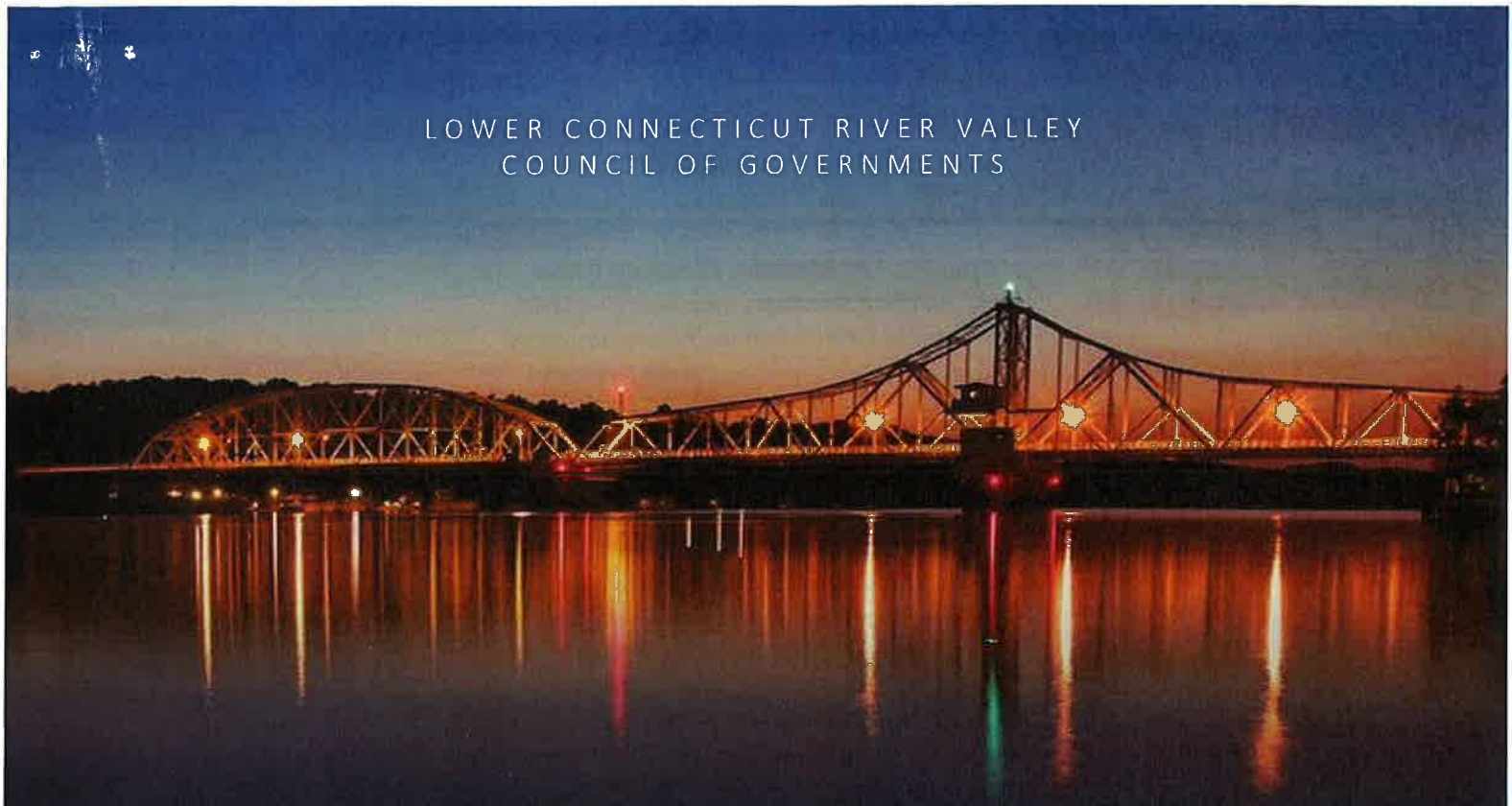
LOWER CONNECTICUT RIVER VALLEY
COUNCIL OF GOVERNMENTS



2015 - 2040

LONG RANGE REGIONAL TRANSPORTATION PLAN

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

ADOPTED
APRIL 2015

PHOTO CREDIT: Ilirjan Rrumbullaku, 2014

MPO MEMBERS

as of 4/29/2015

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Dick Smith, First Selectman, Deep River (Vice Chair)
Susan Bransfield, First Selectman, Portland (Secretary)
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RIVERCOG STAFF

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Nate Hougrand, Planning Intern
Paula Fernald, Financial Administrator
Judith Snyder, Office Manager

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RESOLUTION REGARDING THE REVISION TO THE
REGIONAL TRANSPORTATION PLAN FOR THE LOWER CONNECTICUT RIVER VALLEY REGION

WHEREAS,

the regional transportation plan serves as the 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 2015 revision of the Long Range 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 April 29, 2015.

Susan Bransfield

Susan Bransfield
Secretary

4/29/2015

Date

RESOLUTION ON CONFORMITY WITH THE CLEAN AIR ACT – OZONE

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 measures;
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, April 29, 2015 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 Nonattainment 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 March 2015); and

WHEREAS,

The Connecticut Department of Transportation's assessment (above) has found that plans and programs 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 2015-2040 Regional Transportation Plan and the FFY 2015 – 2018 Transportation Improvement Program and all amendments 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 March 2015 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 April 29, 2015.

Susan Bransfield — 4/29/2015

Susan Bransfield, Secretary — **Date**

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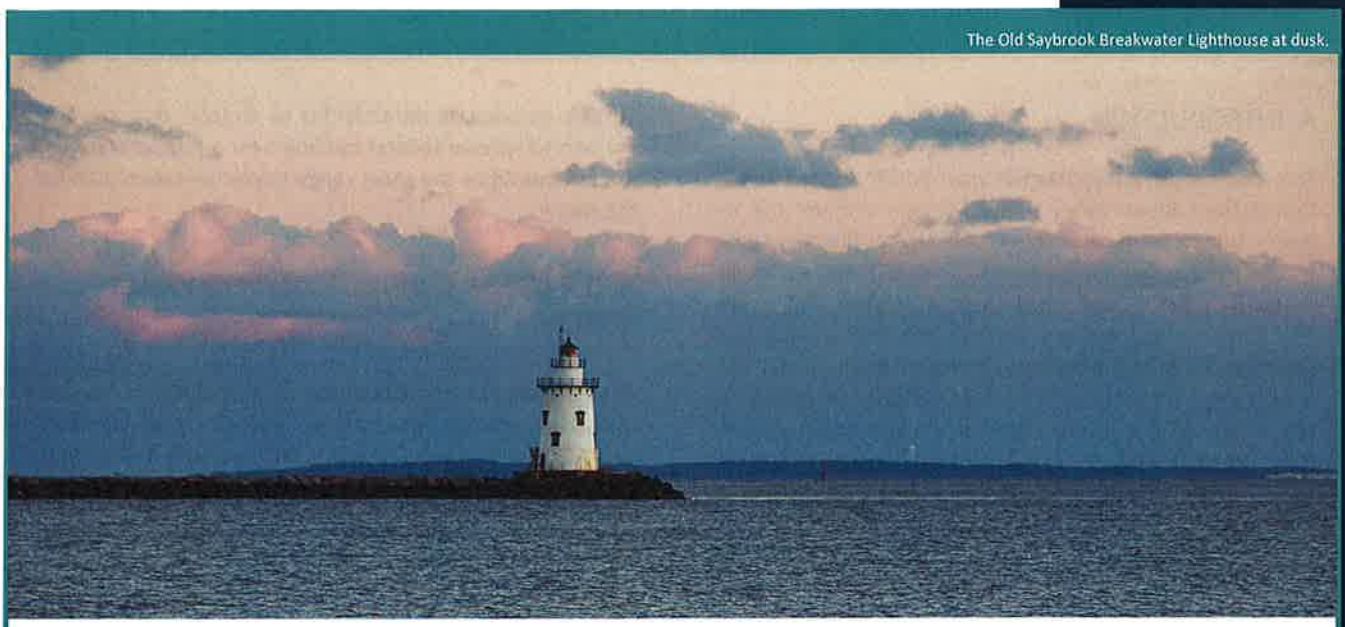


The Old Saybrook Breakwater Lighthouse at dusk.

Chapter 1.

INTRODUCTION

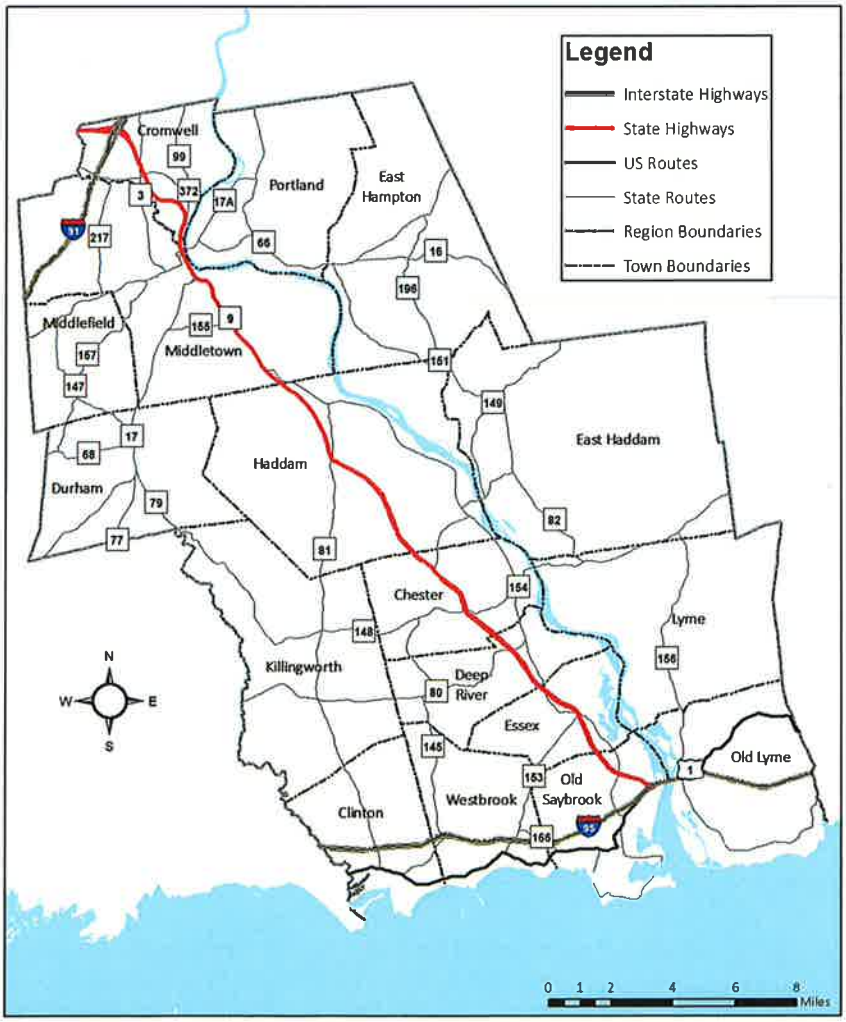
A. INTRODUCTION

The long range transportation plan (LRTP) for the Lower Connecticut River Valley (LCRV) Region defines the region's future transportation vision and outlines regional transportation funding priorities. The LRTP also establishes goals, policies, and steps to help achieve that vision. The 25 year scope of the plan gives the LRTP a broad perspective of the region's future transportation needs. Although new infrastructure is an important component of the LRTP 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 selected based upon their relation to the long range 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.

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 175,685 according to the 2010 U.S. Census. Much of the land area is rural, with Middletown, Cromwell, and Portland comprising the region's urban core.

MAP 1.1 LCRV Region Member Municipalities

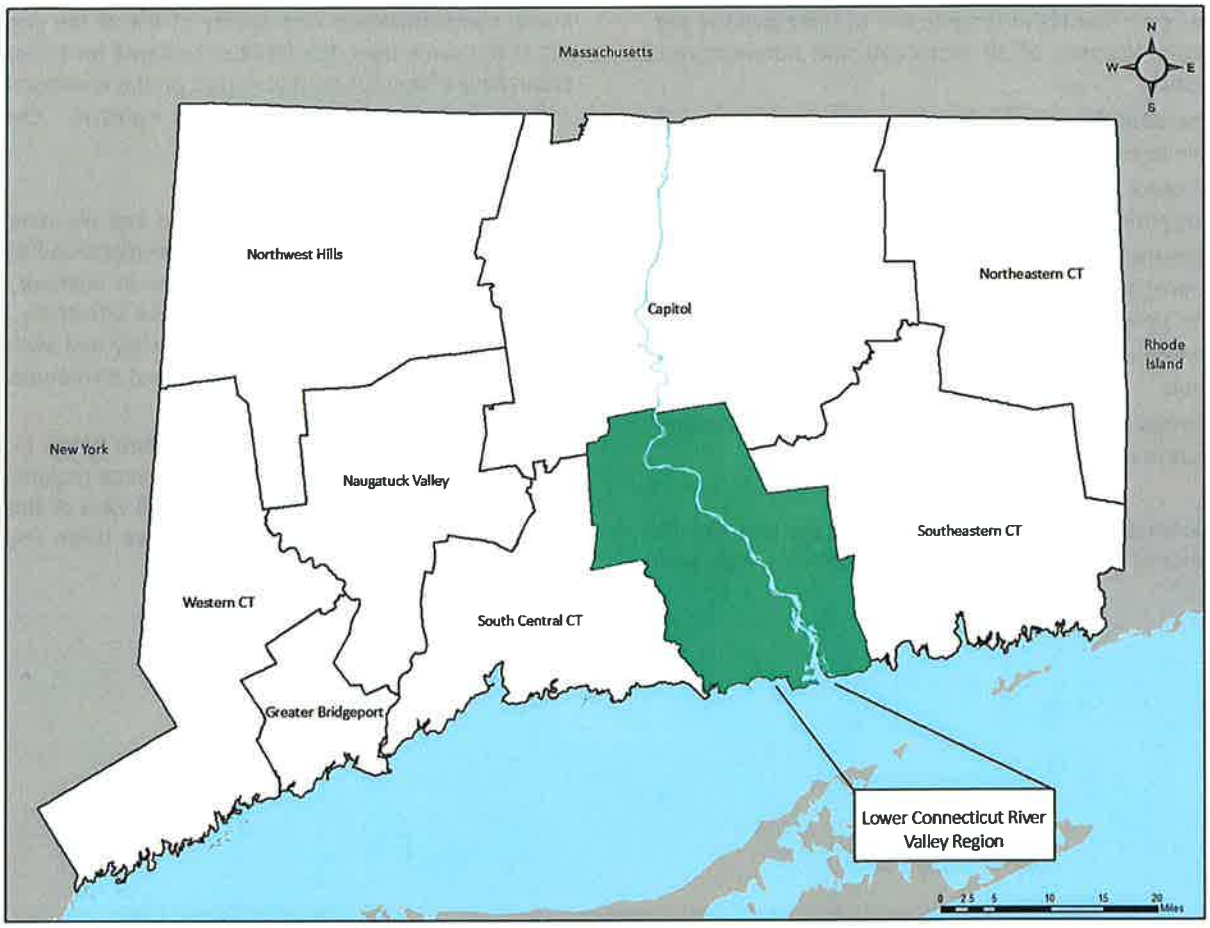


Source: RiverCOG

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 1.1. 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 Metropolitan Planning Organization (MPO) policy board along with the two regional transit districts and chamber of commerce also serving as voting members. Board members approve the LRTP, 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.

MAP 1.2 Connecticut Planning Regions



Source: RiverCOG

It is the MPO that is responsible for the development of the region's Long Range 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.

MAP-21, the Moving Ahead for Progress in the 21st Century Act was signed into law in 2012 and funded surface transportation programs over $105 billion in federal fiscal years 2013 and 2014. Continuing resolutions continue to fund America's transportation system using the framework set by MAP-21. A continuing resolution is congressional legislation that appropriates money for specific federal government departments, agencies, or programs when Congress and the president fail to pass the regular appropriations bill. It is expected that a new transportation bill will eventually be passed by Congress and signed by the President. In the meantime, the uncertainty caused by short-term continuing resolutions may cause delays in federally funded transportation projects.

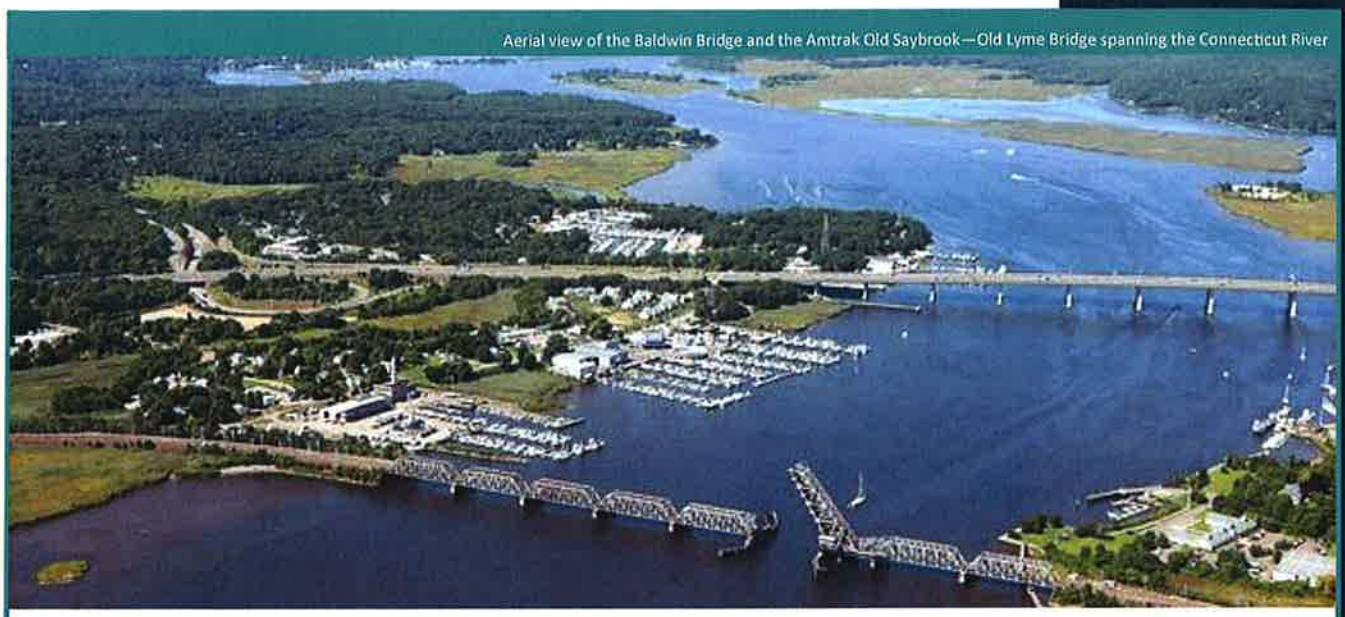
MAP-21 created a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in previous federal transportation laws since 1991. MAP-21 outlines "8 Areas" that an MPO must consider in its transportation planning activities:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.

- Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users.
- Increase the accessibility and mobility options available to people and for freight.
- Protect and enhance the environment, promote energy conservation, and improve the quality of life.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.

Considering these eight 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 very substantial impact on the environment, and are very expensive to build and maintain. Consequently, the goal of this plan is to:

- Provide a strategy for both capital and planning resources for both motorized and non-motorized transportation modes and infrastructure to improve and ensure that people and goods move effectively and efficiently throughout the region safely and securely while addressing social, economic and environmental needs.
- The plan addresses the transportation issues in the region through both specific and general recommendations, and also provides 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

Changes in regional population and demographics directly impact the functioning of the Lower Connecticut River Valley (LCRV) Region's transportation network. An analysis of population, housing, infrastructure, utilities, and economy is necessary to address shifts in transportation demand and the need for transportation enhancements that improve connectivity, accessibility, and efficiency.

The total population of the Lower Connecticut River Valley (LCRV) Region was 176,685 in 2010 (U.S. Census), increasing 7.4% from 164,493 in 2000. The Region grew faster than the State of Connecticut as a whole, which grew only 4.9% between 2000 and 2010. Lyme experienced 19.3% growth between 2000 and 2010, greater than any other town in the region. Haddam, Middletown, and Durham all grew at a rate greater than 10% between 2000 and 2010 (16.6%, 12.7%, 11.5%, respectively). East Hampton and Old Saybrook's populations decreased between the 2000 and 2010 censuses, at -2.9% and -1.2%, respectively.

B. POPULATION PROJECTIONS

According to the State Data Center at the University of Connecticut, the LCRV Region population is projected to grow 2.7% from 2010, to 181,455 in 2020. By 2025, the population is projected to grow an additional 0.6% to 182,587. The projection shows the region trailing the state in population growth between 2010 and 2025, with the state population growing 4.8% and the Region only projected to grow 3.3%.

Based on the population projections in Table 2.1, Lyme will experience the largest population change, with 15.5% growth by 2025. Haddam, Middletown, Cromwell, Westbrook, Durham, and Portland are expected to increase in population, at a faster rate than the State. Old Saybrook, Clinton, and Deep River will experience the largest decreases in population, as well as Chester, East Hampton, Essex, and Old Lyme.

TABLE 2.1 LCRV Region Historical and Projected Population (2000 - 2025)

Geographic Area	Total Population					Percent Change		
	2000	2010	2013	2020	2025	2000 - 2010	2010 - 2020	2010 -2025
LCRV Region	164,493	176,685	175,555	181,455	182,587	7.40%	2.70%	3.30%
Connecticut	3,405,565	3,574,097	3,596,080	3,702,469	3,746,181	4.90%	3.60%	4.80%
Chester	3,743	3,994	4,343	3,973	3,946	6.70%	-0.50%	-1.20%
Clinton	13,094	13,260	13,180	12,841	12,417	1.30%	-3.20%	-6.40%
Cromwell	12,871	14,005	14,178	14,853	15,169	8.80%	6.10%	8.30%
Deep River	4,610	4,629	4,589	4,488	4,346	0.40%	-3.00%	-6.10%
Durham	6,627	7,388	7,361	7,803	7,968	11.50%	5.60%	7.90%
East Haddam	8,333	9,126	9,147	9,463	9,530	9.50%	3.70%	4.40%
East Hampton	13,352	12,959	12,912	12,693	12,392	-2.90%	-2.10%	-4.40%
Essex	6,505	6,683	6,633	6,562	6,442	2.70%	-1.80%	-3.60%
Haddam	7,157	8,346	8,363	9,128	9,423	16.60%	9.40%	12.90%
Killingworth	6,018	6,525	6,490	6,618	6,582	8.40%	1.40%	0.90%
Lyme	2,016	2,406	2,401	2,682	2,780	19.30%	11.50%	15.50%
Middlefield	4,203	4,425	4,425	4,483	4,479	5.30%	1.30%	1.20%
Middletown	43,167	48,648	47,333	51,373	52,922	12.70%	5.60%	8.80%
Old Lyme	7,406	7,603	7,592	7,473	7,308	2.70%	-1.70%	-3.90%
Old Saybrook	10,367	10,242	10,246	9,640	9,226	-1.20%	-5.90%	-9.90%
Portland	8,732	9,508	9,456	10,017	10,159	8.90%	5.40%	6.80%
Westbrook	6,292	6,938	6,906	7,365	7,498	10.30%	6.20%	8.10%

Sources: Connecticut Department of Public Health, Population Statistics (2000, 2013)
U.S. Census Bureau, Census Summary File (2010)
Connecticut State Data Center, Population Projections (2020 - 2025)

C. SOCIO-ECONOMIC CONDITIONS

The socio-economic characteristics of the LCRV Region also affect the regional transportation system and can present special transportation needs, influencing travel modes and patterns. These characteristics include persons and vehicles per household, median household income, and the number of single occupancy vehicle trips to work. 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 likely to be more dependent on public transportation than personal vehicles. Table 2.2 shows the relationship between persons and vehicles per household and the number of households without a vehicle.

TABLE 2.2 LCRV Region Household Size & Vehicles (2013)

Geographic Area	Occupied Households	Persons per Household	Mean Vehicles per Household	Zero Vehicle Households
LCRV Region	70,410	2.49	2.13	3,226
Chester	1,783	2.33	2.29	74
Clinton	5,305	2.5	2.07	209
Cromwell	5,446	2.58	2.09	185
Deep River	1,918	2.41	2.51	120
Durham	2,547	2.9	2.61	29
East Haddam	3,462	2.64	2.51	25
East Hampton	4,838	2.68	2.3	168
Essex	2,928	2.28	2.07	48
Haddam	3,232	2.58	2.68	25
Killingworth	2,584	2.52	2.86	33
Lyme	1,038	2.33	1.98	26
Middlefield	1,700	2.6	3.83	38
Middletown	19,522	2.44	1.59	1,824
Old Lyme	3,231	2.35	2.4	53
Old Saybrook	4,295	2.39	2.17	91
Portland	3,810	2.49	2.08	186
Westbrook	2,771	2.5	2.07	92

Source: U.S. Census Bureau, American Community Survey 5-year estimate, 2013

Of the region's seventeen municipalities, Killingworth has the highest vehicle-to-home ratio, with an average of 2.86 vehicles per home. Similarly, Middlefield, Killingworth, Haddam, Deep River, and Old Lyme are home to more cars than residents per household on average. The towns with the largest percentage of zero vehicle homes are Middletown (9.3%), Deep River (6.3%), and Portland (4.9%). Households without cars or drivers require access to public or private transportation services. Households with only one car may also need to rely on other transportation services or modes such as walking or bicycling.

TABLE 2.3 LCRV Region Income (2013)

Geographic Area	Median Household Income	Median Family Income	Per Capita Income
Connecticut	$69,461	$87,245	$37,892
Middlesex County	$76,994	$98,501	$39,992
New London County	$66,583	$82,076	$33,782
Hartford County	$64,967	$81,805	$34,698
New Haven County	$61,996	$79,408	$32,523
Chester	$74,911	$102,563	$41,055
Clinton	$71,599	$84,914	$37,847
Cromwell	$75,859	$98,388	$38,463
Deep River	$71,500	$95,694	$40,835
Durham	$124,179	$135,037	$47,679
East Haddam	$89,615	$97,423	$39,539
East Hampton	$94,747	$111,019	$41,278
Essex	$86,298	$108,542	$56,197
Haddam	$93,824	$108,528	$43,782
Killingworth	$112,761	$127,121	$52,335
Lyme	$85,263	$107,125	$60,410
Middlefield	$96,765	$112,214	$42,590
Middletown	$59,994	$81,619	$32,966
Old Lyme	$87,416	$103,421	$49,209
Old Saybrook	$75,549	$98,939	$44,150
Portland	$88,693	$107,898	$42,569
Westbrook	$62,832	$85,353	$41,130

Source: U.S. Census Bureau, American Community Survey, 2013 5-year estimate

Regional and municipal household, family, and per capita incomes are outlined in Table 2.3. These factors provide an indication of household mobility level, since lower income persons and households tend to be less able to afford to own or operate a personal vehicle and more dependent on public transportation systems. The LCRV Region is a relatively high income area, when compared to the State and nearby counties. Fifteen of the seventeen LCRV Region municipalities' median household income estimates exceed the state average based on the American Community Survey (ACS) (2009-2013 average).

TABLE 2.4 LCRV Region Low Income and Poverty (2013)

	% of Population with income below poverty level			% of Households				
Municipality	Total Population	Under 18 years	65+ years	% Receiving SSI	% Receiving Cash Public Assistance	% Receiving SNAP benefits	Below 150% Poverty Level	Below 50% Poverty Level
LCRV Region	6.00%	6.60%	4.70%	2.61%	1.63%	5.58%	10.80%	2.90%
Connecticut	10.20%	13.60%	6.80%	3.80%	3.10%	10.70%	16.40%	4.70%
Chester	5.00%	2.00%	2.20%	1.01%	0.56%	3.48%	11.20%	2.70%
Clinton	7.70%	8.90%	6.40%	3.75%	1.34%	5.47%	12.80%	4.10%
Cromwell	4.20%	1.80%	5.20%	2.07%	1.05%	5.03%	8.70%	2.60%
Deep River	2.80%	0.00%	0.10%	0.47%	1.56%	4.33%	14.90%	1.20%
Durham	0.90%	1.10%	1.40%	1.26%	1.33%	1.37%	2.50%	0.70%
East Haddam	5.60%	10.20%	2.80%	1.56%	0.75%	2.28%	10.00%	2.30%
East Hampton	3.50%	3.30%	3.60%	2.60%	1.90%	3.41%	7.10%	2.20%
Essex	5.20%	3.40%	5.70%	0.92%	1.06%	1.57%	9.70%	3.10%
Haddam	3.90%	7.10%	0.00%	0.77%	0.71%	1.79%	4.90%	1.40%
Killingworth	0.30%	0.00%	1.90%	2.17%	4.37%	0.58%	0.60%	0.30%
Lyme	3.70%	2.10%	2.40%	0.00%	0.77%	1.73%	9.60%	2.60%
Middlefield	2.80%	0.90%	6.70%	1.24%	1.47%	3.65%	8.00%	0.90%
Middletown	11.70%	15.40%	7.20%	4.28%	2.54%	11.15%	18.40%	5.30%
Old Lyme	3.10%	3.60%	4.10%	2.17%	0.93%	2.38%	6.30%	0.60%
Old Saybrook	5.40%	4.40%	6.20%	3.47%	0.00%	2.51%	10.80%	2.90%
Portland	5.10%	1.60%	4.30%	1.34%	1.63%	4.96%	7.00%	1.10%
Westbrook	4.90%	1.40%	1.90%	1.91%	1.52%	6.96%	15.60%	3.30%

Source: U.S. Census Bureau, American Community Survey (2009 - 2013) 5-year estimates, DP03, Selected Economic Characteristics
U.S. Census Bureau, American Community Survey (2009 - 2013) 5-year estimates, S1701, Poverty Status In the Past 12 Months

The official poverty thresholds defined by the U.S. Office of Management and Budget are used by the ACS to determine poverty rates, available in Table 2.4. According to the ACS, as of 2013, 6.0% of the region's population was living in poverty, compared to 10.2% of the State. The municipalities with the highest percentage of residents living in poverty are Middletown (11.7%) and Clinton (7.7%). Of the region's population younger than 18 years, 6.6% live in poverty, as well as 4.7% of the region's seniors. One goal of this plan is to increase the types of transportation choices available to the region's residents. With better connectivity, reliable service, and improved facilities, we hope to decrease household transportation costs and enhance access to employment, services, and education.

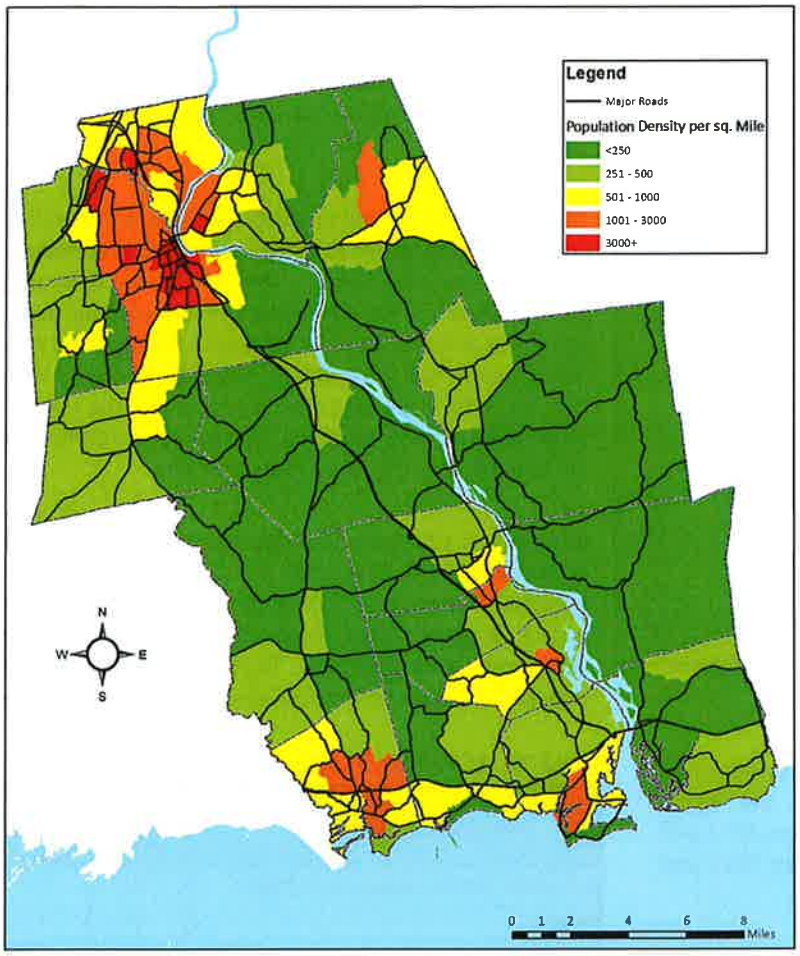
D. POPULATION DENSITY

Population density is an important factor in determining the need for the type and level of transportation services. As density increases, so does the demand for a more robust transportation system. More roads, travel lanes, and signals may be needed to accommodate greater traffic generated by more dense populations. Similarly, denser populations make public transit more economically viable. More density typically also means that trip origins and destinations are closer together, making walking and bicycling also an option for some trips.

The LCRV Region's population density has steadily increased each decade since the 1970's. By 2010, the Region had an average density of 417 people per square mile, significantly less than the state average of 738 people per square mile. The areas with the highest population densities are located along I-95 and I-91 in Middletown, Cromwell, and Clinton while the areas with the lowest population densities are Lyme, East Haddam and Killingworth, with limited access to major expressways and roadways. Regional and municipal population densities are available in Table 2.5 on the following page.

Varying population density across the region provides obstacles for transportation planners. Expansions in public transit are often difficult to implement in low-density areas where trip origins and destinations are scattered and separated by longer distances. It is our

MAP 2.1 LCRV Region Population Density



Source: U.S. Census Bureau, American Community Survey (2008 - 2012) 5-year estimates

goal for the future to provide better access to public transit for residents in low-density municipalities, where feasible.

E. EMPLOYMENT TRENDS

The economy of the LCRV Region includes a diverse set of industries and multiple employment centers. As of 2013, the region was home to 5,092 firms, the majority categorized as "retail trade." Table 2.6 on the following page provides an estimate of the number of firms and employees in each employment sector within the region.

Based on 2011 data from the Census Bureau's Longitudinal Employer-Household Dynamics database, 67,447 individuals were employed in the LCRV Region. Of those employed in the region, 18.1% were employed in the health care and social assistance sector, followed by 13.6% in the manufacturing sector. Not surprisingly, of the 85 largest firms in the region, 18 are in the manufacturing sector, and 12 are in the health care sector. The five largest employers in the region are all located in Middletown, and are Middlesex Hospital, Connecticut State Police, Connecticut Valley Hospital, Wesleyan University, and Whiting Forensic Institute.

In 2011, the region's workforce totaled 86,829 individuals, meaning the region's workforce is significantly larger than the number of individuals employed within the region. Only 14.4% of the region's residents work in their hometown, while 19.8% work elsewhere in the region, meaning 34.2% of the employed population lives and works in the LCRV Region. The overwhelming majority (65.8%) travel outside the region for employment.

The region has long been perceived as a "commuter" region, where residents live, but don't work. The majority of the region's workers travel north-bound for work, with 10.9% employed in Middletown and 8.8% in Hartford. Similarly, Meriden, East Hartford, New Britain, and Newington are large employment hubs for the region's residents. With easy access to 1-95 for the Southern-most municipalities, it is surprising that only 4.1% of the Region's workers commute to New Haven, 1.1% to Groton, and 0.9% to New London. 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 frequent congestion during commuting hours on Route 9 in the Middletown area, as well as traffic build-up on the 1-91 on and off ramps in Cromwell. See Maps 2.2 and 2.3 for a visual depiction of the Region's travel to work flows.

Employment within the region decreased during the Great Recession starting in 2007, and dropped to its lowest in 2010. Unemployment rates have recovered since 2010, yet not to pre-recession levels. Individuals employed in the financial sector were impacted the most by the recession, suffering a 55% decline in employment. Education, health services, trade, professional, and lei-

TABLE 2.5 LCRV Region Population Density (1970 - 2010)

Geographic Area	Land Area (Sq Mi)	Population Density per Sq. Mile				
		1970	1980	1990	2000	2010
LCRV	424.2	286	323	358	388	417
Connecticut	4844.1	626	642	679	703	738
Chester	16	186	192	214	234	250
Clinton	16.3	630	687	783	803	813
Cromwell	12.4	597	828	991	1038	1129
Deep River	13.6	271	294	319	339	340
Durham	23.6	190	218	243	281	313
East Haddam	54.3	86	104	123	153	168
East Hampton	35.6	199	241	293	375	364
Essex	10.4	472	488	568	625	643
Haddam	44	112	145	158	163	190
Killingworth	35.3	69	113	136	170	185
Lyme	31.9	47	57	61	63	75
Middlefield	12.7	325	299	309	331	348
Middletown	40.9	903	955	1046	1055	1189
Old Lyme	23.1	215	267	283	321	329
Old Saybrook	15	565	619	637	691	683
Portland	23.4	377	358	360	373	406
Westbrook	15.7	243	332	345	401	442

Source: Connecticut DECD, Population of Connecticut Towns (1970 - 2000)
U.S. Census Bureau, Census Summary File, (2000)

sure and hospitality industry employment has remained constant following the recession. Although the region saw a 5.1% decrease in employment between 2007 and 2009, employment rebounded 4.1% between 2011 and 2013.

Since 2007, there are approximately 3,000 fewer jobs in the region. Regional employment has increased in recent years, but has yet to recover to pre-recession levels. With 3,000 fewer jobs in the region, we can assume fewer trips are taking place during morning and afternoon peak commute hours, and more trips taking place in off-peak hours when residents perform daily errands and tasks.

F. ELDERLY AND MOBILITY IMPAIRED POPULATION

Historical and projected population age distributions show evidence of an aging population in the LCRV Region. The region's median age has aged approximately 9% each decade, outpacing the state and national population. This gradual increase in median age can be partially, but not entirely, attributed to the aging baby boomer generation occurring throughout the United States. See Table 2.7 for a further analysis of regional and municipal median ages.

In 2010, 15.7% of the population was age 65 or older. By 2025, it is projected that 26.4% of the region's population will be age 65 or older. By 2025, the State Data Center projects 48,267 individuals older than 64 will be residing in the area, a significant increase in the elderly population.

The region's elderly and disabled populations have different transportation needs that require special consideration and accommodation. The American Community Survey estimates that over 9% of the region's total population was disabled in 2013. Of the 15,916 disabled residents, nearly half were elderly and 8,151 were younger than 65. With a growing elderly population, the number of disabled elderly residents will increase, resulting in increased demand for para-transit services.

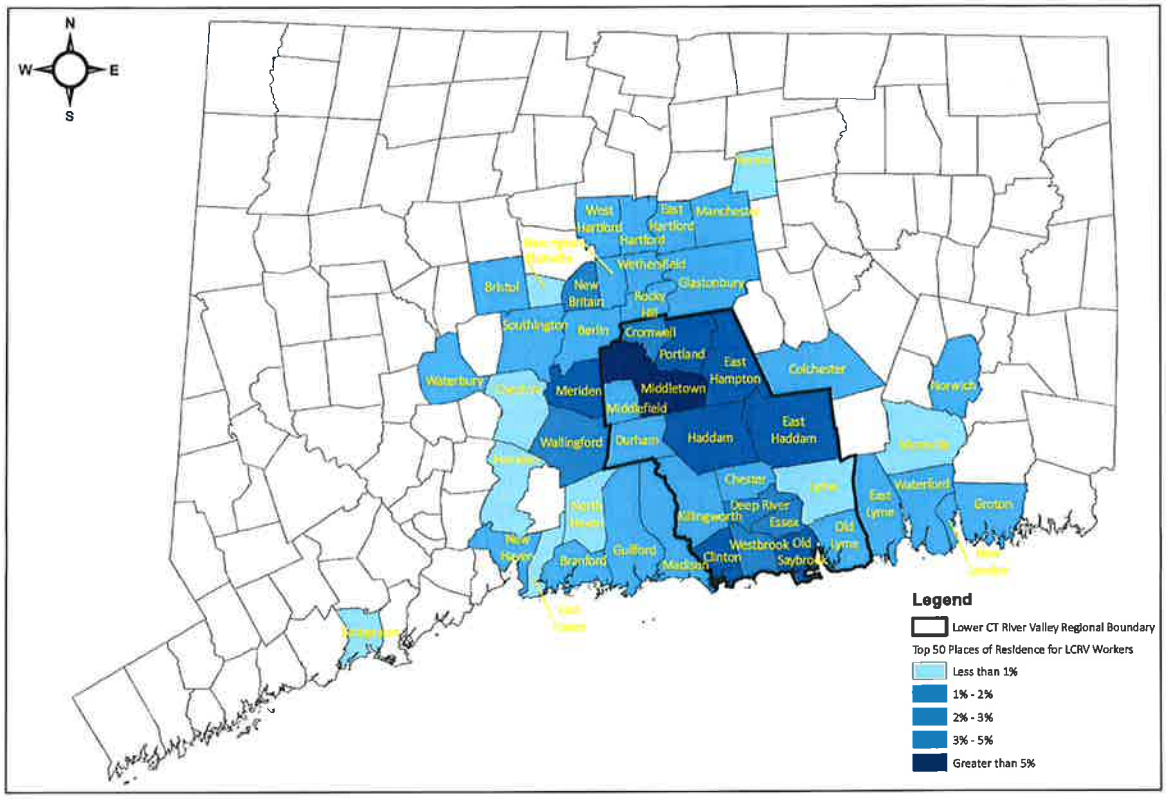
Middletown is home to the most residents age 65 or older, followed by Old Saybrook and Cromwell. The elderly account for more than 20% of the total town population in Old Saybrook, Lyme, Essex, Old Lyme, Chester, and Westbrook. East Hampton, Durham, and Middletown populations have the smallest percentage of elderly resi-

TABLE 2.6 LCRV Region Employment Sectors (2013)

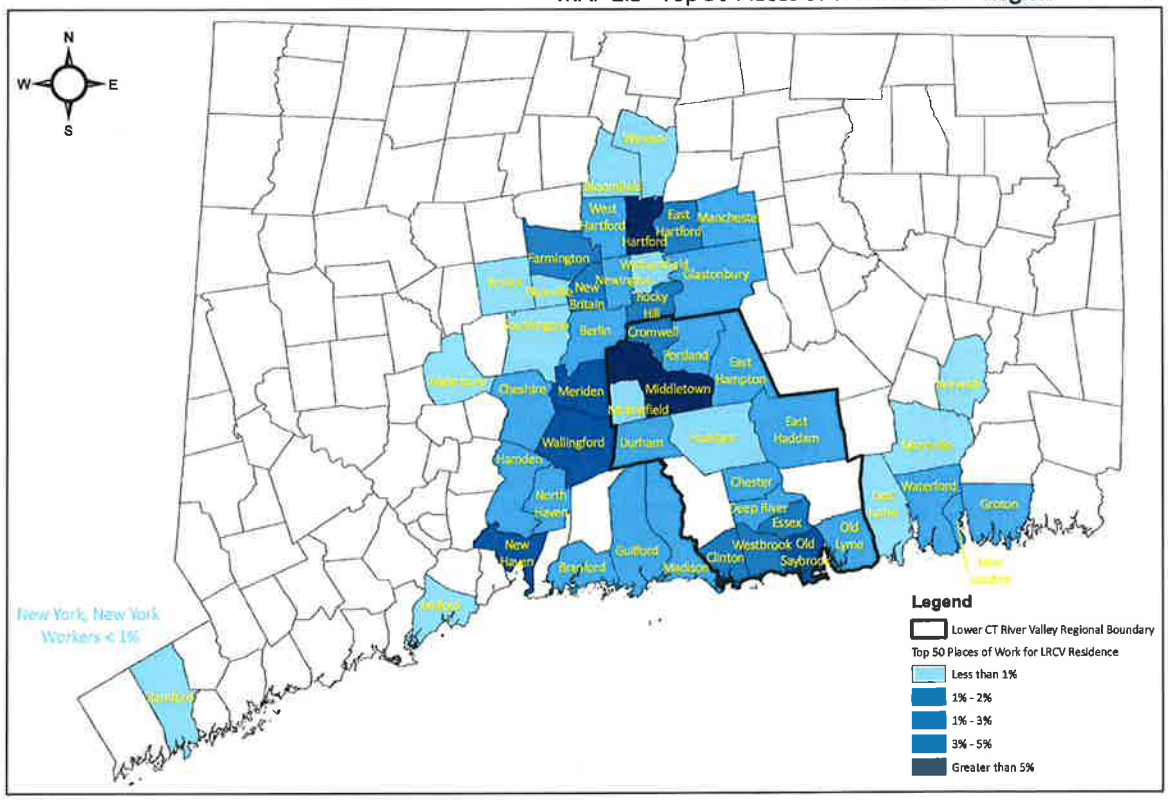
Employment Sector	Number of Jobs (2011)	Number of Firms (2013)
Agriculture, Forestry, Fishing and Hunting	578	7
Utilities	457	4
Construction	2,798	507
Manufacturing	9,202	249
Wholesale Trade	2,899	433
Retail Trade	8,200	683
Transportation and Warehousing	1,175	58
Information	1,013	55
Finance and Insurance	2,039	230
Real Estate and Rental and Leasing	641	117
Professional, Scientific, and Technical Services	3,040	512
Management of Companies and Enterprises	955	14
Administration & Support, Waste Management	2,324	311
Education Services	8,325	29
Health Care and Social Assistance	12,204	484
Arts, Entertainment, and Recreation	1,191	68
Accommodation and Food Services	5,518	421
Other Services (excluding public administration)	2,604	616
Government and Public Administration	2,284	294
Total:	67,447	5,092

Source: U.S. Census Bureau, On The Map, LODES Dataset: Area Profile for All Jobs, 2011
CT Department of Labor, Quarterly Census of Employment and Wages (QCEW), 2013
** Total number of firms not disclosed in original data set.*

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, "OnTheMap" Tool (2011)

TABLE 2.7 LCRV Region Median Age (1990 - 2010)

Geographic Area	Median Age			% Change 1990 - 2010
	1990	2000	2010	
LCRV Region	35.3	38.8	43	22.00%
Connecticut	34.4	37.4	40	16.30%
United States	32.9	35.3	37.2	13.10%
Chester	36.4	41.7	48.7	33.80%
Clinton	33.9	38.2	43.9	29.50%
Cromwell	35.8	40.2	43.1	20.40%
Deep River	36	39.1	43.9	21.90%
Durham	35.3	38.3	42.8	21.20%
East Haddam	34.8	38.5	44.2	27.00%
East Hampton	33.5	32.2	42.8	27.80%
Essex	41.9	43.4	49.2	17.40%
Haddam	36.3	40.3	44.4	22.30%
Killingworth	37.9	39.8	46.5	22.70%
Lyme	41.7	47.1	51.6	23.70%
Middlefield	36.8	40.3	44.7	21.50%
Middletown	31.2	36.3	37	18.60%
Old Lyme	39.8	42.9	48.8	22.60%
Old Saybrook	41.1	44.5	50.1	21.90%
Portland	36.7	39	43.1	17.40%
Westbrook	39.4	41.5	46.6	18.30%

Source: U.S. Census Bureau, 2010 U.S. Census, 2000 U.S. Census, 1990 U.S. Census

dents. See Table 2.8 for further data regarding the elderly and mobility impaired populations.

As the elderly population grows, more consideration and accommodations will be needed to ensure that residents have continued access to their community, regardless of their physical limitations. Existing public transit and private livery or taxi services will have difficulty meeting the growing transportation needs of elderly and disabled residents. Therefore, there will be increased demand for public programs and policies that fill transportation gaps, including expanded transit and paratransit services, sidewalks, and walkable neighborhoods with nearby shops and services. 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 continue to be implemented.

Future highway design must also accommodate the transportation needs of older drivers by increasing the safety and usefulness of the highway system for them and other users. Although not unique to older drivers, many studies have shown aging is often associated with declining physical, cognitive and visual abilities, ultimately affecting 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 these recommendations should be considered when facility improvements are planned.

TABLE 2.8 LCRV Region Elderly & Mobility Impaired Populations

Geographic Area	2010 Persons over age 65	2020 Projected Population over age 65	2025 Projected Population over age 65	2013		
				Disabled Persons over 65	Disabled Persons under 65	Total Disabled Persons
LCRV Region	27,819	40,946	48,267	7,765	8,151	15,916
% of population	15.70%	22.50%	26.40%	4.50%	4.70%	9.20%
Chester	829	1,195	1,416	160	139	299
Clinton	2,013	3,132	3,621	639	765	1,404
Cromwell	2,284	3,119	3,654	662	722	1,384
Deep River	685	1,065	1,227	180	329	509
Durham	943	1,470	1,802	350	219	569
East Haddam	1,186	2,098	2,621	346	315	661
East Hampton	1,547	2,854	3,624	431	558	989
Essex	1,477	2,062	2,370	466	224	690
Haddam	1,154	1,942	2,396	228	328	556
Killingworth	1,046	1,810	2,165	308	220	528
Lyme	568	911	1,021	73	92	165
Middlefield	707	985	1,199	159	159	318
Middletown	6,285	8,430	9,939	1966	2,870	4,836
Old Lyme	1,630	2,312	2,610	351	203	554
Old Saybrook	2,594	3,282	3,586	806	390	1,196
Portland	1,465	2,218	2,608	421	313	734
Westbrook	1,406	2,061	2,408	379	444	823

Source: U.S. Census Bureau, Census Summary File, 2010
Connecticut State Data Center, Population Projections, (2020- 2025)
U.S. Census Bureau, American Community Survey 5-year estimate, (2008 - 2013)

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) Region 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 vital to the regional economy. Amtrak, CTDOT, Tilcon, and CTDEEP all own rail lines in 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 between Boston, MA and Washington, DC. There is one stop within the LCRV region at Old Saybrook. Normal service between New York City and Boston, with intermediate stops, is approximately four hours. Average weekday service between Old Saybrook and Boston (South Station) is about two hours and thirteen minutes. Average weekday service between Old Saybrook and New York (Penn Station) is about two hours and eighteen minutes. Average weekday service between Old Saybrook and Washington DC (Union Station) is approximately six hours and seven minutes. Amtrak owns a portion of the North East Corridor from New Haven to the Connecticut-Rhode Island state line, including the approximately 18 miles in the LCRV region.

Shoreline East

Shoreline East (SLE) is a commuter rail service of the Connecticut Department of Transportation (CTDOT) between New Haven, Old Saybrook, and New London. As of February 2015, service consists of 17 westbound and 17 eastbound trains between New Haven and Old Saybrook on weekdays; of those weekday roundtrips, 7 westbound and 6 eastbound continue onward to New London. These trains connect to 31 westbound Metro North trains to New York City and 32 eastbound Metro North trains connect with the SLE trains in New Haven. Weekend and holiday service consists of 10 westbound and 10 eastbound trains between New Haven and Old Saybrook with 8 westbound and 8 eastbound trains continuing onward to New London. These figures do not include special Friday only trains or Amtrak trains operating on the SLE line. Through a cooperative agreement with CTDOT, AMTRAK honors subscription Shoreline East riders and allows bicycles on all trains. The SLE tracks are constructed with continuously welded rail and with electrical power available via overhead catenary lines. The tracks are maintained at Federal Railroad Administration Class 6 and Class 7 standards, therefore the line is capable of 125 mph operations but the current equipment's allowable operating speed is 80 mph. SLE rolling stock includes 33 Mafersa electric push/pull coaches, 6 GP-40-2H locomotives, and 8 P-40 locomotives. The locomotives are diesel-electric. The diesel engine is directly coupled with an alternator that generates electricity which is distributed to traction motors located on each wheel set.

In 2013, 657,832 passenger trips were recorded for Shoreline East between New Haven, Old Saybrook, and New London, an increase of 12.4% from 585,218 trips in 2010. Shoreline East provides service to three train stations in the LCRV Region: Clinton, Westbrook, and Old Saybrook. SLE service is expected to double between New Haven and Old Saybrook by the year 2030. Increased service will require double side or up-and-over commuter platforms, and agreement by CTDEEP regarding the number of trains operating over movable bridges. Between 2011 and 2013, RiverCOG conducted boat monitoring studies to assess the daily and weekly numbers of boats requiring bridge openings.

Shoreline Freight

Freight service along the shoreline is operated by Providence and Worcester Railroad with options for freight service up to six daily trips or as allowed through CTDEEP permits.

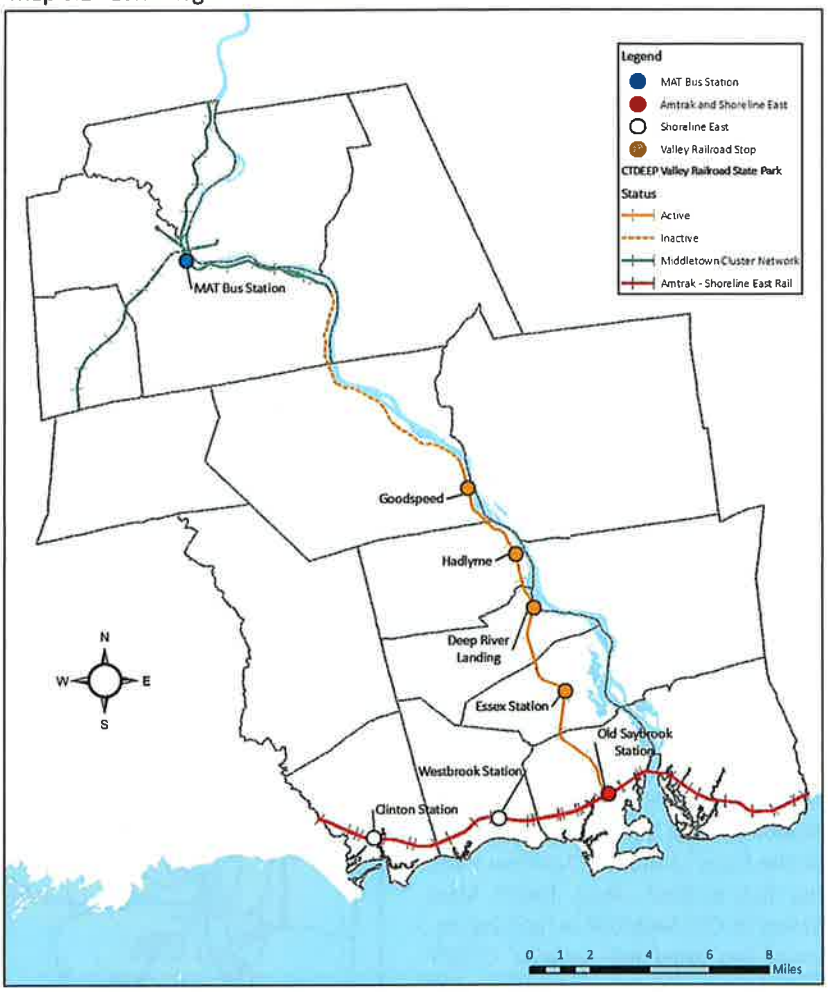
Middletown Rail Cluster

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 Providence & Worcester Railroad (P&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 Providence & Worcester 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.

Map 3.1 LCRV Region Rail Service



Source: CT Department of Energy and Environmental Protection, RiverCOG

Wethersfield Secondary Line

The Wethersfield Secondary Line traverses 16.6 miles north from the Middletown Cluster to the Hartford interchange. This line was inactive south of Hartford for approximately twenty years, but service recommenced in 2002 following restoration by P&W and the Department of Transportation. P&W provides weekly through freight service between Middletown and Hartford on this line.

Valley Rail Line

The Valley Rail Line traverses 22.5 miles from a connection with Amtrak's Northeast Corridor at Old Saybrook to a connection with the Laurel Track in southern Middletown. The Valley Railroad Company has operated tourist train passenger service for the past 40 years between Old Saybrook and Haddam, using historic locomotives and coaches. According to the Valley Railroad, approximately 140,000 passengers ride the line a year. Almost all passengers board and alight at the Valley Railroad depot in Essex. The Valley Rail Line is out of service between mile post 12.9 in Haddam and mile post 22 in Middletown, although this portion of the right of way is cleared for maintenance equipment, vegetation control, and property surveillance. The line is a state park owned by CTDEEP and leased to the Valley Railroad Company. The property was purchased with federal conservation

funds for public recreational use. The Valley Railroad Company has worked with CTDEEP on property encroachment issues, particularly on the out-of-service portion of the line in Haddam and the Maromas section of Middletown. The Valley Railroad Company does not currently carry freight, but retains the right to do so in its lease with CTDEEP. The track from Old Saybrook to Essex is mostly 78 pound rail maintained to FRA Class 1 standard which provides for 10 mph freight speeds. From Essex to Chester there are significant portions of 107 pound rail and stone ballast, all installed and funded by Valley Railroad Company. This portion is maintained to FRA Class 2 standards providing for 25 mph freight speeds.

Rail Parking

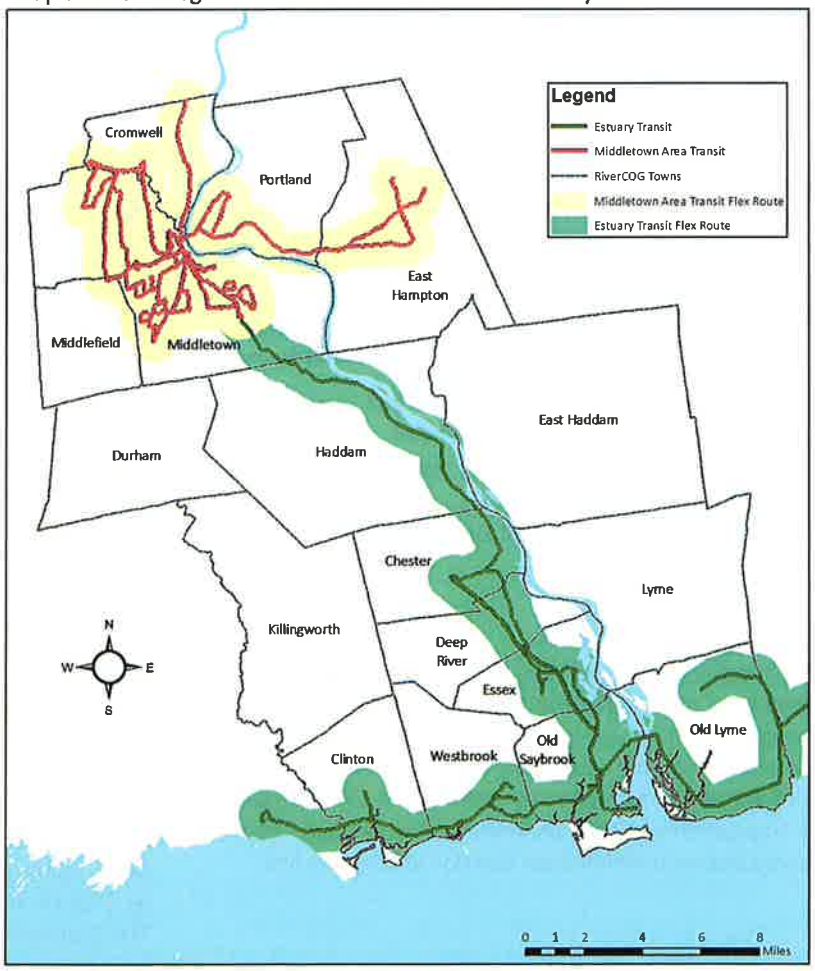
Parking at the region's three rail stations (Clinton, Westbrook, and Old Saybrook) is a continuing issue. Currently, Clinton's parking capacity is 125 spaces. Westbrook's new rail station, which opened in March 2014, has 200 spaces, a significant increase from the previous 40 spaces. Old Saybrook's train station has designated parking for Shoreline East with 137 spaces and approximately 75 spaces for Amtrak parking. Station parking is free and unpatrolled at the three stations. Overflow parking has evolved along North Main Street in Old Saybrook as parking demand has exceeded capacity. CTDOT has begun construction of a 199 space parking lot adjacent to the track on the west side of North Main Street. As CTDOT improves rail parking and station access in all three rail lots connecting to Estuary Transit District's Shoreline Route, bicycle storage, and pedestrian connections are priorities for the region.

PUBLIC BUS

Middletown Transit District

Map 3.2 shows the public bus routes within the LCRV Region, including both the Middletown Transit District and the Estuary Transit District. Middletown Transit District (MTD) operates five regularly scheduled bus routes (routes A-E) in the city of Middletown and Cromwell and a bus terminal in downtown Middletown. MTD also operates one rural transportation route (route F) that serves residents in the towns of Portland and East Hampton. In cooperation with the Meriden Transit District, MTD provides a route (M-Link) that connects Middletown with Meriden. Routes H-South, and I-North are a combination of the regular routes providing service from 7:00 p.m. to 11:00 p.m. and are valuable to workers in commercial areas of the city. Routes S-1, S-2, and S-3 are Saturday only routes. Route S-1 is an expanded A route/Saybrook Road. Route S-2 is a combined B and C Wesleyan Hills/Washington Street route, and S-3 is a combined D and E Newfield Street/ Westlake Drive route. In cooperation with the Estuary Transit District, service is also available from the Old Saybrook railroad station to the MTD terminal. MTD also provides paratransit services for elderly and handicapped citizens. Door-to-door bus service is provided to eligible persons with disabilities in accordance to the ADA Act of

Map 3.2 LCRV Region Public Bus Routes Fixed and Flex Systems



Source: CT Department of Transportation, RiverCOG, Middletown Area Transit, Estuary Transit District

1990. Dial-a-ride service is provided for persons over sixty years of age in East Hampton, Middlefield, Middletown, and Portland. Appointments must be made one day in advance and the fare is $2.00. All MTD vehicles are wheelchair accessible and have bicycle racks.

Estuary Transit District

The Estuary Transit District operates four bus routes as Nine Town Transit (9TT) in Chester, Clinton, Deep River, Durham, Essex, East Haddam, Haddam, Killingworth, Lyme, Old Lyme, Old Saybrook, and Westbrook. These routes operate as flex route services deviating up to 3/4 miles off the primary route. Beyond established bus stops, potential riders may flag down a bus at any point along the route where it is safe for the bus to stop. In addition to the flex route service, the Estuary Transit District offers a "Transit on Call/Dial-A-Ride" service which provides door to door transportation. Reservations are required one day in advance for residents of the 12 towns serviced by 9TT. Nine Town Transit has 13 buses, all equipped with bicycle racks and are accessible to persons with disabilities. Transfers to connecting buses are issued free of charge.

CTTransit

Connecticut Transit's Hartford Division operates one local bus route (55) and two commuter express bus routes (906 and 921) on weekdays between Cromwell, Middletown, and Old Saybrook and Hartford. Free transfers are available between CTTransit routes, MTD, 9TT routes. CTTransit buses are equipped with bike racks.

C. HIGHWAYS

EXISTING NETWORK

The Lower Connecticut River Valley Region contains 1,509 miles of actively maintained roads. Of this total, 314 miles (20.8%) are owned and maintained by CTDOT and the remaining 1,195 miles (79.2%) are maintained by LCVR municipalities. Middletown has the largest amount of roads in the region with 228.4 miles and Chester has the smallest in the region with 46.1 miles.

Of the region's state owned roadways, 253 miles are two or four lane state highways and 61 miles are four to six lane divided limited access expressways. There are another 27 miles of state owned expressway ramps and connectors.

Interstate 95 (I-95) is the LCRV Region's and the nation's 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 2014 this section of I-95 connects New Haven and New London and has an ADT between 59,200 and 69,000. The region's second most traveled expressway is Interstate 91, connecting New Haven and Hartford, and cuts through Middletown and Cromwell in the northwest corner of the LCRV Region. 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. Route 9 connects these municipalities to New Britain and I-84 in West Hartford.

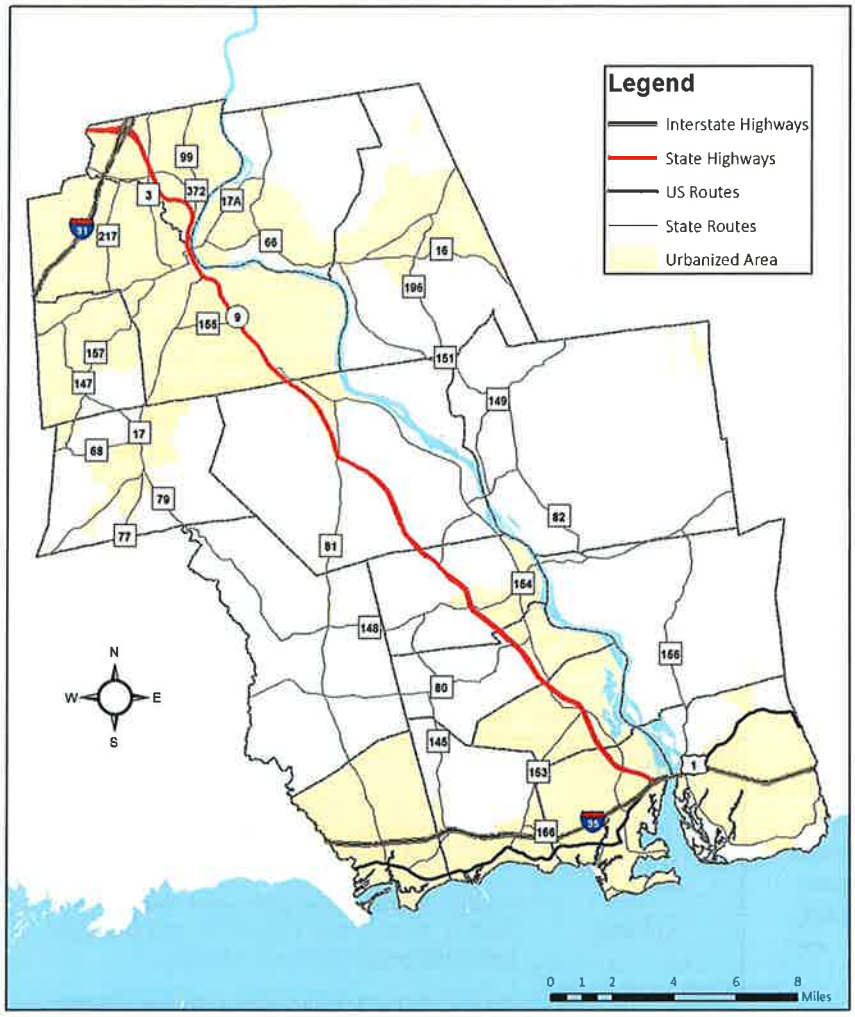
Table 3.1 Functional Classification of Roadways

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.

Map 3.3 LCRV Region Roadway Network



Source: CT Department of Transportation

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 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.

Funding eligibility for improvements and maintenance is an important element of the functional classification of roadways. Federal or State Highway funds are only designated for those roads with functional classification of interstate, expressway, arterial, or major collector. Every ten years, coinciding with decennial census, CTDOT and Connecticut's Metropolitan Planning Organizations review and adjust the functional classification of roadways. The functional classification of specific roads may be reviewed outside of the decennial review on an as needed basis or in conjunction with other state or local programs.

CAPACITY & CONGESTION

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 (ADT) 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.

Table 3.3 Roadway Capacity in 2011 and 2035

LCRV Region	2011	2035
Under Capacity	93%	82%
Approaching Capacity	2%	4%
Over Capacity	5%	14%

State of Connecticut	2011	2035
Under Capacity	86%	77%
Approaching Capacity	5%	5%
Over Capacity	9%	18%

Table 3.4 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

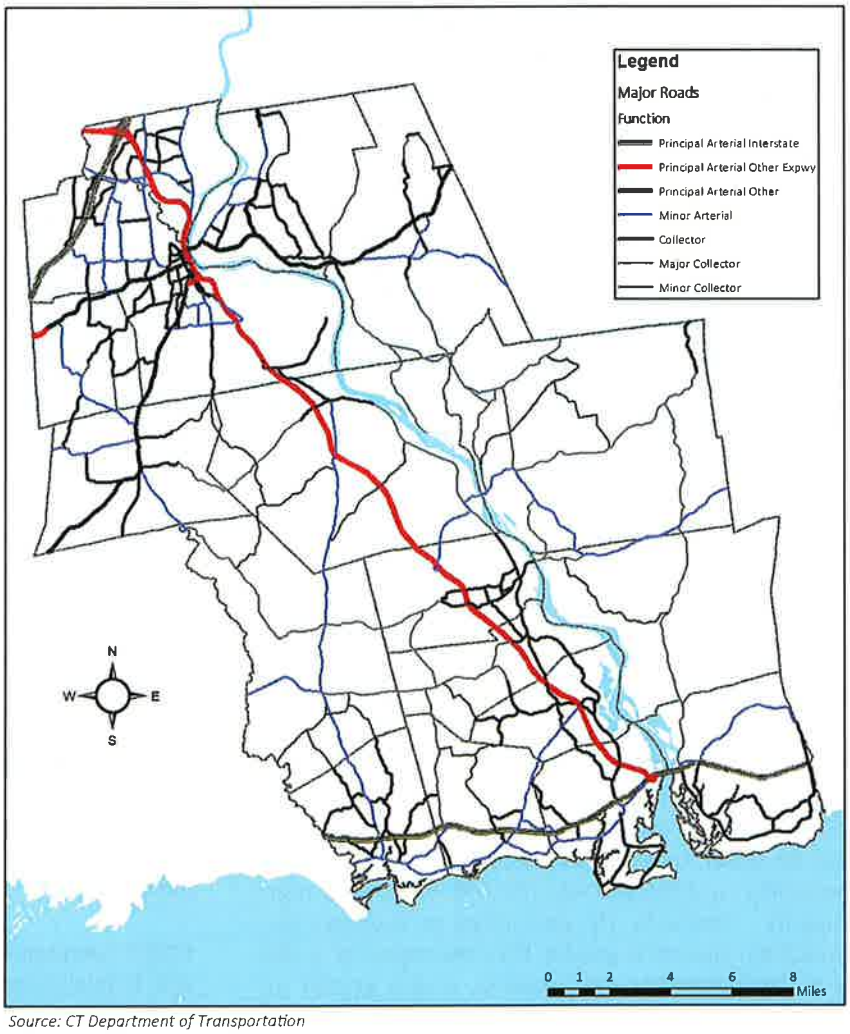
peak hours primarily due to its traffic light configuration. A map of the regional roadway network is located in Map 3.3.

Capacity Analysis

Capacity analysis is a tool that helps identify roads that are congested or will become congested if current trends continue without roadway improvements. According to CTDOT, the LCRV region has many segments of highways that were near or exceeding their capacity in 2011. By 2035 it is projected, many more highway segments are projected to be near or over capacity. See Table 3.3 for roadway capacity estimates in 2011 and 2035. As seen in Map 3.5, roadways of concern include I-95 and I-91, as well as Routes 3, 17, and 66.

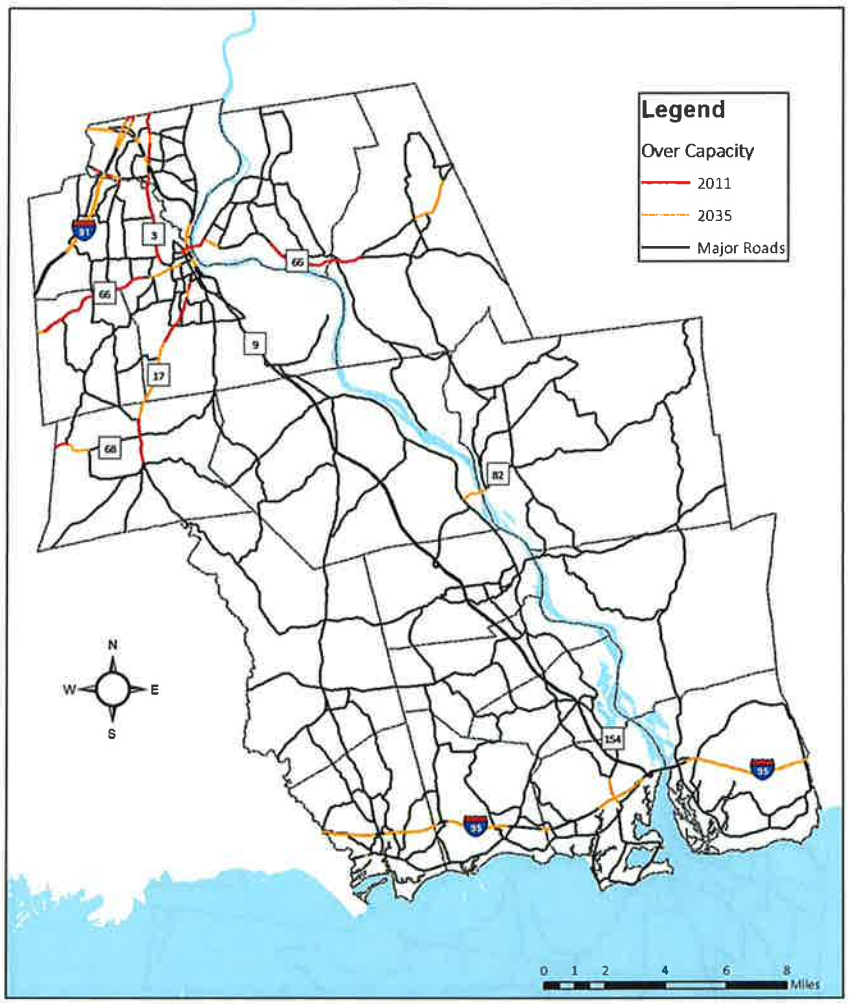
If current growth patterns continue without improvements to roadways or a change in land use policies, even larger areas of the region will experience traffic congestion in the future. In addition to improved infrastructure, congestion management strategies can also be formulated to alleviate existing 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 along areas that are or will be over capacity.

Map 3.4 LCRV Region Functional Classification of Roadways



Source: CT Department of Transportation

Map 3.5 LCRV Region Roadway Capacity



Source: CT Department of Transportation

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. In 2011 there were 313.51 miles of state roadways in the region. Of those, 290.4 (92.6%) miles were under capacity, 7.0 (2.2%) miles were approaching capacity, and 16.1 (5.2%) miles were over capacity. Statewide the percentage of roadways approaching capacity is slightly greater than the region at 4.8%, and the percentage over capacity is also greater at 9.2%. Year 2035 projections by CTDOT indicate, 257.3 (82.1%) miles will be under capacity, 13.8 (4.4%) miles will be approaching capacity, and 42.4 (13.5%) miles were over capacity. Statewide, the percentage of roadways approaching capacity is greater than the region at 5.3%, and the percentage over capacity is also greater at 17.4%.

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

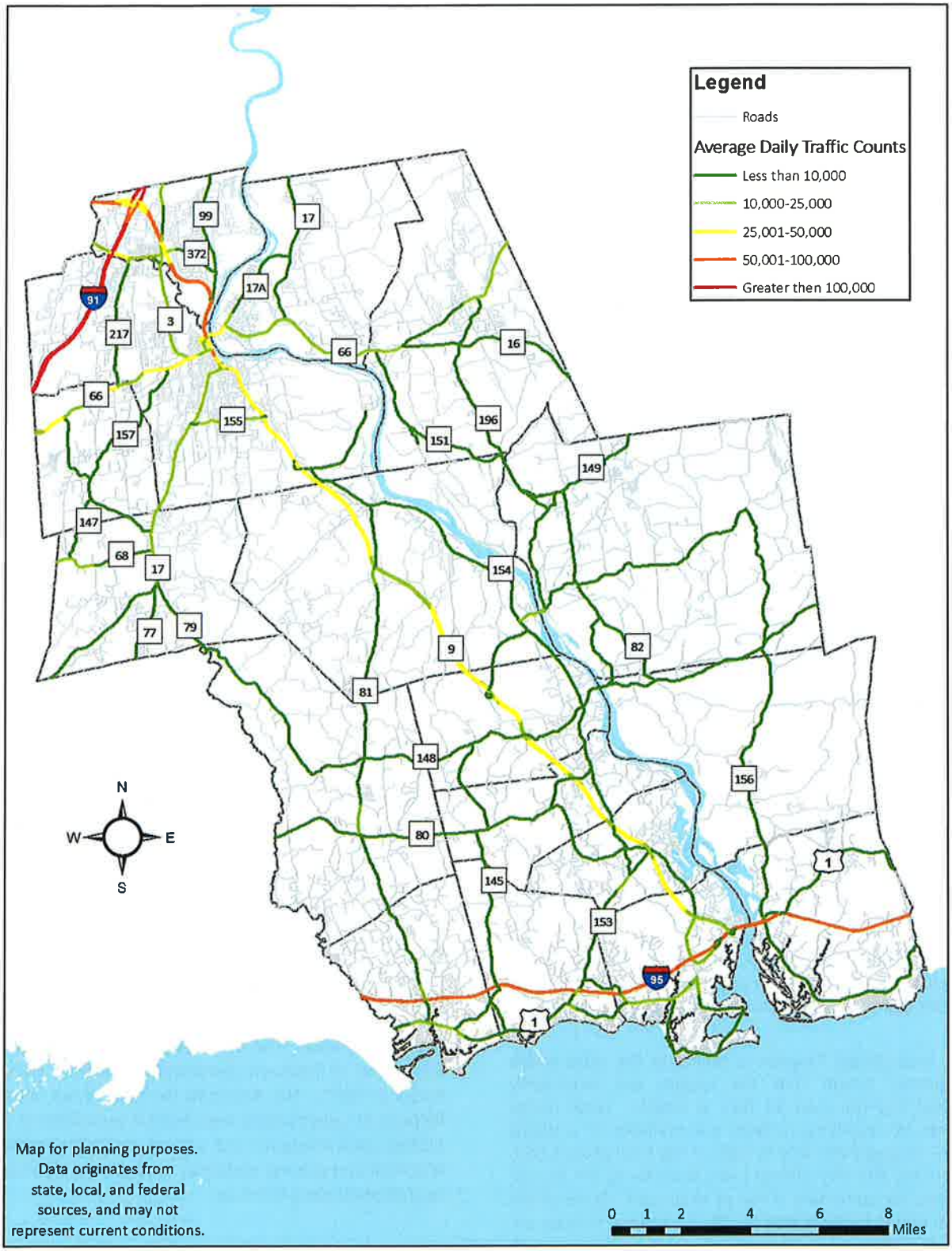
The LCRV region has sixteen commuter parking lots located near interstates and major arterials. Ridesharing options are available through individual arrangements and CTDOT sponsored ride share programs such as CTRides. The CTTransit route #906/Cromwell Express to Hartford serves several commuter lots along Route 9 on weekdays. RiverCOG tracks commuter lot usage on a quarterly basis. Recent counts show commuter lot usage has increased slightly between Fiscal Year (FY) 12 and FY13 increasing from 51% to 53%. Quarterly counts in FY13 found 2,223 vehicles parked in the region's 4,172 available parking spaces. See Table 3.4 for a list of commuter lots.

D. BRIDGES

Many state bridges in the region have been either replaced or refurbished between 2005 and 2014. 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 the federal funding. In the State Bridge Pro

Map 3.6 LCRV Region Average Daily Traffic Counts 2011



Source: CT Department of Transportation

Table 3.5 LCRV Region Eligible Bridges 2015

Municipality	Eligible Bridges
Chester	#026011 Dock Road over Chester Creek tributary
Clinton	#04119 Kelseytown Road over Menunketesuck River
	#06296 Waterside Lane over Hammock River
Deep River	#122001 Tower Hill Road over unnamed brook
East Haddam	#04649 Clark Hill Road over Roaring Brook
	#06126 Haywardville Road over Eight Mile River
East Hampton	#05610 Shipyard Road over Mine Brook
	#041001 Walnut Ave over Pocotopaug Creek
	#041004 Niles Street over Pocotopaug Creek
	#041005 Flat Brook Road over Flat Brook
	#041006 Flat Brook Road over Flat Brook
	#041007 Blacksmith Road over unnamed brook
	#041008 Terp Road over Pine Brook
Essex	#049004 Old Deep River Road over unnamed brook
Haddam	#04682 Dublin Hill Road over Bible Rock Road
	#05515 Jail Hill Road over Beaver Meadow Brook
Killingworth	#06614 Abner Lane over Pond Meadow Brook
Lyme	#04726 MacIntosh Road over Eight Mile River
	#04723 Mount Archer Road over Eight Mile River
	#05818 Day Hill Road over Raging Brook
	#074007 Birch Mill Road over Falls Brook
Middletown	#04187 Main Street Extension over Sumner Brook
	#04190 River Road No.1 over Sumner Brook
	#082040 Westlake Drive over Miner Brook
Westbrook	#06659 Flat Rock Place over wetlands
	#06660 Flat Rock Place over wetlands
	#154002 Winthrop Road over Falls River
	#154003 Lynn Road over Falls River

gram, 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 are available on a sliding scale ranging from 10% to 33% of the total project cost. There are also low interest loans available to the municipalities for up to 50% of the project costs. 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 2015 list of currently eligible bridges is located in Table 3.5. 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 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, American Heritage Rivers in 1997. The American Heritage Rivers initiative helps river communities seek federal assistance to help protect environmental and natural resources, preserve historical and cultural resources, and promote economic revitalization along the river.

NATIONAL BLUEWAY

Although the Secretary of the Interior, Sally Jewell has 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 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 3 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. 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. The RiverQuest is available for daytime, evening, and private educational and scenic excursions.

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

The Chester Ferry crossing the Connecticut River.

Pilot's Point Marina located in Westbrook.

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 Ri*dley*.

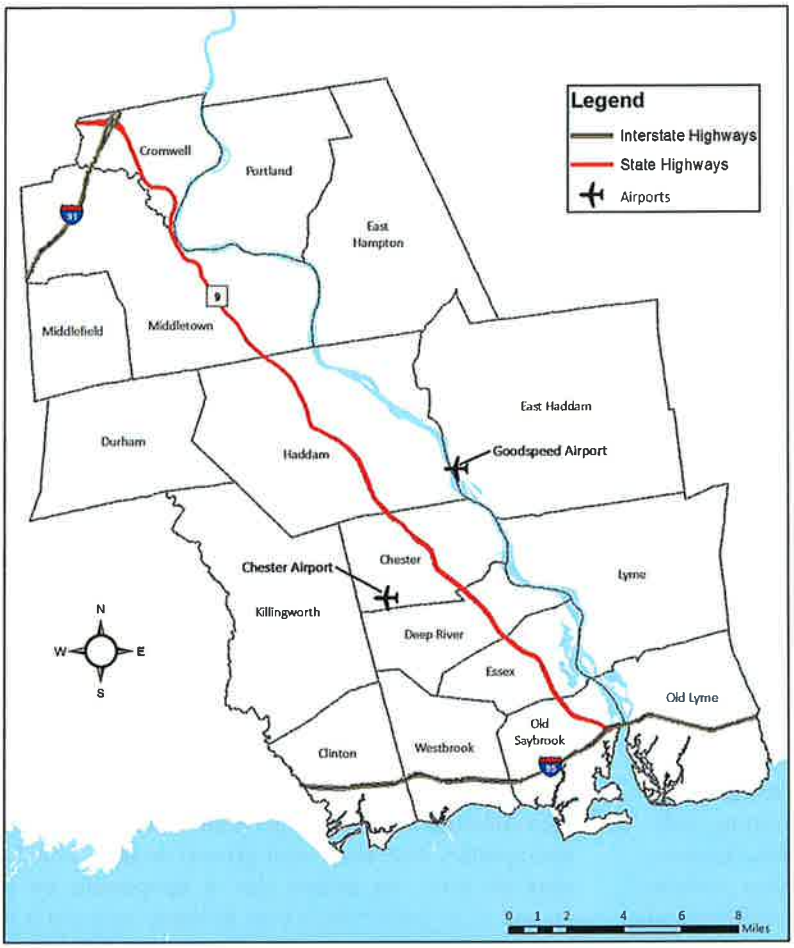
FERRY SERVICE

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. In 2013, there were 21,122 crossings carrying 37,737 vehicles and 78,764 passengers. $145,286 of revenue was generated in ticket sales. 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

Map 3.7 LCRV Region Airport Locations



Source: RiverCOG

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 significant boating use 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 75 slips for small boats. Several of the marinas also offer boat rentals.

PUBLIC BOAT LAUNCHES

Within the LCRV region, there are 17 state owned public boat launches and 6 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).

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 Department's 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 31, 2014. Thirty-three aircraft were based at the airport as of August 2014. 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 August 31, 2014. One hundred five aircraft were based at the airport as of August 2014. One hundred were single engine airplanes and five 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.

The Airline Trail Cranberry Bog entrance in East Hampton.

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.

G. BICYCLE, PEDESTRIAN, TRAILS

COMPLETE STREETS

Connecticut has recently endorsed significant policy changes in providing enhanced bicycle and pedestrian infrastructure by implementing the Complete Streets initiative, in accordance with Public Act 09-154. The Commissioner of CT DOT, James Redeker took steps to promote Complete Streets in October 2014 by releasing a policy statement outlining objectives and procedures 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.

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. RiverCOG is embarking on an inventory and assessment of facilities for pedestrian access in the region to analyze safety and inter-modal access for pedestrians. Special focus areas are highly travelled commercial areas on State highways such as Route 1, Route 17, Route 66 and Route 154. Outside of densely populated areas, pedestrian access is limited.

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 a 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 Matta-

besett 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.

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

Chapter 4.

TRANSPORTATION PLANNING

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.

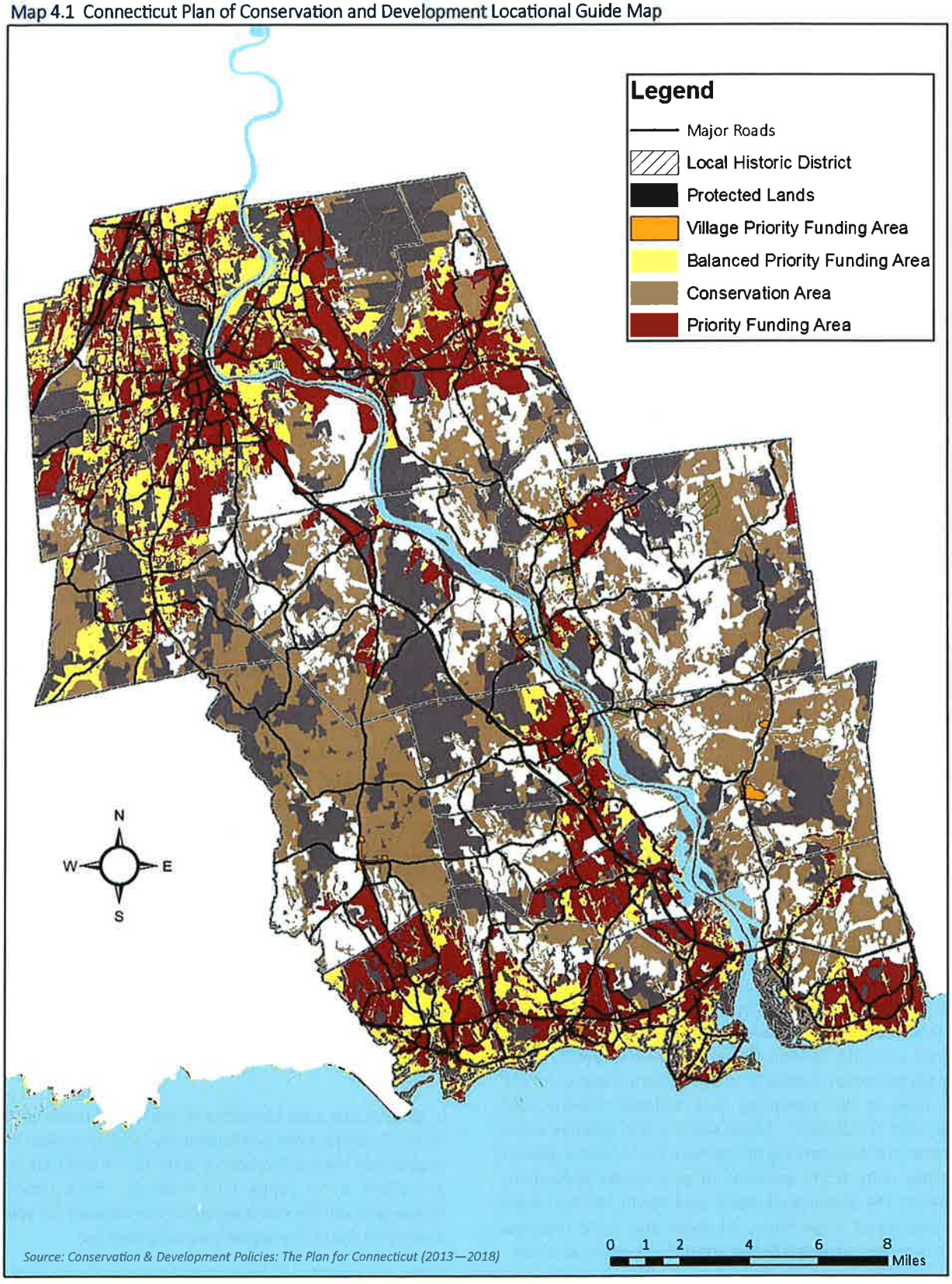
This plan is the first long range transportation plan developed for the recently merged LCRV Region. RiverCOG assists member towns with long range planning including transportation planning for municipal Plans of Conservation and Development. The COG also assists with other municipal plans such as Safe 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

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



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. 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.

The land area of the LCRV Region encompasses about 420 square miles, or about 93.2% of the total area of the Region. In 2010, approximately 42,290 acres of the land area in the region was developed for a specific land use. Over the 20 year period between 1990 and 2010, a net increase of about 3.16%, or almost 14 square miles of formerly uncommitted land, has been developed. About 2.85% of the region's newly developed land was formerly deciduous forests, totaling almost 13 square miles.

Middletown is the region's urban center and home to an increasingly vibrant downtown. The region's hospital, court system, and higher education centers are located in Middletown. Middletown's proximity to the Connecticut River provides opportunity for a revitalization and reconnection to the waterfront. The access to the river is limited by the path of Route 9.

In the shoreline towns of Clinton, Westbrook, Old Saybrook, and Old Lyme, the attraction of the shore and the lack of undeveloped useable land in beach areas have created pressure for conversion of seasonal dwellings to year-round homes. Similar land use patterns have occurred near lakes in East Hampton, East Haddam, Chester, Old Lyme, and Middlefield. These seaside and lakeside communities are experiencing an increase in the conversion of dwelling units from seasonal to year-round habitation. However, the absence of water and sewer utilities limits the amount of conversion. As more and more seasonal dwellings get converted to year-round use, associated construction will aggravate daily traffic flows and emergency relief during storm events.

Continuing development along regional arterials is transforming rural landscapes and increasing traffic volumes. Current zoning regulations and development patterns trend toward isolated commercial strip development. As a result, lack of shared access to driveways and poor traffic flow create a challenge for safety and mobility along these corridors. Also, the town boundaries and individuality of towns become less distinct as subdivision and chain-store commercial development erode the character of the village centers and venues for civic interactions.

Durham and Middlefield are rural agricultural communities, with easy access to larger town centers of Middletown, Meriden, North Haven and Wallingford. These larger towns are characterized by large lot development and rural town centers.

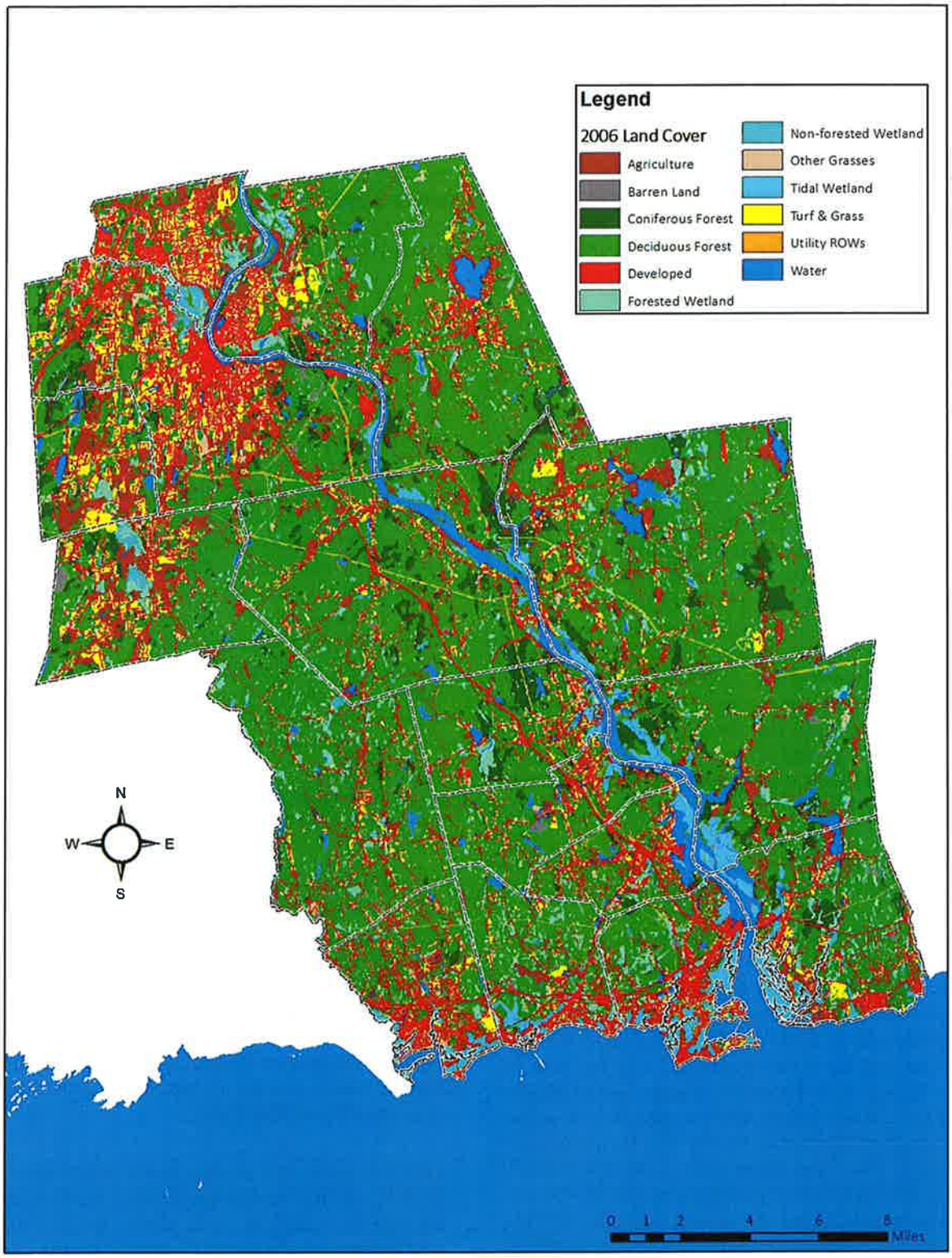
Cromwell is the most suburban municipality with higher density residential and strip mall development near the Route 9 expressway and Route 372. The other areas of town are primarily lower density residential units, with a town government center that is rural in character. Cromwell also hosts a significant number of houses that front the Connecticut River.

Chester, Deep River, East Haddam, Haddam, Killingworth, Lyme, Old Lyme, and Essex are characterized by their small village centers. All except Killingworth are located on the Connecticut River and contain marine facilities. The large tracts of forested open land between each town defines distinct village centers.

In the 19th century, East Hampton became a center for the manufacturing of bells, with residential, commercial, and industrial development historically located in the town center adjacent to Lake Pocotopaug. East Hampton is connected to Hartford and Norwich via the Route 2 expressway.

In general, the rural character of the region north of Interstate 95 results from predominantly large unbroken tracts of privately owned forestland, state forest and park lands, and public water supply land holdings. State parks and forests and wildlife management areas account for approximately 12.5% of the region's existing land use.

Map 4.2 LCRV Region Land Cover (2006)



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

The dominant issue that confronts this region is whether it can maintain a high quality of life for residents and tourists without impairing economic vitality or intruding on the reasonable use of private property, all while maintaining the region's rural and historical character. Local sentiments seem to favor a policy of limiting growth; however, several issues confront the region, which may cause this policy to be further examined or expanded. One important issue is transportation infrastructure and retail development which capitalizes on access to traffic volumes on state and interstate roadways. The other key issue is environmental quality and the availability of wastewater facilities. Sanitary sewers are a contentious and politically charged topic. The concern of residents in non-sewer areas is uncontrolled commercial and residential development if these facilities were available.

C. ENVIRONMENTAL NETWORK

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 Land Trust Exchange works 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 Forest Resource Assessment and Strategy: 2010.*

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. Examples of important 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

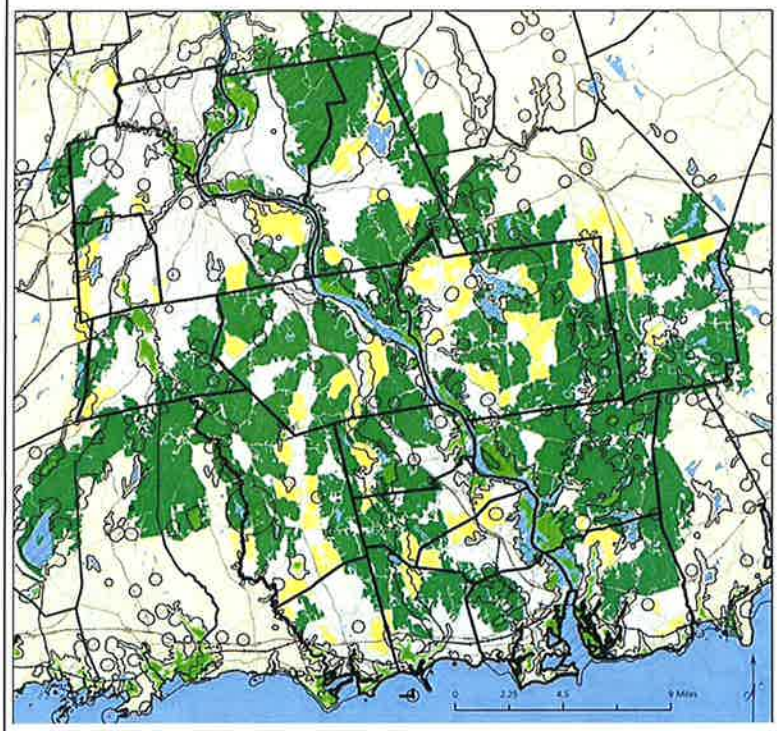
The USDA Forest Service has an ecosystem-based approach called stream simulation that provides a method for designing and building stream crossings intended to permit unrestricted movements of any aquatic species. This method helps the Forest Service achieve goals of maintaining the physical and biological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

Map 4.3 Large Natural Areas Primary & Connecting Corridors



The Lower CT River and Coastal Region Land Trust Exchange
Natural Resource Based Strategic Conservation Plan
A Gis Overlay Analysis

The 86 large natural areas (LNAs) with resource index scores of 4, 5, and 6 account for 68% of the total LNA acreage, 81% of core forest area, and 69% of buffered surface hydrology of all the LNAs analyzed. Because of their size and resource value the Committee chose these LNAs as primary regional wildlife habitat corridors, and the LNAs with the resource index score of 7 which account for an additional 63 LNAs, 11% of LNA acreage, 10% of core forest area, and 11% of buffered surface hydrology, as connecting habitat corridors.

To retain the importance of the locations of Critical Habitats and Natural Diversity Database Areas they are included as separate data layers on the regional model maps. The local and regional models include those LNAs that extend beyond the boundary of the Region to enable planning across regional and municipal boundaries.

Primary Corridors
Connecting Corridors
Natural Diversity Database
Critical Habitats

Water
Intermittent Streams
Streams
Railroad
Primary Road
Secondary Road
Local Road

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

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.

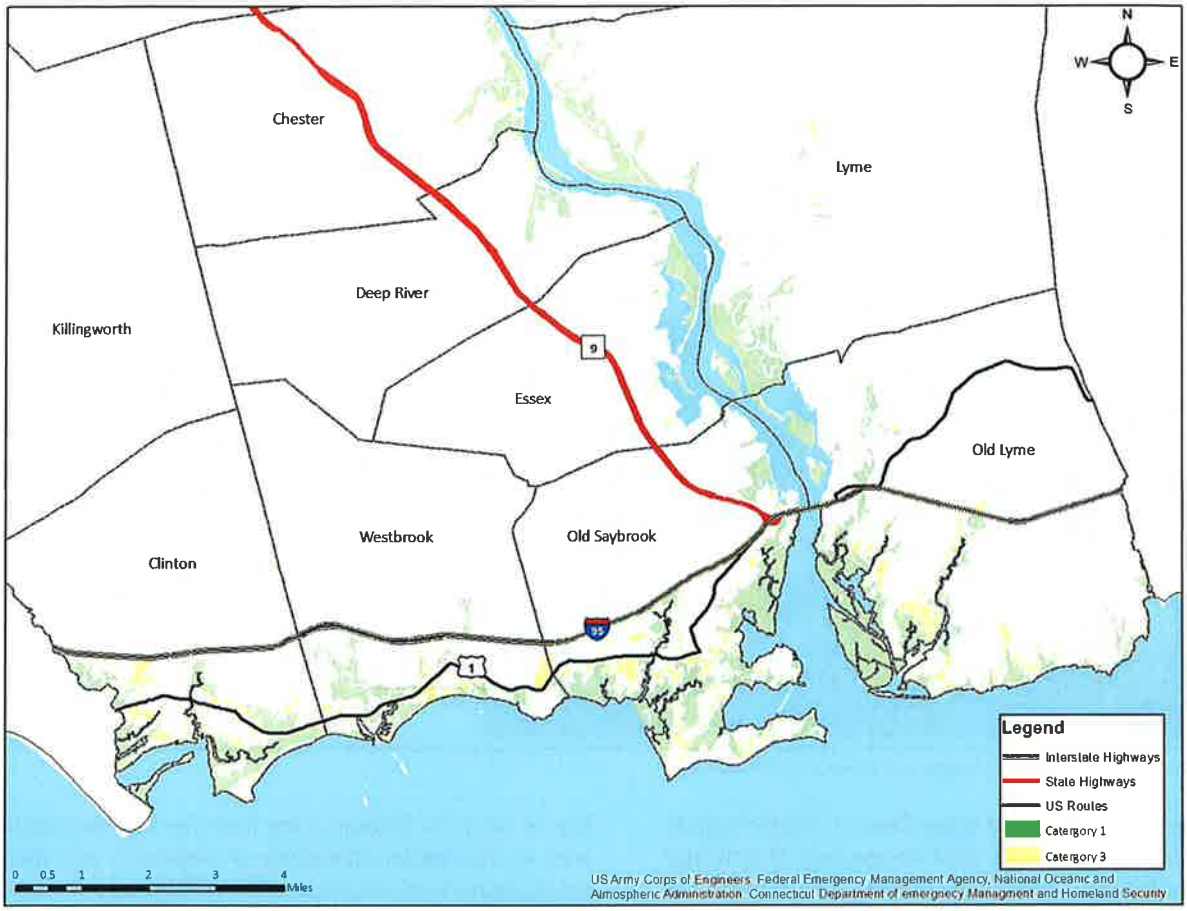
COASTAL FLOODING

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 2014 Natural Hazard Mitigation Plans specify projects to lessen the impacts of storms.

Map 4.4 LCRV Region Hurricane Surge Inundation



Source: U.S. Army Corps of Engineers, Federal Emergency Management Agency, National Oceanic and Atmospheric Administration, CT Department of Emergency Management and Homeland Security

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 conservation land
- Implement trail stewardship to better manage trail maintenance

D. TRANSPORTATION NETWORK & 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

TRANSIT DISTRICTS

The LCRV region's two transit districts, Middletown Area Transit (MAT) and Estuary Transit District (ETD), have partnered to provide connecting bus service from Mid-

dletown to Old Saybrook. Both transit districts provide 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 the two systems, town centers, commuter lots and CTTransit express services, and rail stations is an important regional transportation goal. Better coordination between Middletown Area Transit service and Estuary Transit Service will be dependent on finding creative and efficient use of new and existing funding.

Estuary Transit District is an independent public transit operation, but expansion is still dependent on capital and operation funding from CTDOT. A primary challenge for the Estuary Transit District is the increasing ridership, and a lack of bus capacity and operating hours. ETD acquired two new gasoline-electric hybrid buses. As ridership grows, the current fleet of low-floor, 20 passenger buses will be inadequate. Planning for acquiring and garaging larger buses should be conducted.

Middletown Area Transit (MAT) is an urbanized direct recipient of Federal Transit Administration funds and works cooperatively with CTDOT. MAT recently opened a 19,000 square-foot bus maintenance facility on Pease Avenue and North Main Street in Middletown, replacing a small maintenance facility. The facility includes space to store the company's ten buses, ten vans, maintenance facilities, a wash bay and office space. The design included reshaping the intersection between the two streets making it easier for buses and trucks to make turns, benefiting adjacent businesses in the surrounding the industrial zone.

MAT fixed route bus service provides an average of 288,000 trips per year and perennially surpasses projected ridership figures. In fiscal year 2014, MAT recorded 255,000 miles of transportation services on the fixed routes over the span of 18,400 hours of operation.

RECOMMENDATIONS

Over the next ten years, anticipated projects and improvement include:

- Comprehensive Operations Analysis for improved individual district service for the two transit districts and recommendations for improved cooperative service between the two districts
- Service along Route 81 connecting Clinton to Middletown to service the Clinton Shoreline East train station and Middletown employment, higher education opportunities, and services
- Service between Madison and Middletown with fixed stops in Higganum, Haddam Killingworth High School and various employment centers
- Increase bus capacity for selected Estuary Transit routes for additional 20 passenger buses
- Improved integration of bus service with Wesleyan University and Middlesex Community College, including options for partnering with CRCOG and SECCOG to promote student ridership
- Establish a Riverside Flyer service to Bradley International Airport through the Estuary Transit District for direct connection between the region and the airport
- Improved frequency of service on existing routes to improve inter-connection between other transit modes and village service centers
- Express bus service from Middletown to CT Fastrack in New Britain
- Sunday service for both fixed and dial-a-ride programs
- Add a second Meriden to Middletown run to provide 30 minute service instead of 60 minute service
- Route 153 service from Essex to Westbrook to promote access to Shoreline East train station
- New and improved bus pull outs and waiting areas at key locations, specifically at rail stations and roadway routes, such as Route 1, Route 66 and Route 17.
- *Shoreline Route* – Change from deviated fixed route to regular fixed route and operate larger, thirty foot long, vehicles.
- *Improved connections* – realign schedules to create a pulse system operating from the Old Saybrook train station to improve transfers and reduce travel time
- *Southeast Route* – earlier service times for commuters to New London/SEAT and Saturday service through Old Lyme, East Lyme and New London with access to the Crystal Mall
- *Midshore Route* – Saturday service to provide access to Haddam and Middletown with CT Transit Harford connection
- *Route 80 Service* – Old Saybrook to North Branford service through Ivoryton, Winthrop, Killingworth, Madison, and Guilford with CT Transit New Haven connections
- *Sunday Service* – Study to implement Sunday service on the Shoreline Route, Riverside Route, and Southeast Route for rider in the service and retail industries which are open on Sundays
- *Increased frequency of the Riverside Route* – Add a second route opposite to the existing route to cut headways in half to provide better connections and

improved access along this growing route

- *Increased frequency of the Southeast Route* - Add a second route opposite to the existing route to cut headways in half to provide better connections and improved access along this growing route
- *Medical transportation trips* – Provide additional medical transportation to Middletown and provide service to New Haven
- *Westbrook Commuter Service* – Commuter route between Westbrook Station along Route 153 to Route 9 with stops serving the Essex and Chester park and ride lots, providing easy and timely transfers to Shoreline East
- *Old Saybrook Local Service* – Study a local route to serve RT 1, Main Street, Old Boston Post Road, Maple Ave and Fenwick to reduce dial-a-ride trips, improve access to public transportation, and Shoreline East commuters
- *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

BICYCLE & PEDESTRIAN

Bicycling and walking are important components of the transportation system, and have a unique ability to improve the quality of life and livability of a community. Non-motorized forms of transportation can reduce traffic congestion, parking needs, and help to improve air quality. Bicycling and walking are also less expensive than driving, can aid in the economic development of town centers and downtowns, and improve public health.

The region has many rural roads and neighborhood streets that do not have heavy traffic flows and are potentially well suited bike routes linked to employment and commercial centers. Bike lanes on these roads linking to commuter lots, bus, rail, and village centers can support bicycle access to work and shopping. An improved system of interconnected bike routes would improve bicycle travel throughout the region and support recreational tourism.

Most towns in the region have pedestrian facilities located primarily in the downtown or village center areas. These facilities include sidewalks, crosswalks, pedestrian push button signal phases, illumination, signage and other pedestrian amenities typically found in streetscape projects. Sidewalks are also located in many subdivisions throughout the region as are multi-use trails and paths.

The 2009 State Bicycle and Pedestrian Plan contains recommendations for goals and objectives, policy recommendations, tools for design, and other statewide initiatives. The Plan includes a roadway suitability map of state highways based upon shoulder width and average daily traffic volumes. 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

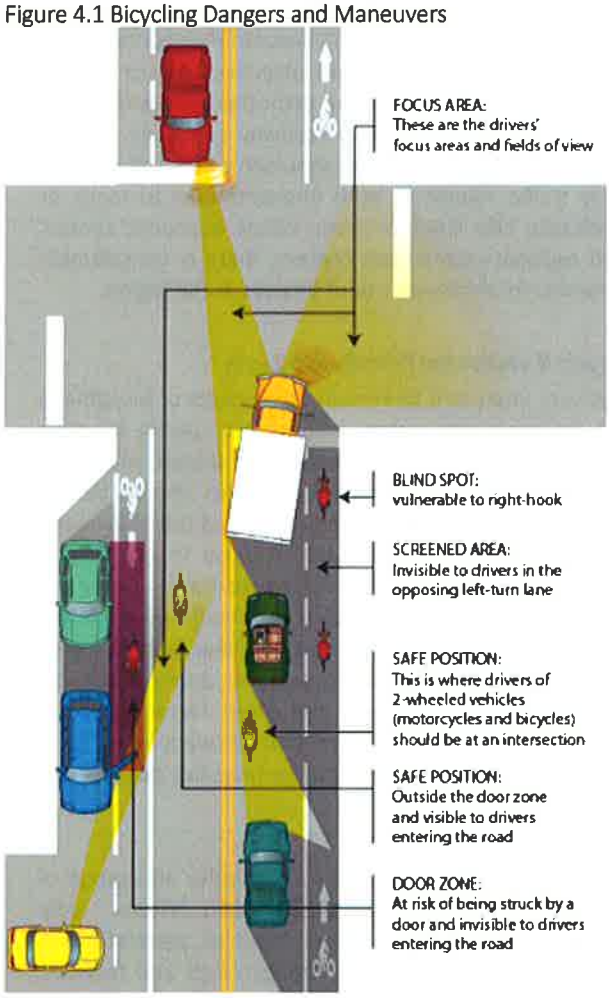
It is very important to consider all aspects of bicycling in the transportation system and not just specific bicycling facilities, since many bikeways are shared roadways. Roadway or intersection improvements should be designed for traffic control orientation, and the elimination of design discontinuities 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. Figure 4.1 shows common bicycling dangers and maneuvers.

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

Figure 4.1 Bicycling Dangers and Maneuvers



Source: Cycling Savvy (2014)

to School days which are also promoted in the community by local organizations.

Safety improves as bicyclists are educated on proper 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. Figure 4.1 shows four common crash types involving bicycles and motorists.

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.

RECOMMENDATIONS

- Finalize and adopt a Regional Bicycle – Pedestrian Plan
- Assist and 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, specifically 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.
- Amending municipal zoning and subdivision regulations to create more complete streets that accommodate multiple transportation modes
- Consider reducing traffic speeds and traffic calming techniques to provide bicyclists and pedestrians with safer routes

FREIGHT NETWORK

Efficient movement of freight within and through the region is important to industry, retail, agriculture, international trade, and freight terminal operators. Within the LCRV Region, freight is transported primarily by truck and a small portion of heavy material is transported along railroads. A small amount of petroleum products also travel

on barges up the Connecticut River to Portland. Specific information on the types of goods transported and their quantities were not available at the time of this publication. RiverCOG, other Connecticut COGs, and CTDOT will be working in partnership to develop a statewide freight plan. RiverCOG also 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 4.5.

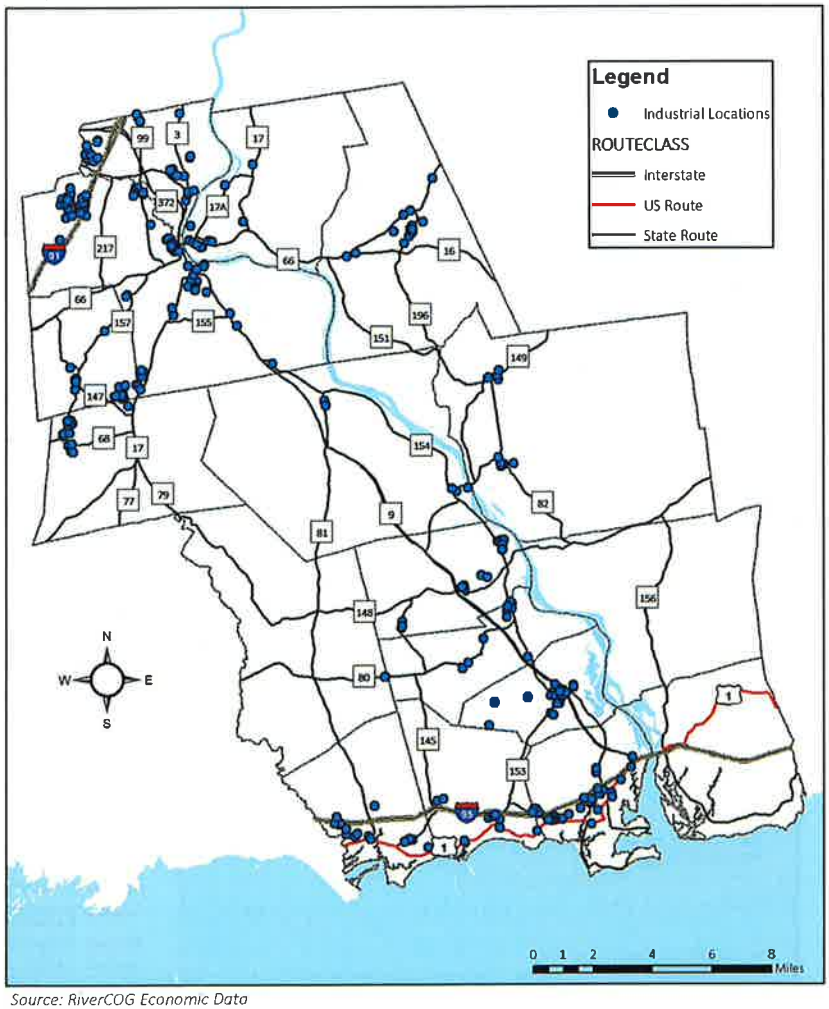
Highway Freight Corridors

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. Single unit trucks (type 4-7) account for only 1.9% of volume on Route 9 during rush hour, and 2.6% of annual average daily traffic (AADT) between exits 9 and 10. Combination trucks (type 8-13) are less prevalent than single unit trucks, and account for only 1.1% of traffic during rush hour, and 2.0% of AADT, according to CTDOT's Traffic Report conducted in June 2012.

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.

Map 4.5 LCRV Region Industrial Freight Locations



Source: RiverCOG Economic Data

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.

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. In 2013, the Company transported 34,402 carloads of freight."

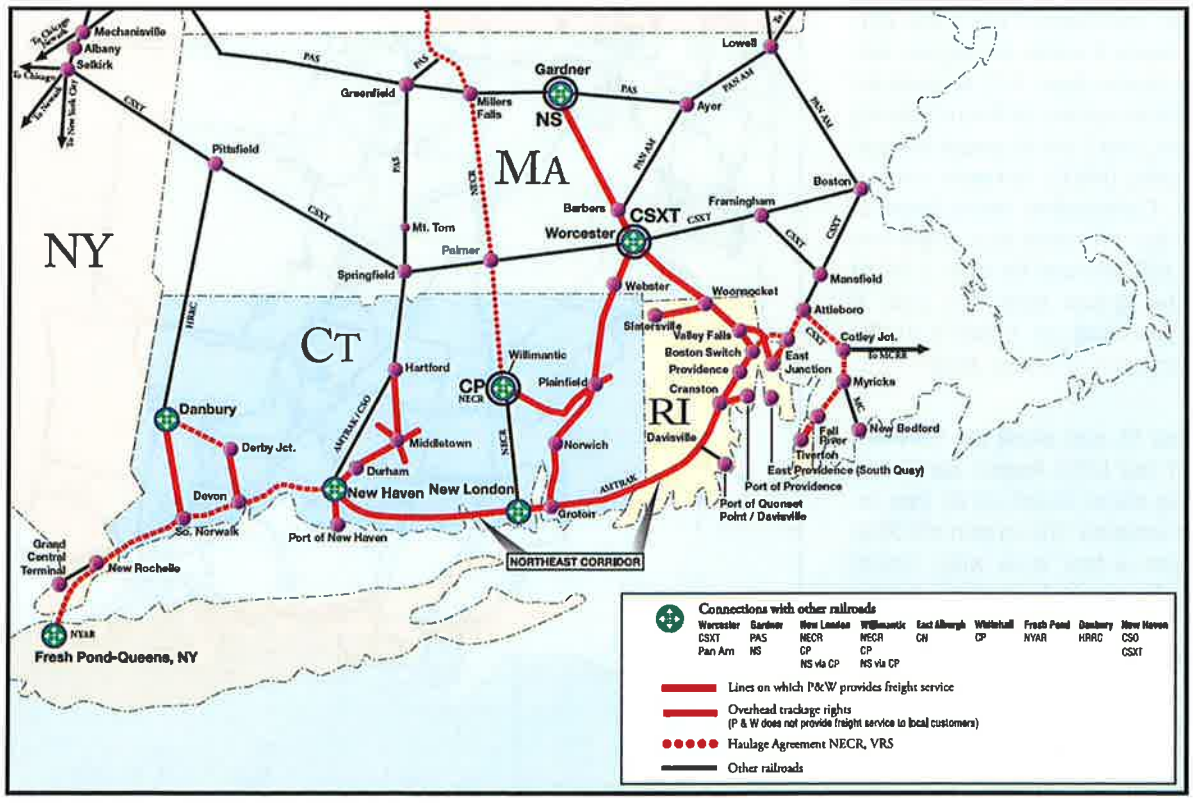
The LCRV Region is home to two rail corridors which are used for freight service. The Northeast Corridor, owned by Amtrak is the main rail route along the shoreline in Connecticut and the northeastern United States. The section in the region runs in an east-to-west direction parallel to Interstate 95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

Map 4.6 Providence & Worcester Railroad Map



Source: Providence & Worcester Railroad (current as of 4/1/15)

Figure 4.2 Valley Railroad State Park: Rail maintained south of Haddam

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

to the Middletown Cluster near the Pratt and Whitney 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 4.2 and 4.3 show 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.

Figure 4.3 Valley Railroad State Park: Deteriorating track and vegetation on Higganum Cove bridge

Source: RiverCOG (2014)

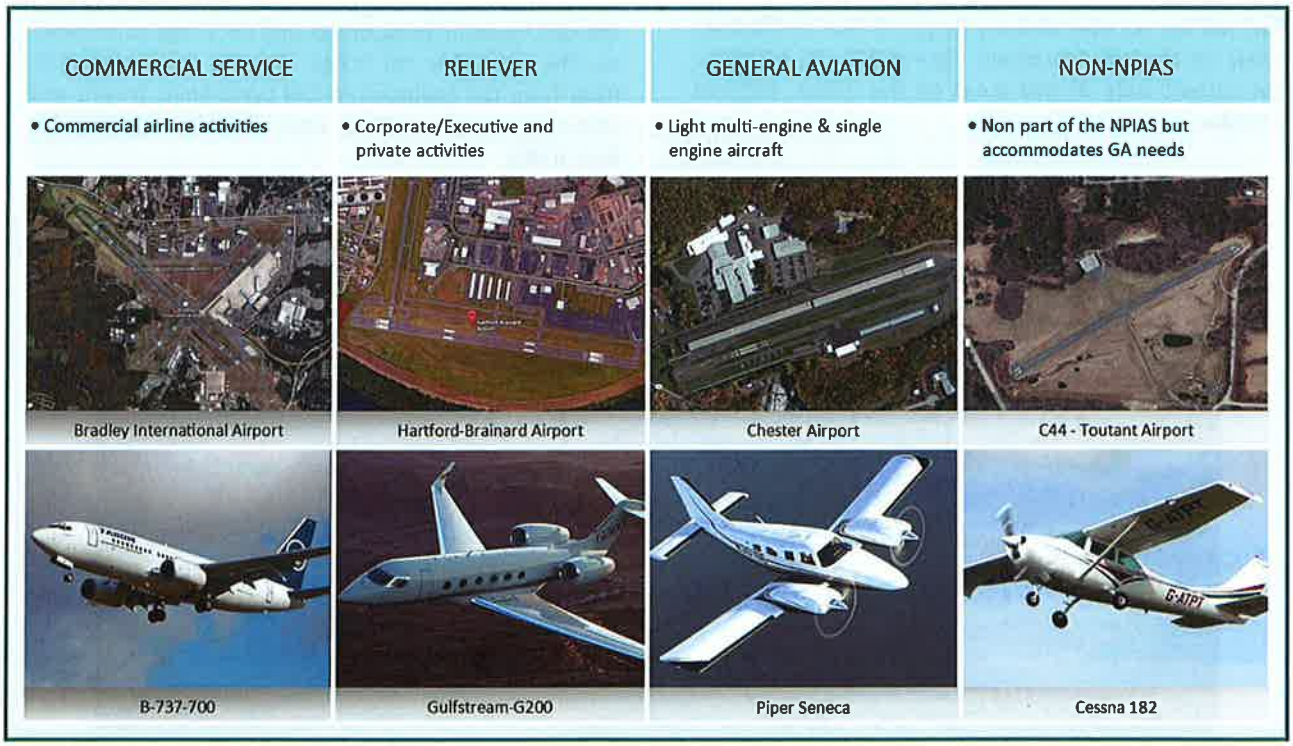
Along the Northeast Corridor Railroad, the 107 year old bridge crossing the Connecticut River is nearing the end of its useful life and is plagued by opening and closing failures causing cascading delays on Amtrak service between Boston, New York, and Washington. Amtrak will replace this bridge in the near future which should solve any delays in train service, both freight and passenger, due to equipment malfunction. According to an environmental analysis recently completed by Amtrak, Providence and Worcester currently operates 6 daily trains over the bridge.

n 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

- An important action item within the next two years is a corridor study for safety improvements and signage along Route 66 from Middletown east to East Hampton. This road is heavily travelled and prone to serious and fatal accidents.
- 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.
- The East Haddam Swing Bridge is a 101 year old movable bridge which crosses the Connecticut River between Haddam and East Haddam. Average daily traffic on this stretch of route 82 is 10,700. Openings occur frequently for river traffic, causing traffic to back up considerably on both sides of the river. Mechanical failures in the past have caused complete closures for long periods of time, severely crippling traffic in the area. Recommended actions include advocacy for yearly bridge maintenance and extension of Chester-Hadlyme Ferry hours of daily operation to provide relief during seasonal congestion.
- Analysis of economic conditions and constraints outlined in the Valley Railroad Study completed in April

Figure 4.4 Airport Roles in Connecticut



Source: CAA

2015, and recommendations by RiverCOG for optimal use of the Valley Railroad State Park.

- An analysis of the region's freight network was started in 2014 and it is recommended that RiverCOG further expand this analysis into a "Regional Freight Plan".
- Additionally, RiverCOG should continue to partner with surrounding COG's as well as local freight haulers and advocacy groups. RiverCOG initiated discussion and has been a strong advocate for partnering with other MPOs and CTDOT to complete a statewide freight mobility plan. The RiverCOG should continue to be an active participant in that process.
- 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. The 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 4.4 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. primarily serves intercity routes in the Northeast. Peter Pan's Hartford to New Haven route stops at the commuter lot on Country Club Road in Middletown near the CT Department of Public Safety.

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. Additionally, Enterprise, Hertz, Rent-a-Wreck and other car rental companies have locations 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, Get-Around 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.

Table 4.2 Electric Vehicle Charging Stations in the LCRV Region

Town	Location	Address	Open	Level
Deep River	Deep River Library	150 Main St	24 hours	1, 2
Deep River	Deep River Library	150 Main St	24 hours	2
East Haddam	Shagbark Lumber and Farm	RT 82	24 hours	2
East Hampton	village center	87 Main St	24 hours	2
Middletown	Middletown Nissan	1153 Newfield St	Dealer hours	2, DC
Middletown	Wesleyan University	161 Cross St	24 hours	2
Old Saybrook	Big Y Supermarket	28 Spencer Plain Rd	24 hours	2
Old Saybrook	Grossman Nissan	295 Middlesex Tpke	Dealer hours	2
Old Saybrook	Old Saybrook Inn	2 Bridge St	Guests only	2
Old Saybrook	Saybrook Point Marina	21 Bridge St	24 hours	2

Source: CT DEEP and CT DOE (2014)

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 ten charging stations in five 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 11 to 17 hours and level 2 chargers (7.5kW/240V) in about 2 to 3 hours. The table below shows the location and type of chargers in the located within region.

MARINE

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

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

Chapter 5.

SPECIALIZED PLANNING

A. INTELLIGENT TRANSPORATION SYSTEMS
B. TMA & UZA COORDINATION
C. CONGESTION MANAGEMENT & AIR QUALITY
D. TRANSPORTATION DEMAND MANAGEMENT
E. MAP-21 COMPIANCE
F. INCIDENT MANAGEMENT
G. SECURITY
H. SAFETY

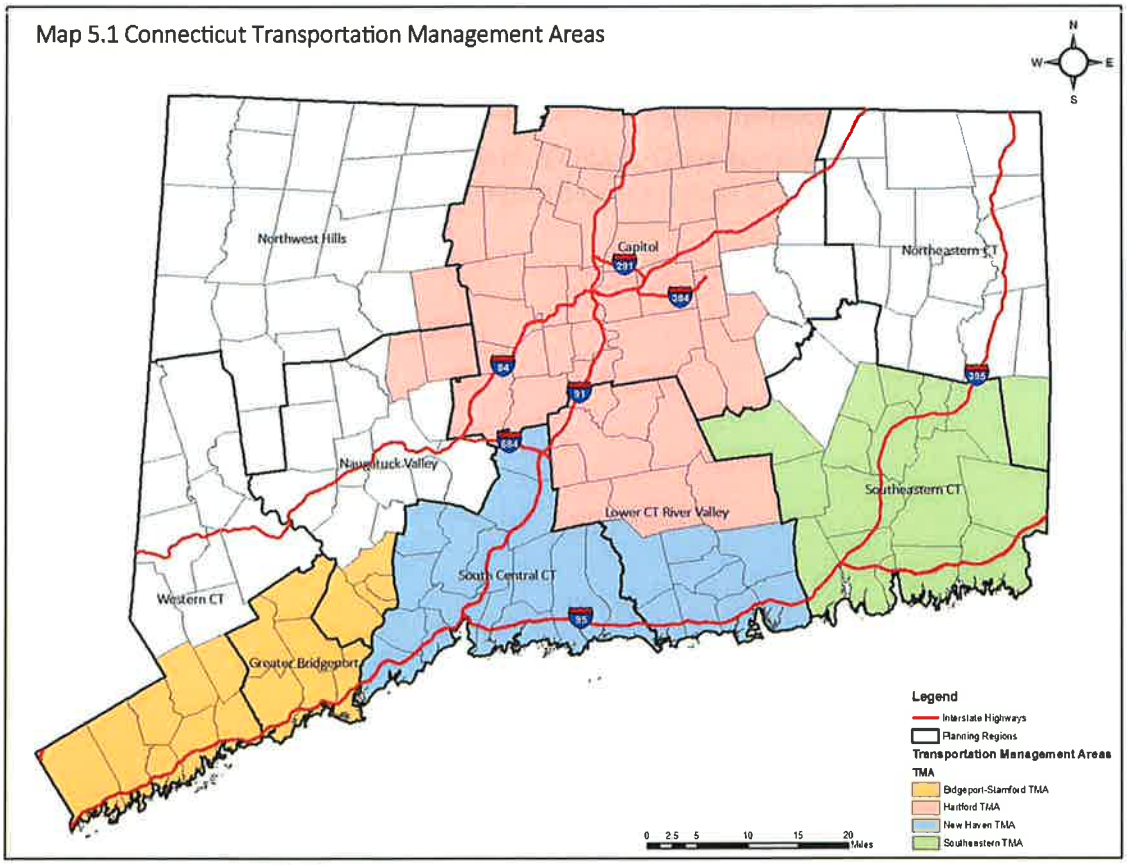
A . INTELLIGENT TRANSPORATION SYSTEMS

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 MPO's in the Hartford Urbanized Area has 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 is currently in the process of being updated. The plan lists stakeholders and their roles and services.

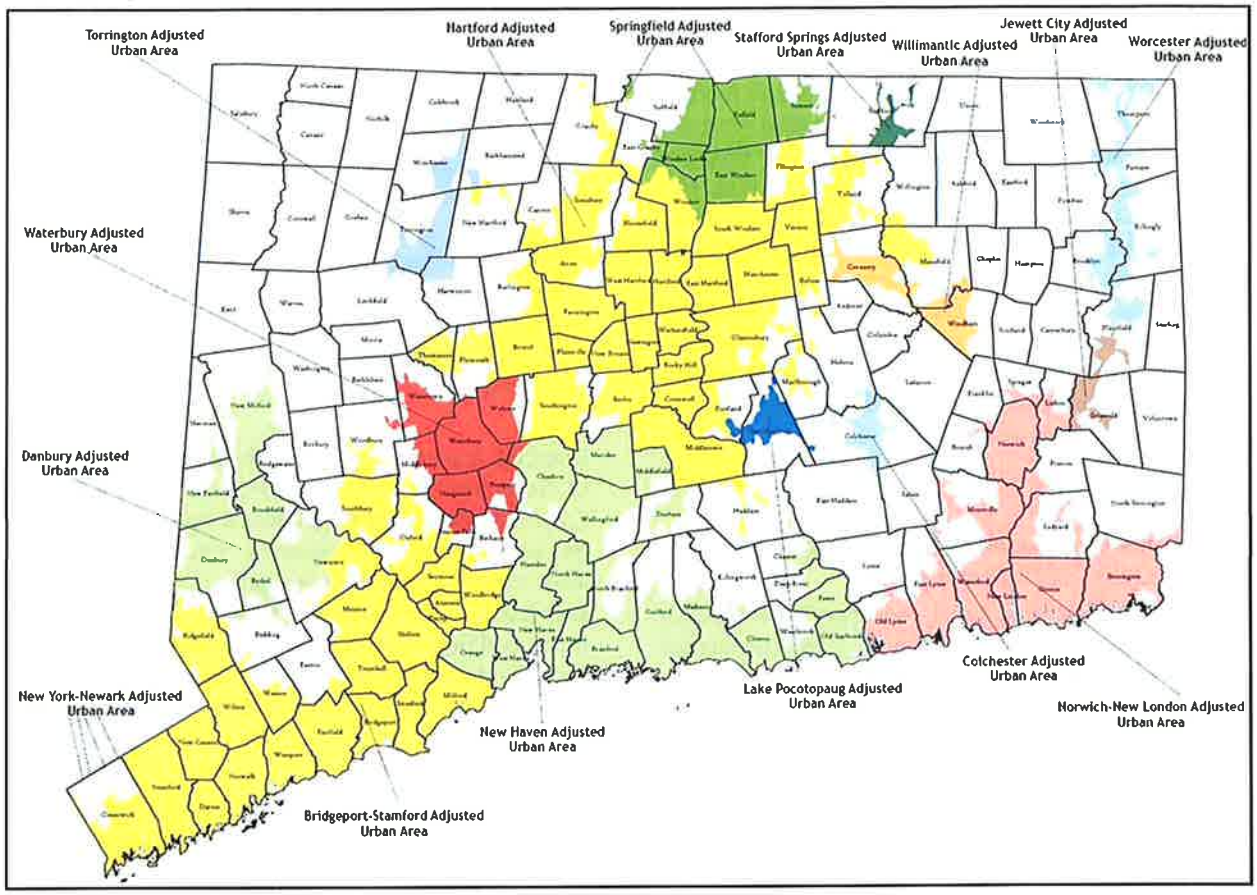
Users of ITS in the region include AMTRAK, CTDEEP, CTDESPP, CTDOT, CT Transit, MTD, ETD, municipal public safety and public works departments, local media, citizens and many others. ITS are incorporated into programs such as traffic incident management systems, traffic information dissemination, roadway closure management, emergency routing, wide area alerts, network surveillance, work zone management, demand responsive transit, transit fare collection, transit operations and security, emergency dispatch, disaster response and recovery, and many additional activities. The driving public can notice items such as traffic cameras, variable message signs and highway advisory radio n sign on major highways such as I-95, I-91, and RT 9 .

Map 5.1 Connecticut Transportation Management Areas



Source: CT Department of Transportation, RiverCOG

Map 5.2 Adjusted Federal Aid Urban Boundaries (2010)



Source: RiverCOG

New technologies from the USDOT 2010 ITS Strategic Research Plan include; vehicle to vehicle (V2V) communication for safety, vehicle to infrastructure (V2I) communication for safety, real time data capture and management, dynamic mobility applications, road weather management, application for environmental real time information synthesis (AERIS), human factors, mode specific research, and exploratory and cross cutting research and activities.

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 Long Range Plan (LRP) 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
- Finalize memorandums of understanding with CRCOG, SCRCOG, and SECOG once new Connecticut MPO boundaries have been finalized

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, 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.

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.

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 Urbanized Area and SCRCOG is the lead organization in the New Haven Urbanized Area. CMP data collected from the LCRV Region is included in both CMP reports for both urbanized and non-urbanized areas.

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 man-

agement will likely be the most common strategies based on the region's roadway network and patterns of congestion.

Table 5.1 Vehicle Miles Traveled - Ozone Emissions State Implementation Plan Budgets (Series 30D)

Year	Ozone Area	Series 30G		Budgets		Difference	
		VOC	NOx	VOC	NOx	VOC	NOx
2015	CT Portion NY/NJ-LI	23.15	42.08	27.4	54.6	-4.25	-12.52
	Greater CT	21.41	36.79	26.3	49.2	-4.89	-12.41
2025	CT Portion NY/NJ-LI	15.48	22.66	27.4	54.6	-11.92	-31.94
	Greater CT	14.54	19.82	26.3	49.2	-11.76	-29.38
2035	CT Portion NY/NJ-LI	13.32	20.12	27.4	54.6	-14.08	-34.48
	Greater CT	12.7	18	26.3	49.2	-13.6	-32.2
2040	CT Portion NY/NJ-LI	13.72	20.72	27.4	54.6	-13.68	-33.88
	Greater CT	13.05	18.44	26.3	49.2	-13.25	-30.76

Source: CTDOT Ozone AQC Determination, March 2015

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, long range plan (LRP) and "regionally significant" project conform to the requirements of the CAAA. CTDOT analyzes all regionally significant projects identified in the LRPs and the draft 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). Nonattainment areas are reviewed by the EPA every five years. The LCRV Region is in an eight-hour Ozone non-attainment area. Projects in the TIP, long range plan, and regionally significant projects cannot create new violations to the NAAQS. Regionally significant projects are new highways in new locations, new expressway interchanges, and new lanes longer than a mile.

CTDOT performs the air quality conformity (AQC) analysis determination when TIP's are updated, long range plans are updated, and when a project deemed regionally significant is added to a TIP or LRP. 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 and the EPA approved MOVES2010b 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.

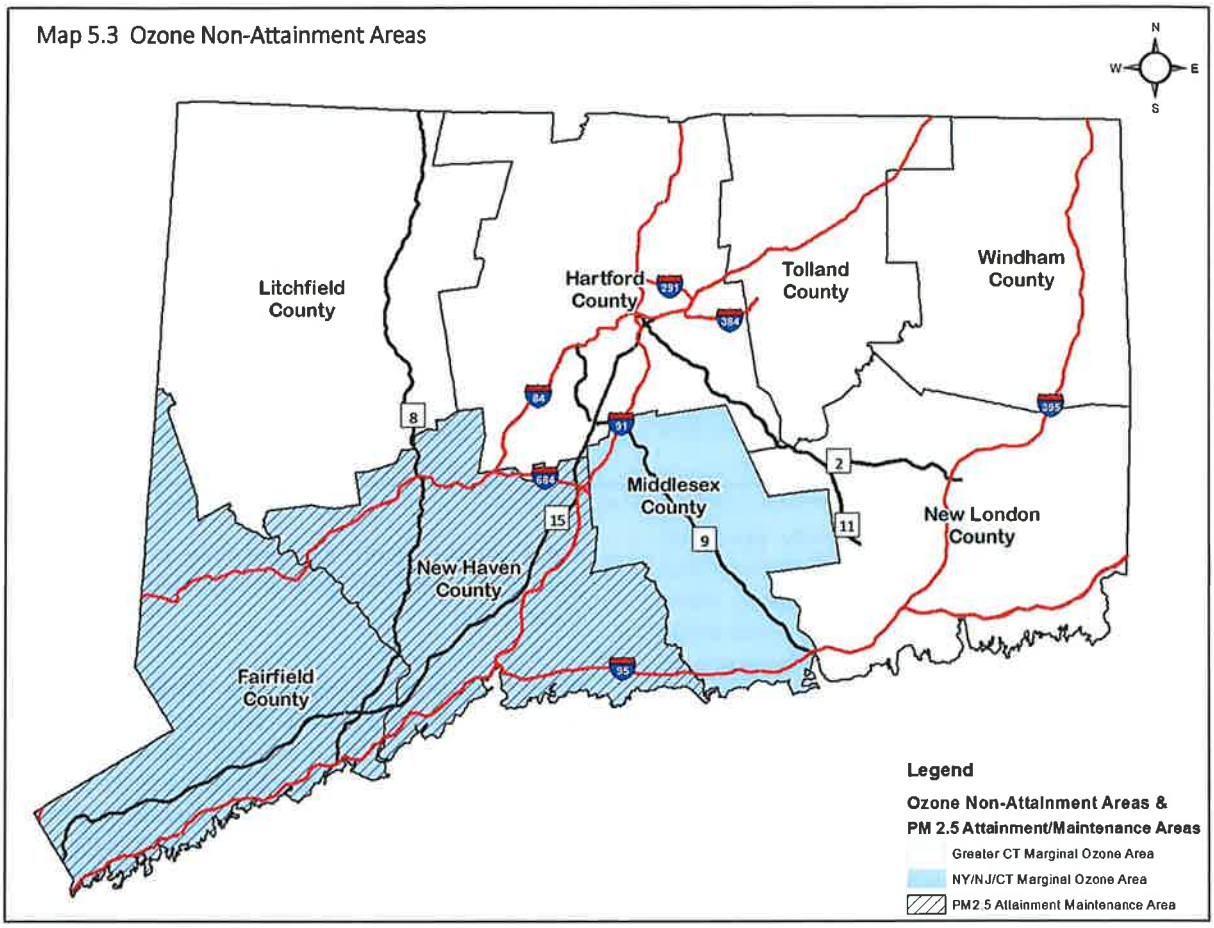
Regional planning organizations in nonattainment areas are required to have a 30 day public comment period on the determination. This is included with the TIP and LRP updates. Regionally significant projects in the past were only acted upon by the regional planning organization they were in. Recently, 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 LRP's must pass a series of tests. The action scenario, or future system build out must produce less VOC and NOx emissions than the 2009 emission budgets if the analysis year is 2009 or later. The action scenario is the future transportation system that will result from full implementation of the TIP and LRP. VOC and NOx emission analysis was conducted for summer conditions and for the following years:

- 2009 (Eight-hour MVEB year)
- 2015 (Attainment year and near term analysis year)
- 2025 (Interim modeling year)
- 2035 (Interim modeling year)
- 2040 (Long Range Transportation Plan horizon year)

The eight-hour emission budgets in Table 5.1 have been approved by EPA for use in this conformity analysis: In 2009 and subsequent years, VOC in the Connecticut por-

Map 5.3 Ozone Non-Attainment Areas



Source: CT Department of Energy and Environmental Protection, RiverCOG

tion of the New York-Northern New Jersey-Long Island Marginal Nonattainment area must be less than 27.4 tons per day. In 2009 and subsequent years, NOx in the Connecticut portion of the New York-Northern New Jersey-Long Island Marginal Nonattainment area must be less than 54.6 tons per day. In 2009 and subsequent years, VOC in the Greater Connecticut Marginal Nonattainment area must be less than 26.3 tons per day. In 2009 and subsequent years, NOx in the Greater Connecticut Marginal Nonattainment area must be less than 49.2 tons per day. The TIP and LRP projects were analyzed by CTDOT as summarized above and found to be in conformance as of March 2105. In fact, transportation emissions are declining dramatically and are expected to continue to do so.

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 non-attainment and maintenance areas. These activities have been employed throughout the country for many years and include many travel demand management strategies.

D. 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.

E. MAP-21 COMPIANCE

MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141) has transformed the policy and programmatic framework for transportation investments to guide the transportation system's growth and development. It created 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. MAP-21 strengthens the highway system, establishes performance based programs, supports economic growth, supports USDOT's safety initiatives, and streamlines federal funding programs to accelerate project delivery. MAP-21 restructures core highway formula programs and incorporated them into the following new core formula programs; National Highway Performance Program (NHPP), Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement Program (CMAQ), Highway Safety Improvement Program (HSIP), Railway-Highway Crossings (set-aside from HSIP), and Metropolitan Planning.

It creates two new formula programs; the Construction of Ferry Boats and Ferry Terminal Facilities and the Transportation Alternatives (TA) which is a new program, encompassing most activities funded under the Transportation Enhancements, Recreational Trails, and Safe Routes to School programs under SAFETEA-LU. MAP-21 creates a new discretionary program called the Tribal High Priority Projects (THPP), and continues the Projects of National and Regional Significance (PNRS), On-the-Job Training Supportive Services, Disadvantaged Business Enterprise (DBE) Supportive Services, Highway Use Tax Evasion (Intergovernmental enforcement projects), and Work Zone Safety Grants.

PERFORMANCE MANAGEMENT

Metropolitan and statewide transportation planning processes are continued and enhanced to incorporate performance goals, measures, and targets into the process of identifying needed transportation improvements and project selection. The cornerstone of MAP-21's highway program transformation is the transition to a performance and outcome-based program. States will invest resources in projects to achieve individual targets that collectively will make progress toward national goals.

The U.S. Secretary of Transportation, in consultation with States, MPOs, and other stakeholders, will establish performance measures for pavement conditions and performance for the Interstate and NHS, bridge conditions, injuries and fatalities, traffic congestion, on-road mobile source emissions, and freight movement on the Interstate System. States and MPOs, where applicable, will set performance targets in support of those measures and monitor and report the progress in achieving these targets. In addition, MAP-21 requires that states maintain minimum standards for interstate pavement and NHS bridge conditions. If a state falls below either standard, then the state must spend a specified portion of its funds for that purpose until the minimum standard is met.

Much of the performance provisions, rulemakings and guidance are currently being developed and additional information should be available the spring/summer of 2015. USDOT expects to publish its Final Planning Rule then, as well as its Final Safety Rule addressing performance measures and HSIP, and Final Weighting Factor Rule for the CMAQ program.

Once the Final Safety Rule is published addressing the performance measures mentioned above, the states have one year to set targets to support those measures. MPO's are then required to set targets in relation to the state's performance measures within one-hundred eighty days. CTDOT, the MPO's and transit providers will coordinate their efforts when setting performance targets.

F. 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.

Due to an increased emphasis on traffic incident management at the statewide level, ESF-1 has not met officially in recent years. A revitalized regional Traffic Incident Management (TIM) Coalition is organized through Region 3. A strengths, weaknesses, opportunities and threats (SWOT) was performed, FHWA's Train the Trainer

program was conducted, and the coalition continues work on the ITS strategic plan update.

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.

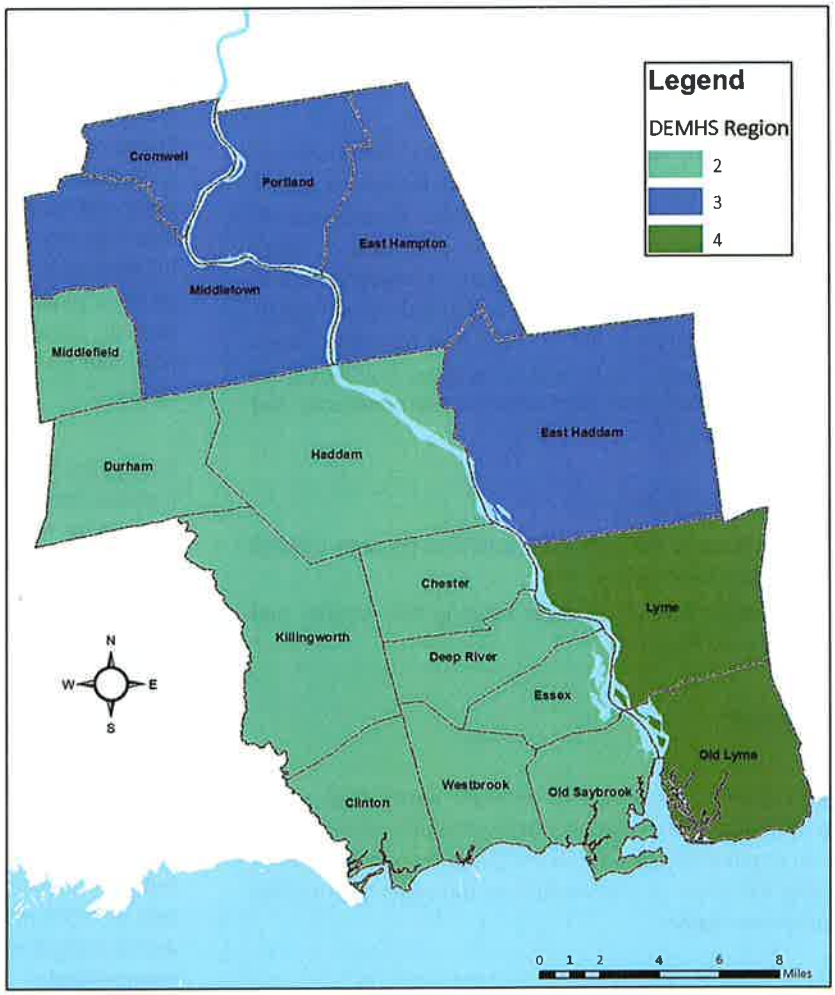
RECOMMENDATIONS

- 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
- Enhance collaboration with CRCOG in incident management planning and expand ESF 1 options in DEMHS Region 2 to encourage regional ESF 1 Committee membership
- 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

G. 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

Map 5.4 RiverCOG Region DEMHS Emergency Planning & Preparedness Regions



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

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

H. 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" (MUTCD) from the U.S. DOT. Creative us 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)*; 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:

RECOMMENDATIONS

- *Traffic Records and Information Systems* - monitors local land use and transportation projects and initiatives which collect data system as part of the engineering and permitting process and coordinate with existing state initiatives
- *Roadway Departure* – coordinate with the Connecticut Department of Transportation to institute a systematic program of lane departure accident counter measures appropriate for Connecticut with the objective of lowering its lane departure rate to a point at or below the national average and thus to contribute to a reduction in the nation's overall traffic related fatality rate
- *Pedestrians and Bicycles* – work actively within the region to increase the number of opportunities and improve existing facilities for pedestrian access to facilitate inter-modal access. Bicycle access and safety is paramount to the region both for residents and for the tourism economy. The region works in conjunction with the Connecticut Department of Transportation Bicycle and Pedestrian Advisory Committee to reduce fatalities and serious injuries, and to continue to examine the causes of bicycle and pedestrian accidents and to utilize available resources efficiently to develop and implement effective counter measures
- *Work Zones* – work in cooperation with the Connecticut Department of Transportation to achieve work zone safety goals identified in the State Transportation Plan by coordinating with member municipalities on dissemination of information and as liaison with CTDOT activities and programs
- *Driver Behavior* – significantly reduce the number of alcohol related crashes, injuries and fatalities by supporting initiatives of CTDOT to promote safety awareness for drivers. This includes: increased safety belt use rates, remaining at a level that is consistently above the national average
- *Motorcycle Safety* – defer to and support comprehensive state-wide programs established by CTDOT to improve motorcycle safety statewide including; reduce the number of speed related crashes
- *Commercial Vehicles* – defer to and support comprehensive statewide programs established by CTDOT to reduce the number and severity of crashes involving commercial motor vehicles and hazardous materials incidents

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Recreational boaters cruising the Connecticut River just north of the Baldwin Bridge.

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
MIDDLETOWN TRANSIT DISTRICT
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
- Implement plans for Clinton Station Improvements
- 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
- Extend Estuary Transit route north on RT 81 to Clinton Crossing, High School, and recreation complex
- Develop a Complete Streets plan
- Plan and implement the Clinton segment of an Estuary Transit District route connecting Shoreline East stations and key tourist destinations

CROMWELL

- Road bridge improvements on Coles Road, Evergreen Road, Willowbrook Road, Court Street, Geer Street, Industrial Park Road, New Lane and Washington 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
- Coles Road phase II and III reconstruction from Christian Hill Road to Evergreen Road, and 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
- RT 3 intersection improvements at the recycling center
- West Street intersection improvements at Franklin Avenue
- Evergreen Road configuration, drainage, and safety improvements
- Geer Street reconstruction to improve vertical curve

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

- Road/bridge improvements on Pent Road, Higganum Road, Cherry Hill Road, Foot Hills Road, Johnson Lane, Maiden Lane, and Parmelee Hill Road, RT17, RT 77, RT 79, RT 147, RT 157
- RT 17 intersection improvements at RT 68 (widen for bypass), and intersection improvements at RT 147/ Haddam Quarter Road (realignment)
- RT 157 intersection improvements at RT 68
- Parmelee Hill Road intersection improvements at Tuttle Road, realignment and reconstruction
- RT 147 Intersection improvements at Cherry Hill Road and Maple Avenue

- RT 17 intersection improvements at RT 79, Fowler Avenue, realign Coe Road, realign RT 77, and realign RT 79 to create a four-way intersection at Higganum Road
- Evaluate the potential for a bypass route to maintain the town's character and address the interregional; traffic north/south traffic patterns
- Old Cemetery Road close access to RT 17 to connect to existing driveway and create parking near the historic bridge
- RT 17 bicycle route signs and pavement markings
- RT 17 pedestrian access improvements such as sidewalk extension to RT 147/Haddam Quarter Road and between RT 79 and Old Cemetery Road (west side), Maiden Lane crosswalk removal, textured crosswalks in the historic district, and removable crosswalk signs when heavy pedestrian use is expected.

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
- RT 82 culver 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
- RT 82 intersection improvements at RT 149, and swing bridge sidewalks
- 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 1, Main Street 2, North Main Street, Old Middle 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 Main Street/ North Main Street (left turn lanes at intersection, increase curve radii, sidewalks, and crosswalks)
- 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

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 Walnut Street, Ivory Street (two spans), 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
- Beaver Meadow Road culvert replacement
- Sidewalk construction and planning along the southern side of Route 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
- Traffic calming at the junction of RT 154 and RT 81 in Higganum consistent with enhancement funding guidelines
- Traffic calming, 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 of Haddam
- Stamped bike lanes along Route 154 between the Middletown and Chester borders
- Support of the 9-Town Transit fixed route with stops along RT 81 in Higganum
- Safety and operational security of the Connecticut River crossings at the East Haddam Swing Bridge and the Chester-Hadlyme Ferry
- Reconstruction of sidewalks along the eastern side of 154 between Haddam Cemetery and UCONN Extension Center
- Design and construction of sidewalks from Higganum along Depot Road to Higganum Cove
- Reconstruction of the eastern portion of Park Road
- Reconstruction and drainage of McTighe Road, Porkorny Road, and Jail Hill Road
- Dish Mill bridge rehabilitation
- Dublin Hill bridge replacement

KILLINGWORTH

- Road/bridge improvement on Little City Road, Green Hill Road, Cow Hill Road, Iron Works Road, Meat Hill Road, Stevens Road, RT 80, RT 81
- Route 81 transit service
- 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 Geer Hill 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
- RT 156 intersection improvements at Bill Hill Road

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
- 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, and Westlake Drive, RT 3, RT 17, RT 66, RT 154, RT 157, RT 217, RT 410, RT 545
- Implement recommendations in the Middletown Redevelopments Commission's 2014 Riverfront Plan
- Implement recommendations in the 2013 Complete Streets Master Plan
- Removal of traffic lights on RT 9
- 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

OLD LYME

- Road/bridge improvements on McCurdy Road, Lyme Street, Four Mile River Road, Mile Creek Road, RT 1, and RT 156
- 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

- 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
- Implement recommendation 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

- Develop a Complete Streets Plan
- 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 reconfiguration, 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
- RT 66 – provide four lanes from Sand Hill Road to the Riverdale motel and potentially to RT 16 with bicycle and pedestrian provisions and cut back outcrops at the ledges to improve sightlines, widen shoulders, and reduce winter icing
- RT 66 feasibility study between Main Street and Camp Ingersoll – Corridor study to 1) identify appropriate measures to accommodate pedestrians and bicyclist and identify traffic calming measures and 2) determine the feasibility of using RT 66 ROW to construct a multi-use trail linking the terminus of the Airline Trail to downtown Portland to link with Middletown
- 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
- Implement recommendations from the Route 1 Corridor Study
- Sidewalk/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
- Kirtland Landing boat launch/kayak/canoe trails
- Menunketesuck Greenway trail construction
- Sidewalk connector from rail station to Town Center
- Bus stops along RT 1
- Extension of Shoreline Greenway from Menunketesuck Greenway at Clinton town line to Old Saybrook
- Implementation of town Sidewalk Plan
- Implementation of recommendations from Natural Hazard Mitigation Plan

MIDDLETOWN TRANSIT DISTRICT

- FTA 5307 capital and operating assistance
- FTA 5311 capital and operating assistance
- Express bus service from Middletown to CT Fastrack in New Britain
- Sunday service for both fixed and dial-a-ride programs
- Add a second Meriden to Middletown run to provide 30 minute service vs. 60 minute.

ESTUARY TRANSIT DISTRICT

- FTA 5307 capital and operating assistance
- FTA 5311 capital and operating assistance
- Shoreline Route – Change from deviated fixed route to regular fixed route and expand buss size to thirty feet
- RT 81 Service – Madison/Clinton to Middletown route through Killingworth and Haddam along RT 81 to Middlesex Community College
- Improved connections – realign schedules to create a pulse system operating from the Old Saybrook train station to improve transfers and reduce travel time
- Bradley Airport Service – Semi-express service to Bradley from Old Saybrook with stops at park and ride lots and the Middletown bus terminal

- Southeast Route – earlier service times for commuters to New London/SEAT and Saturday service through Old Lyme, East Lyme and New London with access to the Crystal Mall
- Midshore Route – Saturday service to provide access to Haddam and Middletown with CT transit Harford connection
- RT 80 Service – Old Saybrook to North Branford service through Ivoryton, Winthrop, Killingworth, Madison, and Guilford with CT transit New Haven connection
- Sunday Service – Study to implement Sunday service on the Shoreline Route, Riverside Route, and Southeast Route for rider in the service and retail industries which are open on Sundays
- Increased frequency Riverside Route – Add a second route opposite to the existing route to cut headways in half to provide better connections and improved access along this growing route
- Increased frequency Southeast Route - Add a second route opposite to the existing route to cut headways in half to provide better connections and improved access along this growing route
- Medical transportation – Provide additional medical transportation to Middletown and provide service to New Haven
- Westbrook Commuter Service – Commuter route between Westbrook Station along RT 153 to RT 9 with limited stops serving the Essex and Chester park and ride lots times with Shoreline east arrival/ departure times for easy transfers
- Old Saybrook Local Service – Study a local route to serve RT 1, Main Street, Old Boston Post Road, Maple Ave and Fenwick to reduce dial-a-ride trips, improve access to public transportation, and Shoreline East commuters
- Summer Services – Service to beach communities/ attractions in the summer tourism months possibly branded separately to attract visitors to the region

LCRVCOG

- Preservation of rail rights of way for any future uses
- 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 when adopted (expected May 2015).
- Designation of scenic roads and highways
- Support livable communities initiatives
- Support transportation control measures
- Support congestion management process
- Support regional and statewide intelligent transportation initiatives
- Support incident management initiatives
- West Street (Middletown) replace bridge 03993 over the P&R railroad
- Central Business District (Middletown) parking garage
- RT 66 (Middletown) rehabilitation of Arrigoni Bridge approach spans
- Multi-use Trail (Middletown) Wesleyan Hills to Downtown
- North Main Street (East Hampton) Christopher Brook culvert replacement north of Sears Park
- Willowbrook Road (Cromwell) reconstruction and widening north of RT 372
- RT 156/Hartford Avenue (Old Lyme) bicycle route, reconfiguration of Hartford Avenue, parking, town park and amenities
- RT 17 to RT 9 (Middletown) ramp and flow configuration modifications and improvements
- RT 66 (East Hampton) intersection improvements at RT 196/Old Marlborough Road
- Westlake Drive (Middletown) improvements and reconstruction
- North Main Street (Old Saybrook) improvements and reconstruction
- Higganum Road (Durham) reconstruction
- RT 621 (Essex) conversion to one-way southbound
- RT 9 (Chester) replace bridge 02937 over Pattaconk Brook
- RT 148 (Chester) replace bridge 06639 over Great Brook
- RT 3 (Cromwell) replace bridge 01338 over RT 9
- Westbrook Road (Essex) Safe Routes pedestrian safety improvements
- RT 154 (Haddam) replace bridge 00625 over Candlewood Hill Brook
- RT 148 (Killingworth) replace bridge 02680 over brook
- RT 147 (Middlefield) replace bridge 02719 over Lyman Meadow Brook
- RT 82 (East Haddam) replace bridge 02507 over Hungerford Brook

- RT 82 (East Haddam) replace bridge 02506 over Hemlock Valley Brook
- Johnsonville Road (East Haddam) replace bridge 04656 over Moodus River
- RT 154 (Old Saybrook) replace bridge 02708 over Plum Bank Creek
- RT 156 (Old Lyme) replace bridge 01395 over Black Hall River
- RT 1 (Old Saybrook) replace bridge 01890 over Center Brook
- RT 9 (Middletown) interchange modifications at RT 66 and RT 17
- I 95 (Old Lyme) widening from the Baldwin Bridge to the Rocky Neck Connector
- RT 66 Corridor Improvement Plan Portland-Columbia
- Tourism/Passenger/Freight Rail Economic and Structural Feasibility and Impacts Study of the Valley Railroad Line
- Tri-region Freight Plan/Statewide Freight Plan
- RiverCOG Comprehensive Bicycle and Pedestrian Plan
- RiverCOG Comprehensive Transit 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 New Freedom 5310 Program
- Support the State Matching Grant Program for Elderly and Disabled Demand Response Transportation

Sunset on the Connecticut shoreline.

Chapter 7.

FINANCIAL PLAN & UNLIMITED CONSTRAINT

A. FINANCIAL PLAN
B. ANTICIPATED HIGHWAY & TRANSIT EXPENDITURES
C. VISION PROJECTS

A. FINANCIAL PLAN

The Regional Long Range 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 estimate of projected highway funding the RiverCOG region between 2015 and 2040 is $1,650,313,818. Of that estimate, $776,868,127 is 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 $346,445,691 and $527,000,000 is allocated to major projects of statewide significance. RiverCOG estimates transit funds based on the prior LRP's and forecasts about $178,000,000 in transit funds from 2015 to 2040.

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 resources provide most of the non-federal matching funds. Available funds and source estimates are shown in more detail in Tables 7.1 and 7.2.

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 inter-modal 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 2015 - 2040 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 inter-modal access.

Table 7.1 Projected Available Highway Funds for the LCRV Region (2015 - 2040)

SYSTEM IMPROVEMENTS	SYSTEM PRESERVATION	MAJOR PROJECTS	TOTAL
$346,445,691	$776,868,127	$527,000,000	$1,650,313,818

Source: Bureau of Policy & Planning, Connecticut Department of Transportation, 2014

Table 7.2 Funding Source Estimates for the LCRV Region (2015 - 2040)

FHWA	FTA	STATE	LOCAL	TOTAL
$1,320,251,055	$89,000,000	$351,753,349	$67,309,414	$1,828,313,818

Table 7.3 Anticipated Highway Expenditures (2015 - 2040)

TOWN	LOCATION	DESCRIPTION	EST. YEAR	EST. COST
System Improvements				
Cromwell	Willowbrook Road	Reconstruction	2015	$2,000,000
Durham	Higganum Road	Reconstruction	2018	$2,000,000
East Hampton	Route 66	Intersection improvements	2016	$3,000,000
Essex	Route 621	SB conversion	2020	$3,000,000
Essex	Westbrook Road	Pedestrian improvements	2015	$500,000
Middletown	Downtown	Parking garage	2017	$14,000,000
Middletown	Downtown	Multi-use trail	2015	$750,000
Middletown	Westlake Drive	Reconstruction	2016	$2,000,000
Old Lyme	Route 156/Htfd Ave	Bike/ped improvements	2015	$750.00
Old Saybrook	N Main Street	Reconstruction	2017	$1,000,000
Projected Expenditures				$29,000,000
Projected Balance for Unscheduled Projects				$317,445,691
System Preservation				
Chester	Route 9	Bridge replacement	2015	$3,000,000
Chester	Route 148	Bridge replacement	2015	$1,000,000
Cromwell	Route 3	Bridge replacement	2015	$10,000,000
East Haddam	Route 82	Bridge replacement	2016	$2,000,000
East Haddam	Route 82	Bridge replacement	2016	$2,500,000
East Haddam	Johnsonville Road	Bridge replacement	2016	$2,000,000
East Hampton	N Main Street	Culvert replacement	2015	$1,000,000
Haddam	Route 154	Bridge replacement	2015	$3,500,000
Killingworth	Route 148	Bridge replacement	2015	$1,500,000
Middlefield	Route 147	Bridge replacement	2015	$1,500,000
Middletown	West Street	Bridge replacement	2015	$3,000,000
Middletown	Route 66	Bridge rehabilitation	2016	$12,000,000
Middletown	Bow Lane	Bridge replacement	2018	$5,000,000
Old Lyme	Route 156	Bridge replacement	2018	$2,000,000
Old Saybrook	Route 154	Bridge replacement	2017	$1,500,000
Old Saybrook	Route 1	Bridge replacement	2017	$2,000,000
Projected Expenditures				$53,500,000
Projected Balance for Unscheduled Projects				$723,368,127
Major Projects				
Middletown	Route 9	Interchange modification	2025	$320,000,000
Old Lyme	Int 95	Widening	2020	$207,000,000
Projected Expenditures				$527,000,000
Projected Balance for Unscheduled Projects				$0

Table 7.4 Anticipated Transit Expenditures (2015 - 2040)

IMPROVEMENTS	LOCATION	EST. YEAR	EST. COST
Transit capital	ETD	2015	$115,000
Transit capital	ETD	2016	$2,320,000
Transit capital	ETD	2017	$65,000
Transit capital	ETD	2018	$14,000,000
Transit capital	ETD	2019	$50,000
Transit capital	ETD	2020	$95,000
Transit capital	ETD	2021	$60,000
Transit capital	ETD	2022	$20,000
Transit capital	ETD	2023	$26,000
Transit capital	ETD	2024	$80,000
Transit capital	ETD	2025-2040	$4,882,500
Transit capital	MTD	2015	$385,000
Transit capital	MTD	2016	$314,000
Transit capital	MTD	2017	$500,000
Transit capital	MTD	2018	$720,000
Transit capital	MTD	2019	$160,000
Transit capital	MTD	2020	$150,000
Transit capital	MTD	2021	$310,000
Transit capital	MTD	2022	$270,000
Transit capital	MTD	2023	$1,755,000
Transit capital	MTD	2024	$240,000
Transit capital	MTD	2025-2040	$16,975,000
Projected Expenditures			$43,694,200
Bus replacement	ETD	2015	$1,970,000
Bus replacement	ETD	2017	$945,000
Bus replacement	ETD	2018	$280,000
Bus replacement	ETD	2019	$190,000
Bus replacement	ETD	2020	$250,000
Bus replacement	ETD	2021	$365,000
Bus replacement	ETD	2023	$510,000
Bus replacement	ETD	2025	$395,000
Bus replacement	ETD	2026-2040	$7,357,500
Bus replacement	MTD	2015	$1,720,000
Bus replacement	MTD	2020	$800,000
Bus replacement	MTD	2024	$1,350,000
Bus replacement	MTD	2025	$1,000,000
Bus replacement	MTD	2026-2040	$12,900,000
Projected Expenditures			$30,002,500
Projected Balance for Unscheduled Projects			$104,303,300

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 Long Range Transportation Plan in making regional transportation investments.

The public comment period for the Regional Long Range Transportation Plan commenced on April 8, 2015 and ended May 7, 2015. The River MPO voted to provisionally adopt the Long Range Transportation Plan at their meeting on April 29, 2015 contingent upon there being no substantial additions or modifications to the Plan before the end of the public comment period. The River COG Regional Planning Commission also provisionally endorsed the Long Range Transportation Plan on April 27, 2015. 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 April 8th. Two public comment sessions were scheduled, the first was held at the Regional Planning Committee meeting on April 27th at the RiverCOG office. A second public comment session was held on April 29th prior to the Metropolitan Planning Organization meeting. All comments received and RiverCOG responses to those comments are detailed in this section. Italicized changes were those that were incorporated in the final draft.

- Change "curb-to-curb" reference to "*door-to-door*" in Public Bus section on page 22
- Update Map 4.3 with more current data – *2006 data is the most current data available*
- Edit Essex municipal priorities to read "Pedestrian improvements on *Westbrook Road*"
- Edit Valley Railroad mile post description from 13.25 to *12.90* on page 21
- Change graphic on page 46 to better describe bicycling dangers - *The current graphic was newly added, along with the discussion of Figure 4.1 on page 46.*
- The employers listed in Table 2.7 "Largest Employers in the LCRV Region (2014)" were inaccurately reported by the Department of Labor — *This table was removed from the document due to reporting discrepancies leading to confusion amongst RiverMPO board members.*
- In Westbrook's municipal priorities on page 70, change Route 154 to "*Route 153*", change "connector" to "*connectors*", change "Kirkland" to "*Kirtland*", and add the word "*trail*" before "construction" regarding the Menunketesuck Greenway
- Emphasize the importance of CT River crossings, including the East Haddam Swing Bridge and the Hadlyme-Chester Ferry in regards to safety, quality of life, tourism, and the economic vitality of the region (p. 30) – *A further discussion of the importance of the Ferry was added to page 30, and the Haddam municipal priorities section.*
- Emphasize reduced traffic speeds, narrow travel lanes, traffic calming, bike lanes, and pedestrian crosswalks when referencing the Complete Streets Program – *A recommendation was added to the Bicycle and Pedestrian section on page 33 that proposes to "Consider reducing traffic speeds and traffic calming techniques to provide bicyclists and pedestrians with safer routes".*
- *Improve the link between* East Haddam and Haddam with a pedestrian walkway that spans the East Haddam Swing Bridge – *A recommendation was added to the Haddam municipal priorities section on page 68 stating: "Sidewalk construction and planning along the southern side of Route 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".*
- Stress the importance of a fixed bus route from Middletown to Madison that would have fixed stops in Higganum, Haddam Killingworth High School and employment centers – *A recommendation was added to page 44 stating: "Service between Madison and Middletown with fixed stops in Higganum, Haddam Killingworth High School and various employment centers". Also, a similar recommendation was added to the Haddam municipal priorities section.*
- Expanded Haddam Recommendations on page 68:
  - ◊ *Traffic calming at the junction of RT 154 and RT 81 in Higganum consistent with enhancement funding guidelines*
  - ◊ *Sidewalk construction and planning along the southern side of Route 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*

- ◊ *Traffic calming, 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 of Haddam*
- ◊ *Stamped bike lanes along Route 154 between the Middletown and Chester borders*
- ◊ *Support of the 9-Town Transit fixed route with stops along RT 81 in Higganum*
- ◊ *Safety and operational security of the Connecticut River crossings at the East Haddam Swing Bridge and the Chester-Hadlyme Ferry*
- ◊ *Reconstruction of sidewalks along the eastern side of 154 between Haddam Cemetery and UCONN Extension Center*
- ◊ *Design and construction of sidewalks from Higganum along Depot Road to Higganum Cove*
- ◊ *Reconstruction of the eastern portion of Park Road*
- ◊ *Reconstruction and drainage of McTighe Road, Porkorny Road, and Jail Hill Road*
- ◊ *Dish Mill bridge rehabilitation*
- ◊ *Dublin Hill bridge replacement*

- Emphasize traffic slowing at the juncture of Route 154 and Route 81 in Haddam, consistent with the town's Safe Walk to School proposal - *A recommendation was added to Haddam's municipal priorities stating: "Traffic calming at the junction of RT 154 and RT 81 in Higganum consistent with enhancement funding guidelines"*
- Edit description of the Middletown Cluster – *A more comprehensive discussion of the Middletown Cluster was added to page 21.*
- A discussion about the region's bicycle and pedestrian priorities began at the April 27th public meeting - *RiverCOG's executive director noted that the region will be publishing a Bicycle and Pedestrian Plan in 2015.*
- Include ADT data regarding large trucks on Route 9 – *A discussion of large truck traffic was added to page 47.*
- Edit Killingworth demographics regarding Cash Public Assistance – *Table 2.4 was updated to coincide with the 2013 data provided by the American Community Survey.*
- Emphasize 9 Town Transit (9TT) as the cornerstone of a public transit system – *A further emphasis on 9TT services was added throughout the final document, including additional proposed routes, and demand for expanded service, as 9TT has quickly become critical to the region's economic wellbeing.*
- Emphasize wider and safer bikeways on Rt 154 in Haddam – *A similar recommendation was added to Haddam's municipal priorities on page 68.*
- Request that specific Route 1 Corridor Study recommendations be removed from the Long Range Regional Transportation Plan – *Recommendations stating "Implement recommendations from Route 1 Corridor Study" were added to Clinton, Westbrook, and Old Saybrook municipal priority lists, as requested by town planners.*
- Include discussion of CTTransit bike racks – *The following statement was added to page 23: "CTTransit buses are equipped with bike racks."*
- Emphasize the number of residents that live and work within the region – *The number of residents who work and reside in the region was calculated and added to page 15.*
- Emphasize the lack of barges traveling on the CT River – *The following statement was added to page 30: "In recent years, barge traffic has significantly decreased from previous levels."*
- Include discussion of state statutes on "Complete Streets" – *The following addition was made to page 33: "Connecticut has recently endorsed significant policy changes in providing enhanced bicycle and pedestrian infrastructure by implementing the Complete Streets initiative, in accordance with Public Act 09-154. The Commissioner of CT DOT, James Redeker took steps to promote Complete Streets in October 2014 by releasing a policy statement outlining objectives and procedures 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.*
- Define "Suff Rate" on bridge tables – *The following definition was added to page 85: "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."*
- Include CT Department of Health population estimates for 2013 in Table 2.1 – *The 2013 population estimates were added to Table 2.1 on page 12.*
- Include data regarding employment by sector in Table 2.6 – *Another column was added to Table 2.6 to accommodate the number of jobs in the region, by sector in 2011.*
- Expanded Clinton Recommendations on page 66:

- ◊ *Implement recommendations from Route 1 Corridor Study*
- ◊ *Implement plans for Clinton Station Improvements*
- ◊ *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*
- ◊ *Extend Estuary Transit route north on RT 81 to Clinton Crossing, High School, and recreation complex*
- ◊ *Develop a Complete Streets plan*
- ◊ *Plan and implement the Clinton segment of an Estuary Transit District route connecting Shoreline East stations and key tourist destinations*

- Include the following recommendations to Middletown's municipal priorities on page 69:
  - ◊ *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*
- Additions to Westbrook's municipal priorities on page 70:
  - ◊ *Sidewalk connector from rail station to Town Center*
  - ◊ *Bus stops along RT 1*
  - ◊ *Extension of Shoreline Greenway from Menunketesuck Greenway at Clinton town line to Old Saybrook*
  - ◊ *Implementation of town Sidewalk Plan*
  - ◊ *Implementation of recommendations from Natural Hazard Mitigation Plan*
- The following recommendations were added to the "Environmental Network" section on page 42:
  - ◊ *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 conservation land*
  - ◊ *Implement trail stewardship to better manage trail maintenance*
- The RPC discussed Map 4.1 "Connecticut Plan of Conservation and Development Locational Guide Map" and raised some concerns about the "Village Development Area" designated in the town of Durham - *The State Plan of Conservation and Development was included in the LRTP, because the State Plan identifies "Priority Funding Areas" for state funds. Major state funded transportation investments need to be in conformity with the State Plan of Conservation and Development.*
- The RPC discussed the use of sand and salt on roadways in winter and whether a discussion and recommendations should be included in the LRTP – *The LRTP is not the best document for an investigation of sand and salt best practices. A separate report, in which this issue can be investigate in greater depth is recommended.*
- Further bicycle-related verbiage was requested throughout the document, especially in sections related to pedestrian improvements – *Terms such as "bikeable", "multimodal integration", and "designated bicycle lanes" were added throughout the document to further emphasize the recommendation for bicycle-friendly transportation infrastructure.*

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,

- Mitigation of 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, 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 A.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 B.2 shows areas within the LCRV Region where the percentage of low income households exceeds 20%.

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 whom does not speak English as a 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 for the languages noted above.

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 updated May 15, 2012. 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 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 access to certain activities that take place before bus service starts in the morning or after bus service ends in the evening.

OTHER UNMAPPED 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, and 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.

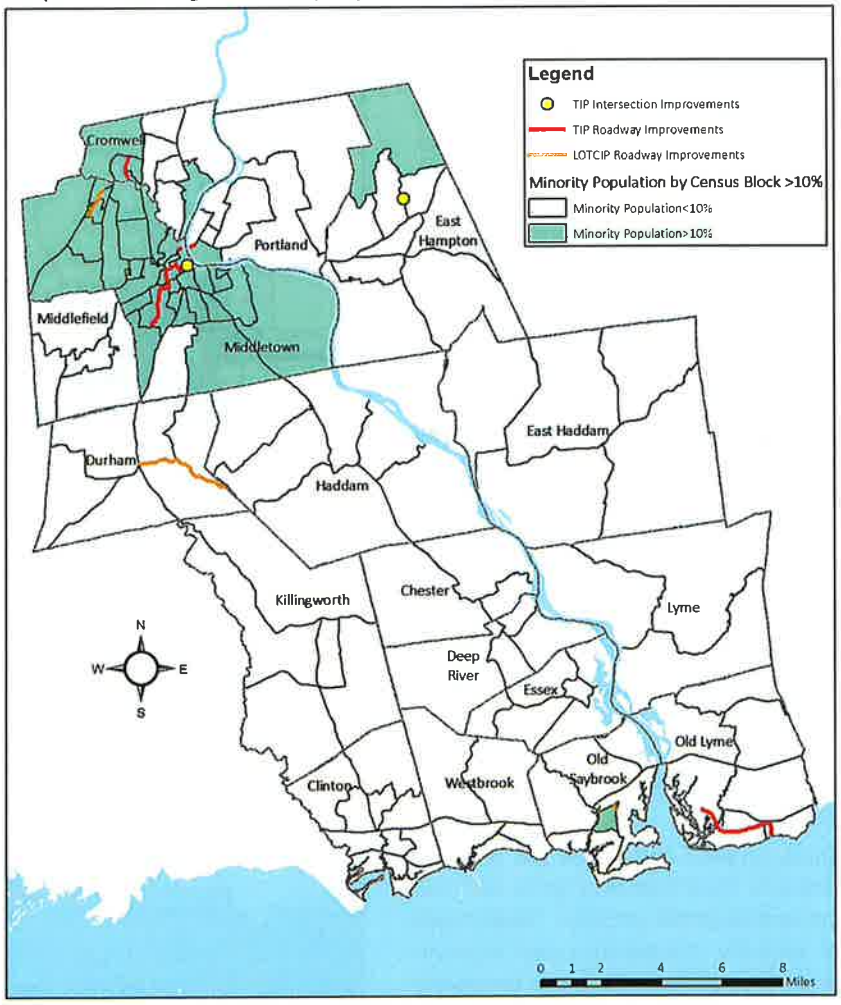
EJ ASSESMENT

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 whom 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 s EJ mailing list in addition to the standard mailing list.

The TIP and LOTCIP projects shown in Maps B.1 and B.2 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.

Map B.1 LCRV Region Minority Population



Source: U.S. Census Bureau, American Community Survey (2008 - 2012) 5-year Estimates, CT DOT

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 effect 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 provides an indication of the benefits and burdens of transportation investments are distributed between the targeted and non-targets EJ areas.

INVESTMENT 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%. Six regional roadway segment and spot projects are mapped in relation to the minority population block groups. Approximately 66% of the regional projects are in or adjacent to minority block groups. Based on investment levels of regional projects, approximately 97% of the regional funds are spent in areas in or adjacent to minority census block groups using projects from the 2015 TIP

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 income population is greater than 20%. The specific roadway segment and spot projects are mapped in relation to the low income block groups. Approximately 50% of the regional projects are in or adjacent to low income block groups. Based on investment levels of regional projects, approximately 91% of the regional funds are spent in areas in or adjacent to low income census block groups using projects from the 2015 TIP.

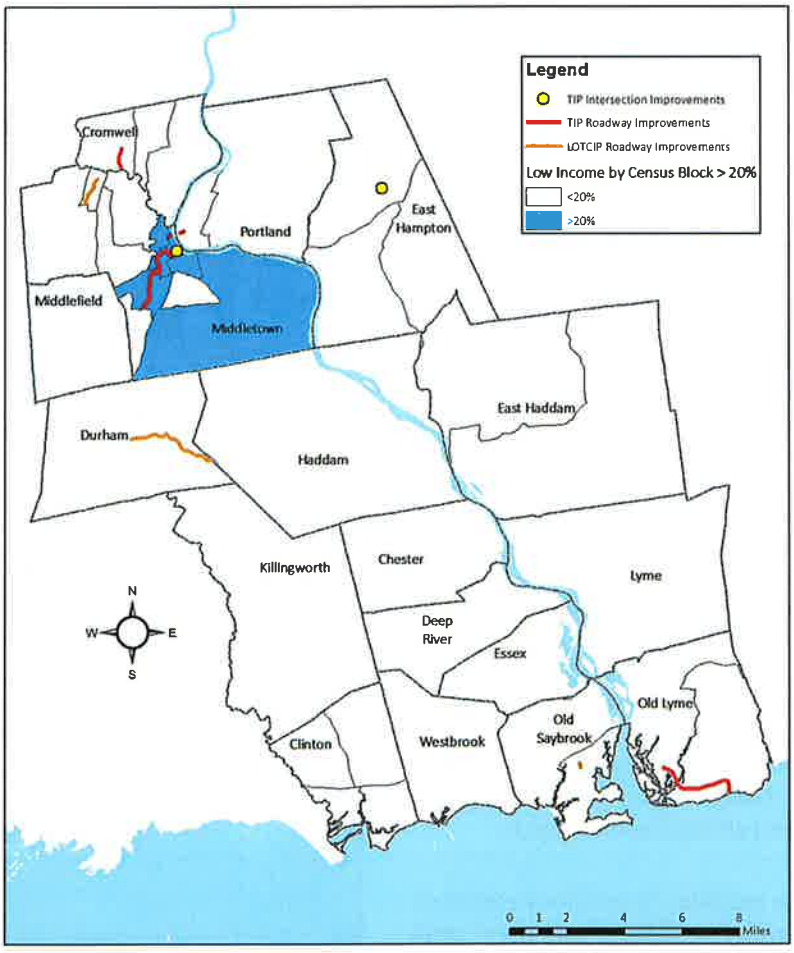
IMPLEMENTATION IMPACT CONSIDERATIONS

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 increased congestion on both the project roadway as well as surrounding streets. Disturbances to abutters include increased particulate matter or other air pollutants, noise pollutions and light pollution if the construction work is performed 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 if the project. Operational impacts can concurrently be benefits and burdens to different user populations.

Map B.2 LCRV Region Low Income Population



Source: U.S. Census Bureau, American Community Survey (2008 - 2012) 5-year Estimates, CT DOT

Appendix C:

MUNICIPAL BRIDGES

The following tables show the complete list of all municipal bridges as expanded on from Chapter 3 of the plan. Bridges currently eligible under the local bridge program and noted by +. Bridges under twenty feet are noted by * and will not be inspected again by CTDOT unless mandated. 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 Crossed	Year Built	Insp. Date	Suff. Rate
4605	Chester	North Main Street	Great Brook	2001	3/29/2012	79.61%
4608	Chester	Wig Hill Road	Pattaconk Brook	2008	4/4/2012	85.21%
5286	Chester	North Main Street	Great Brook	1983	3/29/2012	79.48%
6061	Chester	North Main Street	Great Brook	1990	3/29/2012	74.71%
26001	Chester*	Cedar Lake Road	Pattaconk Brook	1940	9/12/1991	68.20%
26002	Chester*	Bailey Road	Pattaconk Brook	1970	9/12/1991	60.63%
26003	Chester*	Hoopole Hill Road	Pattaconk Brook	1970	9/21/1991	86.82%
26004	Chester*	Turkey Hill Road	Great Brook	1965	9/12/1991	
26005	Chester*	Deep Hollow Road	an unnamed brook	1940	9/11/1991	60.63%
26006	Chester*	Deep Hollow Road	an unnamed brook	1940	9/11/1991	88.83%
26007	Chester*	Deep Hollow Road	an unnamed brook	1995		new
26008	Chester*	Straits Road	an unnamed brook	1990	9/11/1991	95.21%
26009	Chester*	Liberty Street	an unnamed brook	1995		new
26010	Chester*	Kings Highway	an unnamed brook	1940	9/11/1991	91.21%
26011	Chester*+	Dock Road	Chester Creek tributary	1900	6/4/1996	37.69%
4117	Clinton	Glenwood Road	Indian River	1958	11/6/2012	69.69%
4118	Clinton	Beach Park Road	Hammock River	1947	11/7/2012	81.75%
4119	Clinton+	Kelseytown Road	Menunketesuck River	1938	12/6/2012	47.08%
4609	Clinton+	Pleasant Valley Road	Menunketesuck River	1930	11/7/2012	45.07%
4610	Clinton+	Carter Hill Road	Menunketesuck River	1930	11/7/2012	47.33%
4612	Clinton	Kelseytown Bridge Road	Menunketesuck River	1938	11/20/2012	76.25%
5662	Clinton	Brickyard Road	Menunketesuck River	1934	11/19/2012	82.82%
6195	Clinton+	Liberty Street	Amtrak	1992	9/16/2009	78.77%
6203	Clinton	Silver Birch Lane	an unnamed brook	1980	11/19/2012	61.44%
6296	Clinton+	Waterside Lane	Hammock River	1994	11/6/2012	58.08%
27002	Clinton*	Cream Pot Road	Indian River	1982	3/14/1991	76.30%
27003	Clinton*	Hurd Bridge Road	Indian Stream	1950	3/12/1991	64.06%
27004	Clinton*	Brook	Woods Lane	1970	3/13/1991	88.18%
27005	Clinton*	Knollwood	an unnamed stream	1960	3/12/1991	87.43%
27006	Clinton*	Causeway Road	Hammock River	1975	3/11/1991	78.88%
5006	Cromwell	Industrial Park Road	Sebethe River	1983	5/31/2012	87.47%
5939	Cromwell	North Road Ext.	Cole's Brook	1980	5/31/2012	82.33%
33001	Cromwell*	Christian Hill Road	Coles Brook	1931	1/11/1991	53.34%
33003	Cromwell*	New Lane	an unnamed stream	1970	4/4/1991	68.18%
33004	Cromwell*	River Road	an unnamed stream	1980	4/4/1991	90.83%
4636	Deep River	Village Street	Deep River	2012	12/12/2012	74.36%
4637	Deep River	Union Street	Deep River	1930	2/3/2012	75.96%
4638	Deep River	Essex Street	Pratt Cove	1999	2/3/2012	92.46%
5287	Deep River	Spring Street	Deep River	1982	2/3/2012	77.70%
6056	Deep River	Bridge Street	Deep River	1990	2/24/2012	79.89%
122001	Deep River*+	Tower Hill Road	an unnamed brook	1970	2/13/1991	65.84%
122002	Deep River*	Plains Road	Deep River	1970	7/19/1991	69.21%
4849	Durham	Saw Mill Road	Parmelee Brook	2001	5/5/2012	91.80%
4850	Durham	Maple Avenue	Allyns Brook	1957	5/5/2012	89.49%
37001	Durham*	Air Line Drive	Asmon Brook	1980	9/16/1991	

Bridge No	Town	Feature Carried	Feature Crossed	Year Built	Insp. Date	Suff. Rate
37002	Durham*	Howd Road	Sawmill Brook	1940	9/16/1991	
37003	Durham*	Coe Road	Parmalee Brook	1970	9/13/1991	67.84%
37004	Durham*	Howd Road	Parmalee Brook	1989	9/13/1991	
37005	Durham*	Indian Lane	Parmalee Brook	1970	9/13/1991	
37006	Durham*	Parmelee Hill Road	Parmalee Brook	1940	9/13/1991	
37007	Durham*	Meetinghouse Hill Road	Coginchaug River	1970	9/16/1991	
37008	Durham*	Maiden Road	an unnamed brook	1931	9/16/1991	
37009	Durham*	Cream Pot Brook	Pisgah Road	1945	9/17/1991	
37010	Durham*	Picket Lane	Hersig Brook	1970	9/16/1991	
37011	Durham*	Guire Road	Hersig Brook	1970	9/16/1991	
37012	Durham*	Picket Lane	an unnamed brook	1975	9/17/1991	
37013	Durham*	Blue Hills Road	Arrigoni Brook	1950	9/7/1991	
37014	Durham*	Johnson Lane	Sumner Brook	1948		
37015	Durham*	Creamery Road	Coginchaug River			
4647	East Haddam	E Haddam-Col Tpke	Moodus Reservoir	2000	3/7/2013	68.51%
4648	East Haddam	Gristmill Road	Moodus River	1956	3/12/2013	92.24%
4649	East Haddam+	Clark Hill Road	Roaring Brook	1935	3/12/2013	67.44%
4650	East Haddam	Dolbia Hill Road No. 2	Eight Mile River	2005	3/14/2013	92.39%
4651	East Haddam	Foxtown Road	Eight Mile River	1940	3/14/2013	49.43%
4656	East Haddam	Johnsonville Road	Moodus River	1930	3/14/2013	60.97%
5267	East Haddam	Jones Hill Road	Eight Mile River	2006	3/14/2013	63.37%
6126	East Haddam+	Haywardville Road	Eight Mile River	1970	12/12/2013	17.91%
40001	East Haddam*	East Shore Drive	an unnamed brook	1983	6/6/1991	75.13%
40002	East Haddam*	Clark Sates Road	an unnamed brook	1980	6/4/1991	
40003	East Haddam*	Falls Bansham Road	Moodus River	1965	6/4/1991	
40004	East Haddam*	Falls Bajham Road	Moodus River	1965	6/5/1991	
40005	East Haddam*	Acklet Cemetery Road	Early Brook	1975	6/5/1991	
40006	East Haddam*	Geoffrey Road	Eight Mile River	1970	6/4/1991	77.15%
40007	East Haddam*	North Moodus Road	Moodus River	1975	6/5/1991	
40008	East Haddam*	Joe Williams Road	Shady Brook	1965	6/10/1991	
40009	East Haddam*	Bajham Road	an unnamed brook	1960	6/6/1991	
40011	East Haddam*	Haywardville Road	Early Brook	1970	6/4/1991	
40012	East Haddam*	Salem Road	Hayward Brook	1965	6/10/1991	
40013	East Haddam*	Foxtown Cemetery Road	Hayward Brook	1980	6/6/1991	
40014	East Haddam*	Foxtown Cemetery Road	an unnamed brook	1965	5/31/1991	
40015	East Haddam*	Foxtown Cemetery Road	Foxtown Cemetery Rd Brook	1965	5/31/1991	
40016	East Haddam*	Foxtown Cemetery Road	an unnamed brook	1965	6/10/1991	
40017	East Haddam*	Bardman Road	Succor Brook	1970	6/6/1991	
40018	East Haddam*	Creamery Road	Succor Brook	1975	6/3/1991	
40019	East Haddam*	Lumber Yard Road	Succor Brook	1975	6/3/1991	
40020	East Haddam*	Three Bridges Road #1	Strong Brook	1985	6/5/1991	70.28%
40021	East Haddam*	Hungerford Road	Hungerford Road Brook	1970	6/3/1991	
40022	East Haddam*	Bone Mill Road	Hemlock Valley Brook	1965	6/6/1991	
40023	East Haddam*	Bone Mill Road #2	an unnamed brook	1985	6/6/1991	
40024	East Haddam*	Florida Road #1	an unnamed brook	1980	6/3/1991	
5610	East Hampton+	Shipyard Road	Mine Brook	1941	11/29/2012	69.00%

Bridge No	Town	Feature Carried	Feature Crossed	Year Built	Insp. Date	Suff. Rate
5739	East Hampton	Chestnut Hill Road	Pine Brook	1987	11/29/2012	61.42%
41001	East Hampton*	White Birch Road	Fawn Hill Brook	1960	4/12/1991	
41002	East Hampton*+	Walnut Ave	Pocotopaug Creek	1950	4/16/1991	59.84%
41003	East Hampton*	Main Street	Pocotopaug Creek	1925	4/15/1991	64.80%
41004	East Hampton*+	Niles Street	Pocotopaug Creek	1950	4/11/1991	41.99%
41005	East Hampton*+	Flat Brook Road	Flat Brook	1980	4/16/1991	59.80%
41006	East Hampton*+	Flat Brook Road	Flat Brook	1970	4/15/1991	26.83%
41007	East Hampton*+	Blacksmith Road	an unnamed brook	1850	4/10/1991	27.00%
41008	East Hampton*+	Terp Road	Pine Brook	1950	5/21/1991	46.51%
41009	East Hampton*	Old Chestnut Hill Road	Pocotopaug Creek	1970	4/16/1991	
41010	East Hampton*	Tartia Road	Safstrom Brook	2000		new
41011	East Hampton*	Wopowog Street	Safstrom Brook	1975	4/10/1991	87.43%
4356	Essex	Pond Meadow Road	Falls River	1980	9/24/2013	80.18%
4660	Essex	Walnut Street	Falls River	1968	12/14/2013	40.88%
4662	Essex	Dennison Road	Falls River	1968	10/17/2013	83.65%
4663	Essex	River Road	Falls River	1954	9/20/2013	91.56%
4664	Essex	Dennison Road	Falls River	1964	9/30/2013	88.79%
5288	Essex	Cheney Street	an unnamed brook	1983	9/20/2013	87.45%
5289	Essex	Main Street #2	an unnamed brook	1983	9/26/2013	69.10%
49001	Essex*	Ivory Street	Falls River (North Branch)	1940	7/10/1991	82.21%
49002	Essex*	Ivory Street	Falls River (South Branch)	1940	7/10/1991	64.21%
49003	Essex*	Falls River	Falls River Drive	1980	7/2/1991	60.05%
49004	Essex*+	Old Deep River Road	an unnamed brook	1940	7/2/1991	50.82%
4681	Haddam	St. Peters Lane	Candlewood Hill Brook	1963	6/24/2013	48.32%
4682	Haddam+	Dublin Hill Road	Bible Rock Brook	1920	12/14/2012	50.41%
4688	Haddam	Little City Road	Ponset Brook	1960	6/18/2013	78.44%
4816	Haddam	Depot Road	Ponset Brook	1983	6/18/2013	61.40%
4817	Haddam	Scovil Road	Candlewood Hill Brook	1983	6/24/2013	86.17%
5405	Haddam	Depot Road	Candlewood Hill Brook	1986	6/18/2013	77.91%
5406	Haddam	Boulder Dell Road	Bible Rock Brook	1986	7/7/2011	82.03%
5515	Haddam+	Jail Hill Road	Beaver Meadow Brook	1986	6/18/2013	68.14%
5537	Haddam	Beaver Meadow Road	Beaver Meadow Brook	1983	6/18/2013	78.93%
6020	Haddam	Thayer Road	Bible Rock Brook	1990	6/24/2013	76.29%
6028	Haddam	Grapevine Road	Candlewood Hill Brook	1990	6/24/2013	81.91%
6209	Haddam	Little City Road	Candlewood Hill Brook	1991	6/18/2013	76.09%
6301	Haddam	Dish Mill Road	Ponset Brook	1963	6/24/2013	63.86%
60001	Haddam*	Dudley Clark Road	an unnamed brook	1970	9/16/1991	69.20%
60002	Haddam*	Dudley Clark Road	an unnamed brook	1970	9/16/1991	
60003	Haddam*	Ruth Hill Road	Roaring Brook	1965	9/16/1991	
60004	Haddam*	Beaver Meadow Road	Beaver Meadow Brook	1971	9/16/1991	84.63%
60005	Haddam*	Walkley Hill Road	Swain Johnson Brook	1920	9/10/1991	
60006	Haddam*	Pownsett Road	Saltpeter Brook	1983	9/16/1991	
60007	Haddam*	Candlewood Hill Road	Candlewood Hill Brook	1940	9/16/1991	
60008	Haddam*	Hidden Lake Road	Hidden lake Spillway	1939	9/14/1991	
60009	Haddam*	Wiese Albert Road	Candlewood Hill Brook	1950	9/17/1991	77.19%
60010	Haddam*	Brainard Hill Road	Bible Rock Brook	1983	9/17/1991	

Bridge No	Town	Feature Carried	Feature Crossed	Year Built	Insp. Date	Suff. Rate
60011	Haddam*	Oxbaw Road	Bible Rock Brook	1949	9/17/1991	
60012	Haddam*	Little City Road	Candlewood Hill Brook	1991	10/29/1991	93.21%
60013	Haddam*	Candlewood Hill Road	Candlewood Hill Brook	1936	3/17/1997	
60014	Haddam*	Candlewood Hill Road	Candlewood Hill Brook	1936	3/17/1997	
60015	Haddam*	Candlewood Hill Road	Candlewood Hill Brook	1936	3/17/1997	
60016	Haddam*	Beaver Meadow Road	Beaver Meadow Brook			
4712	Killingworth	River Road	Deer Lake Brook	1960	12/11/2013	77.91%
4716	Killingworth	Reservoir Road	Menunketesuck River	2009	12/11/2013	85.42%
6614	Killingworth+	Abner Lane	Pond Meadow Brook	1998	12/11/2013	75.76%
69001	Killingworth*	Burr Hill Road	an unnamed brook	1970	7/12/1991	
69002	Killingworth*	Bunell Bridge Road	an unnamed brook	1950	7/15/1991	64.10%
69003	Killingworth*	Emanuel Church Road	an unnamed brook	1965	7/15/1991	84.20%
69005	Killingworth*	Birch Mill Road	Pond Meadow Brook	1980	7/11/1991	73.85%
69006	Killingworth*	Alders Bridge Road	an unnamed brook	1980	7/12/1991	66.20%
69007	Killingworth*	Roast Meat Hill Road	Menunketesuck River	1950	7/11/1991	81.19%
69008	Killingworth*	River Road	an unnamed brook	1980	7/15/1991	94.96%
69009	Killingworth*	Paper Mill Road	an unnamed brook	1950	7/11/1991	62.56%
69010	Killingworth*	River Road	an unnamed brook	1960	7/11/1991	94.37%
69011	Killingworth*	Roast Meat Hill Road	Indian River	1970	7/10/1991	84.18%
4723	Lyme+	Mount Archer Road	Eight Mile River	1966	3/2/2011	70.64%
4724	Lyme	Joshuatown Road	Eight Mile River	1920	12/3/2013	70.41%
4726	Lyme+	Macintosh Road	Eight Mile River	1972	12/31/2013	33.98%
5818	Lyme+	Day Hill Road	Roaring Brook	1989	12/31/2013	50.95%
6039	Lyme	Salem Road	East Branch Eight Mile River	1991	12/27/2012	66.83%
74001	Lyme*	Gungy Road	an unnamed brook	1965	6/10/1991	86.18%
74002	Lyme*	Beaver Brook Road	an unnamed brook	1960	6/11/1991	69.16%
74003	Lyme*	Grassy Hill Road	Beaver Brook	1950	6/10/1991	78.20%
74004	Lyme*	Kenny Road	Beaver Brook	1960	6/11/1991	90.02%
74005	Lyme*	Joshuatown Road	Joshua Creek	1950	6/11/1991	86.45%
74006	Lyme*	Cove Road #1	Hamburg Cove	1960	6/10/1991	78.20%
74007	Lyme*+	Birch Mill Road	Falls Brook	1940	8/8/1991	58.75%
74008	Lyme*	Sterling City Road	Falls Brook	1960	6/10/1991	79.21%
4150	Middlefield	Cherry Hill Road	Coginchaug River	2000	5/22/2012	95.60%
4843	Middlefield	Miller Road	Coginchaug River	1936	5/17/2012	82.10%
4844	Middlefield	Strickland Road	Coginchaug River	1936	5/16/2012	91.32%
5553	Middlefield	Cider Mill Road	Coginchaug River	1933	5/14/2012	90.24%
81001	Middlefield*	Mattabeseck Road	an unnamed brook	2006	2/9/2005	
4187	Middletown+	Main Street Extension	Sumner Brook	1935	11/20/2012	62.06%
4189	Middletown	Ridge Road	Sumner Brook	1938	8/10/2012	69.61%
4190	Middletown+	River Road No. 1	Sumner Brook	1920	9/26/2013	50.57%
4533	Middletown	Mill Street	Sumner Brook	1953	8/20/2012	76.23%
4535	Middletown	Middlefield Street	Coginchaug River	1900	9/4/2012	90.32%
4538	Middletown	Miner Street	Fall Brook	1978	8/6/2012	61.12%
4542	Middletown	Bell Street	Sawmill Brook	1955	9/10/2012	58.43%
5352	Middletown	East Main Street	Sumner Brook	1985	9/4/2012	98.60%
5564	Middletown	Russel Street	Sumner Brook	1987	8/21/2012	77.70%

Bridge No	Town	Feature Carried	Feature Crossed	Year Built	Insp. Date	Suff. Rate
5616	Middletown	Mill Street	Long Hill Brook	2001	8/8/2012	79.07%
5621	Middletown	Wilcox Street	Sumner Brook	2010	9/26/2012	80.35%
5622	Middletown	Boardman Lane No. 1	an unnamed brook	1981	9/10/2012	59.43%
5957	Middletown	River Road No. 2	an unnamed brook	1970	8/8/2012	52.76%
5958	Middletown	Wesleyan Hills Road	Long Hill Brook	1960	6/1/2012	68.73%
5959	Middletown	Heritage Boulevard	an unnamed brook	1986	8/10/2012	52.38%
5450	Middletown	Mill Brook Road	Sumner Brook	1934	5/10/2004	83.28%
82001	Middletown*	Country Club Road	West Highland Brook	1965	5/7/1991	
82002	Middletown*	Timber Ridge Road	East Bradley Brook	1985	5/7/1991	
82003	Middletown*	Bradley Street	Bradley Brook	1981	5/7/1991	
82004	Middletown*	Smith Street	Sawmill Brook	1972	5/7/1991	
82005	Middletown*	Freeman Road	an unnamed stream	1995		new
82006	Middletown*	Freeman Road	an unnamed stream	1930	5/8/1991	
82008	Middletown*	Maromas Road	Hubbard Brook	1988	5/8/1991	
82009	Middletown*	Reservoir Road	Reservoir Brook	1960	5/8/1991	
82010	Middletown*	Bow Lane	an unnamed stream	1975	5/8/1991	
82011	Middletown*	Chamberlain Road	Harris Brook	1927	5/9/1991	
82012	Middletown*	Mill Brook Road	an unnamed stream	1930	5/9/1991	
82013	Middletown*	Mill Brook Road	Summer Brook	1975	5/9/1991	
82014	Middletown*	Bow Lane	an unnamed stream	1982	5/9/1991	
82015	Middletown*	River Road #1	an unnamed stream	1960	5/9/1991	
82016	Middletown*	Arbutus Street	Round Hill Brook	1970	5/13/1991	
82017	Middletown*	Anderson Road	Laurel Brook	1930	5/13/1991	73.71%
82018	Middletown*	Brown Street	Long Hill Brook	1970		new
82019	Middletown*	Randolph Road #1	Long Hill Brook	1980	5/13/1991	
82020	Middletown*	Wadworth Street	an unnamed stream	1985	5/13/1991	
82021	Middletown*	Butternut Street	an unnamed stream	1975	5/15/1991	
82022	Middletown*	Butternut Street	an unnamed stream	1930	5/15/1991	
82023	Middletown*	River Road #1	Reservoir Brook	1965	5/15/1991	
82024	Middletown*	High Street	an unnamed stream	1939	5/15/1991	
82025	Middletown*	Mile Lane	East Swamp Brook	1970	5/16/1991	
82026	Middletown*	Lawrence Drive	West Swamp brook	1980	5/16/1991	
82028	Middletown*	Ridgewood Road	an unnamed stream	1980	5/16/1991	
82029	Middletown*	Country Club Road	Fall Brook	1980	5/16/1991	
82030	Middletown*	Smith Street	Fall Brook	1980	5/17/1991	
82031	Middletown*	Industrial Park Road	Fall Brook	1992		new
82032	Middletown*	Industrial Park	an unnamed stream	1980	5/17/1991	
82033	Middletown*	Boardman Lane	Sawmill Brook	1980	5/17/1991	
82034	Middletown*	Wesleyan Hills Road	Pedestrian Walkway	1980	6/5/1991	
82035	Middletown*	Long Hill Road	Pedestrian Walkway	1980	6/5/1991	
82037	Middletown*	Pameacha Avenue	Long Hill Brook	1920		
82038	Middletown*	Lee Street	Prout Brook	1940	6/9/2004	71.41%
82039	Middletown*	Anderson Road	Laurel Brook	1995	5/10/2004	61.41%
82040	Middletown*+	West Lake Drive	Miner Brook	1985	4/26/2013	54.63%
4346	Old Lyme	Button Ball Road	Amtrak	1933	10/16/2009	81.22%
4738	Old Lyme	Town Woods Road	Mill Brook	1982	6/15/2012	81.49%

Bridge No	Town	Feature Carried	Feature Crossed	Year Built	Insp. Date	Suff. Rate
4739	Old Lyme	Sill Lane #1	Mill Brook	1982	6/15/2012	69.33%
4747	Old Lyme	Mile Creek Road	Blackhall River	1955	6/26/2012	92.74%
4818	Old Lyme	Sill Lane #2	Mill Brook	1982	6/15/2012	71.42%
104001	Old Lyme*	Tantummaheag Road	an unnamed brook	1960	6/12/1991	79.10%
104002	Old Lyme*	Hatchetts Hill Road	Three Mile River	1980	6/13/1991	69.14%
104003	Old Lyme*	Mile Creek Road	Three Mile River	1990	6/12/1991	88.88%
104004	Old Lyme*	McCurdy Road	Duck River	1960	3/7/1991	66.61%
4749	Old Saybrook	Nehantic Trail #2	Mud Creek	2003	11/3/2011	83.68%
5923	Old Saybrook	Ingham Hill Road	Amtrak	1990	11/8/2011	86.31%
6021	Old Saybrook	Schoolhouse Road	Amtrak	1991	9/16/2009	81.29%
105001	Old Saybrook*	Otter Cove Drive	an unnamed brook	1980	6/28/1991	69.21%
105002	Old Saybrook*	Ingham Hill Road	Fishing Brook	1931	7/1/1991	76.92%
6519	Portland	Wilcox Hill Road	Reservoir Brook	1995	4/5/2010	61.42%
112001	Portland*	Penfield Hill Road	Carr Brook	1938	6/3/1991	
112002	Portland*	Cox Road #2	Carr Brook	1960	6/3/1991	
112003	Portland*	Cox Road #2	Carr Brook	1960	6/3/1991	
112004	Portland*	Cox Road #2	Carr Brook	1960	6/3/1991	
112005	Portland*	South Road	Carr Brook	1982	6/5/1991	
112006	Portland*	Rose Hilll Road	Carr Brook	1938	6/4/1991	
112007	Portland*	Old Marlborough Tpke	Reservoir Brook	1938	6/4/1991	
112008	Portland*	Thompson Hill Road	Reservoir Brook	1939	6/4/1991	
112009	Portland*	Isinglass Hill Road	an unnamed stream	1950	6/5/1991	
3894	Westbrook	Old Clinton Road	Amtrak	1997	9/16/2009	91.13%
4807	Westbrook	Old Clinton Road	Patchogue River	1976	6/11/2012	80.72%
6084	Westbrook	Wesley Avenue	Patchogue River	1991	6/11/2012	93.98%
6658	Westbrook+	Flat Rock Place	wetlands	1996	7/5/2012	58.00%
6659	Westbrook+	Flat Rock Place	wetlands	1996	5/17/2012	59.94%
6660	Westbrook+	Flat Rock Place	wetlands	1996	5/17/2012	59.28%
6661	Westbrook*	Flat Rock Place	wetlands	1996	5/17/2012	59.47%
154001	Westbrook*	Pritchett Drive	an unnamed brook	1988	7/18/1991	64.16%
154002	Westbrook*+	Winthrop Road	Falls River	1945	5/7/1999	56.53%
154003	Westbrook*+	Lynn Road	Falls River	1939	7/17/1991	61.80%
154004	Westbrook*	Fishing Brook Road	Spring Lot Brook	1986	7/17/1991	63.63%
154005	Westbrook*	Fair View Road	an unnamed brook	1987	7/16/1991	64.10%
154006	Westbrook*	Brookwood Drive	Spring Lot Brook	1986	7/17/1991	63.63%
154007	Westbrook*	Pond Meadow Road	an unnamed brook	1982	7/16/1991	69.20%
154008	Westbrook*	Willard Avenue	an unnamed brook	1970	7/16/1991	67.16%
154009	Westbrook*	Toby Hill Road #1	Trout Brook	1982	7/16/1991	87.15%
	Under 20' bridges *					
	Eligible bridges +					

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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 Long Range Regional Transportation Plan
or to provide feedback, please contact the offices of the
Lower Connecticut River Valley Council of Governments at (860)581-8554.