

DRAFT

Metropolitan Transportation

Plan: 2019 ~ 2045

For the

Naugatuck Valley Planning

Region &

Central Naugatuck Valley

Metropolitan Planning Area

February 2019



NAUGATUCK VALLEY  
COUNCIL of GOVERNMENTS

Title:	Metropolitan Transportation Plan for the Naugatuck Valley Planning Region: 2019-2045
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Date:	February 2019
Metropolitan Planning Organization:	Central Naugatuck Valley Metropolitan Planning Organization (CNVMPO)
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Website:	<a href="http://www.nvcogct.org">www.nvcogct.org</a>
Abstract:	Federal regulations require any urbanized area with a population greater than 50,000 to designate a metropolitan planning organization (MPO) to evaluate and assess its transportation systems, identify needed improvements to its transportation systems, and help decide how investments in the transportation systems will be made, including identifying the funding program allocations, project timing and schedule, and which projects to program. The NVCOG, as the host agency for the Central Naugatuck Valley MPO, assessed and analyzed the existing transportation system, identified deficiencies and determined future transportation needs. Based on these analyses, a program of transportation improvement projects is recommended. Future transportation investments reflect reasonably expected funding resources.
Acknowledgements:	The Metropolitan Transportation Plan for the Naugatuck Valley planning region and the Central Naugatuck Valley Metropolitan Planning Organization (CNVMPO) was prepared by the Naugatuck Valley Council of Governments (NVCOG) in cooperation with member municipalities and the Connecticut Department of Transportation (CTDOT). It was completed in accordance with federal transportation planning requirements, stipulated in 23 CFR Part 450§324, and under the NVCOG's <u>FY 2018/2019 Unified Planning Work Program for the</u>



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Naugatuck Valley Planning Region. Funding was provided through the UPWP by the US Department of Transportation (USDOT), Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the CTDOT and member municipalities. The findings and conclusions expressed in the report are those of the NVCOG and do not reflect the official views of CTDOT or the USDOT.

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For more information:

For more information about the NVCOG's transportation planning process and the update of the Metropolitan Transportation Plan, please visit the NVCOG's website at: [www.nvcogct.org](http://www.nvcogct.org)

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## Table of Contents

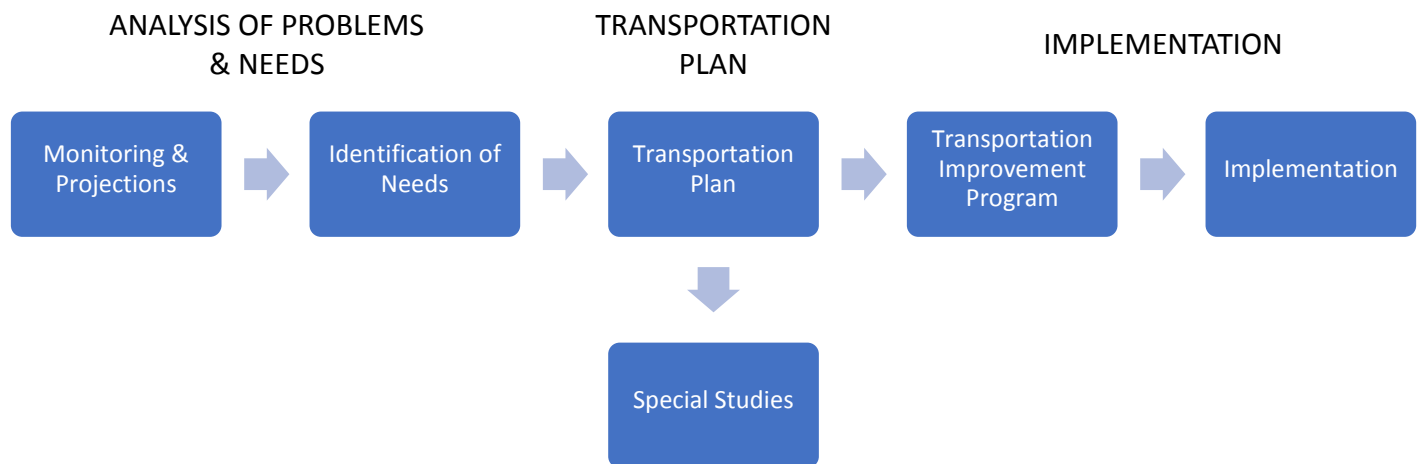
<b>1.0</b>	<b><i>Metropolitan Transportation Planning Process .....</i></b>	<b><i>1</i></b>
<b>2.0</b>	<b><i>Naugatuck Valley Regional Profile.....</i></b>	<b><i>4</i></b>
<b>3.0</b>	<b><i>Transportation Issues &amp; Goals .....</i></b>	<b><i>8</i></b>
<b>4.0</b>	<b><i>Highway System.....</i></b>	<b><i>9</i></b>
<b>5.0</b>	<b><i>Public Transit Systems .....</i></b>	<b><i>20</i></b>
<b>6.0</b>	<b><i>Active Transportation Systems .....</i></b>	<b><i>25</i></b>
<b>7.0</b>	<b><i>Freight and Goods Movement .....</i></b>	<b><i>31</i></b>
<b>8.0</b>	<b><i>Aviation .....</i></b>	<b><i>35</i></b>
<b>9.0</b>	<b><i>Sustainable Transportation .....</i></b>	<b><i>35</i></b>
<b>10.0</b>	<b><i>Transportation Security.....</i></b>	<b><i>38</i></b>
<b>11.0</b>	<b><i>Advanced Technologies .....</i></b>	<b><i>40</i></b>
<b>12.0</b>	<b><i>Capital Improvement Program .....</i></b>	<b><i>42</i></b>
<b>13.0</b>	<b><i>Public Outreach.....</i></b>	<b><i>47</i></b>

## 1.0 Metropolitan Transportation Planning Process

The Naugatuck Valley Council of Governments (NVCOG) is a multi-discipline, regional planning organization for the Naugatuck Valley planning region. It commenced operations on January 1, 2015, as a result of the state-mandated mergers and consolidations of regional planning organizations. The NVCOG is the federally designated transportation planning agency for the Waterbury Urban Area and the Central Naugatuck Valley Metropolitan Planning Organization (CNVMPO). It also provides transportation planning support to its four communities that are members of the Greater Bridgeport and Valley MPO (GBVMPO).

The transportation planning process is conducted in accordance with federal transportation planning regulations, as stipulated in Title 23 of the US Code of Federal Regulations. As the transportation planning agency for the Waterbury Urban Area, the NVCOG conducts transportation planning tasks listed and described in an annual Unified Planning Work Program (UPWP), adopts and maintains the short-range Transportation Improvement Program (TIP), prepares a long range Metropolitan Transportation Plan (MTP), and ensures its transportation projects, plans and programs contribute to attainment of national air quality standards (Air Quality Conformity).

The transportation planning process is depicted in the following illustration:

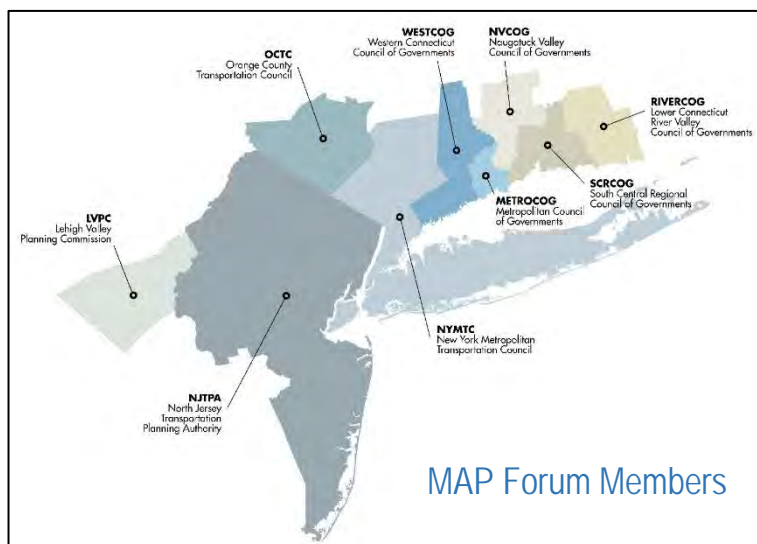


Federal regulations state that *“If more than one MPO has been designated to serve an urbanized area there shall be a written agreement among the MPOs, the State(s), and the public transportation operator(s) describing how the metropolitan transportation planning processes will be coordinated to assure the development of consistent metropolitan transportation plans and TIPs across the MPA (metropolitan planning area) boundaries...”* In order to comply with this

requirement, the NVCOG has entered into several transportation planning agreements with partner MPOs. These agreements define mutual responsibilities in carrying out the metropolitan planning process.

The Naugatuck Valley planning region is not designated as a Transportation Management Area (TMA). Despite the region's 2010 Census population of 448,708, the population of the Waterbury UZA, which defines a TMA, was 194,535, just under the 200,000 population requirement. Therefore, federal certification of its transportation planning process is not required. However, the transportation planning process is conducted in conformity with applicable metropolitan planning requirements and the CNVMPO self certifies that its planning process conforms to the Metropolitan Planning Rule, 23 CFR Part 450 Subpart C and 49 CFR Part 613. Also, the NVCOG participates in the federal certification review of adjacent MPOs, as several member municipalities are located in urbanized areas that are designated as a TMA, including the Bridgeport-Stamford UZA and Hartford UZA.

The NVCOG is also a member of the multi-state Metropolitan Area Planning (MAP) Forum, a consortium of MPOs in New York, New Jersey, Connecticut and Pennsylvania. The MAP Forum was established in 2008 to cooperate and coordinate transportation planning activities in the New York metropolitan area. An MOU has been signed by the nine members of the MAP Forum for the voluntary coordination of planning activities in the multi-state metropolitan region.



Federal planning regulations require the MTP to consider projects and strategies that will address ten specific planning factors. The MTP addresses each of the factors:

- 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 security of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for freight.

- Protect and enhance the environment, promote energy conservation, improve the quality-of-life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
- 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.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- Enhance travel and tourism.

Over the last two decades, states and MPOs have increasingly relied upon highway performance data to guide planning and programming, a process that has come to be referred to as performance management. The 2012 federal *Moving Ahead for Progress in the 21st Century Act (MAP-21)* integrated many of these practices into statute by putting requirements on states and MPOs to include performance management in their planning documents. The *Fixing America's Surface Transportation (FAST) Act* re-emphasized the performance based approach to transportation planning. Federal targets have been or are being established in the following goal areas:

- Highway Safety: number of fatalities, rate of fatalities, number of serious injuries, rate of serious injuries, and number of non-motorized fatalities and serious injuries.
- Transit Asset Management: State of Good Repair measures and targets for rolling stock, equipment, facilities, and infrastructure.
- Infrastructure Condition: Pavement and Bridge Condition: percentage of road miles and bridge decks on the National Highway System in good or poor condition.
- System Reliability: system travel time reliability.
- Freight Movement: truck travel time reliability.
- Air Quality: reduction of poor air emissions from CMAQ projects.

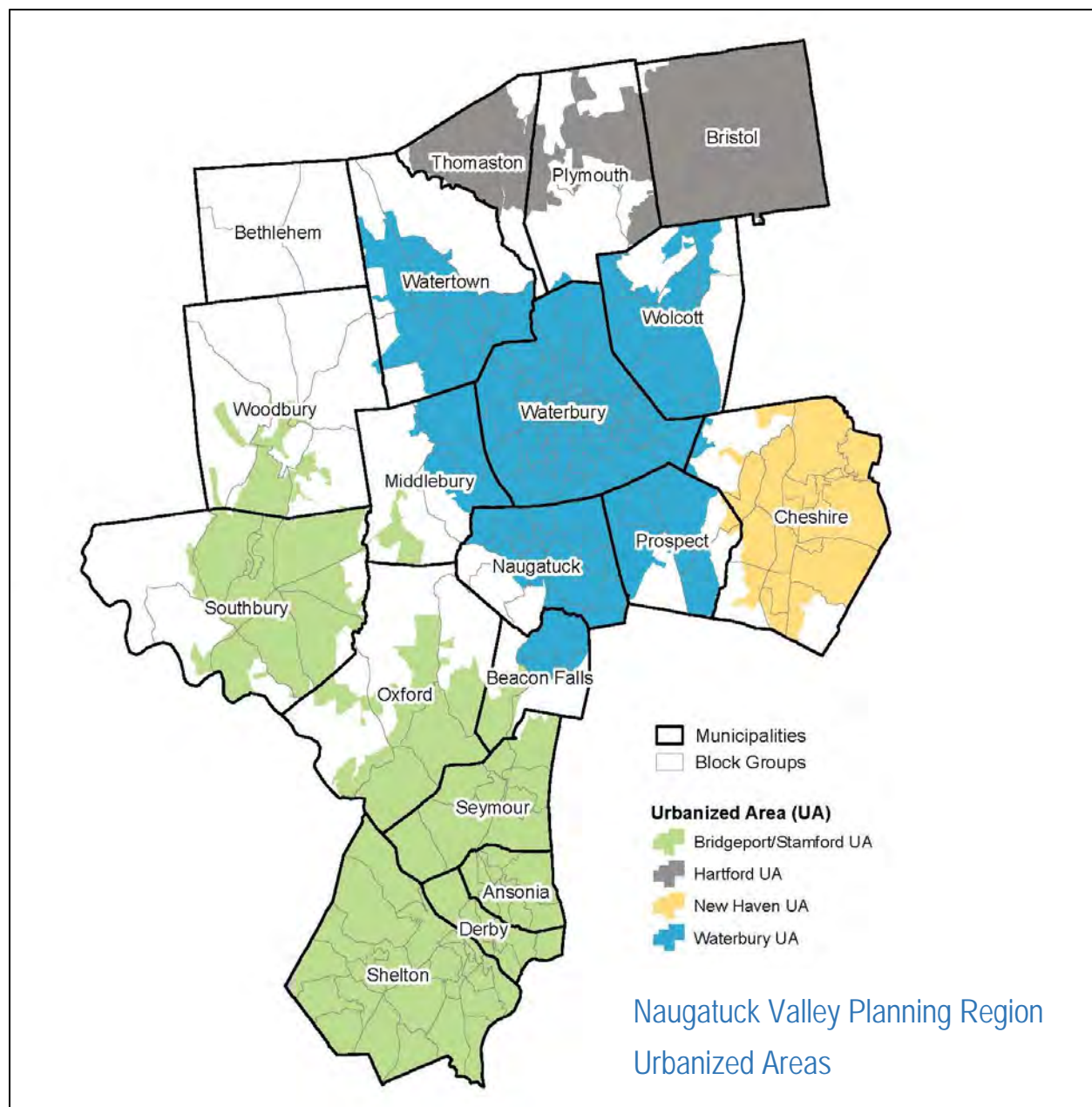
Several federal acts and executive orders require the transportation planning process conducted by MPOs to make the process accessible to all residents, regardless of race, ethnicity, nationality, income, or ability to speak English. The NVCOG adheres to and complies with these principles through the following activities:

- Developed and adopted a formal *Title VI Plan* in April of 2016.
- Determined the number and proportion of the population with Limited English Proficiency and completed a *Language Assistance Plan*.
- Identified areas with a disproportionately high concentration of minority and low-income populations and adopted an *Environmental Justice Policy*.
- Developed and adopted a proactive *Public Involvement Program* and policy.



## 2.0 Naugatuck Valley Regional Profile

The Naugatuck Valley planning region is located in west-central Connecticut, covering about 422 square miles. The City of Waterbury is the largest city in the region and serves as its central city. The region lies mid-way between Hartford to the east, New Haven to the south, Bridgeport to the southwest and Danbury to the west. The Naugatuck Valley planning region includes the whole of the Census-defined Waterbury urbanized area, and parts of the Bridgeport-Stamford urbanized area, New Haven urbanized area and Hartford urbanized area. It has a combined population of 447,390 people (2016 ACS).



The map illustrates the Waterbury, CT Metropolitan Area, categorized into three concentric rings of urban development. The Urban Core (dark blue) is the central, most densely populated area. The Inner Ring (medium blue) surrounds the core, and the Outer Ring (light blue) is the most extensive, least densely populated area. Major highways (I-84, I-95, I-691, and US-8) are shown in red. The map also includes a legend, a scale bar (0 to 4 miles), and a north arrow.

Ring	Counties	Cities/Towns
Urban Core	Waterbury	Waterbury, Naugatuck
Inner Ring	Middlebury, Woodbury, Southbury, Shelton	Middlebury, Woodbury, Southbury, Shelton, Waterbury, Naugatuck
Outer Ring	Bethel, Danbury, Southbury, Shelton	Bethel, Danbury, Southbury, Shelton, Waterbury, Naugatuck, Middlebury, Woodbury

## Naugatuck Valley Planning Region

### Land Composition

From 2000 to 2016, the region saw a modest 4.3% growth rate, adding 18,600 new residents, increasing its total population of 447,390 people. This was a faster growth rate than the 1990s, but much slower than the 1980s. Population projections from the Connecticut State Data Center indicate that the region's population will continue to grow until 2025, but at a much slower rate than in the past. From 2025 to 2040, the region is projected to shrink by 1.2%, losing approximately 5,355 residents.

Population & Population Projections Naugatuck Valley Planning Region	
2000	428,790
2010	448,708
2016	447,390
2020	451,405
2025	452,628
2030	452,712
2035	450,601
2040	447,273

Percentage Change in Population Naugatuck Valley Planning Region	
2000-2010	4.6%
2010-2016	-0.3%
2016-2020	0.9%
2020-2040	-0.9%

Source: U.S. Census Bureau,  
American Community Survey 5 Year  
Estimates: 2012-2016 (B01003), 2010  
U.S. Census, 2000 U.S. Census

Source: Connecticut State Data  
Center, Population Projections: 2015-  
2040

The Naugatuck Valley region has a higher population density than the state as a whole. In 2016, the region had an estimated 1,061 persons per square mile (which includes non-residential land and roads), compared to 741 statewide. Immigration, migration, and higher birth rates among minority groups have made the region's population more diverse than ever before. As of 2016, 123,878 residents were of a minority race or ethnicity, making up 27.7% of the total.

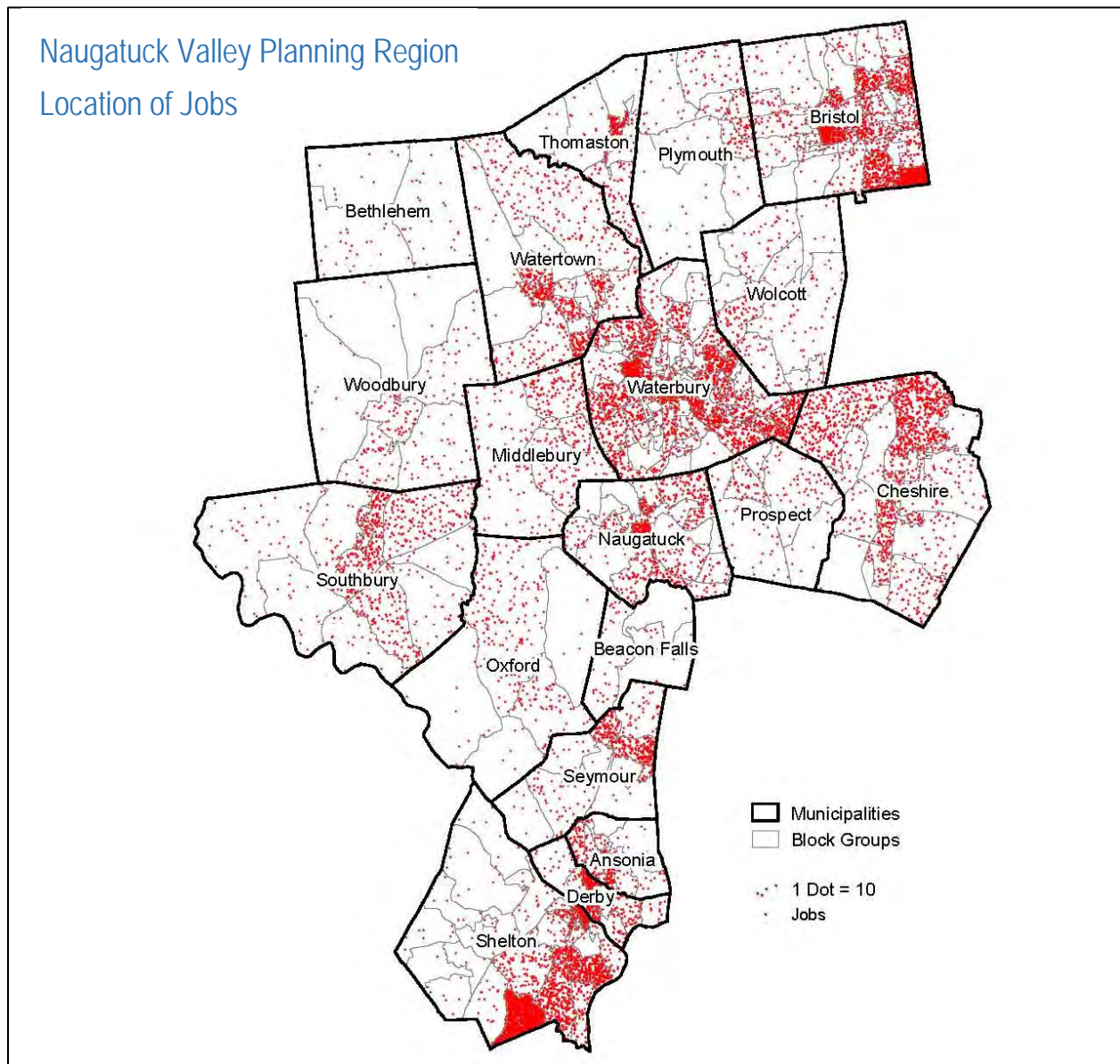
During the 2008 recession, the region experienced sharper job losses than the state and nation as a whole. Between years 2007 and 2011, 12,337 jobs were lost, a decline of 7.6%. Since 2011 the economy has improved, adding over 8,700 jobs. By 2017, the region regained 71% of the jobs lost during the recession. Comparatively, the state gained back 146% of those lost jobs. As of 2017 there were 158,781 jobs in the region. Despite job losses during the last ten years, Waterbury remains the job center of the region followed by Shelton, Bristol, and Cheshire.

As the suburbs gain population, many employers have followed to be closer to their workforce. From 2004 to 2017, the urban core lost over 3,300 jobs while the inner ring gained over 4,700 jobs, mostly in Shelton, and Cheshire. Bristol was the only urban core municipality to gain jobs



(1,032). Outer ring towns with good highway access (such as Oxford and Middlebury) also saw job growth.

Over the last half century, the regional economy has shifted from a manufacturing based economy to one oriented to service sector industries. Health care and social assistance is now the largest job sector followed by government (which includes public school teachers). While much less prominent than in the past, manufacturing remains the third largest sector of the region's economy, with over 20,000 jobs.



### 3.0 Transportation Issues & Goals

The Naugatuck Valley planning region is a region in motion, with about 2 million trips occurring within the region each day. Private vehicles are used for most of these trips; however, public transit modes (rail and local bus) and active transportation (walking and bicycling) are becoming increasingly important and more frequently ways for people travel. Over the next 20 years, as the population continues to grow, congestion and delays on the region's highways and roads will worsen and further burden an aging infrastructure in need of rehabilitation and replacement. Despite these needs, there is expected to be insufficient funding to maintain the current system in a state of good repair, let alone resources to enhance and expand infrastructure. Also, trends suggest that the region's population is not only growing but aging, which will require a shift in how transportation is provided to individuals with mobility impairments. Technology may offer some solutions to the transportation issues facing the region, but much uncertainty remains as to the extent technology will affect peoples' travel patterns.

The transportation system of the Naugatuck Valley planning region is diverse and includes a mature network of highways and roads, a commuter rail line, fixed-route, local bus services, general aviation airport, multi-use greenways and trails, and pedestrian facilities. Through the transportation planning process, transportation concerns and issues facing the region have been identified. Over the next twenty years, the principal transportation issues facing the region include:

- Aging Infrastructure
- Recurring Congestion and Travel Delay
- Highway Safety
- Under Investment in the Waterbury Branch Commuter Rail Line
- Fragmented Local Bus Service
- ADA Paratransit Service Gaps
- Expand and Maintain Multi-use Greenway and Trail Facilities
- Pedestrian Safety

These issues led to the identification of common values, opportunities and challenges encapsulated in the following vision statement for the region's transportation system:

*The NVCOG region will be home to an efficient multi-modal transportation system which will enhance the mobility of its residents and visitors, facilitate movement of people and goods and minimize adverse social, economic and environmental impacts. The transportation system will include pedestrian-related infrastructure, features and amenities to support the safety and well-*



*being of pedestrians, as well as infrastructure to promote and encourage bicycling and other forms of active transportation.*

To achieve this vision, the NVCOG transportation planning will focus on investing in existing infrastructure to improve operations of existing capacity, revitalizing our town centers to avoid costly highway expansion, and developing livable and sustainable downtowns with unique facilities and open space that leverage their existing infrastructure and assets.

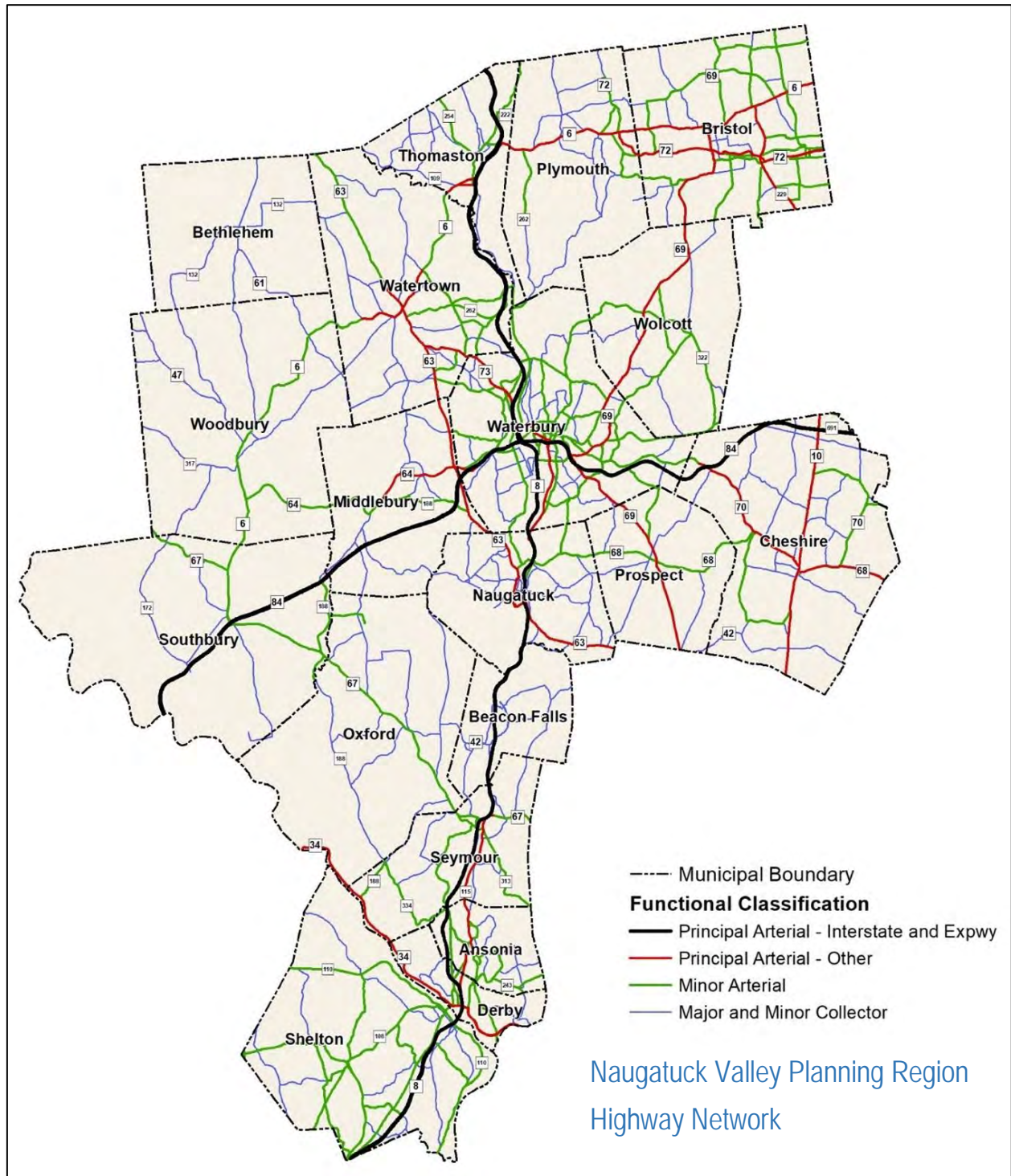
The primary goals to help achieve this vision are organized as chapters within the MTP:

- Preserve, Maintain and Enhance the Highway System
- Congestion Management
- Improve Safety
- Ensure Transportation System Security
- Advanced Technology
- Preserve and Enhance Public Transportation Services
- Expand Multi-Modal Opportunities
- Enhance the Efficient Movement of Freight and Goods Enhance
- Bicycle and Pedestrian Facilities
- Environmental Mitigation and Air Quality Conformity
- Sustainably Promote Economic Development and Revitalization
- Environmental Justice
- Ensure Transparency and Proactive Public Involvement

## 4.0 Highway System

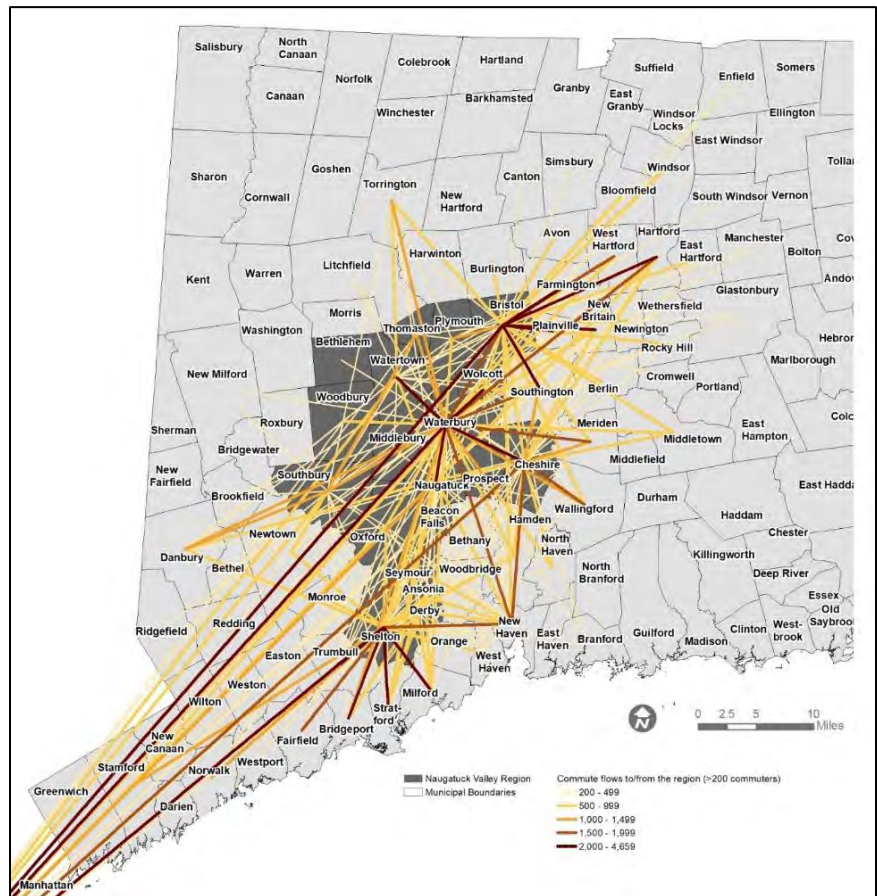
The regional highway system functions as the primary means of distributing people and goods within and throughout the region. Most of the highway travel is accommodated by the nearly 59 miles of interstate and other expressways that traverse the region. While these high function highways account for only 2.4% of the road mileage in the region, over 40% of total daily travel takes place on these facilities.

Two interstate highways serve the region. Interstate 84 is the region's principal east-west expressway, providing access to Danbury and the New York metropolitan area to the west and Hartford and Massachusetts to the east. Interstate 691 serves as an interstate connector between I-84 in Cheshire and Interstate 91 in Meriden. Route 8 is the region's north-south limited access expressway, connecting Interstate 95 in Bridgeport to I-84 in Waterbury.



The highway network also includes about 350 miles of arterial roads, which facilitate the flow of traffic within and between municipalities, 340 miles of collector streets, which link local streets and neighborhoods to the arterial routes, and 1,689 miles of local roads.

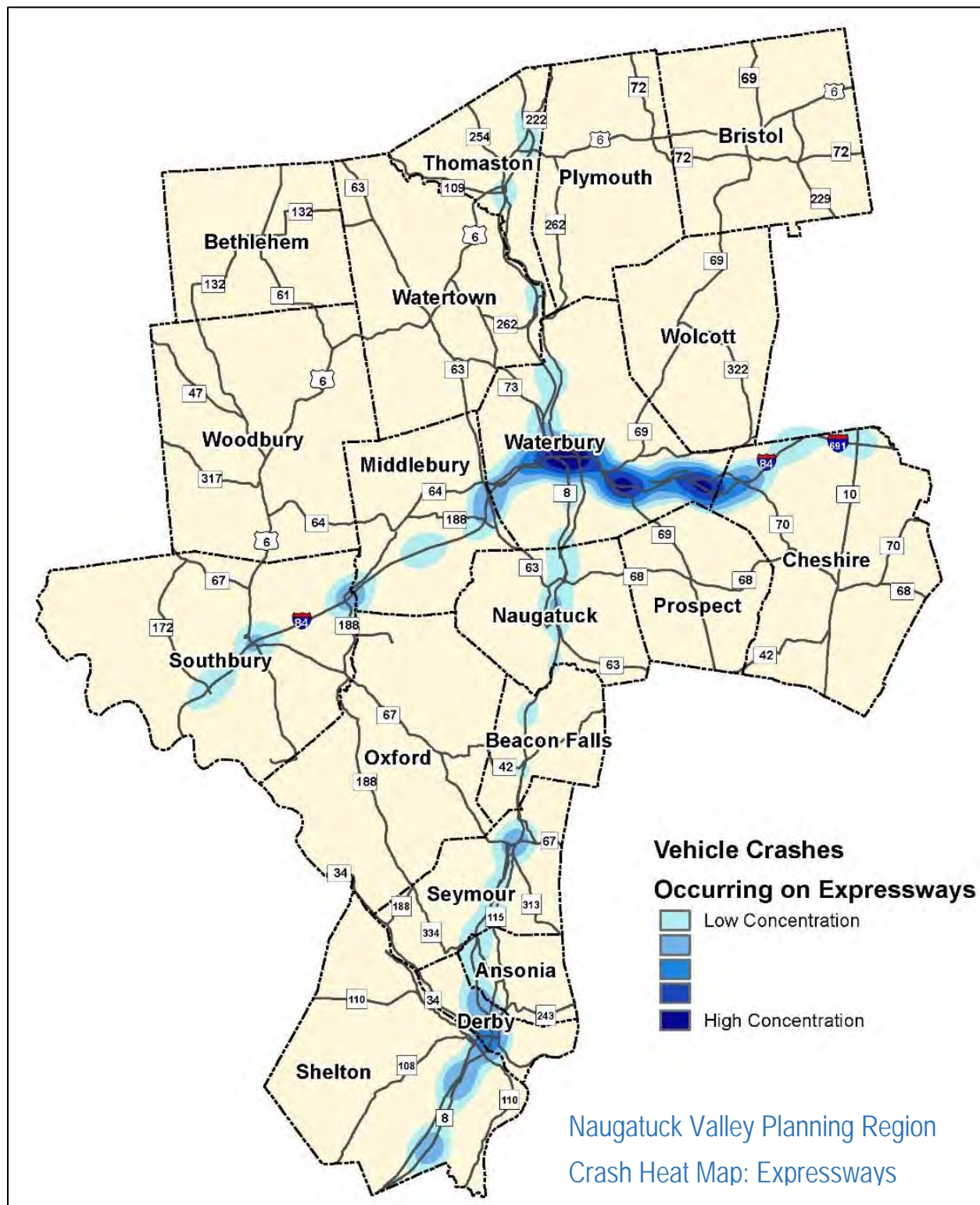
Commuting patterns in the Naugatuck Valley planning region reflect national trends. The migration of the region's population from the central city to the suburbs and rural areas is accompanied by decentralized travel. As people move farther away from urban core areas, they assume longer commutes and increased reliance on the automobile. Commuting data for the region show diverse movements across the region with strong ties between the major cities and employment areas. The length of the average work trip of people living in the region is about 28 minutes.

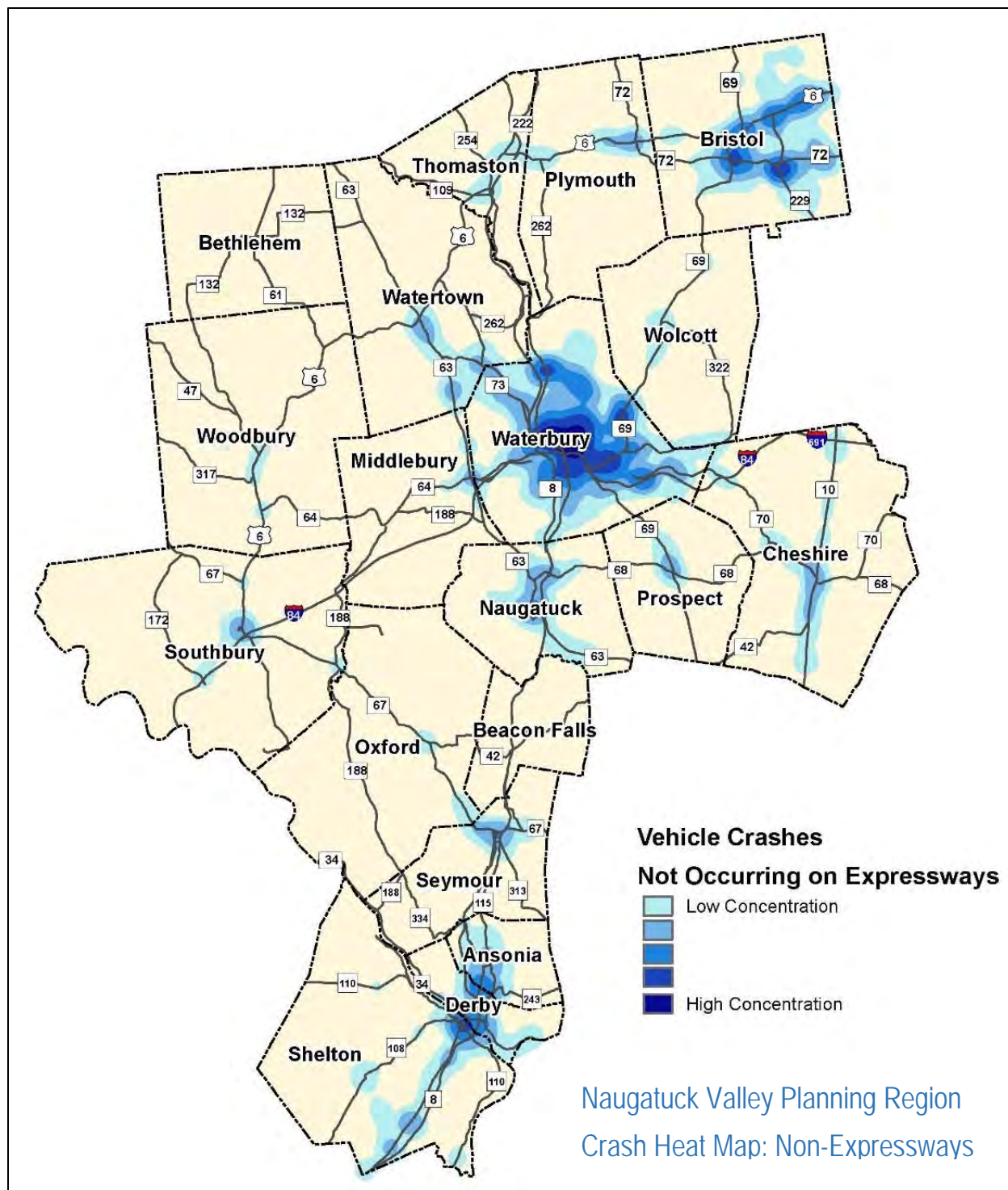


## Naugatuck Valley Planning Region Commuting Patterns

The NVCOG has adopted a regional approach to highway safety. The NVCOG follows a data driven planning process to first profile vehicle crashes throughout the region, assess risk, and prioritize location specific actions to maximize limited fiscal resources available for capital improvements. The NVCOG uses regional crash data from the UCONN Crash Repository. The following heat maps visualize and locate high hazard areas on expressway and non-expressway highway and roads.









Congestion impedes vehicles, causes motorist delays, decreases safety, and increases fuel consumption and vehicle emissions. The FHWA defines congestion as *“the level at which transportation system performance is no longer acceptable due to excessive travel times and delays.”* Congestion has many causes, each of which impact how it can be alleviated. Recurring congestion is predictable and is often mitigated by implementing projects to increase the throughput of vehicles. Recurring congestion can also be addressed by changing driver behavior and offering convenient and attractive alternative means of transportation that lessen reliance on a private automobile. Congestion on the region’s highways was measured using three criteria:

- Volume-to-Capacity (v/c) ratio: The v/c ratio is defined as the peak hour traffic volume in the peak direction of flow divided by a road segment’s capacity.
- Travel Time Reliability (TTR): The TTR is defined as the ratio of the longer travel times (80th percentile) to a “normal” travel time (50th percentile).
- Excessive peak hour delay: This measure is an aggregation of the time road users spent on a given segment of roadway above and beyond what would be expected in free flow conditions.

The most common measure of highway congestion is the volume-to-capacity (v/c) ratio. A v/c ratio just over 1.00 implies the traffic volume exceeds the road’s capacity and is indicative of moderate peak hour congestion. The higher the ratio, the worse the congestion. Factors used in determining v/c ratios include: number of lanes, lane width, truck traffic, traffic signal timing, abutting land use, and terrain. Based on this measure, peak hour congestion occurs along most sections of I-84 through Waterbury, Middlebury and Southbury and at several points on Route 8, especially in the lower Valley area and in the vicinity of the interchange with I-84. Travel on most non-expressway roads is fairly good with congestion noted on only limited number of sections. While the congestion depicted on this map is limited and manageable, future conditions suggest a worsening problem. Based on anticipated growth rates, traffic demand will exceed roadway capacity on an increasing number of highways and roads, and the recurring congestion will become more prevalent on non-expressway routes.

In addition to identifying congestion based on a v/c ratio, travel time reliability was considered. This measure attempts to determine road sections where travel is unreliable. The reliability of a road segment has been found to be an important factor as to how drivers assess the congestion on their commute. Regular congestion is seen as less offensive than unpredictability. Many of the same facilities that were identified as congested based on the v/c ratio measure had poor travel time reliability indices.

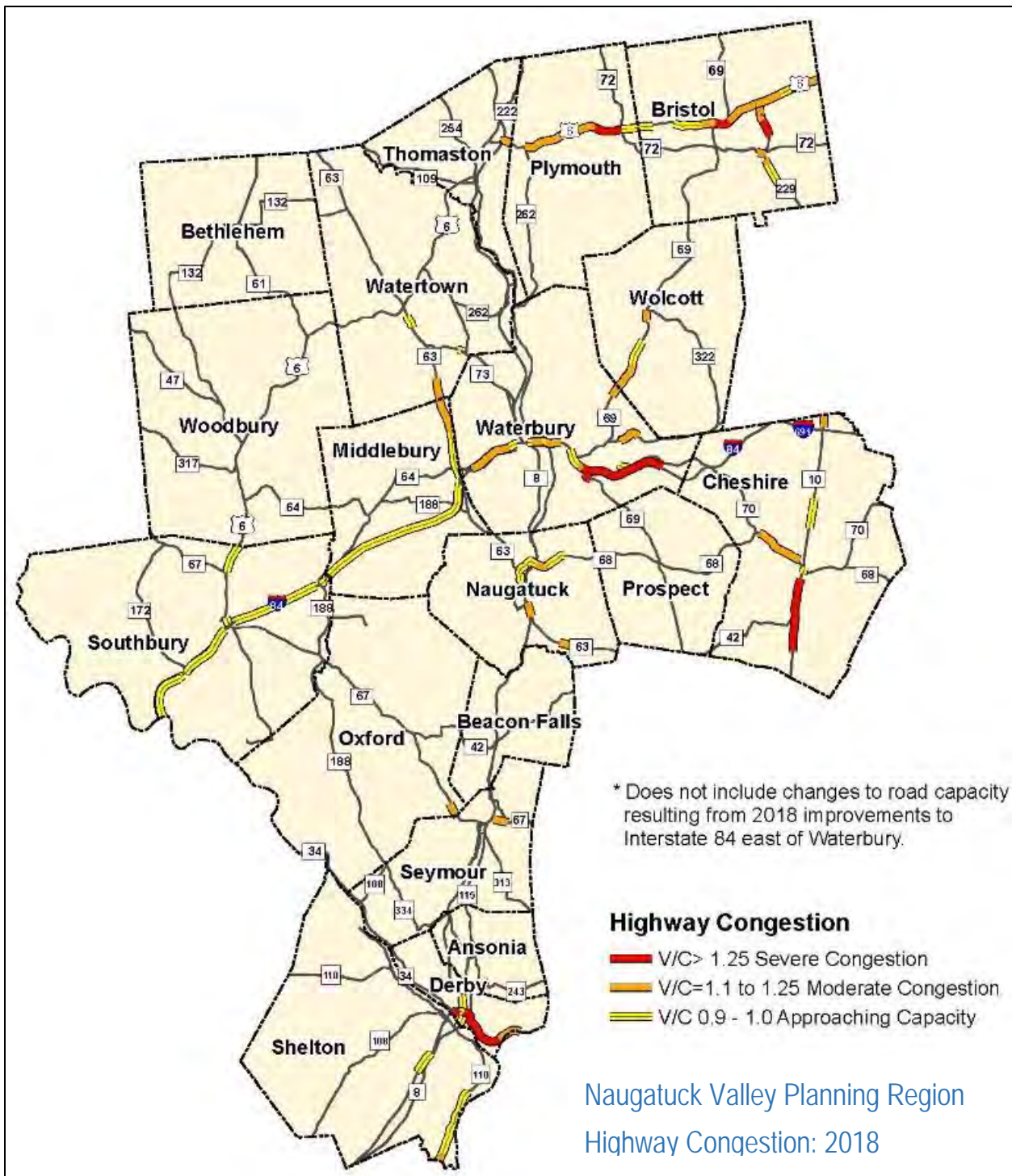
The Peak Hour Excessive Delay measure is an aggregation of the time road users spent on a given segment of roadway above and beyond what would be expected in free flow conditions. This

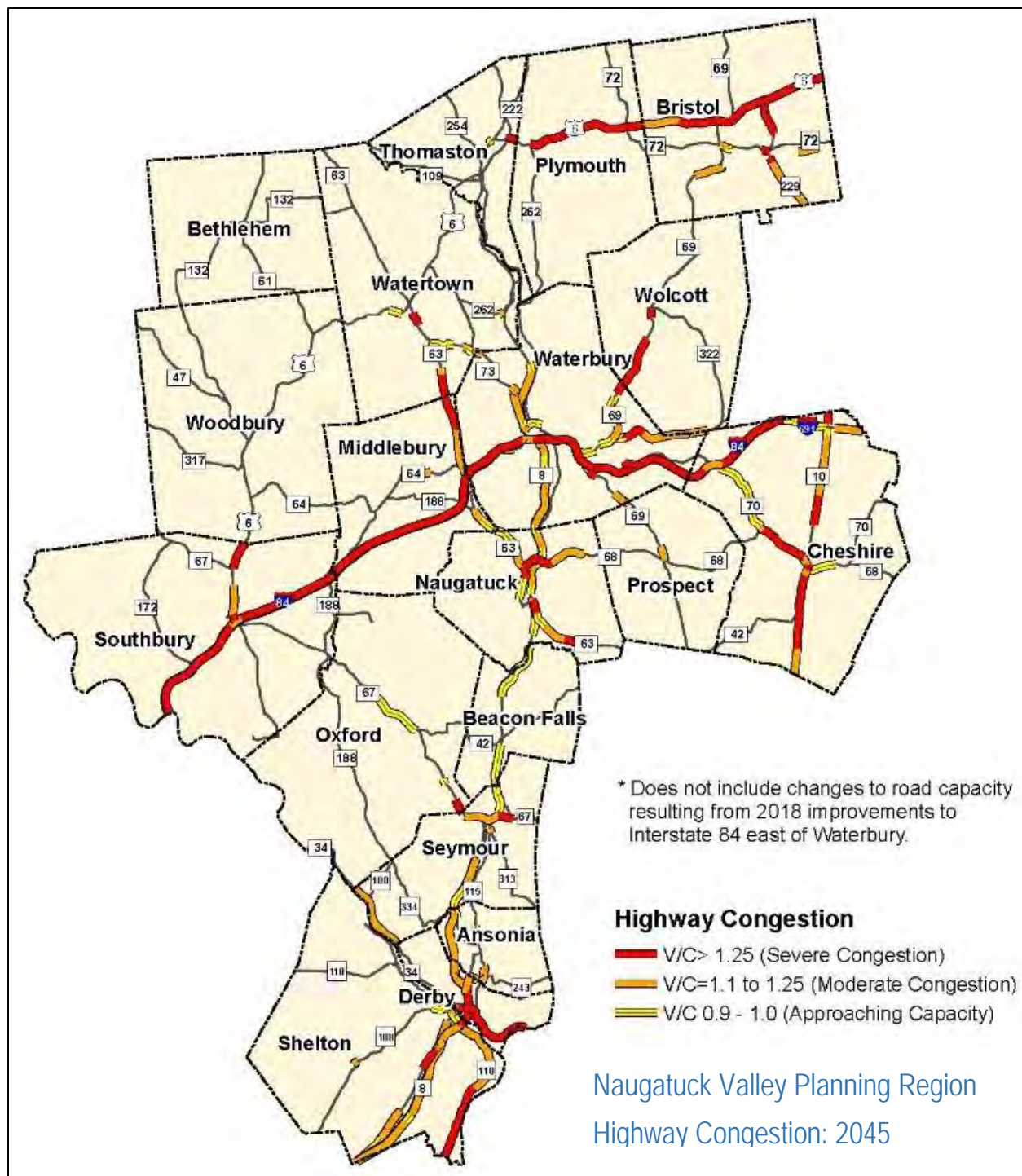
additional time is then aggregated by the total number of roadway users to create a total excessive delay metric. It does not just consider vehicle delay but the total delay experienced by all travelers on that roadway section.

Steady increases in traffic volume will lead to a greater number of highway miles being congested; coincidentally reliability will decrease and delay will increase. When the above discussed indicators are considered in combination, the sections of US Route 6 in Bristol approaching the Farmington town line, I-84 east of Waterbury, and Route 69 from south of the Waterbury border to roughly Beach Road in Wolcott experience recurring congestion and excessive travel delay. However, recent and ongoing projects along US Route 6 and I-84 will ameliorate congestion on these sections of roadway. At the time of MTP writing, no major work was underway to address the issues along Route 69.

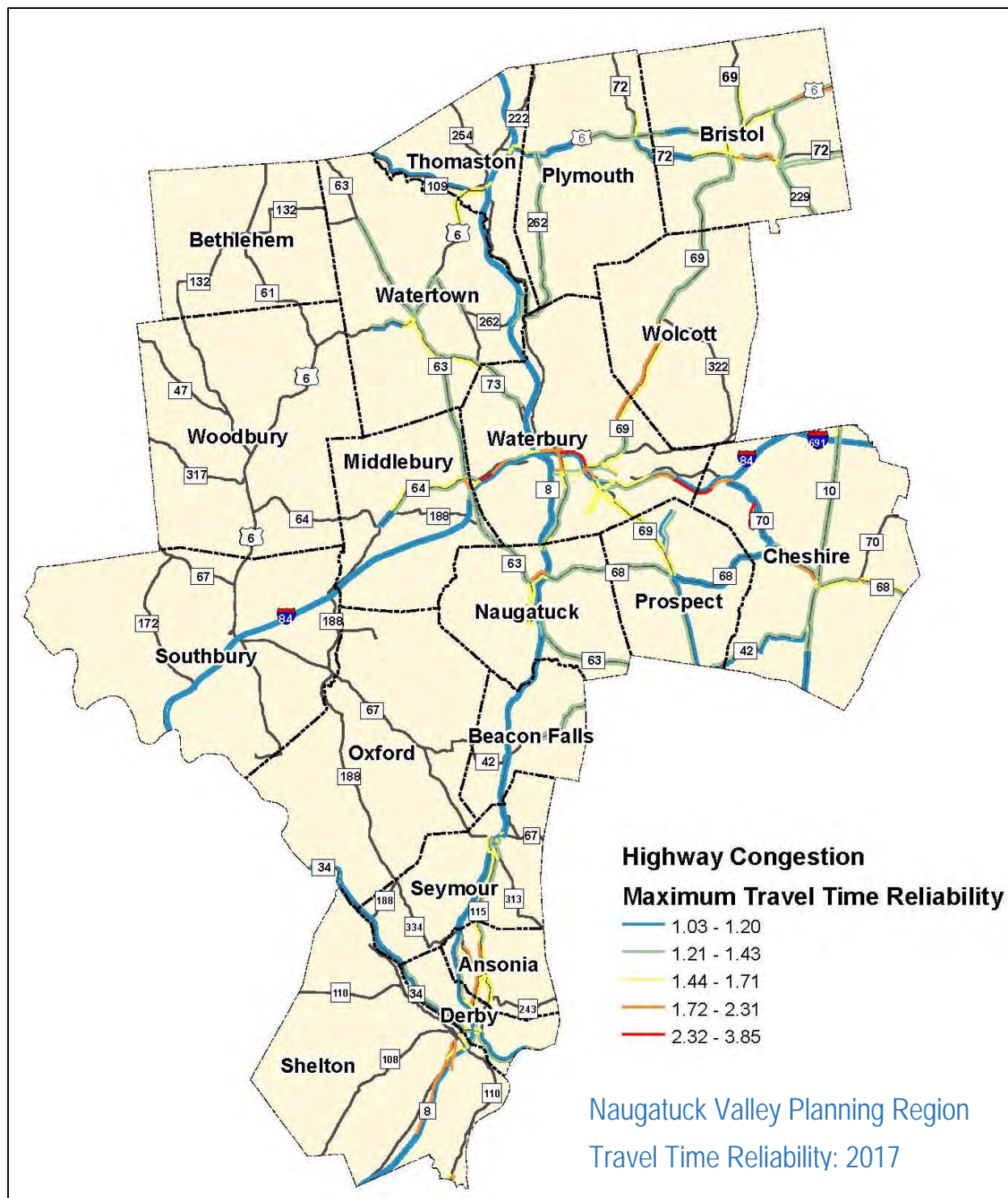
Congestion of the region's highways based on these measures are depicted on the following maps.

To improve system reliability and safety and reduce congestion and delay, a large number of roadway projects have been identified and included in the MTP. These projects also are intended to preserve and maintain the essential highway system. Specific highway projects are listed in the capital improvement program chapter.

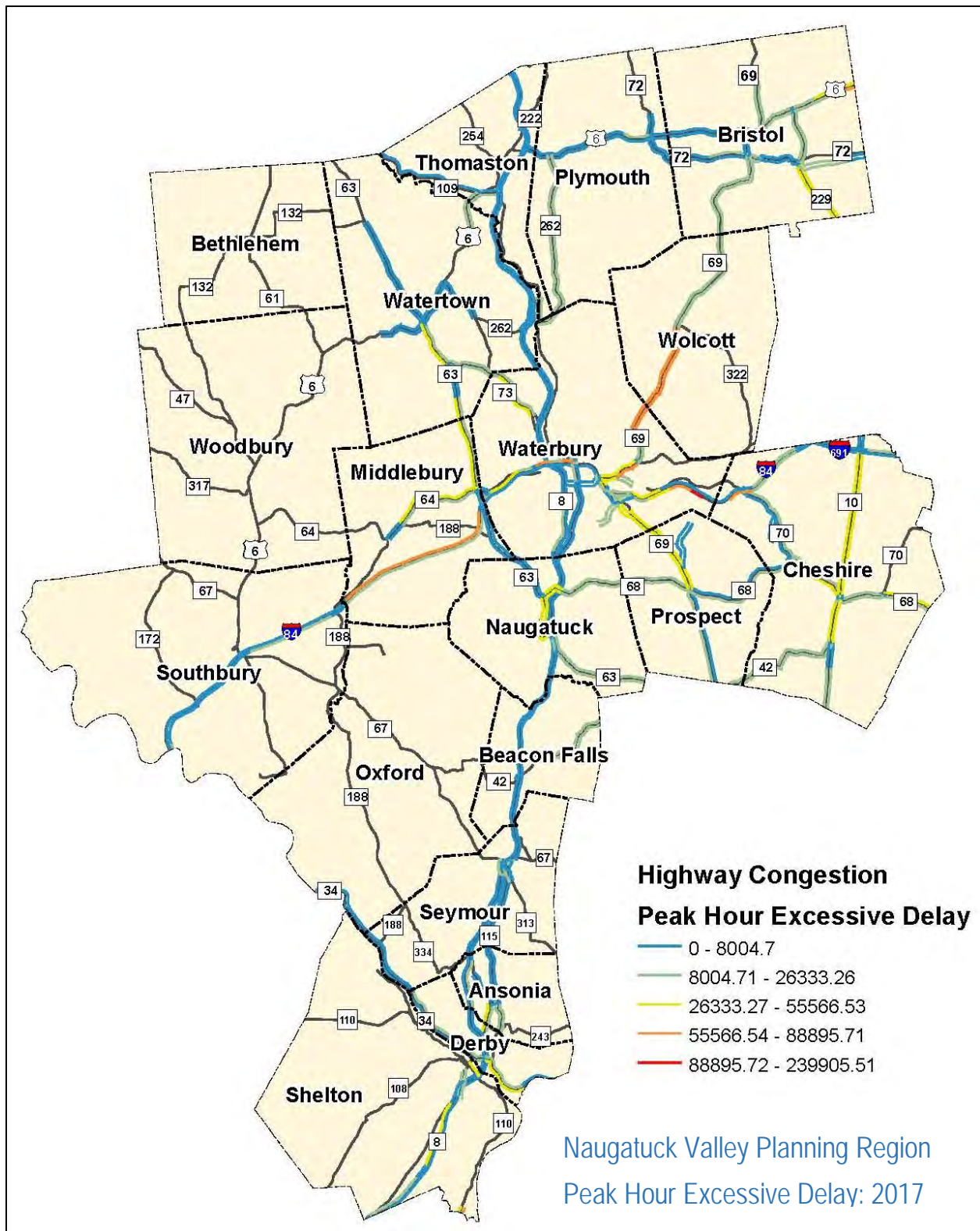












## 5.0 Public Transit Systems

The Naugatuck Valley planning region is well served by a range of public transportation options and choices, including local, fixed-route bus services, commuter rail, specialized paratransit services for the elderly and mobility impaired residents, and express bus services oriented to downtown Hartford that operate primarily during peak hours. In addition, *CTfastrak* routes extend to Bristol, Cheshire and Waterbury from New Britain that provide a connection to Hartford via the dedicated busway.

Local, fixed bus route services are operated by four primary operators:

- Three divisions of *CTtransit* – Waterbury, Bristol-New Britain, and New Haven
- Greater Bridgeport Transit (GBT) Authority

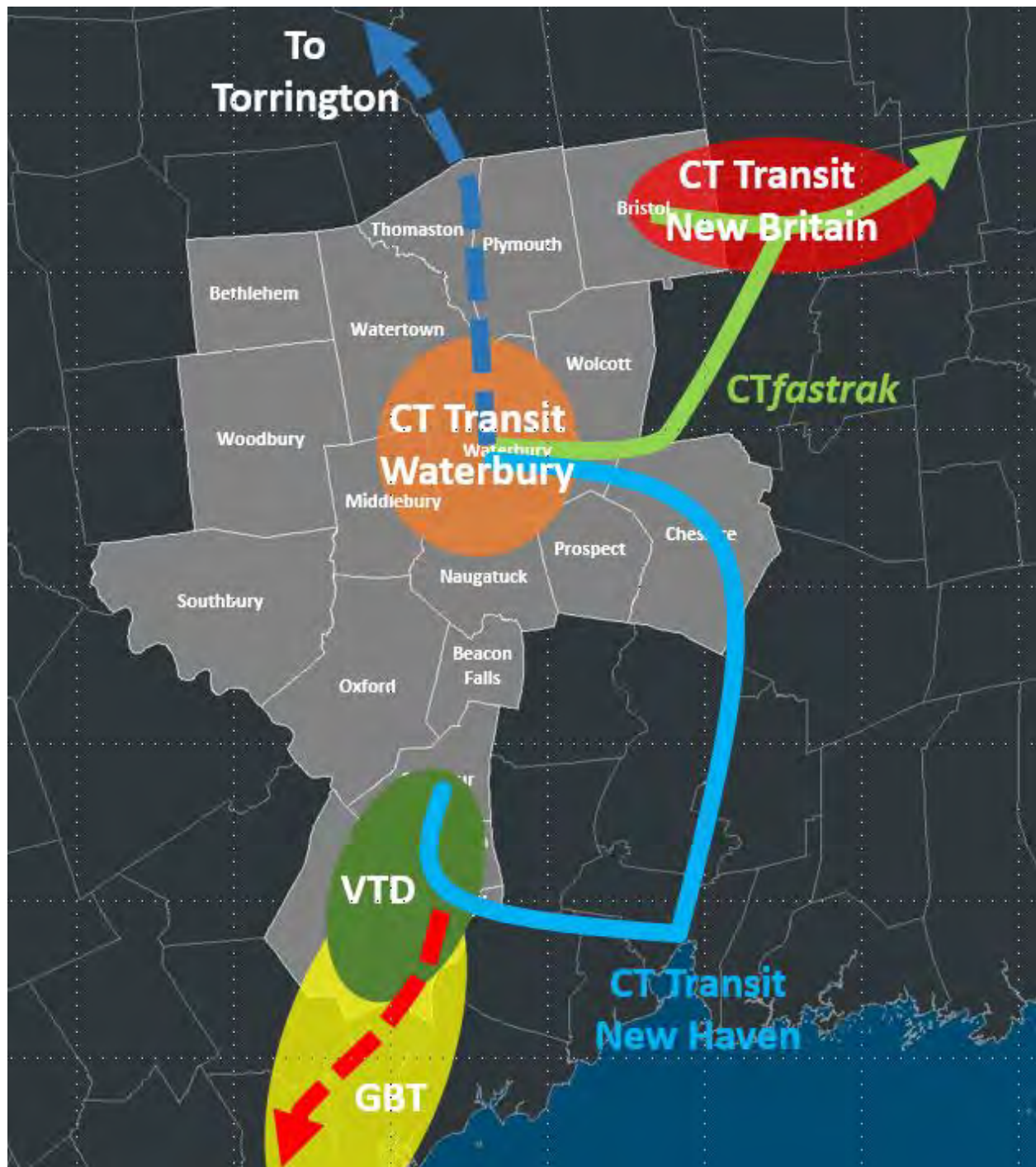
Four express bus routes extend from the region to downtown Hartford; two beginning in downtown Waterbury, one from downtown Bristol and one from Cheshire. These routes take advantage of high speed connections afforded on regional expressways. Before the opening of the *CTfastrak* busway, these express routes would follow the expressways directly into downtown Hartford. Today, they access the busway in New Britain to complete the trip to Hartford. In addition, a limited-stop bus route was initiated in 2017 between Torrington and Waterbury with stops in Thomaston.

Within the Naugatuck Valley planning region, there are four local bus system operators:

- *CTtransit*-Waterbury
- *CTtransit*-New Haven
- *CTtransit*-Bristol/New Britain
- Greater Bridgeport Transit (GBT)

Three of the fixed-route bus systems are centered primarily outside of the region. Only the *CTtransit*-Waterbury system provides coverage wholly within the region. The system is centered on downtown Waterbury with all routes passing through or connecting at the Waterbury Green. The *CTtransit*-Bristol/New Britain system is oriented to downtown New Britain, but three routes are operated primarily within Bristol. The routes operated by *CTtransit*-New Haven serve to connect downtown Waterbury and the lower Valley communities to New Haven, while the GBT routes extend from downtown Bridgeport through Shelton and terminating at the Derby/Shelton train station. Although a substantial portion of the region is covered by local bus service, the operations are fragmented with gaps between the urban core areas. This results in extensive

unserved and under-served areas. There are currently no connections between Waterbury and the lower Valley towns nor between Waterbury and Bristol.



Several transit studies have been completed or are underway to assess current local bus operations and develop a program of projects to address deficiencies and provide a more integrated system. Key recommendations from these studies are included in the MTP:

- *CTtransit*-Waterbury:
  - Restructure the Naugatuck routes to provide all day service.
  - Implement Lakewood Road (Waterbury) service.
  - Rationalize and combine routes and reduce service on underperforming routes and eliminate low ridership deviations.
  - Enhance weekend service.
  - Decrease headways and improve frequency.
  - Connect greater Waterbury bus service with the lower Valley area and consolidate the *CTtransit*-Waterbury and Valley Transit District systems.
- *CTtransit*-Bristol/New Britain:
  - Realign circuitous routes in Bristol and extend local routes directly to Plainville and New Britain.
  - Provide new service to eastern Bristol to serve major employment centers.
- *CTfastrak*:
  - Adjust service for Route 925 or 928 to operate along Route 229 from I-84 to serve large employers in eastern Bristol and continue non-stop to the *CTfastrak* station in New Britain.
- Greater Bridgeport Transit:
  - Enhance Route 22X by continuing the current routing north to the Derby/Shelton rail station and providing a contiguous route between the Bridgeport Transportation Center and the Derby/Shelton Station.
  - Institute and operate a Derby-to-Waterbury express bus service along Route 8 to serve the rail stations along the WBL and provide service between schedule rail times.
  - Implement a Bus Rapid Transit route within and along the Route 8 corridor between the Derby/Shelton rail station and the Bridgeport Transportation Center. The BRT would consist either of a shoulder running or median running facility.

The federal *Americans with Disabilities Act of 1990 (ADA)* requires transit districts that operate regular fixed-route bus services to provide complementary paratransit services to persons that are unable to use the regular bus services. This complementary service is available to all certified ADA eligible residents that have origins and destinations within  $\frac{3}{4}$  of a mile of a local fixed route.

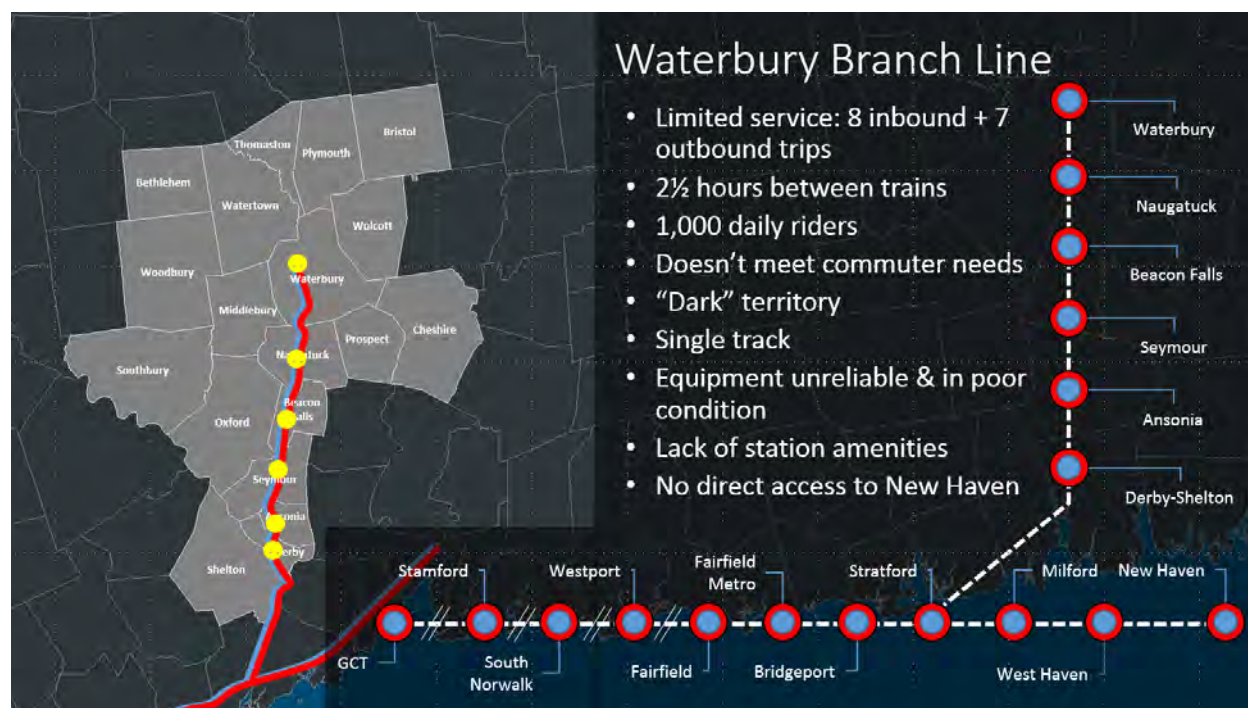
Within the region a number of transit services are available for individuals who, because of their disability, are unable to travel on the fixed route public transit service operated. Paratransit services are offered to Waterbury area residents by *CTtransit*-Waterbury and Bristol residents receive service from the Greater Hartford Transit District (GHTD). The Valley Transit District (VTD)



provides the complementary ADA service to the lower Valley communities. In addition to the required complementary ADA paratransit services, expanded paratransit services are provided within the region. These services are referred to as “non-ADA paratransit dial-a-ride service” to differentiate it from the services required by the ADA.

The MTP recommends continuing paratransit services and filling gaps currently existing in ADA, non-ADA and dial-a-ride services.

Commuter rail services are operated along the Waterbury branch line (WBL) of the New Haven main rail line by the Metro North Railroad under contract to the State of Connecticut, which owns the rail lines. The WBL is the longest of the three branch lines and connects with the main line at the Devon wye. Connecting service to Stamford and New York City is available at the Bridgeport station. While daily service is offered on the WBL, the frequency and quality of service is constrained by the existing infrastructure.



The WBL passenger train schedule consists of 15 weekday trips between Waterbury and Bridgeport. There are eight northbound and seven southbound trains daily, Monday through Friday. With the exception of one morning peak train, service to Stamford requires a transfer at the Bridgeport rail station. Service along the WBL is limited because it is currently unsignalized, referred to as “dark” territory. A project is underway to implement full signalization and Positive Train Control along the line. Currently, about 1,000 riders use the WBL service each day. The majority, over 60%, board at the Waterbury rail station. About 80% of the riders heading



southbound, exit the train at Bridgeport, where over half transfer to another New Haven line train to reach their final destination. The most common final destinations are Stamford and New York City. The equipment operating on the WBL is old, outdated and in poor condition. Passenger interview surveys indicate that the condition of the equipment and lack of service are critical problems.

Recommended projects to enhance commuter rail service along the WBL include:

- Renovate existing rail station buildings at Waterbury and Derby/Shelton and construct new station buildings at Ansonia, Seymour (relocated), Beacon Falls and Naugatuck (relocated).
- Install high level platforms and passenger amenities at all stations.
- Purchase four new locomotives and trains sets (2 coaches + 1 push-pull cab) to replace existing rolling stock and three locomotives and trains sets to expand service to operate at 30-minute headways during peak hours.
- Construct a new rail storage and maintenance yard along the WBL to accommodate new rolling stock.
- Maintain and preserve New Haven main line (NHML) and branch line infrastructure at a State-of-Good-Repair, including annual track and maintenance of way programs, catenary and power system upgrades, and system-wide technology and communications upgrades.

A critical goal of the MTP is to improve operations along the WBL and provide services and schedules that would be attractive and convenient to commuters and provide a reliable alternative to driving. Enhanced service along the WBL is also critical to revitalizing the downtowns located along the branch line and incentivizing transit supportive developments within the station areas.

The planned installation of a full centralized signal system and construction of four by-pass sidings will permit a substantial increase in the number of trains that could operate on the WBL. Despite the future ability to operate more trains, a limiting issue will continue to be the number of available slots on the New Haven main line. While more trains could operate on the WBL after signals are installed, increasing the number of trains with direct service to Bridgeport or Stamford may not be possible. In addition, the existing interlocking at Devon between the NHML and the WBL does not allow service to New Haven.

To increase the frequency of rail service on the WBL and expand potential transfers and connections with NHML trains, construction of a new, permanent transfer station at the Devon junction is recommended. The new station would provide the ability to increase service to

mainline destinations without taking up additional schedule slots on the New Haven Line. Waterbury branch line service would be altered to operate more like a shuttle service. Operations would terminate trains at Devon and the schedule would be retooled to facilitate the transfers. The proposed Devon station would be located within the Devon “wye”. High level platforms would be installed and connected to provide seamless transfers.

## 6.0 Active Transportation Systems

Streets are an integral part of our cities and towns, providing a network for all the dynamic activities that contribute to our quality of life, including the movement of people and goods. The road network in the Naugatuck Valley planning region is extensive, totaling about 2,441 miles. It serves to connect neighborhoods and provides access to businesses, jobs, schools and a wide range of public and private services. The goal of transportation improvement programs has usually been to make the highway and road networks operate more efficiently, with efficiency defined as making the flow of traffic better. Often the needs of pedestrians, bicyclists and others who travel by non-traditional, non-motorized means, also known as active transportation, have been ignored or minimally considered. Road design standards, with the emphasis on moving traffic and vehicular safety, have made the street environment an intimidating place for bicyclists and pedestrians. However, the focus of streets as the sole environment for motorized vehicles has changed over the past 10-to-15 years, as federal transportation acts have provided dedicated funding active transportation projects and new Connecticut policies require transportation projects to consider the needs of bicyclists and pedestrians.

Walking is the most basic form of transportation, and those who walk, including those using wheelchairs, are considered pedestrians in the scope of this plan. Nearly all people are pedestrians during some part of most trips, whether it is walking to and from their car in a parking lot, walking a transit stop, or walking to and from work. In the Naugatuck Valley planning region, only about 1.7% of commuters walk to work (*American Community Survey 5-year estimates 2010-2014*, US Bureau of the Census). This is the lowest walk rate of any region in the state, including the non-urbanized regions. By comparison, about 4.5% of commuters living in the Southeast Connecticut planning region and about 4.3% living in the South Central Connecticut planning region walk to work.

Of more concern is that the NVCOG planning region is the second most dangerous region for walkers in the state, based on a calculated “Pedestrian Danger Index (PDI)” of 85.59 (2016). The urban core areas of Waterbury and Bristol are of particular concern because these two cities accounted for over 70% of the pedestrian-involved crashes. The severity of pedestrian-involved

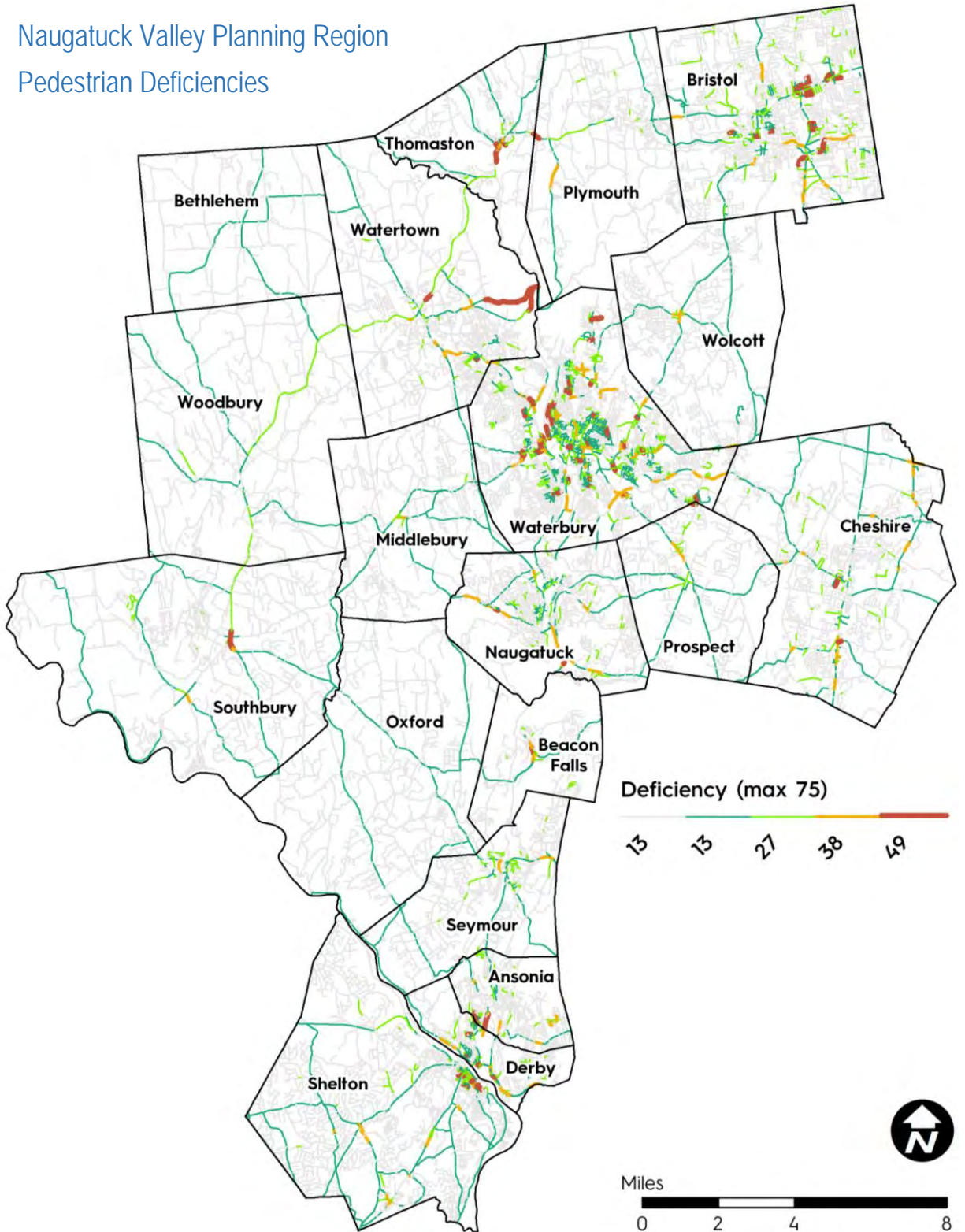
vehicle crashes is a critical concern. Pedestrians hit by a vehicle are exposed to severe injury and death, especially when vehicle speeds are high. This exposure is illustrated by the fact that pedestrians are overrepresented in fatal crashes, not only in Connecticut but nationally.

Typical road design, with an emphasis on moving traffic, has made the street environment an intimidating place for pedestrians. They feel insecure walking along a high speed, multi-lane road and are reluctant to cross arterials even when crosswalks are provided. Well-designed pedestrian facilities can change the street setting and help create a more walkable street environment, where pedestrians feel safe and secure and adjacent traffic is not perceived as intimidating.

To help realize the vision of a transportation system that supports and increases pedestrian safety and well-being, the MTP recommends the following specific actions:

- Pedestrian activated signals to provide protection while crossing. Count-down indicators provide reinforcement that the signal is working and lets walkers know how much time remains to their protection.
- Well marked and visible crosswalks.
- Interconnected and continuous sidewalks.
- Buffers between the street and the sidewalk.
- Curb ramps.
- Signing.
- Audible tones to aid persons with vision impairments.
- Implement road diets on excessively wide roads.
- Implement “complete” streets policies that require improving the street environment to accommodate all travelers, not just motorized vehicles.

Naugatuck Valley Planning Region  
Pedestrian Deficiencies





In Connecticut, bicycles are considered a form and type of vehicle and can be ridden on all roadways where they are legally permitted. It is not necessary to specifically designate roads as bicycle routes or provide bicycle lanes. Rather, all roadways should be maintained and upgraded to ensure bicycle travel can occur safely and conveniently. This allows bicyclists to decide which road they want to ride. Bicycle use and travel can be accommodated and encouraged by implementing the following actions:

- Adopt bicycle facility guidelines.
- Include bicycle elements, such as pavement markings, signs, widened shoulder width, and use of a smooth, compacted asphalt material for road surfaces, in all road projects.
- Designate various roads that are less than 30-feet wide as “Shared Road” bicycle routes and marked with “Sharrows” and share-the-road signs.
- Designate a network of bicycle routes to provide intra- and inter-town connections. Candidate routes are those with a minimum four-foot shoulder.
- Install bicycle racks at strategic locations throughout the region and at the commuter rail stations.
- Develop an information and education campaign to communicate the rules of the road and the importance of following all traffic laws

Multiuse trails, also referred to as shared-use paths, both paved or compacted, are off-road facilities separated from motor vehicle traffic and designed to accommodate non-motorized users, including pedestrians, bicyclists, joggers, in-line skaters and others. They are typically designed, where practical, to be accessible to users of all abilities. While multiuse trails are often viewed as “recreational” facilities, well sited and designed paths can be a viable transportation option, serving as non-motorized “expressways” for those who do not have or would rather not use a motor vehicle. Multiuse trails, in conjunction with a well-connected network of sidewalks and on-road bicycle routes, can provide safe corridors linking residential areas, commercial areas, transit and other destinations.

There are several existing and planned multiuse trails in the Naugatuck Valley planning region. The partially built Naugatuck River Greenway (NRG) Trail is envisioned as the main non-motorized travel spine running north-to-south along the Naugatuck River and Route 8 corridor. There are plans to connect several other trails to the Naugatuck River Greenway Trail, including the Larkin State Bridle Trail, the Middlebury Greenway, the Steele Brook Greenway, the Shelton Riverwalk, and the Sue Grossman Trail to the north of the region. The Farmington Canal Heritage Trail traverses Cheshire north-to-south, and will eventually connect Northampton, Massachusetts to New Haven, Connecticut.



The overall goal of the MTP is to create an active transportation network, with the intent of safely connecting residents to destinations throughout the region via non-motorized means. A critical actions are the completion of the 44-mile NRG Trail and creating connections between the NRG Trail and the other multiuse trails in the region, as well as in neighboring regions, and to sidewalk networks and on-road bicycle facilities. The MTP recommends the following actions:

- Construct the Waterbury Phase I project (scheduled for 2019).
- Construct a section of trail in Thomaston from Old Waterbury Road to the Branch Brook, including installing a new bridge over the brook (scheduled for 2019).
- Construct the Ansonia Riverwalk segments 2a, 2b, 3 and 4 (scheduled for 2020).
- Renovate the Derby-Shelton Bridge to include a dedicated cycle-track (scheduled for 2020).
- Construct a section of the NRG Trail in Naugatuck to connect the Pulaski Walk and the Waterbury Phase I project.
- Construct a section of the NRG Trail in Naugatuck to extend the trail from Maple Street to the Beacon Falls town line.
- Construct the NRG Trail from the Thomaston Dam (Vista Picnic Area; USACE property) to Old Waterbury Road.
- Construct the NRG Trail in Watertown from Frost Bridge Road to the new bridge over the Branch Brook and extend the trail south to Waterbury town line.
- Construct the Waterbury Phase 2 section from Eagle Street to West Main Street and Phase 3 from West Main Street and Thomaston Avenue to the Watertown town line.
- Extend the road diet of Route 42 in Beacon Falls from its current terminus to Toby's Pond
- Construct a section of the NRG Trail to connect from Naugatuck town line to Main Street in Beacon Falls.
- Construct a greenway between Route 42 in Beacon Falls and Route 67 in Seymour as part of the proposed connector road project.
- Conduct a preliminary engineering study to identify the preferred alignment for a multi-use trail to connect the Larkin State Bridal Trail in Oxford to the NRG Trail in Seymour.
- Conduct a preliminary engineering study to determine the feasibility of connecting the Woodbury Trolley Bed Preserve to the Middlebury Greenway and identify the preferred alignment.
- Construct an extension of the Middlebury Greenway from its terminus at Woodside Avenue to the Hop Brook Lake Recreation Area, with a spur connection to Post University.
- Complete sections of the Steele Brook Greenway Trail in Watertown and connect the SBG to the NRG Trail.
- Complete sections of the Shelton River Walk.
- Complete and develop an *"Oxford Main Street Master Plan"* to provide routing and treatment options along with phasing recommendations and construction cost estimates.

- Implement pedestrian and bicyclist access and safety enhancements along the Farmington Canal Heritage Trail in Cheshire.
- Investigate the feasibility of connecting the Farmington Canal Heritage Trail to the NRG Trail.

## 7.0 Freight and Goods Movement

The economic success of the region is inextricable from the economic health of the nation, the Northeast Mega-Region and Connecticut as a whole. Much of the national, state and regional economies depend upon the reliable movement goods over the nation's major freight networks: highway, rail, pipeline, air, and waterborne shipping. The MTP will focus on highway and rail freight networks, which are critical to the economic success of the region. The NVCOG works with the state, municipalities and regional stakeholders to identify and prioritize projects that will most effectively support the reliable movement of freight within the region and beyond.

### Highway Networks

The regional highway system functions as the primary means of distributing people and goods within and throughout the region. Most of the highway traffic is accommodated by 59 miles of expressways. Trucks carry 93.7% of the tonnage and 92.4% of the value of freight moving throughout the state (2014). Interstate 84 is the principal freight corridor within the Naugatuck Valley region. The I-84 corridor is important to local shippers and those across New England and New York. While I-91 and I-84 service statewide north-south freight traffic, Route 8 is the regional north-south freight corridor.

Truck freight volume is forecast to grow substantially over the next 20 years. Not unexpectedly, I-84 and I-691 are predicted to continue to carry significant amounts of this expected freight traffic. Of equal importance regionally, Route 8 is also predicted to experience a similar rate of growth in freight traffic.

Regional freight reliability is a priority for freight dependent enterprises. Costs to move goods increase as shippers have to run additional or partially loaded trucks. When enterprises cannot rely on just-in-time shipping, they must carry the additional inventory needed to maintain productivity. As a result, reliability directly impacts how enterprises within the region manage their supply chain and compete in the market. The truck travel time reliability index shows irregular truck congestion is expected to increase in the coming years. As a result, the reliability of freight movement through the state and region is expected to decrease.



Regional freight reliability is best improved by changing how roads are managed and operated, rather than by expanding the system. The key recommendations are:

- Incident Management – Identifying incidents more quickly, improving response times, and managing incident scenes more effectively.
- Work Zone Management – Reducing the amount of time work zones need to be used and moving traffic more effectively through work zones, particularly at peak times.
- Road Weather Management – Prediction of weather events (such as rain, snow, ice, and fog) in specific areas and on specific roadways, allowing for more effective road surface treatment.
- Planned Special Events Traffic Management – Pre-event planning and coordination and traffic control plans.
- Freeway, Arterial, and Corridor Management – Advanced computerized control of traffic signals, ramp meters, and lane usage.
- Traveler Information – Providing travelers with real-time information on roadway conditions, where congestion has formed, how bad it is, and advice on alternative routes.
- Value Pricing Strategies – Proactively managing demand and available highway capacity by dynamically adjusting the toll paid by users.
- Continue to prioritize the maintenance of the existing network at a state of good repair.
- Limit Heavy duty vehicle speeds.
- Pursue safe roadway designs on freight routes to reduce risk of front-to-front crashes.
- Connecticut should continue to develop and implement pilot programs to test connected and autonomous vehicles.

### Rail Networks

Rail is among the most efficient modes to move goods around the United States; however, it is best suited for commodities that are bulky, heavy and not time sensitive. Over the last two decades, due to improved training, technology, and an updated fleet, efficiency has improved 61 percent. Moving additional freight from the highway to rail offers potential advantages towards better fuel efficiency, associated air quality benefits, and reduced congestion on the federal highway system. The state's primary imports via rail include chemicals, pulp and paper, lumber and wood, sand, and iron and steel. Primary rail exports include waste, scrap, stone, gravel, and sand.

Despite these advantages there are barriers that inhibit the increased use of rail-borne freight statewide:

- The lack of a convenient Hudson River rail crossings makes through shipping of freight west of Connecticut challenging.

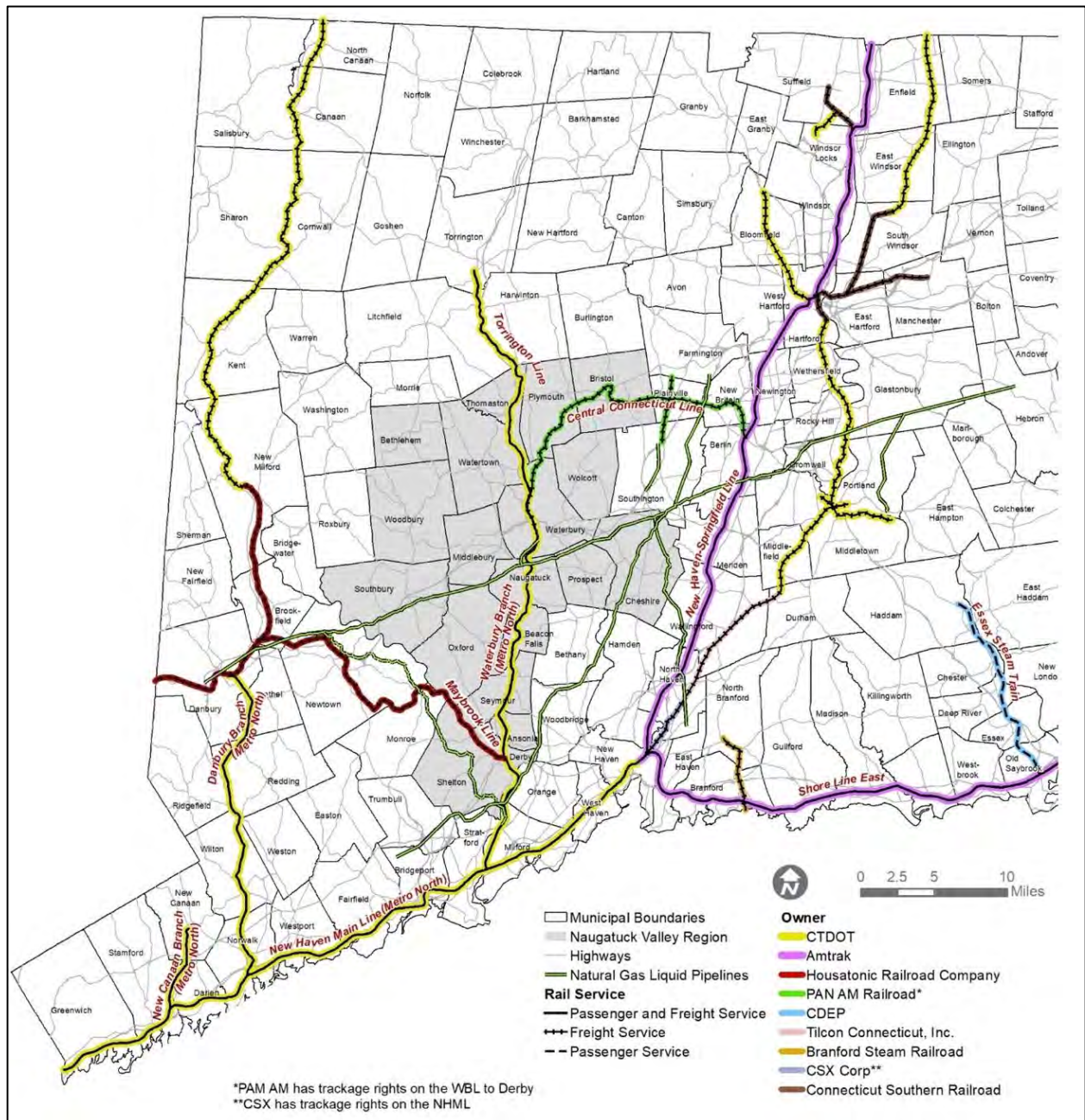
- Overhead clearances below 22 feet, 8 inches limit the size of freight cars that can be used, including double stacked containers.
- Many freight railroads in Connecticut operate at low speeds, between 10 and 25 MPH, due to rail weight and age.
- Car weight restrictions of below 286,000-pound axle loading on many lines do not meet current industry standards. These restrictions limit the weight of commodities carried per car and hurts rail's economic advantage.
- Freight railroads are required to pay track fees for operating over Amtrak's rights-of-way.
- The strong competitive position of the trucking industry due to the short distances involved in movement into and through the state.
- The state increasingly is oriented to business and service activities, which do not generate large volumes of freight.

However, despite these limitations and disadvantages, within the Naugatuck Valley planning region, past investment in the rail network offers a great opportunity for the industry. The existing freight rail network offers opportunities to access most regional municipalities. While, the region has good rail connectivity, each line is maintained to a different standard and has a variety of restrictions.

Three freight rail lines traverse the region:

- The Maybrook Line runs 33.5 miles from Danbury to Derby, where it intersects with the Waterbury Branch Line. It is operated by the Housatonic Rail Road Company (HRRRC). From Danbury, trains can either continue west into New York State or go north to interchange with CSX in Pittsfield, Massachusetts, and connect to the national rail system.
- The Central CT Line (Terryville Secondary, New Britain Secondary, and the Berlin Secondary) extends 23.9 miles from Waterbury to Berlin, where it connects to the Amtrak New Haven, Hartford, and Springfield line. The Pan Am Railroad owns and regularly operates freight on the line. The FRA currently rates the Central CT line as a Class 2 track, with speeds restricted to 25 mph. However, due to track conditions in certain locations, much of the line functions as a Class 1 track with speeds limited to 10 mph. Rail axel loading is limited to 263,000 pounds. Clearance is limited to 17 feet (Plate F).
- The Torrington Branch extends 19.5 miles from the terminus of the Waterbury Branch Line in Waterbury to Torrington. The line is owned by the state and leased to the Naugatuck Railroad. From the Railroad Museum of New England, the railroad operates seasonal tourist trains. Limited freight, up to a 263,000-pound axel loading, operates regularly in the southern portion of the track from Waterbury through Watertown. The track meets FRA track Class 1 standards, limiting freight operating speeds to 10 mph.

The following map shows the freight rail lines in the western part of the state.



## Naugatuck Valley Planning Region: Rail & Pipeline Network

While the existing rail freight infrastructure limits the movement of freight by rail, the MTP recommends expanding the opportunities for rail freight, not only in the region but statewide as well. The key actions to maximize the efficiency and productivity of rail-borne freight include investing in the rehabilitation of the existing rail lines. Specific recommended actions include:

- Increase capacity of Amtrak-owned rail bridge over the Connecticut River (Windsor Locks) to accommodate a 286,000-pound standard car size.
- Improve Central CT Railroad to FRA Track Class 3.
- Improve Maybrook Line to FRA Track Class 2.

### Inland Port

The MTP also supports efforts by the Borough of Naugatuck to develop an intermodal, inland port on the site of the former Chemtura plant. The parcel is about 86.6 acres and located along the Waterbury Branch Line. The Pan Am Railways has trackage rights to the site and owns freight rail lines that connect to northern New England. The inland port would be used to transport consumer goods for warehousing and distribution at the inland port. It would also allow international goods to pass through customs in the borough. The project involves the construction of a rail spur from the WBL to serve new warehousing and distribution centers.

## 8.0 Aviation

The NVCOG region hosts one general aviation (GA) airport, four small aircraft facilities, and six Federal Airport Administration (FAA) registered heliports. The GA Airports and Heliports are managed by the Connecticut Airport Authority (CAA). The region's publicly owned and operated GA service level airport is located in both Oxford and Middlebury and named the Waterbury-Oxford Airport (OXC). The OXC primarily services corporate, business and recreational flight operations, and does not serve commercial airlines.

The MTP will consider only general aviation airports and supports the recommendations in the Connecticut Statewide Airport System Plan (2016), as well as the Waterbury-Oxford Master and Business Plans (2007 and 2012). The main recommended actions are:

- Increase hangar space.
- Implement various safety improvements, including expanded taxiways, new lighting and obstruction removal.
- Maintain the condition of the runway, taxiway and safety areas.

## 9.0 Sustainable Transportation

Sustainable transportation looks beyond infrastructure investments in highway improvements to consider how transportation decisions made today will affect the health and wealth of



communities in the future. When transportation investments take into consideration economic, environmental and social issues, opportunities to improve all travelers' quality-of-life or livability are created. Since 2009, the federal government has used an interdisciplinary approach to foster sustainable communities and improve peoples' livability. The US Department of Transportation (USDOT), the US Department of Housing and Urban Development (HUD) and US Environmental Protection Agency (EPA) formed the Partnership for Sustainable Communities to improve access to affordable housing, provide more transportation options, and lower transportation costs. The partnership established six livability principles, which describe the multidisciplinary nature of sustainable development:

- Provide more transportation choices.
- Promote equitable, affordable housing.
- Enhance economic competitiveness.
- Support existing communities.
- Coordinate and leverage Federal policies and investment.
- Value communities and neighborhoods.

The MTP focuses attention on and supports the consideration and implementation of sustainable transportation elements in all projects and has identified key stand-alone actions.

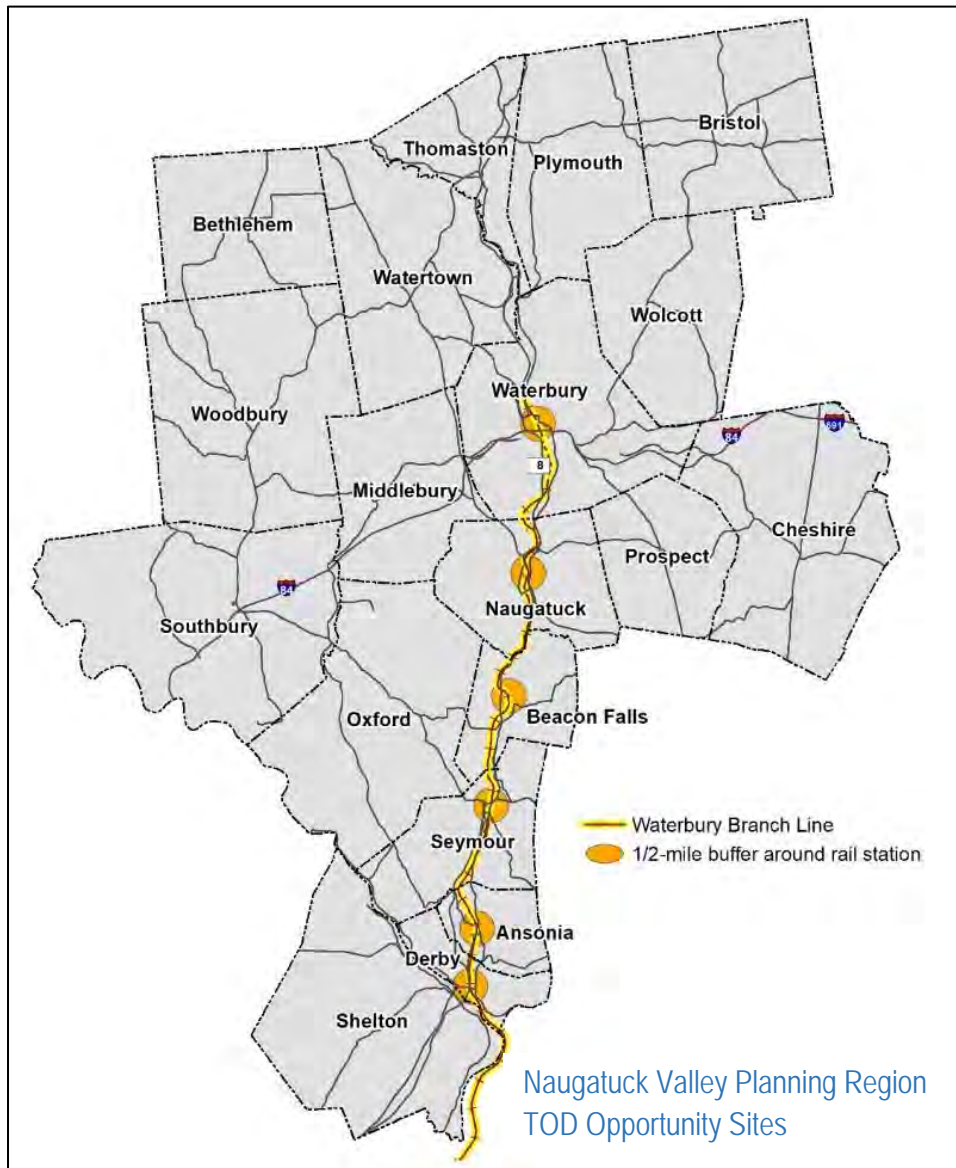
- Implement "Complete Streets" Policies and Actions:

The intent of "Complete Streets" is to effectuate a change in how the street environment is planned, designed and built and, as a consequence, change how it is used. In essence, the street environment is altered from one where vehicles dominate



to one where all users are accommodated. Actions that comprise a "Complete Streets" project include: bicycle facilities, bus features, pedestrian enhancements, green infrastructure, and on-street parking treatments.

- Transit-Oriented Developments: The key principle of Transit-Oriented Development (TOD) is to leverage the availability of transit services to reinforce the existing character of communities and historical downtowns and enhance the opportunities for healthy, walkable and safe neighborhoods to flourish. TODs focus on compact, mixed land uses in proximity to a major transit stop, such as a train station. In the Naugatuck Valley planning region, the MTP targets transit oriented and supportive development in the downtowns that have stations on the Waterbury Branch Line.



- **Promote Public Transit and Other Mobility Strategies:** Public transportation is the best alternative to single-occupancy vehicle commuting. The MTP includes actions to expand and enhance commuter rail service of the Waterbury Branch Line by recommending the purchase of new locomotives and rolling stock to replace the existing outdate equipment and permit 30-minute headways. In addition, various improvements to the existing local bus service are recommended in the MTP, including extending route coverage to encompass the entire region. New express bus service is also recommended, especially along the Waterbury Branch Line corridor and between urban core areas and CTfastrack service.
- **Ensure Access to Tourist Attractions:** The MTP located regional tourist attractions in the region and assessed current transportation access. The key finding was the need to provide adequate wayfinding to sites.

- Promote Electric Vehicles and Infrastructure: According to the EPA, transportation was responsible for 28.5% of U.S. greenhouse gas emissions in 2016, representing the largest share of greenhouse gas emissions in the nation. Electric Vehicles (EVs) are widely seen as a way to curb these impacts by shifting away from the use of fossil fuels in motor vehicles to those that will be less impactful. The MTP supports the deployment of EV and encourages the installation of charging stations, especially along I-84, I-691 and Route 8.

## 10.0 Transportation Security

A major concern for users and would-be-users of public transportation is their security and safety. The security of passengers waiting at a rail station or walking between the station and parking area is an important issue. Broadly, transit has lower overall associated crime risk than the use of passenger vehicles.

Generally, crime statistics indicate that overall, transit users have lower exposure to risk. At transit stations, regardless of neighborhood, the large number of people circulating in the vicinity leads to better security for the individual. To ensure the security of their riders, each transit operator within the region is taking steps to prevent or mitigate risk on their vehicles and stations. CTtransit promotes the *See Something, Say Something* campaign, a program meant to benefit from many daily users being able to recognize something that is suspicious. For security on the buses, the CTtransit has video recording devices onboard all of its full sized buses and para-transit vans in case of an incident. The Valley Transit District is currently in the process of upgrading its fleets of paratransit vehicles. The new vehicles will all be equipped with security cameras. While Metro North Railroad provides monitoring and security features along the New Haven rail line, including security officers at the major stations, there are very few monitoring devices located along the Waterbury Branch Line and at stations and platforms. Video cameras have only been installed along the platforms and parking lot at the Waterbury station to monitor activity.

To enhance the security of transit users waiting at a station or a stop or on-board a vehicle, the following actions are recommended:

- Install Closed-circuit television, video cameras at critical areas, including rail station platforms and waiting areas.
- Install on-board transit vehicle surveillance, including silent alarms and video monitoring to allow transit security personnel to assess the incident, determine appropriate response and acknowledge the incident.

In the scope of the MTP, transportation security extends to minimizing and responding to disruptions of the regional transportation system, and more specifically the quick, safe and efficient response to emergency situations on major expressways. The NVCOG participates in the state-defined *Regional Emergency Planning Teams (REPT)*. The intent of the REPTs is to foster collaborative planning by providing resource information between local communities and state agencies.

Recommended actions to improve transportation security include:

- Prepare and maintain the Traffic Diversion Plan for I-84 and parts of US Route 7 and Route 8. The diversion routes were developed in 2011, but need to be updated to reflect the recently completed widening of I-84.
- Expand and extend traffic incident management infrastructure to Route 8. The system includes traffic cameras, Variable Message Signs (VMS), and a Highway Advisory Radio (HAR) system.

Transportation resilience or resiliency is defined by FHWA as *"the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions."* As part of the MTP, an assessment of the vulnerability of the region's transportation facilities and systems to the impacts of climate change and extreme weather was conducted. The MTP recommends ways to improve transportation system resiliency in the future. Much of the existing infrastructure in the region was built during the post-war era. Stormwater systems and waterway conveyances were in most cases designed using now outdated rainfall data. More recent trends indicate that precipitation is increasing and will be delivered in more frequent intense events. Because of these trends, infrastructure that is not currently in danger from a storm event, may become more vulnerable in the future.

Because of its location about 7.5 miles from Long Island Sound, the Naugatuck Valley region is less vulnerable to a damaging storm surge and coastal flooding. During a Category 1 Hurricane, the storm surge could impact sections of the Waterbury Branch Line and the Route 34 Bridge over the Naugatuck River. However, in both instances, the facilities are elevated above the maximum flood stage. A Category 2 Hurricane would create a larger storm surge and inundate the area south of downtown Derby. While Route 8 passes through the storm surge area, it is elevated above the peak surge height. However, it is likely that the WBL would be flooded. In addition, the Derby-Shelton rail station and the Valley Transit District administrative offices, garage and maintenance facility are located in the area. Under the Category 3 and 4 Hurricane conditions, the impacted areas spread farther inland and have the potential for more extensive



flooding. Either strength storm would cause greater impact to the WBL and various state and local roads.

Inland flooding, caused by hurricanes and tropical storms, summer storms and tornadoes, winter storms and nor'easters, is more widespread and has a greater potential to impact transportation facilities in the region. Natural hazard mitigation plans have been prepared for all municipalities in the region. These plans have assessed the region's vulnerability to a wide range of natural storm events and disasters and have identified locations where periodic flooding may occur. The most common threat is from undersized culverts and low lying roads. The plans recommend increasing the conveyance of bridges and culverts and elevating roads and bridges above flood levels.

## 11.0 Advanced Technologies

Advanced technologies have the potential to make the region's transportation system operate more efficiently and safely and provide more information to travelers. These technologies focus on Intelligent Transportation Systems (ITS) and connected and autonomous vehicle (CAV) technologies.

ITS refers to using advanced technologies to better manage and operate transportation systems. It is defined as: "the application of advanced sensor, computer, electronics, and communication technologies and management strategies—in an integrated manner—to improve the safety and efficiency of the surface transportation system." These advanced systems include computer hardware or software, traffic control devices, communications links, and remote detectors. ITS projects need to be consistent with the National ITS Architecture and must satisfy a set of user services defined by FHWA.

In the Naugatuck Valley planning region, ITS projects conform to the state architecture and focus on three broad areas:

- Freeway Incident Management: Expand the CTDOT 24-hour incident management program to include coverage along Route 8 through the region. The project would include the installation of video cameras along the highway and speed detectors to monitoring operations and identify incidents.
- Enhanced Highway Corridor Operations: Integrate existing and planned traffic control devices to enhance and coordinate arterial traffic control systems.
- Real Time Traveler Information System: Provide real-time traveler information to transit travelers on vehicle location, schedule adherence, and delays. The project would install

interactive information kiosks and dynamic message signs at the region's commuter rail stations.

In recent years, most automobile manufacturers have begun offering a range of driver assistance devices that help drivers avoid collisions. The key feature of these systems is that the driver remains in control. However, the evolution of technology to operate a vehicle and take control from the driver is accelerating. Fully automated cars and trucks that drive themselves is likely to be a reality over the timeframe of this transportation plan. Concurrently, wireless communication innovations are increasing the ability to exchange information between vehicles and to and from road side devices. As inter-vehicle communication advances, drivers will become better informed about their surroundings and the position of nearby vehicles.

Regardless of which path CAV advancement and deployment follows, there are likely to be impacts to the transportation system and how transportation improvement plans are developed. There are numerous benefits to CAV technology, with improving road safety the paramount benefit from CAV technology. Other often cited benefits are:

- Enhanced mobility: CAV will provide new mobility options to persons that are unable to drive, either due to age or disability.
- Economic: Reduction of vehicle crashes will avoid billions of dollars in lost economic activity and productivity, save lives and improve quality-of-life due to fewer injuries.
- Congestion: CAV will result in smoother traffic flows, thereby, reducing impedance and congestion.

While the prospects for widespread acceptance of connected and autonomous vehicle technologies and systems loom large on the horizon of transportation planning, the potential implication these systems could have on motor carrier freight transportation is enormous. The trucking industry is a \$700 billion business and truck borne freight has the potential to be revolutionized by the introduction of connected and autonomous trucks. Demonstrated benefits from connected and automated truck include: safety, fuel savings, air quality and mobility.

A number of Transportation Network Companies (TNC), auto manufacturers, and technology companies are investing in the design and development of CAV systems and technologies, as well as, purchasing vehicle fleets to deploy their Automated Driving Systems (ADS). However, a successful path to safe testing and deployment of ADS requires government oversight, engagement of key stakeholders, and development of uniform, consistent and reciprocal policies, regulations and standards.

In Connecticut, the legislature enacted legislation (Public Act 17-69) that authorized the state to establish and implement a pilot program for testing fully autonomous vehicles (AV). Under the program, the Office of Policy and Management will solicit AV proposals and select up to four municipalities to participate in the program. The pilot program aims to encourage and allow for the testing of fully autonomous vehicles on local highways in Connecticut. The municipalities must outline the location and routes where AVs may operate, hours of operation for vehicle testing, as well as record the make, year, and model of the test vehicles. Partnerships with an automated vehicle manufacturer, university and service provider (Lyft, Uber, etc.) are encouraged for the purposes of providing shuttle services and other programs. The legislation requires a tester to be seated in the driver's seat and be capable of taking immediate control of the AV, and prohibits testing on limited access highways.

## 12.0 Capital Improvement Program

The Metropolitan Transportation Plan for the Naugatuck Valley planning and the Central Naugatuck Valley MPO is intended to address the issues and deficiencies of the area's transportation systems. The critical transportation problems facing the region are:

- Aging Infrastructure
- Roadway Congestion
- Highway and Pedestrian Safety
- Under Investment in Public Transit
- Incomplete and Gaps in Active Transportation Facilities

Federal regulations require the MTP to be "financially constrained" (Title 23 CFR 450.324) and develop a financial plan based on reasonably expected available and projected sources of federal, state, and local revenues and the costs of implementing proposed transportation system improvements. The Capital improvement program (CIP) is this financial plan which will help the region to effectively meet the goals and objectives discussed throughout this MTP over its timeframe. More specifically, the CIP goals involve:

- Maintaining and preserving critical systems in a State-of-Good-Repair
- Promote better and more efficient operation and management of the transportation system
- Enhance transportation systems to meet the traveling needs of all residents and travelers
- Support economic revitalization

- Support sustainable communities initiatives that link land development with investments in transportation infrastructure and support the development of transit-oriented districts

The principal sources of funds are the various federal-aid transportation programs administered by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The federal aid programs are authorized by federal act and typically provide 80% of the project costs, with state and local funds covering the remaining 20% non-federal share. The current federal transportation act, known as the *FAST Act*, was signed into law on December 4, 2015. It is a five-year legislation. While many of the programs and provisions were included in the previous federal act (*MAP-21*), the *FAST Act* reformed and strengthened the transportation programs and refocused federal-aid on national priorities. Key elements of the new act were providing long-term certainty and more flexibility for states and local governments.

Most federal transportation programs apportion funds by formula using program-specific factors. Some transportation funding is provided through discretionary programs, with states required to compete on a project-by-project basis.

In Connecticut, the Special Transportation Fund (STF) finances transportation improvement projects and is accessed to provide the non-federal match of funds under the FAST Act. The primary use of the STF is to pay debt service on Special Tax Obligation Bonds issued for transportation infrastructure purposes. A small portion of the STF is used for “pay-as-you-go” projects, including ongoing maintenance. The major sources of STF dollars are the motor fuels tax and motor vehicle receipts, which combined account for about 80% of the total STF revenues.

The core federal aid transportation programs administered by FHWA and FTA are as follows:

- Better Utilizing Investments to Leverage Development Program – BUILD (USDOT)
- National Highway Performance Program – NHPP (FHWA)
- National Highway Freight Program – NHFP (FHWA)
- Highway Safety Improvement Program – HSIP (FHWA)
- Surface Transportation Block Grant Program – STBG (FHWA)
- Congestion Mitigation and Air Quality Program – CMAQ (FHWA)
- Off-System Bridges – (FHWA)
- National Highway Traffic Safety (NHTS) / Section 154 Penalty Funds (FHWA)
- Urbanized Area Formula Grant Program – Section 5307 (FTA)
- Capital Investment Grants – Section 5309 Discretionary Capital Program (FTA)
- Enhanced Mobility of Seniors and Individuals with Disabilities – Section 5310 (FTA)
- Emergency Relief Program – Section 5324 (FTA)
- State of Good Repair Grant Program – Section 5337 (FTA)



- Bus and Bus Facilities Infrastructure Investment Program – Section 5339 (FTA)

In recent years, several 100% state-funded programs have been established.

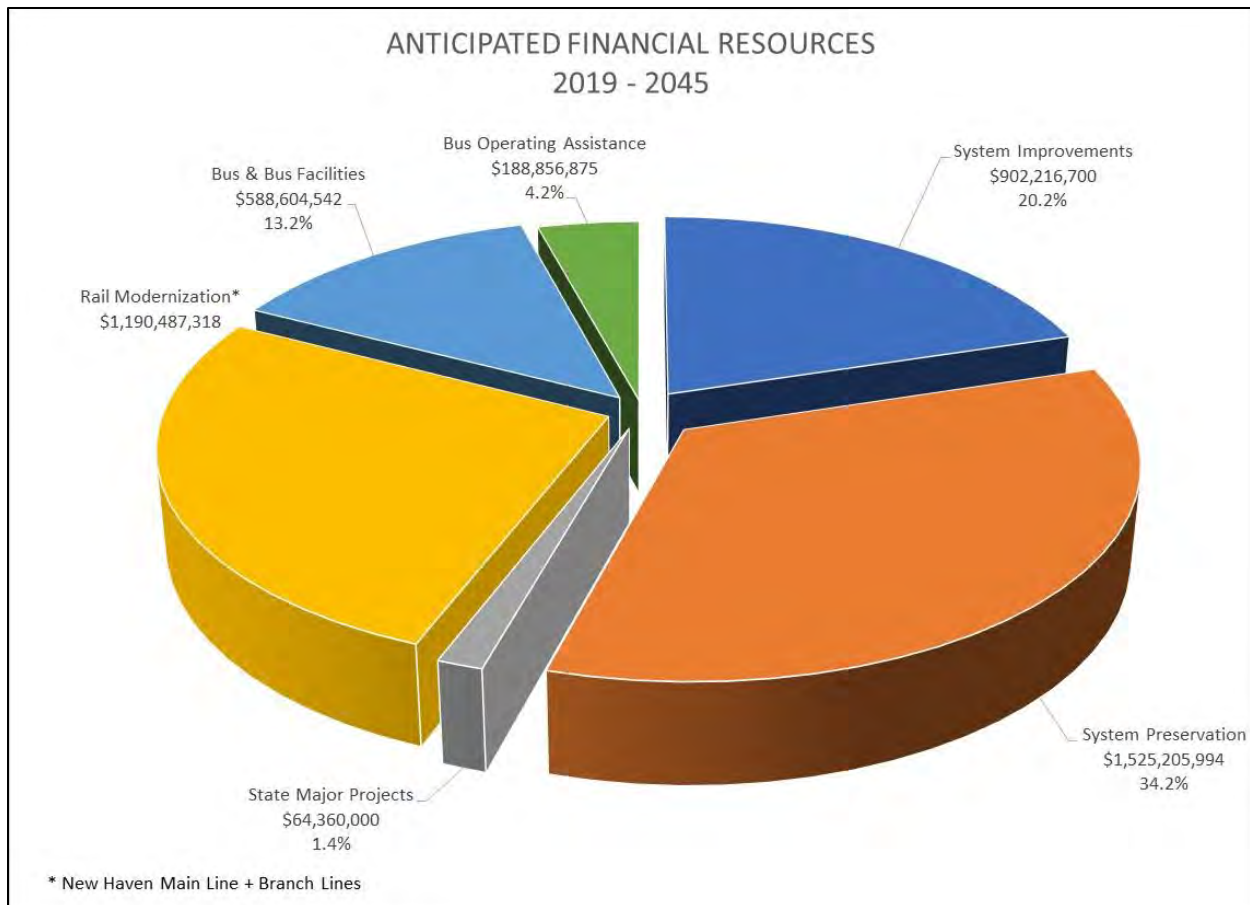
- Local Transportation Capital Improvement Program (LOTICIP)
- Community Connectivity Program
- State Recreational Trails Program

The CTDOT, as part of its financial planning responsibilities, calculated the total estimated funds reasonably anticipated to be available from the FHWA over the timeframe of the MTP. The state and federal aid funds apportioned to Connecticut for highway projects in FFY 2018 was used as a base, and compounded at 3% per year over the life of the MTP. The CTDOT estimates that, over the next 27 years, about \$2.5 billion will be available to implement the highway improvements in the metropolitan planning area under the jurisdiction of the CNVMPO.

For the public transportation funding sources, current FTA apportionments to the Waterbury urbanized area were extrapolated over the life of the MTP inflated by 3% per year. The state has committed to providing funds to cover 100% of the operating subsidies for local bus services. Funds to operate complementary ADA transit services were expected to be continued over the life of the MTP. Rail capital projects proposed and planned for the Naugatuck Valley planning region represent major statewide investments and integrated with the capital program for the state-owned New Haven rail line and its related branch lines. The funding for these projects is assumed to be included in the CTDOT's rail plan.

Based on current appropriations, it is expected that about \$1.2 billion will be available through FTA programs for rail modernization projects on state-owned fixed guideway (New Haven main rail line and the Danbury, New Canaan and Waterbury branch rail lines). Funds projected to be available for regional bus and bus facilities projects are estimated at about \$588.6 million. About \$188.9 million will be allocated to the CT*transit* Waterbury and Bristol divisions to support bus operations. While the total allocation for bus operating assistance is expected to meet existing needs and demand, it does not factor in or allow for any new services or route enhancements and expansions.

The breakdown by funding source is shown in the following chart.

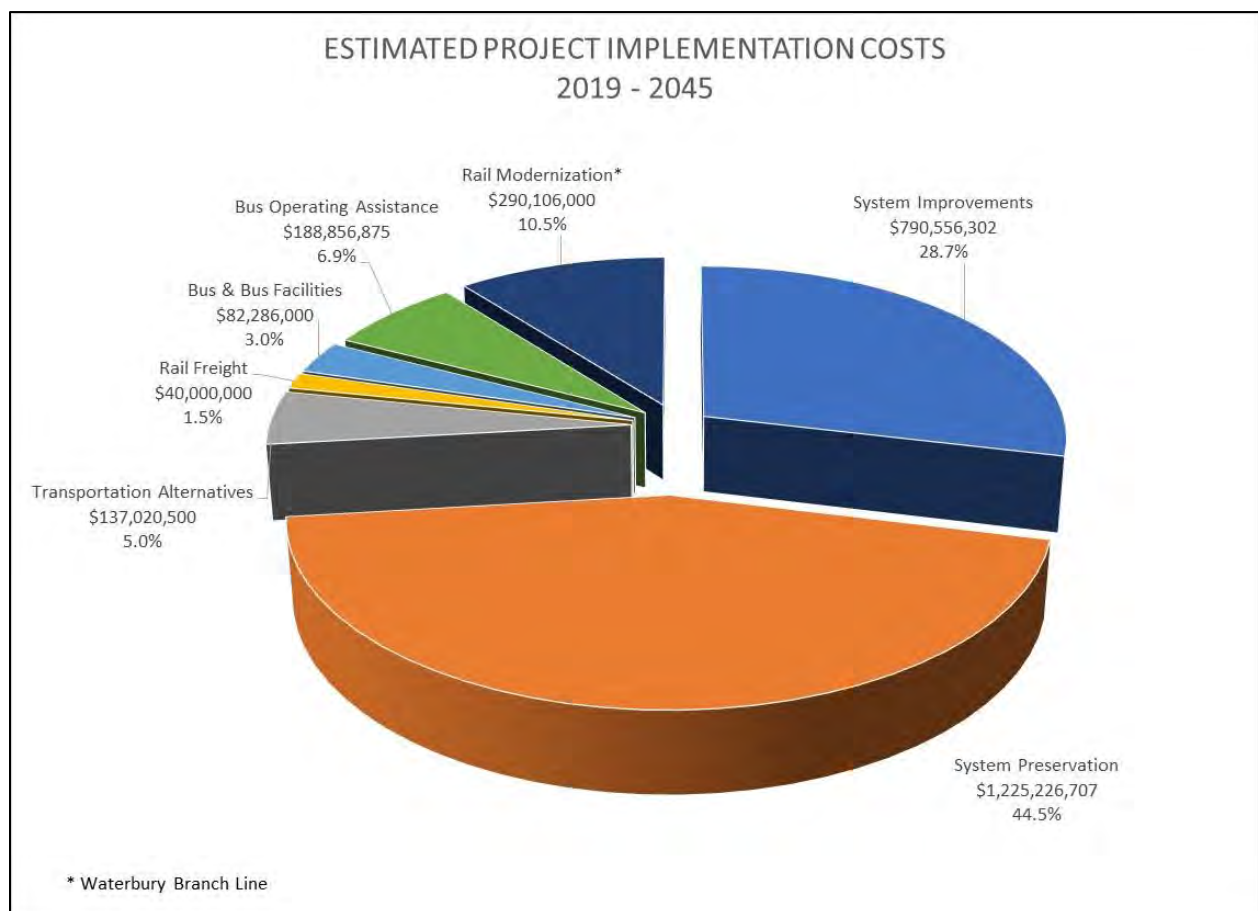


The funding needed to implement the transportation improvements recommended in the MTP is substantial. Over the timeframe of the MTP, an investment of over \$2.8 billion is recommended. This cost includes a substantial investment in modernizing the infrastructure of the Waterbury branch rail line, preserving and maintaining I-84 and Route 8 in states-of-good-repair, providing dedicated bicycle and pedestrian facilities to ensure safe travel, including completing the Naugatuck River Greenway Trail, and supporting and enhancing public transit operation. The MTP has also identified opportunities to provide new, alternate modes of transportation, such as Bus Rapid Transit, and create transit-supportive land development in the vicinity of WBL rail station.

Over 70% of the total funding needs are attributable to highway preservation and enhancement projects and less than 25% of the funds are allocated to public transit improvements. The Highway System Preservation category includes active transportation projects and improvements to support and expand transportation of freight by rail.

There are a total of 126 specifically defined regional projects, listed by municipality and their expected implementation timeframe. For illustrative purposes, generic projects have been included as place holders to account for system improvements and enhancements that have not been identified. These types of projects are generally programmed in the later years of the MTP and include the following types of projects:

- Regional bridge program
- Regional pavement program
- Regional road reconstruction program
- Regional bicycle program
- Regional pedestrian safety program
- Regional community connectivity program



## 13.0 Public Outreach

The MTP is the product of collaboration between NVCOG, its members, and the public, and has been informed by consultation with stakeholders throughout the region. To develop the MTP, the NVCOG gathered input from the diverse groups that make up the region using a variety of methods and means.

- Mobility Project Reporter: This is an online application developed on a GIS platform that allows the public to submit problems or observations related to local mobility and transportation for consideration in future planning projects. Users can submit new suggestions or review and vote on existing suggestions submitted by other users.
- Online Survey: A survey was developed and posted online to solicit information and comments from the public regarding their opinions on the transportation systems of the Naugatuck Valley planning region. A Spanish-language version of the survey was developed and posted on the NVCOG website.
- MTP Update Webpage: A separate webpage was created on the NVCOG website to inform visitors to the site that the long range transportation plan for the region was being updated. The webpage provides links to the transportation survey and the Mobility Project Reporter.
- Social Media: The NVCOG posts notices on the progress of updating the MTP on its Facebook page.
- NVCOG Board, CNVMPO, Transportation Technical Advisory Committee (TTAC) and Regional Planning Commission (RPC) Meetings: Progress on updating the MTP was presented at monthly meetings of the NVCOG Board and the CNVMPO, as well as at the bi-monthly meetings of the RPC and TTAC. The chief elected officials of the NVCOG member municipalities comprise the Board and CNVMPO. The RPC is made up of planners and/or planning officials of NVCOG member cities and towns and the TTAC members are the local municipal engineers and/or public works officials. All meetings are open to the public. Members of these boards and committees collaborated with NVCOG staff to finalize the proposed program of projects.

In addition to the above listed methods, the NVCOG will conduct a minimum 30-day public review and comment period. During that period, the NVCOG website will include access to the draft MTP and a summary of the draft MTP, an online story map describing the MTP, and updates about the MTP planning process. A public information meeting will be held on March 27, 2019 during the comment period to present the transportation vision for the region, review recommended actions to realize the vision, and solicit comments. The CNV MPO will consider adoption of the



MTP at its April 12, 2019 meeting. The public will be afforded an opportunity to address the MPO before a vote on the MTP is taken.