide an indication of household mobility level, since lower income persons and households tend to be less mobile by personal vehicle and more dependent on public transportation systems.

Fourteen of the seventeen municipalities in the LCRV region have annual median household income estimates (2020) that exceed the state average. These municipalities are relatively high-income earning areas when compared to the state and nearby regions.

Table 2.6 includes data regarding regional poverty and social assistance. As of 2017, 6.9 % of the total population in the LCRV region was below the poverty level, compared to 10.1 % for the state as a whole. Middletown, Clinton, and Westbrook have the highest percentage of residents living in poverty in the LCRV region. Of the region's population younger than 18 years, 7.8 % live below the poverty level, and 4.8 % of the elderly population in the LCRV region are below the poverty level.

D. POPULATION DENSITY

The population density of an area should be considered in developing transportation plans. As density increases, so does the level of economic activity, resulting in a greater demand for public amenities (i.e., water & sewer, schools, etc.), and an increase in issues related to traffic congestion. Thus, traffic congestion can be considered a negative aspect of increasing population density. However, relatively high population densities will generally support public transportation services by providing a large pool of riders to allow the transit system to be economically viable.

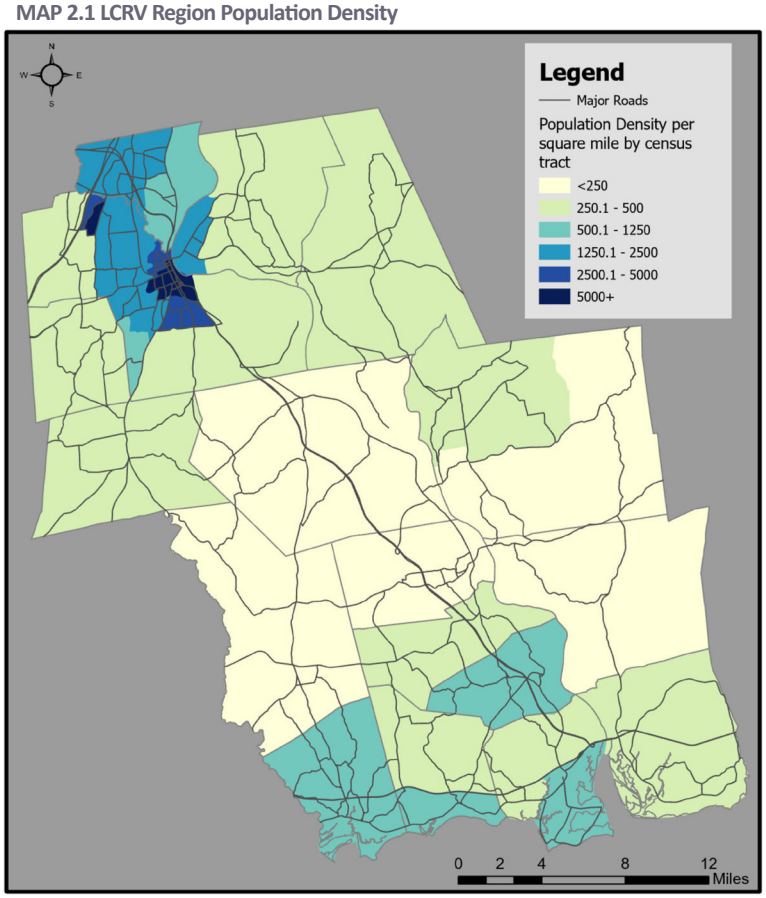
Table 2.7 shows that the LCRV region's population density has increased each decade from 1970 to 2010. The population of the LCRV region declined from 2010 to 2020 resulting in a slight decrease in population density for most municipalities. In 2020, there were an estimated 411 residents living in each square mile of the region. The regional population density is significantly less than the state average of 744 residents per square mile. The areas with the highest population densities are Middletown, Cromwell, and Clinton. The areas with the lowest population densities are Lyme, East Haddam, Killingworth and Haddam, all with less than 200 individuals

TABLE 2.6 Regional Poverty and Public Assistance, 2020

	Percent Below Poverty Level				Percent of Families		
Geography	Total Population	All Families	Under 18 years	65 years and over	With Cash Assistance or SNAP	Below 150% Poverty Level	Below 50% Poverty Level
Connecticut	9.8%	9.0%	12.5%	7.2%	11.6%	11.6%	2.7%
LCRVR	6.8%	5.1%	7.4%	6.0%	8.1%	7.5%	1.8%
Chester	5.3%	5.2%	3.4%	4.8%	4.5%	5.2%	0.0%
Clinton	5.8%	4.3%	6.7%	3.3%	6.4%	5.7%	1.4%
Cromwell	6.9%	3.1%	8.1%	5.8%	7.7%	7.3%	0.5%
Deep River	3.0%	1.6%	0.0%	0.9%	6.6%	2.6%	0.0%
Durham	4.6%	1.7%	0.0%	6.2%	3.8%	3.0%	1.1%
East Haddam	3.6%	3.2%	5.3%	2.4%	2.5%	10.0%	0.0%
East Hampton	5.6%	5.0%	7.9%	2.1%	4.9%	5.9%	3.4%
Essex	4.7%	2.0%	3.8%	3.7%	2.8%	4.1%	1.1%
Haddam	3.0%	1.6%	0.0%	7.3%	3.7%	3.9%	1.1%
Killingworth	4.9%	2.7%	3.7%	10.2%	0.7%	3.3%	2.0%
Lyme	1.1%	0.0%	0.0%	1.8%	2.8%	3.1%	0.0%
Middlefield	8.5%	5.3%	6.4%	17.3%	10.5%	5.3%	1.8%
Middletown	12.3%	9.9%	15.4%	10.4%	15.6%	14.1%	3.5%
Old Lyme	3.7%	4.0%	2.8%	5.1%	2.6%	4.7%	0.6%
Old Saybrook	4.3%	6.4%	3.2%	5.3%	5.9%	7.3%	2.1%
Portland	7.0%	5.9%	10.0%	2.8%	10.4%	6.5%	0.7%
Westbrook	3.0%	1.6%	3.3%	3.4%	4.8%	2.8%	1.6%

Source: 2016-2020 American Community Survey 5-year Estimates

MAP 2.1 LCRV Region Population Density



Source: U.S. Census Bureau, 2020 Census Demographic Data Map Viewer

per square mile.

E. EMPLOYMENT TRENDS

The economic base in the LCRV region includes a diverse set of industries and employment centers. As of 2018, the region was home to 4,305 firms, the majority categorized as "retail trade". Based on data from the Census Bureau's Longitudinal Employer-Household Dynamics database, 68,493 individuals were employed in the LCRV region in 2019. Of those employed in the region, 18.0 % were employed in the health care and social assistance sector, followed by 13.9% in the manufacturing sector. Table 2.9 lists the five largest employers by town. Of the 85 firms listed, 14 are in the manufacturing sector, and 10 are in the health care sector. Many of the largest employers in the region are located in Middletown, including Middlesex Hospital, Connecticut Valley Hospital, Wesleyan University, and FedEx Ground, which employs 722 people in a new facility built in 2018. The region's largest employer outside of Middletown is the Lee Company which manufactures hydraulic equipment in their facility on Pettipaug Road in Westbrook. In many of the LCRV region municipalities, the public schools and chain supermarkets are the largest employers. Significant clusters of retail jobs can be found in the region's two outlet malls, Clinton Crossing in Clinton and Tanger Outlets in Westbrook, both located near I-95. More business and employment sector data is available in Tables 2.8 (page 17) & 2.9 (page 18).

In 2019, the region's workforce totaled 86,150 individuals, a larger number than those individuals employed within the LCRV region. The majority of LCRV region residents (67.7 %) commuted outside of the region for work. The majority of the region's workers travel northbound for work, with 10.4 % employed in Middletown and 7.1 % in Hartford. Meriden, East Hartford, New Britain, and Newington are also large employment hubs for the region's residents. With easy access to I-95 for the southernmost municipalities, it is surprising that only 4.4 % of the region's workers commute to New Haven, 1.6 % to Groton, and 1.2 % to New London. See Maps 2.2 and 2.3 for a visual depiction of the region's travel to work flows.

These commuting trends call for better connectivity between the region and employment hubs to the North. The demand for better connectivity is evidenced by the

TABLE 2.7 Population Density in the LCRV Region, 1980—2020

Geography	Land Area (Sq. Miles)	Population Density Per Square Mile				
		1980	1990	2000	2010	2020
Connecticut	4844.1	642	679	703	738	744
LCRVR	424.2	323	358	388	417	411
Chester	16	192	214	234	250	234
Clinton	16.3	687	783	803	813	809
Cromwell	12.4	828	991	1,038	1,129	1,147
Deep River	13.6	294	319	339	340	325
Durham	23.6	218	243	281	313	303
East Haddam	54.3	104	123	153	168	163
East Hampton	35.6	241	293	375	364	357
Essex	10.4	488	568	625	643	647
Haddam	44	145	158	163	190	192
Killingworth	35.3	113	136	170	185	175
Lyme	31.9	57	61	63	75	74
Middlefield	12.7	299	309	331	348	332
Middletown	40.9	955	1,046	1,055	1,189	1,167
Old Lyme	23.1	267	283	321	329	330
Old Saybrook	15	619	637	691	683	699
Portland	23.4	358	360	373	406	401
Westbrook	15.7	332	345	401	442	431

Sources: 1980, 1990, 2000, 2010, and 2020 Decennial Census of Population and Housing

frequent congestion during commuting hours on Route 9 in the Middletown area, as well as traffic build-up on the I-91 on and off ramps in Cromwell.

Following the recession of 2007/2008, employment within the region decreased sharply but as of 2019 has recovered to 98.7% of the pre-recession total. The biggest contributor to decreasing employment following the recession was the contraction of the financial sector. Currently, this sector employs 31.5% fewer employees than it did in 2006. The share of jobs in the manufacturing sector declined steadily until 2016 but has since rebounded slightly. Health care and social service jobs have steadily increased. Education, retail, and accommodation and food services employment has remained relatively constant following the recession.

Regional employment rates have increased steadily since the Great Recession and have now approached pre-recession levels. The unemployment rates have mirrored those of the state, although tracking one-half to one percent less.

Table 2.10 (page 18) shows the regional employment projections by CTDOT as mentioned in section A. According to these figures the LCRV region employment was to have increased by 2.6% by 2023, 3.4% by 2025, 9.2% by 2035, 15.4% by 2045 and 18.6% by 2050. Statewide employment is projected to increase by 2.3% by 2023, 3.4% by 2025, 9.4 % by 2035, 15.7% by 2045 and 18.9% by 2050.

TABLE 2.8 Jobs & Workers in the LCRV Region by Sector, 2019

Sector	Jobs in the Region		Workers Residing in the Region	
	Count	Share	Count	Share
Total	68,449	100.0%	86,331	100.0%
Agriculture, Forestry, Fishing and Hunting	380	0.6%	286	0.3%
Mining, Quarrying, and Oil and Gas Extraction	7	0.0%	17	0.0%
Utilities	391	0.6%	571	0.7%
Construction	4,038	5.9%	3,935	4.6%
Manufacturing	9,505	13.9%	9,689	11.2%
Wholesale Trade	2,839	4.1%	3,455	4.0%
Retail Trade	8,332	12.2%	8,759	10.2%
Transportation and Warehousing	1,721	2.5%	2,305	2.7%
Information	894	1.3%	1,716	2.0%
Finance and Insurance	1,701	2.5%	5,183	6.0%
Real Estate and Rental and Leasing	538	0.8%	904	1.1%
Professional, Scientific, and Technical Services	3,420	5.0%	5,215	6.0%
Management of Companies and Enterprises	980	1.4%	1,541	1.8%
Administration & Support, Waste Management and Remediation	3,039	4.4%	3,667	4.3%
Educational Services	6,147	9.0%	9,761	11.3%
Health Care and Social Assistance	12,295	18.0%	14,213	16.5%
Arts, Entertainment, and Recreation	1,367	2.0%	1,706	2.0%
Accommodation and Food Services	6,177	9.0%	6,558	7.6%
Other Services (excluding Public Administration)	2,872	4.2%	3,130	3.6%
Public Administration	1,866	2.7%	3,700	4.3%

Source: U.S. Census Bureau (2019) LODES On the Map

TABLE 2.9 Top Five Employers by Town, 2022

Chester	Whelen Engineering	Greenwald Industries	Roto Frank	Camp Hazen	Norma Terris Theatre
Clinton	Stop and Shop	Shop Rite	Joel School	Big Y	National Sintered Alloys
Cromwell	Stop and Shop	Walmart	Pilgrim Manor	Shop Rite	Apria Healthcare
Deep River	Adam's	Hale-Ray Middle School	Silgan Plastics	Incarnation Center	Deep River Elementary School
Durham	Hobson Motzer	Durham Manufacturing	Morgan AM&T	Coginchaug High School	Brewster School
East Haddam	Chestelm Health and Rehab	Goodspeed Theater	Hale-Ray High School	Hale-Ray Middle School	Shagbark True Value
East Hampton	Stop and Shop	Dickinson Brands Inc.	Cobalt Healthcare & Rehab Center	East Hampton High School	East Hampton Middle School
Essex	Essex Meadows	Underwater Construction	Griswold Inn	Valley Railroad	Tower Labs
Haddam	Saybrook at Haddam	Haddam-Killingworth High School	Burr District Elementary School	AAA Plumbing, Heating, and Cooling	Higganum Heating
Killingworth	Regional School Ditsrict 17	Killingworth Elementary School	Budget Dry Waterproofing	Simpson Healthcare	AAA Plumbing
Lyme	H.P. Broom Housewright Inc.	Reynold's Marine	Hadlyme Public Hall	Becket Hill State Park	Lyme Fire Company
Middlefield	Ametek Zygo	Marquee Events	Cooper-Atkins	Lyman Orchards	Rogers Manufacturing
Middletown	Connecticut Valley Hospital	Middlesex Hospital	Wesleyan University	Fed Ex	Whiting Forensic Institute
Old Lyme	Neumann USA	Kellogg Marine Supply	Big Y	Mile Creek School	Lyme-Old Lyme High School
Old Saybrook	Saybrook Point Inn & Spa	Walmart	Business and Legal Resources	Gladeview Rehabilitation	Stop and Shop
Portland	Town of Portland	Standard-Knapp	Valley Oil	Promold Plastics	Saint Clement's Castle
Westbrook	Lee Company	Water's Edge Resort and Spa	Clinton Nurseries	YMCA	Shoreline Medical Center

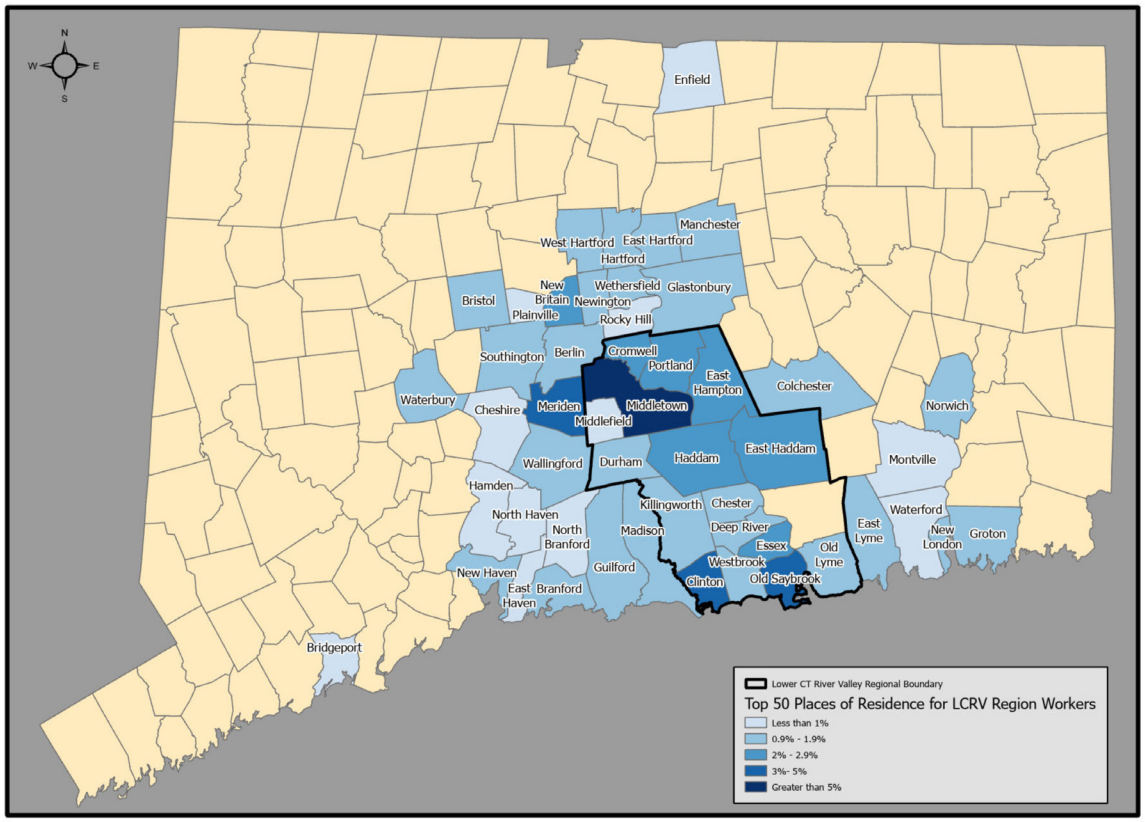
Source: Connecticut Department of Labor (2022). Labor Market Information.

TABLE 2.10 Municipal Employment Projections

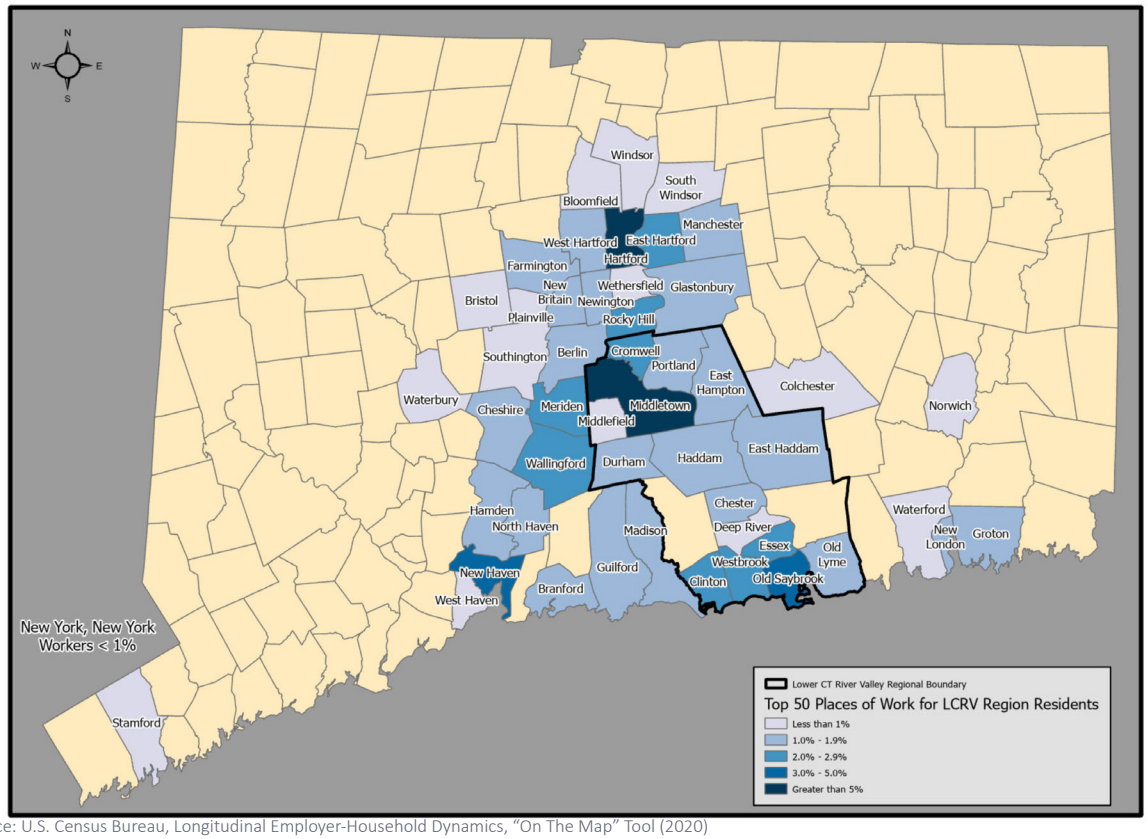
Town	2019	2023	2025	2035	2045	2050
Chester	2,094	2,142	2,167	2,293	2,426	2,496
Clinton	4,165	4,237	4,275	4,463	4,664	4,765
Cromwell	7,516	7,684	7,768	8,200	8,658	8,895
Deep River	1,325	1,354	1,369	1,444	1,522	1,563
Durham	2,415	2,473	2,502	2,649	2,806	2,887
East Haddam	1,457	1,490	1,508	1,597	1,691	1,740
East Hampton	2,031	2,077	2,100	2,215	2,338	2,402
Essex	3,743	3,831	3,875	4,102	4,343	4,468
Haddam	1,234	1,263	1,275	1,345	1,419	1,459
Killingworth	760	778	788	834	884	910
Lyme	159	161	162	169	176	180
Middlefield	1,905	1,949	1,973	2,091	2,216	2,281
Middletown	28,111	28,784	29,118	30,856	32,695	33,644
Old Lyme	2,573	2,632	2,662	2,814	2,973	3,056
Old Saybrook	6,511	6,639	6,705	7,042	7,398	7,583
Portland	2,323	2,373	2,398	2,527	2,665	2,736
Westbrook	3,687	3,764	3,803	3,997	4,205	4,314
LCRV Region	72,009	73,631	74,448	78,638	83,079	85,379
Connecticut	1,630,295	1,667,690	1,686,348	1,782,960	1,885,637	1,938,586

Source: CTDOTs Travel Demand and Air Quality Modeling Unit, 2023

MAP 2.2 Top 50 Places of Residence for LCRV Region Workers



MAP 2.3 Top 50 Places of Work for LCRV Region Residents



Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics, "On The Map" Tool (2020)

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The Essex Steam Train just north of Deep River Landing

Chapter 3.

EXISTING TRANSPORTATION NETWORK

A. EXISTING TRANSPORTION NETWORK

The transportation network of the Lower Connecticut River Valley (LCRV) reflects the history, topography, and settlement patterns of the region. The LCRV region is defined by the Connecticut River which drove the development of the communities along the river and still plays an important role in the region's economy. The region's expressways (I-95, Rte. 9, and I-91), state routes, and local roads make up the majority of the region's transportation infrastructure.

The density of roads in the region reflects the population density of the area. From Middletown with its urban center, to Cromwell, Portland, and East Hampton, which are suburban in character, the northern area of the region contains a denser network of town roads, bridges and urban streets. The remaining majority of the region is more rural in nature, with a less dense street network. Other significant components of the region's transportation network include railroads, public transit, bicycle routes, and sidewalks.

B. TRANSIT SYSTEM

RAIL

The railroads are an important component of the LCRV region's multi-modal transportation system and are vital to the regional economy. Amtrak, CTDOT, Tilcon, and CTDEEP all own rail lines in the region on which passenger, tourist, and freight services are provided. Map 3.1 shows all rail lines and stations within the LCRV region.

Amtrak

The national passenger railroad company, Amtrak, provides rail service along the Northeast Corridor (NEC) between Boston, MA and Washington, DC on the Acela and between Boston and Roanoke/Norfolk/Newport News on the Northeast Regional. Stops are west of the region in New Haven and Stamford.

There is one stop within the LCRV region at Old Saybrook on the Northeast Regional. This station was originally constructed in 1873 by the New Haven Railroad. Normal service between Boston and New York, with intermediate stops, is approximately three hours and forty-five minutes. Based on the current schedule in 2022, average weekday service between Old Saybrook and Boston (South Station) is about two hours and ten minutes. Average weekday service between Old Saybrook and New York (Penn Station) is about two hours and twenty minutes. Average weekday service between Old Saybrook and Washington DC (Union Station) is approximately six hours. Amtrak owns a portion of the Northeast Corridor from New Haven to the Connecticut-Rhode Island state line, including the approximately 18 miles in the LCRV region.

The Hartford Line runs from Springfield to New Haven with stops at Berlin, Meriden and Wallingford to the west of the region. The Valley Flyer from Greenfield to New Haven using the same stops near the region.

Shore Line East

Shore Line East (SLE) is a CTrail commuter rail service that began operation in 1990 and provides service along a portion (50.6 miles) of the NEC from New London to New Haven with stops in Old Saybrook, Westbrook, Clinton, Madison, Guilford, and Branford with transfer to the Metro North Railroad in New Haven. It began to reduce congestion along I-95 and is fully subsidized by CTDOT, with Amtrak under contract to operate the service, and perform maintenance throughout the system. Amtrak owns all fixed infrastructure along this route, while CTDOT owns the rolling stock and is the lessee to five of the seven Shore Line East stations that are owned by Amtrak. Stations were upgraded over the years including ADA accessibility and second platforms to support bidirectional service. Service was temporarily cut in 2018 and 19 because of track work and a locomotive shortage and again in 2020 due to the COVID-19 pandemic.

The line has two continuously welded rail tracks and it is maintained at FRA Class 6 and 7 track standards, meaning top speeds are either 110 mph or 125 mph. This noted, current Shore Line East operating speeds, due to M8 equipment requirements, are 90 mph. The line has electrified propulsion capabilities and CTDOT finished upgrades in 2022 to allow its current electric fleet of self-propelled Kawasaki M8 vehicles to operate on the line.

Trips from New London to New Haven take about an hour with seven AM and seven PM trips on weekdays connecting to Metro North and three AM and five PM trips on weekends and holidays connecting to Metro North.

Trips from New Haven to New London also take about an hour with five AM and eight PM trips on weekdays with connections from Metro North and four AM and four PM trips on weekends and holidays with connections from Metro North.

SLE total annual ridership was 828,721 in 2016. Ridership decreased overall for the next five years dropping to 786,331 (-5.1%) in 2017, 601,158 (-23.5%) in 2018, 660,447 (9.9%) in 2019, 155,857 (-76.4%) in 2020, and 122,019 (-21.8%) in 2021. Operational funding between 2015 and 2019 averaged approximately $32,400,000 per year. Fare and other revenue recovered about 7.4% of the costs although commuter rail brings a variety of public benefits in terms of safety, fuel efficiency, connectivity, congestion reduction, and air quality.

Active Rail Freight

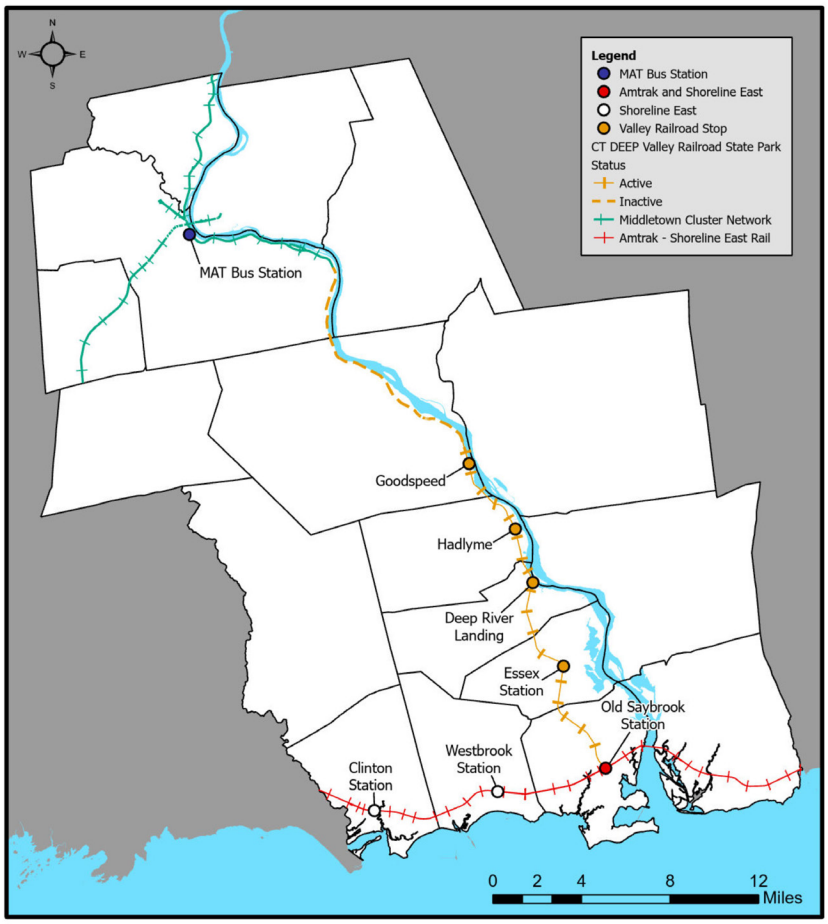
There are private freight railroad companies operating in Connecticut. Primary commodities include non-metallic

minerals, food and consumer products, waste and scrap, primary metals, lumber and wood, and petroleum products. The majority of Connecticut's freight system does not meet the 286K national car standard, limiting the types and quantities of goods shipped through the state.

Providence and Worcester Railroad Company

A Genesee & Wyoming Inc. (GWI) subsidiary, Providence and Worcester Railroad Co. (P&W) is a regional FRA designated Class II railroad operating in Massachusetts, Rhode Island, Connecticut, and New York. It handles about 18,000 carloads of chemicals, transformers, plastics, steel, oil, minerals and stone, building materials, chemicals, salt, and malt, among other commodities. Mineral and stone shipments make up 66% of P&W's business in Connecticut, which is home to 6 out of the railroad's top 11 customers. In Connecticut, P&W interchanges traffic with the NECR in Willimantic and New London; with CSX in New Haven; with the HRRC in Danbury via P&W overhead rights; and with the BSRR on Amtrak's NEC in Branford. The carload weight limit is typically 286,000 pounds. It has classification yards in Plainfield and Willimantic.

Map 3.1 LCRV Region Rail Service



Source: CT Department of Energy and Environmental Protection, RiverCOG

NEC

Freight service along the shoreline is operated along the Northeast Corridors, shared with passenger service.

Middletown Cluster

The Middletown Cluster consists of four lines originating from the City of Middletown. The State of Connecticut owns these lines which are maintained to FRA Class 1 or Class 2 track standards. There is no passenger or through freight service on these lines, only freight service provided by G&W.

The Middletown Rail Cluster is comprised of the following four lines:

- The Portland Line travels 1 mile east from Middletown across the Connecticut River into Portland.
- The East Berlin Line travels 1.1 miles northwest from the Middletown diamond towards Berlin. The Middletown diamond is a superimposed pair of crossovers, resembling the letter "X", permitting travel in either direction between a pair of parallel tracks.
- The Middletown Secondary Line traverses 7.3 miles southwest from the Middletown diamond through Middletown, Middlefield, and Durham to Reeds Gap. From Reeds Gap to North Haven, the line is owned by Tilcon and operated by the G&W Railroad.
- The Laurel Track traverses 5.5 miles southeast from Middletown towards Haddam and connects to the CTDEEP owned Valley Rail Line. The Laurel Track is currently out of service.

Middletown Secondary

The Middletown Secondary Line traverses 15 miles between North Haven and Durham. It runs from the Springfield Line in North Haven and serves the Middletown Cluster. CSX owns this line in North Haven (4.8 miles), and Tilcon Connecticut, Inc. owns this line from North Haven to Durham (10.2 miles). Tilcon operates a major stone quarry in East Wallingford/ Durham and ships crushed stone from this location to the New York City metropolitan area, Danbury, and Old

Saybrook. The State of Connecticut owns the line from Durham to Middletown (see the Middletown Cluster, above). It is maintained at FRA Class 2 track standards. There is no passenger or through freight service on this line and local freight service is provided by the P&W.

Wethersfield Secondary Line

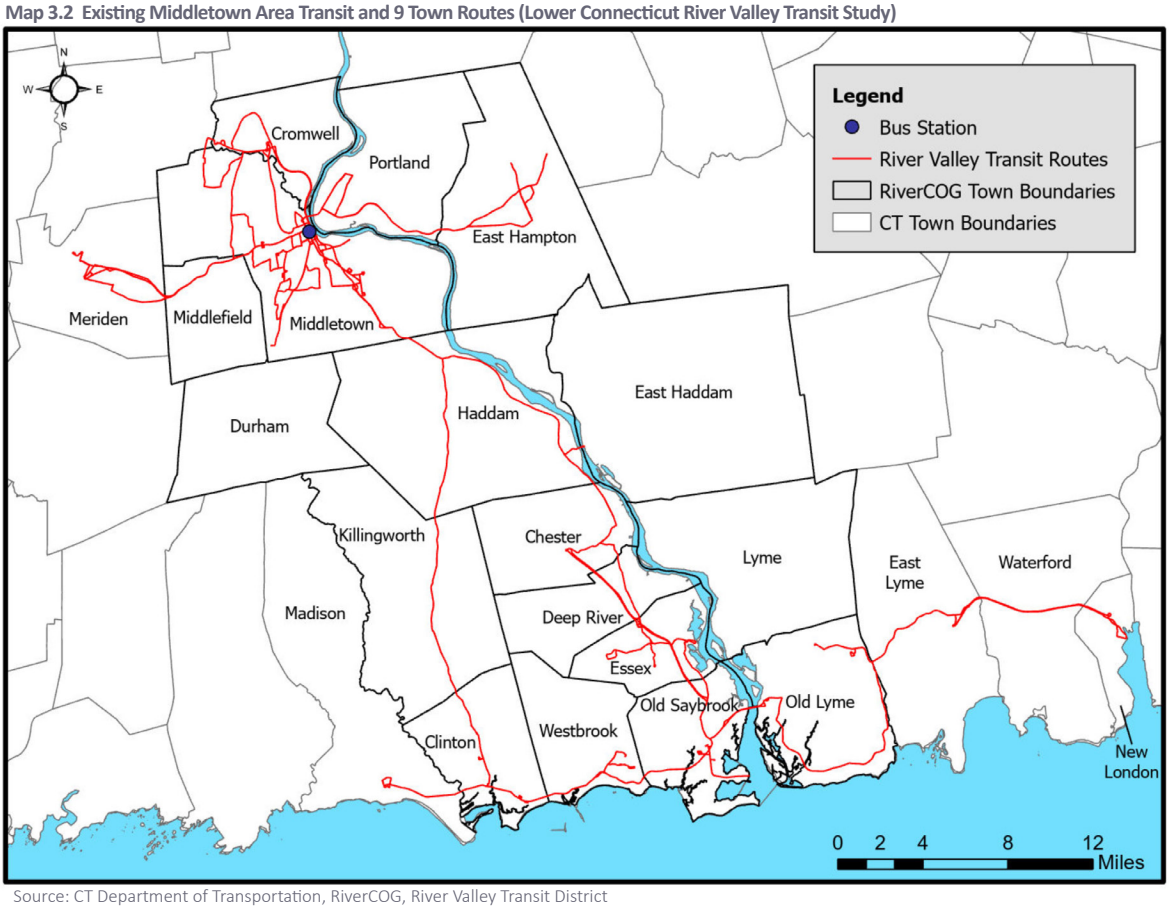
The Wethersfield Secondary Line traverses 16.6 miles through urban and suburban areas between Hartford and Middletown. It connects to the Middletown Cluster in Middletown. CSO owns the northern 3 miles of this line, and the State of Connecticut owns the remainder. It is maintained at FRA Excepted Track standards. There is weekly through freight service on this line between Middletown and Hartford. Local freight service on the northern three (3) miles of the line is provided by the CSO. P&W provides local freight service south of Hartford. There is no passenger service on this line.

Valley Rail Line

The Valley Railroad is a heritage railroad operating on 14.3 route miles between Old Saybrook and Haddam. The route continues for another 7.6 route miles north to the Maromas section of Middletown, but this segment is out of service. North of Deep River, the line runs for 6.4 miles along the west side of the Connecticut River. The total 22-mile route from Old Saybrook to Maromas is leased from the CTDEEP. Valley Railroad operates the Essex Steam Train and the Essex Clipper Dinner Train. The company's mission is to keep alive the rich mechanical, industrial, and transportation heritage of the state through the continual operation of vintage steam and diesel locomotives and passenger coaches, as well as the operation and maintenance of the facilities and infrastructure that support train operations. It has an engine servicing facility in Essex and an interchange with the P&W Railroad in Old Saybrook. Maximum operating speed is 20 MPH. The carload weight limit is 265,000 pounds. There is no freight service on the line, though the lease from the state allows for freight service.

The Valley Railroad Company has operated tourist train passenger service since 1971. According to the Valley Railroad, approximately 140,000 passengers ride the line a year. Almost all passengers board and alight at the Valley Railroad's 1892 Essex Station. Train trips are about one hour and connections to the riverboat at Deep River Landing about two and a half hours round trip. Dinner trains run two to two and a half hours. During the summer and fall, another option is an eight-mile round trip rail-bike trip from Essex Station south to Old Saybrook through The Preserve, a 963 acre protected coastal forest.

Map 3.2 Existing Middletown Area Transit and 9 Town Routes (Lower Connecticut River Valley Transit Study)



Source: CT Department of Transportation, RiverCOG, River Valley Transit District

RiverCOG's 2014 Valley Railroad State Park Scenic Corridor Study analyzes the regional and local context of the northern nine miles of the Valley Rail Line corridor and the existing conditions along the corridor between Tylerville (in Haddam) and Maromas. Approximately eight miles of this rail has not been used for train travel since 1968. The report provides conceptual designs and design guidelines for development of a multiuse trail along the corridor. The study examines the role that this asset should play in regional planning efforts related to transportation, conservation, and economic development.

RiverCOG's 2015 Valley Railroad State Park Economic Impacts Study identifies various costs and impacts of future uses of the Connecticut Valley Railroad State Park right of way as input for determining the future best use or uses of the corridor. These uses include construction of a multi-use trail, expanded use of the rail line for freight purposes, expanded uses of the rail line for passenger rail purposes, or extension of the rail line for continued scenic rail service. The study identifies costs and benefits related to the future uses contemplated for the corridor, as well as conditions that bring into question the feasibility of potential future uses.

Rail Parking and Amenities

Parking at the region's three rail stations (Clinton, Westbrook, and Old Saybrook) is often an issue. The Clinton station was upgraded in 2022 and has a parking capacity of 141. Westbrook's updated rail station, which opened in March 2014, has 210 spaces. Old Saybrook's train station has designated parking for Shoreline East with 137 spaces and approximately 75 spaces for Amtrak parking. In addition, CTDOT has constructed a 199-space parking lot adjacent to the track on the west side of North Main Street which opened in 2016. Station parking is free and unpatrolled at the three stations. Sidewalks, amenities and roadway improvements along North Main were completed in 2018 using LOTCIP funds to improve access to the station. The new lot increased total parking to 324 spaces and allowed overnight parking for the first time.

The three stations are accessible and have bicycle racks. The rail stations are connected to bus transit and on-demand rideshare services such as taxi, Uber, and Lyft may be used from stations. Owners of electric vehicles are welcome to use any of the four charging stations available at the new Clinton Station at no cost to users.

PUBLIC BUS

Estuary Transit District

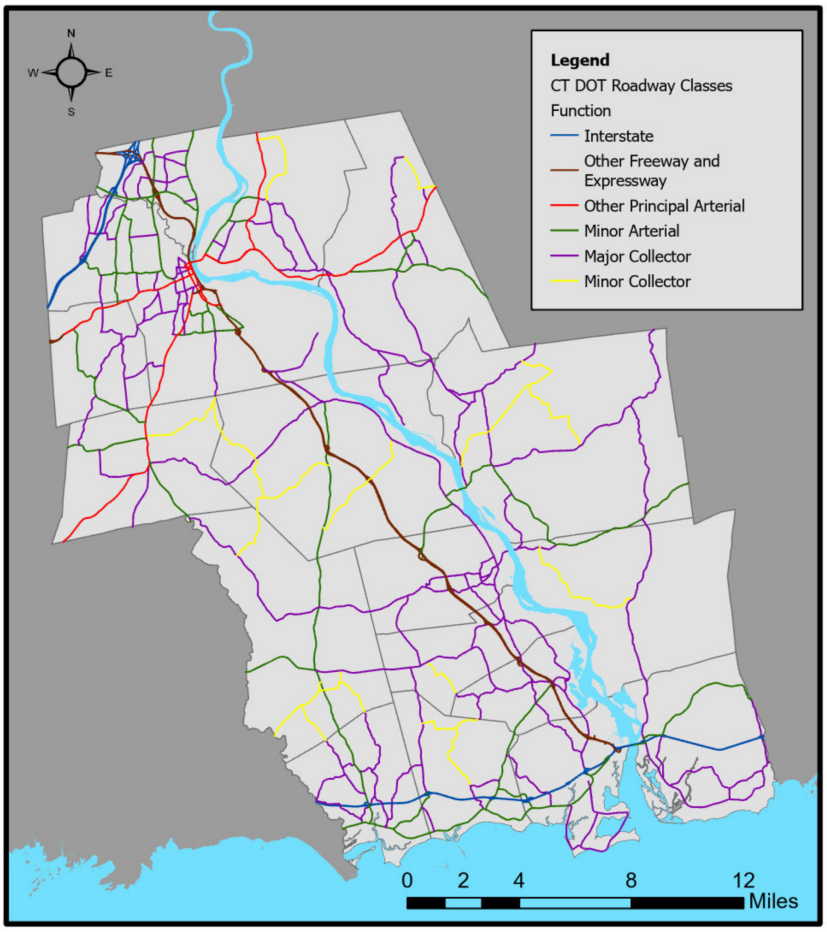
Map 3.2 shows the public bus routes within the LCRV region, operated entirely by the Estuary Transit District. Formally, the LCRV Region was served by two transit districts, Middletown Area Transit and Estuary Transit District. Middletown Area Transit served Middletown, Cromwell, Portland, East Hampton, and Middlefield with fixed route and ADA transportation. As of July 1st 2022, Middletown Area Transit has merged with Estuary Transit to become one unified transit operator for the LCRV region. As part of the merger, a series of route alignment, frequency, service span, fare, and branding changes are being implemented. This includes a new public facing name of River Valley Transit and new branding for vehicles and promotional materials.

Under this new system, the routes of Middletown Area Transit and Estuary Transit are combined, which can be seen in map 3.2. River Valley Transit operates 12 regularly scheduled routes throughout the region, providing valuable connections throughout the LCRV region and beyond. In addition to serving the LCRV region, River Valley Transit routes provide access to key destinations outside the region including access to Meriden, New London, Madison, and East Lyme. Transfers exist between other transit operators such as CT Transit, Southeast Area Transit, and Meriden Transit District. These transfers provide additional access to key destinations such as Hartford and New Haven. All vehicles are wheelchair accessible and have bicycle racks for increased intermodal mobility options.

Many other River Valley Transit services exist for LCRV residents in the region. People not with in ¾ of a mile from a fixed route bus may be eligible for Dial-A-Ride, a curb-to-curb ride sharing service. Advance reservations are required to use the service, but Dial-A-Ride is an excellent option for those not currently well served by River Valley Transit existing fixed routes. A map of the Dial-A-Ride eligible zone can be seen in map 3.3. Another great option is the XtraMile Program, an on-demand ride sharing service with no reservations required. Similar to other ride sharing apps such as Uber and Lyft, riders request a pickup and can select a drop off location. Our first XtraMile zone has service in Old Saybrook and parts of Westbrook and Essex. Started in 2019, the service has been successful in gaining a consistent rider base as riders enjoy the flexibility and convenience of the on-demand service. A new XtraMile pilot program in Middletown is currently underway and is growing in ridership.

River Valley Transit also provides paratransit services for people with disabilities. Door-to-door bus service is provided to eligible persons with disabilities in accordance with the Americans with Disabilities Act of 1990. ADA services are only within ¾ of a mile of the fixed routes, as ADA paratransit provides transit for those near bus routes who cannot use them based on disability. ADA service operates at similar times to the fixed route service and will drop riders off anywhere within the ADA Corridor according to map 3.4. eligible residents apply for ADA paratransit certification if they are not able to ride fixed routes. ADA paratransit certification will also qualify riders for half price taxi vouchers for trips outside of the ADA corridor anywhere in Connecticut. We also work with Curtin Transportation Group to provide taxi vouchers where

Map 3.3 LCRV Region Functional Classification of Roadways



Source: CT Department of Transportation

ETD will pay for half of the cost of a trip for non-ADA eligible individuals. ETD also works with the state to provide better access to natural recreation spots for LCRV residents, such as Hammonasset Beach service in the summer, through the ParkConneCT program.

CTTransit

Connecticut Transit's (CTTransit) operates one local bus route (55/55X) and one commuter express bus route (921). Local bus routes make frequent stops, linking neighborhoods with urban centers and providing connections within and between communities. Many express routes operate weekdays during peak hours mostly between suburban Park and Ride lots and downtown Hartford.

Route 55 runs between Hartford and Middletown via the Silas Deane Highway and Wethersfield Avenue or I-91 (55X) with stops in Hartford, Wethersfield, Rocky Hill, Cromwell and Middletown on weekdays and a limited Saturday schedule.

Route 921 runs between Hartford and Old Saybrook via RT 9 and I-91 with stops in Hartford, Middletown, Chester, Essex, and Old Saybrook. Weekday only service was suspended in September 2021 and resumed in August 2022. Free transfers are available between CTTransit routes and local bus systems. CTTransit buses are equipped with bike racks holding up to two bikes on a first come-first serve basis. Collapsible personal vehicles, such as collapsible bicycles and e-scooters are permitted to be transported onboard the bus.

C. HIGHWAYS

EXISTING NETWORK

The Lower Connecticut River Valley Region contains 1,519 miles of actively maintained roads. Of this total, 314 miles (20.5%) are owned and maintained by CTDOT and the remaining 1,208 miles (79.5%) are maintained by LCRV municipalities. Middletown has the largest number of roads in the region with 229.8 miles and Middlefield has the smallest in the region with 46.1 miles.

Of the region's state-owned roadways, 286 miles are contiguous two or four lane state highways and 63 miles are two to six lane divided limited access expressways. There are another 29 miles of state-owned expressway ramps and connectors.

Table 3.1 LCRV Region Functional Classification of Roadways

Functional System	Services Provided
Arterial	Provides the highest level of service at the greatest speed for the longest uninterrupted distance with some degree of access control.
Collector	Provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.
Local	Consists of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.

Table 3.2 LCRV Region Functional Classification of Roadways

Interstate	Provides a network of limited access, divided highways offering high levels of mobility while linking the major urban areas
Other Freeway/ Expressway	Designed as directional travel lanes, usually separated by some type of physical barrier with access and egress points that are limited to on- and off-ramp locations or a very limited number of at-grade intersections.
Principal Arterial	Major activity centers, have the highest volumes, and longest trip desires.
Minor Arterial	Serves trips of moderate lengths, with a greater emphasis on land access, and a lower level of traffic mobility and primary bus routes
Major Collector	Collect traffic from local streets and direct it to the arterials.
Minor Collector	Link traffic generators such as neighborhood stores with outlying rural areas and collect traffic from local roads
Local	Local streets provide direct access to abutting properties and the higher classified roadways.

The region's most traveled expressway is Interstate 91, connecting New Haven and Hartford, and passing through Middletown and Cromwell in the northwest corner of the LCRV region. This five-mile segment of highway had an average daily traffic (ADT) between 145,500 north of exit 22S in Crowell, and 104,700 south of exit 20 in Middletown in 2019.

Interstate 95 is the LCRV region's second most heavily traveled expressway. The region's section of I-95 travels approximately 16.9 miles east to west through towns of Old Lyme, Old Saybrook, Westbrook, and Clinton, crossing the Connecticut River on the Baldwin Bridge. As of 2019 this section of I-95 connects New Haven and New London and has an ADT between 72,000 west of the Baldwin Bridge in Old Saybrook and 45,000 at the RT 153 underpass in Westbrook.

Connecticut Route 9 is the region's third most heavily traveled and longest expressway with a length of approximately 30.7 miles in the LCRV region. Route 9 runs through Cromwell, Middletown, Haddam, Chester, Deep River, Essex, and Old Saybrook. Portland has access to Route 9 via the Arrigoni Bridge in Middletown. ADT's ranged between 75,400 north of the Evergreen Rod underpass in Cromwell, to 28,500 south of exit 1 in Old Saybrook. Route 9 connects municipalities to New Britain and I-84 in West Hartford to the north.

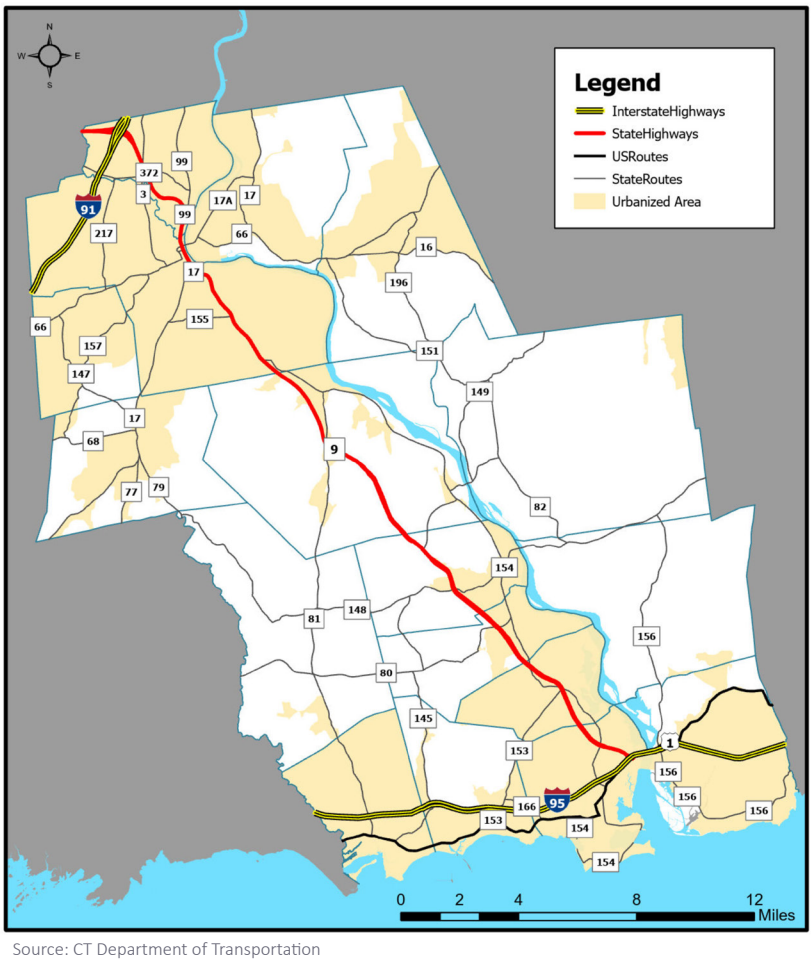
FUNCTIONAL CLASSIFICATION

All roadways can be classified based on the character of traffic service that they provide (i.e., local or long distance) and the degree of access to adjacent land that they provide. There are three highway functional classifications: arterial, collector, and local roads. How drivers use roadways will determine both the functional classification and the requisite design and capacity of the road. Table 3.1 describes the characteristics of the three primary road classes. The Federal Highway Administration (FHWA) and CTDOT provide a more detailed classification system for Connecticut highways and roads as described in Table 3.2. A visual depiction of regional roadway classification is available in Map 3.4.

CAPACITY & CONGESTION

In general, congestion is defined from a road user's perspective, and this perception solely relies on users'

Map 3.4 LCRV Region Roadway Network



Source: CT Department of Transportation

Map 3.5 LCRV Region Roadway Congestion

Source: Hartford Area CMP 2020 and New Haven Area CMP 2018

experiences from traveling on roadways. These experiences differ based on the location of road users. As a result, it is somewhat challenging to define congestion. However, FHWA generally defines congestion as stopped or stop-and-go traffic and identifies severity, extent, and duration as the main elements of congestion. The interaction of these elements determines the effects of congestion on road users. With the exception of Interstate 95 during an accident or summer weekend traffic, few areas of the region's road network can be considered truly congested. During the summer tourist season, the average daily traffic on Route 1 and other major connectors near the shoreline increases significantly. This occurs primarily along the Route 1 commercial corridor west of the Connecticut River and connector routes such as Routes 153 and 154 in Old Saybrook, and 156 in Old Lyme. Another area that experiences minor congestion is Route 9 in Middletown at the a.m. and p.m. peak hours primarily due to its traffic light configuration. A map of the regional roadway network is located in Map 3.3.

Capacity Analysis

Capacity analysis is a tool that identifies roads that are congested or will become congested if current trends continue without roadway improvements. The level of capacity was determined by the road's volume-to-capacity ratio (V/C). A V/C ratio between 0.90 and 0.99 suggests a roadway is approaching capacity, whereas ratios of 1.00 or greater are roadways that are over capacity. This method is used in the SCRCOG Congestion Management program (CMP). The northern municipalities included in the CRCOG CMP incorporate congestion monitoring and assessment data from the National Performance Management Research Data Set (NPMRDS).

If current growth patterns continue without improvements to roadways or a change in land use policies, even larger areas of the region will experience traffic congestion in the future. In addition to improved infrastructure, congestion management strategies can also be formulated to alleviate existing and potential congestion and enhance the mobility of people and goods. Examples of potential congestion management strategies related to roadway operations include; geometric improvements at bottlenecks access management, signalization improvements, incident management and special event/work zone management. Other potential congestion management strategies related to alternative modes could be revised transit services and ridesharing programs, while other demand management strategies could include traveler information systems, telecommuting programs, and flexible work schedules. These types of strategies would help lessen congestion when implemented in areas that are or will be over capacity. Roadways identified as congested in the regional CMPs are shown in congestion map 3.5.

Average daily traffic (ADT) on state routes is shown on Map 3.6. Roads that are at or approaching capacity are also the roads with the highest ADT including I-91 and I-95. Route 9 has the third highest traffic volume in the region, but typically congestion occurs only at the signals in Middletown and ramps in Cromwell.

COMMUTER LOTS

The LCRV region has sixteen commuter parking lots located near interstates and major arterials as well as three lots at the SLE stations. Ridesharing options are available through

TABLE 3.3 LCRV Region Commuter Lot Capacity

Municipality	Location	Capacity
Chester	RT 9 at RT 148 (exit 6)	75
Clinton	I-95 at RT 81 (exit 63)	135
Cromwell	I-91 at RT 372 (exit 21)	70
East Hampton	RT 66 at RT 16	27
Essex	RT 9 at RT 154 (exit 4)	100
Haddam	RT 9 at Beaver Meadow Road (exit 8)	25
Killingworth	RT 80 at RT 81	25
Middletown	Industrial Park Road (off RT 372)	250
Middletown	Eastern Drive (Connecticut Valley Hospital)	12
Middletown	RT 9 at Silver Street (exit 12)	86
Middletown	I-91 at Country Club Road (exit 20)	50
Old Lyme	I-95 at RT 156 (exit 70)	50
Old Lyme	I-94 at Four Mile River Road (exit 71)	28
Old Saybrook	RT 154 at CTDOT maintenance garage	37
Westbrook	I-95 at RT 153 (exit 65)	50
Westbrook	I-95 at RT 145 (exit 64)	23

individual arrangements and CTDOT sponsored ride share programs such as CTRides. RiverCOG tracks commuter lot usage on a quarterly basis. Recent counts show commuter lot usage was low during the pandemic. Quarterly counts show the lots were approximately 36% filled based on current capacity prior to the start of the pandemic. During the pandemic lots averaged about 17% capacity between 12/19 and 2/22 and since then lot usage has increased to about 23% of capacity. See Table 3.3 for a list of commuter lots.

D. BRIDGES

The Connecticut Department of Transportation partners with the region to identify, maintain, and replace bridges on state and local roads within the region. There are several bridges slated for replacement within the region. The challenge is to ensure that bridge design is coordinated with towns and other CTDOT departments to ensure that design accommodates users of multiple transportation modes and reflects municipal plans and goals.

CTDOT administers a bridge program in conjunction with federal programs, since many bridges may be eligible for federal funding. In the State Bridge Program, all bridges on the state highway system and municipal bridges more than twenty feet in length are inspected and rated every two years. CTDOT analyzes the substructure, superstructure, deck, or culvert, and safe load capacity. The sufficiency rating is used to develop an annual ranked list of candidate bridges to be considered under the programs. This rating takes into account the condition and strength of the bridge, number of vehicles using the bridge per day, and length of alternative routes if the bridge were to be closed. The service life of a rehabilitated bridge is projected to be a minimum of twenty years, and fifty years for replacements.

The Local Bridge Program is similar to the state bridge programs, except that the bridges are municipally owned and are over six feet in length. Local bridge grants for qualifying projects were available on a sliding scale ranging from 10% to 33% of the total project cost since 1985. P.A. 16-151 includes a change of the grant rate to 50% for all municipalities, and extends eligibility to bridges that are not currently structurally deficient, but have other issues. These include bridges that are functionally obsolete or scour critical, or bridges that could benefit from minor repairs to extend their useful life. The change took effect on July 1, 2016 and the grant rate for FY17 projects is 50%. CTDOT plans to revise the program regulations for FY18 application criteria for bridges that are not yet structurally deficient. Some of the local bridge projects may qualify for federal funding under the Off-System Program. If qualifications are met, the municipality may receive up to 80% federal funds for the project, and the other 10%-20% from the state's Local Bridge Program, effectively requiring no local funds.

The primary difference between the Local Bridge Program and State Bridge Program is that CTDOT inspects the bridges more than twenty feet in length biannually, whereas the local bridges spanning between six and twenty feet were inspected once as mandated by Public Act 87-584. CTDOT does not intend to inspect the local bridges again unless mandated by the Legislature. As a result, the Local Bridge Program eligibility list remains static. Bridges not on the list may be eligible for funding, but the municipality has to prove the bridge to be deficient. If found deficient, and approved for eligibility, the state adds the bridge to the list of eligible bridges, and establishes a priority ranking. Funding authorization will be determined annually by the ranking and available funds. If not authorized in one fiscal year, project applications must be resubmitted for consideration during the next fiscal year. A bridge is not eligible if it has received assistance from the state bridge program within the last twenty years.

The 2022 list of currently eligible bridges is located in Table 3.4. (page 30) A list of bridges under and over twenty feet can be found in Appendix B.

E. MARINE

CONNECTICUT RIVER

The Connecticut River is the largest river in New England. It begins at the Connecticut Lakes in northern New Hampshire and flows 405 miles south to Long Island Sound. The river has a drainage basin extending over 11,250 square miles. The

TABLE 3.4 Eligible Bridges 2022

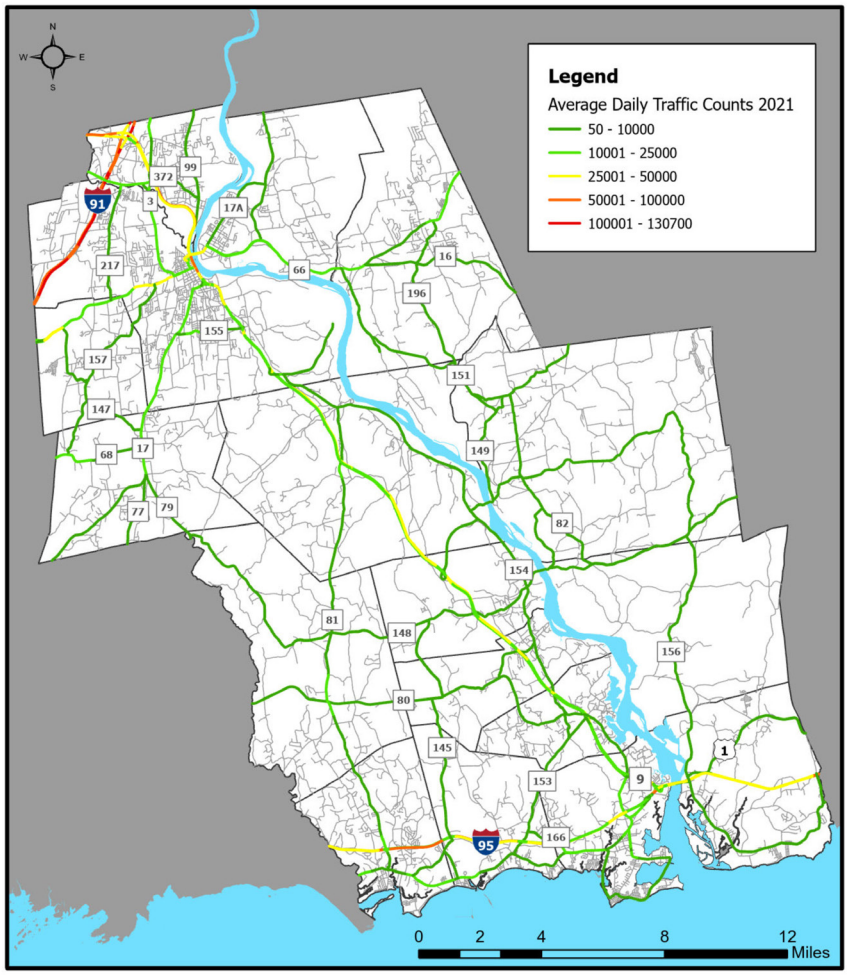
Municipality	Eligible Bridges
Chester	04608 Wig Hill Road over Pattaconk Brook 026001 Cedar Lake Road over Pattaconk Brook 026012 North Cedar Lake Road over Great Brook
Clinton	04118 Beach Park Road over Hammock River 04612 Kelseytown Road over Menunketesuck River 05662 Brickyard Road over Menunketesuck River 06195 Liberty Street over Amtrak Railroad 06296 Waterside Lane over Hammock River 07013 Ben Merrill Road over Brook
Cromwell	Pasco Hill Road over Pasco Brook
Deep River	04637 Union Street over Deep River 04638 Essex Street over Pratt Cove 06056 Bridge Street over Deep River 122005 Kelsey Hill Road over Brook
Durham	06981 Cesca Lane over Ball Brook 037008 Maiden Road over stream 037018 Coe Road over Parmelee Brook
East Haddam	04647 EH/Col Turnpike over Moodus Reservoir 04648 Gristmill Road over Moodus River 04649 Clark Hill Road over Roaring Brook 06126 Haywardville Road over Eight Mile River 040019 Lumber Yard Road over Succor Brook
East Hampton	05610 Shipyard Road over Mine Brook 05739 Chestnut Hill Road over Pine Brook 07014 Main Street over Pocotopaug Creek 041002 Walnut Avenue over Pocotopaug Creek 041004 Niles Street over Pocotopaug Creek 041005 Flat Brook Road over Flat Brook 041015 Gadpouch Road over Mine Brook 041011 Wopowog Street over Safstrom Brook
Essex	04356 Pond Meadow Road over Falls River 04662 Dennison Road over Falls River 04663 River Road over Falls River 04664 Dennison Road over Falls River 05288 Cheney Road over brook 05289 Main Street over brook 049001 Ivory Street over Falls River 049002 Ivory Street over Falls River 049004 Old Deep River Road over un-named brook
Haddam	04816 Depot Road over Ponset Brook 04817 Scovil Road over Candlewood Hill Brook 05515 Jail Hill Road over Beaver Meadow Brook 05537 Beaver Meadow Road over Beaver Meadow Brook 060019 Hubbard Road over Pole Bridge Brook
Killingworth	06614 Abner Lane over Pond Meadow Brook 069007 Roast Meat Hill Road over Menunketesuck River
Lyme	04723 Mount Archer Road over Eight Mile River 04724 Joshuatown Road over Eight Mile River 05818 Day Hill Road over Raging Brook 06039 Salem Road over Eight Mile River 074002 Beaver Brook Road over Cedar Pond Brook 074004 Kenny Road over Beaver Brook 074006 Cover Road over Hamburg Cove
Middlefield	04843 Miller Road over Coginchaug River 04844 Strickland Road over Coginchaug River 05553 Cider Mill Road over Coginchaug River
Middletown	04187 Main Street Extension over Sumner Brook 04189 Ridge Road over Sumner Brook 04190 River Road over Sumner Brook 04533 Mill Street over Sumner Brook 04535 Middlefield Street over Coginchaug River 04538 Miner Street over Fall Brook 04542 Bell Street over Sawmill Brook 05564 Russell Street over Sumner Brook 05621 Wilcox Street over Sumner Brook 05957 River Road over brook 05958 Wesleyan Hills Road over Long Hill Brook 082011 Chamberlain Road over Harris Brook 082012 Mill Brook Road over un-named stream 082029 Country Club Road over Fall Brook 082038 Lee Street over Prout Brook 082043 Briarwood Lane over West Minor Brook
Old Lyme	04346 Button Ball Road over Amtrak Railroad 04738 Town Woods Road over Mill Brook 04739 Sill Lane over Mill Brook 04818 Sill Lane over Mill Brook
Old Saybrook	05923 Ingham Hill Road over Amtrak Railroad 06021 Schoolhouse Road over Amtrak Railroad 105002 Ingham Hill Road over Fishing Brook 105003 Beaver Dam Trail over Fishing Brook
Portland	112002 Cox Road #2 over Carr Brook 112003 Cox Road over Carr Brook 112006 Rose Hill Road over Carr Brook 112008 Thompson Hill Road over reservoir Road 112010 Del Reeves Road over Buck Brook
Westbrook	03894 Old Clinton Road over un-named brook 04807 Old Clinton Road over Patchogue River 06084 Wesley Avenue over Patchogue River 06658 Flat Rock Place over wetlands 06659 Flat Rock Place over wetlands 06660 Flat Rock Place over wetlands 06661 Flat Rock Place over wetlands

mean fresh water discharge into Long Island Sound is 19,600 cubic feet per second and the river is tidal north to Windsor Locks. The river carries large amounts of silt especially during the spring snow melt which forms a sandbar near its mouth and hinders navigation. Historic difficulty in navigation is a main reason why there is not a major city located near the river's mouth. The EPA designated the Connecticut River, one of fourteen nationwide, an American Heritage River in 1997. The American Heritage Rivers initiative helps river communities seek federal assistance to protect environmental and natural resources, preserve historical and cultural resources, and promote economic revitalization along the river.

NATIONAL BLUEWAY

Although the former Secretary of the Interior, Sally Jewell, released a Secretarial Order in January 2014 eliminating the National Blueway System that had been established by Secretarial Order in 2012, the Connecticut River retains its designation as the nation's first and only National Blueway. The Connecticut River National Blueway designation recognizes the collaborative leadership of more than forty partner organizations under the umbrella of the Friends of

MAP 3.6 LCRV Region Average Daily Traffic Counts 2021



Source: CT Department of Transportation

the Silvio O. Conte National Fish and Wildlife Refuge and the cumulative successes of the Connecticut River Watershed Council, states, and many other partners.

RIVER TRAFFIC

A 2010 study conducted by RiverCOG analyzed the marina and boating traffic in the lower Connecticut River. The study reported a total of 32 boating facilities on the Connecticut River that provide slips for recreational and commercial boating. Within those 32 facilities, there are approximately 2,855 slips. There are approximately 810 moorings in place, both private and public. Of those 810 moorings, approximately 791 were occupied for an occupancy rate of approximately 98%. In addition to the number of slips available in the lower Connecticut River, there are approximately 251 private residential docks that are, for the most part, at full capacity. An occupancy rate similar to that for marinas was used to estimate the occupancy rate for boats at private residential docks. Of the approximately 4,200 boats present within a study of boat traffic on the Connecticut River in 2011, the number of sailboats was estimated to be approximately 10% of the total. In addition to the commercial marinas and harbors, there are 12 limited access inlets and coves that are accessible to small craft and/or kayaks and canoes. Boating on the Connecticut River is an important driver of the region's tourism economy.

There are three commercial recreational river tour vessels and several charter companies offering sightseeing tours, including the Valley Railroad combined steam train and riverboat roundtrip. The Valley Railroad's seventy foot riverboat, the Becky Thatcher, offers a round-trip cruise from Deep River Landing to the Goodspeed Opera House and swing bridge in East Haddam. The riverboat is also available for charters. They also operate the Adventure, a smaller riverboat under CT River Tours. Lady Katherine Cruises operates the one hundred thirteen foot Mystique and Lady Katherine from Harbor Park Landing in Middletown and Charter Oak Landing in Hartford. They operate brunch and lunch cruises, entertainment cruises, fall foliage cruises, holiday cruises and other types of cruises. The ships are also available for private charters. The RiverQuest is a 64-foot vessel operated by Connecticut River Expeditions out of Eagle Landing State Park in Haddam to be replaced by the Keeper.

COMMERCIAL BARGE TRAFFIC & RIVER MAINTENANCE

Barge traffic on the Connecticut River consists primarily of black oil and petroleum distillates, although the majority of these products are now shipped by pipeline. The petroleum products are transported to the Connecticut Light & Power plant in Middletown, the Valley Oil Division of the Briggs Corporation in Portland, and the Northeast Petroleum Division of Cargill, Inc. in Wethersfield. During the summer months, asphalt is occasionally transported by barge to Portland. In recent years, barge traffic has significantly decreased from previous levels.

The United States Coast Guard Cutter Bollard has operated along the

Connecticut River and throughout Long Island Sound and north to Narragansett Bay, since it was commissioned in 1967. The vessel's home port is New Haven. With a crew of six, the unit services aids to navigation, conducts domestic ice operations, search and rescue, law enforcement, and homeland security missions. The sixty-five foot Bollard conducts the majority of its ice breaking on the Connecticut River, where it escorts fuel barges through the river to the Middletown power plant and beyond. It can break ice up to a foot thick. It is one of four cutters that work the Long Island Sound sector. Coast Guard Sector Long Island Sound was established on May 31, 2005 by consolidating CG Group/MSO Long Island Sound and Coast Guard Group Moriches. CG Sector Long Island Sound performs all of the traditional marine safety duties plus the traditional missions of a Coast Guard Group.

Operations for Long Island Sound, including the south shore of Long Island and along coastal Connecticut are coordinated from a single command center located at Sector Long Island Sound, on the eastern side of New Haven Harbor. There are approximately 500 active duty, 200 reservists, and 1200 volunteer CG Auxiliary members working the sector. The other ship units include the Morro Bay, Chinook, and Ridley.

FERRY SERVICE

The Chester-Hadlyme Ferry is one of two historic river ferries in operation in Connecticut. It is both a scenic and economic asset for the region during its season operations across the Connecticut River from April 1 through November 30 weather permitting. The Valley Railroad works cooperatively to link rail passengers on the Essex Steam Train to the Chester Ferry for access to Gillette's State Park for hiking and castle tours. In addition to the East Haddam Swing Bridge, the ferry provides emergency service options for Hadlyme and Lyme for ambulance and emergency transport to services in Middletown and Westbrook. Both of these river crossings are essential for the safety of residents along the river, particularly residents of Haddam, East Haddam, Chester, and Lyme, especially in the event of a natural or man-made disaster.

The Chester-Hadlyme Ferry service began in 1769 by Jonathan Warner who owned land on both sides of the river. The ferry was used during the Revolutionary War to transport supplies across the river. A steam power barge began service in 1879. The State has operated the ferry since 1917 and currently operates the Selden III, which was built in 1949. It is an open, self-propelled craft 65 feet long and 30 feet wide and accommodates 8 to 9 cars. The fee is $5.00 per vehicle on weekdays and $6.00 on weekends. A $3.00 pre-purchase commuter rate is available and bicyclists and pedestrians cost $2.00

The LCRV Region is also home to the Plum Island ferry which hails out of Harbor One Marina in Old Saybrook. The passenger ferry delivers 200 employees to Plum Island each day. The trip between Old Saybrook and Plum Island crosses Long Island Sound and spans a little over 10 miles. The 840 acre island currently houses the Plum Island Animal Disease Center, a Biosafety Level 3 laboratory facility operated by the United States Department of Agriculture (USDA). Due to restricted access on the island, the ferry is not open to the public.

LONG ISLAND SOUND TRAFFIC

The LCRV region's four shoreline municipalities have a significant amount of boating and infrastructures on Long Island Sound. There are nine marinas in Westbrook hosting 1,327 slips within the lower mouth of the Patchogue River. Clinton has eight marinas hosting 908 slips and a charter cruise sailing vessel. Old Lyme has a marina at Point of Woods hosting seventy-five slips for small boats. Several of the marinas also offer boat rentals.

PUBLIC BOAT LAUNCHES

Within the LCRV region, there are seventeen state owned public boat launches and six car-top boat launch locations.

DREDGING

Harbor maintenance and dredging of navigable waterways are essential to the region's marine and boating economy. Maintaining navigable harbors and waterways is also an important component of the region's emergency management planning. Dredging of sediment is a difficult issue for both

economic and environmental reasons. Capacity for disposal of dredged materials is limited.

In 2010, dredging was a high priority for the Town of Westbrook in partnership with the Army Corp of Engineers. Funding for the dredging project was an important hurdle as the estimated cost to dredge was $1,500,000. The work consisted of dredging about 36,000 cubic yards of predominantly fine-grained silt and clay, from the 8-foot channel and anchorage. The dredged material was removed using a mechanical dredge and scows. Disposal was located at the Cornfield Shoals Disposal Site in Long Island Sound, about 9 miles away.

With a shortage of disposal sites for dredged material, the Army Corps of Engineers issued a report in 2012 titled, "Long Island Sound Dredged Material Management Plan (LIS DMMP)-Investigation of Potential Containment Sites for Placement of Dredged Materials". The report lists an area of Clinton Harbor as a potential site for dredge materials. The Clinton Harbor containment site alternative is a potential shoreline "Confined Disposal Facility" (CDF) that would create a salt marsh habitat adjacent to the Clinton Harbor federal navigation channel along the southern shoreline of Cedar Island and the eastern shoreline of Willard Island (Hammonasset Beach State Park).

In 2022 the Army Corps of Engineers announced two projects that are now slated to begin in eastern Connecticut using $760,000 of IIJA funding for the commencement of dredging work and surveys along the Patchogue River in Westbrook, CT. The last full maintenance dredging was completed back in 1998, and over time the dimensions of the channel have shifted as the riverbed has changed naturally.

WATERWAY SECURITY

Sector Long Island Sound, on the eastern side of New Haven Harbor, is the U.S. Coast Guard command center for Long Island Sound whose jurisdictions covers the Connecticut River. Search and rescue and law enforcement response efforts are coordinated through the command center and respond to eight small boat stations. The stations are manned twenty-four hours a day to respond to marine distress calls and enforce federal laws and regulations. The Coast Guard inspects oil tankers, chemical barges, and cargo ships to ensure seaworthiness and compliance with federal and international laws. The Coast Guard works closely with federal, state, and local authorities to ensure the security and integrity of the maritime domain through awareness, prevention, response, and consequence management.

The State Environmental Conservation (EnCon) Police are responsible for patrolling all waters within the state and Long Island Sound, focusing on recreational boating enforcement issues. The EnCon Police investigate boating accidents occurring on Connecticut waters and engage in search and rescue activities. They also serve as the primary backup to the U.S. Coast Guard on homeland security issues.

The Middletown, Cromwell and Old Saybrook Police Departments all have specialized marine patrol units. These units typically enforce recreational boating violations, perform safety inspections, aid disabled boaters, and investigate boating accidents. They also perform search and recovery missions, investigate water related crimes, and provide emergency rescue services.

F. AIRPORTS

There are two public airports in operation in the LCRV Region; both have been highlighted in Map 3.7. Goodspeed Airport in East Haddam is one of thirteen privately owned general

aviation airports in Connecticut. The airport is located south of Route 82 and north of Chapman Pond near the Connecticut River. It is easily accessible from Route 9, exit 7. There is a northwest to southeast orientated runway at 2,120 feet in length and 50 feet wide with an adjacent taxiway providing direct access. The runway is paved, lighted, and well maintained. Two hangar buildings provide thirty-one private hangar spaces, and sixteen private tie-downs are found at the airport.

The Goodspeed Airport is the only sea plane training facility in Connecticut and has the largest public designated sea plane waterway in the state at 4,500 feet by 1,000 feet. Aviation use of the waterway is limited by extensive boat traffic in the summer months. There was an estimated 119 per week aircraft operations (take offs and landings) at the Goodspeed Airport for the twelve month period ending August 19, 2022. Thirty-three aircraft were based at the airport as of August 2022. Twenty-nine were single engine airplanes, one multi engine airplane, and three were ultralights. Approximately 80% of the operations were local general aviation, 19% transient general aviation, and 1% air taxi.

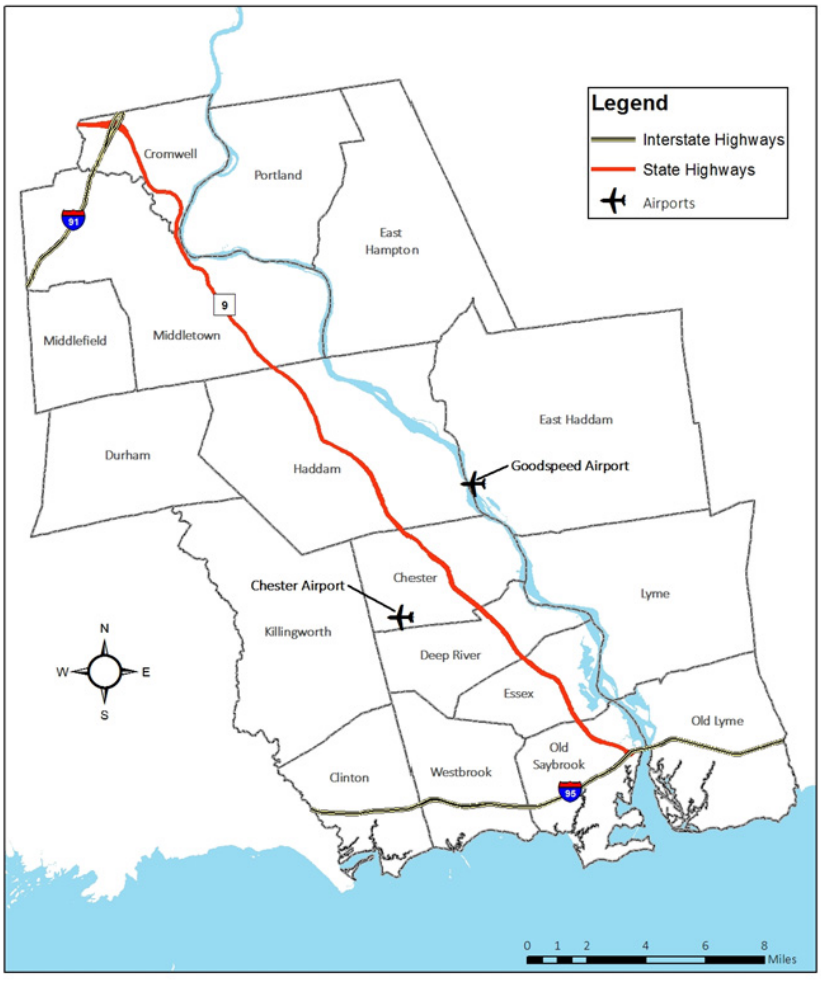
The Chester Airport is the other privately owned and publicly accessible airport in the region. The airport is located south of Route 148 and is also easily accessible from Route 9 exit 6. There is a northwest to southeast orientated runway at 2,722 feet in length and 50 feet wide with an adjacent taxiway providing direct access. The runway is paved, lighted, and well maintained. There are hangars and tie downs as well as fuel service. Air frame and power plant services are also available.

There was an estimated 33 per day aircraft operations at the Chester Airport for the twelve month period ending July 31, 2019. Fifty-nine aircraft were based at the airport as of July 2019. Fifty-six were single engine airplanes and three were multi engine airplanes. Approximately 41% of the operations were transient general aviation, 41% were local general aviation, and 17% were air taxi. An aircraft that is temporarily on the ground at an airport other than its home base and is not being used is a transient aircraft. The aircraft is usually transient because it makes more financial sense to leave it at that airport until the return flight. Transient aircraft are typically away from home base for two to five days and can be available for charter services.

There are two private restricted landing areas (RLAs) in the region. One is Devils Hopyard with a runway approximately 1,250 long and 50 feet wide, found in the southeast corner of East Haddam. It is located off Hopyard Road, just north of Route 82. The other is Maplewood Farm with a runway approximately 1,400x50 feet in length and found off Tuttle Road in Durham. Both have a turf runway surface and a hangar. Neither have tie-downs or runway lighting. Devils Hopyard has been in operation since the 1930's and is estimated to be one of the higher used RLA in the state. Maplewood farms has been in operation since the 1970's. There are a total of thirty-eight RLAs in the state consisting of thirty airports, six sea plane bases, and two military facilities.

Emergency medical service helicopters such as LifeStar, dispatched out of Hartford Hospital and Backus Hospital are capable of landing at Middlesex Hospital and its shoreline emergency center on Flat Rock Place in Westbrook.

Map 3.7 LCRV Region Airport Locations



Source: RiverCOG

G. BICYCLE, PEDESTRIAN, TRAILS

COMPLETE STREETS

Connecticut endorsed significant policy changes in providing enhanced bicycle and pedestrian infrastructure by implementing the Complete Streets initiative, in accordance with Public Act 09-154 in 2014 to encourage transportation improvements for non-motorized users. The Complete Streets policy requires 1% of all funds used for the construction or rehabilitation of roads and highways be used for the enhancement of bikeways and sidewalks.

Since then, in accordance with CGS Section 13a-153f, and CTDOTs attention to accommodating non-motorized travel modes, accommodation of all users is now a routine part of the planning, design, construction and operating activities of all roadways. The need for inclusion of accommodations for bicyclists and pedestrians, including those with disabilities, must be reviewed for every project. The bicycle and pedestrian travel needs assessment form provides the documentation and information needed to make decisions on the need and extent of bicycle and pedestrian features. The form is not intended to dictate what features should be included in a project design. The form is completed to the extent practical during the project scoping phase and fully completed no later than at the completion of the preliminary design of transportation projects funded under LOTCIP, STP, TA and other state and federal transportation programs.

To ensure the goal of considering all modes in the planning and design of the transportation network projects are reviewed in relation to the Strategic Highway Safety Plan, Active Transportation Plan and ADA Transition Plan. Alternative modes are also analyzed through the community connectivity program and road safety audits.

The Airline Trail Cranberry Bog entrance in East Hampton

BICYCLE

Support of bike friendly shared roadways, bike lanes, wide shoulder lanes, shoulder bikeways, signed bicycle routes, off road multi-use paths, trails, and greenway corridors for bicycle and pedestrian use should be a priority for recreational, personal business, and commuting purposes. Benefits from such projects include more than reduced roadway congestion, environmental, and personal user benefits. Several studies have shown an increase of property values near trails and greenways, which may likewise increase local tax revenues. Facility users patronize local businesses such as food, lodging, and other recreation-orientated establishments. Surveys also show that trails and greenways improve the quality of life in a region and quality of life factors are important in business and corporate relocation and retention decisions.

Designated bicycle lanes should be added to roadways, along with the proper signage. Bicycle parking areas, racks, and lockers should be provided in shopping areas, downtowns, public buildings, train stations and transit centers, parks, and commuter lots, etc. to aid existing bicyclists and promote more bicycling.

PEDESTRIANS

Regional municipalities have a network of paved walkways and sidewalks. These walkways connect residential areas with town centers, shopping and services, schools, and recreational facilities. The existence and formality of walkways is usually indicative of the density of development. Past CTDOT policies have limited sidewalk construction along state highways and have left noticeable gaps in places where sidewalks would be merited. Current strategies to increase pedestrian safety include reduction and better management of traffic speeds in areas with significant pedestrian activity, implementation of safer roadway design at crosswalks, intersections and streets, and increased public awareness to promote safer behaviors.

TRAILS

The region hosts a system of multi-use trails, many of which are in state parks and forests, town owned lands, and land trust properties. RiverCOG is presently working on an inventory of trail systems with the objective of integrating the existing trail systems (sidewalks, hiking trails, kayak trails, bike routes, etc.) with connections to the public transit system.

Two important multi-use trails in the region are located in Middletown and include the Westlake Area Bikeway and Mattabesett Trolley Trail. The Westlake Trail is 2.2 miles long and located in a residential/commercial area that links the Aetna building, a previous major regional employer, to a densely populated residential area. The trail is level, paved, lighted, eight feet wide and separated from the road by a

grassy buffer zone. The Mattabesett Trolley Trail was recently extended in 2014, and now spans 3.9 miles in length. It loops around the residential area and provides scenic views and access to the Mattabesett River.

The beginning of the Air Line State Park Trail is located in East Hampton. The gravel trail starts at Smith Street and traverses about 2.5 miles before crossing into Colchester at Bull Hill Road. Portland is working to extend the Air Line Trail to the Connecticut River and the Brownstone Exploration & Discovery Park. Along the trail visitors pass an old cranberry bog which has not been harvested since the 1930's, the 1,380 foot long Rapallo viaduct, and can access the Comstock covered bridge, about a mile south of the trail. It is one of three covered bridges remaining in Connecticut. The trail follows the former Airline Railroad that used to Connect New York City and Boston, and ends about fifty miles to the northeast in Thompson, CT.

There are also Connecticut Forest and Park Association (CFPA) blue-blazed trails in many parts of the region located on both state and private property. The New England Trail follows the ridgeline contours through Middletown, Middlefield, Durham, and Haddam. These trails are primarily designed for hiking and designated as non-motorized trails.

The MMM Trail was officially designated as the New England National Scenic Trail when the New England National Scenic Trail Designation Act passed both chambers of the U.S. Congress on March 25, 2009 and was signed into law. The New England Trail includes the former Metacomet and Mattabesett Trails in Connecticut and the Metacomet-Monadnock Trail in Massachusetts which made up the former MMM trail. This was the first new National Scenic Trail designation in 25 years. The New England Trail is over 200 miles long passing ridges, forests, and state, municipal, and private lands in 39 communities spanning central Connecticut, western Massachusetts, and southern New Hampshire. CFPA volunteers maintain the trail in Connecticut.

LCRV greenways include the Menunketesuck—Cockaponset Regional Greenway and the Quinimay Trail, Eight Mile River Greenway, Old Lyme Greenway, and the Connecticut River Gateway Conservation Zone Greenway. There is also potential to extend the Shoreline Greenway Trail from its planned eastern terminus at Hammonasset Beach State Park in Madison into the LCRV Region. A greenway is a linear open space established at different scales along a natural corridor, such as a river, forest, stream, ridgeline, rail-trail, canal, or other route for conservation, recreation, or multimodal transportation purposes. Greenways can connect parks, nature preserves, cultural facilities, and historic sites with business and residential areas. Examples of other types of trails include; access trails, backcountry trails, equestrian trails, interpretive trails, linear trails, long distance trails, multi-use trails, water trails, and many other types of trails.

H. AGRICULTURE

According to the 2021 State Agriculture overview, the total impact of Connecticut's agricultural industry on the state economy was approx. $4 billion and employs roughly 22,000 residents in jobs statewide whether in production, processing or agribusiness.

The RiverCOG continues its work with the Regional Agriculture Council (RAC) to support farming in the seventeen municipalities and to promote agriculture friendly land use and municipal policies. The commission provides agricultural information and education, guidance and review of land use

The Westlake Trail, Middletown

regulations and tax policies, as well as identifying economic opportunities.

In 2020, the RAC received a grant from the Department of Agriculture with the purpose of increasing land farmed in the region through no-till practices. A drill, transplanter, roller crimper and trailer were purchase for the regional farmers to provide an opportunity for regional farmers to experiment with no-till practices and to learn about the economic opportunities and benefits that it can bring to the soil. A demonstration day was held in the spring of 2022 and another equipment day is scheduled for March of 2023 to introduce the program to local farmers. The grant also included mapping regional towns showing prime and important farmland soil and vacant land that could possibly be farmed. The hope is to find land that can be offered to new and beginning farmers.

The regional agriculture website knowyourfarmers.org continues to be updated. After tracking how many people visit the site and what they are interested in, we are learning how best to promote the local farmers.

The RAC will be working with a local company whose website features an online marketplace with fresh food from local sustainable farms and food artisans. The plan is it offer another opportunity for local farmers to market their products with pick-up locations for residents to get their goods.

Connecticut Resource Conservation and Development (CTRC&D) is currently working with the Estuary Transit District on an Access to Agriculture project for incorporating transit information systems for transit dependent populations to inform them of sources for locally grown food, fresh produce vendors, farms, CSAs, as well as soup kitchens and pantries through smart phone and digital technology. It is anticipated that this project may also expand to provide information via the regional transit system for information on basic needs, services, and emergency planning near transit routes.

In addition, CTRC&D is creating a Master Plan for the Air Line Trail State Park using a CTDEEP grant. The plan is incorporating maintenance, marketing, access, and economic growth analysis in the town centers of the adjacent twelve towns. East Hampton and Portland are two of RiverCOG's towns that CTRC&D will be supporting in this process. The project's scope encompasses over 50 miles of the Air Line Trail and properties adjacent near the trail, including town centers, state and town parks, and forests located within the twelve towns, four Council of Government regions, and the Last Green Valley region. CTRC&D Executive Director noted, "This is a tremendous opportunity to bring together the 12 towns of the Air Line State Park Trail, along with CTDEEP and other stakeholders to promote the use, maintenance, and marketing of this amazing state asset. CTRC&D is very excited to be facilitating this process and working with all involved."

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Middletown Area Transit (MAT) bus station located in Downtown Middletown

Chapter 4.

TRANSPORTATION INTEGRATION

A. CONTEXT

The Lower Connecticut River Valley Region is unique in character among Connecticut's MPO regions. Connecticut MPO regions generally contain one or more urban centers with large areas of adjacent densely populated suburban areas connected by an extensive transportation grid of major highways and interstates. While the region has an extensive transportation grid, it is a connecting region that links the urban centers of Hartford to the north, New Haven area to the west and New London area to the east. This chapter introduces the challenges and opportunities to improve and integrate the various modes of transportation within the region into a seamless, accessible, and cost effective network.

Denser urban and suburban land use settlement patterns in the region are found in the northern 442 square miles near Middletown and Cromwell and along the Route 1 corridor parallel to the shoreline. Other areas of the region are rural in character with small compact town centers that could be described as villages. While 67% of the region's land area has a population density per square mile that can be characterized as rural, major expressways and rail corridors pass through the region connecting Connecticut to Boston and New York City.

The challenge of protecting the intrinsic economic and environmental value of the region's resources cannot be overstated. Balancing the region's growth and environmental assets with creative transportation engineering and operations will preserve the economic integrity of the region and facilitate the movement of people and goods through and around the region.

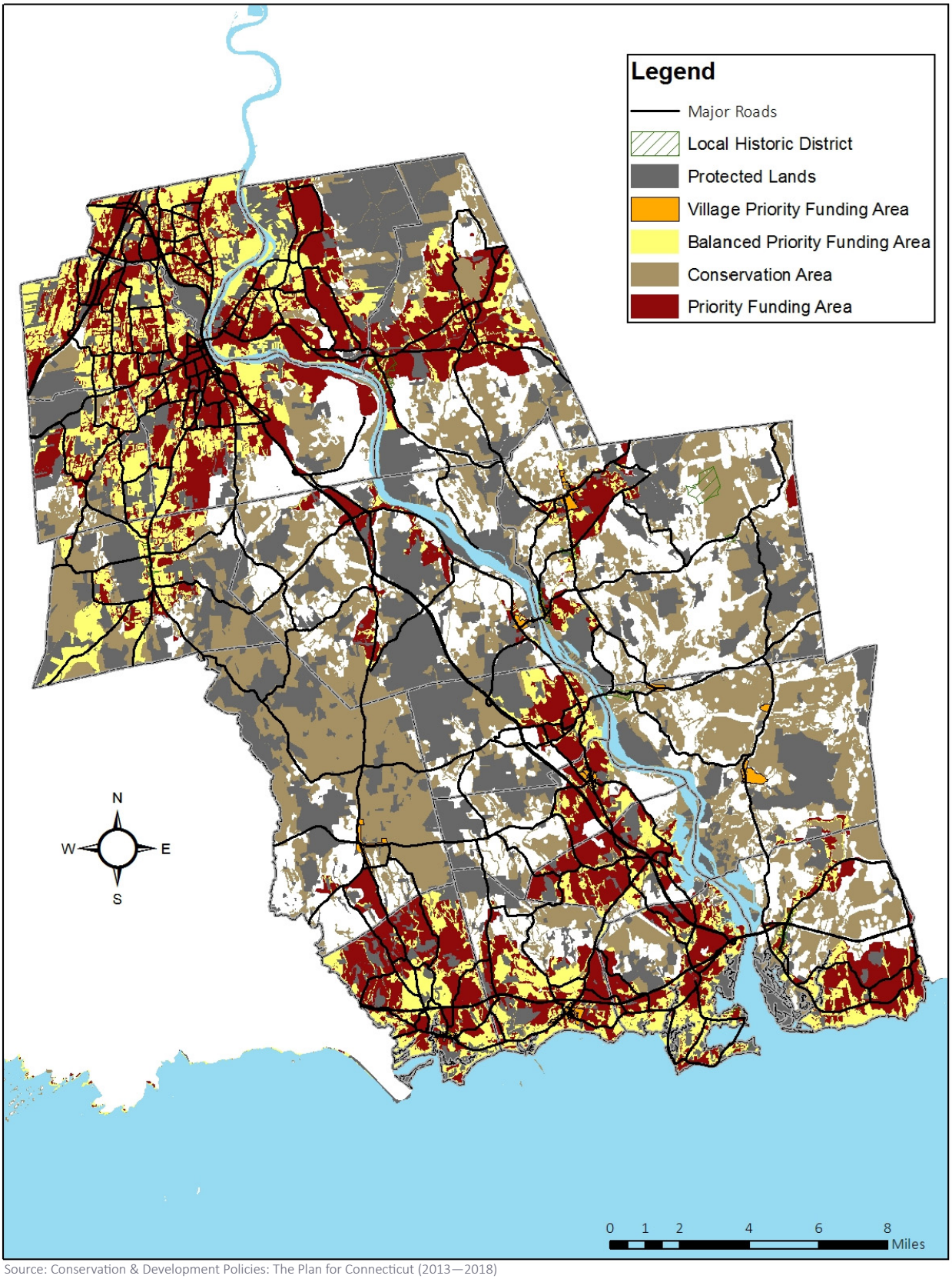
This plan is the second long range transportation plan developed for the merged LCRV Region. RiverCOG assists member towns with long range planning including transportation planning for municipal Plans of Conservation and Development. The COG also assists with other municipal plans such as Safe Routes to School and Complete Streets plans. The region works to ensure that town plans are consistent with the State Plan of Conservation and Development. Ultimately, efficient and coordinated transportation planning is a consequence of visionary and technically competent land use planning on the local, regional, and state level. Similarly RiverCOG contributes in the development of state plans such as the bicycle and pedestrian plan, freight plan, highway safety improvement plan, and other CTDOT planning initiatives. Map 4.1 shows the LCRV Region conservation and development areas from the CT Plan of Conservation and Development.

The LCRV Region works closely with the State Department of Energy and Environmental Protection (CT DEEP) and Office of Policy and Management (OPM) to incorporate best management practices into local land use regulations and policies. The agency coordinates local, regional, and state land use plans to ensure continuity with other federal and state wide initiatives, plans, and programs. Coordinated transportation, housing, and commercial development gives people access to affordable and environmentally sustainable transportation. The six livability principles in Table 4.1 are recognized by the United States Department of Transportation to promote place-based policies and investments that ultimately increase transportation choices and access.

Table 4.1 Livability Principles

LIVABILITY PRINCIPLES
PROVIDE MORE TRANSPORTATION CHOICES: Develop safe and reliable transportation choices to decrease household transportation costs, reduce dependence on oil, improve air quality and promote public health.
PROVIDE EQUITABLE, AFFORDABLE, AND ENERGY-EFFICIENT HOUSING CHOICES: Expand housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
IMPROVE ECONOMIC COMPETITIVENESS OF NEIGHBORHOODS: Enhance access to employment centers, educational opportunities, services, and various other basic needs.
TARGET FEDERAL FUNDING TOWARD EXISTING COMMUNITIES: Support existing communities through strategies like transit-oriented development and land recycling to revitalize communities, reduce public works costs, and safeguard rural landscapes.
LEVERAGE FEDERAL POLICIES AND FUNDING: Align federal policies and funding to eliminate barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth.
ENHANCE THE UNIQUE CHARACTERISTICS OF ALL COMMUNITIES: Value the unique characteristics of all communities by investing in healthy, safe, bikeable and walkable neighborhoods, whether rural, urban, or suburban.

Map 4.1 Connecticut Plan of Conservation and Development Locational Guide Map



Source: Conservation & Development Policies: The Plan for Connecticut (2013—2018)

RiverCOG has incorporated these livability principles into transportation planning to enhance the Regional transit network and provide guidelines for better connectivity.

B. DEVELOPMENT PATTERNS

Map 4.2 shows that the LCRV Region is predominately rural, covered by forest and woodlands, with large lot single family housing. More densely populated small historic town centers are common near the Connecticut River, while town centers toward the western area of the region are more rural in character. The shoreline supports higher residential densities, with beach communities, retail, and commercial developments oriented towards Interstate 95.

While the region currently follows a low density, sprawling pattern of development, the Regional Plan of Conservation and Development (RPOCD), adopted in 2021, envisions a more sustainable pattern emerging over the next ten years. The four themes of that plan, Sustainable, Innovative, Connected, and Community, encourage methods of growth that will invigorate the region's existing town and village centers while preserving large tracts of connected natural habitat.

The RPOCD promotes compact, infill development in existing town and village centers and near major transit facilities that focus on walkability, transit integration, and live/work environments. These nodes will develop as the heart of each community, where residential, commercial, and civic uses are present and integrated. Recognizing the unique character of each of the region's municipalities, development will be context-sensitive in scale and character, but in all cases notable for active, bicycle and pedestrian friendly streets and public spaces. Over time, the RPOCD envisions a robust, multi-modal transit system will connect each node to one another, with particular attention paid to areas where vehicle ownership rates are low.

The development pattern proposed by the RPOCD will promote sustainability in the region by directing development away from undeveloped land on the periphery of communities and lowering the impact of development on the region's land resources, encouraging walking and cycling for many in-town trips, promoting public transit for between town trips, and ultimately reducing the region's dependence on fossil fuels and resultant harm from greenhouse gas emissions. It will also act as a draw for businesses and residents seeking a vibrant and accessible place to live and work.

Additional information about the RPOCD including the executive summary and plan as well as appendices and interactive future land use map can be viewed at https://www.rivercog.org/plans/rpocd/

C. HOUSING AND TRANSPORTATION INTEGRATION

The RPOCD envisioned that the region would become more diverse over time by strategically creating and promoting a wider variety of housing that is attractive to younger residents, supportive of seniors, affordable to a variety of income levels, and suitable for many household sizes and types. As an initial step, it recommended the creation of a Regional Housing Plan that would encourage the development of housing near transit, employment centers, and resource-rich areas.

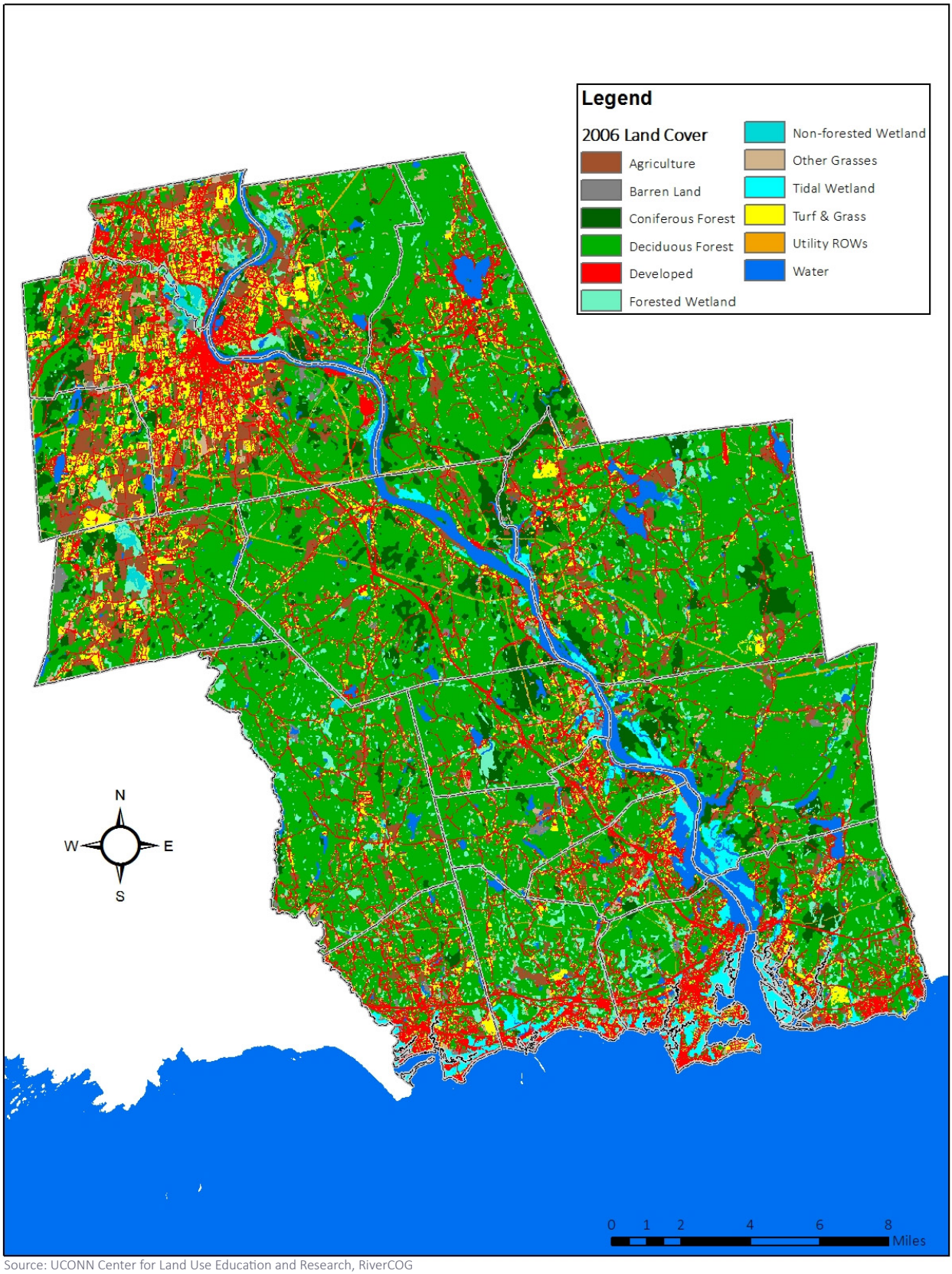
The Regional Housing Plan was adopted in 2022 and contains six overarching objectives in furtherance of the RPOCD vision:

1. Diversify the region's population in terms of age, race, and socio-economic status. 2.
2. Create a resilient workforce in the region. 3.
3. Ensure that people who work in the region can live in close proximity to their jobs.
4. Diversify housing stock for non-traditional households.
5. Examine ways to make the existing housing stock, office, and retail space in the Region functional for a changing population.
6. Encourage orderly creation of housing of different styles and types throughout the Region near existing areas of development, employment, and transit.

The RHP found that there was a mismatch between the region's population, housing supply, and jobs – all three of which had been in a stagnant to declining trend over several years. The region's existing supply of larger, older, and more expensive houses on larger lots are not well suited to an aging demographic or shrinking household, not likely to attract or retain younger population, and not attainable to much of the population working in the region. In addition, land for new housing is limited. While there are large areas of the region zoned for low density single-family residential, much of that land contains important environmental resources, lacks infrastructure like sewer and water, or has limited access to transportation.

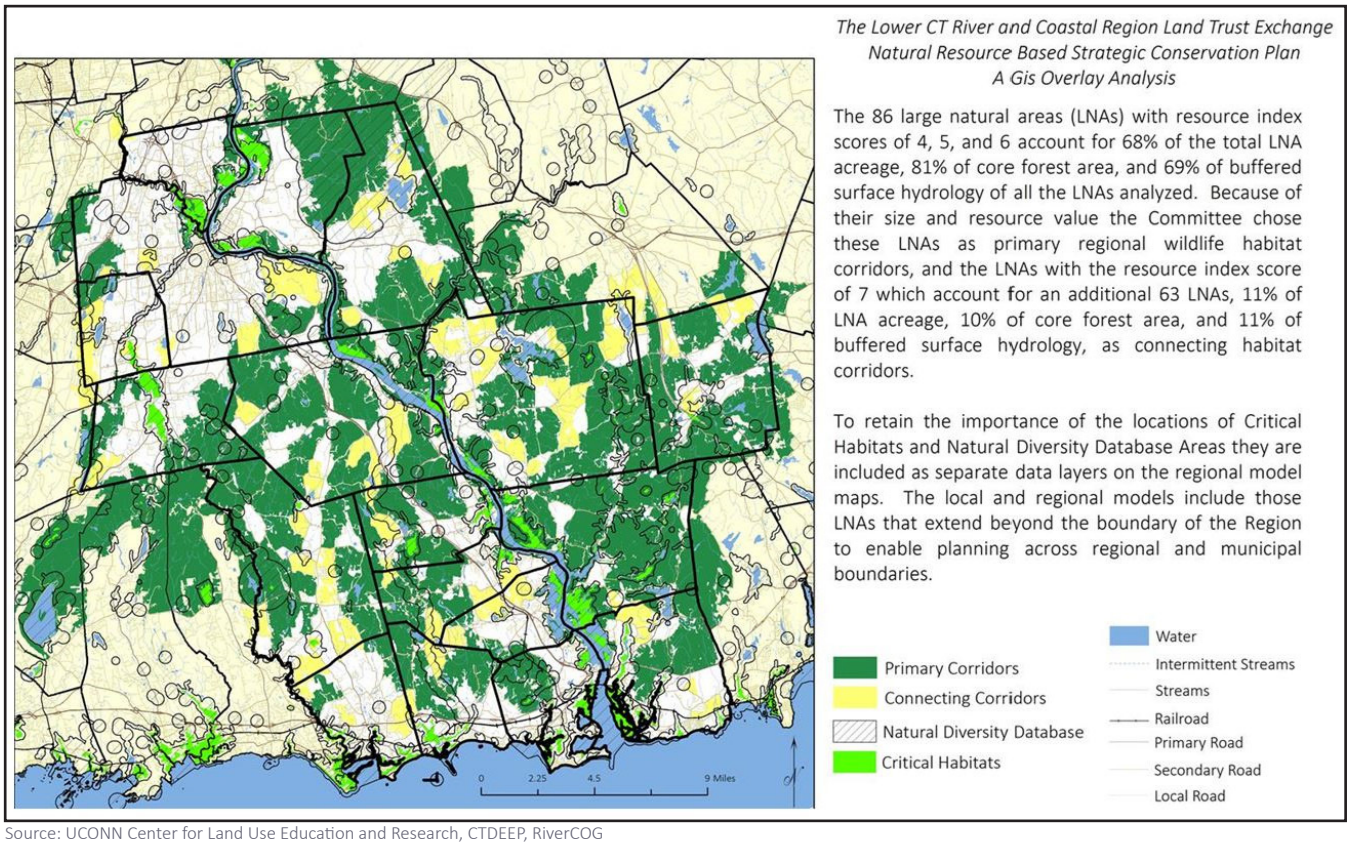
To address these concerns and further the six housing objectives, the RHP recommends that the region promote a range of housing options that are affordable for a variety of income levels and suitable to varying household sizes and types. New housing should be provided in such a way to encourage ease of access to jobs, services, and amenities by all modes of travel and for all types of people. This means locating varied housing in and around the region's existing town and village centers and near major transit stations, where it can be collocated with a strong mixture of employment and recreational uses and provide ready access

Map 4.2 LCRV Region Land Cover (2006)



Source: UCONN Center for Land Use Education and Research, RiverCOG

Map 4.3 Large Natural Areas Primary & Connecting Corridors



Source: UCONN Center for Land Use Education and Research, CTDEEP, RiverCOG

to larger employment centers.

Housing in a mixed-use environment with multi-modal transportation access is preferable younger populations and more supportive of seniors, providing a draw for those groups to live in the region. It is also central to the issue of equity. In areas where vehicle ownership rates may be low, providing transit options allow those without cars or those who do not drive the ability to live in the region. Further, the impacts of increasing gas and car prices disparately impact lower income individuals, making proximity to reliable alternative modes of transportation critical. Increasing housing opportunity with access to a broad range of transportation alternatives will be important to attract a wider diversity of residents across a range of incomes.

Already, the region has significant opportunity to promote transit-oriented development owing to its three SLE stations. However, the RHP found that only 30 percent of all land within a ½ mile of those stations is currently zoned medium-density residential and only 15 percent is zoned for mixed-use. The RHP recommends that RiverCOG, in coordination with the towns where SLE lines are located (Clinton, Westbrook, and Old Saybrook), conduct a Transit-Oriented Development Study (TODS) that would analyze the capacity of the land around those transit stations to accommodate walkable, bikeable, mixed-use development as well as considering alternative land use development around these stations to improve access and connectivity in the region.

Additional information about the Regional Housing Plan including the plan market study and municipal 8-30j plans can be viewed at https://www.rivercog.org/plans/rhp/

D. ECONOMIC DEVELOPMENT AND TRANSPORTATION INTEGRATION

Job growth in the region has been stagnant in recent years. Some of this stagnation can be attributed to the lack of young people moving to or remaining in the region. To improve the region's attraction and retention of young professionals, the RPOCD recommends the creating "innovation districts" throughout the region. These districts should cluster and connect anchor institutions with supporting and spin-off businesses and incubators, as well as housing, office, retail, and public amenities. Within each district, there should be a connected network of sidewalks and bike lanes, as well as micro-mobility opportunities, that support ease of access throughout. Young people are increasingly attracted to the convenience and mobility of denser, more vibrant areas of Connecticut that provide transit options, therefore this mixture of uses and multi-modal access will act as a draw for

that population and the businesses that hope to employ them.

In addition, the COVID-19 pandemic has hastened a national shift to full or partial remote work. Because the region is situated between three major metropolitan cities (New York, Boston, and Washington, DC) as well as three local employment centers (Hartford, New Haven, and New London), there is a significant opportunity to attract remote workers that commute occasionally to these places. However, convenient rail access, affordable housing, and reliable broadband internet, in addition to high-quality lifestyle amenities, are essential prerequisites.

Figure 4.1 Washed Out Bridge in Chester, After Storm of 10/22/18

In 2022, the region began work on its first Comprehensive Economic Development strategy (CEDS) to better understand the economic dynamics of the region and improve economic outcomes. It is anticipated that this plan will be completed in the spring of 2023. Additional information regarding the CEDS can be reviewed at https://www.rivercog.org/plans/ceds/

E. ENVIROMENT AND TRANSPORTATION INTEGRATION

FORESTATION

The Lower Connecticut River and Coastal Region Land Trust Exchange, a RiverCOG conservation cooperative, has created a prioritized strategic conservation plan which includes a natural resource based GIS overlay for the region. The intent is to create large connected natural areas to provide wildlife habitat, protect water quality and quantity, and protect working and scenic lands. The corridors were created in conjunction with the Natural Resource Conservation Service, US Fish and Wildlife Service, CT Department of Energy and Environmental Protection, the University of Connecticut, and various other agencies and organizations.

Map 4.3 shows the region's natural resource corridors as well as critical habitats and natural diversity locations. Natural resource corridors are locations that are resource rich natural areas. The overlay analysis helps to weigh the suitability of locations relative to each other based on specific criteria. Transportation infrastructure is a primary cause of forest fragmentation. It is critical that remaining un-fragmented core forest areas are kept intact for reasons of biodiversity, water quality and quantity, and air quality. Core forest areas were calculated and developed using CLEAR's forest fragmentation model which is available online at http://clear.uconn.edu. For the purpose of this analysis, core forest is any point in the forest that is 300 feet from any type of human development. This dataset was chosen because the region's large natural areas (LNAs) and the State's emphasis on the detrimental effects of fragmentation of the forest resources in Connecticut's 2020 Forest Action Plan.

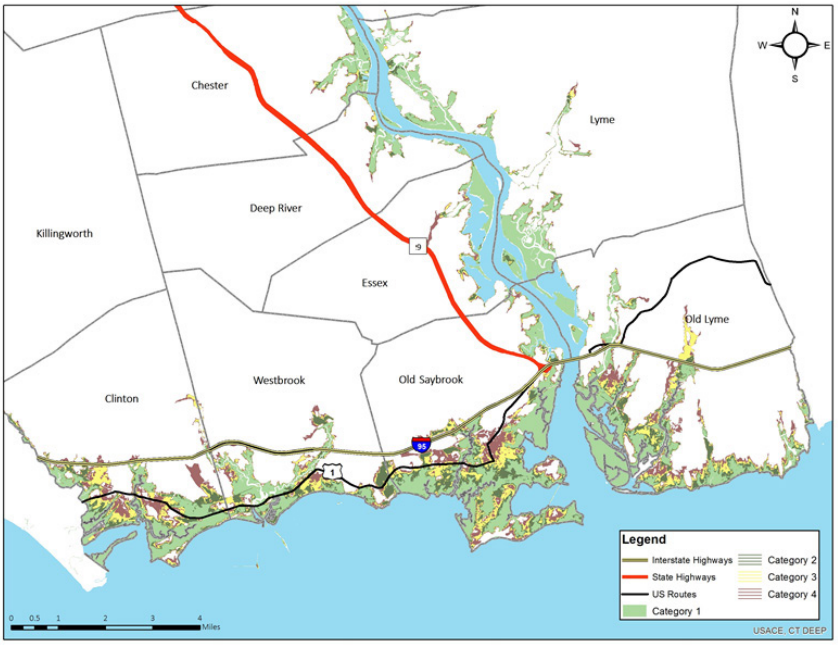
VIEWSHEDS

Viewsheds are visual perspectives of landscapes that are aesthetically enhanced by either natural or human built features. These views can be important in defining the character of a place and protection of critical ecosystem services. Examples of important public viewsheds include ridgelines like the Metacomet Ridge, roads such as the Route 9 scenic corridor, and streams and rivers included in the Connecticut River Gateway zone. Viewshed protection is important to maintaining and enhancing the region's attractiveness, quality of life, wildlife, natural resources, and tourist economy.

WILDLIFE

The USDA Forest Service has an ecosystem-based approach called stream simulation that provides a method for designing and building stream crossings intended to permit unrestricted movements of any aquatic species. This method helps the Forest Service achieve goals of maintaining the physical and biological integrity of water systems, including the existing fish and wildlife populations, by helping to reduce habitat

Map 4.4 Large Natural Areas Primary & Connecting Corridors



Source: UCONN Center for Land Use Education and Research, CTDEEP, RiverCOG

fragmentation. Stream simulation provides continuity through crossing structures by providing water depths, flow velocities, and flow paths in the channel through the road-stream crossing similar to those encountered in a natural stream. The crossing, whether on a roadway, trail, rail, or other crossing type would provide unimpeded fish and other aquatic organism passage through the structure, restore natural channel characteristics and fluvial processes, and maximize the long-term stability of the structure. Transportation ecology will continue to be investigated in the LCRV Region as a means to mitigate effects of its transportation infrastructure on wildlife and their habitats.

WETLANDS AND STORMWATER

Forests and wetlands regulate water flow and purify water, buffer the effects of storms, provide habitats for diverse flora and fauna, and supply drinking water. Stormwater running off impermeable road and paved surfaces washes automobile chemicals, rubber, litter, heat, salt, and sand into waterbodies and wetlands, impairing water quality and destroying natural habitats. Runoff flows into the Connecticut River's estuary, in turn harming the River and Long Island Sound's fisheries.

RiverCOG works with member municipalities and CTDOT, CT DEEP, and the Department of Public Health to mitigate the adverse impacts of transportation projects and new development on the region's water resources. Modern stormwater handling Best Management Practices (BMPs) can help mitigate the impact of roadway construction and drainage on wetlands and watersheds. CT DEEP outlines stormwater BMPs in the 2004 Connecticut Stormwater Quality Manual. BMPs that provide opportunities for stormwater to infiltrate into the soil can reduce flooding, recharge aquifers, and filter contaminates.

COASTAL AND INLAND FLOODING

Flooding from hurricanes, tropical and winter storms, and sea level rise all pose a challenge to transportation planning and the LCRV Region's transportation network. Several major transportation corridors in the region are susceptible to flooding, including the Northeast Corridor railroad line along Long Island Sound. Although most of the railroad is elevated out of the flood zone, access to it can be cut off. The railroad has been shut down between New York and Boston several times in recent years due to coastal flooding. Events forcing closure of the railroad included Tropical Storms Irene and Sandy, and the February 2013 Blizzard.

In addition, US Route 1 lies parallel to the Long Island Sound shoreline and is susceptible to flooding in many areas. Outside of Middletown and Cromwell, the shoreline of the LCRV Region is the most densely developed area in the region. Thousands of properties and their street connections are susceptible to flooding and hurricane events. The area supports the local economies along the shoreline with significant commercial development and valuable properties. Large stretches of Route 1 through Old Saybrook, Westbrook, and Clinton are in Hurricane Inundation Zones. The hurricane surge inundation zones (see Map 4.4) predict the inundation that can be expected to result from a worst case combination of hurricane landfall location, forward speed, and direction for each hurricane category. Category 1 Area inundated by a hurricane category 1 storm having a maximum sustained wind speed of 74-95 mph are shown in light green in the map below. Category 3 Area inundated by a hurricane category 3 storm including categories 1 and 2 having a maximum sustained wind speed of 111-130 mph in yellow.

Many smaller local roads in the region's four coastal towns also face the threat of flooding. Much of the area south of the railroad is located in hurricane inundation zones. The region's 2021 Natural Hazard Mitigation Plans (NHMP) specify projects to lessen the impacts of storms.

Included in the region's 2021 NHMP is an update to RiverCOG's

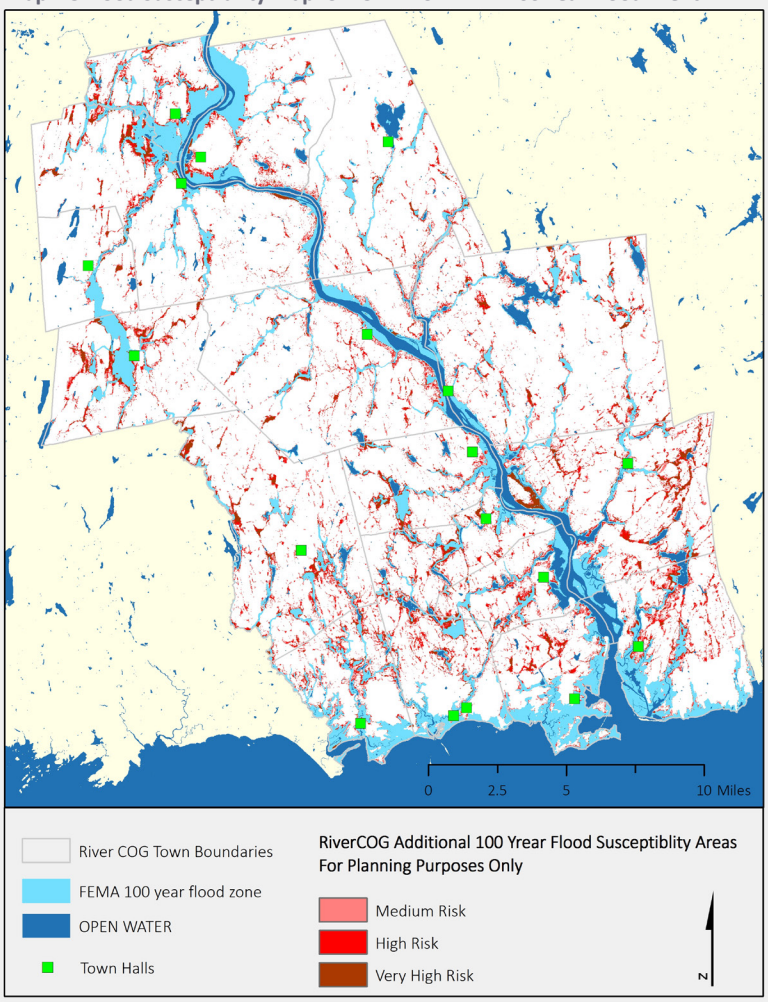
2018 Long Term Recovery and Land Use Resiliency Through Community Flood Resilience Study, Flood Susceptibility Mapping for the Lower Connecticut River Valley. The study was conducted only for planning purposes and to research less expensive flood modeling techniques to explore flood areas outside of existing older FEMA special flood hazard areas and inland flash flooding potential. We will be using the data to investigate stream and road crossings for needed improvements in the studys' additionally identified special flood hazard area and it's intersection with areas of high and medium development density. The study can be found at https://www.rivercog.org/plans/natural-hazard-mitigation-plan/ .

Aquatic invasive plants continue to be a critical water systems area of concern of the region for navigational purposes, public recreation, ecosystem maintenance, and economic development of our marine businesses. The region in collaboration with federal and multistate partners ,and local organizations continually works to mitigate the effects of Trapa natans (water chestnut) and Hydrilla verticillata. This effort continues to need staff and equipment to steward the region's water resources and protect them and other regions', and New England wide water resources from their spread, mostly through the vector of recreational boaters. Clean, drain, and dry educational boating programs and inspections are critical to this effort.

RECOMMENDATIONS

- Study regional wildlife movement and design wildlife crossing infrastructure in future major transportation infrastructure projects
- Provide crosswalks near trail heads and trail parking, specifically near Cockaponset State Forest and the Quinimay Trail
- Develop better management strategies of vegetation along trails – including pruning, control of invasive species, and minimization of hazardous overgrowth
- Install signage on roads designating conservation land, wildlife refuges, and public access to trail heads, street crossings, and parking
- Improve access to trail parking and federal, state and local conservation land
- Implement trail stewardship to better manage trail maintenance
- Implement Connecticut River invasive aquatic plant species monitoring, removal and rapid response program.
- Implement local educational programs concerning aquatic invasive species and clean, drain, and dry educational boating programs.
- Stuy implications of the regional flood susceptibility study and transportation system resiliency solutions.

Map 4.5 Flood Susceptibility Map for LCRVR for FEMA 100-Year Flood Event



F. TRANSPORTATION NETWORK AND INTEGRATION

COMPLETE STREETS, SCENARIO PLANNING, AND INTEGRATED ACCESS

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets make it easy to cross the street, walk to shops, and cycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations. Scenario Planning is defined by FHWA as "a defining characteristic of successful public sector scenario planning in that it actively involves the public, the business community, and elected officials on a broad scale, educating them about growth trends and trade-offs, and incorporating their values and feedback into future plans."

"Integrated Access" is defined by RiverCOG as a transportation planning method which incorporates the Complete Streets and Scenario Planning, but also looks toward an ongoing process to promote collaboration and planning between state, regional and local governmental structures. Integrated Access has several goals:

- A larger spatial planning dynamic for future transportation improvements that identify outcomes for enhancing land use, economics, and environmental goals
- Work with CTDOT and its internal divisions to support transportation investments or maintenance which are constructed in coordination with regional and local transportation and land use projects.
- Promote communication with all involved organizations to increase collaboration and cost efficiency for transportation projects
- A transportation planning process that extends beyond capital infrastructure planning into a collaborative effort that involves local, regional, and state land use and conservation projects and goals. Transportation mode choice promotes tourism and more sustainable growth
- Educate local land use officials on methods to incorporate transportation planning into local land use and conservation plans and vice versa

By fostering an integrated transportation network that supports downtowns and village centers, residents and businesses in the region are offered more options. Encouraging walking, bicycling, and transit use reduces vehicle miles traveled, improves community interactions, and protects natural and ecological resources. A transportation network that provides transportation mode choice will strengthen the region and support socio-economic development.

The next step is to illustrate how these transportation and land use elements can be woven together to create a regional destination for business, tourists, and a dynamic workforce. The region is rich in heritage, scenic beauty, recreational opportunities, and local community charm.

The goals of integrated access are achieved through visionary thinking on the part of the municipal land use commissions and elected officials. While land use commissions have implemented planned programs in their individual towns, land use trends in the region have been predicated on parcel-by-parcel decisions within each of the towns. This results in an unplanned and scattered approach to transportation improvements including:

- Lack of access for transit riders, pedestrians and bicyclists;
- Exponential growth of traffic congestion on the region's collector routes;
- Demands for costly improvements to post development commercial areas for transit access, sidewalks, bikeways and other amenities;
- Lack of inter-parcel access in commercial zones which would alleviate trip generation on highways
- Retail and office strip development patterns with multiple access points as a result of parcel by parcel planning or variance

Actions to improve integrated access include: revision of zoning and subdivision regulations, amendments to Plans of Conservation and Development, a local commitment to regional plans of integrated access, decisions on site plan or subdivision applications at the municipal land use meetings that promote complete streets.

RECOMMENDATIONS

- Continued coordination and outreach with local and state stakeholders
- Formation of a regional intermodal transportation committee to prioritize funding for regional transportation initiatives and projects
- A regional "Complete Street Plan and Policy"
- Scenario planning workshops which incorporate transportation, land use, and conservation for short range infrastructure planning

- Zoning and subdivision template for towns to promote regional and local complete streets policy
- Complete a "Transportation Tourism Plan" to design accessible, timely, and cost effective methods and improvements in the regional transportation system for visitors.
- Analysis and implementation of the transportation improvements outlined in the Route 1 Corridor Study, completed in 2015 various RiverCOG plans and studies.

TRANSIT DISTRICTS

The LCRV region's two previous transit districts, Middletown Area Transit (MAT) and Estuary Transit District (ETD), have merged to provide connecting bus service from Middletown to Old Saybrook. The combined Estuary Transit District provides access to jobs and services for all residents, particularly benefiting our aging population and the region's economic wellbeing. Optimization and improvement of transit connections between town centers, commuter lots and CTTransit express services, and rail stations is an important regional transportation goal.

Middletown Area Transit merged with Estuary Transit in 2022 to create one unified transit system for the LCRV. Despite many advantages of merging the two districts such as larger vehicle pools, better connected services, greater resources and staff, simplification for riders and more, many of the same challenges exist. Despite being an independent public transit operator, Estuary Transit district is still largely dependent on capital and operational funding from CTDOT and federal funding. The speed and extent to which service improvements outlined in the Lower Connecticut River Valley Transit Study get implemented will largely be dictated by the availability of consistent annual funding from these sources going forward. Additional concerns include supply chain shortages affecting the availability of new buses, parts, and other support vehicles. This is especially burdensome as many vehicles in the current fleet are already older and in needing of replacement. Shortages of drivers and mechanics may also significantly impact Estuary Transit's ability to maintain and expand service in the future. New maintenance and storage facilities in Middletown and the Shoreline are also underway to better accommodate the existing fleet and prepare for expansion in the future.

Estuary Transit District's fixed route bus service provides an average of 288,000 trips per year and perennially surpasses projected ridership figures. Estuary Transit District has a total combined fleet of 15 full size buses and 25 smaller cutaway shuttle buses. Annually, the thirteen routes provide over 1.3 million miles of service in the region. The district employs 60 fulltime and 11 part time employees encompassing drivers, dispatchers, mechanics, management and other staff.

CURRENT TRANSIT PROJECTS

RiverCOG Ridership Study and Integration Study

A recommendation of the 2015 RiverCOG RTP was to perform a Comprehensive Operations Analysis for improved individual district service for the two transit districts and recommendations for improved cooperative service between the two districts. An RFQ to conduct a comprehensive study of bus transit in the LCRV Region with a focus on integration scenarios for bus operations, administration, and governance of the Estuary and Middletown transit districts was issued in August 2018.

Coming out of the Lower Connecticut Regional Bus Integration Study, was the decision to formally merge Middletown Area Transit with Estuary Transit to provide better service within the LCRV area and neighboring destinations. Several additional projects have been completed or are currently underway, as part of the study and merger. Merger related projects include human resources, fare, and branding integration to successfully merge as one new transit operation. This study also makes a series of service improvements for the new unified system to implement. These improvements will be outlined in the following section, but they involve route design improvements, frequency improvements, new routes, and service span improvements to help provide better service for riders in the LCRV Region

Shoreline Maintenance and Operations Facility

From 2008 to 2015, the Shoreline routes have approximately doubled their passenger trips, revenue hours, and revenue miles. The Shoreline routes' ridership are also recovering well coming out of the Covid-19 pandemic, which damaged ridership nationwide. In addition to forecasted continued growth, including the addition of fixed routes and coach buses to its fleet, the Shoreline Facility has outgrown its current space in its current building and on the site. Interior space lacks sufficient storage and private offices. Exterior space is uncovered creating hazardous conditions in inclement weather and has resulted in vandalism of the fleet. The site is also constrained due to parking spots being shared with employee and other tenant vehicles. Lastly, having maintenance, automatic bus washing, and fueling off site not only creates operational inefficiencies, but has become cost prohibited.

ETD issued a Request for Qualifications (RFQ) to explore the feasibility of constructing a new standalone Bus Maintenance and Operations Facility. Wedel Company completed the phase I Facility Needs Assessment and Program Report in March 2017 and phase II Site Selection and Conceptual Design Report in July 2017. Phase I evaluated ETD's current and future functional space programming needs for the purpose of identifying and classifying the program, size, and needs of a new bus operations and maintenance facility. Phase II provides ETD the necessary information to determine the feasibility of constructing a new Bus Maintenance and Operation Facility. The LCRV bus study confirmed the need for a shoreline facility with a merged transit district. CTDOT has agreed to pursue development of the shoreline facility as part of the agreement to merge the two districts.

Middletown Maintenance and Operations Facility

A new maintenance and garage facility is also underway in Middletown, based on the LCRV bus study. The facility will expand the fleet maintenance capacity, allowing for maintenance of the entire combined fleet. Property has been purchased adjacent the existing facility on North Main Street in Middletown. ETD is also currently about to start creating a master plan for the site to make sure it will serve the current and future needs of the fleet.

New Route 81 Service

Another recommendation of the 2015 RTP was to add service along Route 81 connecting Clinton to Middletown to service the Clinton Shoreline East train station and Middletown employment, higher education opportunities, and services and between Madison and Middletown with fixed stops in Higganum, Haddam Killingworth High School and various employment centers.

As of August 27, 2018 a new bus route from Madison to Middletown along Routes 1, 81, and 154 is operational. The route begins in the center of Madison and travels along Routes 1 in Madison and Clinton, 81 in Clinton, Killingworth and Haddam and 154 to Middlesex Community college and downtown Middletown. Free connections are available to CT Transit New Haven, CT Transit Hartford and Middletown Area Transit bus services, as well as connections to the other 9 Town Transit routes. The route has specific time points along the way through the towns of Madison, Clinton, Killingworth and Haddam, but riders may flag the bus down from any safe location along the route. All buses are handicapped accessible.

This service is currently called Route 645 and it has so far achieved expected ridership and offers great geographic coverage of our region. However, CTDOT has yet to confirm permanent funding for the service in the years to come. We are hopeful that we will be able to continue this service in the future, as it provides transit to an area of the LCRVT region not previously served well by transit.

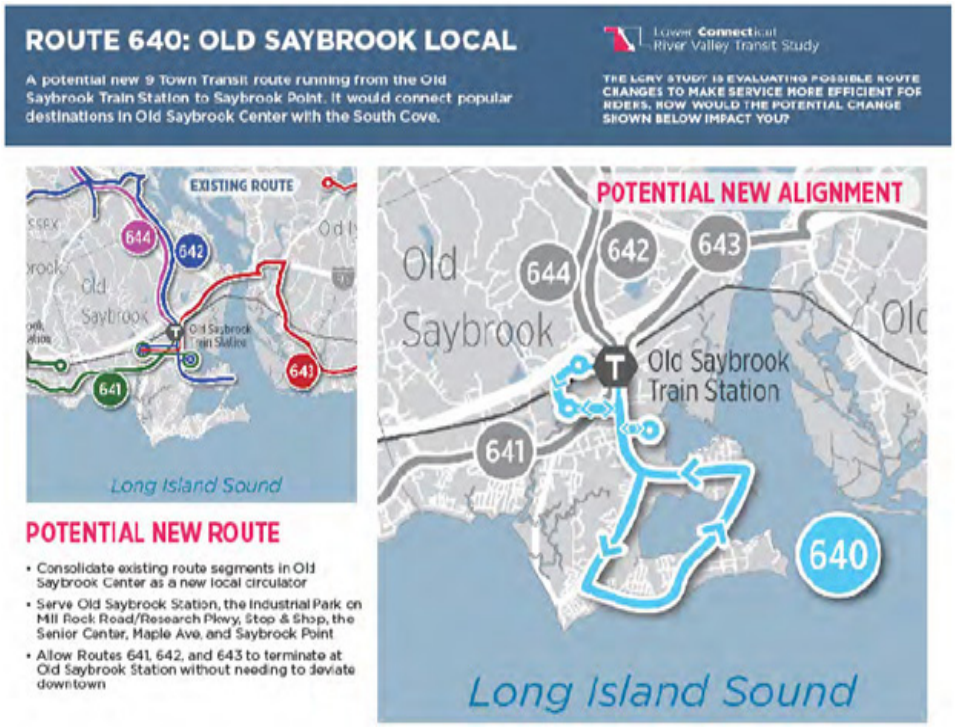
Creating a Shoreline Pulse System

Currently, Middletown routes operate in an hourly pulse system. This means that all six routes, with some exceptions, meet at the terminal at the same time, making transfers to other buses more convenient with less wait times. This allows transferring throughout the region much easier than if the buses arrive and depart sporadically. Currently, there is no pulse system in the Shoreline routes. Creating an hourly pulse system at the Old Saybrook Train Station, a regional transportation hub, will easier access to transfers. Route 641, 642, 643, and 644 all will pulse hourly at the Old Saybrook Train Station, just like what currently happens in the Middletown Terminal. However, to transition to this pulse system, new alignment changes to existing routes and a new route will need to be created.

New Route 640: Old Saybrook Local

This new route, Route 640, will be a circulator route that will allow other routes to terminate at the Old Saybrook Train Station, making the hourly pulse possible. Currently, Routes

Figure 4.2 New Route 640: Old Saybrook Local



641, 642, and 643 have stops beyond the train station in Old Saybrook. Route 640 will also provide better service to many businesses, residential areas, and other destinations in Old Saybrook. It will serve to better connect Old Saybrook residents with the rest of the Shoreline system. The basic design for Route 640 can be seen in figure 4.2.

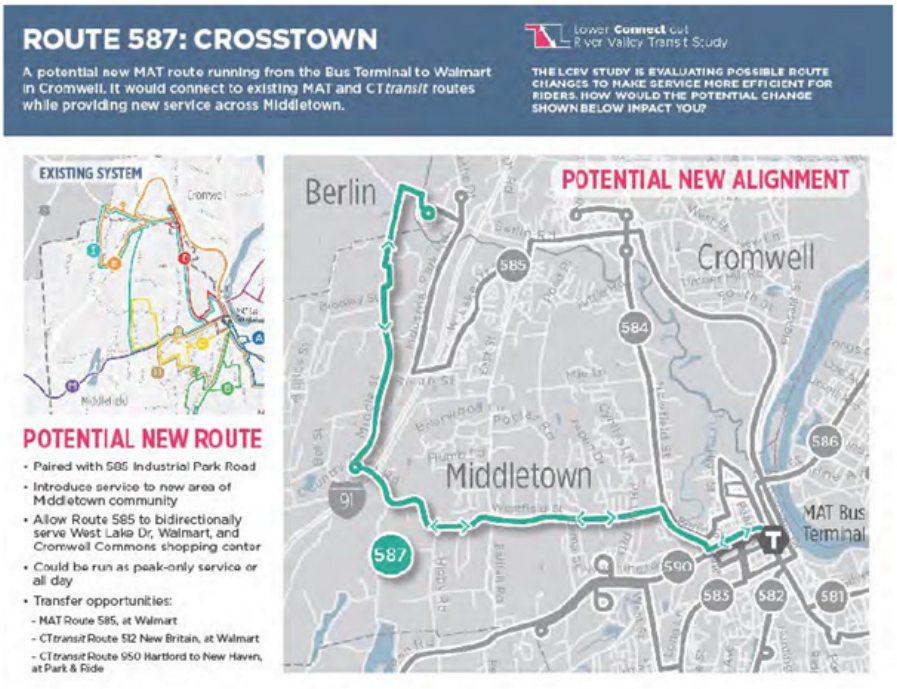
New Route 587: Crosstown

A new route is also recommended for the Middletown area. Route 587 would be a new route that would pair well with Route 585 and would provide additional service to the popular Walmart and Cromwell Commons shopping centers. Route 587 would operate via Berlin Street, Westfield Street, Country Club Road, and Middle Street. This route would also provide the opportunity to streamline route 585 to more efficiently serve the Walmart, Cromwell Commons, and West Lake Drive. This route would also provide several new transfer opportunities with CT Transit Routes 512: New Britain at the Walmart stop and CT Transit Route 950: Hartford to New Haven, at the park and ride. This route would provide new service to areas of Middletown, provide valuable transfer connections, and allow for efficient route for Route 585. The basic design for Route 587 can be seen in figure 4.3.

BICYCLE & PEDESTRIAN

RiverCOG adopted a bicycle and pedestrian master Plan in 2022. The goals of the plan are to 1) provide safe and inviting routes used by cyclists and pedestrians as they are assets that improve regional connectivity, promote public health, and are economic drivers, 2) provide an equitable network of bicycle and pedestrian amenities that are accessible to users across the Region and 3) provide bicycle and pedestrian facilities that connect village centers and nodes as well as the open space resources that are valued across the Region. The plan provides information on existing conditions, opportunities, and challenges related to bicycle and pedestrian projects, design guidelines, and recommendations. Recommendations were developed for implementing multi-modal improvements that will ensure a safe and efficient transportation network that enhances quality of life and economic vitality. The Plan is focused on "placemaking". Placemaking inspires people to collectively reimagine and reinvent public spaces as the heart of every community. Strengthening the connection between people and the places they share, placemaking refers to a collaborative process by which we can shape our public realm in order to maximize shared value. More than just promoting better urban design, placemaking facilitates creative patterns of use, paying particular attention to the physical, cultural, and social identities that define a place and support its ongoing evolution. The Plan identifies projects based on facility type that can be implemented to expand bicycle and pedestrian mobility and placemaking throughout the Region building on previous planning efforts. The plan is a significant move towards improving safety, mobility options, and connectivity while preserving and enhancing the Region's scenic, historic, and environmental resources. The plan can be viewed at https://www.rivercog.org/plans/bikeped/ The 2019 CT Active Transportation Plan contains recommendations for goals and objectives, policy

Figure 4.3 New Route 587: Crosstown



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recommendations, tools for design, and other statewide initiatives. The Plan includes an interactive bycycle map of state highways based upon shoulder width and average daily traffic volumes. Goals of the plan are to 1) improve bicyclist and pedestrian safety, 2) enhance mobility for bicyclists and pedestrians, and 3) maximize resources to achieve meaningfull improvements. With improvements to roads or dedicated bike lanes between village economic centers and regional recreational centers, there is considerable potential for increased use of bicycles in the region.

Bicycle & Pedestrian Friendly Roadways

It is very important to consider all aspects of bicycling in the transportation system and not just specific bicycling facilities, since many bikeways are shared roadways. Roadway or intersection improvements should be designed for traffic control orientation, and the elimination of design discontinuities such as those found in sidewalks, ramps/curbs, and pavement textures. Other design considerations for a bicycle friendly environment include the placement of signs, drainage grates, joints, grading (to prevent standing water or debris accumulation), pavement markings, and other factors that are often overlooked in roadway accommodations for bicyclists. Similarly, it is very important to consider all aspects of pedestrian users of the transportation system. Sidewalks, shared use paths, street crossings, pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that pedestrians, including those with disabilities, can travel safely and independently.

Education and Awareness

Promoting bicycle and pedestrian access also involves education. Public schools, police departments, bicycle clubs, service organizations, and other local agencies should coordinate with each other to provide educational programs for bicyclists, pedestrians, and drivers of all ages. The State Department of Motor Vehicles could help educate drivers by providing additional bicycle and pedestrian curricula in driver's education programs. Information could be distributed by state departments such as education, transportation, or motor vehicles, and also by nonprofit and public interest organizations. It is also important to promote bicycling and walking as a viable alternative transportation mode. Bike/Walk CT promotes annual Bike to Work, Bike to School and Walk to School days which are also promoted in the community by local organizations.

Safety improves as bicyclists are educated on proper

Figure 4.4 Airline Trail to Farmington Canal Connector

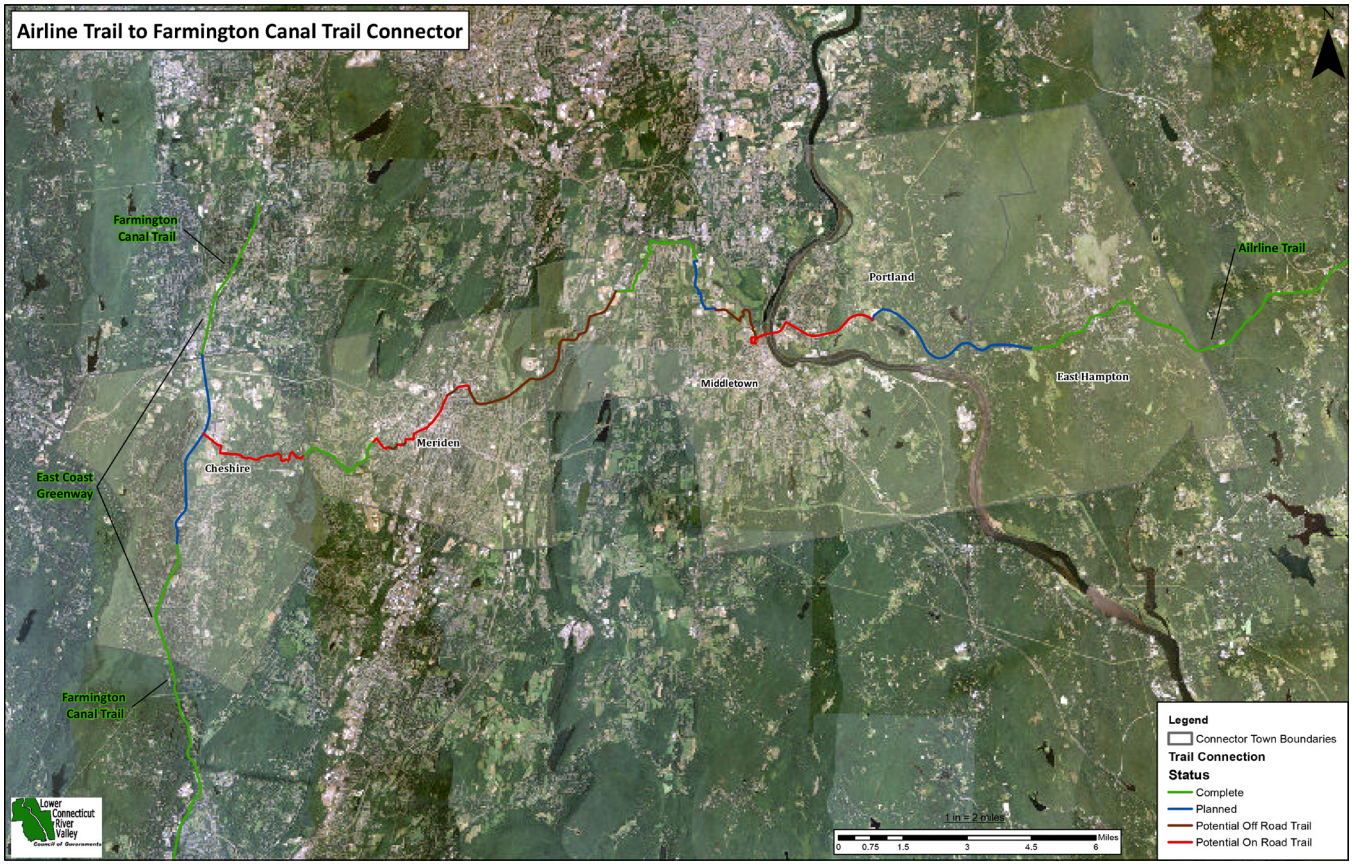


Figure 4.5 Valley Railroad State Park: Rail maintained south of Haddam

Source: VRR Tourism, Passenger, Freight Rail Economic and Structural Feasibility Study (2015)

operation, equipment, helmets, and signaling and scanning. Pamphlets, brochures, videos, and other media pertaining to safe bicycling can be targeted to different bicyclist types such as children, basic bicyclists, and advanced bicyclists depending on needs.

Enforcement of traffic laws is also vital in ensuring the safety of bicyclists and pedestrians. Connecticut General Statute Section 14-232, effective since 2008, requires motorists to allow at least three feet of separation when overtaking and passing bicyclists. Failure to do so could cause motorists to receive a fine under the motor vehicle code "failure to grant the right of way to a bicycle" (14-242). Due to the large disparities in size, weight, and speed between bicycles and motor vehicles, bicyclists are at a tremendous disadvantage in the result of a collision with a car or truck. This law strives to increase motorist awareness of bicycles, and to make conditions safer by preventing collisions.

Planning for sidewalks and pedestrian accessibility is important to the economic success and quality of life of the city and town centers within the region. RiverCOG has consistently worked with member municipalities, businesses, state agencies, and transit districts to support facilities and development that includes pedestrians and bicyclists.

Bicycle and Pedestrian Programs

There are programs in the region and state to improve the environment for bicyclists and pedestrians. The state's Community Connectivity Program places an emphasis on bicyclists and pedestrians through road Safety Audits (RSAs) and funding for infrastructure improvements. The Safe Routes to School (SRTS) Program was designed to help communities to make walking and bicycling to school a safe and routine activity for children in Kindergarten through eighth grade. The state's Vendor-in- Place (VIP) Paving Program looks at whether it is appropriate to reduce lane width, allowing for wider shoulders, during the routine repaving and restriping of roads. Since 2012, CTDOT has been reducing lane widths to 11 feet, where applicable, which has allowed for state roadways to become more bicycle and pedestrian friendly. The state's sidewalk and complete streets policies have also aided in sidewalk development and accommodation of all users in the design of any transportation facilities. The Highway Safety Improvement Program and ADA Transition Plan also aid in the reduction of crasheds on public roadways.

Other programs include CTDOT's Give Respect, Get Respect, Share the Road Program in which "everyone should feel safe on Connecticut's roads" and workshops such as the Bi-annual Connecticut Bike Walk hosted by Bike Walk CT since 2013. In addition, advocacy groups, bike shops, and other organizations establish regularly scheduled group rides and annual events to help connect bicyclists of similar interests and abilities.

Airline Trail Extension

RiverCOG has received funding for an 18-mile bike route that would allow cyclists on the Air Line Trail to reach the Farmington Canal Trail in Cheshire (part of the East Coast Greenway). The route would consist mostly of off-road trails traveling westward from the Arrigoni Bridge through Middletown, Meriden, and Cheshire. Of this 18-mile route, approximately 7 miles have already been built or planned in Meriden and Middletown. Navigating eastward from Cheshire, bicyclists could reach the scenic Air Line Trail

in Portland and continue for 25 additional miles to reach Willimantic and reconnect with the East Coast Greenway.

The project complements the Connecticut section of the East Coast Greenway, and would alsoresult in a 125 mile loop trail in central Connecticut, passing through Meriden, Middletown, Portland, East Hampton, Willimantic, Manchester, Hartford, Bloomfield, Simsbury, Avon Farmington, Plainville, Southington, and Cheshire.

- The Air Line Trail – Farmington Canal Trail Connector Route would provide many benefits to the towns involved and to the state as a whole.It would enhance existing shorter walking and cycling trails by greatly increasing the accessible mileage of each. Bicycle travel for school children and bicycle commuters would be vastly improved.
- It would provide a bike route to the commuter rail hub in downtown Meriden which cyclists could use to travel to New Haven, Hartford, or Springfield and beyond.
- It would connect the Air Line Trail with the East Coast Greenway at two locations, Cheshire and Willimantic, thereby creating a 125 mile bike trail loop around the greater Hartford area. Such a facility would attract recreational bicyclists from a large surrounding area.

RiverCOG hopes to begin the study in the spring of 2023. Additional funding is available to begin preliminary design of recommendations that are endorse through the study

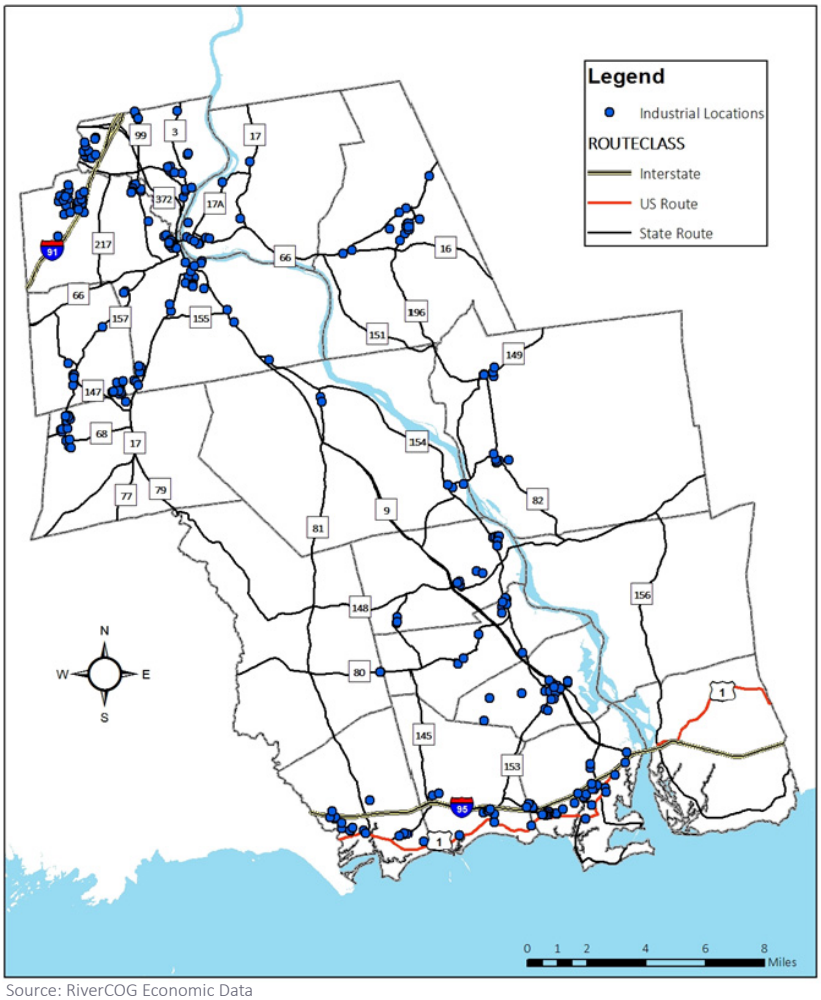
RECOMMENDATIONS

- Implement recommendations in the Bicycle and Pedestrian Master Plan
- Obtain funding for complete streets planning for sidewalk planning and construction, with the regional goal of linking dense population clusters within the towns
- Establish a system of trails connecting open spaces, while respecting landowner rights
- Map and promote various biking options for various users, specif lly bike commuters
- Prioritize commuter bike facilities for funding and programs for advocating support by regional businesses
- Integrate bicycle and pedestrian facilities with other transportation modes, particularly transit
- Encourage bicycle links between neighborhoods, employment centers, schools, parks and other destinations
- Support and promote bicycle and pedestrian safety and education through coordination with CTDOT, school districts, colleges, traffic safety commissions, police departments and businesses.
- Develop model zoning and subdi-vision regulations for complete streets that accommodate multi-ple transportation modes for po-tential town adoption
- Consider reducing traffic speeds and traffic calming techniques to provide bicyclists and pedestrians with safer routes
- Encourage towns to form complete streets committees

FREIGHT NETWORK

Efficient movement of freight within and through the region is important to industry, retail, agriculture, inter-national trade, and freight terminal operators. Within the LCRV

Map 4.6 LCRV Region Industrial Freight Locations



Source: RiverCOG Economic Data

Figure 4.6 Valley Railroad State Park: Deteriorating track and vegetation on Higganum Cove bridge

Source: RiverCOG (2014)

region, freight is transported primarily by truck, and a small portion of heavy material is transported by railroads. A small amount of petroleum products also travel on barges up the Connecticut River to Portland. RiverCOG has begun a regional freight analysis to better identify measures to improve freight movement within the region, in part by analyzing receiving and distribution points, shown in Map 4.6.The CTCOGs and CTDOT worked in partnership to develop a statewide freight plan in 2017 because Connecticut is a small state and much of the freight is passing through not only regions but also the state. Goals of the draft 2022 updated Statewide Freight Plan are 1) Enhance safety and security of the freight transportation system in all modes, 2) Support economic competitiveness, efficiency, and development through investment in the freight transportation system, 3) Attain and maintain adequate capacity and operational efficiency in the freight system, 4) Proactively maintain freight system infrastructure to preserve capital investments, 5) Mitigate freight movement impacts on communities located near freight facilities or freight corridors, and 6) Deliver projects and services faster, cost-effectively, and with greater customer satisfaction.

Transearch data shows over 212.0 173.2 million tons of freight traversed the Connecticut transportation infrastructure network in 2019, valued at over $262.4 billion. Trucks carry the majority of both tonnage (91%) and value (89%). However, as values per ton vary significantly between modes, the non-truck statewide modal composition varies between tonnage and value.

- Truck: 158.2 million tons (91% of total) and $233.6 billion (89% of total)
- Rail: 6.7 million tons (4%) and $3.0 billion (1%)
- Port: 8.1 million tons (5%), valued at $4.4 billion (2%) Air: 0.2 million tons (0.1% total) and $21.3 billion (8%)
- Pipeline: relatively insignificant volumes and value compared to other modes

Truck

Through-state truck tonnage (42%) and value (38%) lead directional movement. Connecticut exhibited a negative truck-bound trade balance, with more inbound than outbound volume, therefore the state is a net consumer of truck-borne freight. Truck traffic primarily moves along the interstates, especially I-84/I-95. Out-of-state origin and/or destinations primarily include Massachusetts, New York, and New Jersey. By 2040, Connecticut truck freight is projected to increase over 31 million tons to 189 million tons, a 20-percent total increase (0.9 percent annually). Similarly, truck units are projected to grow by 2.1 million (21-percent increase, 0.9 percent annually). And truck value is projected to grow by 91 billion (39-percent increase, 1.6 percent annually).

Rail

Unlike trucks, freight rail volumes are primarily originating or terminating in Connecticut, representing 99 percent of rail volume. Outbound comprises the largest share of tons (4.4 million, 65%) and railcars (43,744, 64%). Highest volumes primarily reflect outbound volume from New Haven County headed southeast towards the New York City metro area. Connecticut rail freight is projected to increase to almost 8.6 million tons, a 30-percent total increase, or 1.3 percent annually buy 2040

Ports

In 2019, Connecticut's Bridgeport and New Haven ports

Map 4.7 Providence & Worcester Railroad Map

Source: Providence & Worcester Railroad (current as of 11/20)

combined to handle 11.1 million tons of domestic freight. Data for the Port of New London is not included, as the State Pier facility is currently being redeveloped into a state-of-the-art modern, heavy-lift capable terminal. Port of New Haven – Inbound petroleum products (7.4 million tons) dominated movements (79 percent), other directional freight (outbound, intra, and through), 1.9 million tons, comprised the other 21 percent. Port of Bridgeport – Similarly, inbound petroleum products (1.1 million tons) led all movements (59 percent), Various directional freight, 0.8 million tons, comprised the other 41 percent.

Air

Regional airborne freight is small volume-wise compared to other modes. TRANSEARCH reported 169,433 tons of air cargo moved via Bradley International Airport in 2019, with an aggregate value of $21.3 billion, with greater than than half inbound (58-percent tons, 56-percent value). Small package shipments are the leading commodity (55,846 tons, 33 percent). Air Freight tonnage is forecast grow 70% by 2040 (286,116 tons), while value will grow 55 percent ($33.0 billion).

The Metropolitan Area Planning (MAP) Forum is a consortium of 10 Metropolitan Planning Organizations (MPOs) from New Jersey, New York, Connecticut and Pennsylvania that have entered into an agreement to better coordinate planning activities in the multi-state region. The forum has worked with NYMTC to develop the Regional Freight Element (Appendix H) of their Regional Transportation Plan through 2050. It provides background information on the volume and value and trends of commodity flows within, to, and from the NYMTC planning area and the larger area comprising 10 regional planning agencies covering portions of New York, Connecticut, New Jersey, and Pennsylvania. The analysis of commodity flows, permits evaluations of performance and needs related to multimodal freight networks, facilities, and logistics.

Regional Highway Freight Corridors

Connecticut Route 9 provides freight movement via truck in a north-to-south orientation through the middle of the LCRV region, parallel to the Connecticut River to the east, and connects Interstate 95 in Old Saybrook with Interstate 91 in Cromwell and the Hartford metro region. Route 9 is a limited access expressway except for a short stretch in Middletown where two traffic lights exist at signalized intersections. The highway is typically four lanes divided with climbing lanes provided as necessary. Congestion occurs in the northbound direction in Middletown during the normal morning rush hours and in the southbound direction in the evening during normal evening rush hours. Outside of the vicinity of the traffic lights, congestion is almost non-existent along the portion of Route 9 within the region.

Interstate 95 runs along the Southern edge of the LCRV Region parallel to the Long Island Sound, in an east-to-west orientation. The stretch of I-95 in the region is four lanes wide, except on the Raymond E. Baldwin Bridge, where it becomes six lanes wide. Climbing lanes are limited and travel is affected by tourist traffic congestion in the summer months. Interstate 95 is the busiest interstate in the country and connects major metropolitan regions along the east coast. I-95, along with Interstate 84, is the main truck route between New York and Boston. International shipments arriving at the major ports in New York and New Jersey are often off loaded and trucked into New England via Interstate 95. Accidents, road work, or other issues along the interstate also lead to stopped traffic and delayed shipments.

The third major freight corridor lies in the northwest corner of the region. Interstate 91 travels through the western portion of both Cromwell and Middletown, and in addition to I-95, carries freight shipments between New York and Boston, as well as the Hartford metro-region. Interstate 91 is a six to eight lane wide divided limited-access highway for most of its length through Connecticut, including the LCRV Region. Congestion on I-91 is minimal in the region, but is typical in and around Hartford.

Other corridors used for the transport of freight include Routes 154, 156, 66, 68, 17, 82, and 1. These are two lane undivided roads which run through the region providing access to homes and businesses.

Regional Freight Rail Corridors

A small percentage of freight is moved on rail. The primary operator of freight rail in the LCRV Region is the Providence and Worcester Railroad (P&W). P&W is a short-line freight carrier based in Worcester, Massachusetts and operating in Massachusetts, Rhode Island, and Connecticut. According to the company website, P&W "transports a wide variety of commodities for its approximately 140 customers, including automobiles, construction aggregates, iron and steel products, chemicals and plastics (including ethanol), lumber, scrap metals, plastic resins, cement, coal, construction and demolition debris, and processed foods and edible foodstuffs, such as corn syrup and vegetable oils.

The LCRV Region is home to two rail corridors which are used for freight service. The Northeast Corridor, owned by Amtrak is the main rail route along the shoreline in Connecticut and the northeastern United States. The section in the region runs in an east-to-west direction parallel to Interstate 95 and Long Island Sound. The route is electrified and used for passenger service.

P&W operates freight service along the Northeast Corridor throughout the region to several customers. Their operations extend along the corridor from New Haven to Providence. Providence and Worcester also holds overhead trackage rights along the Northeast Corridor between New Haven and New Rochelle, New York, but does not currently provide service to that area. Map 4.6 shows the P&W Railroad corridors.

The bulk of regional rail freight operations are currently in and around Middletown. P&W Railroad currently operates freight movements throughout the Middletown Cluster which includes shipments between Middletown and New Haven.

The Valley Railroad Corridor runs from a wye at Old Saybrook Junction with the Northeast Corridor, northwest Plant in the Maromas section of Middletown. Currently, about 13 miles of track from the wye, up to Route 82 in the Tylerville section of Haddam is used for the Valley Railroad Company's tourism steam train operations. A 9 mile section from Route 82 up to Maromas is currently not usable by trains but is maintained free of vegetation and is passible, in parts, by a high-rail vehicle. The Valley Railroad has exclusive rights to the railroad at present, with the right to operate freight service. To date, Valley Railroad has not operated any freight service and focuses solely on tourism operations. Figures 4.4 (page 52) shows the current state of two areas on the Valley Railroad Corridor.

Constraints for Freight Movement

The majority of constraints on the freight network are with expressway corridors, particularly I-95. The Connecticut Department of Transportation has made it a priority in long-range plans to increase the width of I-95 from 4 lanes to 6 between Branford and the Rhode Island State line. Widening I-95 would relieve congestion; however, funding for this project is not yet in place. Other notable choke points within the region's roads network include the traffic lights on Route 9 in Middletown, the East Haddam Swing Bridge and rail bridge underpasses. The moveable rail bridge crossing the Connecticut River from Old Saybrook to Old Lyme limits freight and commuter service, due to required bridge openings for boat traffic.

Along the Northeast Corridor Railroad, the 112 year old bridge crossing the Connecticut River is nearing the end of its useful life and is plagued by opening and closing failures causing cascading delays on Amtrak service between Boston, New York, and Washington. The bridge's movable span is a Bascule design in which one end is raised up to allow boats to pass. By law, the bridge must remain open from May through September for recreational boats to pass and closes only when trains approach. Over a century of operation in a marine environment, coupled with age of the structure

has taken its toll and speeds are restricted to 45 mph. The frequent opening and closing of the bridge, over 3,000 times per yea , puts high demands on its aging components, increasing maintenance costs for Amtrak and reducing reliability for both railway and marine traffic.

Amtrak currently plans to replace the Connecticut River Bridge. An Environmental Assessment (EA) and Preliminary Design has been completed.. The new design and configuration of a replacement bridge would aim to improve reliability and offer higher speeds for Amtrak and Shore Line East trains. Amtrak hopes to progress final design over the next few years, however, there are no identified funding sources for construction.

In addition, the lack of a freight rail bridge south of Selkirk, NY (about 140 miles north of New York City) over the Hudson River, forces rail freight shipments north and therefore away from Connecticut. Freight coming up from the ports of New York and New Jersey must either be trucked, or brought north on railcars to Selkirk to cross the Hudson, then interchanged at Springfield with other freight operators in order to reach Connecticut markets, adding considerable mileage to Connecticut-bound rail freight.

RECOMMENDATIONS

- Improvement to Route 9 at the two traffic lights in Middletown is a high priority. The highway's proximity to the Connecticut River and the railroad are the primary reasons no solution has been implemented. Accidents or other incidents can create and exacerbate congestion. Rebuilding Route 9 in this area will be costly and for this reason, a recommended action is a comprehensive analysis of freight movement and options for bypass routes.
- Rehabilitation of the structural, mechanical, and electrical components of the 110 year old East Haddam swing bridge bridge including a cantilevered sidewalk and approach sidewalks.Analysis of economic conditions and constraints outlined in the Valley Railroad Study completed in 2015, and recommendations by RiverCOG for optimal use of the Valley Railroad State Park.
- Investigate solutions to benefit freight movements such as lane widths, turning radii, bridge widths and shoulder widths. Freight mobility planning should be integrated into all future transportation planning, maintenance and transportation improvements. RiverCOG should develop a freight inventory to identify infrastructure improvements to improve freight mobility within the region.

AIRPORTS

Within an hour's drive of the LCRV Region residents can access three airports with commercial passenger service. Bradley International Airport in Windsor Locks, Tweed Airport in New Haven, and T.F. Green Airport in Warwick, RI offer direct flights to airports across North America, including airline hubs, where connections can be made to major international destinations. Neither Bradley International Airport nor Tweed New Haven is easily accessible to people lacking access to an automobile. T.F. Green Airport has a train station with commuter rail service provided from Providence, Boston and Wickford Junction in Southern Rhode Island. Long range plans to connect the Connecticut shoreline to T.F. Green via commuter rail is being advocated by state representatives. This link would be a valuable boost to the LCRV Region's economy, especially as German airline Condor initiates seasonal transatlantic service from Frankfurt, Germany to T.F. Green in the summer of 2015.

Other nearby major airports include: Logan International Airport in Boston, Newark Liberty International Airport in New Jersey, John F. Kennedy International Airport, and LaGuardia Airport in New York. These airports can be accessed by Amtrak or commuter rail from the LCRV region.

The LCRV Region is home to two general aviation airports in Chester and East Haddam. Municipal comprehensive plans should acknowledge airports and consider their existing and futures roles in relation to zoning, transportation, economic development, and other planning factors. For example, commercial and certain industrial uses are more compatible near airports than residential and noise sensitive land uses. Similarly, land uses that are attractive to birds should be discouraged near airports as birds are a potential hazard to aircraft, just as smoke from industrial and manufacturing facilities can cause visibility problems. Figure 4.7 shows several types of airports and their associated roles.

RECOMMENDATIONS

- Continued RiverCOG coordination with Connecticut Airport Authority for long range planning
- Establish a Riverside Flyer – Airport Public Shuttle Service through the Estuary Transit District with direct daily connections to Bradley International Airport
- Actively support passenger rail connections to T.F. Green Airport
- Work with East Haddam and Chester, as needed, to enhance land use regulations to promote use of the Chester and East Haddam airports

INTERCITY BUS, TAXIS, LIVERY, SHUTTLES & RENTALS

Peter Pan Bus Lines, Inc. and Greyhould Lines Inc. primarily serves intercity routes in the Northeast including Connecticut

Figure 4.7 Airport Roles in Connecticut

Source: CAA

A few limousine and taxi companies service the region. These include Hunter Limousine, Executive 2000 Transportation, Liberty Limousine, Premier Limousine, and CT Limo. All provide local and long distance trips in variety of vehicles including sedans, limousines, vans and mini-coaches. Arrow Cab, Yellow Cab, and Essex taxi are a few of the taxi operators in the area. Enterprise Rent a Car is located in Middletown and others renatal companies are near the the region

RECOMMENDATIONS

- Accommodate intercity bus, taxi/livery, and automobile rental companies at important intermodal locations such as rail stations, large commuter lots, and town centers. Options include: ZipCar Locations, GetAround Car Sharing, or Relay Rides.
- Perform analysis of regional market for rental cars and taxis for optimizing fleet, schedule, and location near transit oriented centers.

FUELING & DISTRIBUTION

Electric Vehicles

CTDEEP operates the EVConnecticut program which provides funding to municipalities to subsidize the installation of charging station at major traffic generators such as town halls, downtowns and other area. The goal of the program is to support efforts to have 3.3 million EV's on the road by 2025. CTDEEP operates a similar program for private companies. Governor Dannel P. Malloy announced on April 22, 2014 that with a growing network of publicly available charging stations for electric vehicles, Connecticut can now be considered a "range confident" state, giving drivers more confidence than ever before that they can recharge their batteries when needed. Governor Malloy stated, "For well over 90% of Connecticut residents, there is now a publicly accessible electric vehicle charging station within 20 miles that drivers can use to power up the battery on electric vehicles."

There are twenty-eight charging stations in eleven municipalities in the region, listed in Table 4.2. The electric vehicle chargers are either 50kW/480V or 150kW/480V and can fully charge a typical vehicle between 10 and 30 minutes. Level 1 chargers (1.4kW/120V) can fully charge a vehicle in 8 to 12 hours and level 2 chargers (7.5kW/240V) in about 3 to 6 hours. The table below shows the location and type of chargers in the located within region. DC fast charging sometimes known as Level 3 charging (or in the case of Tesla's own charging stations, the Tesla Supercharger) requires dedicated equipment which uses 480 volt direct current. DC fast charging can provide a 50-80% charge in 30 minutes or less. Unfortunately, not all EVs can support DC fast charging.

Table 4.2 Electric Vehicle Charging Stations in the LCRV Region

Town	Location	Address	Open	Level
Clinton	Town Hall	54 East Main St	24 hours	2
Cromwell	Landon at Cromwell Village	150 Country Squire Dr	Unknown	2
Deep River	Deep River Library	150 Main St	24 hours	1 and 2
East Haddam	Shagbark Lumber and Farm Supply	RT 82 and Mt Parnassus	Business hours	2
East Hampton	Village Center	87 Main St	24 hours	2
East Hampton	Stop & Shop	11 East High St	24 hours	2
Essex	Post Office	12 Main St	24 hours	2
Lyme	Reynolds Subaru	272 Hamburg Rd	24 hours	2
Middletown	Lawrence School	Kaplan Dr	24 hours	2
Middletown	Mellili Plaza	245 DeKoven Dr	24 hours	2
Middletown	Middletown High School	200 LaRosa Ln	24 hours	2
Middletown	Middletown Nissan	1153 Newfield St	Business hours	2 and DC
Middletown	Middletown Public Schools Annex	310 Hunting hill Ave	24 hours	2
Middletown	Moody School	300 Country Club Rd	24 hours	2
Middletown	Wesleyan University	161 Cross St	24 hours	2
Middletown	Hajjar	213 Court St	24 hours	
Middletown	Parker House Apartments	234 South Main St	24 hours	2
Middletown	Washington West	808 Washington St	24 hours	2
Old Lyme	DEEP Marine HQ	333 Ferry Road	24 hours	2
Old Saybrook	Big Y	28 Spencer Plains Rd	24 hours	2
Old Saybrook	Grossman Nissan	295 Middlesex Tpke	Business hours	2 and DC
Old Saybrook	Old Saybrook Inn	2 Bridge St	24 hours/guests only	2 and Tesla
Old Saybrook	Saybrook Point Marina	21 Bridge St	24 hours	2
Old Saybrook	Saybrook Ford	1 Ford Dr	24 hours	2
Old Saybrook	Saybrook Park	225 Main St	24 hours	2
Old Saybrook	Partehnon Diner	809 Boston Post Rd	24 hours/customers only	Tesla
Old Saybrook	VW of Old Saybrook	319 Middlesex Tpke	24 hours	2
Westbrook	Waters Edge Spa and Resort	1525 Boston Post Road	24 hours/guests only	1 and Tesla

Source: CT DEEP and CT DOE (2018)

RECOMMENDATIONS

- Implement incentive programs for residents who purchase or lease eligible battery electric, plug-in hybrid electric or fuel cell electric vehicles (EV).
- Support the EV Charging Program providing a combination of incentives for infrastructure, including electric vehicle supply equipment (EVSE) and fast charging stations, and accompanying rate design offerings in an effort to develop a self-sustaining zero emission vehicle market (administered by Eversource and The United Illuminating Company as of 01/01/22).

- Support strategies toward the state's commitment to creating cleaner, healthier, and more sustainable communities and achieving statewide clean air goals.

COMING CHANGES

There are a number of emerging technologies and initiatives that have the potential to impact how the LCRV travels in coming years. It is beyond the scope of this plan to speculate on adoption rates, technological break throughs, and similar matters out to 2050. However, it is worthwhile to note what changes are already occurring or being discussed so they can be proactively planned for and anticipated.

Connecticut Tolls and Congestion Pricing

For several years, Connecticut has been considering tolling as a potential new source of revenue to support its transportation programs. CTDOT has conducted studies to gain insight into how much revenue tolls might raise and how tolling can help manage congestion on busy highways. CDM Smith prepared the Connecticut Tolling Options and Evaluation Study in November 2018 to provide detailed answers to questions raised during recent tolling discussions among the governor, the legislature, state agencies, COGs and the public. The study provides estimates of revenue, cost, and congestion reduction benefits that could result from tolling. It is based on a statewide system and includes specific routes, toll locations, toll rates, discounts, costs, and revenue estimates to inform the on-going discussion on tolling, rather than providing specific recommendations.

The system, as detailed in CDM Smith's study, is a statewide, electronic tolling system inclusive of all inter-state highways and four other major expressways and parkways. According to their analysis, CDM Smith pro-jects this system would yield $950 million in annual net revenue in 2023 and is based on some of the lowest toll rates in the country. Different scenarios were evaluated, but the scenario presented was selected for discussion because it met four criteria including 1) fairness, 2) equity, 3) flexibility, and 4) revenue efficiency.

All-electronic tolling (AET) systems, like that under consideration for Connecticut tolling, use electronic toll readers and cameras mounted overhead to read transponders and license plates of vehicles at normal highway speeds. Connecticut would join the existing E-ZPass system that is in use from Maine to Virginia as its payment and collection method.

The addition of new tolling systems on existing toll-free interstate highways is generally prohibited by federal law. However, the reinstitution of tolls, if ultimately approved by the State Legislature, would be enabled by the state's current designation as one of thirteen states in the Federal Highway Administration's (FHWA) Value Pricing Pilot Program (VPPP). This program requires the use of variable tolls by time of day, basically meaning higher rates during morning and evening peak hours to mitigate traffic congestion by: 1) encouraging drivers who do not need to travel during rush hours to shift to off-peak periods, 2) encouraging commuters to shift to alternate modes of travel such as car pools or transit, 3) encouraging drivers to combine or consolidate trips, which reduces traffic, and 4) encouraging drivers to choose alternative routes or alternate destinations.

One objective of tolling/congestion pricing on highways is the reduction of congestion, creating travel time savings along congested routes. Similarly, revenue would be dedicated to highway maintenance and improvements aimed at reducing congestion on the state's highway system.

Corridors evaluated in the region include I-95, I-91, and Route 9. Additional statewide corridors that were evaluated in the study include: I-84, I-395, I-291, I-691, Route 15, Route 8, and Route 2.

Concerns with regards to tolling in Connecticut include the potential loss of federal funds if state funds are collected, regressive taxation, and moving traffic to local roads as drivers attempt to bypass toll roads.

Modern Ridesharing

Ridesharing dates back to World War 2 when there was a shortage of gas resulting in shared rides, and later in the 1970s during both the oil and energy crises. Modern ridesharing works on a peer-to-peer driver-partner concept where drivers partner with a particular car sharing company like Uber and Lyft to provide rides to potential customers using technology based on smart phones, GPS and online services. Modern ridesharing services help to save money, reduce pollution, and conserve resources. Future advances in the ridesharing industry may include the use of autonomous vehicles, greater employer incentives for ridesharing, more predictive navigation software, and the potential for infrastructure transformation to accommodate the modern

ridesharing trend.

Autonomous Cars

Autonomous cars—also known as driverless cars, self-driving cars or robot cars—are vehicles that can pilot themselves without human intervention. These vehicles are now a reality, though not yet commercially available to consumers. However, many vehicles now come with lower levels of automation, including self-braking cars that can engage the brakes many times faster than a human driver can react to avoid accidents. Another increasing common feature in modern vehicles is lane departure assist, which can sense if the car is drifting into an-other lane and either provide a warning to the driver or even steer the car back into the proper lane. While fully autonomous cars are several years from commercial availability, they have the potential to one day greatly reduce accidents and congestion by continually sensing and communicating with the other vehicles on the road and even new "smart" road surfaces.

Automated vehicles have the potential to significantly transform the nation's roadways. They offer potential safety benefits but also introduce uncertainty for the agencies responsible for the planning, design, construction, operation, and maintenance of the roadway infrastructure. In 2018, FHWA initiated a national conversation with partners and stakeholders, as well as the public at-large, to receive input on key areas of interest and to prepare FHWA programs and policies to incorporate automation considerations. Meetings have been held across the country to facilitate information sharing, identify key is-sues, and support the transportation community to safely and efficiently integrate automated vehicles into the road network. The input received will help inform FHWA research, policies, and programs.

In Connecticut, pursuant to Public Act 17-69, a Fully Autonomous Vehicle Testing Pilot Program (FAVTPP) has been established by OPM, in consultation with DMV, DOT, DESPP, and the Connecticut Insurance Department (CID). This program encourages and allows for the testing of fully autonomous vehicles (FAV) on local highways in Connecticut. It allows for a variety of FAV testing in four municipalities throughout the state and brings Connecticut to the forefront of the innovative and burgeoning autonomous vehicle industry.

As autonomous car technology continues to evolve so do the potential benefits and costs. Some potential benefits include: 1) a reduction in crashes, 2) a reduction in travel time, 3) an increase in speed limits, 4) better parking in less space, 5) bet-ter perception of the environment, 6) lower cost of insurance, 7) reduced theft, and 8) greater access to vehicles for the young, old, disabled and others who currently cannot drive. Some potential costs include: 1) high vehicle expense, 2) high infrastructure expense, 3) loss of jobs/employment, 4) artificial intelligence (AI) malfunc-tion and/or hacks, 5) criminal/terrorist misuse or attacks, 6) and the need to settle matters of liability following accidents – is it the fault of the AI engineer, vehicle owner, people in vehicle, etc.?

Driverless cars represent the future of transportation. There has been a great deal of investment in driverless technology, but vehicle manufacturers still have technical and ethical challenges that will have to be addressed before autonomous and human driven vehicles can interact without great risks to one another. Until then, people will benefit from partial autonomous technology such as lane-changing systems, crash-crash-avoidance, and post-accident braking systems.

RECOMMENDATIONS

- Support CTRides carpools, vanpools, bus, train, biking/walking and telecommuting programs
- Support autonomous vehicle research and testing in Connecticut

WATERWAYS

The LCRV region's location on the Connecticut River and Long Island Sound makes water access important to the regional transportation system. There are two major transportation objectives for the regional marine resources with recreational access being the primary objective. Alternative transportation and business support is a secondary objective. Access to recreational marine sites through sidewalk, bus, trail, and bicycle is important to the region's tourist economy and marine industry.

RECOMMENDATIONS

- Improved transit access to waterfront business areas
- Mapping and promotion of intermodal access to waterfront recreational and business areas
- Conservation planning and mapping of drainage basins and riparian corridors for major lakes, rivers, and streams
- Invasive species control and mapping
- Monitoring permitting for rail bridge openings
- Support for local waterfront revitalization plans including Middletown and Portland
- Planning and legislative support for dredging of coves, channels, and inlets
- Improve ecological function of waterfront structures such as seawalls, landings, or causeways

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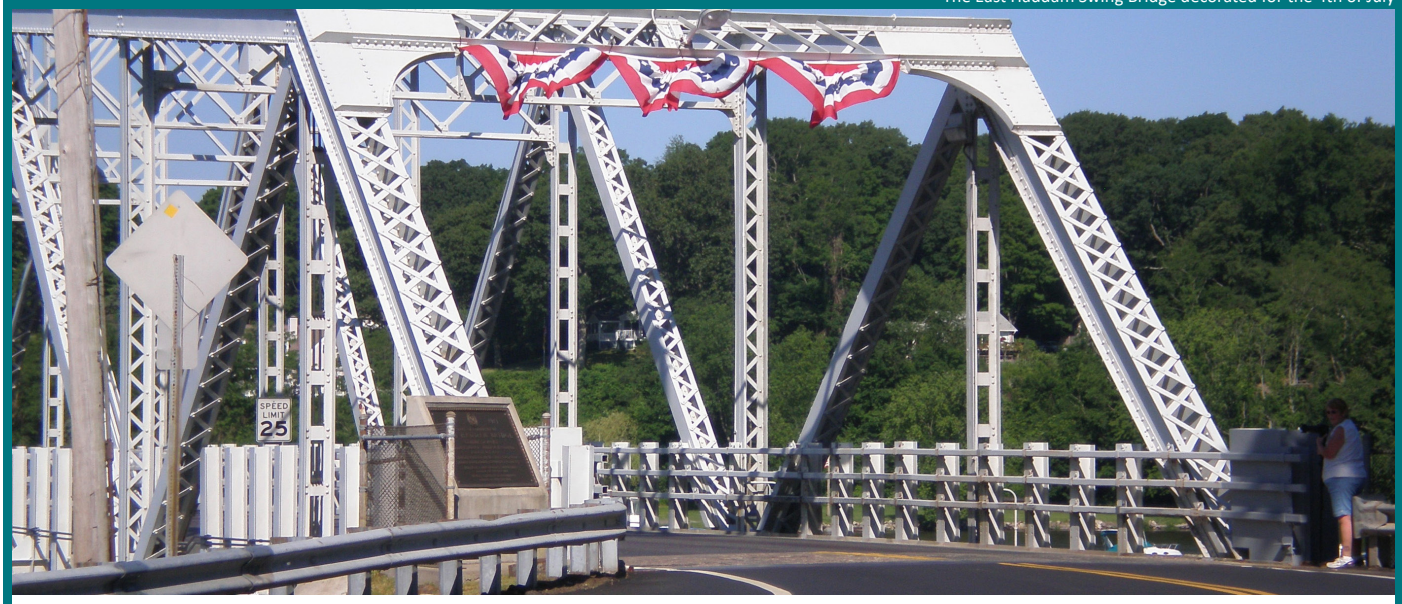
The East Haddam Swing Bridge decorated for the 4th of July



Chapter 5.

SPECIALIZED PLANNING

A . INTELLIGENT TRANSPORATION SYSTEMS

Intelligent Transportation Systems (ITS) can be defined as the application of advanced information and communications technology to surface transportation in order to achieve enhanced safety and mobility while reducing the environmental impact of transportation. ITS encompasses a broad range of wireless and wire line communications based information and electronics technologies. Applications focus on both the infrastructure and vehicle as well as integrated applications between the two. Familiar ITS technologies include electronic toll collection, in-vehicle navigation systems, rear-end collision avoidance systems, and dynamic message signs.

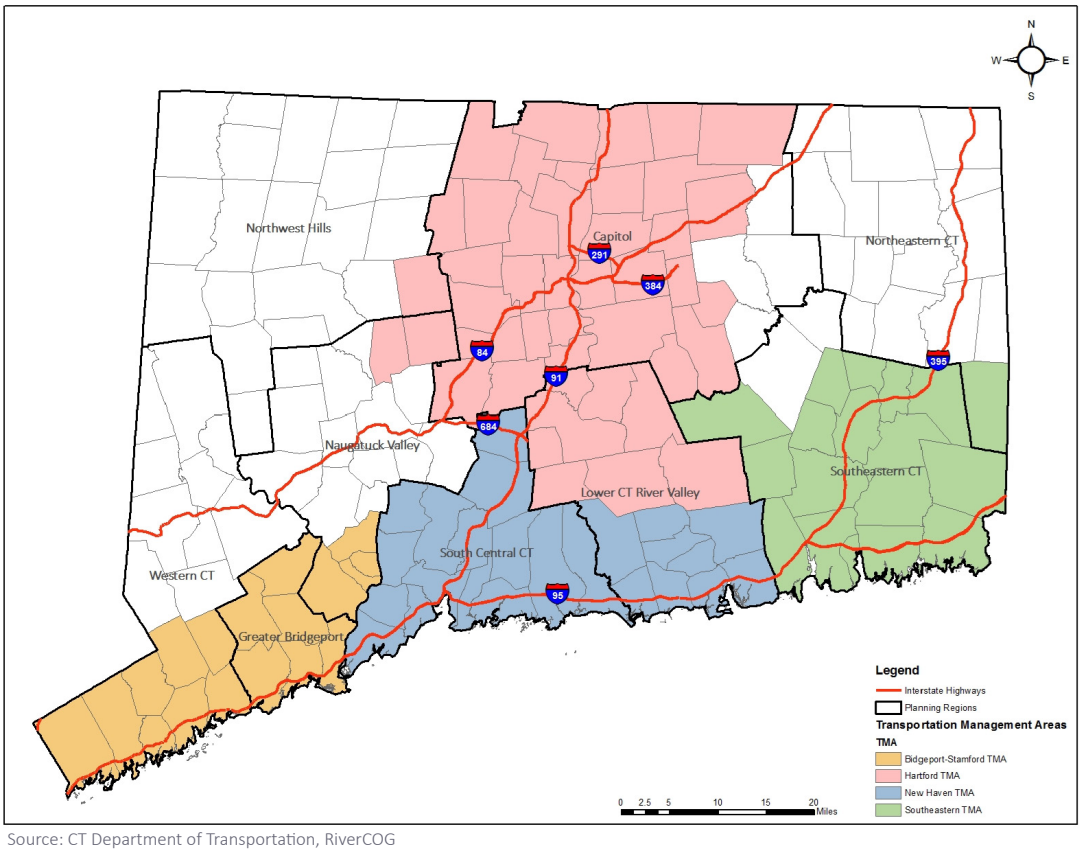
Prior federal transportation legislation required ITS projects conform to national ITS Architecture and standards. The Federal Highway Administration's (FHWA) Final Rule and FTA's Policy on the national ITS Architecture were published in 2001 to foster the integration and deployment of regional ITS systems. CTDOT, in association with the three former MPO's in the Hartford Urbanized Area had developed a Regional ITS Architecture for the Hartford Area in conjunction with the IBI Group. The final architecture was completed in August of 2004, and this was expanded to a statewide architecture in 2006. An ITS strategic plan was developed for the Hartford Urbanized Area in 1997 and was updated in 2015. The plan lists ITS needs overtime and costs of implementation.

The Connecticut Statewide ITS Architecture updated in 2021, incorporates the Hartford Area ITS Architecture from 2015. It is a plan for transportation systems integration in the state over the next 10 to 15 years. The Statewide ITS Architecture has been developed through a cooperative effort by the state's transportation agencies, covering all modes and all roads in the state. It is an update of a 2018 plan, based on Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) V9.0 and adds new projects.

The architecture represents a shared vision of how each agencies' systems will work together; sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the state and satisfies FHWA Rule 940 requirements, as well as the FTA policy directives, on ITS Architectures.

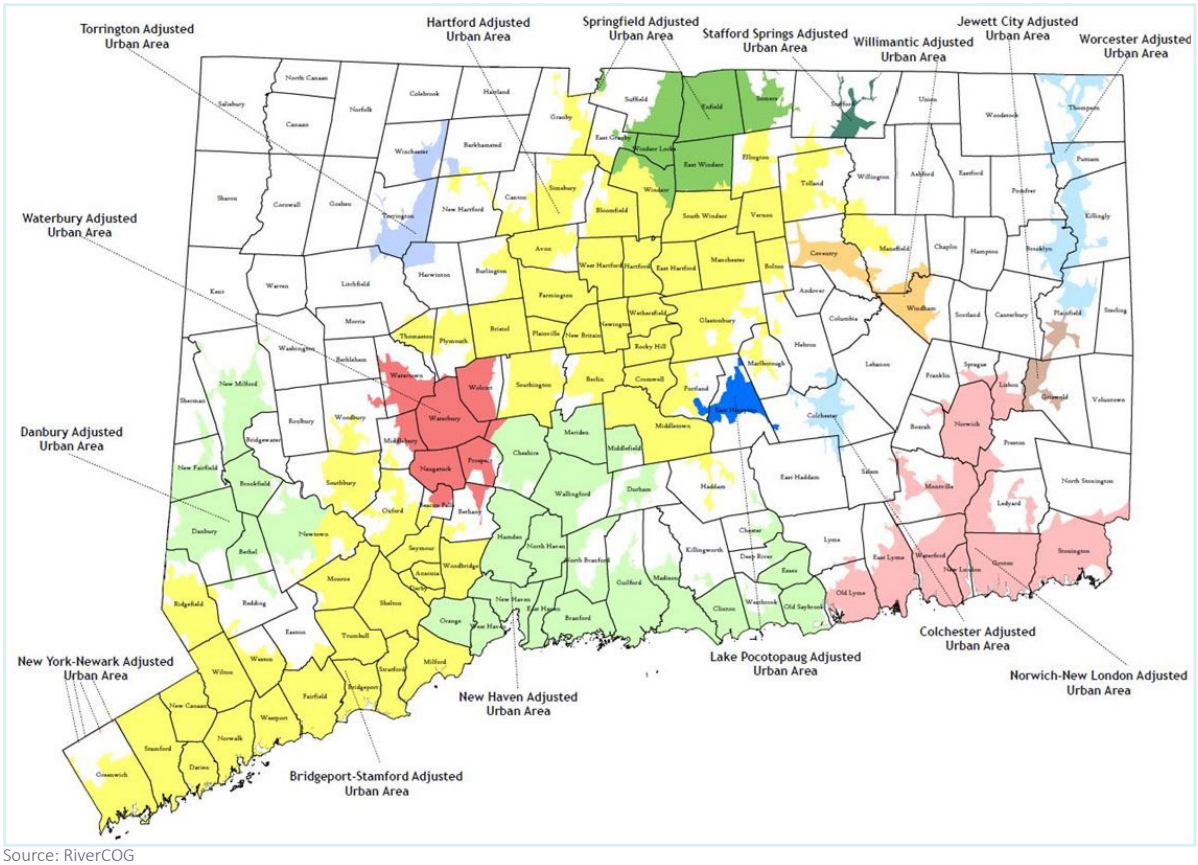
The architecture has a time horizon of up to fifteen years with particular focus on those transportation elements likely to be implemented in the next ten years. The ITS architecture covers the broad spectrum of Intelligent Transportation Systems, including traffic management, public transit management,

Map 5.1 Connecticut Transportation Management Areas



Source: CT Department of Transportation, RiverCOG

Map 5.2 Adjusted Federal Aid Urban Boundaries (2010)



Source: RiverCOG

traveler information, maintenance and construction, emergency management, and data management over this time horizon.

Users of ITS in the region include CTDESPP, CTDOT, CT Transit, transit districts, municipal public safety and public works departments, local media, citizens and many others. The driving public can notice items such as traffic cameras, variable message signs and highway advisory radio on major highways such as I-95, I-91, and RT 9. Other projects examples include: real time traveler information https://ctroads.org/, road weather information systems (RWIS), advanced traffic management systems (ATMS), and computerized traffic signal systems (CTSS).

The current ITS Joint Program Office (JPO) program areas for 2020 through 2025 include 1) emerging and enabling technologies, 2) data access and exchanges, 3) cybersecurity for ITS, 4) automation, 5) complete trip – ITS4US, and 6) accelerating ITS deployment. Emerging technologies include artificial intelligence (AI) to advance next generation transportation systems and services by leveraging trustworthy, ethical AI for safer, more efficient, and accessible movement of people and goods and ITS/V2X Communications for deployment is focusing on wireless communications technologies to support a wide range of transportation system communications requirements regarding safety, effectiveness and other capabilities. Data access and exchanges focus on enabling access to core transportation data across the ITS system which is essential to connected and automated vehicles and other emerging ITS areas that are highly data dependent. Cyber threats to transportation systems can impact national security, public safety, and the economy. The Cybersecurity Research Program was developed in response to the need to protect (ITS) from cyber-attacks. Public and private sectors must work in together to develop automation technologies and address the concerns of the general public. Advanced Driver Assistance System (ADAS) provides partial driving automation in the form of assisting an attentive driver. Automated Driving System ADS includes further automation where the driver must monitor the surroundings and be prepared to provide steering, braking, and throttle inputs. At its mature state, a vehicle equipped with ADS can perform the entire dynamic driving task on a sustained basis within a defined operating design domain (ODD) without driver involvement. Detailed information on automation can be found at https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety

The ITS4US Deployment Program is a multimodal effort,

to identify ways to provide more efficient, affordable, and accessible transportation options for underserved communities that often face greater challenges in accessing essential services. The program looks at mobility challenges for all travelers including people with disabilities, older adults, low-income individuals, rural residents, veterans, and limited English proficiency travelers. This program will enable communities to build local partnerships, develop and deploy integrated and replicable mobility solutions to achieve complete trips for all travelers. By integrating evaluation, capacity building, standards, and communications in an effort to coordinate actions and resources will help to accelerate ITS deployment.

Systems Engineering is required for all federal-aid ITS projects per 23 CFR 940, regardless of size or complexity. This process covers the entire life cycle of a project, from planning (concept of operations, stakeholder and user needs identification) to design, operations, and maintenance. The Systems Engineering Analysis Form (SEAFORM) is submitted to FHWA for concurrence and oversight level. CTDOT and FHWA determine if the project is a Major or Minor ITS project and follow design procedures based on that determination.

B. TMA & UZA COORDINATION

RiverCOG is a Metropolitan Planning Organization (MPO) responsible for transportation planning for the LCRV Region. An MPO must be designated for each urbanized area defined in the most recent decennial Census with a population of more than 50,000 people. RiverCOG hosted MPOs for the former Midstate and Connecticut River Estuary MPOs. The MPOs were officially merged into a single entity and board on April 3, 2014, creating the Lower Connecticut River Valley MPO.

A Transportation Management Area (TMA) is designated by the Secretary of Transportation, when an urbanized area (UZA) has a population of over 200,000. TMA coordination is essential in the administration of the federal surface transportation program. RiverCOG shares transportation planning responsibility for portions of the Hartford, New Haven, and New London TMAs and UZAs. RiverCOG coordinates with the other COGs in the TMAs / UZAs, including Capitol Region COG, South Central Region COG, and Southeastern Connecticut COG. The LCRV Region's eight northern towns are in the Hartford TMA and seven southern towns are in the New Haven TMA. The towns of Lyme and Old Lyme are in the Southeastern TMA on the eastern side of the Connecticut River. See Map 5.1 for a visual depiction of the TMAs and Map 5.1 for UZA boundaries within the state.

River MPO documents such as the Unified Planning Work Program (UPWP), Transportation Improvement Program (TIP) and Metropolitan Transportation Plan (MTP) are reviewed by the other neighboring MPOs for consistency. Federal funding programs such as the Surface Transportation Program (STP), Congestion Mitigation and Air Quality Program (CMAQ), Transportation Alternatives program (TA), FTA Section 5310 program and others are also reviewed in a coordinated process between MPOs. Many transportation planning programs are performed at the TMA or UZA level including the Locally Coordinated Human Services Transportation Program (LOCHSTP), Congestion Management Process (CMP), Intelligent Transportation Systems (ITS), incident management, mobility management and other programs.

RECOMMENDATIONS

- Enhance coordination on larger TMA planning issues with CRCOG, SCRCOG and SECOG
- Revise memorandums of understanding with other COGs when Connecticut MPO boundaries are revised

C. CONGESTION MANAGEMENT & AIR QUALITY

CONEGESTION MANAGEMENT

Development patterns of the LCRV Region have fostered a near universal dependency on the automobile. Automobile transportation and land use patterns over the last 60 years have been mutually self-supporting. If roads were improved or widened, then new commercial and residential developments would take advantage of the expanded traffic capacity until new traffic generated by more intense land uses would again exceed the road capacity. This leads to a cycle of more corridor improvements and ultimately road widening or highway or bypass construction to accommodate the congestion, induced by greater traffic carrying capacity.

As a response to the unsustainable cycle of road building and the unattractive sprawl-type development that this cycle promotes, as well as increasingly limited resources and environmental concerns, other approaches to addressing road congestion are being implemented. The focus is shifting from the singular goal of moving automobile traffic, to a more comprehensive focus on community livability. Concepts such as; complete streets, transit oriented development, traffic calming, and share the road are being implemented, along with other efforts to improve the economic vitality of a town or neighborhood, but accommodating all modes of transportation.

RiverCOG is partnering with both Capital Region Council of Governments (CRCOG) and South Central Regional Council of Governments (SCRCOG) in planning for congestion mitigation and reduction. CRCOG has taken the lead managing role in the congestion management process (CMP) in the Hartford

Table 5.1 Ozone Conformity | NOx and VOC Emissions Budget Test Results for Both 2008 and 2015 Ozone NAAQS

Year	Ozone Area	Cube Series 2		Budgets		Difference	
		VOC	NOx	VOC	NOx	VOC	NOx
2023	CT Portion NY-NJ-LI Area	15.28	18.56	17.6	24.6	-2.32	-6.04
	Greater CT Area	13.58	16.30	15.9	22.2	-2.32	-5.90
2025	CT Portion NY-NJ-LI Area	13.89	15.54	17.6	24.6	-3.71	-9.06
	Greater CT Area	12.42	13.67	15.9	22.2	-3.48	-8.5
2035	CT Portion NY-NJ-LI Area	8.66	8.36	17.6	24.6	-8.94	-16.24
	Greater CT Area	7.78	7.47	15.9	22.2	-8.12	-14.73
2045	CT Portion NY-NJ-LI Area	7.47	7.65	17.6	24.6	-10.13	-16.95
	Greater CT Area	6.74	6.82	15.9	22.2	-9.16	-15.38
2050	CT Portion NY-NJ-LI Area	7.03	7.61	17.6	24.6	-10.57	-16.99
	Greater CT Area	6.35	6.80	15.9	22.2	-9.55	-15.40

Source: CTDOT Ozone AQC Determination, March 2015

Urbanized Area and SCRCOG is the lead organization in the New Haven Urbanized Area. The Hartford Area CMP was updated in 2020 using NPMRDS data. The New Haven area CMP was updated in 2018 by VN Engineers. CMP data collected from the LCRV Region is included in both CMP reports for both urbanized and non-urbanized areas and can be found on RiverCOGs website under the publication tab. The documents discuss performance measures, performance monitoring, trend analysis and strategies.

There are several general categories of congestion mitigation strategies that have the potential to be implemented at the regional or roadway level. These strategies include:

- Transportation demand management strategies (TDM's)
- Traffic operational improvements
- Measures to encourage high occupancy vehicle (HOV) usage
- Public transit capital improvements
- Public transit operational improvements
- Measures to encourage non-motorized modes of transportation
- Congestion pricing
- Growth management
- Access management
- Incident management
- Intelligent transportation systems (ITS)
- Increased roadway capacity

Some of these strategies may be more viable than others. Traffic operational improvements such as signalization operational improvements, enforcement, and management will likely be the most common strategies based on the region's roadway network and patterns of congestion.

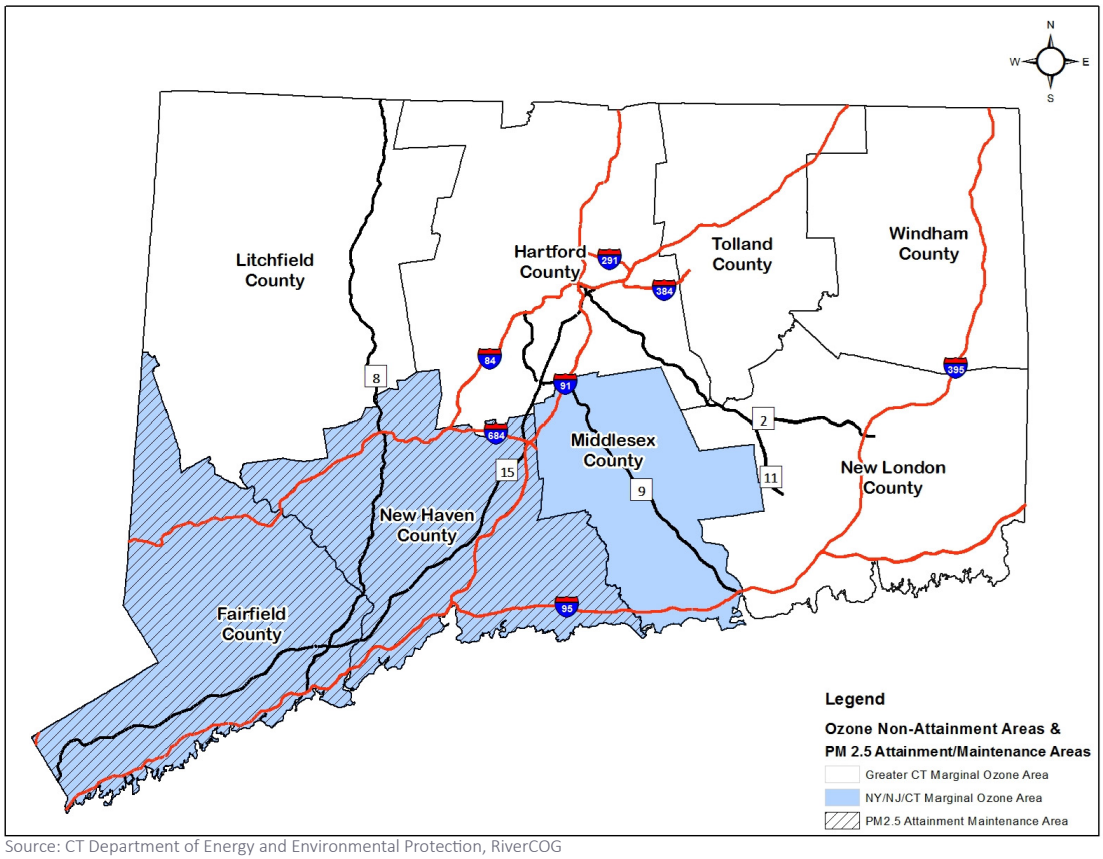
AIR QUALITY

A conformity report is required by the federal Clean Air Act Amendments of 1990 (CAAA). The MPOs and CTDOT cooperatively work to develop and endorse the Air Quality Conformity Statement, which demonstrates that each TIP, STIP, and MTP projects conform to the requirements of the CAAA. CTDOT analyzes all regionally significant projects identified in the draft MTPs and the TIPs prepared by the MPOs. The conformity statement certifies to the federal government that the projects in the STIP and LRP will "conform" to the State Air Quality Implementation Plan (SIP). The SIP, required for "non-attainment areas" where certain types of pollutants do not meet federal standards, is a plan to reduce the emissions of volatile organic compounds, nitrogen oxides, and carbon monoxide to meet the federally mandated air quality standards.

Air Quality Conformity

The Clean Air Act and Amendments of 1990 define a "nonattainment area" as a locality where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS). The LCRV Region is in an eight-hour Ozone non-attainment area, Serious for 2008 NAAQS and Moderate for 2015 NAAQS. Projects in the TIP, MTP, and regionally significant projects will not cause or contribute to any new violations of the NAAQS; increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone new violations to the NAAQS. A regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel. For MTP and TIP conformity, the determination shows that the total emissions from on-road

Map 5.3 Ozone Non-Attainment Areas



Source: CT Department of Energy and Environmental Protection, RiverCOG

travel on an area's transportation system are consistent with the motor vehicle emissions budgets (MVEBs) and goals for air quality found in the state's SIP.

CTDOT performs the air quality conformity (AQC) analysis determination when TIP's are updated, MTPs are updated, and when a project deemed regionally significant is added to a TIP or MTP. The AQC Determination is a coordinated effort with CTDOT, CTDEEP, EPA, FHWA, and regional planning organizations. The determination document shows the relationship between the state travel demand models Cube Series 2 and the EPA approved MOVES3 emissions model to determine if the transportation system build out creates new violations to the NAAQS or not. New violations result in nonconformity with the Clean Air Act.

Regional planning organizations in nonattainment areas are required to have a 30 day public comment period on the determination. This is included with the TIP and MTP updates. Regionally significant projects in the past were only acted upon by the regional planning organization they were in. Recently, FHWA decided that all the regional planning organizations within the nonattainment area have to act upon the AQC determination except beyond state boarders.

In relation to the TIP the future transportation system as a result of fully implemented TIP's and MTP's must pass a series of tests. The Action Scenario is the future transportation system that will result from full implementation of the MTP. For the ozone nonattainment areas, VOC and NOx transportation emissions from the Action Scenarios must be less than the 2017 transportation emission budgets if analysis year is 2017 or later. VOC and NOx emission analysis were conducted for summer conditions and for the following years:

- 2023 (Attainment year and near-term analysis year for both the Greater CT and CT portion of NY-NJ-LI Serious nonattainment areas under the 2008 and 2015 Ozone NAAQS)
- 2025 (Interim modeling year)
- 2035 (Interim modeling year)
- 2045 (Interim modeling year)
- 2050 (Metropolitan Transportation Plan horizon year)

CTDOT has assessed its compliance with the applicable conformity criteria requirements of the 1990 CAAA. Based upon this analysis, it is concluded that all elements of MTPs conform to applicable SIP and 1990 CAAA Conformity Guidance criteria and the approved transportation conformity budgets. The detailed report "Ozone and PM2.5 Air Quality Conformity

Determination of the 2023-2050 Metropolitan Transportation Plans and the 2021-2024 Transportation Improvement Programs, As Amended" can be found at RiverCOGs website under the Transportation and TIP sections.

Transportation Control Measures (TCMs)

Under the Transportation Conformity Rule, Transportation Control Measures (TCMs) are strategies that: are specifically identified and committed to in State Implementation Plans (SIPs); and are either listed in Section 108 of the Clean Air Act or will reduce transportation-related emissions by reducing vehicle use or improving traffic flow.

Measures that reduce emissions by improving vehicle technologies, fuels, or maintenance practices are not TCMs. Section 108 of the CAA provides examples of TCMs including, but not limited to: Improved public transit, traffic flow improvements and high-occupancy vehicle lanes, shared ride services, pedestrian/bicycle facilities, and flexible work schedules.

Implementation of TCMs criterion must be satisfied before conformity determinations can be made. Consequently, TCMs receive the highest priority for funding under the Congestion Mitigation and Air Quality Improvement (CMAQ) Program .

Many other measures, similar to the TCMs listed in the CAA, are being used throughout the country to manage traffic congestion on streets and highways and to reduce vehicle emissions. Increasingly they are being recognized for their benefits toward improving an area's livability. These TCM type activities may be eligible for CMAQ funding, whether or not they are in approved SIPs, if they are documented to have emission reduction benefits in nonattainment and maintenance areas. These activities have been employed throughout the country for many years and include many travel demand management strategies.

D. AGING POPULATION

The aging population will have different transportation needs, including transit and more walkable neighborhoods. Younger generations are less interested in automobile ownership and also have a greater preference for denser, less car-based communities focused around mass transit. The challenge for the region and Connecticut as a whole is to get ahead of these trends by proactively investing in more complete transportation networks and implementing land use policies that are less auto-centric.

Aging people often want to age in place for as long as possible and often live longer than their ability to drive safely and personal mobility is considered essential to maintaining independence. Therefore, they need different access to supports, services, and amenities than younger persons to make their trips. It is a challenge for seniors when they lose their ability to drive in a society based on cars and walking or biking may be difficult for those with physical limitations. Everyone has a stake in creating an aging-friendly built environment and transportation infrastructure as it will benefit us all in the future as we age.

Factors that should be considered for various modes of transportation for an aging population include 1) housing and transportation infrastructure, 2) transportation availability, 3) transportation affordability, 4) transportation accessibility, and 5) transportation safety as they affect travel decisions of an aging population.

E. TRANSPORATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a general term for strategies that result in more efficient use of transportation resources. Some TDM strategies are designed to achieve specific objectives such as congestion reduction, emissions reduction, improving equity, improving livability, parking solutions, safety strategies and others. They can be implemented by individuals, community organizations, institutions, businesses and municipal, regional, state, and federal governments. The tables in Appendix C show examples of specific TDM strategies by categories.

Various existing programs can be used to support TDM initiatives and noted above. Transportation data collection and surveys can be used in the TDM program planning and evaluation process. Access management can be used to aid in livable communities plans. ITS can be used to improve transportation system performance and efficiency. Marketing schemes can be used to encourage programs that promote TDMs and other programs can be used to incorporate TDM into the transportation planning process.

F. FAST ACT/IIJA COMPLIANCE

The FAST Act, Fixing America's Surface Transportation Act, (P.L. 114-94) has transformed the policy and programmatic framework for transportation investments to guide the transportation system's growth and development. The FAST Act funds surface transportation programs including, but not limited to, Federal-aid highways at over $305 billion for fiscal years (FY) 2016 through 2020. It creates a more streamlined and performance based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established since 1991. The act establishes a cooperative, continuous, and comprehensive framework for making transportation investment decisions in metropolitan areas. Program oversight is a joint Federal

Highway Administration/Federal Transit Administration responsibility.

The FAST Act continues the MAP-21 approach to formula program funding, authorizing a lump sum total instead of individual authorizations for each program. Once each State's combined total apportionment is calculated, funding is set aside for the State's Metropolitan Planning program from: the State's base apportionment [23 U.S.C. 104(b)(6)]; and the State's apportionment for the National Highway Freight Program [23 U.S.C. 104(b)(5)(D)]. The Fast Act continues to prohibit transfer of Metropolitan Planning Program funds to other apportioned programs. [23 U.S.C. 126(b)(1)]

The prior Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, included provisions to make the Federal surface transportation more streamlined, performance based, and multimodal, and to address challenges facing the U.S. transportation system, including improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.

The FAST Act builds on the changes made by MAP-21 by including new goal to:

- *Improve mobility on America's highways*

The FAST Act establishes and funds new programs to support critical transportation projects to ease congestion and facilitate the movement of freight on the Interstate System and other major roads. Examples include developing a new National Multimodal Freight Policy, apportioning funding through a new National Highway Freight Program, and authorizing a new discretionary grant program for Nationally Significant Freight and Highway Projects (FASTLANE Grants).

- *Create jobs and supports economic growth*

The FAST Act authorizes $226.3 billion in Federal funding for FY 2016 through 2020 for road, bridge, bicycling, and walking improvements. In addition, the FAST Act includes a number of provisions designed to improve freight movement in support of national goals.

- *Accelerate project delivery and promotes innovation*

Building on the reforms of MAP-21 and FHWA's Every Day Counts initiative, the FAST Act incorporates changes aimed at ensuring the timely delivery of transportation projects. These changes will improve innovation and efficiency in the development of projects, through the planning and environmental review process, to project delivery.

The FAST Act continues most of the metropolitan planning requirements that were in effect under MAP-21. Minor revisions were made in areas regarding, 1) support for intercity bus and commuter vanpools, 2) selection of MPO officials, 3) consultation with other planning officials, 4) scope of planning process, 5) capital investment and other strategies, 6) resilience and environmental mitigation activities, 7) transportation and transit enhancement activities, 8) participation by interested parties in the planning process, and 9) congestion management activities.

On November 15, 2021, President Biden signed the Infrastructure Investment and Jobs Act (IIJA) (Public Law 117-58, also known as the "Bipartisan Infrastructure Law") into law. It provides approximately $350 billion for Federal highway programs over a five-year period (fiscal years 2022 through 2026) and further funding through a wide range of new competitive grant programs.

In January 2022 FTA and FHWA issued updated Planning Emphasis Areas (PEAs) to be incorporated into MPOs UPWPs and State Planning and Research Work Programs. There is considerable flexibility in how MPOs and State DOTs can incorporate the PEAs into the transportation planning process and encourage these PEAs to be incorporated as programs are updated.

The new 2021 planning emphasis areas include:

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement
- Strategic Highway Network/ U.S. Department of Defense Coordination
- Federal Land Management Agency Coordination
- Planning and Environment Linkages (PEL)
- Data in Transportation Planning

G. INCIDENT MANAGEMENT

The Connecticut Department of Emergency Services and Public Protection's (CTDESPP) division of Emergency Management and Homeland Security (DEMHS) encompasses five emergency planning regions and works with COGs and municipalities within these regions to develop emergency response plans. All plans in the state are NIMS (National Incident Management System) compliant as required by gubernatorial executive order 34 dated June 12, 2013. CTDESPP is also working in conjunction with other agencies, to update various emergency response planning documents.

Non-recurring incidents such as accidents and vehicle breakdowns are responsible for approximately 50% of all highway congestion. Incident management helps to manage highway congestion by providing quicker response time for accident clearance and safer traffic management in the vicinity of the incident. The region currently cooperates and plans with the Capital Region Council of Governments (CRCOG), Southeast Connecticut Council of Governments (SCCOG), South Central Connecticut Council of Governments (SCRCOG), and Connecticut DOT to address planning for incident management. Incident management is typically performed at the DESPP/DEMHS emergency planning region level. These DEMHS regions are shown in Map 5.4.

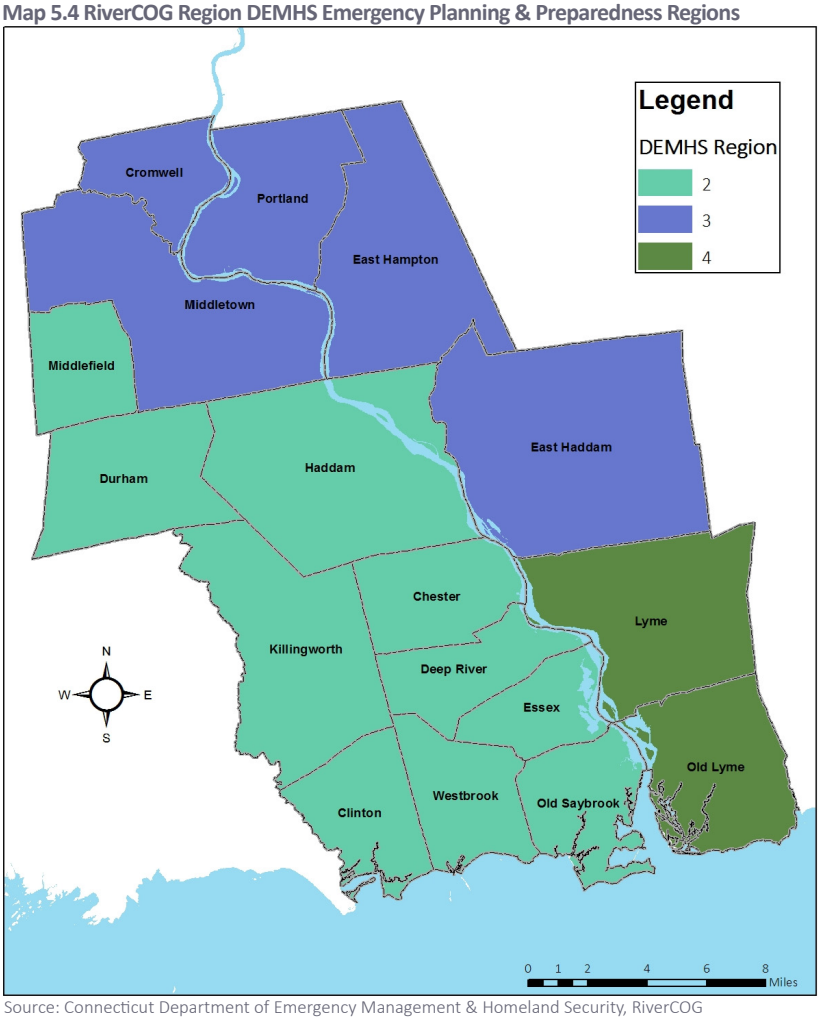
RiverCOG towns are members of CTDESPP/DEMHS Regions 2, 3 and 4 and RiverCOG has worked collaboratively with CRCOG, SCRCOG and SCCOG to create and implement traffic diversion plans, and a regional radio system. The planning process has identified stand pipe, noise barrier doors to hydrants and median break location improvements on limited access highways that can be added to highway construction projects, where appropriate to improve emergency response operations. Many additional training and operational programs have been implemented for timely communications and response. For example, a program was started to train and equip wrecker services in emptying unbreached saddle tanks of commercial vehicles and tractor trailers under specific conditions to help increase the clearance time of major incidents.

Emergency support functions (ESF) were designated, one of which was ESF-1 (Transportation). The 15 ESF's provide the structure for coordinating Federal interagency support for a Federal response to an incident. They are mechanisms for grouping functions most frequently used to provide Federal support to States and Federal-to-Federal support, both for declared disasters and emergencies under the Stafford Act and for non-Stafford Act incidents The purpose of ESF-1 is to facilitate communication and coordination among regional jurisdictions and agencies concerning transportation issues and activities during a major disaster. Many of the incident management concerns facing the region have been determined to be statewide issues through statewide exercises and training.

Programs that have been implemented statewide include, DMV recommendations regarding towing, recovery professionals certification and training, DESPP recommendations regarding tower equipment, and the use of GPS to determine origination of 911 calls. Funding has been provided or identified for additional diversion plans, additional Connecticut Highway Assistance Motorist Patrol (CHAMP) services, installation of push bumpers on state police vehicles, photogrammetric equipment for state police accident investigation units, and to write a statewide Unified Response Manual (URM) intended to be compliant with the National Incident Management System. The URM will be adopted as a standard operating procedure by all agencies responding to highway incidents.

The Greater Hartford Traffic Incident Management (TIM) Coalition is organized through Region 3. CRCOGs RESF 1 – Transportation is part of the Capital Region Emergency Planning Council (CREPC) that works with the municipalities

Map 5.4 RiverCOG Region DEMHS Emergency Planning & Preparedness Regions



Source: Connecticut Department of Emergency Management & Homeland Security, RiverCOG

located in the Department of Emergency Management and Homeland Security DEMHS Region 3.

Additionally, the Region 2 Incident Management Team is one of several teams operating in the state. It was recently recognized by several Region 2 Fire Chiefs under Regional Emergency Planning Team (REPT) ESF4 there was a need for a Regional Incident Management Team (IMT). Typically the highest ranking firefighter on the scene is the incident commander, therefore incident management tends to fall under ESF 4 (Firefighting) rather than ESF 1 Transportation. This need was brought forward to the REPT and, with State guidance through DEMHS. The team was organized and is fully operational. The chairperson gave several informal presentations to fire chiefs and others including CEOs, police chiefs and emergency management directors to educate them on the value of a regional team as well as receive the full support of public safety entities within the region. The Region 2 IMT is managed through an executive committee overseen by its REPT chairman, meeting regularly to approve new members and plan training.

Traffic Incident Management (TIM) is one of the emphasis areas within the Connecticut Strategic Highway Safety Plan (SHSP). The plan is a statewide data driven traffic safety plan that coordinates the efforts of a wide range of organizations to reduce traffic accident fatalities and serious injuries on all public roads. In coordination with federal, state, local and private sector safety stakeholders, the SHSP establishes goals, objectives, and emphasis areas. Other areas include critical roadway locations, driver behavior, motorcyclists, non-motorized users, and young drivers. Statewide incident management strategies identified in the prior SHSP include interagency cooperation, training, and quick clearance. Statewide incident management strategies identified in the 2017 SHSP include:

- Establish a statewide TIM program with a lead agency to administer clearly defined responsibilities that meet the requirements of the National Incident Management System (NIMS).
- Implement a statewide NIMS-based Unified Response Manual (URM).
- Reduce incident duration, which is achieved through (a) reducing the time to detect incidents, (b) initiating an expedient and appropriate response, and (c) clearing the incident as quickly as possible.
- Improve Traveler Information to the media and public.
- Continue to conduct public awareness programs to support effective on-scene traffic incident management by road users.
- Promote best practices for traffic incident management and provide accessibility to intelligent transportation systems (ITS) tools.
- Support regular multi-disciplinary TIM training and exercises.
- Conduct After-Action Reviews to improve response and scene management.
- Identify staffing needs and training resources for CTDOT staff and emergency responders.
- Evaluate expansion of ITS infrastructure to additional regional corridors based on prioritized need.
- Include Weather Responsive Traffic Management (WRTM) strategies, such as Road Weather Information Systems (RWIS).
- Support the development and tracking of TIM performance metrics following national standards and definitions.

RECOMMENDATIONS

- Continue collaboration with partnered MPOs within the Hartford, New Haven, and New London TMAs to promote planning and infrastructure that improves congestion in critical areas
- Incorporate congestion management goals into integrated access planning
- Recommend funding for updated plan for evacuation route for DEMHS Region 2.
- Implement recommendations from Route 1 Corridor Study to optimize incident management on Interstate 95

H. SECURITY

The state's Natural Disaster Plan establishes the roles of all state agencies responding to natural disasters. When implemented by the governor, DEMHS activates the state emergency operations center (EOC) and requests representation by the appropriate responding agencies. CTDOT is responsible for activities relating to state roadways. These activities include: signing/barricading unsafe highways, closing unsafe airports and rail lines, providing buses and drivers for evacuations, proving public information regarding conditions and closures, leaning debris and removing snow and ice from state maintained roadways, proving municipal assistance after state priorities have been met, requesting federal financial assistance, and other natural disaster related missions. The DPS also has responsibilities on state roadways. Their activities include: controlling access to dangerous or impassible roadways, providing assistance to civil preparedness forces for traffic control, proving emergency transportation for federal and state officials, and coordinating response with local police authorities. The DMV is responsible for assisting the DPS in traffic control, and the National Guard is road and bridge repairs, clearance of debris, and transportation for federal and state officials.

The U.S. Department of Homeland Security's National Infrastructure Protection Plan (NIPP) was developed as an outcome of the Homeland Security Act of 2002 and HSPD-7, Critical Infrastructure Identification, Prioritization, and Protection. The purpose of NIPP is to establish a framework to develop, implement and maintain a coordinated effort to protect the nation's critical infrastructure and key resources. The NIPP describes the roles and responsibilities of agencies, managing risk, organizing and partnering, integrating the protection of critical infrastructure and key resources into homeland security and developing a long term protection program. It is important to be familiar with this plan since the transportation network is an important component of the nation's infrastructure.

There are many additional federal statues, national strategies, HSPD's and authorities related to homeland security, but the two mentioned above have a direct focus relating to transportation planning in our region. Other federal statues such as the Disaster Mitigation Act of 2000, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the Maritime Transportation Security Act of 2002 and other legislation, include information and initiatives related to security and transportation.

RECOMMENDATIONS

- Continue to support ESF1 activities through DEMHS Region 2, 3, and 4
- Promote transit operator training for security and crisis management
- Improve security at park and ride lots throughout the region

I. SAFETY

The region's transportation network emphasizes safety for all users of the region's transportation system. Safety is an ongoing concern for RiverCOG with an emphasis on safety for users of non-motorized transportation modes within the region.

The 4E process (Engineering, Education, Emergency and Enforcement) makes important and overlapping contributions to increase safety on the region's highway network. It is vital to consider safety engineering in the project development process. Some broad examples of safety engineering include access management to reduce points of conflict, geometrics to increase sight distances and promote proper speeds, lighting to improve nighttime visibility, safe roadside design to minimize the impacts of run-off-road collisions, and bicycle and pedestrian friendly design. More specific examples include safety engineering for highway signs, pavement markings, and traffic control devises, where standards can be found in the "Manual on Uniform Traffic Control Devises 2009" Revision 3, July 2022 (MUTCD) from the U.S. DOT. Use of the MUTCD can also enhance safety engineering for site specifics such as in the design for at-grade rail crossings, school zones, work zones, and any zones where travel mode conflicts occur for example.

Education is another vital part of safety planning. RiverCOG encourages bicycle and pedestrian safety programs, seat belt awareness programs, rail safety programs, and driver education programs. The UConn Transportation Institute Technology Transfer Center has a valuable resource in its "Connecticut Road Master Program" initiated in 1993. The program is designed to provide highway agency personnel with knowledge of road maintenance management procedures and techniques such as public relations, winter operations, vegetation control, equipment management, pavement preservation, and a variety of other factors that affect roadway safety.

Emergency response is improved through incident and highway management techniques. ITS will similarly aid in decreasing response times throughout the region and state, as will proper roadway maintenance. Enforcement is an important tool using speed management to promote a safer roadway network. Deterring drivers from exceeding the posted speed limit creates a safer driving environment. Likewise, enforcing other driving infractions such as failure to stop at signs, traffic lights, or school busses, and enforcing DWI/DUI laws, also promotes a safer driving environment.

Another particular safety focus is the transition points between transportation modes and the intersection of two or more modes. Several important transition points are identified as: 1) pedestrian to transit (bus and rail connections), 2) vehicle operator to pedestrian (sidewalks, trails, parking lots), and, 3) vehicle operator to bicyclist (parking and road intersections with safe bicycle corridors). This plan emphasizes components of the State Strategic Highway Safety Plan and recommends the following:

Connecticut has made a commitment to support healthy, livable, and safe communities and established a Toward Zero Deaths vision. The General Assembly passed, and Governor Ned Lamont signed into law, Public Act 21-28, which took effect October 1, 2021. This law intended to improve transportation safety by defining laws to improve pedestrian and bicycle safety, and established the Vision Zero Council to develop a statewide policy and interagency approach to eliminate all transportation-related fatalities and severe injuries to pedestrians, bicyclists, transit users, motorists, and passengers.

The 2022 Strategic Highway Safety Plan (SHSP) is a statewide,

data-driven, comprehensive, multidisciplinary transportation safety plan integrating the 4Es of safety — education, enforcement, engineering, and emergency response. By conducting innovative data analysis to prioritize system needs, combined with broad and diverse stakeholder outreach, the Connecticut SHSP provides the framework to collaborate and prioritize safety needs and investments. This SHSP is focused on three Emphasis Areas (EA), infrastructure, behavior, and pedestrian, and identifies strategies, approaches, and policies that will be implemented to move Toward Zero Deaths. The goal is to achieve a 15% reduction or more based on the five-year rolling average of fatalities and serious injuries from 2022 to 2026.

The Infrastructure EA focuses on reducing the number of fatal and serious injury roadway departure and intersection-related crashes. The Behavioral EA accounts for eliminating fatalities and serious injuries related to impaired driving, aggressive driving, unrestrained occupants, motorcycles, and distracted driving. The Pedestrian EA is focused on eliminating fatalities and severe injuries while walking, running, or standing along or near the roadway. Pedestrians maybe in the crosswalk, crossing at midblock, or walking on the side of the road, on a path, or on a sidewalk. Each of the EAs requires collaboration with enforcement, education, engineering, and emergency services partners to identify and implement effective strategies to reduce fatalities and serious injuries. RiverCOG supports the state's HSIP efforts.

RiverCOGs 2022 Regional Transportation Safety Plan (RTSP) is in congruence with the state's SHSP. It serves as a strategy to help the LCRV Region and its 17 municipalities collaborate with the State in reducing injury and fatal crashes. It will also serve to increase safety awareness and focus on their transportation safety issues. The approach applies similar methodology to the State plan, but it includes more local input, reflecting the needs of the region and municipalities. The RTSP is data-driven, multimodal, and multidisciplinary. It identifies the region's high-frequency crash locations and outlines effective countermeasures and strategies to reduce crashes. The overall goal of the RTSP is to reduce the number of traffic fatalities occurring in the region. RiverCOG has endorsed the targets for safety performance measures established by CTDOT since 2017 and will continue to review and conceivably endorse them in the future.

The five safety performance measures are described below. Targets are set annually and reported in the HSIP annual report. The targets for the first three performance measures are also required in the SHSP Report and are identical to the HSIP targets.

The following are the performance measures:

1. Fatalities: The number of persons killed in crashes on all public roads in a calendar year.

Table 5.1 Required FHWA National Performance Measures

Goal	Area	Measure
Safety	Injuries and fatalities	• Number of fatalities • Fatality rate (per 100 million vehicle miles traveled) • Number of serious injuries • Serious injury rate (per 100 million vehicle miles) • Number of non-motorized fatalities and non-traveled) motorized serious injuries
Infrastructure condition	Pavement condition	• 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 National Highway System (NHS) in Good condition • Percentage of pavements on the non-Interstate NHS in Poor condition
Infrastructure condition	Bridge condition	• Percentage of NHS bridges classified as in Good condition • Percentage of NHS bridges classified as in Poor condition
System reliability	Performance of the NHS	• Percent of person miles traveled on the Interstate System that are reliable • Percent of person miles traveled on the non-Interstate NHS that are reliable
Freight move-ment	Freight movement on the IS	• Truck Travel Time Reliability Index
Congestion reduction	Traffic congestion	• Annual hours of peak-hour excessive delay per capita • Percent of non-single-occupant vehicle travel
Environmental sustainability	On-road mobile source emissions	• Total emissions reduction

2. Fatality Rate: The number of persons killed in crashes per 100 million VMT in a calendar year.

3. Serious Injuries: The number of persons seriously injured in crashes on all public roads in a calendar year.

4. Serious-Injury Rate: The number of persons seriously injured in crashes per 100 million VMT in a calendar year.

5. Non-Motorized Fatalities & Serious Injuries: The number of pedestrians and bicyclists killed or seriously injured in crashes involving a motor vehicle on all public roads in a calendar year.

The process included a regional study and seventeen municipal studies. The regional overview was a data-driven analysis of the top crash locations, which includes a listing of possible countermeasures, and the selection of emphasis areas and strategies to reduce injury and fatal crashes. The municipal studies includes data-driven crash locations and stakeholder input to reduce injury and fatal crashes in each municipality. Combining the data-driven analysis with stakeholder input provided for a more comprehensive regional transportation safety plan.

The emphasis areas in the LCRV region were selected based on the conclusion that these contributed to the majority of the injury and fatal crashes verified from the 2015-2019 data. The seven emphasis areas are:

1. Critical Roadway Locations: Includes both intersections and roadway departure crashes.

2. Driver Behavior: Includes aggressive driving, unrestrained occupants, substance-impaired driving, and distracted driving.

3. Young Drivers: Includes drivers aged 15-25 years old.

4. Older Drivers: Includes drivers aged 65 years and older.

5. Motorcyclist Safety.

6. Non-Motorized Users: Includes pedestrians and bicyclists.

7. Traffic Incident Management

The critical roadway locations emphasis areas include both intersection and roadway departure crashes. The performance objective is to decrease intersection and roadway departure injuries and fatalities over the five-year period of the RTSP.

The second emphasis area is driver behavior, which includes the subset areas of speeding or aggressive driving, unrestrained occupants, substance-impaired driving, and distracted driving. These subsections are related to driver behavior and not due to traffic or roadway characteristics, although they can be interdependent. The performance objective is to lower the average of speed related deaths per year by 2026.

Young drivers are motorists between the ages of 15-25. Due to their driving inexperience and behavior that can involve an increase in novelty seeking and risk-taking, this subset of drivers is at a greater risk of being involved in traffic crashes. The performance objective is to decrease the Region's five-year average young driver fatal crashes by the year 2026.

The fourth emphasis area is older drivers, which are categorized as drivers 65 years and older. Although age itself is not the principal determinant in driving performance as people age their mental and physical abilities change, which can affect their driving. The most common of these conditions is poor vision, but other cognitive skills may be affected, including memory and coordination. Older drivers crash survivability is a major safety concern. The performance objective is to decrease the number of drivers aged 65 or older involved in fatal crashes per year by 2026.

The non-motorized users emphasis area includes crashes involving pedestrians and bicyclists. Pedestrians and bicyclists are more susceptible to injuries and fatalities when involved in a crash with a motor vehicle. Pedestrian friendly environments are consistent with complete streets, desirable residential and

Table 5.2 Required FTA National Performance Measures Include

Asset Category	Measure
Rolling stock	• Percent of revenue vehicle exceeding useful life benchmark (ULB)
Equipment	• Percent of non-revenue vehicle exceeding useful life benchmark (ULB)
Facilities	• Percent of facilities rated under 3 (SGR) on the TERM Scale
Infrastructure	• Percent of track segments under performance restrictions

employment sites, and sustainable/low cost transportation. The performance objective is to is in congruence with the SHSP's goal of reducing pedestrian and bicycle injury and fatal crashes over the 5-year period of the SHSP ending in 2026.

Motorcyclist safety is an area of traffic concern both regionally and nationally. According to NHTSA 2015 Countermeasures that Work report, "per vehicle mile traveled, motorcyclists are about 26 times more likely than passenger car occupants to die in traffic crashes". (NHTSA Countermeasures that Work, 2015 8th edition). A motorcyclist travels at the same speeds and in the same lanes as other motorized vehicles, but without the same degree of protection. The performance measure is in congruence with the SHSP goal of decreasing the number of motorcyclist fatalities from the five-year average by 2026, especially the number of unhelmeted fatalities. This could be accomplished through increased media outreach and encouragement of motorcycle riders to wear protective clothing and gear.

A traffic incident is an event (such as a vehicle crash, work zone activity, or vehicle breakdown) that disrupts the normal operation of the transportation system. Traffic incidents are an important concern in Connecticut because they can potentially cause safety issues, increasing the risk to uninvolved motorists, congestion delays, and secondary incidents. The CTDOT recommends a statewide Traffic Incident Management (TIM) plan be implemented to coordinate the use of human, institutional, mechanical, and technological resources to reduce the duration and impact of incidents.

The performance objective is In congruence with the CT SHSP's goals, whereas the LCRV Region's goal is to promote the safety of motorists, crash victims, and incident responders by reducing secondary crashes and associated fatalities and serious injuries. In order to achieve this goal the region could increase its first responders in incident management training.

Detailed strategies based on the 4Es of safety (engineering, enforcement, education and emergency response) in support of the aforementioned goals can be viewed in the plan at: https://www.rivercog.org/wp-content/uploads/2022/08/Lower-CT-River-Valley-RTSP_final_rev_Web.pdf The plan then discusses implementation, evaluation and update requirements as well as individual reports for each of the LCRV municipalities.

Additional areas of concern for improving safety include commercial vehicles, school busses, transit busses as well as grade crossings, work zones, hit and runs, wrong way drivers and unlicensed drivers.

J. PERFORMANCE BASED PLANNING AND PROGRAMMING

Background

The Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning regulations published on May 27, 2016, (FHWA 23 CFR Parts 450 and 771 and FTA 49 CFR Part 613) implemented changes to the planning process, including requiring a performance-based approach to planning and requires that state DOTs, MPOs, and the operators of public transportation use performance measures to document expectations for future performance. Performance based planning and programming increases the accountability and transparency of the Federal-aid Program and offers a framework to support improved investment decision making by focusing on performance outcomes for national transportation goals.

FHWA defines Transportation Performance Management (TPM) as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. FHWAs desired outcomes include, Optimizing investments of public funds, improving consistency across the county, increasing coordination of decision makers, increasing understanding of what works, and communication federal investment returns. FHWA and FTA established national performance measures in areas such as safety, infrastructure condition, congestion, system reliability, emissions, freight movement, transit safety and transit state of good repair.

The last of a series of FHWA TPM related rules, the System Performance/Freight/CMAQ Performance Measures Final Rule and Pavement and Bridge Condition Performance Measures Final Rules took effect on May 20, 2017 and state DOTs had one year from that effective date to establish performance targets and MPOs had 180 days after the State DOT establishes their performance targets to establish regional performance targets. State DOTs are directed to coordinate with MPOs when setting targets.

Required FHWA national performance measures include those listed on **Table 5.1 on page 74**.

CTDOT developed performance measure targets in compliance with federal regulations. On December 6, 2017, the RiverCOG MPO Board endorsed a resolution of support for CTDOT's safety performance targets as the regional performance targets for the MPO. On May 23, 2019, the RiverCOG MPO Board endorsed a resolution of support for CTDOT's various performance targets as the regional performance targets for the MPO, including the other areas noted in the table above.

Table 5.3 LCRVR MTP &TIP Project Goals

Tier II Bus Revenue Vehicles

Asset	Target	Goal
Bus	ULB – 12 years	14% beyond ULB
Cutaway bus	ULB – 5 years	17% beyond ULB
Mini van	ULB – 5 years	17% beyond ULB

Tier II Bus Service Vehicles

Asset	Target	Goal
Rubber and tire vehicles	ULB – 14 years	7% beyond ULB
Automobiles	ULB – 5 years	17% beyond ULB
Vans	ULB – 5 years	17% beyond ULB
Sport utility vehicles	ULB – 5 years	17% beyond ULB

Tier II Bus Facilities

Asset	Target	Goal
Passenger and Parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

Tier I Rail Revenue Vehicles

Asset	Target	Goal
Commuter rail locomotive	ULB – 35 years	17% beyond ULB
Commuter rail coach	ULB – 25 years	17% beyond ULB
Commuter rail self propelled car	ULB – 35 years	13% beyond ULB

Tier I Rail Service Vehicles *

Asset	Target	Goal
Rubber and tire vehicles	ULB – 14 years	7% beyond ULB
Steel wheel vehicles	ULB – 25 years	0% beyond ULB

*Report only MNR to FTA, as Amtrak owns the SLE and Hartford Lines

Tier I Rail Guideway Infrastructure *

Asset	Target	Goal
Commuter rail guideway	Percent restricted	2% restricted

* Report only MNR to FTA, as Amtrak owns SLE and Hartford lines

Tier 1 Rail Facilities

Asset	Target	Goal
Passenger and parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

Tier I Ferry Facilities

Asset	Target	Goal
Passenger and parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

The FTA Transit Asset Management (TAM) final rule requires transit providers and MPOs to set State of Good Repair (SGR) targets and reset them each year (49 CFR Part 625). Required FTA national performance measures include those listed on **Table 5.2 on page 75.**

Transit providers had until October 1, 2018 to develop TAM Plans. They must update their TAM Plan at least every four years and should share their TAM Plan, supporting documents of performance targets, investment strategies, and an annual condition assessment with the State and MPO that provides their funding (49 CFR§625.53). Tier I transit providers must develop an individual TAM Plan, whereas Tier II providers may participate in a group plan facilitated by the State. Tier I: A provider that owns, operates, or manages either (a) 101 or more vehicles in revenue service during peak regular service across all fixed route modes or in any one non-fixed route mode, or (b) rail transit. Tier II: A provider that owns, operates, or manages (a) 100 or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (b) a subrecipient under the 5311 Rural Area Formula Program, or (c) any American Indian tribe. CTDOT prepared a Tier I TAM Plan for the rail, bus, and ferry transit it provides such as CTtransit and Hadlyme Ferry. CTDOT developed a group Tier II TAM Plan, which include the Estuary and Middletown Transit Districts.

CTDOT developed SGR targets for both Tier I and Tier II providers in compliance with federal regulations. On July 19, 2017, the RiverCOG MPO Board endorsed a resolution of support for CTDOT's State of Good Repair Performance Targets as the regional performance targets for the MPO.

As part of this new performance-based approach, recipients of Federal-aid highway program funds and Federal transit funds are required to integrate performance targets and performance plans (such as the CMAQ plan, Strategic Highway Safety Plan, State Freight Plan, Highway and Transit Asset Management Plans, etc.) into MPO planning documents such as the LRP and TIP to the maximum extent practicable

Targets

Highway Safety

Highway Safety is determined by the interaction between drivers, their behavior and the highway infrastructure. The five (5) performance measures for Highway Safety include: (1) the number of fatalities; (2) the rate of fatalities; (3) the number of serious injuries; (4) the rate of serious injuries; and, (5) the number of non-motorized fatalities and serious injuries. The region's MTP and TIP program projects to meet the annual targets set by the CTDOT and agreed upon by

RiverCOG including Highway Safety Improvement Program (HSIP) safety projects such as: 1) programmatic highway safety improvements, 2) programmatic driver safety activities, and 3) location-specific highway safety projects.

In an effort to meet federal reporting requirements, CTDOT and MPOs must set targets that are attainable. They must also review performance, assess trends, and set targets on an annual basis. The safety targets reported to FHWA are shown in **Table 5.4 below**.

FHWA uses 5-year moving averages to determine the State's progress towards achieving safety targets which smooths out what can sometimes be significant fluctuations in data from one year to the next. It also means that some fatality and serious injury data included in the moving averages are 4 and 5 years old and trends might have changed especially during the two years of the COVID-19 pandemic. Connecticut believes that the 5-year moving average is a "lagging indicator" that cannot serve as the sole or even primary guideline for setting safety performance targets.

Beginning in FY 21, Connecticut has been using a modified approach to target setting using both a 5-year moving average trendline and an annual trendline to guide the selection of targets. In addition, CTDOT has used 10 years of data for annual forecasting to assist with better decision making. The final target selection is also based on professional judgement and a strengthened commitment to advancing CTDOT's overall safety goal of improving the safety of all roadway users.

Transit

The Transit Asset Management (TAM) rule requires that recipients and sub recipients of Federal Transit Administration (FTA) funds set annual performance targets for federally established State of Good Repair (SGR) measures for rolling stock, equipment, facilities and guideway infrastructure. CTDOT has identified asset classes for its transit service providers specific to each of the four assets categories for bus, rail and ferry services.

The percentage of assets exceeding the useful life benchmark (ULB) is the performance measure set for rolling stock and equipment. For facilities, the performance measure is based on a five point condition rating scale derived from FTA's Transit Economic Requirement Model (TERM). Guideway infrastructure is rail specific and the performance measure set by FTA is the percent of guideway with a performance restriction which is interpreted as slow zones.

Under the FAST Act, transit providers are required to submit an annual narrative report to the Nation Transit Database (NTD) that provides a description of any change in the condition of its transit system from the previous year and describes the progress made during the year to meet the targets previously set for that year. Performance targets are reported annually to the National Transit Database by CTDOT for the state's transit system.

The region's MTP and TIP program projects to meet the targets set by the CTDOT and endorsed by RiverCOG are shown in the table below. A detailed asset analysis can be found in CTDOTs 2022-2025 Transit Asset Management Group Plan (Tier II) in

Table 5.4 Required FTA National Performance Measures Include

Targets Reported	2018	2019	2020	2021 *	2022	2023
Target Years	14-18	15-19	16-20	17-21	18-22	19-23
Assessment Year	2020	2021	2022	2023	2024	2025
Number of Traffic Fatalities	257.0	274.0	277.0	270.0	270.0	270.0
Fatality rate	0.823	0.873	0.883	0.850	0.850	0.850
Number of Serious injuries	1571.0	1574.0	1547.0	1360.0	1300.0	1300.0
Injury Rate	5.033	5.024	4.931	4.300	4.300	4.300
Number of Non-Motorized Fatalities and Serious Injuries	280.0	290.0	307.2	300.0	280.0	280.0

accordance with 49 CFR 625.5.

Tier II Bus Revenue Vehicles

Asset	Target	Goal
Bus	ULB- 12 year	14% beyond ULB
Cutaway Bus	ULB- 5 years	17% beyond ULB
Mini Van	ULB- 5 years	17% beyond ULB

Tier II Bus Service Vehicles

Asset	Target	Goal
Rubber and tire vehicles	ULB – 14 years	17% beyond ULB
Automobiles	ULB – 5 years	17% beyond ULB
Vans	ULB – 5 years	17% beyond ULB
Sport utility vehicles	ULB – 5 years	17% beyond ULB

Tier II Bus Facilities

Asset	Target	Goal
Passenger and Parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

Tier I Rail Revenue Vehicles

Asset	Target	Goal
Commuter rail locomotive	ULB – 35 years	17% beyond ULB
Commuter rail coach	ULB – 25 years	17% beyond ULB
Commuter rail self propelled car	ULB- 35 years	13% beyond ULB

Tier I Rail Service Vehicles*

Asset	Target	Goal
Rubber and tire vehicles	ULB – 14 years	7% beyond ULB
Steel wheel vehicles	ULB – 25 years	0% beyond ULB

Report only MNR to FTA, as Amtrak owns SLE and Hartford lines.

Tier I Rail Guideway Infrastructure*

Asset	Target	Goal
Commuter rail guideway	Percent re-stricted	2% restricted

Report only MNR to FTA, as Amtrak owns SLE and Hartford lines.

Tier I Rail Facilities

Asset	Target	Goal
Passenger and Parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

Tier I Ferry Facilities

Asset	Target	Goal
Passenger and Parking	TERM 1-5	0% below 3
Admin. and Maint.	TERM 1-5	0% below 3

Pavement and Bridge Condition

The four performance measures for pavement condition include the percent of the Interstate system in good and poor condition and the percent of the non-interstate National Highway System (NHS) in good and poor condition. The two performance measures for Bridge condition include the percent of NHS bridges in good and good condition.

A pavement condition index (PCI) categorizes pavement by cracking, ride, rutting, raveling, and drainage indexed on scale from one to nine, with a state of good repair equaling six. The calculation of the international roughness index (IRI), cracking, and rutting are determined for pavements. If all three measures are good, then the condition is measured as good. If two or more measures are poo then the condition is measures as poor.

Similarly, bridges are rated on a scale from zero to nine. A bridge with all major components (deck, superstructure, and substructure) rated seven or higher is measured as good. A bridge with all major components) rated four or lower is measured as poor.

The region's MTP and TIP programs projects to meet the targets set by CTDOT and endorsed by RiverCOG using CTDOTs Pavement Management System and the Bridge Management System (dTIMS – Deighton's Total Infrastructure Management

System). These systems provide for a systematic method to view conditions to develop strategies found in CTDOTs Transportation Asset Management Plan (TAMP).

The TAMP acts as a focal point for information about the assets, their management strategies, long-term expenditure forecasts, and business management processes. CTDOT is required to develop a risk-based TAMP for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system. Asset management is defined as a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.

Pavement and bridge state of good repair needs are identified, quantified, and prioritized through the TAMP process. Projects to address SOGR repair needs are selected from the TAMP for inclusion in the MTP and TIP.

System Reliability

Highway travel time reliability is closely related to congestion and is greatly influenced by the complex interactions of traffic demand, physical capacity, and roadway "events." Travel-time reliability is a significant aspect of transportation system performance.

The national system reliability performance measures assess the impact of the CTDOT's various programs on the mobility of the transportation highway system users. Operational improvement, capacity expansion, and to a certain degree highway road and bridge condition improvement projects, impact both congestion and system reliability. Demand management initiatives also impact system reliability. Travel-time reliability is a new concept to which much of the transportation profession has had only limited exposure, as compared to traditional congestion measures such as the travel time index.

The two performance measures for System reliability condition include; percent of person miles traveled on the Interstate System that are reliable, and Percent of person miles traveled on the non-Interstate NHS that are reliable. The metric used is the level of travel time reliability (LOTTR) which uses the ratio of longer travel times (80th percentile) to normal travel times (50th percentile) using NPMRDS or similar travel time data. Person-miles traveled is obtained by incorporating AADT and vehicle occupancy rates.

The region's MTP and TIP programs projects to meet the targets set by CTDOT and endorsed by RiverCOG.

Freight Movement

Freight measures consider factors that are unique to the trucking industry. The unusual characteristics of truck freight include: the use of the system during all hours of the day, high percentage of travel in off-peak periods, and the need for shippers and receivers to factor in more 'buffer' time into their logistics planning for on-time arrivals.

The freight movement is assessed by the Truck Travel Time Reliability (TTTR) index metric. For the first reporting period, Connecticut will be using the analysis conducted as part of the truck freight bottleneck analysis that was done as part of the freight plan, and which was approved by FHWA. Therefore, for this first year of reporting, CTDOT and RiverCOG is using the trend and truck bottleneck analysis done for the recently completed Statewide Freight Plan. The future metric used is the truck travel time reliability metric (TTTR) which uses the ratio of longer travel times (95th percentile) to normal travel times (50th percentile) using NPMRDS or similar travel time data. The measure includes the maximum TTTR per segment (for 5 periods) divided by total Interstate mileage.

Air Quality

US DOT requires that states and MPO's assess the impact of their transportation systems on air quality and specifically the impacts vehicle exhaust emissions. Their performance measure for air quality is based on an assessment of projects selected for funding under the Congestion Mitigation and Air Quality Improvement (CMAQ) program.

The CMAQ program's purpose is to fund transportation projects or programs that contribute to the attainment or maintenance of National Ambient Air Quality Standards (NAAQS) in those specific areas. The performance measure is total emissions reduction. It is calculated by cumulative 2-year and 4-year Emissions Reduction (kg/day) for CMAQ-funded projects of reduced emissions for: Nitrogen Oxide (NOx), Volatile Organic Compounds (VOCs), Carbon Monoxide (CO), Particulate Matter (PM10 and PM2.5) and Ozone (O3), CO, PM10 and PM2.5 nonattainment and maintenance areas.

The MTP and TIP programs projects to meet the targets set by the CTDOT and endorsed by RiverCOG. CMAQ eligible projects include: congestion reduction and traffic flow improvements, ridesharing, transit improvements, travel demand management, and bicycle and pedestrian facilities.

Chapter 6.

MUNICIPAL TRANSPORTATION PRIORITIES

CHESTER
CLINTON
CROMWELL
DEEP RIVER
DURHAM
EAST HADDAM
EAST HAMPTON
ESSEX
HADDAM
KILLINGWORTH
LYME
MIDDLEFIELD
MIDDLETOWN
OLD LYME
OLD SAYBROOK
PORTLAND
WESTBROOK
ESTUARY TRANSIT DISTRICT
LCRVCOG

MUNICIPAL TRANSPORTATION PRIORITES

RiverCOG asked the region's chief elected officials, public works directors, and planners for the transportation priorities of their municipalities. Below is a listing of the priorities of the seventeen municipalities and two transit districts of the Lower Connecticut River Valley Region.

CHESTER

- Road/bridge improvements on Main Street, North Main Street, Lower Goose Hill Road, Pleasant Street, Straits Road, Wig Hill Road, Liberty Street, East Liberty Street, Ferry Road, RT 154, RT 148, RT 145, and RT 82 connector
- Continuity of CT Ferry Operations
- North-South Commuter Recreational Bikeway
- Transit Oriented land use development along public transit route

CLINTON

- Road/Bridge improvements on Walnut Hill Road, Hurd Bridge Road, Egypt Road, Iron Works Road, Cow Hill Road, Airline Road, North High Street, RT 1, High Street, Glenwood Road, Pleasant Valley Road, Long Hill Road, Liberty Street, Nod Road, RT 145, and RT 81.
- Implement recommendations from Route 1 Corridor Study
- Develop multi-modal Plan for Transit Oriented Development around Clinton station including parking, street improvements and enhanced pedestrian and bicycle connections
- Extend Shoreline Greenway from Hammonassett State Park to Menunketesuck Greenway in Westbrook
- Safe Routes to School and Recreational Facilities—with special attention to RT 81 between the Morgan School and recreational complex
- Implement Bicycle and Pedestrian Alliance Bikeways Plan linking residential areas to train station, major public facilities, and waterfront
- Implement bus turnout/pullout areas on RT 81 for proposed Estuary Transit Madison/Clinton to Middletown route
- Develop a Complete Streets plan

CROMWELL

- Road bridge improvements on Court Street, Industrial Park Road, RT 3, RT 99, RT 372, RT 524, RT 901
- Evaluate the need to reconfigure or construct a new ramp in the vicinity of RT9/RT372 due to growing safety and congestion concerns
- Evergreen Road to RT 3 with bicycle and pedestrian provisions
- RT 99 intersection improvements and signal replacement at Main Street and intersection improvements at Court Street
- West Street intersection improvements at Franklin Avenue
- Implement Safe Routes to School Plan
- Intersection improvements to Route 372 at intersection with Country Squire Drive and Willowbrook Road
- Develop pedestrian walking routes or trails along the CT River
- Develop boat access (docks, possible Town marina) within Town owned parcels on CT River
- Add sidewalks throught the Town where needed

DEEP RIVER

- Road/bridge improvements on Bushy Hill Road, Westbrook Road, Essex Street, Book Hill Road, Union Street, RT 154, RT 80, RT 602, and RT 145
- Transit Oriented land use development in the Village Core
- Coordination/synchronization with the Valley Railroad
- Complete Safe Routes to School program

DURHAM

- Bridge/culvert improvements on Indian Lane, Seward Lane, Bear Rock Road, Guire Road
- RT 17 intersection improvements at RT 68 (widen for turn lane), and intersection improvements at RT 147/ Haddam Quarter Road (realignment)
- RT 157 intersection improvements at RT 68, DOT has schematic drawing of a roundabout to fix the congestion at this intersection
- Parmelee Hill Road intersection improvements at RT 17
- RT 147 Intersection improvements at Cherry Hill Road and Maple Avenue
- RT 17 intersection improvements at RT 79, RT 17 to create a four-way intersection at Higganum Road
- RT 17 bicycle route signs and pavement markings
- RT 17 pedestrian access improvements such as sidewalk extension from RT 147/Haddam Quarter Road south to RT 79 intersection (west side Main Street)

EAST HADDAM

- Road/bridge improvements on Bashan Road, Creek Road, East Haddam/Colchester Turnpike, Haywardville Road, Lake Shore Road, Landing hill Road, Mott Lane, Newbury Road, Orchard Road, and Schulman Veselak Road, RT 82, RT 149, RT 151, RT 431, RT 434, RT 609
- Sidewalk construction and planning along the southern side of RT 82 with access to Eagle Landing State Park

and across the East Haddam swing bridge with access between East Haddam, Eagle Landing State Park and the Valley Railroad station in Haddam
- RT 82 culvert replacement and retaining wall construction at Malt House Brook
- RT 151 bridge repairs over the Salmon River, intersection improvements at RT 149, and intersection improvements at Colchester Turnpike
- Foxtown Road bridge reconstruction over Eight Mile River
- Three Bridges Road bridge reconstruction over Eight Mile River
- RT 151 vertical realignment from west of the Moodus River Crossing
- RT 149 vertical realignment between Trowbridge Road and Clark Gates Road

EAST HAMPTON

- Road/bridge improvements on Brewer Road, Mott Hill Road, White Birch Road, Depot Hill Road, Haddam Neck Road, Lake Drive, Lake Road, Main Street, North Main Street, South Main Street, Old Middletown Road, and Staeth Road, RT 16, RT 66, RT 151, RT 439
- RT 66 intersection improvements at Long Hill Road (realign to perpendicular and slight widening for vehicular bypass)
- RT 66 grading and sight line improvements at Champion Hill Road
- RT 66 intersection improvements at RT 151/Depot Hill Road/Oakum Dock Road (left turn lanes, remove island, close Depot Hill Road at RT 66 and consolidate curb cuts, clear sightlines at Oakum Dock Road)
- RT 151 intersection improvements at Keighly Pond Road and Long Hill Road
- RT 151 incorporate traffic calming measures as high speeds, poor sightlines, frequent curb cuts and minimal shoulder create unsafe conditions for bicyclists and pedestrians
- RT 16 intersection improvements at Hog Hill Road and straighten curve between Harlan Place and Tartia Road
- Flat Brook Road culvert replacement
- Mott Hill Road intersection improvements at Lake Drive
- White Birch Road realign between Chapman Road and Country Road
- RT 16 intersection improvements at Tartia Road and Long Hill Road
- RT 66 intersection improvements at Marlborough Road, Maple Street, Barton Hill Road, and East Hampton mall/ Brooks Plaza area
- Pedestrian and bicycle improvements on Main Street to connect Airline Trail to Route 66
- Pedestrian and road improvements including sidewalks and drainage surrounding the Memorial School on Walnut Avenue, Edgerton Street and Smith Street

ESSEX

- Road/bridge improvement on Bushy Hill Road, West Avenue, South Main Street, Prospect Street, Methodist Hill Road, North Main Street, River Road, Book Hill Road, RT 604, RT 602, RT 621, RT 154, RT 153
- Implement recommendations in the 2011 Town Transportation Study
- Implement Essex Safe Routes to School Plan
- Repair/replace bridges on Old Deep River Road, Pond Meadow Road, Falls River Road, and Dennison Road over Falls River
- Reconstruction of Westbrook Road (RT 604) and add sidewalks between Centerbrook Center and Bokum Center
- Add sidewalks and bicycle lanes on RT 153 (Plains Road/Westbrook Road), RT 154 (Middlesex Turnpike/ Main Street/Deep River Road), and RT 602 (Main Street Ivoryton)
- Install traffic calming measures on RT 154 in Centerbrook
- Reconstruct intersection on RT 154/Main Street at Dennison Road
- Reconstruct intersection at RT 154/Main Street at Deep River Road NB
- Reconfigure central intersection of Centerbrook (RT 154/RT 604/RT 602)
- Reconfigure intersection of RT 153/Westbrook Road at Mares Hill Road
- Reconstruct drainage system on South Main Street
- Improve/reconstruct River Road
- Improve/reconstruct Dennison Road
- Improve/reconstruct Mares Hill Road

HADDAM

- Road/bridge improvements on Candlewood Hill Road, Foot Hills Road, Beaver Meadow Road, Injun Hollow Road, Jail Hill Road, Little City Road, Rock Landing Road and Sima Road, RT 81, RT 82, RT 151, RT 154
- Candlewood Hill Road reconstruction, drainage improvements and bridge improvements
- RT 154 intersection improvements at Thayer Road
- RT 81 intersection improvements at Old County Road/ Hidden Lake Road
- RT 81 drainage improvements at Beaver Meadow Road and Brault Road
- Traffic calming in Higganum Center, including the narrowing of travel lanes on RT 154 (0.8 miles) between the Haddam Fire House and the Haddam Elementary School to reduce traffic speed through the historic district and village area consistent with enhancement

funding guidelines.
- Congestion management study for the Bridge Road area, including the possibility of adding secondary roads to the road network to enhance connections between the Swing Bridge and travelers on RT 154
- Traffic calming within 1,000 feet of the intersection of RT 154 and 82 East in the village of Tylerville
- Stamped bike lanes along Route 154 between the Middletown and Chester borders and along RT 81 from Higganum Center south to the intersection of High Street
- Safety and operational security of the Connecticut River crossings at the East Haddam Swing Bridge and the Chester-Hadlyme Ferry
- Design and construction of sidewalks from the Haddam Elementary School to the Higganum Cove
- Reconstruction of sidewalks along the eastern side of RT 154 from Jail Hill to the UCONN Extension Center
- Reconstruction of the eastern portion of Park Road
- Reconstruction and drainage of Porkorny Road, and Jail Hill Road
- Installation of a flashing yellow traffic light at 750 Saybrook Road (the Haddam Transfer Station)

KILLINGWORTH

- Road/bridge improvement on Little City Road, Green Hill Road, Cow Hill Road, Iron Works Road, Roast Meat Hill Road, Stevens Road, RT 80, RT 81
- Traffic management in town center/commercial center
- Scenic Road designation of Green Hill Road and RT 148
- Avoidance of concrete sidewalks to maintain rural character

LYME

- Road/bridge improvements on Grassy Hill Road, Macintosh Road, Joshuatown Road, RT 156, RT 82, RT 148
- RT 156 Scenic/bikeway/marine/multimodal corridor
- Maintenance of the Hadlyme-Chester Ferry corridor
- Reconstruction of Scenic RT 148
- Bridge maintenance best practices to protect stream ecology and maintain rural character
- Reconstruction of retaining walls along RT 156

MIDDLEFIELD

- Road/bridge improvements on Jackson Hill Road, Cherry Hill Road, Cedar Street, Derby Road, Higby Road, and Laurel Brook Road, RT 66, RT 147, RT 155, RT 157, RT 217
- Second egress road from west side of Beseck Lake
- RT 157 drainage improvements north of Cider Hill Road
- RT 147/RT 157 intersection improvements at Peckham Field
- RT 147 intersection improvements at Powder Hill Road
- Jackson Hill Road intersection improvement at Cedar Street/School Street
- RT 157 intersection improvements at Jackson Hill Road
- Miller Road bridge replacement
- RT 157 Intersection improvements at Strickland Road
- Cedar Street drainage improvements
- Cider Mill Road bridge improvements
- Cherry Hill Road bridge improvements

MIDDLETOWN

- Road/bridge improvements on Anderson Road, Bow Lane, Bretton Road, Brush Hill Road, Camp Street, Church Street, Country Club Road, Crescent Street, Cross Street, DeKoven Drive, East Main Street, Farm Hill Road, Grand Street, Higby Road, High Street, Highland Avenue, Industrial Park Road, Laurel Grove Road, Liberty Street 2, Main Street, Main Street Ext, Middle Street, Mile Lane, Millbrook Road, Miner Street, North Main Street, Old Mill Road, Pameacha Avenue, Pine Street, Pleasant Street, Prospect Street, Randolph Road, Rapallo Avenue, Ridge Road, Ridgewood Road, Russell Street, Saybrook Road, Smith Street, South Main Street, Spring Street, Union Street, Vine Street, Wadsworth Street, West Street, Westfield Street, Westlake Drive, and RT 3, RT 17, RT 66, RT 154, RT 157, RT 217, RT 410, RT 545
- Implement recommendations in the Middletown Return to the Reiverben Master Plan
- Implement recommendations in the 2013 Complete Streets Master Plan
- Removal of traffic lights on RT 9
- Implement recommendations in the Middletown Area River Crossing Study
- Rehabilitation of the railroad swing bridge
- Downtown transportation infrastructure improvements
- River Road from Pratt and Whitney to Silver Street to RT 9 should be a continuous state roadway to complete a loop with RT 410
- Arrigoni enhancement lighting project
- RT 17 – two way left turn lanes between Pameacha Pond and Highland Ave and widen southbound lane near pond
- North End Industrial Area access improvements
- Install traffic lights at RT 217/Country Club Road and Newfield Street/Congdon Street
- Rehabilitation of Main Street between Washing ton Avenue and Hartford Avenue
- Extend/maintain rail line from Middletown to the Valley Railroad
- RT 9 at 66 intersection improvements
- Pedestrian access from downtown over RT 9/railroad to

riverfront
- RT 17 bicycle route signs and pavement markings
- Reconstruct Saybrook Road to allow for sidewalks and safer travel for bicyclists. Improvements would allow for commercial development and provide a link between communities to the South and Middlesex Community College
- Conduct a study regarding bicycle travel between downtown and the high density residential area of northern Middletown
- Increase pedestrian and bicycle access from downtown Middletown to the riverfront
- Commuter rail from Middletown to Hartford Study

OLD LYME
- Road/bridge improvements on McCurdy Road, Lyme Street, Four Mile River Road, Mile Creek Road, RT 1, and RT 156
- Sidewalk & crosswalk improvements on Halls Road
- Preservation of historic character with proposed I-95 reconstruction
- Improved bicycle and pedestrian access to the shoreline
- Prevention of infrastructure damage from sea level changes and storms
- Access to Northeast Corridor/Shoreline East

OLD SAYBROOK
- RT 1/ Saybrook Junction Pedestrian Node Infrastructure Project- Construct streetscape enhancements within the node of pedestrian activity around its train station and town center to smooth the growing exchange in modes of transportation—train, bus, automobile, bicycle and pedestrians
- Road/bridge improvements on Schoolhouse Road, Maple Avenue, Bokum Road, Elm Street, RT 1, I-95 improvements with emphasis on the RT 154 Gateway Area per town plan with emphasis on bicycle and pedestrian improvements
- Implement recommendations from the town's 2014 Scenic Roads Plan
- Implement transportation related recommendations from the town's Natural Hazard Mitigation Plan and subsequent updates
- Implement transportation related recommendations from the town's 2018 Community Coastal Resilience Study
- Implement recommendations from the 2013 Mariner's Way Plan
- Implement recommendations from the Route 1 Corridor Study
- Safe routes to school plan and infrastructure
- Enhance sidewalks per Town Sidewalk Plan
- Transit oriented development near the rail station
- Elm Street Underpass

PORTLAND
- Road ridge improvement on Bartlett Street, Breezy Corners Road, Collins Hill Road, Cox Street, High Street, Isinglass Road, Jobs Pond Road, Middle Haddam Road, Old Marlborough Turnpike, Penfield Road, Penfield Hill Road, Rose Hill Road, Sage Hollow Road, Spring Street, and Thompson Hill Road, RT 17, RT 17A, RT 66
- Safe Routes to School improvements near the Brownstone Intermediate School on Main Street
- Extend the Airline Trail from East Hampton through Portland to the town center/river area
- Provide additional trails from the Airline Trail Extension north to Glastonbury and south to Middletown
- RT 17A Streetscape extension- Expanded sidewalks, curb cut consolidation, pavement markings, lane re-configuration, elimination of above ground utilities, plantings, signage, lighting, furniture, etc. from the Arrigoni to north of Middlesex Avenue
- RT 17A Traffic calming and bike/ped improvements northward from the streetscape extension – narrower travel lanes and widen shoulder for better bicycle access with pavement markings, repair and extend sidewalks and widen where feasible while maintaining street trees
- Breezy Corners Road – intersection and drainage improvements at Middle Haddam Road
- Multi-use trail feasibility study – Trail study to determine the feasibility of a multi-use trail from Riverside Park in Portland to Tryon Street in Glastonbury. This could be extended west to link with Middletown and its complete streets network and north to the Glastonbury Ferry and be part of a regional trail system on both sides of the Connecticut River.

WESTBROOK
- Road/bridge improvements on Breakneck Road, Monahan Road, Cross Road, East Pond Meadow Road, Pond Meadow Road, RT 625, Dennison Road, McVeagh Road, RT 166, RT 153, RT 1, and RT 145, and Old Mill Trail
- Intersection improvements at Route 145/Pequot Park, Route 153/McVeagh Road, and Route 1/Kingfisher/S. Main
- Implement recommendations from the Route 1 Corridor Study: Route 1/Westbrook Heights/Library Intersection, Narrow/neck down crossing distance at Route 1/Old Clinton Road, Route 1/Town Green
- Bikeway connectors to rail station
- Transit oriented development near the rail station/ village center

- RT 145 Scenic road corridor
- Improved connections to the waterfront/marinas/boat launches
- Harbor dredging and improved marina access per Westbrook Blueways Plan
- Menunketesuck Greenway trail construction
- Sidewalk connector from rail station to Town Center
- Bus stops along RT 1 as necessary
- Extension of Shoreline Greenway from Menunketesuck Greenway at Clinton town line to Old Saybrook
- Implementation of town Sidewalk Plan: Route 1, Essex Road/Route 153, McVeagh Road, Willard Avenue, Pond Meadow Road, Spencer Plains Road
- Implementation of recommendations from Natural Hazard Mitigation Plan: Adopt a Complete Streets Policy, Evaluation of Town Center for improvements for safety and convenience, Establish bicycle routes and associated improvements, Future road connection areas (Pequot Park, Flat Rock Place and Toby Hill Road), Pond Meadow Road underpass improvements.
- Provide bicycle racks at town facilities and schools

ESTUARY TRANSIT DISTRICT / MIDDLETOWN TRANSIT DISTRICT/

- Alignment changes on system routes to provide more efficient and consistent service
- Creation of an Old Saybrook Train Station hourly pulse
- Frequency improvements to Routes 581, 584, 586, 590, 641, 643 and 644. These frequency improvements will enable an at least hourly service on these key routes
- Extending or starting evening service on Routes 581, 584, 585, 590, 641, and 644 that would provide service until 11pm.
- Saturday night service for key Routes including 581, 584, 585, and 590 that would provide service until 11pm.
- Starting Saturday service for Routes 643, 644, and 645 in the Shoreline region.
- Starting Sunday service for Routes 581, 584, 585, 590, 641, and 644.
- Continuation of existing and creation of new XtraMile on-demand micro transit service areas in the region
- Creation of Route 640: Old Saybrook Local
- Creation of Route 587: Crosstown
- Creation of a Downtown Middletown Shuttle
- Creation of Route 587: Crosstown
- Creation of a Downtown Middletown Shuttle
- Creation of an Old Saybrook Seasonal Shuttle to better connect summer residents and visitors with key attractions
- Better coordination to increase ease of transfer opportunities with other transit operators by meeting other system pulses
- Increased promotion and transfer opportunities with CT Rail connections
- Examine Transit Signal Priority as congestion grows
- Improved integration of bus service with Wesleyan University and Middlesex Community College, including options for partnering with CRCOG and SECCOG to promote student ridership
- Summer Services – Service to beach communities/ attractions in the summer tourism months possibly branded separately to attract visitors to the region
- Support and enhance transit options and schedule through the New Haven TMA Mobility Manager

LCRVCOG

- Preservation of rail rights of way for any future uses
- Advocate for the construction of bikeways, bike paths, pedestrian paths and multi-use trails to connect activity nodes, lessen congestion, and improve air quality
- Establish coalitions to promote and market multi-use trails and coordinate with CTDOT to incorporate bicycle and pedestrian accommodations in state projects
- Implement Route 1 Corridor Study recommendations
- Implement Route 81 Corridor Study recommendations
- Implement Route 66 Corridor Study recommendations
- Implement LCRV Transit Study Recommendations
- Implement Regional Transportation Safety Plan recommendations
- Implement Bicycle and Pedestrian Master Plan recommendations
- Implement municipal RSA recommendations
- Study Airlie Trail to Farming Canal Trail extension
- Support CTDOTs implementation of roundabout designs in the region where applicable
- Designation of scenic roads and highways
- Support livable communities initiatives
- Support Transit oriented development
- Support transportation control measures
- Support congestion management process
- Support regional and statewide intelligent transportation initiatives
- Support incident management initiatives
- Support community connectivity program activities
- Central usiness District (Middletown) parking garage
- RT 621 (Essex) conversion to one-way southbound
- RT 1 (Clinton) bicycle and pedestrian amenities
- Candlewood Hill Road (Haddam) capital improvements
- Saybrook Road (Middletown) capital improvements
- Smith Street (East Hampton) bicycle and pedestrian amenities
- RT 1 (Old Saybrook) bicycle and pedestrian amenities
- RT 17 (Durham) bicycle and pedestrian amenities
- Long Hill Road (Clinton) Intersection improvements

- RT 153 (Essex) bicycle and pedestrian amenities
- RT 1/Halls Road (Old Lyme) bicycle and pedestrian amenities
- Goose Hill Road (Chester) capital improvements
- Jackson Hill Road (Middlefield) capital improvements
- I 95 (Old Lyme) widening from the Baldwin Bridge to the Rocky Neck Connector
- Regional Freight Plan/Statewide Freight Plan
- Transportation system preservation programs and projects (repaving, bridge repair, roadway reconstruction, sign replacement, signal replacement, bridge inspections, etc.)
- Transportation system improvement programs and projects (safety enhancements, mobility enhancements, enhancements to increase productivity and economic growth, etc.)
- Support the FTA 5310 Program
- Support the State Matching Grant Program for Elderly and Disabled Demand Response Transportation
- Support a Safety Study along RT 9 south of Middletown assessing lighting and reflectivity

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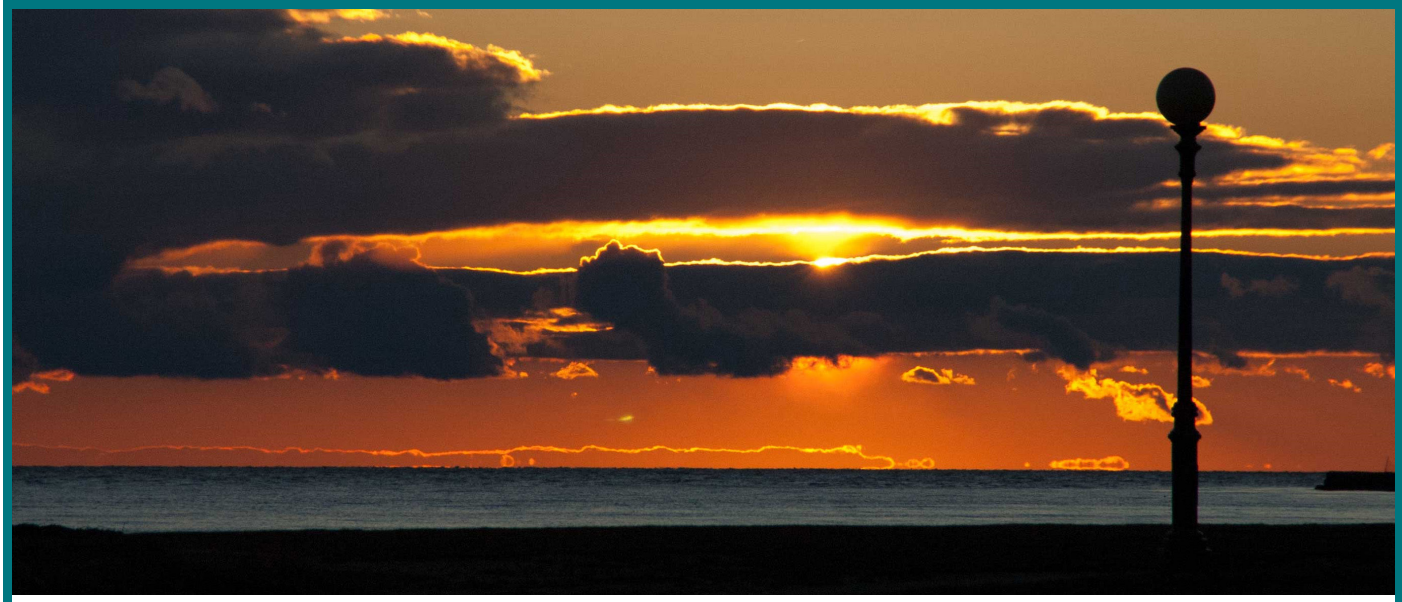

Chapter 7.

FINANCIAL PLAN & UNLIMITED CONSTRAINT

A. FINANCIAL PLAN

The Metropolitan Transportation Plan is required by federal guidelines to be fiscally constrained. This means plans can only include projects that the region can reasonably expect to afford to build and operate over the given time period. As a long range plan, the fiscal constraint must be based upon the estimates of the available revenue for transportation needs over the timeframe of the plan. CTDOT has provided estimates of the anticipated highway funding. These estimates have been allocated to major categories of system preservation and system improvements. System preservation projects include tasks such as roadway repaving and bridge repair or replacement. System improvement projects include designs that enhance safety, improve mobility, increase system productivity or promote economic growth.

The Federal Highway Administration (FHWA) estimate for the RiverCOG region 2023 – 2050 is $4,377,130,532. Of that estimate, $1 ,539,576,637 of the allocation of funding for preservation, determined by weighting factors which include vehicle miles of travel, congested vehicle miles of travel, and lane mile. The system improvement allocation is estimated at $1,207,553,894 and $1,630,000,000 is allocated to major projects of statewide significance. River COG estimates transit funds based on the prior LRPs and forecasts about $200,000,000 in transit funds from 2023 to 2050. The anticipated transit expenditures in table 7.3 are based on statewide programs funded in the region, as provided by FTA, rather than the region's allocation of the total statewide anticipated expenditures. Maintaining the transit system in a state of good repair and implementation of the TAM plan, requires the use of all transit funds for the scope of the MTP. It is estimated that there could be approximately $17 billion of federal and state transit funds available over the next 28 years. This number is based on a yearly total of federal and state funds of approximately $500 million with a yearly increase of 1.5%. The breakout of rail vs bus generally equates to a 70/30 split, therefore approximately $12 billion could be available for rail projects and $5 billion available for bus projects statewide

The projects listed in the regional transportation plan are funded with reasonably expected public resources. The majority of funding comes from the Federal Highway Administration and Federal Transit Administration. The State of Connecticut and municipal government re-sources provide most of the non-federal matching funds. Available funds and source estimates are shown in more detail in tables 7.1 through 7.3

B. ANTICIPATED HIGHWAY & TRANSIT EXPENDITURES

The implementation of many of the projects listed within this plan requires coordination between regional agencies, towns, and CTDOT to maximize the benefits derived from this planning process. Specific anticipated highway and transit expenditures are shown in Tables 7.3 and 7.4.

C. VISION PROJECTS

Certain regional plans and projects have or will have positive intermodal impact and benefit all seventeen towns and adjacent regions. While subsequent studies and plans will provide additional regional and town specific recommendations, projects of regional significance identified in the 2023- 2050 RTP and in need of reiteration include:

- road improvements for safety of all modes of travel (Complete Streets Program)
- coordinated transit routing and bus stop improvements
- bikeway corridor construction
- mapping of trail systems (recreational, marine, and heritage)
- construction of designated bicycle lanes and pedestrian pathways
- regional rail coordination and access
- boating and ferry access
- sidewalk construction and critical crosswalk connections

These projects will support inter-modal efficiency, encourage land use development which promotes sustainable transportation access, support greenway protection initiatives, and coordinate transportation capital improvements within the region's towns to achieve integration of sustainable intermodal access.

Table 7.1 Projected Available Highway Funds for the LCRV Region (2023 - 2050)

System Improvements	System Preservation	Major Projects	Total
$1,207,553,894	$1,539,576,637	$1,630,000,000	$4,377,130,532

Source: Connecticut Department of Transportation

Table 7.2 Projected Available Highway Funds for the LCRV Region (2023-2050)

	FTA	STATE	TOTAL	STATE ONLY
RAIL/MPO	$0	$0	$0	$25,000,000
RAIL/MULTI				
SLE	$0	$0	$0	$5.000.000
TRANSIT/TDs				
ETD	$380,000	$95,000	$475,000	$0
MTD	$5,368,000	$1,342,000	$6,710,000	$0

Table 7.3 Funding Source Estimates for the LCRV Region (2023 - 2050)

FHWA	FTA	STATE	LOCAL	Total
$3,501,704,426	$200,000,000	$856,569,580	$218,856,526	$4,777,130,532

Table 7.3 Financial Table

Town	Location	Description	Est. Year	Est. Cost
Highway				
Major Projects				
Branford-RI state line	I-95	Capacity and safety improvements from Eastern PEL		$1,500,000,000
Cromwell	RT 9	Interchange improvements at exit 19/ Safety and congestion improvements RT 372/RT3		$30,000,000
Middletown	RT 9	Removal of traffic signals		$75,000,000
Middletown	RT 9/RT 17	Operational and safety improvements RT 17 ramp to RT 9 NB		$25,000,000
Major Projects Total				$1,630,000,000
Tip Projects				
System Improvements				
Cromwell	RT 9	CCTV Installation	2023	$2,393,000
Cromwell	RT 9/RT 372	CCTV installation	2023	$8,313,000
Middletown	RT 9	Removal of traffic signals	2023	$15,082,000
Statewide	Various	On/off system bridge improvements	2023	$50,000,000
Statewide	Various	Safety program HSIP	2023	$22,222,000
System Preservation				
Statewide	Various	CE sign support intersections NHS	2023	$2,250,000
Statewide	Various	CE bridge inspection NHS/NBI	2023	$15,000,000
Statewide	Various	SF bridge inspection NHS	2023	$2,000,000
Statewide	Various	Load ratings for bridges NHS	2023	$2,000,000
Statewide	Various	CHAMP safety service patrol	2023	$4,537,000
Statewide	Various	CE sign support inspection non NHS	2023	$500,000
Statewide	Various	Line striping/pavement marking	2023	$8,000,000
Statewide	Various	CE bridge inspection non NHS	2023	$8,000,000
Statewide	Various	SF bridge inspection non NHS	2023	$2,500,000
Statewide	Various	Load rating for bridges non NHS	2023	$1,000,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
System Improvements				
Middletown	RT 9	Removal of traffic signals	2024	$15,000,000
Statewide	Various	On/off system bridge improvements	2024	$50,000,000
Statewide	Various	Safety Program HSIP	2024	$22,222,000
System Preservation				
Statewide	Various	CE sign support inspection NHS	2024	$2,250,000
Statewide	Various	CE bridge inspection NHS/NBI	2024	$50,000,000
Statewide	Various	SF bridge inspection NHS	2024	$2,000,000
Statewide	Various	Load rating for bridges NHS	2024	$2,000,000
Statewide	Various	CHAMP safety service patrol	2024	$4,537,000
Statewide	Various	CE sign support inspection non NHS	2024	$500,000
Statewide	Various	Mast arm/span pole inspection	2024	$700,000
Statewide	Various	Line striping/pavement markings	2024	$8,000,000
Statewide	Various	CE bridge inspection non NHS	2024	$8,000,000
Statewide	Various	SF bridge inspection non NHS	2024	$2,500,000
Statewide	Various	Load rating for bridges non NHS	2024	$1,000,000
System Preservation				
Statewide	Various	CE sign support inspection NHS	2025	$2,500,000
Statewide	Various	CE bridge inspection NHS	2025	$15,000,000
Statewide	Various	SF bridge inspection NHS	2025	$2,000,000
Statewide	Various	Load rating for bridges NHS	2025	$2,000,000
Statewide	Various	CE sign support inspection non NHS	2025	$500,000
Statewide	Various	CE bridge inspection non NHS	2025	$8,000,000
Statewide	Various	SF bridge inspection non NHS	2025	$2,500,000
Statewide	Various	Load rating for bridges non NHS	2025	$1,000,000
TIP Improvements			23-25	$185,232,000
TIP Preservation			23-25	$126,054,000
TIP Projects Total			23-25	$311,286,000
LOTCIP/TAP				
System Improvements				
Clinton	RT 1	Sidewalk improvements	2023	$500,000
Haddam	Candlewood Hill Road	Roadway improvements	2023	$3,500,000
Middletown	Saybrook Road	Roadway improvements	2023	$3,900,000
East Hampton	Smith Street	Roadway improvements	2024	$2,000,000
Old Saybrook	RT 1	Sidewalk improvements	2024	$2,000,000
Durham	RT 17	Sidewalk improvements	2025	$1,500,000
Haddam	Candlewood Hill Road	Roadway improvements	2025	$2,500,000
Clinton	Long Hill Road	Roadway improvements	2025	$1,500,000
Essex	RT 154	Sidewalk improvements	2026	$1,500,000
Old Lyme	Hall's Road	Roadway improvements	2026	$3,000,000
Chester	Goose Hill Road	Roadway improvements	2027	$2,000,000
Middlefield	Jackson Hill Road	Roadway improvements	2027	$2,000,000
Westbrook	RT 1	Sidewalk improvements	2025	$1,000,000
Middletown	Newfiled Connector	Trail improvements	2025	$1,500,000
LOTCIP/TAP Total			23-27	$28,400,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
Capital Plan				
System Preservation				
Durham	RT 68	Replace bridge 02442 over Saw Mill Brook	2023	$1,700,000
Haddam	RT 82/RT 154	Replace T-type intersection with roundabouts	2023	$7,300,000
Lyme	McIntosh Road	Replace bridge 04726 over Eight Mile River	2023	$2.025,000
Old Lyme	RT 156	Replace bridge 02713 over Four Mile Rive and 06896 over Armstrong Brook	2023	$7,900,000
Essex	RT 154	Replace signals at RT 9 NB ramps at Old Dump Road	2024	$1,251,000
Middletown	I 91	Replace bridge 06891 over brook	2024	$1,200,000
East Haddam	RT 149	Replace Bridge 02698 over brook	2025	$2,500,000
East Hampton	RT 16	Replace bridge 00853 over Salmon River	2025	$6,400,000
Capital Plan Total			23-26	$30,276,000
Projected expenditures				
Major Projects				$1,630,000,000
Improvements				$213,632,000
Preservation				$156,230,000
Balance				
Major Projects				$0
Improvements				$993,921,894
Preservation				$1,383,346,637
RT 1 Study				
COG/Clinton	RT 1/Liberty Street	Intersection Improvements		$75,000
COG/Clinton	RT 1/John Street	Roadway Improvements		$662,500
COG/Clinton	RT 1/High Street	Roadway Improvements		$1,503,000
COG/Clinton	RT 1/Dan Vese Way	Roadway Improvements		$1,102,000
COG/Clinton	RT 1/Stevens Road	Roadway Improvements		$1,000,000
COG/Clinton	RT 1/I 95	Signage		$5,000
COG/Clinton	RT 1	Pedestrian Improvements		$225,000
COG/Clinton	RT 1	Pedestrian Improvements		$15,000
COG/Clinton	RT 1	Pedestrian Improvements		$100.00
COG/Westbrook	RT 1/Westbrook Heights	Intersection Improvements		$50,000
COG/Westbrook	RT 1/Marina District	Roadway Improvements		$3,100,000
COG/Westbrook	RT 1/Town Green	Roadway Improvements		$352,000
COG/Westbrook	RT 1	Pedestrian Improvements		$100,000
COG/Westbrook	RT 1	Pedestrian Improvements		$5,000
COG/Westbrook	RT 1	Roadway Improvements		$60,000
COG/Westbrook	RT 1/Hammock Road	Pedestrian Improvements		$2,000
COG/Old Saybrook	RT 1/RT 166	Intersection Improvements		$700,000
COG/Old Saybrook	RT 1/Business District	Roadway Improvements		$1,000,000
COG/Old Saybrook	RT 1	Roadway Improvements		$4,030,000
COG/Old Saybrook	RT 1	Roadway Improvements		$8,350,000
COG/Old Saybrook	RT 1	Pedestrian Improvements		$50,000
COG/Old Saybrook	RT 1	Pedestrian Improvements		$5,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Old Saybrook	RT 1	Pedestrian Improvements		$2,500
				$22,394,100
RT 81 Study				
COG/Clinton	RT 81/RT 1	Intersection Improvements		$10,000
COG/Clinton	RT 81	Rail Tressel Improvements		$120,000
COG/Clinton	Unilever Site	ROW Improvements		$300,000
COG/Clinton	RT 81/Central Avenue	Intersection Improvements		$650,000
COG/Clinton	RT 81 High Street	Pedestrian Improvements		$100,000
COG/Clinton	RT 81	Pedestrian Improvements		$600,000
COG/Clinton	RT 81/North High Street	Intersection Improvements		$20,000
COG/Clinton	RT 81/I 95 Overpass	Pedestrian Improvements		$50,000
COG/Clinton	RT 81/Glennwood Road	Pedestrian Improvements		$200,000
COG/Clinton	RT 81/Commuter Lot	Pedestrian Improvements		$40,000
COG/Clinton	RT 81/I 95 SB	Pedestrian Improvements		$1,000,000
COG/Clinton	RT 81/Library	Pedestrian Improvements		$60,000
COG/Clinton	RT 81/Former School	Trail Improvements		$400,000
COG/Clinton	RT 81/Clinton Crossing	Pedestrian Improvements		$500,000
COG/Clinton	Clinton Crossing	Pedestrian Improvements		$500,000
COG/Clinton	RT 81	Roadway Improvements		$800,000
				$5,350,000
RT 66 Study				
COG/Portland	Marlborough/Main Street	Roadway Improvements		$2,000,000
COG/Portland	RT 66	Pedestrian Improvements		$1,500,000
COG/Portland	RT 66	Multi-modal Improvemetns		$5,000,000
COG/Portland	RT 66	Roadway Improvements		$165,000
COG/Portland	RT 66/Gas Station	Roadway Improvements		$710,000
COG/Portland	RT 66/Ledges	Roadway Improvements		$5,000,000
COG/East Hampton	RT 66/RT 151/Depot Hill	Intersection Improvements		$4,200,000
COG/East Hampton	RT 66/RT 16	Intersection Improvements		$880,000
COG/East Hampton	RT 66/Childs Road	Roadway Improvements		$550,000
COG/East Hampton	RT 66/Commercial District	Roadway Improvements		$470,000
COG/East Hampton	RT 66/Paul and Sandy's	Roadway Improvements		$2,200,000
COG/East Hampton	RT 66/Edgewater Hill	Intersection Improvements		$870,000
COG/East Hampton	RT 66/Edgewater Hill	Intersection Improvements		$2,300,000
COG/East Hampton	RT 66/Lake Drive	Roadway Improvements		$380,000
				$26,225,000
RTSP Motorized				
COG/Middletown	RT 3 bet Rose and Westfield	Roadway Improvements		$5,500
COG/Clinton	RT 81 bet Hurd Bridge Rd and Oakwood Ln	Roadway Improvements		$3,500
COG/Portland	RT 17/RT 66 bet CT-17A and Perry Ave	Roadway Improvements		$14,500
COG/Middlefield	RT 147 bet Lakeview Pl and Powder Hill Rd	Roadway Improvements		$17,000
COG/Middletown	RT 17 bet Pinewood Ter and Ward St	Roadway Improvements		$335,000
COG/Portland	RT 17/RT 66 bet High St and Grove St	Roadway Improvements		$4,500

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Middletown	RT 9/RT 17 bet St John's Sq and Washington St	Roadway Improvements		$4,500
COG/Portland	RT 17/RT 66 bet Grand-view Ter and Sand Hill Rd	Roadway Improvements		$8,000
COG/Middletown	RT 3 bet La Rosa Ln and Congdon St E	Roadway Improvements		$109,500
COG/Chester	RT 154 bet Gilbert Hill Rd and Winter Ave	Roadway Improvements		$14,000
COG/Westbrook	RT 166 bet Cold Spring Dr and BJM Pumps	Roadway Improvements		$17,000
COG/East Hampton	RT 16 bet Harlan Pl and Tartia Rd	Roadway Improvements		$17,000
COG/Middletown	RT 17/RT 66 bet overpass above N Main St and ramps to Lower Main St	Roadway Improvements		$17,000
COG/Cromwell	RT 3 bet Stop & Shop South entrance and 99 Restaurant entrance	Roadway Improvements		$2,000
COG/Durham	RT 79 bet S End Ave and Sand Hill Rd	Roadway Improvements		$14,000
COG/Haddam	RT 81 bet Hubbard Rd/ Pokorny Rd and Soobitsky Rd	Roadway Improvements		$17,500
COG/Middletown	RT 66 bet Computer Tune & Lube Entrance and Mc-Donald's Entrance	Roadway Improvements		$85,000
COG/Killingworth	RT 81 bet RT 148 and L Hommedieu Rd	Roadway Improvements		$15,500
COG/Portland	RT 66 bet Payne Blvd/ Middle Haddam Rd and Grist Mill Ln/Oakum Dock Rd	Roadway Improvements		$102,000
COG/Middletown	RT 66 bet RT 157 and Bernie O'Rourke Dr and Sunoco gas station	Roadway Improvements		$95,000
COG/Durham	RT 16 bet Stage Coach Rd (West Entrance) and Coe Rd	Roadway Improvements		$17,500
COG/Chester	RT 148 and RT 145	Roadway Improvements		$5,000
COG/Middletown	RT 66 bet Boston Rd and CT-157/Bernie O'Rourke Dr	Roadway Improvements		$10,500
COG/Old Saybrook	RT 154 and Bokum Rd	Roadway Improvements		$1,000,000
COG/East Hampton	RT 66 and RT 151	Roadway Improvements		$2,000
COG/East Haddam	RT 434 bet Devil's Hop-yard State Park entrance and Jones Hill Rd/Mitchell Rd	Roadway Improvements		$1,000
COG/Old Saybrook	RT 1 bet Burger King Entrance and Stage Rd/ River St	Roadway Improvements		$95,500
COG/Portland	RT 17/RT 66 bet Ramps to Lower Main St and CT-17/ CT-66 (Marlborough St)	Roadway Improvements		$95,500
COG/Middletown	RT 66 bet Sunoco gas station and Butternut St	Roadway Improvements		$14,000
COG/Middletown	Main Street bet RT 66and Court St	Roadway Improvements		$10,500
COG/Cromwell	RT 3 bet RT 524 and Stop & Shop South entrance	Roadway Improvements		$99,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Old Saybrook	RT 1 bet RT 166 (Spencer Plains Rd) and Denmore Ln	Roadway Improvements		$85,000
COG/Middletown	RT 17/RT 66 bet N Main St and overpass above N Main St	Roadway Improvements		$6,000
COG/Middletown	RT 9 and RT 17	Roadway Improvements		$1,000
COG/Cromwell	RT 372 bet Kirby Rd and Industrial Park Rd	Roadway Improvements		$5,000
COG/Middletown	Saybrook Road bet Dejohn Dr and Windy Hill Dr	Roadway Improvements		$10,000
COG/Cromwell	RT 372 bet I-91 North-bound ramps and Coles Rd	Roadway Improvements		$6,500
COG/Cromwell	RT 3 bet 99 Restaurant entrance and RT 372	Roadway Improvements		$6,500
COG/Middletown	RT 66 bet Rapallo Ave and Washington St	Roadway Improvements		$10,000
RTSP Nonmotorized				
COG/Middletown	Church Street bet Pine St/ Foss Hill Dr and High St	Pedestrian Improvements		$7,000
COG/Middletown	Main Street between Washington St and Court St	Pedestrian Improvements		$10,000
COG/Middletown	RT 66 bet Rapallo Ave and Washington St	Pedestrian Improvements		$4,000
COG/Old Saybrook	RT 1 bet Starbucks entrance and Stage Rd/ River St	Pedestrian Improvements		$4,000
COG/Old Saybrook	RT 1 bet Baum Ave and School House Rd	Pedestrian Improvements		$4,000
COG/Middletown	RT 66 and Washington Street	Pedestrian Improvements		$3,000
COG/Clinton	"RT 1 bet Beach Park Rd/Plymouth Ct and Mal-lard Ln/Meadow Rd"	Pedestrian Improvements		$4,000
COG/Cromwell	RT 372 and RT 524	Pedestrian Improvements		$5,000
COG/Middletown	RT 3 and Westfield St	Pedestrian Improvements		$2,000
COG/Middletown	RT 66 and Grand St	Pedestrian Improvements		$2,000
COG/Middletown	RT 217 and W Lake Dr/E Lake Dr	Pedestrian Improvements		$10,000
COG/Middletown	RT 66 and Plaza Drive	Pedestrian Improvements		$22,000
RTSP Municipalities				
COG/Chester	RT 145 and RT 148	Roadway improvements		$12, 000
COG/Chester	RT 154 bet Goose Hill Rd/ Parkers Point Rd to Castle View Dr	Roadway improvements		$15,000
COG/Chester	RT 148 and RT 145	Pedestrian improvements		$1,000,000
COG/Chester				
COG/Clinton	RT 81 and and Hurd Bridge Rd/Rocky Ledge Dr	Roadway improvements		$11,500
COG/Clinton	RT 81 bet from Central Ave to Rt 1 (West Main St)	Roadway improvements		$10,000
COG/Clinton	RT 1	Pedestrian improvements		$1,000,000
COG/Clinton	RT 81 and N High St	Roadway improvements		$1,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Cromwell	Court St and Woodside Rd/Orchard Rd	Roadway improvements		$1,500,000
COG/Cromwell	RT 9 Exit 19 Southbound and RT 372	Roadway improvements		$1,000,000
COG/Cromwell	RT 99 bet RT 372 and Iron Gate Ln/Nooks Hill Rd	Roadway improvements		$1,000,000
COG/Cromwell	Townwide	Roadway improvements		$1,050,000
COG/Deep River	RT 80 and Cedar Swamp Rd/Westbrook Rd	Roadway improvements		$31,000
COG/Deep River	RT 154/Village center	Roadway improvements		$5,000
COG/Deep River	RT 80	Roadway improvements		$5,000
COG/Durham	RT 17 and Parmelee Hill Rd	Roadway improvements		$5,000
COG/Durham	RT 17 and Coon Club Rd	Roadway improvements		$5,000
COG/Durham	RT 157 and RT 68	Roadway improvements		$3,000,000
COG/Durham	RT 68	Roadway improvements		$2,500
COG/East Haddam	RT 149 from RT 151 to N Moodus Rd/William Palmer Rd	Roadway improvements		$200,000
COG/East Haddam	RT 149 and Falls Bashan Rd	Roadway improvements		$1,000,000
COG/East Haddam	Townwide	Roadway improvements		$25,000
COG/East Hampton	RT 151 and RT 439	Roadway improvements		$12,000
COG/East Hampton	RT 16 and Tartia Ave	Roadway improvements		$28,000
COG/East Hampton	RT 66 and RT 151	Roadway improvements		$170,000
COG/East Hampton	RT 66/Village center	Roadway improvements		$20,000
COG/East Hampton	RT 16 and RT 196	Roadway improvements		$4,000
COG/Essex	RT 153 and Mares Hill Rd	Roadway Improvements		$1,000,000
COG/Essex	RT 154 and RT 9 exit 3	Roadway Improvements		$1,000,000
COG/Essex	RT 154 and RT 153	Roadway Improvements		$2,500
COG/Essex	RT 602 and Bracket Ln	Roadway Improvements		$5,000
COG/Haddam	RT 154 bet Hayden Hill Rd and Jail Hill Rd	Roadway improvements		$500,000
COG/Haddam	RT 81/RT 154 near Candlewood Hill Rd	Roadway improvements		$20,000
COG/Haddam	Townwide	Roadway improvements		$20,000
COG/Killingworth	RT 81 and Green Hill Rd	Roadway Improvements		$25,000
COG/Killingworth	RT 148 near Kroopa Pond	Roadway Improvements		$15,000
COG/Lyme	RT 156 at Marvin Cemetery	Roadway Improvements		$15,000
COG/Lyme	RT 156 near Hamburg Cove	Roadway Improvements		$10,000
COG/Lyme	Townwide	Roadway Improvements		$1,000,000
COG/Middlefield	RT 66 and RT 147	Roadway Improvements		$15,000
COG/Middlefield	RT 66 and and Higby Rd/Jackson Hill Rd	Roadway Improvements		$15,000
COG/Middlefield	RT 147 south of Rosemary Ln	Roadway Improvements		$200,000
COG/Middletown	RT 3 bet RT 66 and Tuttle Rd	Roadway Improvements		$500,000
COG/Middletown	RT 66 bet RT 3/Vine St and Main St	Roadway Improvements		$500,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Middletown	Citywide	Roadway Improvements		$25,000
COG/Old Lyme	RT 1 bet Boggy Hole Rd to Town Woods Rd	Roadway improvements		$5,000
COG/Old Lyme	RT 156 and and Smith Neck Rd/Mile Creek Rd	Roadway improvements		$2,500
COG/Old Lyme	RT 1 and Four Mile River Rd	Roadway improvements		$5,000
COG/Old Saybrook	RT 1/RT 154 and RT 1/Mill Roack Rd E	Roadway Improvements		$25,000
COG/Old Saybrook	RT 1/RT 154 bet RT 154/N Main St and River St/Stage Rd	Roadway Improvements		$10,000
COG/Portland	RT 17A North of Coe Ave – Gildersleeve Area	Roadway Improvements		$500,000
COG/Portland	RT 66 at the ledges	Roadway Improvements		$25,000
COG/Portland	RT 17A South of Coe Ave	Roadway Improvements		$170,000
COG/Westbrook	RT 145 bet Interstate 95 and Cross Rd	Roadway Improvements		$22,000
COG/Westbrook	RT 153 bet bet I 95 and Westbrook/Essex TL	Roadway Improvements		$22,000
COG/Westbrook	Seaside Ave	Roadway Improvements		$10,000
COG/Westbrook	Pond Meadow Rd	Roadway Improvements		$5,000
				$19,238,500
Bike/Ped Plan				
COG/Chester	Village	Bike/ped improvements		$500,000
COG/Chester	Region	Bike/ped improvements		$500,000
COG/Chester	State	Bike/ped improvements		$500,000
COG/Clinton	Village	Bike/ped improvements		$500,000
COG/Clinton	Beach	Bike/ped improvements		$500,000
COG/Clinton	Region	Bike/ped improvements		$500,000
COG/Clinton	State	Bike/ped improvements		$500,000
COG/Cromwell	Village	Bike/ped improvements		$500,000
COG/Cromwell	State	Bike/ped improvements		$500,000
COG/Deep River	Village	Bike/ped improvements		$500,000
COG/Deep River	Region	Bike/ped improvements		$500,000
COG/Deep River	State	Bike/ped improvements		$500,000
COG/Durham	Village	Bike/ped improvements		$500,000
COG/Durham	Region	Bike/ped improvements		$500,000
COG/Durham	State	Bike/ped improvements		$500,000
COG/East Haddam	Village	Bike/ped improvements		$500,000
COG/East Haddam	Beach	Bike/ped improvements		$500,000
COG/East Haddam	Region	Bike/ped improvements		$500,000
COG/East Haddam	State	Bike/ped improvements		$500,000
COG/East Hampton	Village	Bike/ped improvements		$500,000
COG/East Hampton	Beach	Bike/ped improvements		$500,000
COG/East Hampton	Region	Bike/ped improvements		$500,000
COG/East Hampton	State	Bike/ped improvements		$500,000
COG/Essex	Village	Bike/ped improvements		$500,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
COG/Essex	Region	Bike/ped improvements		$500,000
COG/Essex	State	Bike/ped improvements		$500,000
COG/Haddam	Village	Bike/ped improvements		$500,000
COG/Haddam	Region	Bike/ped improvements		$500,000
COG/Haddam	State	Bike/ped improvements		$500,000
COG/Killingworth	Region	Bike/ped improvements		$500,000
COG/Killingworth	State	Bike/ped improvements		$500,000
COG/Lyme	Village	Bike/ped improvements		$500,000
COG/Lyme	Region	Bike/ped improvements		$500,000
COG/Lyme	State	Bike/ped improvements		$500,000
COG/Middlefield	Village	Bike/ped improvements		$500,000
COG/Middlefield	Beach	Bike/ped improvements		$500,000
COG/Middlefield	Region	Bike/ped improvements		$500,000
COG/Middlefield	State	Bike/ped improvements		$500,000
COG/Middletown	Village	Bike/ped improvements		$500,000
COG/Middletown	Region	Bike/ped improvements		$500,000
COG/Middletown	State	Bike/ped improvements		$500,000
COG/Old Lyme	Village	Bike/ped improvements		$500,000
COG/Old Lyme	Beach	Bike/ped improvements		$500,000
RiverCOG/Old Lyme	Region	Bike/ped improvements		$500,000
RiverCOG/Old Lyme	State	Bike/ped improvements		$500,000
COG/Old Saybrook	Village	Bike/ped improvements		$500,000
COG/Old Saybrook	Beach	Bike/ped improvements		$500,000
COG/Old Saybrook	Region	Bike/ped improvements		$500,000
COG/Old Saybrook	State	Bike/ped improvements		$500,000
RiverCOG/Portland	Village	Bike/ped improvements		$500,000
RiverCOG/Portland	Region	Bike/ped improvements		$500,000
RiverCOG/Portland	State	Bike/ped improvements		$500,000
COG/Westbrook	Village	Bike/ped improvements		$500,000
COG/Westbrook	Beach	Bike/ped improvements		$500,000
COG/Westbrook	Region	Bike/ped improvements		$500,000
COG/Westbrook	State	Bike/ped improvements		$500,000
				$28,000,000
Projected expenditures				
Improvements				$101,207,600
Balance				
Major Projects				$0
Improvements				$892,714,294
Preservation				$1,383,346,637
Transit				
Major Projects				
MTD	Infrastructure improvements	accommodate electric vehicles and bring facility up to state of good repair		$6,710,000
	Infrastructure improvements	accommodate electric vehicles and bring facility up to state of good repair		$475,000
Various	Park and ride lots	Repairs and improvements		$56,500,000
Various	Park and ride lots	Shelter replacements		$234,000

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
Various	PIDS	Connectivity and Improvements to SLE and the Hartford Line		$5,000,000
Various	Infrastructure improvements	Middletown swing bridge rehabilitation		$25,000,000
Major Projects Total				$93,919,000
TIP Projects				
MTD	MTD	Admin capital/misc support	2023	$300.00
ETD	ETD	Admin capital misc support	2023	$56,000
Various	Statewide	Statewide bus shelter improvements	2023	$1,500,000
Various	CTTransit	Facility improvements/admin capital	2023	$1,000,000
Various	Statewide	Transit capital planning	2023	$450,000
Various	Rural	5310 enhanced mobility/seniors and disabled	2023	$374,000
MTD	MTD	5311 capital	2023	$5,000
MTD	MTD	5311 operating	2023	$166,000
ETD	ETD	5311 capital	2023	$100,000
ETD	ETD	5311 operating	2023	$82,000
Various	Various	5311 program adjust to actual appr/admin/RTAP	2023	$500,000
Various	CTTransit	Systemwide bus replacements	2023	$4,938.00
Various	CTTransit	Facility improvements	2023	$938,000
MTD	MTD	Admin capital/misc support	2024	$300,000
MTD	MTD	Facility improvements	2024	$500.00
MTD	MTD	Replace 3 30' buses	2024	$1,875,000
ETD	ETD	Admin capital/misc support	2024	$400,000
Various	Statewide	Statewide bus shelter improvements	2024	$1,500,000
Various	CTTransit	Facility improvements/admin capital	2024	$1,000,000
Various	CTTransit	Facility improvements/admin capital (htfd/stam)	2024	$35,000,000
Various	CTTransit	Bus replacements	2024	$21,250,000
Various	Statewide	Transit capital planning	2024	$450,000
Various	Rural	5310 enhanced mobility/seniors and disabled	2024	$385,000
MTD	MTD	5311 capital	2024	$10,000
MTD	MTD	5311 operating	2024	$176,000
ETD	ETD	5311 capital	2024	$635,000
ETD	ETD	5311 operating	2024	$87,000
Various	Various	5311 program adjust to actual appr/admin/RTAP	2024	$500,000
Various	CTTransit	Systemwide bus replacements	2024	$938,000
Various	CTTransit	Facility improvements	2024	$4,938,000
TIP Projects Total			23-25	$77,621,000
Other				
Chester	Cester/Hadlyme Ferry	Operations		
Bus Study				
RiverCOG	New operations and maintenace facility			
RiverCOG	Technology upgrades	AVL, IVR, radio system, fare collection, scheduling system		
RiverCOG	Rebranding/marketing			

Table 7.4 Financial Table (continued)

Town	Location	Description	Est. Year	Est. Cost
RiverCOG	Non-revenue vehicles			
RiverCOG	581 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	582 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	583 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	584 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	585 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	586 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	590 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	641 algnment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	642 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	643 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	644 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	645 alignment	Recommended for all routes to make service faster, more direct, more reliable, and more efficient and anincrease in Dial-A-Ride and ADA capacity		
RiverCOG	640 new	Old Saybrook local		
RiverCOG	587 new	Middletown crosstown		
RiverCOG	Xtra mile new	Middletown/Wesleyan zone		
RiverCOG	Xtra mile new	Riverside zone		
RiverCOG	Xtra mile new	Southeast zone		
RiverCOG	Shuttles new	Downton Middletown		
RiverCOG	Shuttles new	Old Saybrook seasonal		
RiverCOG	Service span changes	Expansion of service hours (weekday evenings Sunday service, expanded weekday hours)		
RiverCOG	Service frequency changes	Adjustments to weekday servce in Middletown		
RiverCOG	Service frequency changes	Introduce a shoreline area pulse point at Old Saybrook train station		
RiverCOG	Service frequency changes	Meeting other system pulses		
RiverCOG	Systemwide changes	Promote transfer opportunities with CTtransit		
RiverCOG	Systemwide changes	Promote transfer opportunities with Ctrail		
RiverCOG	Systemwide changes	Transition away from flag stop systems / Add more designated bus stops		
RiverCOG	Systemwide changes	Install more bus shelters with seating		
RiverCOG	Systemwide changes	Consider transit signal priority as congestion grows		
RiverCOG	Systemwide changes	Regional delivery of Dial-A-Ride and ADA services		
RiverCOG	Systemwide changes	Improved hub infrastructure at Old Saybrook train station		

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Appendix A:

PUBLIC INVOLVEMENT

PUBLIC INVOLVEMENT

A robust public involvement process is essential in the planning process. Public review, comments, and questions bring new information forward and ensure that the plan accurately reflects the community. The information received through the public involvement process not only assists the writing of the plan, but further assists decision makers as they use the Metropolitan Transportation Plan in making regional transportation investments.

The public comment period for the Metropolitan Transportation Plan commenced on March 1, 2019 and ended April 1, 2019. The MPO voted to provisionally adopt the Metropolitan Transportation Plan at their meeting on March 27, 2019 contingent upon there being no substantial additions or modifications to the Plan before the end of the public comment period. No significant comment was received after the provisional adoption of the draft plan.

The draft plan was published on the RiverCOG website and a notice was issued to local papers on March 1, 2019. Two public comment sessions were scheduled, the first was held at the Middletown Area Transit meeting on March 13 at the MAT Building, 91 N. Main St., Middletown. A second public comment session was held on March 25 prior to the Regional Planning Committee meeting at the RiverCOG office.

04/27/22 LCRV COG/MPO meeting

COG and MPO Board members were told about the update process, schedule, and their role in the MTP revisions and asked that status updates be provided to the COG and MPO Board on a regular as basis as the plan is developed

05/25/22 LCRV COG/MPO meeting

Discussion of municipal priorities

06/22/22 LCRV COG/MPO meeting

Discussion of project priority list, schedule. Discussion of recently completed the Regional POCD and Natural Hazard Mitigation Plan update and will soon complete the Regional Housing Plan for new integration inputs.

06/27/22 LCRV RPC meeting

Discussion of update process and schedule. Transit needs and challenges discussion as well as transit integration study. Invite to ETDs transit planner to the net RPC meeting.

07/27/22 LCRV COG/MPO meeting

Discussion of recently completed Regional Transportation Safety Plan and Bicycle and Pedestrian Master Plan for new transportation inputs

09/19/22 LCRV RPC meeting

Discussion of MTP chapters and schedule.

09/28/22 LCRV COG/MPO meeting

Discussion of draft MTP/AQC/Endorsement schedule

10/26/22 LCRV COG/MPO meeting

Discussion of draft MTP update status

11/02/22 Middlesex COC Environment and Infrastructure meeting

Discussion of update process, schedule, public involvement, chapters and projects

11/30/22 LCRV COG/MPO meeting

Discussion of upcoming public information meetings on the MTP over the next two weeks. A draft is currently being worked on. There are new data inputs such as the RPOCD, the Regional Housing Plan, the LCRV Transit Study, etc. and schedule update.

12/08/22 In-person public information meeting

SWOT Analysis

12/13/22 Virtual public information meeting

Presentation and stakeholder input

Appendix B:

ENVIRONMENTAL JUSTICE

ENVIRONMENTAL JUSTICE

Transportation projects using federal funds have to comply with Title VI of the Civil Rights Act of 1964 and Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Population, of 1994. Title VI states that persons cannot be excluded from participation in, denied benefits of, or subjected to discrimination under programs receiving federal assistance based on race, color or national origin. E.O. 12898 furthers this cause by addressing the effects of programs, policies, and activities on minority and low income populations.

Incorporating environmental justice (EJ) into the planning process makes for better transportation decisions that meet the needs of everyone. It does so by:

- Mitigating impacts on minority and low income populations
- Enhancing participation in the decision making process and;
- Assuring minority and low income populations receive a proportionate share of benefits.

RiverCOG has an EJ work program consisting of ongoing and constantly evolving tasks. Primary tasks include keeping statistics at the census block group level in relation to minority and low income communities and providing this information in tabular and mapped formats, keeping a current EJ mailing list consisting of interested organizations such as church groups, social service organizations, and neighborhood groups, and also use of alternative media sources where applicable. Outreach is improved by including a representative of minority and low income communities in the special study advisory committees when applicable and working with areas directly affected by any such study using cooperative methods agreed upon by all involved parties.

RiverCOG mitigates disproportionately high and adverse impacts in the planning process by first identifying potential impacts of proposed plans and programs and then comparing the potential impacts of the proposed alternatives. Potential impacts are then analyzed to see if minority and low-income populations are adversely affected and modifications made to mitigate disproportionate impacts to the communities. Enhanced public participation and impact mitigation in the early stages of project development are two ways to assure minority and low income populations receive an appropriate share of benefits resulting from federal expenditures.

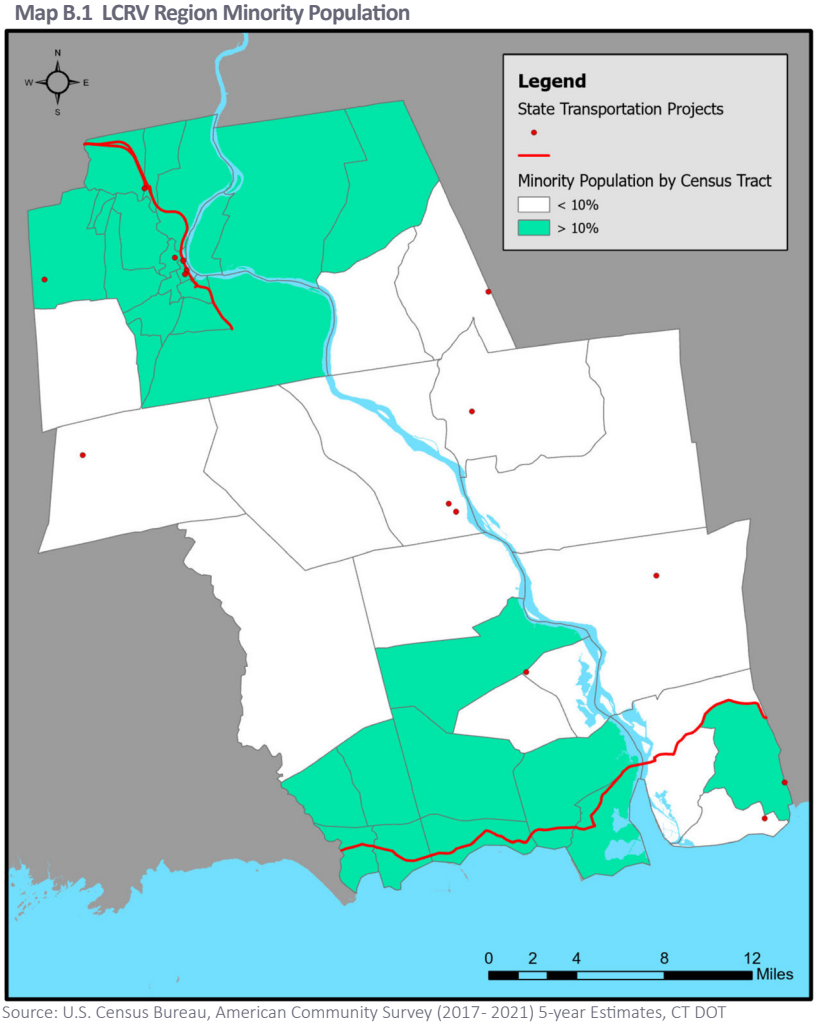
MINORITY POPULATION

RiverCOG keeps statistics and maps at the various geographic census levels for the White, Black, American Indian/Alaskan Native, Asian, and Native Hawaiian/Pacific Islander, Other, two or more races, and Hispanic Origin populations. Map B.1 highlights areas within the LCRV region with minority populations greater than 10%.

LOW INCOME POPULATION

The ratio of income to poverty level is determined by the U.S. Bureau of the Census as part of the decennial census, based on household size and income. Poverty level statistics are then produced for persons residing in households below the poverty level. The low income population is considerably smaller than the minority population in the region. Map

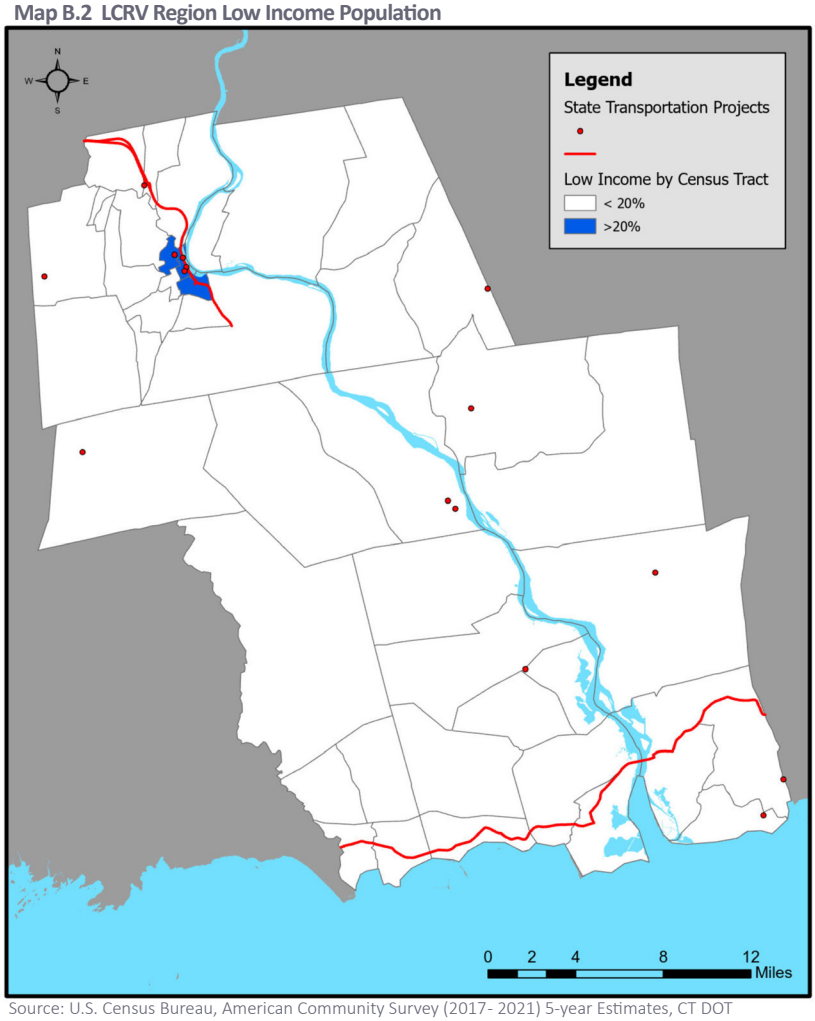
Map B.1 LCRV Region Minority Population



Source: U.S. Census Bureau, American Community Survey (2017- 2021) 5-year Estimates, CT DOT

B.2 shows areas within the LCRV region where the percentage of low income households exceeds 20%.

Map B.2 LCRV Region Low Income Population



Source: U.S. Census Bureau, American Community Survey (2017- 2021) 5-year Estimates, CT DOT

LIMITED ENGLISH PROFICIENCY

Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP) was signed on August 11, 2000. The E.O. requires that federal agencies or agencies receiving federal financial assistance examine the services they provide and implement a system by which LEP populations can access services without unduly burdening the agency. A LEP person is a person who does not speak English as their primary language and has limited ability to read, speak, write or understand English. They do, however, speak another language, and due to their limited English fluency, must use that other language if they are to have an equal opportunity to participate or benefit from any aid or service provided by federally funded programs or activities.

Based on the small size of the LEP population in the region, most LEP outreach efforts are limited to studies and projects that directly affect neighborhoods with high concentrations of non-English-speaking persons, when necessary. Interpretation services are available upon advanced request. Map B.3 shows areas within the LCRV region where the percentage of LEP persons exceeds 5%.

TRANSIT

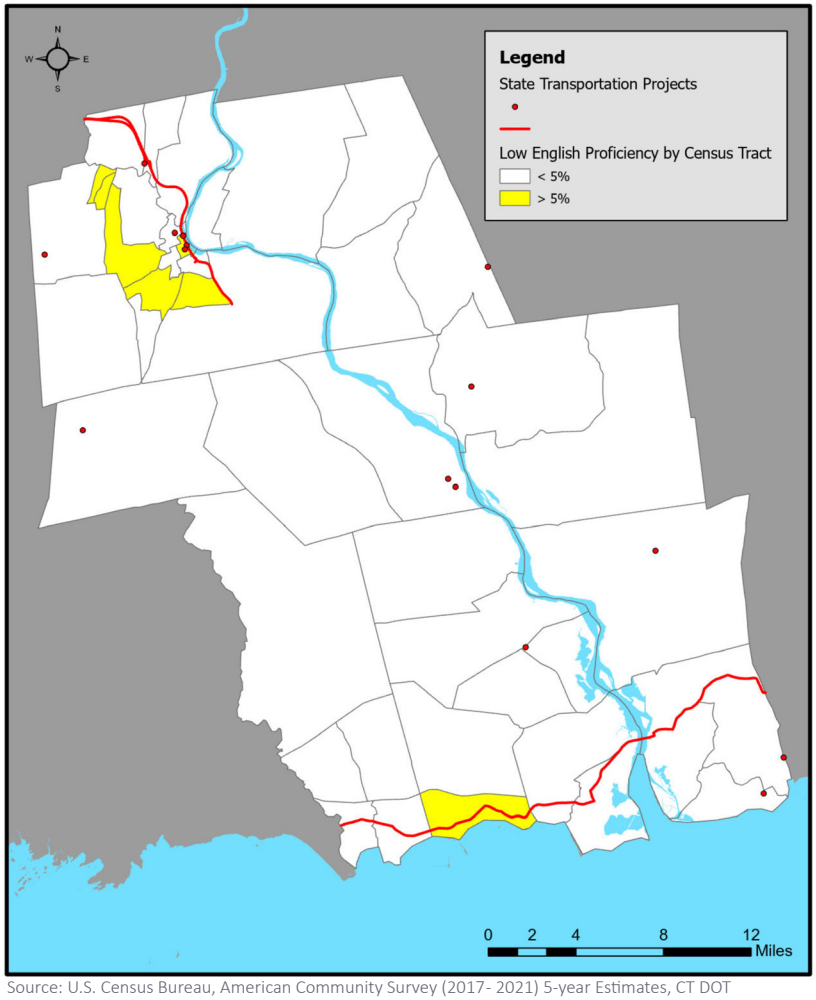
Fixed route transit is mapped in relation to minority and low income census tracts in the tri-annual Middletown Transit District Title VI report. The report identifies minority communities and inventories transit service and travel patterns. It also analyzes and compares transit level of service and quality of service in the minority and low income tracts versus the non-minority and non-low income tracts. Minority and non-minority census tracts exhibit very similar characteristics system wide. The minority tracts perform, on average, slightly better than non-minority tracts based on travel time and costs. The resulting report shows whether the benefits from the service are proportionate in different areas of the community and supports route modification where necessary. MTD's jobs access program is designed to help low-income workers gain access to job sites otherwise unavailable to them. The report recommended extending hours of service for the bus system to enable people who are dependent on transit to access activities that take place before bus service starts in the morning or after bus service ends in the evening.

HIGHWAYS

Future improvements to RT 9 relating to the removal of traffic signals has the potential to adversely affect minority or low-income neighborhoods adjacent to or within close proximity to the roadway. RiverCOG works with CTDOT and the City of Middletown to help identify potential impacts, solicit input, and discuss concerns for mitigation.

Plans for the Removal of Traffic Signals on Route 9 and Main Street Improvements were presented to the public in July 2016. Main concerns included the effect of the additional traffic on Main Street, despite the operational benefits of the proposed bump-outs, and the view obstruction of the Connecticut River by the southern elevated section of Route 9 southbound. A follow up public meeting and CEPA scoping meeting was held in March 2018 breaking out work into

Map B.3 LCRVR LEP Population



Source: U.S. Census Bureau, American Community Survey (2017- 2021) 5-year Estimates, CT DOT

three separate projects addressing the prior public concerns. Right of way impacts associated with the proposed Route 9 northbound off-ramp require the acquisition and relocation of three commercial properties and traffic pattern changes in an EJ neighborhood. Based on views and comments the community expressed concerning the proposed projects, the projects will be further revised to lessen impacts in this area.

Breakout 82-322 Public Involvement Example 2020

The Department's environmental review process identified the minority, low income and LEP populations. The design team met with the Title VI Coordinator and Equal Opportunity Specialist in the Contract Compliance Unit and decided to send a letter to all addresses on Miller Street, Bridge Street and Portland, as well the owners of those properties that do not reside there. The letter explained the process, project, funding, schedule and additional contact information.

Most other highway improvements are not expected to directly affect minority or low-income neighborhoods, as the operational and safety improvements typically occur within the existing right of way, and therefore do not affect residential neighborhoods. Similarly, arterial recommendations included in the region's plans and studies are not expected to affect minority or low-income neighborhoods.

BICYCLE AND PEDESTRIAN

RiverCOG's bicycle and pedestrian program does not negatively impact low income or minority neighborhoods. Bike/ped safety improvements typically benefit low income individuals as these improvements provide additional alternative modes to public transit and improved bicycle and pedestrian safety in both urban and rural areas. The plan discusses users such as children, women, people of color, people with disabilities, seniors and low income riders.

OTHER FACTORS

Many projects, programs, and investments are difficult to map geographically but are still considered in relation to EJ. These projects and investments include, but are not limited to, transit operating subsidies, transit capital purchases, transportation control measures (TCM) such as vehicle controls, fuel standards, encouraging employer rideshare incentives, bicycle and pedestrian programs that promote non-motorized transportation alternatives, and land development strategies that help to manage transportation demand. Transit system operating subsidies and capital purchases, as well as other projects, benefit the target EJ populations.

EJ ASSESMENT

One purpose of EJ is to promote public participation in an effort to involve minority and low income populations in decision making from the early stages of the planning process through to the end. Another purpose of EJ is to determine if minority and low income populations are receiving their fair share of benefits or a disproportionate share of burdens as a result of transportation projects and investments. These purposes are directly related since one of the best determinants of benefits and burdens is through those who are actually being affected by the projects.

The majority of EJ studies are done on a project level basis due to the small minority and low income population found

in the region. For example, special studies, such as corridor studies, have an EJ representative on the advisory committee, and neighborhood organizations are consulted when affected. Similarly, these persons and organizations are contacted on a project level basis such as for meetings relating to transportation projects. Outreach efforts for the LRP, TIP, special studies and other documents include publishing notices in local and foreign language newspapers and sending information to those on the EJ mailing list in addition to the standard mailing list.

The regional TIP and LOTCIP and major state projects shown in Maps B.1, B.2 and B3 are small scale projects such as roadway rehabilitation or reconstruction projects and intersection improvement projects which equally benefit and burden all roadway users regardless of the census block group of residence. These types of system preservation and improvement projects provide considerably greater benefits than burdens. The state projects are larger in scale but most also provide considerably greater benefits than burdens.

As noted above, the burdens and benefits are evaluated at the project level since factors such as noise, dust, travel delay, displacement and other negative factors associated with projects are generally localized and affect primarily those adjacent to the project. To determine burdens and benefits at the regional level, the region's minority and low income populations were mapped based on the overall minority and low income populations in the region. This assessment pro-vides an indication of how the benefits and burdens of transportation investments are distributed between the targeted and non-targets EJ areas

INVESTEMENT IMPACT CONSIDERATIONS

Overall, the minority population comprises 9.8% of the region's population. Map A.1 shows the Census 2010 block groups where the minority population is greater than 10%. Approximately 41% of the projects are in or adjacent to minority block groups. Based on investment levels of projects, approximately 25% of the funds are spent in areas in or adjacent to minority census block groups.

The low income population, consisting of persons below the poverty level, comprises 13% of the region's population. Map B.2 shows the Census 2010 tracts where the low in-come population is greater than 20%. The specific roadway segment and spot projects are mapped in relation to the low income block groups. Approximately 24% of the projects are in or adjacent to low income block groups. Based on investment levels of regional projects, approximately 24% of the regional funds are spent in areas in or adjacent to low in-come census block groups.

Map B.3 shows the LEP population greater than 5% based on the 2012-2016 American Community Survey. The specific roadway segment and spot projects are mapped in relation to the LEP Tracts. Approximately 29% of the projects are in or adjacent to LEP tracts. Based on investment levels of projects, approximately 22% of the funds are spent in areas in or adjacent to LEP populations.

IMPLEMENTATION IMPACT CONSIDERATIONS

Three projects mapped in the plan are primarily maintenance projects and two are enhancement projects. These types of roadway maintenance and improvement projects typically cause temporary disruptions to the motoring and abutting communities. The resulting disturbances to motorists commonly include traffic delays, diversions, and in-creased congestion on both the project roadway as well as surrounding streets. Disturbances to abutters include in-creased particulate matter or other air pollutants, noise pollutions, and light pollution if the construction work is per-formed at night. Project implementation impacts are generally burdens.

OPERATIONAL IMPACT CONSIDERATIONS

The projects shown provide for maintaining the existing infrastructure in the region. Benefits and burdens will affect the current users of the facilities, which in most cases will be primarily local residents. The Arrigoni Bridge project in Middletown may also benefit additional users from beyond the region based on land use and transportation patterns in the vicinity of the project. Operational impacts can concurrently be benefits and burdens to different user populations.

RIVERMPO TITLE VI AND ADA

Race, income and LEP census data also is used in RiverCOGs Title VI Program. The program consists of demographic profiles and maps identifying populations and impacts if funds used for transportation projects. There are also public notice brochures, and Title VI policy, complaint procedures and forms as well as a public participation plan and language assistance plan based on the LEP four factors. RiverCOG also coordinates with the state and municipalities regarding ADA compliance, transition plans and compliance with ADA when planning, designing, and constructing transportation facilities.

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Appendix C:

MUNICIPAL BRIDGES

The following tables show the complete list of all municipal bridges as expanded on from Chapter 3 of the plan. They may be eligible for funding under the local bridge program, but the municipalities are responsible for the inspections. All other bridges on the list are over twenty feet and inspected biannually by CTDOT. The sufficiency rating indicates the bridge sufficiency to remain in service, with 100% representing an entirely sufficient bridge and 0% representing an entirely insufficient bridge.

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
04605	Chester	North Main St.	Great Brook	Culvert	2001	2/2/2022
04608	Chester	Wig Hill Rd.	Pattaconk Brook	Slab	1950	2/7/2022
05286	Chester	North Main St.	Great Brook	Culvert	1983	2/2/2022
06061	Chester	North Main St.	Great Brook	Culvert	1990	1/28/2020
07025	Chester	Liberty St.	Great Brook	Arch- Deck	2009	1/22/2020
026001	Chester	Cedar Lake Rd.	Pattaconk Brook	Slab	1940	9/12/1991
026002	Chester	Bailey Rd.	Pattaconk Brook	Culvert	1970	9/12/1991
026003	Chester	Hoopole Hill Rd.	Pattaconk Brook	Culvert	1970	9/21/1991
026004	Chester	Turkey Hill Rd.	Great Brook	Culvert	1965	9/12/1991
026005	Chester	Deep Hollow Rd.	Stream	Slab	1940	9/11/1991
026006	Chester	Deep Hollow Rd.	Chester Creek	Slab	1940	9/11/1991
026007	Chester	Deep Hollow Rd.	Chester Creek	Arch- Deck	1995	
026008	Chester	Straits Rd.	An Unnamed Brook	Culvert	1990	9/11/1991
026009	Chester	Liberty St.	An Unnamed Brook		1995	
026010	Chester	Kings Hwy.	An Unnamed Brook	Slab	1940	9/11/1991
026011	Chester	Dock Rd.	Chester Creek Tributary	Stringer/Multi-beam or Girder	1900	6/4/1996
026012	Chester	N Cedar Lake Rd.	Great Brook	Culvert		
026013	Chester	S Wig Hill Rd.	Brook	Culvert		
026014	Chester	Waterhouse Ln.	Eaterhouse Brook	Culvert		
04117	Clinton	Glenwood Rd.	Indian River	Culvert	1958	9/8/2020
04118	Clinton	Beach Park Rd.	Hammock River	Slab	1947	10/21/2020
04119	Clinton	Kelseytown Rd.	Menunketesuck River	Box Beam	2021	9/15/2020
04609	Clinton	Pleasant Valley Rd.	Menunketesuck River	Slab	1930	9/16/2020
04610	Clinton	Carter Hill Rd.	Menunketesuck River	Slab	1930	9/16/2020
04612	Clinton	Kelseytwn Brdge Rd.	Menunketesuck River	Tee Beam	1938	9/15/2020
05662	Clinton	Brickyard Rd.	Menunketesuck River	Slab	1934	9/16/2020
06195	Clinton	Liberty St. #1	Amtrak Railroad	Slab	1992	3/6/2019
06203	Clinton	Silver Birch Ln.	Brook	Culvert	1980	10/3/2018
06296	Clinton	Waterside Ln.	Hammock River	Slab	1994	9/22/2020
06956	Clinton	Country Village Rd.	Brook	Culvert	1970	9/8/2020
07013	Clinton	Ben Merrill Rd.	Brook	Culvert	2000	9/22/2020
027002	Clinton	Cream Pot Rd.	Indian River	Culvert	1982	3/14/1991
027003	Clinton	Hurd Bridge Rd.	Indian Stream	Slab	1950	3/12/1991
027004	Clinton	Woods Ln.	Menunketesuck River	Stringer/Multi-beam or Girder	1970	3/13/1991
027005	Clinton	Knollwood Dr.	An Unnamed Stream	Culvert	1960	3/12/1991
027006	Clinton	Causeway Rd.	Hammock River	Box Beam or Girders- Multiple	1975	3/11/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
027007	Clinton	Circle Dr.	Brook	Culvert		
027008	Clinton	Nod Rd.	Brook	Culvert		
027009	Clinton	Sassafrass Ln.	Brook	Culvert		
05006	Cromwell	Industrial Park Rd.	Mattabesset River	Stringer/Multi-beam or Girder	1983	6/1/2020
05939	Cromwell	North Rd. Ext.	Coles Brook	Culvert	2020	11/25/2020
033001	Cromwell	Christian Hill Rd.	Coles Brook	Culvert	1931	1/11/1991
033003	Cromwell	New Ln.	An Unnamed Stream	Culvert	1970	4/4/1991
033004	Cromwell	River Rd.	An Unnamed Stream	Culvert	1980	4/4/1991
033005	Cromwell	Bucks Crossing	Brook	Culvert		
033006	Cromwell	Evergreen Rd.	Coles Brook	Culvert		
033007	Cromwell	Evergreen Rd.	Chestnut Brook	Culvert		
033008	Cromwell	Fawn Run	Brook	Culvert		
033009	Cromwell	Pasco Hill Rd	North Brook	Culvert		
033010	Cromwell	Pasco Hill Rd.	Pasco Brook	Culvert		
033011	Cromwell	Russell Rd.	Pasco Brook	Culvert		
033012	Cromwell	Shady Brook Dr.	Brook	Culvert		
033013	Cromwell	South St.	Cromwell Ckeek	Culvert		
04636	Deep River	Village St.	Deep River	Slab	2012	3/25/2020
04637	Deep River	Union St.	Deep River	Slab	1930	1/15/2020
04638	Deep River	Essex St.	Pratt Cove	Box Beam or Girders- Multiple	1999	1/15/2020
05287	Deep River	Spring St.	Deep River	Culvert	1982	1/24/2022
06056	Deep River	Bridge St.	Deep River	Slab	1990	3/25/2020
122001	Deep River	Tower Hill Rd.	An Unnamed Brook	Culvert	1970	2/13/1991
122002	Deep River	Plains Rd.	Deep River	Culvert	1970	7/19/1991
122003	Deep River	Hoople Hill Rd.	Deep River	Culvert		
122004	Deep River	Bokum Rd.	Brook	Culvert		
122005	Deep River	Kelsey Hill Rd.	Brook	Culvert		
122006	Deep River	Rosemont Dr.	Brook	Culvert		
04849	Durham	Saw Mill Rd.	Parmelee Brook	Box Beam or Girders- Multiple	2001	4/9/2018
04850	Durham	Maple Ave.	Allyn Brook	Slab	1957	4/9/2018
06981	Durham	Cesca Ln.	Ball Brook	Arch- Deck	2000	3/17/2020
037001	Durham	Air Line Dr.	Asmon Brook	Culvert	1980	9/16/1991
037002	Durham	Howd Rd.	Sawmill Brook	Slab	1940	9/16/1991
037003	Durham	Coe Rd.	Parmalee Brook	Culvert	1970	9/13/1991
037004	Durham	Howd Rd.	Parmalee Brook	Culvert	1989	9/13/1991
037005	Durham	Indian Ln.	Parmalee Brook	Culvert	1970	9/13/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
037006	Durham	Parmelee Hill Rd.	Parmalee Brook	Slab	1940	9/13/1991
037007	Durham	Meetinghouse Hill Rd.	Coginchaug River	Culvert	1970	9/16/1991
037008	Durham	Maiden Rd.	Stream	Slab	1931	9/16/1991
037009	Durham	Pisgah Rd.	Cream Pot Brook	Culvert	1945	9/17/1991
037010	Durham	Picket Ln.	Hersig Brook	Culvert	1970	9/16/1991
037011	Durham	Guire Rd.	Hersig Brook	Culvert	1970	9/16/1991
037012	Durham	Picket Ln.	An Unnamed Brook	Culvert	1975	9/17/1991
037013	Durham	Blue Hills Rd.	Arrigoni Brook	Culvert	1950	9/7/1991
037014	Durham	Johnson Ln.	Sumner Brook	Arch- Deck	1948	
037015	Durham	Creamery Rd.	Coginchaug River	Culvert		
037016	Durham	Bear Rock Rd.	Hersig Brook	Culvert		
037017	Durham	Bear Rock Rd.	Brook	Culvert		
037018	Durham	Coe Rd.	Parmelee Brook	Culvert		
037019	Durham	Etzel Dr.	Sawmill Brook	Culvert		
037020	Durham	Pisgah Rd.	Brook	Culvert		
037022	Durhan	Trimountain Rd.	Saw Mill Brook	Culvert		
037022	Durham	Turkey Hill Rd.	Asnum Brook	Arch- Deck		
04647	East Haddam	EH/Col Tpke	Moodus Reservoir	Slab	2000	11/20/2020
04648	East Haddam	Gristmill Rd.	Moodus River	Slab	1956	10/7/2020
04649	East Haddam	Clark Hill Rd.	Roaring Brook	Slab	1935	11/9/2020
04650	East Haddam	Dolbia Hill Rd. #2	Eight Mile River	Slab	2005	11/27/2018
04651	East Haddam	Foxtown Rd.	Eight Mile River	Slab	2019	10/28/2020
04656	East Haddam	Johnsonville Rd.	Moodus River	Slab	2019	11/9/2020
05267	East Haddam	Jones Hill Rd.	Eight Mile River	Slab	2006	11/27/2018
06126	East Haddam	Haywardville Rd.	Eight Mile River	Culvert	1970	11/27/2018
040001	East Haddam	East Shore Dr.	Stream	Arch- Deck	1983	6/6/1991
040002	East Haddam	Clark Sates Rd.	Stream	Culvert	1980	6/4/1991
040003	East Haddam	Falls Bansham Rd.	Moodus River	Culvert	1965	6/4/1991
040004	East Haddam	Falls Bashan Rd.	Moodus River	Culvert	1965	6/5/1991
040005	East Haddam	Acklet Cemetery Rd.	Early Brook	Culvert	1975	6/5/1991
040006	East Haddam	Geoffrey Rd.	Eight Mile River	Stringer/Multi-beam or Girder	1970	6/4/1991
040007	East Haddam	North Moodus Rd.	Moodus River	Culvert	1975	6/5/1991
040008	East Haddam	Joe Williams Rd.	Shady Brook	Culvert	1965	6/10/1991
040009	East Haddam	Bashan Rd.	Stream	Culvert	1960	6/6/1991
040011	East Haddam	Haywardville Rd.	Early Brook	Culvert	1970	6/4/1991
040012	East Haddam	Salem Rd.	Lake Hayward Brook	Culvert	1965	6/10/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
040013	East Haddam	Foxtown Cemetery Rd.	Lake Hayward Brook	Culvert	1980	6/6/1991
040014	East Haddam	Foxtown Cemetery Rd.	Stream	Culvert	1965	5/31/1991
040015	East Haddam	Foxtown Cemetery Rd.	Foxtown Cemetery Road Brook	Culvert	1965	5/31/1991
040016	East Haddam	Foxtown Cemetery Rd.	Stream	Culvert	1965	6/10/1991
040017	East Haddam	Bardman Rd.	Succor Brook	Culvert	1970	6/6/1991
040018	East Haddam	Creamery Rd.	Succor Brook	Culvert	1975	6/3/1991
040019	East Haddam	Lumber Yard Rd.	Succor Brook	Culvert	1975	6/3/1991
040020	East Haddam	Three Bridges Rd.	Strong Brook	Culvert	1985	6/5/1991
040021	East Haddam	Hungerford Rd.	Hungerford Road Brook	Culvert	1970	6/3/1991
040022	East Haddam	Bone Mill Rd.	Hemlock Valley Brook	Culvert	1965	6/6/1991
040023	East Haddam	Bone Mill Rd. #2	An Unnamed Brook	Stringer/Multi-beam or Girder	1985	4/25/2014
040024	East Haddam	Florida Rd.	Stream	Culvert	1980	6/3/1991
040025	East Haddam	AP Gates Rd.	Brook	Culvert		
040026	East Haddam	Bebee Rd.	Pine Brook	Culvert		
040027	East Haddam	Clark Gates rd.	Brook	Culvert		
040028	East Haddam	Davidson Rd.	Brook	Culvert		
040029	East Haddam	Peticoat Ln.	Brook	Culvert		
040030	East Haddam	Baker Rd.	Burhams Brook	Culvert		
05610	East Hampton	Shipyard Rd.	Mine Brook	Slab	1941	10/7/2020
05739	East Hampton	Chestnut Hill Rd.	Pine Brook	Culvert	1987	10/1/2020
07014	East Hampton	Main St.	Pocotopaug Creek	Arch- Deck	2009	10/1/2020
041001	East Hampton	White Birch Rd.	Fawn Hill Brook	Slab	1960	4/12/1991
041002	East Hampton	Walnut Ave.	Pocotopaug Creek	Slab	1950	4/16/1991
041003	East Hampton	Main St.	Pocotopaug Creek	Arch- Deck	1925	4/15/1991
041004	East Hampton	Niles St.	Pocotopaug Creek	Stringer/Multi-beam or Girder	1950	4/11/1991
041005	East Hampton	Flat Brook Road	Flat Brook	Slab	1980	4/16/1991
041006	East Hampton	Flat Brook Rd.	Flat Brook	Culvert	1970	4/15/1991
041007	East Hampton	Blacksmith Rd.	An Unnamed Brook	Arch- Deck	1850	4/10/1991
041008	East Hampton	Terp Rd.	Pine Brook	Slab	1950	5/21/1991
041009	East Hampton	Old Chestnut Hill Rd.	Pocotopaug Creek	Slab	1970	4/16/1991
041010	East Hampton	Tartia Rd.	Safstrom Brook		2000	
041011	East Hampton	Wopowog St.	Safstrom Brook	Culvert	1975	4/10/1991
041012	East Hampton	Long Crossing Rd.	Pine Brook	Culvert		
041013	East Hampton	Brook Hill Dr.	Safstrom Brook	Culvert		
041014	East Hampton	Champion Hill Rd.	Brook	Culvert		
041015	East Hampton	Gadpouch Road	Mine Brook	Culvert		

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
041016	East Hampton	Long Crossing Rd.	Pine Brook	Culvert		
041017	East Hampton	Long Hill Rd.	Brook	Slab		
041018	East Hampton	Wilkes Rd.	Pine Brook	Culvert		
041019	East Hampton	Wilkes Rd.	Pine Brook	Culvert		
041020	East Hampton	Wopowaug Rd.	Safstrom Brook	Culvert		
041021	East Hampton	Wopowaug Rd.	Safstrom Brook	Culvert		
04356	Essex	Pond Meadow Rd.	Falls River	Culvert	1980	10/13/2021
04660	Essex	Walnut St.	Falls River	Culvert	2018	10/20/2021
04662	Essex	Dennison Rd.	Falls River	Culvert	1968	7/2/2019
04663	Essex	River Rd.	Falls River	Stringer/Multi-beam or Girder	1954	9/15/2021
04664	Essex	Dennison Rd.	Falls River	Culvert	1964	8/25/2021
05288	Essex	Cheney St.	Brook	Culvert	1983	10/13/2021
05289	Essex	Main St. #2	Brook	Culvert	1983	10/20/2021
049001	Essex	Ivory St.	Falls River (North Branch)	Slab	1940	7/10/1991
049002	Essex	Ivory St.	Falls River (South Branch)	Slab	1940	7/10/1991
049003	Essex	Falls River Dr.	Falls River	Culvert	1980	7/2/1991
049004	Essex	Old Deep River Rd.	An Unnamed Brook	Slab	1940	7/2/1991
04681	Haddam	St. Peters Ln.	Candlewood Hill Brook	Culvert	1963	5/10/2021
04682	Haddam	Dublin Hill Rd.	Bible Rock Brook	Slab	2019	5/25/2019
04688	Haddam	Little City Rd.	Ponset Brook	Culvert	1961	6/1/2021
04816	Haddam	Depot Rd.	Ponset Brook	Culvert	1983	5/12/2021
04817	Haddam	Scovil Rd.	Candlewood Hill Brook	Culvert	1983	5/10/2021
05405	Haddam	Depot Rd.	Candlewood Hill Brook	Box Beam or Girders- Multiple	1986	4/28/2021
05406	Haddam	Boulder Dell Rd.	Bible Rock Brook	Culvert	1986	6/12/2019
05515	Haddam	Jail Hill Rd.	Beaver Meadow Brook	Slab	1986	5/25/2021
05537	Haddam	Beaver Meadow Rd.	Beaver Meadow Brook	Culvert	1983	5/24/2021
06020	Haddam	Thayer Rd.	Bible Rock Brook	Slab	1990	4/26/2021
06028	Haddam	Grapevine Rd.	Candlewood Hill Brook	Slab	1990	6/17/2019
06209	Haddam	Little City Rd.	Candlewood Hill Brook	Slab	1991	5/10/2021
06301	Haddam	Dish Mill Rd.	Ponset Brook	Stringer/Multi-beam or Girder	1963	5/11/2021
06938	Haddam	Beaver Meadow Rd.	Beaver Meadow Brook	Culvert	1974	5/24/2021
060001	Haddam	Dudley Clark Rd.	An Unnamed Brook	Culvert	1970	9/16/1991
060002	Haddam	Dudley Clark Rd.	Stream	Culvert	1970	9/16/1991
060003	Haddam	Ruth Hill Rd.	Clark Creek	Culvert	1965	9/16/1991
060004	Haddam	Beaver Meadow Rd.	Beaver Meadow Brook	Culvert	1971	9/16/1991
060005	Haddam	Walkley Hill Rd.	Swain Johnson Brook	Slab	1920	9/10/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
060006	Haddam	Pownsett Rd.	Saltpeter Brook	Culvert	1983	9/16/1991
060007	Haddam	Candlewood Hill Rd.	Candlewood Hill Brook	Slab	1940	9/16/1991
060008	Haddam	Hidden Lake Rd.	Hidden Lake Spillway	Slab	1939	9/14/1991
060009	Haddam	Wiese Albert Rd.	Candlewood Hill Brook	Slab	1950	9/17/1991
060010	Haddam	Brainard Hill Rd.	Bible Rock Brook	Culvert	1983	9/17/1991
060011	Haddam	Oxbow Rd.	Bible Rock Brook	Culvert	1949	9/17/1991
060012	Haddam	Little City Rd.	Candlewood Hill Brook	Box Beam or Girders- Multiple	1991	10/29/1991
060013	Haddam	Candlewood Hill Rd.	Candlewood Hill Brook	Slab	1936	3/17/1997
060014	Haddam	Candlewood Hill Rd.	Candlewood Hill Brook	Slab	1936	3/17/1997
060015	Haddam	Candlewood Hill Rd.	Candlewood Hill Brook	Slab	1936	3/17/1997
060017	Haddam	Clark Rd.	Swain Johnson Brook	Culvert		
060018	Haddam	Qulf Quarry Rd.	Mill Creek	Slab		
060019	Haddam	Hubbard Rd.	Pole Bridge Brook	Culvert		
060020	Haddam	Park Rd.	Turkey Hill Brook	Culvert		
11/9/2021	Killingworth	River Rd. #1	Deer Lake Brook	Stringer/Multi-beam or Girder	1960	11/9/2021
04716	Killingworth	Reservoir Rd.	Menunketesuck River	Culvert	2009	11/9/2021
06614	Killingworth	Abner Ln.	Pond Meadow Brook	Slab	1998	11/9/2021
069001	Killingworth	Burr Hill Rd.	An Unnamed Brook	Culvert	1970	7/12/1991
069002	Killingworth	Bunell Bridge Rd.	Hammonasset River	Culvert	1950	7/15/1991
069003	Killingworth	Emanuel Church Rd.	An Unnamed Brook	Culvert	1965	7/15/1991
069005	Killingworth	Birch Mill Rd.	Pond Meadow Brook	Culvert	1980	7/11/1991
069006	Killingworth	Alders Bridge Rd.	An Unnamed Brook	Culvert	1980	7/12/1991
069007	Killingworth	Roast Meat Hill Rd.	Menunketesuck River	Culvert	1950	7/11/1991
069008	Killingworth	River Rd.	An Unnamed Brook	Culvert	1980	7/15/1991
069009	Killingworth	Paper Mill Rd.	Chatfield Hollow Brook	Slab	1950	7/11/1991
069010	Killingworth	River Rd.	An Unnamed Brook	Culvert	1960	7/11/1991
069011	Killingworth	Roast Meat Hill Rd.	Indian River	Culvert	1970	7/10/1991
069012	Killingworth	Beech Tree Ridge	Brook	Culvert		
069013	Killingworth	Burr Hill Rd.	Brook	Culvert		
069014	Killingworth	N Chestnut Hill Rd.	Brook	Culvert		
069015	Killingworth	Coughlin Rd.	Brook	Culvert		
069016	Killingworth	Country Hill Rd.	Bunker Hill Brook	Culvert		
069017	Killingworth	Laurel Ridge Trail	Brook	Culvert		
069018	Killingworth	Green Hill Rd.	Brook	Culvert		
069019	Killingworth	Schnoor Rd.	Pond Meadow Brook	Culvert		
9/24/2018	Lyme	Mount Archer Rd.	Eight Mile River	Box Beam or Girders- Multiple	1966	9/24/2018

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
04724	Lyme	Joshuatown Rd.	Eight Mile River	Arch- Deck	1920	9/28/2020
04726	Lyme	Macintosh Rd.	Eight Mile River	Stringer/Multi-beam or Girder	1972	9/23/2020
05818	Lyme	Day Hill Rd.	Roaring Brook	Stringer/Multi-beam or Girder	1989	9/22/2020
06039	Lyme	Salem Rd.	East Br Eight Mile River	Stringer/Multi-beam or Girder	1991	9/23/2020
074001	Lyme	Gungy Rd.	Cedar Pond Brook	Culvert	1965	6/10/1991
074002	Lyme	Beaver Brook Rd.	Cedar Pond Brook	Culvert	1960	6/11/1991
074003	Lyme	Grassy Hill Rd.	Beaver Brook	Arch- Deck	1950	6/10/1991
074004	Lyme	Kenny Rd.	Beaver Brook	Culvert	1960	6/11/1991
074005	Lyme	Joshuatown Rd.	Joshua Creek	Slab	1950	6/11/1991
074006	Lyme	Cove Rd. #1	Hamburg Cove	Slab	1960	6/10/1991
074007	Lyme	Birch Mill Rd.	Falls Brook	Stringer/Multi-beam or Girder	1940	8/8/1991
074008	Lyme	Sterling City Rd.	Falls Brook	Slab	1960	6/10/1991
074009	Lyme	Sterling City Rd.	Tisdale Brook	Culvert		
04150	Middlefield	Cherry Hill Rd.	Coginchaug River	Stringer/Multi-beam or Girder	2000	5/4/2020
04843	Middlefield	Miller Rd.	Coginchaug River	Tee Beam	1936	5/13/2020
04844	Middlefield	Strickland Rd.	Coginchaug River	Slab	1936	5/11/2020
05553	Middlefield	Cider Mill Rd.	Coginchaug River	Box Beam or Girders- Multiple	1933	5/4/2020
081001	Middlefield	Mattabeseck Rd.	An Unnamed Brook		2006	2/9/2005
081002	Middlefield	Strickland Rd.	Brook	culvert		
04187	Middletown	Main St. Ext.	Sumner Brook	Arch- Deck	1935	6/2/2020
04189	Middletown	Ridge Rd.	Sumner Brook	Culvert	1938	6/1/2020
04190	Middletown	River Rd. #1	Sumner Brook	Box Beam or Girders- Multiple	1920	7/28/2020
04533	Middletown	Mill St.	Sumner Brook	Stringer/Multi-beam or Girder	1953	6/1/2020
04535	Middletown	Middlefield St.	Coginchaug River	Stringer/Multi-beam or Girder	1900	6/11/2020
04538	Middletown	Miner Street	Fall Brook	Culvert	1978	6/8/2020
04542	Middletown	Bell Street	Sawmill Brook	Culvert	1955	6/11/2020
05352	Middletown	East Main St.	Sumner Brook	Stringer/Multi-beam or Girder	1985	6/2/2020
05450	Middletown	Mill Brook Rd.	Sumner Brook	Slab	1934	5/10/2004
05564	Middletown	Russell St.	Sumner Brook	Slab	1935	6/2/2020
05616	Middletown	Mill St.	Long Hill Brook	Culvert	2001	5/15/2020
05621	Middletown	Wilcox St.	Sumner Brook	Frame	2010	5/15/2020
05622	Middletown	Boardman Ln. #1	Sawmill Brook	Culvert	1981	5/19/2020
05957	Middletown	River Rd. # 2	Brook	Culvert	1970	5/20/2020
05958	Middletown	Wesleyan Hills Rd.	Long Hill Brook	Culvert	1960	5/7/2020
05959	Middletown	Heritage Blvd.	Miner Brook	Culvert	1986	5/17/2020
082001	Middletown	Country Club Rd.	West Highland Brook	Culvert	1965	5/7/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
082002	Middletown	Timber Ridge Rd.	East Bradley Brook	Culvert	1985	5/7/1991
082003	Middletown	Bradley St.	Bradley Brook	Culvert	1981	5/7/1991
082004	Middletown	Smith St.	Sawmill Brook	Culvert	1972	5/7/1991
082005	Middletown	Freeman Rd.	An Unnamed Stream	Culvert	1995	
082006	Middletown	Freeman Rd.	An Unnamed Stream	Slab	1930	5/8/1991
082008	Middletown	Maromas Rd.	Hubbard Brook	Culvert	1988	5/8/1991
082009	Middletown	Reservoir Rd.	Reservoir Brook	Culvert	1960	5/8/1991
082010	Middletown	Bow Ln.	An Unnamed Stream	Culvert	1975	5/8/1991
082011	Middletown	Chamberlain Rd.	Harris Brook	Slab	1927	5/9/1991
082012	Middletown	Mill Brook Rd.	An Unnamed Stream	Slab	1930	5/9/1991
082013	Middletown	Mill Brook Rd.	Summer Brook	Culvert	1975	5/9/1991
082014	Middletown	Bow Ln.	An Unnamed Stream	Culvert	1982	5/9/1991
082015	Middletown	River Rd. #1	An Unnamed Stream	Culvert	1960	5/9/1991
082016	Middletown	Arbutus St.	Round Hill Brook	Culvert	1970	5/13/1991
082017	Middletown	Anderson Rd.	Laurel Brook	Culvert	1930	5/13/1991
082018	Middletown	Brown St.	Long Hill Brook	Culvert		
082019	Middletown	Randolph Rd. #1	Long Hill Brook	Culvert	1980	5/13/1991
082020	Middletown	Wadworth St.	An Unnamed Stream	Culvert	1985	5/13/1991
082021	Middletown	Butternut St.	An Unnamed Stream	Culvert	1975	5/15/1991
082022	Middletown	Butternut St.	An Unnamed Stream	Culvert	1930	5/15/1991
082023	Middletown	River Rd. #1	Reservoir Brook	Slab	1965	5/15/1991
082024	Middletown	High St.	An Unnamed Stream	Culvert	1939	5/15/1991
082025	Middletown	Mile Ln.	East Swamp Brook	Culvert	1970	5/16/1991
082026	Middletown	Lawrence Dr.	West Swamp Brook	Culvert	1980	5/16/1991
082028	Middletown	Ridgewood Rd.	An Unnamed Stream	Culvert	1980	5/16/1991
082029	Middletown	Country Club Rd.	Fall Brook	Culvert	1980	5/16/1991
082030	Middletown	Smith St.	Fall Brook	Culvert	1980	5/17/1991
082031	Middletown	Industrial Park Rd.	Fall Brook	Culvert	1992	
082032	Middletown	Industrial Park	An Unnamed Stream	Culvert	1980	5/17/1991
082033	Middletown	Boardman Ln.	Sawmill Brook	Culvert	1980	5/17/1991
082034	Middletown	Wesleyan Hills Rd.	Pedestrian Walkway	Culvert	1980	6/5/1991
082035	Middletown	Long Hill Rd.	Pedestrian Walkway	Culvert	1980	6/5/1991
082037	Middletown	Pameacha Ave.	Long Hill Brook	Culvert	1920	
082038	Middletown	Lee St.	Prout Brook	Slab	1940	6/9/2004
082039	Middletown	Anderson Rd.	Laurel Brook	Culvert	1995	5/10/2004
082040	Middletown	West Lake Dr.	Miner Brook	Culvert	1985	4/26/2013

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
082041	Middletown	Boston Rd.	Hans Brook	Culvert		
082042	Middletown	Boston Rd.	Hans Brook	Culvert		
082043	Middletown	Briarwood Ln.	West Miner Brook	Culvert		
082044	Middletown	Highland Ave.	Brook	Culvert		
082045	Middletown	La Rosa Ln.	East Swamp Brook	Culvert		
082046	Middletown	Middle St.	Brook	Culvert		
082047	Middletown	Mile Ln.	West Swamp Brook	Culvert		
082048	Middletown	Nejako Dr.	Brook	Culvert		
082049	Middletown	Nejako Dr.	Brook	Culvert		
082050	Middletown	River Rd. 1	Brook	Culvert		
082052	Middletown	Spruce Brook Rd.	Bradley Brook	Culvert		
082053	Middletown	York Rd.	West Miner Brook	Culvert		
082054	Middletown	Millbrook Rd.	Brook	Culvert		
2/20/2018	Old Lyme	Button Ball Rd.	Amtrak Railroad	Slab	1933	2/20/2018
04738	Old Lyme	Town Woods Rd.	Mill Brook	Culvert	1982	4/22/2020
04739	Old Lyme	Sill Ln. #1	Mill Brook	Culvert	1982	4/22/2020
04747	Old Lyme	Mile Creek Rd.	Blackhall River	Stringer/Multi-beam or Girder	1955	10/8/2020
04818	Old Lyme	Sill Ln. #2	Mill Brook	Culvert	1982	4/22/2020
104001	Old Lyme	Tantummaheag Rd.	An Unnamed Brook	Arch- Deck	1960	6/12/1991
104002	Old Lyme	Hatchetts Hill Rd.	Three Mile River	Culvert	1980	6/13/1991
104003	Old Lyme	Mile Creek Rd.	Three Mile River	Culvert	1990	6/12/1991
104004	Old Lyme	Mccurdy Rd.	Duck River	Culvert	1960	3/7/1991
104005	Old Lyme	Grassy Hill Road	Stream	Culvert		
104006	Old Lyme	Parsons Farm Lane	Brook	Culvert		
104007	Old Lyme	Tantummaheag Rd.	Brook	Culvert		
04749	Old Saybrook	Nehantic Trail #2	Mud Creek	Box Beam or Girders- Multiple	2003	1/23/2020
05923	Old Saybrook	Ingham Hill Road	Amtrak Railroad	Stringer/Multi-beam or Girder	1990	2/4/2020
06021	Old Saybrook	Schoolhouse Rd.	Amtrak Railroad	Box Beam or Girders- Multiple	1933	2/26/2018
105001	Old Saybrook	Otter Cove Dr.	Stream	19- Culvert (includes frame culverts)	1980	6/28/1991
105002	Old Saybrook	Ingham Hill Rd.	Fishing Brook	Slab	1931	7/1/1991
105003	Old Saybrook	Beaver Dam Trail	Fishing Brook			
105004	Old Saybrook	Ingham Hill Rd.	Oyster River			
105005	Old Saybrook	James Court	Brook			
105006	Old Saybrook	Custom Dr.	Cold Spring Brook			
06519	Portland	Wilcox Hill Rd.	Reservoir Brook	Arch- Deck	1995	4/26/2018
112001	Portland	Penfield Hill Rd.	Carr Brook	Culvert	1938	6/3/1991

Bridge No.	Town	Feature Carried	Feature Intersected	Structure Type	Year Built	Inspected
112002	Portland	Cox Rd. #2	Carr Brook	Slab	1960	6/3/1991
112003	Portland	Cox Rd.	Carr Brook	Slab	1960	6/3/1991
112004	Portland	Cox Rd.	Carr Brook	Slab	1960	6/3/1991
112005	Portland	South Rd.	Carr Brook	Culvert	1982	6/5/1991
112006	Portland	Rose Hill Rd.	Carr Brook	Slab	1938	6/4/1991
112007	Portland	Old Marlborough Tpke.	Reservoir Brook	Slab	1938	6/4/1991
112008	Portland	Thompson Hill Road	Reservoir Brook	Slab	1939	6/4/1991
112009	Portland	Isinglass Hill Rd.	An Unnamed Stream	Slab	1950	6/5/1991
112010	Portland	Del Reeves Rd.	Buck Brook	Culvert		
112011	Portland	Cox Rd.	Carr Brook	Culvert		
112012	Portland	Great Hill Pond Road	Brook	Culvert		
112013	Portland	Jobs Pond Road	Brook	Culvert		
112014	Portland	State Forrest Rd.	Reservoir Brook	Slab		
03894	Westbrook	Old Clinton Rd.	Amtrak Railroad	Box Beam or Girders- Multiple	1997	2/28/2018
04807	Westbrook	Old Clinton Rd.	Patchogue River	Slab	1976	4/20/2020
06084	Westbrook	Wesley Ave.	Patchogue River	Box Beam or Girders- Multiple	1991	4/8/2020
06658	Westbrook	Flat Rock Pl.	Wetlands	Box Beam or Girders- Multiple	1996	7/17/2018
06659	Westbrook	Flat Rock Pl.	Wetlands	Box Beam or Girders- Multiple	1996	5/29/2018
06660	Westbrook	Flat Rock Pl.	Wetlands	Box Beam or Girders- Multiple	1996	5/29/2018
06661	Westbrook	Flat Rock Pl.	Wetlands	Box Beam or Girders- Multiple	1996	5/29/2018
06942	Westbrook	Winthrop Rd.	Falls River	Frame	2016	6/1/2020
07038	Westbrook	Lynn Rd.	Falls River	Slab	2019	6/1/2020
154001	Westbrook	Pritchett Dr.	Stream	Culvert	1988	7/18/1991
154002	Westbrook	Winthrop Rd.	Falls River	Arch- Deck	1945	5/7/1999
154003	Westbrook	Lynn Rd.	Falls River	Slab	1939	7/17/1991
154004	Westbrook	Fishing Brook Rd.	Spring Lot Brook	Culvert	1986	7/17/1991
154005	Westbrook	Fair View Rd.	An Unnamed Brook	Culvert	1987	7/16/1991
154006	Westbrook	Brookwood Dr.	Spring Lot Brook	Culvert	1986	7/17/1991
154007	Westbrook	Pond Meadow Rd.	Stream	Culvert	1982	7/16/1991
154008	Westbrook	Willard Ave.	Stream	Culvert	1970	7/16/1991
154009	Westbrook	Toby Hill Rd. #1	Trout Brook	Culvert	1982	7/16/1991
154010	Westbrook	Docs Hill Rd.	Trout Brook	Culvert		
154011	Westbrook	Docs Hill Rd.	Trout Brook	Culvert		
154012	Westbrook	E Pond Meadow Rd.	Brook	Culvert		
154013	Westbrook	McVeagh Rd.	Patchogue River	Culvert		
154014	Westbrook	Rintoul Pond Rd.	Trout Brook	Culvert		
154015	Westbrook	Rintoul Pond Rd.	Trout Brook	Culvert		

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Appendix D:

TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Improved Transportation Options:

Bicycle parking	Bike racks, lockers, changing facilities, etc.
Commercial centers	Vibrant downtowns, business districts, villages, etc.
Connectivity	Connected roadway and path networks
Density and clustering	Locating common destination together to increase accessibility
Livable communities	Accessible, livable community design
Parking management	Efficient parking, evaluation, and solutions
Smart growth	Accessible, efficient, livable development
Streetscape	Improve urban street design
Transit oriented development (TOD)	Transit stations to promote livable communities

Incentives to Reduce Driving and Use Alternative Routes:

Asset management	Preserve the value of assets such as roads and parking facilities
Comprehensive market reforms	Policy changes resulting in efficient transportation pricing
Context sensitive design	Flexible design requirements based on community values
Contingency based planning	Identifying solutions to potential future issues
Institutional reform	Creating organization that support efficient transportation
Operation and management	Encourage efficient use of existing systems
Prioritization	Principals for prioritization of activities and investments
Regulatory reform	Policy changes to encourage innovation and efficiency

Parking and Land Use Management:

Alternative work schedules	Flextime, compressed work week, staggered shifts, etc.
Bus rapid transit (BRT)	Higher quality transit service in busy urban corridors
Car sharing	Rental services to substitute for ownership
Bicycling improvements	Improving the bicycling facilities and connections
Guaranteed ride home	Subsidized ride home for alternative mode commuters when needed
Light rail transit (LRT)	Convenient service in busy urban corridors
Non-motorized planning	Planning for pedestrians, bicyclists, etc.
Park and ride	Convenient parking with links to transit/rideshare facilities
Pedestrian improvements	Improving the walking environment and connections
Public bicycle systems	Bike rental systems for short urban trips
Ridesharing	Encouraging carpools and vanpools
Transit station improvements	Improving station and stop conditions
Telecommuting	Telecommunications as a substitute for physical travel
Traffic calming	Designs to reduce traffic speeds and volumes
Transit improvements	Improving public transit services

Policy and Institutional Reforms:

Carbon taxes	Taxes based on carbon content to encourage conservation
Commuter financial incentives	Travel allowances, transit benefits, etc.
Congestion pricing	Variable road pricing to reduce peak period trips
Complete streets	Design for diverse modes, users, and activities
Distance based pricing	Fees and taxes based on mileage
Fuel Taxes	Fuel tax increases for TDM objectives
HOV priority	High occupancy vehicle priority lanes and strategies
Parking pricing	Direct charges for parking
Roadway pricing	Value pricing, congestion pricing, toll roads, etc.
Road space allocation	Design to favor efficient modes
Transit encouragement	Encourage public transit use
Vehicle use restrictions	Limit vehicular traffic at a particular times and place
Walking/bicycling encouragement	Encourage non-motorized transportation use

For further information regarding the Metropolitan Transportation Plan or to provide feedback, please contact the offices of the Lower Connecticut River Valley Council of Governments at (860)581-8554.