Regional Transportation Plan for the Greater Bridgeport Planning Region: 2015-2040

Prepared by the Greater Bridgeport Regional Council
2015

Staff:

Mr. Brian Bidolli, Executive Director
Mr. Patrick Carleton, Regional Planner
Ms. Linda Colello, Executive Assistant to the Director
Mr. Mathew Fulda, Regional Planner
Mr. Mark Hoover, GIS Specialist
Mr. Mark Goetz, Senior Transportation Planner/GIS Director
Ms. Colleen Kelleher, Administrative Assistant
Mr. George Obeng, GIS Technician
Ms. Meghan Sloan, Senior Transportation Planner

Source of copies

Greater Bridgeport Regional Council
525 Water Street, Suite 1, Bridgeport Transportation Center, Bridgeport, Connecticut 06604
Phone: (203) 366-5405 Fax: (203) 366-8437
E-mail: info@gbrct.org Website: www.gbrct.org

Date

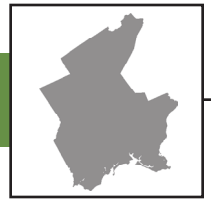
Acknowledgements

The LRP was prepared by the GBRC in cooperation with member municipalities and the Greater Bridgeport Transit Authority. It was completed under the GBRC's FY 2014-2015 Unified Planning Work Program and funded through the UPWP by the US Department of Transportation, Connecticut Department of Transportation and member municipalities. The findings and conclusions expressed in the report are those of the GBRC and do not reflect the official views of ConnDOT or the USDOT.

For more information

For more information about the GBRC's transportation planning process and the update of the long range transportation plan, please visit the GBRC's website at: www.GBRCt.org

Abstract



The Greater Bridgeport Regional Council (GBRC) is a multi-discipline, regional planning organization with six member communities centered on the city of Bridgeport. The GBRC is the federally designated transportation planning agency for the Greater Bridgeport Planning Region and conducts the transportation planning process in accordance with federal regulations, including planning guidelines provided in Map-21. It also serves as the transportation planning agency for the Greater Bridgeport and Valley Metropolitan Planning Organization (MPO). The Map-21 requires the preparation of a long range transportation plan (LRP) for the region. The LRP, among many requirements:

• Must have at least a 20-year planning horizon.

• Must be multi-modal, in that all modes must be considered – highway, public transit, non-motorized.

• Provide opportunities for the public to participate in the planning process.

• Follow a continuing, cooperative and comprehensive framework for making transportation investment decisions.

• Be financially constrained, that is, there must be a reasonable expectation that funds will be available to implement the proposed projects.

Federal regulations also require the LRP to be updated at least every four years. The LRP was last updated and endorsed by the MPO in 2011 and, in order to fully comply with Map-21 planning guidelines, a new LRP for the region needs to be approved and in place by July 1, 2011. The new LRP extends the horizon year to 2040 and covers a timeframe from 2015 through 2040.

The long range plan reflects the future transportation needs of the Greater Bridgeport Planning Region and includes recommended actions, programs and projects to improve, enhance and better manage and operate the public transit and highway systems, promote alternative modes, accommodate bicyclists and pedestrians, consider other non-motorized modes of transportation, provide freight mobility and mitigate environmental impacts. It also adheres to the six livability principles established by the US DOT, HUD and EPA. The proposed actions are intended to accommodate existing travel, make the current transportation system more efficient, meet growing travel requirements and improve mobility within the area.

As a joint MPO, the GBVMPO also includes the towns of Ansonia, Derby, Seymour and Shelton, which partially make up the Naugatuck Valley Council of Governments (formerly Valley Council of Governments). The LRTP for the Valley Region is included as Appendix 1. Significant projects and programs throughout the GBVMPO region include GBT's fixed-route bus service, a feasibility study for BRT along the Route corridor and the need for improvements to MNR's Waterbury branch line.

The LRP is divided into 13 sections, each focusing on a specific aspect of the long range transportation plan, including the planning process, current and forecast planning data, various transportation systems and modes, operations and management considerations, security of critical transportation infrastructure, freight and goods mobility, non-motorized transportation, growth management, sustainability and environmental mitigation, and financial assessment. The recommended plan actions focus on the preservation and maintenance of the essential systems and services in the region and better operations and management of systems. There is also an emphasis on expanding the use of alternative transportation modes, as well as, on various non-traditional programs. A critical focus of the new plan is to realize a link between transportation and land use planning.

Endorsements

GREATER BRIDGEPORT AND VALLEY METROPOLITAN PLANNING ORGANIZATION

Ansonia●Bridgeport●Derby●Easton●Fairfield●Monroe●Seymour●Shelton●Stratford●Trumbull

RESOLUTION 2015-11

ENDORSEMENT
LONG RANGE REGIONAL TRANSPORTATION PLANS: 2015 ~ 2040
FOR THE GREATER BRIDGEPORT PLANNING REGION AND
THE VALLEY PLANNING REGION

WHEREAS, the Greater Bridgeport Regional Council and the Valley Council of Governments are designated by the US Department of Transportation as the transportation planning agencies for, respectively, the Greater Bridgeport Planning Region and the Valley Planning Region, and conduct the transportation planning process in accordance with Section 34 of Title 23 of the United States Code, as amended by the ***Moving Ahead for Progress in the 21st Century (MAP-21)*** and related US Department of Transportation planning regulations;

WHEREAS, the ***Greater Bridgeport Regional Transportation Plan: 2015 - 2040*** was prepared by the GBRC in 2015 and endorsed by the Greater Bridgeport and Valley Metropolitan Planning Organization at its April 14, 2015, meeting,

WHEREAS, the ***Regional Transportation Plan for the Valley Planning Region: 2015 - 2040*** was prepared by the VCOG in 2015 and endorsed by the Greater Bridgeport and Valley Metropolitan Planning Organization at its April 14, 2015, meeting;

WHEREAS, the ***MAP-21*** requires MPOs to prepare and develop long range transportation plans every four years that reflect at least a 20-year planning horizon, are financially constrained, comply with federal planning guidelines, consider eight planning factors, consider six livability principles and conform to the ***Clean Air Act Amendments of 1990*** and Connecticut's ***State Implementation Plan for Air Quality***, as revised;

WHEREAS, the GBRC completed a minor update of its existing long range transportation plan and the new ***Plan*** was prepared through the transportation planning process and in conformity with ***MAP-21*** planning guidelines;

WHEREAS, the VCOG completed a minor update of its existing long range transportation plan and the new ***Plan*** was prepared through the transportation planning process and in conformity with ***MAP-21*** planning guidelines;

WHEREAS, the GBRC and VCOG conducted a proactive public involvement process that followed the procedures set forth in the GBVMPOs ***Public Participation Program*** handbook, as revised, including making the draft plans available to the public electronically (on the web), notifying the public of the new plans and soliciting review and comment, providing at least a 30-day review period, holding public information meetings (April 7, 2015 at the office of the GBRC and April 9, 2015 at the office of the VCOG), recording comments from the public and considering and responding to comments;

WHEREAS, the proposed program of projects recommended in the GBRC's and VCOG's long range transportation plans were assessed for their impacts on air quality and the State's ability to attain ***8-Hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards***;

WHEREAS, the regional emissions assessments demonstrate that the proposed projects will not have an adverse impact on air quality.

NOW, THEREFORE BE IT RESOLVED that the Greater Bridgeport and Valley Metropolitan Planning Organization, after reviewing the final draft ***Regional Transportation Plan for the Greater Bridgeport Planning Region: 2015 ~ 2040*** and the final draft ***Valley Council of Government's Long Range Regional Transportation Update 2015 ~ 2040***, find that the ***Plans*** and all Amendments conform to air quality requirements of the U.S. Environmental Protection Agency (40 CFR 21 and 93), related U.S. Department of Transportation guidelines (23 CFR 450) and with Title 42, Section 7506 (3) (A) and hereby endorses these plans as the MPO's official long range transportation plans for the Greater Bridgeport Planning Region and Valley Planning Region, respectively contingent upon no major adverse comments being received during the 30-day public comment period.

This resolution shall become effective as of April 14, 2015.

We, the undersigned co-secretaries of Greater Bridgeport and Valley Metropolitan Planning Organization (GBVMPO), Connecticut, do hereby certify that the resolution adopted by the GBVMPO at a public meeting held on April 14, 2015, at which a quorum was present and that the same is a correct and true transcript from the original thereof.

Respectfully submitted,

Brian Bidolli, Executive Director
GBRC – MPO Co-Secretary

Richard T. Dunne, Executive Director
VCOG – MPO Co-Secretary

Responsible Metropolitan Transportation Planning Agencies

GREATER BRIDGEPORT REGIONAL COUNCIL
525 Water Street, Transportation Center, Suite 1
Bridgeport, Connecticut 06604-4902
Phone: (203) 366-5405 Fax: 366-8437
E-mail: bbidolli@gbrct.org

VALLEY COUNCIL OF GOVERNMENTS
12 Main Street, Derby Train Station
Derby, Connecticut 06418
Phone: (203) 735-8688 Fax: 735-8680
E-mail: rdunne@valleycog.org

GREATER BRIDGEPORT AND VALLEY METROPOLITAN PLANNING ORGANIZATION

Ansonia●Bridgeport●Derby●Easton●Fairfield●Monroe●Seymour●Shelton●Stratford●Trumbull

RESOLUTION 2015-09

ENDORSEMENT
RESOLUTION ON CONFORMITY WITH THE CLEAN AIR ACT
OZONE

WHEREAS, the **Greater Bridgeport and Valley MPO** 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 Regions 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 **Greater Bridgeport and Valley MPO** that the plans and programs approved on **April 14, 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 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 jointly meet mobile source emission's guidelines advanced by EPA pursuant to Section 7506 (3) (A).

NOW, THEREFORE BE IT RESOLVED by the **Greater Bridgeport and Valley MPO**, That the **Greater Bridgeport and Valley MPO** finds that the 2015 **Long Range Transportation Plans for the Greater Bridgeport and Valley regions** 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 being received during said period.

CERTIFICATE
The undersigned duly qualified and acting Secretary of **Greater Bridgeport and Valley MPO** certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the **Greater Bridgeport and Valley MPO** on **April 14, 2015.**

Brian Bidolli, Executive Director
GBRC – MPO Co-Secretary

Richard T. Dunne, Executive Director
VCOG – MPO Co-Secretary

Date: 4/14/2015

Responsible Metropolitan Transportation Planning Agencies

GREATER BRIDGEPORT REGIONAL COUNCIL
525 Water Street, Transportation Center, Suite 1
Bridgeport, Connecticut 06604-4902
Phone: (203) 366-5405 Fax: 366-8437

VALLEY COUNCIL OF GOVERNMENTS
12 Main Street, Derby Train Station
Derby, Connecticut 06418
Phone: (203) 735-8688 Fax: 735-8680

Endorsements

GREATER BRIDGEPORT AND VALLEY METROPOLITAN PLANNING ORGANIZATION

Ansonia●Bridgeport●Derby●Easton●Fairfield●Monroe●Seymour●Shelton●Stratford●Trumbull

RESOLUTION 2015-10

ENDORSEMENT
RESOLUTION ON CONFORMITY WITH THE CLEAN AIR ACT
PM 2.5

WHEREAS, the **Greater Bridgeport and Valley MPO** 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 **Greater Bridgeport and Valley MPO** that the plans and programs approved on **April 14, 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 Connecticut portion of the New York – Northern New Jersey – Long Island, NY-NJ-CT area is designated a PM 2.5 attainment/maintenance area; and

WHEREAS, The State of Connecticut has elected to jointly assess conformity in all PM 2.5 attainment/maintenance areas in Connecticut (Fairfield County and New Haven County) and

WHEREAS, The results of the required emissions analysis performed by the Connecticut Department of Transportation on the 2015 **Long Range Transportation Plans for the Greater Bridgeport and Valley regions** and the FFY 2015-2018 **Transportation Improvement Program** and Amendments show that the implementation of the projects contained therein will result in emissions of PM2.5 in each analysis year that are less than the emissions of the baseline year; and

NOW, THEREFORE BE IT RESOLVED, that the **Greater Bridgeport and Valley MPO** finds that the 2015 **Long Range Transportation Plans for the Greater Bridgeport and Valley regions** 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 PM2.5 Conformity Determination contingent upon no major adverse comments being received during said period.

CERTIFICATE
The undersigned duly qualified and acting Secretary of **Greater Bridgeport and Valley MPO** certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the **Greater Bridgeport and Valley MPO** on **April 14, 2015.**

Brian Bidolli, Executive Director
GBRC – MPO Co-Secretary

Richard T. Dunne, Executive Director
VCOG – MPO Co-Secretary

Date: 4/14/2015

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525 Water Street, Transportation Center, Suite 1
Bridgeport, Connecticut 06604-4902
Phone: (203) 366-5405 Fax: 366-8437

VALLEY COUNCIL OF GOVERNMENTS
12 Main Street, Derby Train Station
Derby, Connecticut 06418
Phone: (203) 735-8688 Fax: 735-8680

GREATER BRIDGEPORT AND VALLEY METROPOLITAN PLANNING ORGANIZATION

Ansonia●Bridgeport●Derby●Easton●Fairfield●Monroe●Seymour●Shelton●Stratford●Trumbull

RESOLUTION 2015-12

URBAN TRANSPORTATION PLANNING CERTIFICATION
GREATER BRIDGEPORT AND VALLEY MPO

WHEREAS, the Greater Bridgeport and Valley Metropolitan Planning Organization (MPO) is authorized by the ***Moving Ahead for Progress in the 21st Century (MAP-21)*** relating to self-certification of metropolitan planning organizations, requires the MPO to certify that the metropolitan transportation planning process is being carried out in accordance with all applicable US Department of Transportation requirements and must submit such certification concurrent with the submittal of the entire proposed TIP to the FHWA and the FTA as part of the STIP approval;

WHEREAS, the Greater Bridgeport Regional Council and the Valley Council of Governments conduct the transportation planning process for their respective planning regions in accordance with the planning regulations promulgated by the US Department of Transportation and specified in the ***MAP-21,*** by preparing an annual Unified Planning Work Programs for their respective regions, conducting and performing transportation planning activities as contained in their UPWP's, cooperatively preparing, maintaining and amending the endorsed short-range transportation improvement program (TIP), preparing and updating the long range regional transportation plans (LRPs), assessing the air quality impacts of the proposed transportation improvement projects included in the TIP and LRPs, and proactively involving the public in the transportation planning process and;

WHEREAS, the GBVMPO adheres to the principles of non-discrimination on the basis of race, color, creed, national origin, sex, or age in employment or business opportunity, as specified in Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 and Older Americans Act, and regarding the involvement of disadvantaged business enterprises in USDOT funded projects and the implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts.

NOW, THEREFORE BE IT RESOLVED that the Greater Bridgeport and Valley Metropolitan Planning Organization, the Metropolitan Planning Organization for the Bridgeport-Stamford Urbanized Area covered by Greater Bridgeport and the Valley planning regions, hereby certifies that the urban transportation planning process has been and is being conducted in accordance with the terms and provisions of the rules and regulations promulgated by the US Department of Transportation under the ***MAP-21*** and that all applicable provisions relative to involvement of public and private providers of mass transportation, civil rights, involvement of minority business enterprises, special efforts for elderly and disabled persons, the Clean Air Act and amendments, 23 U.S.C and 49 U.S.C have been satisfied.

This resolution shall become effective as of April 14, 2015.

We, the undersigned co-secretaries of Greater Bridgeport and Valley Metropolitan Planning Organization (MPO), Connecticut, do hereby certify that the resolution adopted by the MPO at a public meeting held on April 14, 2015, at which a quorum was present and that the same is a correct and true transcript from the original thereof.

Brian Bidolli, Executive Director
GBRC – MPO Co-Secretary

Richard T. Dunne, Executive Director
VCOG – MPO Co-Secretary

DATE: April 14, 2015

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Bridgeport, Connecticut 06604-4902
Phone: (203) 366-5405 Fax: 366-8437

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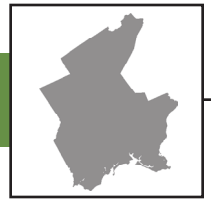
Table of Contents



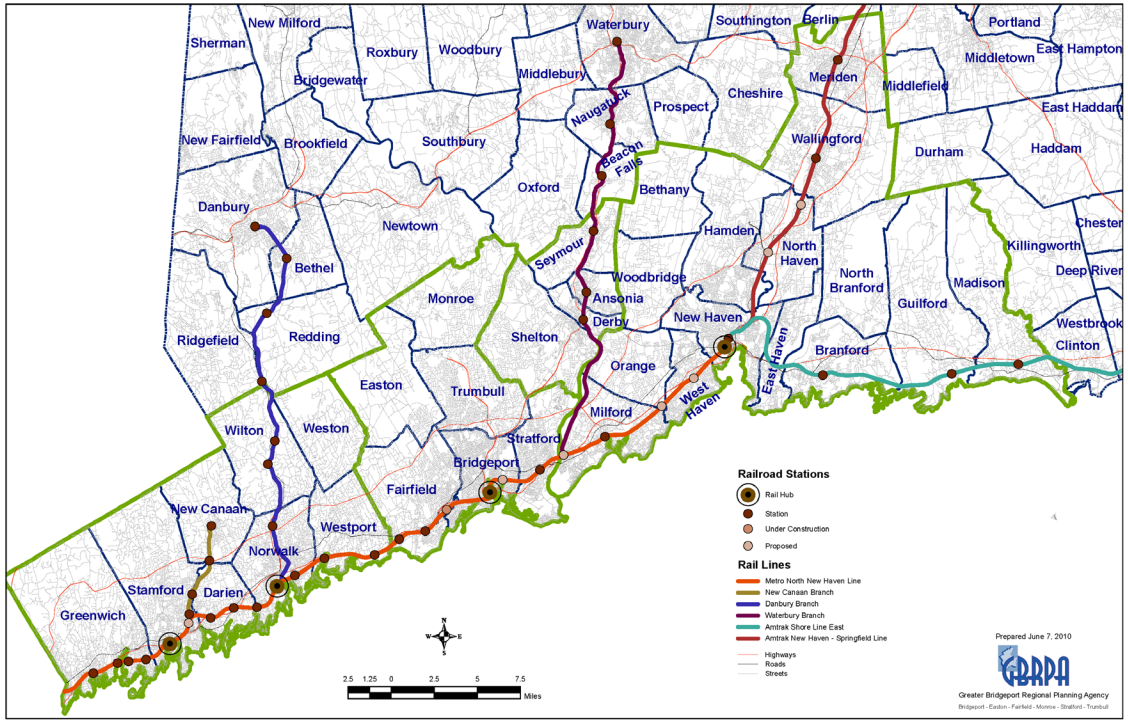
Section 1: Planning Process, Issues & Goals

Transportation Planning Process

The Greater Bridgeport Regional Council (GBRC) is a multi-discipline, regional planning organization with six member communities centered on the city of Bridgeport. Together, the municipalities of Bridgeport, Easton, Fairfield, Monroe, Stratford and Trumbull encompass about 145 square miles and have an estimated 2009 population of about 304,256. The combination of population and land area results in a population density (2,098 persons per square mile) that is the highest of any region in the state. This density and intensive development patterns are reflected in the high proportion of the region that lies within the Census-defined urbanized area. About 98% of the Region's residents live in areas designated as urban.

The GBRC is the federally designated transportation planning agency for the Greater Bridgeport Region and conducts the transportation planning process in accordance with federal regulations. It also serves as the transportation planning agency for the Greater Bridgeport and Valley Metropolitan Planning Organization (MPO). Oversight of the metropolitan transportation planning process is jointly provided by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

The Moving Ahead for Progress in the 21st Century Act (MAP-21) was enacted July 6, 2012 and reauthorized through 2020 on May 15, 2014. MAP-21 authorizes the federal surface transportation programs for highways, highway safety, and transit and includes provisions on how the transportation planning process is to be conducted. The US Department of Transportation (US DOT) issued planning guidelines and regulations that substantially implement the metropolitan planning provisions of MAP-21. The development of the long range metropolitan plan adheres to the guidelines and requirements detailed



in Title 23 of the Code of Federal Regulations (CFR), Section 450.322.

Key guidelines are:

1. The LRP must address at least a 20 year planning horizon, be consistent with air quality goals (conformity) and be fiscally constrained.

2. The LRP shall include long-range and short-range strategies/actions that lead to the development of an integrated multimodal transportation system so as to facilitate the safe and efficient movement of people and goods in addressing current and future transportation demand.

3. The update cycle for the LRP is every four years (in air quality nonattainment areas), unless the MPO chooses to do so more frequently. In air quality nonattainment areas, development of the LRP must be coordinated with the process for developing transportation control measures (TCMs) in a State Implementation Plan (SIP).

4. The LRP must be based on the latest available population, land use, travel, employment, congestion and economic activity estimates.

5. Development of the LRP shall include consultation with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation. This consultation will involve the comparison of the LRP with conservation plans, conservation maps and inventories of natural or historic resources, as appropriate and available.

6. The LRP shall include a safety element that incorporates or summarizes the priorities, goals, countermeasures, or projects as well as emergency relief and disaster preparedness plans and strategies and policies that support homeland security and safeguard the personal security of all motorized and non-motorized users.

7. The LRP shall follow an approved public participation plan, A reasonable opportunity to comment on the LRP must be provided to citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties. The MPO must make the LRP readily available for public review, including in electronically accessible formats.

Required content includes:

1. Projected transportation demand of persons and goods in the area over the planning period.

2. Existing and proposed transportation facilities that should function as an integrated transportation system, with an emphasis on those facilities that serve important national and regional transportation functions over the planning period. A locally preferred alternative (selected from an Alternatives Analysis under the FTA's Capital Investment Grant program) must be adopted in the LRP for 5309 funding.

3. Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.

4. In nonattainment areas, consideration of the results of the congestion management process including the identification of SOV projects.

5. In nonattainment areas, design concept and design scope descriptions of all existing and proposed transportation facilities in sufficient detail, regardless of funding source for conformity determinations under the EPA's transportation conformity rule (40 CFR part 93). All proposed improvements

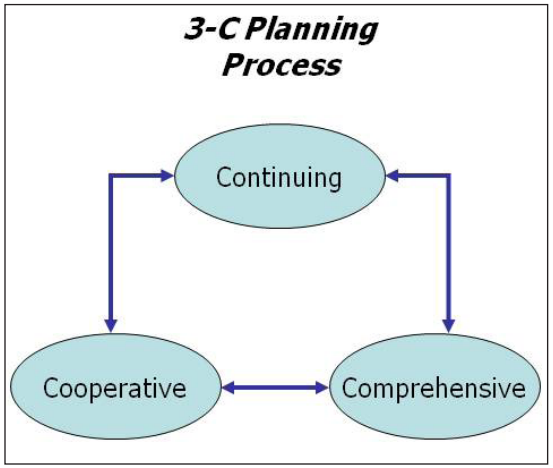
should be described in sufficient detail to develop cost estimates;

6. Assessment of capital investments and other strategies to preserve existing and projected infrastructure and provide for multimodal capacity increases based on regional priorities and needs.

7. Potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the LRP.

8. Pedestrian walkway and bicycle transportation facilities.

9. Transportation and transit enhancement activities.



10. A financial plan that demonstrates how the adopted transportation plan can be implemented.

MAP 21 National Performance Management Goals

MAP-21 introduces performance-based planning requirements to the statewide and metropolitan transportation planning process. MPOs and states are required to establish performance targets based on national goals and performance measures established by MAP-21 and U.S. DOT. CTDOT and GBVMPO are waiting for U.S. DOT to issue a final rule on this subject before establishing statewide and metropolitan performance measures that address the national goals. GBVMPO will work with CTDOT and U.S. DOT to implement a performance-based planning process once U.S. DOT issues its final rule. The National Goals expressed in 23 U.S.C. § 150 are presented and described below:

1. Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

2. Infrastructure condition: To maintain the highway infrastructure asset system in a state of good repair.

3. Congestion reduction: To achieve a significant reduction in congestion on the National Highway System.

4. System reliability: To improve the efficiency of the surface transportation system.

5. Freight movement and economic vitality: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development

6. Environmental sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment

7. Reduced project delivery delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The primary purpose of the metropolitan planning process, as provided by these guidelines, is for the MPO to follow and establish a continuing, cooperative and comprehensive framework for making transportation investment decisions.

This is generally referred to as the "3-C planning process." It was followed in updating the LRP and developing a capital improvement program. The process is defined as follows:

- A continuing process enables changes in the transportation systems to be monitored and reflected in a revised plan.
- A cooperative process involves local, state, and federal agencies, as well as the general public, in the development of plan alternatives, to solicit input, to achieve mutual support and to take community concerns into account.
- A comprehensive process ensures that all transportation modes are considered, that system impacts are assessed and that the recommended transportation projects relate to the surrounding environment.
- The current LRP was endorsed in 2011 and has a horizon year of 2040. This minor plan update will remove projects that have been completed between 2011 and 2014 but will not extend the horizon year. The minor update includes the following steps:

o Incorporate MAP-21 legislation.

o Add four new major projects.

o Air Quality assessment.

o Financial assessment.

- The next update of the LRP will be a major update. A major update will determine the current condition of the transportation systems, estimate future needs and determine the status of projects and programs included in the current plan. The update will include the following steps:

o Analysis and assessment of existing conditions.

o Projections and forecasts of future travel demand.

o Formulation and evaluation of plan alternatives and policies.

o Air Quality assessment.

o Financial assessment.

Planning Factors from MAP-21

MAP-21 and the previous SAFETEA-LU legislation require that MPOs consider eight specific planning factors when conducting the transportation planning process and identifying projects and strategies. The planning factors are:

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

Transportation Systems

The Greater Bridgeport Region is located in southwest Connecticut, fifty miles east of New York City and 150 miles west of Boston, Massachusetts. It is a component of the Census-defined Bridgeport-Stamford Urbanized Area. The region is, in many respects, a "metropolitan area in motion." Each day, more than one

million trips are made to, from and within the region. This travel reflects the daily activities of its residents, and, in broader perspective, the region's economy. How well it takes place is an important measure of the region's vitality.

Located on the main travel corridor to New England, the transportation system of the Region is diverse and offers its residents an integrated range of options, including a system of expressways and highways, rail facilities, intra-region bus service, a regional airport, harbor facilities and ferry service. Key transportation facilities include:

Expressways: Interstate Route 95 – Governor John Davis Lodge Turnpike; Route 15 – Merritt Parkway; Route 8 and Route 25.

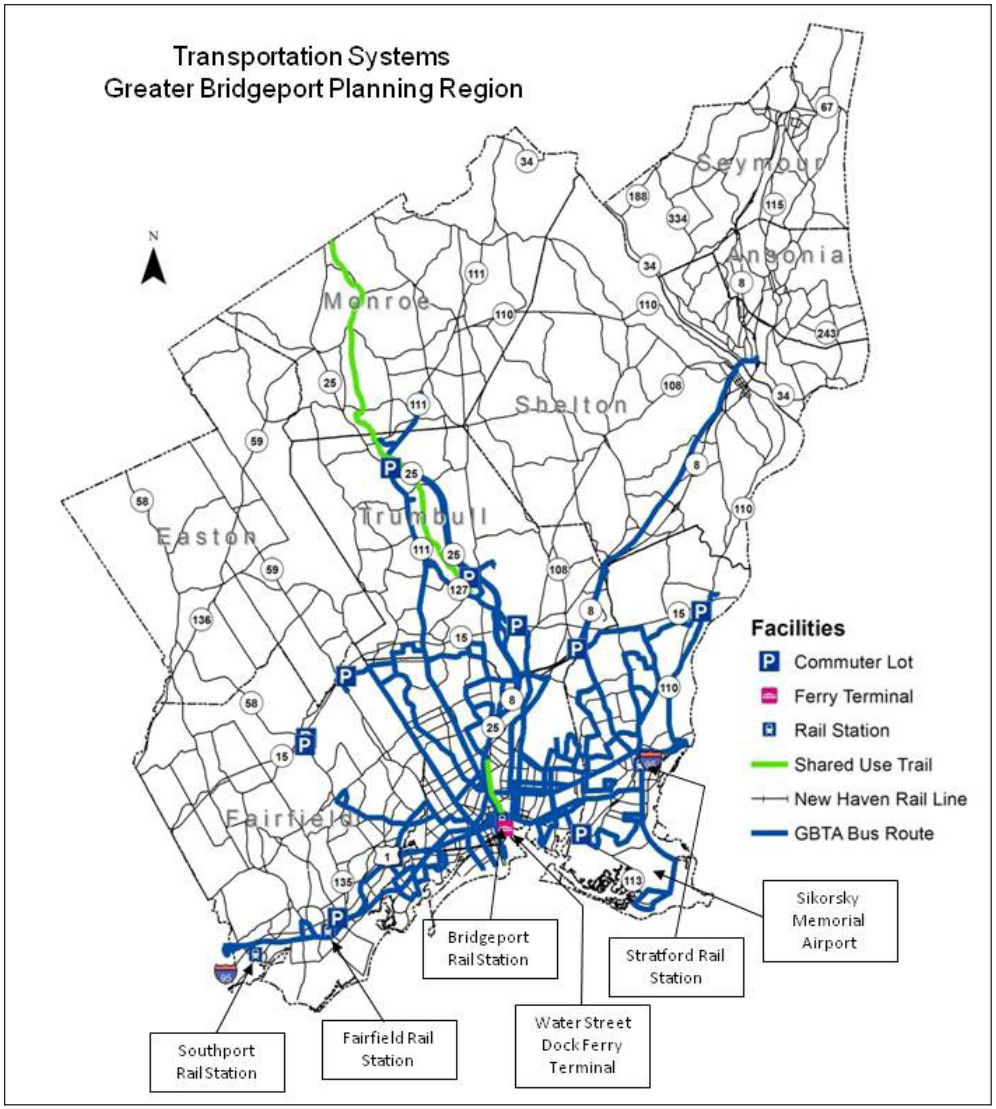
Several principal arterials – US Route 1, Route 25, Route 113 and Main Street in Bridgeport.

An interconnected network of minor arterials and collector roads.

Local bus and specialized paratransit services for the elderly and disabled – Greater Bridgeport Transit.

Commuter rail service along the New Haven main rail line – Metro North Railroad.

Intercity and interstate passenger rail



service – Northeast Corridor, Amtrak.

Passenger and auto ferry service – Port Jefferson Steamboat Company.

Deep water access to Long Island Sound – Bridgeport Harbor.

Sikorsky Memorial Airport – General aviation and charter operations; heliport.

Shared-use paths – Housatonic Railroad Trail.

State-maintained commuter parking lots located near limited access highway interchanges – I-95, Route 8, Route 15, and Route 25.

Livability Initiatives and Sustainable Communities

The long range transportation plan acknowledges and supports the six livability principles established by the Partnership for Sustainable Communities, an interagency partnership established by the U. S. Department of Transportation (USDOT), U.S. Department of Housing and Urban Development (HUD) and the Environmental Protection Agency in 2009. The three agencies have agreed to work together to improve access to affordable housing, provide more transportation options, and lower transportation costs. By linking these efforts, transportation improvement programs and projects will be the catalyst for protecting the environment, addressing climate change and creating sustainable communities. Through a set of guiding livability principles, the long range transportation plan will coordinate land use, housing, environment, transportation, and other infrastructure investments. Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. This includes addressing safety and capacity issues on all roads through better planning and design, maximizing and expanding new technologies, such as ITS, the use of quiet and non-pervious pavements, and using systems planning and operations techniques. An over-riding approach to achieving these objectives is the planning, consideration and development of transit oriented districts and areas that will create a web of multiple, interconnected transit-oriented communities that expand on existing centers. The result will be a uniquely well-integrated set of transit-served centers that support a variety of modes capitalizing in on existing infrastructure. Not only will this foster an increase in non-motorized trips to work but these walkable communities will encourage the use of alternative modes for other trips as well. Moreover, by growing these centers, many current vehicular trips will be replaced with shorter trips to these centers rather than dispersed to peripheral areas. Also, shifts in mode splits will likely occur from the new land use patterns as residents leave their cars and opt to walk, bike, take a train or use a bus.

The six livability principles are:

Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

Promote equitable, affordable housing: Expand location-and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

Enhance economic competitiveness: Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.

Support existing communities: Target Federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

Coordinate and leverage Federal policies and investment: Align Federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

Value communities and neighborhoods: Enhance the unique characteristics of all communities by investing in healthy, safe, and walk able neighborhoods—rural, urban, or suburban.

Transportation Planning Issues and Goals

The transportation system of the region offers residents a variety of transportation modes and facilities by which to make trips. Travelers have access to an interconnected network of streets and highways, local bus services, commuter rail and passenger ferries. Programs are available to help the elderly and disabled to remain mobile or for commuters to share a ride. The efficient movement of freight is vital to the region's economy and efforts have been made to facilitate goods movement. Non-motorized opportunities have also been expanded, with several shared-use trails being planned and built. These modes can be used for both short and long distance trips.

The principle goals of the LRP are to continue efforts to make the transportation network operate as efficiently and effectively as possible and promote a balanced transportation system that offers alternatives to the private vehicle. The analyses conducted as part of the update of the LRP demonstrate that many components of the system operate poorly and congestion occurs daily and reaches severe conditions at some locations. Through the transportation planning process the key transportation concerns and issues were identified.

The constraints of the region's physical and economic resources influence transportation systems performance and limit feasible alternatives. However, it is important to preserve and maintain essential infrastructure and services, while making the system operate as efficiently as possible. It is also equally critical to enhance the mobility of people and goods by increasing choice, access and convenience, as well as selectively and strategically expanding transportation capacity. Although the highway system dominates movement, non-highway components are equally important and provide alternatives for travelers.

The LRP also reinforces future regional land use development objectives and economic revitalization goals. Transportation and land use planning have a similar goal: efficient use of a limited resource (land) that allows for the efficient movement of people and goods. Together, transportation and land use planning will lead to the creation of strong communities and better define quality of life and livability.

The issues and goals of the LRP remain consistent with past long range transportation plans and provide the framework for making transportation investment decisions:

Preserve, Maintain and Enhance the Highway System: To maintain the principal expressway and highway system in a state-of-good repair through lane continuity, minor widening, rehabilitation and reconstruction,

as necessary to improve safety and operating efficiency and to selectively and strategically expand the capacity of key highways to reduce delay and congestion.

Congestion Management: To alleviate congestion through the implementation of intersection improvements (turn lanes), traffic signal modernization and coordination, and TDM actions (ridesharing, telecommuting and alternate work schedules).

Safety: To improve safety and efficiency of the highway network and for both motorized and non-motorized users of the transportation system, with appropriate transportation improvement projects.

Security: To improve and expand overall security of transportation infrastructure and for persons while using, on-board or waiting for transportation modes and services.

Advanced Technology: To better manage transportation operations, enhance safety and mobility, ensure greater reliability in travel times and/or reduced travel delay, and provide more detailed and up-to-the-minute information to travelers and system operators through the application of various ITS actions.

Preserve and Enhance Public Transportation Services: To maintain essential local bus, commuter rail and paratransit services by providing full funding for operations, replacing capital equipment on a life-cycle cost basis, and renovate and rehabilitate facilities and infrastructure to a state-of-good-repair, and enhance services by optimizing how resources are allocated and coordinating the delivery of paratransit service.

Multi-modal Opportunities: To expand and enhance opportunities for linking and connecting multiple modes and facilitating the movement between various transportation modes by constructing new multi-modal facilities and coordinating transit services.

Bicycle and Pedestrian Activities: To encourage and promote the increased use of bicycling and walking as a mode of transportation while enhancing safety by developing a network of shared-use trails and providing pedestrian walkways and features.

Flexibility in Highway Design: To balance the needs for improving roads with the context of the surrounding area and develop transportation facilities that fit their physical setting and preserve scenic, aesthetic, historic and environmental resources, while improving safety and mobility.

Environmental Mitigation: To implement actions to mitigate and alleviate natural and cultural environmental impacts of transportation projects.

Freight Movement: To implement actions and projects that diversify how goods are moved to, from and through the region and improve how well freight is moved.

Aviation: To upgrade the Sikorsky Memorial Airport to a high quality, regional facility capable of supporting commuter airline services and meeting corporate needs, while enhancing safety.

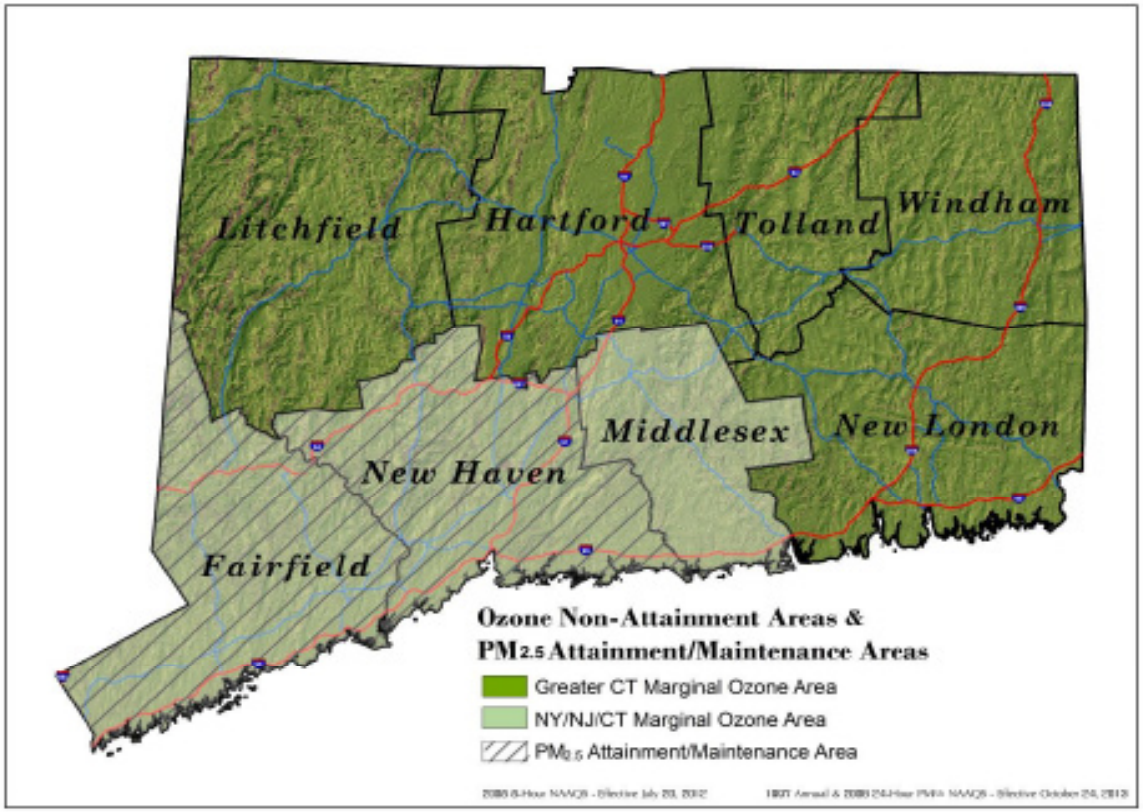
Sustainability: To develop a long range plan consistent with the Regional Plan of Conservation and Development and the state Conservation and Development Policies Plan, and links local land use management, transportation improvements and sustainability and livability initiatives.

Economic Development: To improve transportation infrastructure critical to the economic revitalization of the city of Bridgeport and the region.

Air Quality Goals and Conformity

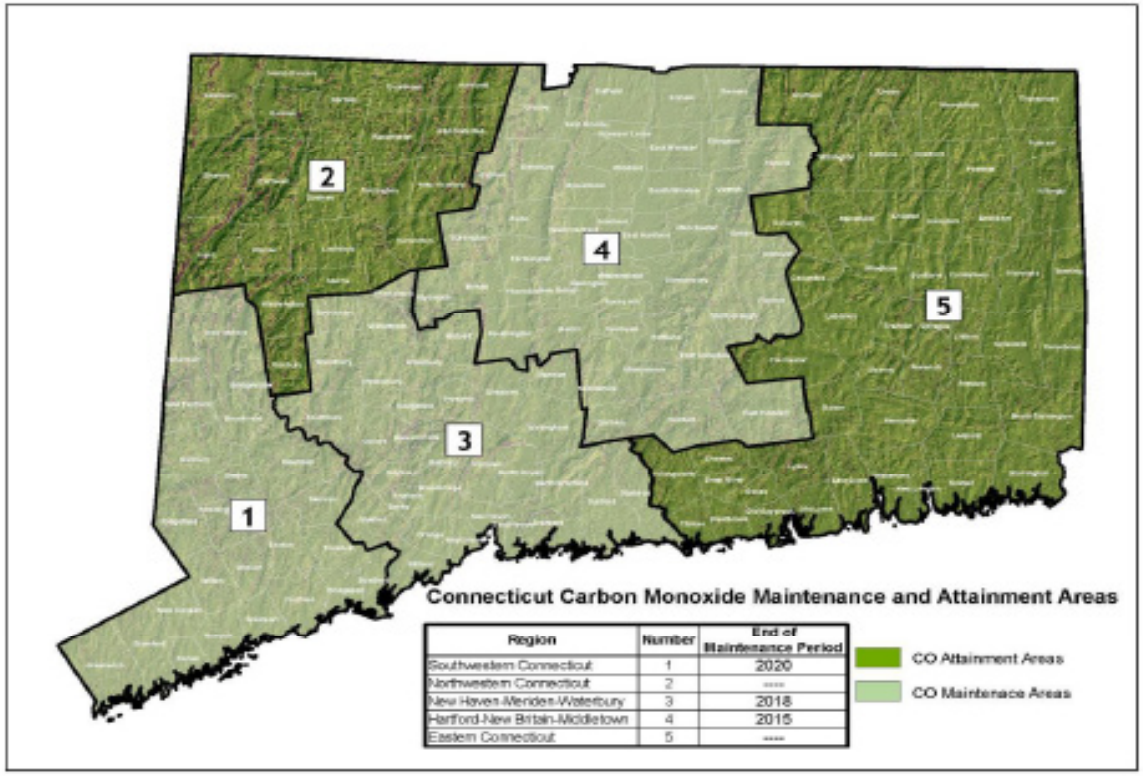
The Clean Air Act Amendments (CAAA) stipulate the US Environmental Protection Agency (EPA) establish National Ambient

Air Quality Standards (NAAQS) and designate areas of the country based on pollution levels. Three transportation-related pollutants are regulated: Ozone, Carbon Monoxide and Particulate Matter. Ozone is an area-wide pollutant that forms from a chemical reaction of hydrocarbons, oxygen, and nitrogen oxides with sunlight. Carbon Monoxide is emitted from vehicles and can become concentrated at spot locations. It dissipates fairly quickly, so the concern is more associated with intersections where severe congestion occurs. Particulate Matter is made up of small particles present in the air formed by the incomplete combustion of engines. It also includes dust and small particles from the wear of vehicle parts (tires, brake linings, etc) re-entrained into the air by the movement of vehicles. The finer the particulate matter, the greater the health risk is.



For the purposes of air quality analysis, portions of Connecticut are included in the New York-Northern New Jersey-Long Island areas for ozone and fine particulate matter (PM2.5). The rest of the state makes up the Greater Connecticut area for analysis of these pollutants. The Greater Bridgeport Region is located in the New York-Northern New Jersey-Long Island area. All of Connecticut – including the New York-Northern New Jersey-Long Island area and the Greater Connecticut area are designated as marginal non-attainment areas for ozone. Previously in non-attainment for PM2.5, the Connecticut portion of the New Jersey – New York – Connecticut non-attainment area was redesignated as an attainment maintenance area for particulate matter on October 24, 2013.

In contrast to ozone and PM2.5 analysis, Connecticut is divided into five areas for the analysis of carbon monoxide (CO). The Greater Bridgeport Region is located in the Southwestern Connecticut analysis area. Southwestern Connecticut, as well as the Greater New Haven and Greater Hartford had been in non-attainment for CO. Subsequently, all of these areas



have demonstrated attainment and were redesignated to full maintenance areas.

For particulate matter, the non-attainment area encompasses Fairfield and New Haven counties and is part of the larger New York-New Jersey-Connecticut area.

For non-attainment areas, the CAAA requires the state to develop a State Implementation Plan for Air Quality (SIP) that specifies how the state plans to improve air quality and achieve the NAAQS. The plans, projects and programs developed by the state and MPOs must demonstrate that planned and recommended projects will contribute to annual reductions in transportation-related emissions and not delay or prevent attainment of air quality standards. This demonstration is based on a regional emissions analysis that compares the estimated emissions from all transportation sources to allowable levels. The allowable level is referred to as an emissions budget and is approved by EPA. The approved budgets are listed in the table to the right.

EPA Approved Emission Budgets	
Ozone Pollutants	**Budgets (tons per day)**
Volatile Organic Compounds (VOCs)	27.4
Nitrogen Oxide Emissions (NOx)	54.6
Particulate Matter Pollutants	**Budgets (tons per year)**
Direct PM2.5 Emissions (2017-2024)	575.8
Indirect PM2.5 Emissions	12,791.8

Note: The emission budgets for the Connecticut portion of non-attainment areas.

The Connecticut Department of Transportation is responsible for conducting the regional emissions analyses for the region. The analyses are based on the most travel demand model maintained by ConnDOT and uses

MOVES2010b emissions factors. The methodology, inputs and factors have been approved by the US Environmental Protection Agency (EPA) and agreed to through a consultative process. Projects included in the LRP have been added to the transportation network and their potential affect on transportation-related emissions and impact on the state's ability to meet air quality goals and standards has been considered.

The LRP conforms to the air quality goals if the estimated emissions from "Action" scenario analyses (that is, implementation of plan projects) for each analysis year, including the horizon year, are less than the approved emissions budgets. The analysis years required for the 2015-2040 LRP are:

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)

Furthermore, EPA's guidelines indicate the LRP would conform to the SIP and the CAAA, if the LRP:

Supports the SIP purpose of achieving the National Ambient Air Quality Standards (NAAQS);

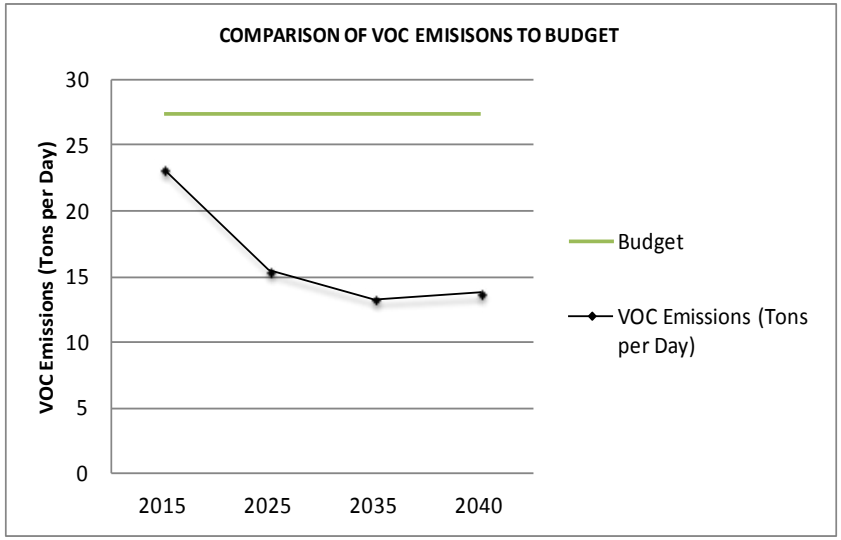
Has no goals, directions, recommendations or projects that will adversely impact the SIP;

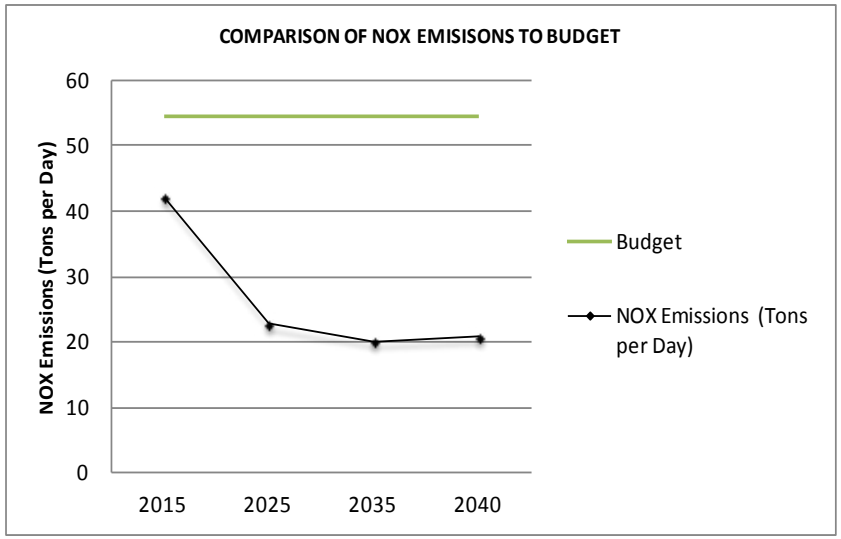
Provides an expeditious implementation of transportation control measures TCMs;

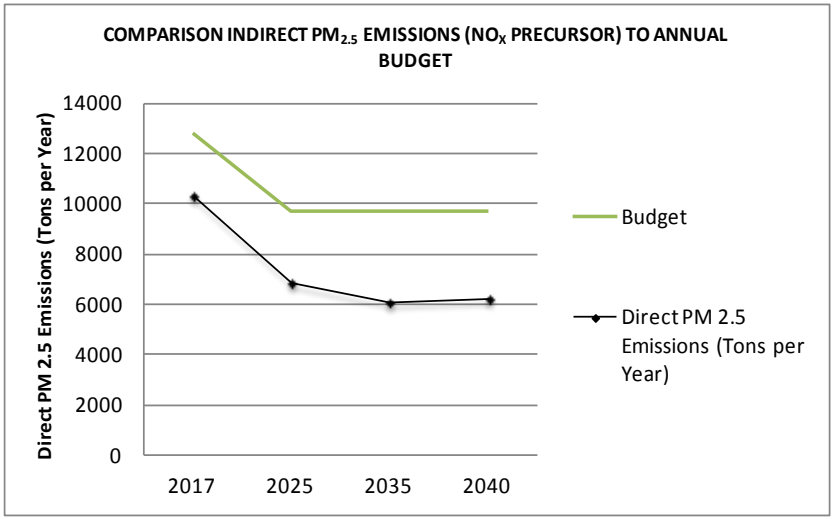
Contributes to reductions of volatile organic compounds (VOC); and

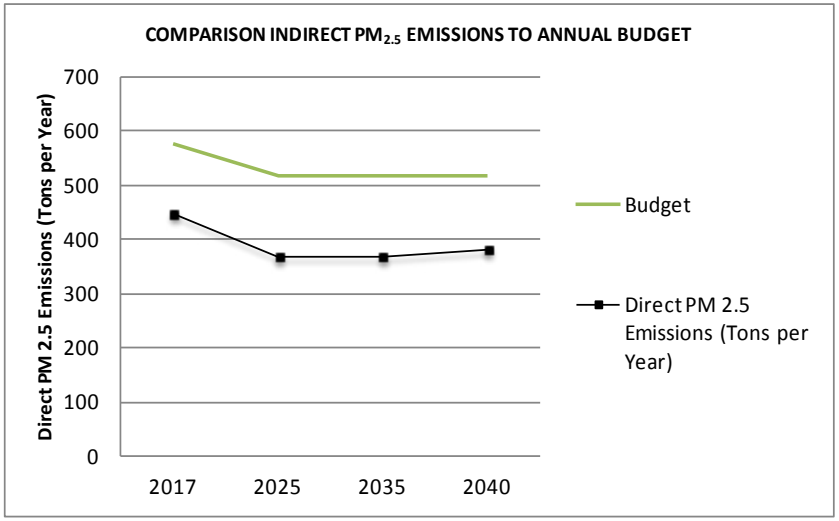
Does not increase the frequency or severity of existing violations.

Based on the results of the regional air quality emissions analyses (OZONE Air Quality Conformity Determination of the 2015 Regional Transportation Plans and the FY 2015-2018 Transportation Improvement Programs for the Connecticut portion of the New York-









Northern New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area and the Greater Connecticut Ozone Nonattainment Area, March 2015 and PM 2.5 Air Quality Conformity Determination of the 2015 Regional Transportation Plans and the FY 2015-2018 Transportation Improvement Programs for the Connecticut portion of the NY-NJ-CT PM2.5 Nonattainment Area, March, 2015) and the comparison of estimated emissions accruing from the implementation of the long range transportation plan to EPA-approved emissions budgets for both Ozone and PM2.5 emissions, the LRP conforms to the requirements of the Clean Air Act Amendments and other federal regulations.

For the Ozone analysis, conformity is based on two criteria pollutants: volatile organic compounds (VOCs) and nitrogen oxide (NOX). The results of the emissions analyses are depicted in the charts on this page.

PM2.5 emissions can result from both direct sources (such as, exhaust fumes, brake and tire wear, and road dust) and indirect sources (exhaust gases that combine with other elements and compounds in the air to form fine particulates). In Connecticut only nitrogen oxides (NOX) need to be analyzed as a precursor to PM2.5 emissions. The results of the emissions analyses are depicted in the charts on this page.

Environmental Justice Issues and Objectives

Executive and US DOT orders on Environmental Justice require recipients of federal transportation assistance, through their actions, to “avoid, minimize or mitigate disproportionately high and adverse impacts” on minority and low income populations. The GBRC addresses Environmental Justice concerns and issues in all aspects of its transportation planning process, including the long range transportation plan.

The intent of Environmental Justice is three-fold:

1. To ensure full and fair participation of minority and low-income persons.
2. To ensure no action prevents, prohibits

or makes it difficult for minority or low-income persons from participating in the transportation planning process.

3. To ensure transportation investments are made in minority and low-income areas and the improvements planned for these areas meet the needs of the residents, improve access to jobs and services, and increase overall mobility.

The GBRC conducted an in-depth analysis of population, income and transit dependency in the region and developed a demographic profile of the region and identified areas of concerns. The spatial assessment of the demographic profile revealed that the “at risk” areas were predominately in Bridgeport. Although a few block groups in Fairfield and Stratford met one or more of the criteria, all but one block group that met the threshold on all variables were located in Bridgeport. None of the areas in Easton, Monroe and Trumbull were identified as “at risk” on any of the variables.

The second step in the Environmental Justice process is an assessment of the LRP to answer the following questions:

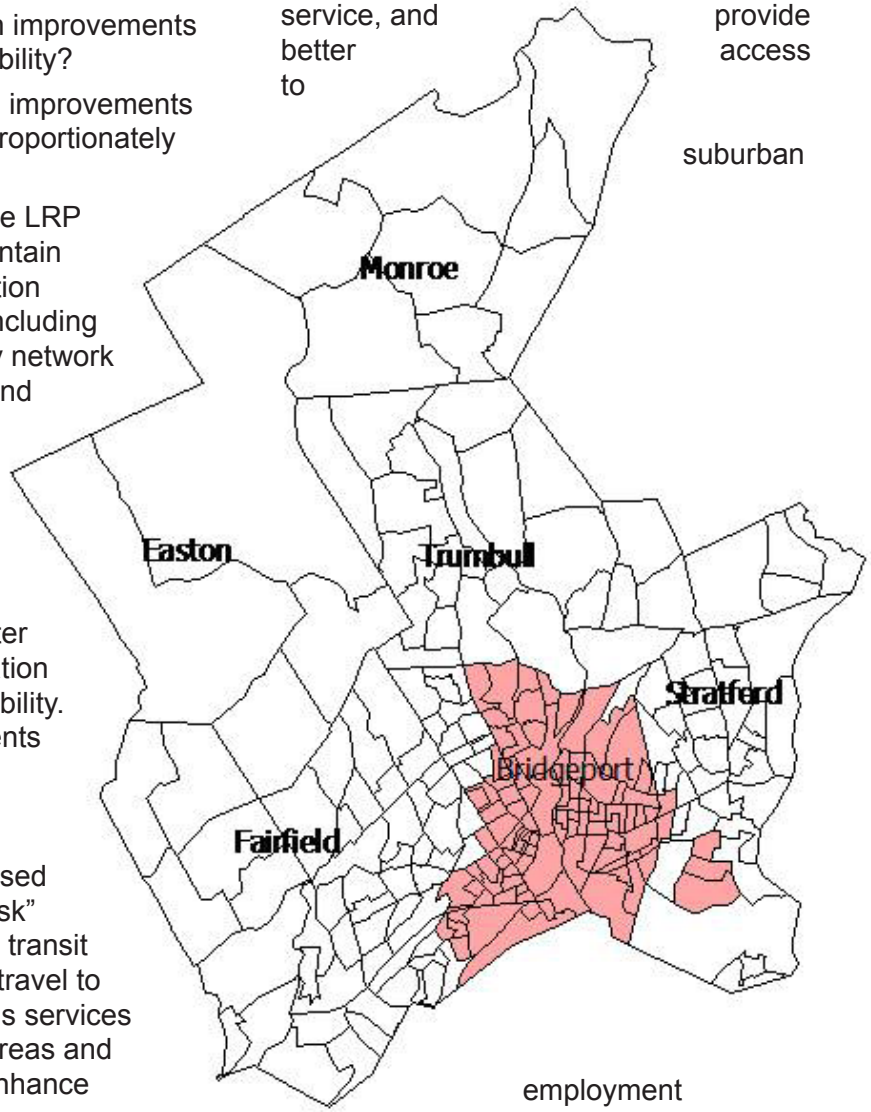
1. Are transportation investments being made in targeted or critical areas?

2. Are the transportation improvement projects appropriate, that is, are they meeting the travel needs of the residents?

3. Will the transportation improvements improve access and mobility?

4. Will the transportation improvements cause adverse and disproportionately high impacts?

The principle goals of the LRP are to preserve and maintain the essential transportation services in the region, including maintaining the highway network in state-of-good repair and enhancing public transportation operations. The LRP provides a balanced transportation improvement program, designed to provide better access to the transportation system and improve mobility. Transportation investments are appropriate and will improve efficiency and result in better management. As discussed above, most of the “at risk” areas are dependent on transit service for mobility and travel to and from work. Local bus services are extensive in these areas and funds are allocated to enhance bus operations, service, and better to optimize provide access suburban employment



opportunities. Newer capital equipment and advanced technology will make bus service more reliable and efficient, with a corresponding increase in mobility and decrease in travel times. Highway-related projects are designed to address recurring congestion, mitigate problems associated with operating deficiencies and improve safety. Implementation of these actions will reduce delay and improve the quality of life of the surrounding areas.

Public Involvement and Outreach

Federal guidelines require an effective public participation program to ensure that transportation actions do not adversely impact sensitive areas. To meet these guidelines, the MPO needs to:

Proactively include public in transportation planning process.

Provide reasonable opportunities for public to comment.

Provide early and continuing notification and information.

Make available plans and reports, including in an electronic format.

Provide feedback to the public on comments and suggestions.

The public outreach program for the update of the LRP consisted of the following activities:

The draft Regional Transportation Plan for the Greater Bridgeport Region: 2015 ~ 2040 was prepared and made available for review and comment from March 27th, 2015 through April 27th, 2015.

Public notification of the draft plan for review and comment was published in the Connecticut Post on March 27th, 2015.

A 30-day public review and comment period was provided beginning on March 27th, 2015 through April 27th, 2015.

Comments on the plan were received, reviewed and considered; responses were provided.

Information on the long range transportation plan and a link to the document was placed on the GBRC website. Also placed on the website were summaries of the regional emissions analyses and draft air quality conformity reports for the 8-hour Ozone and the PM2.5 assessments – March 2015.

A public information meeting was held on Tuesday, April 7, 2015, at the office of the Greater Bridgeport Regional Council. The meeting began at 5:00 PM. GBRC staff was available to make brief presentations and answer questions about the LRP.

A discussion on the final draft LRP was made at the MPO meeting held on April 14th, 2015. Questions and comments were made after the presentation and the public was provided an opportunity to comment of the LRP.

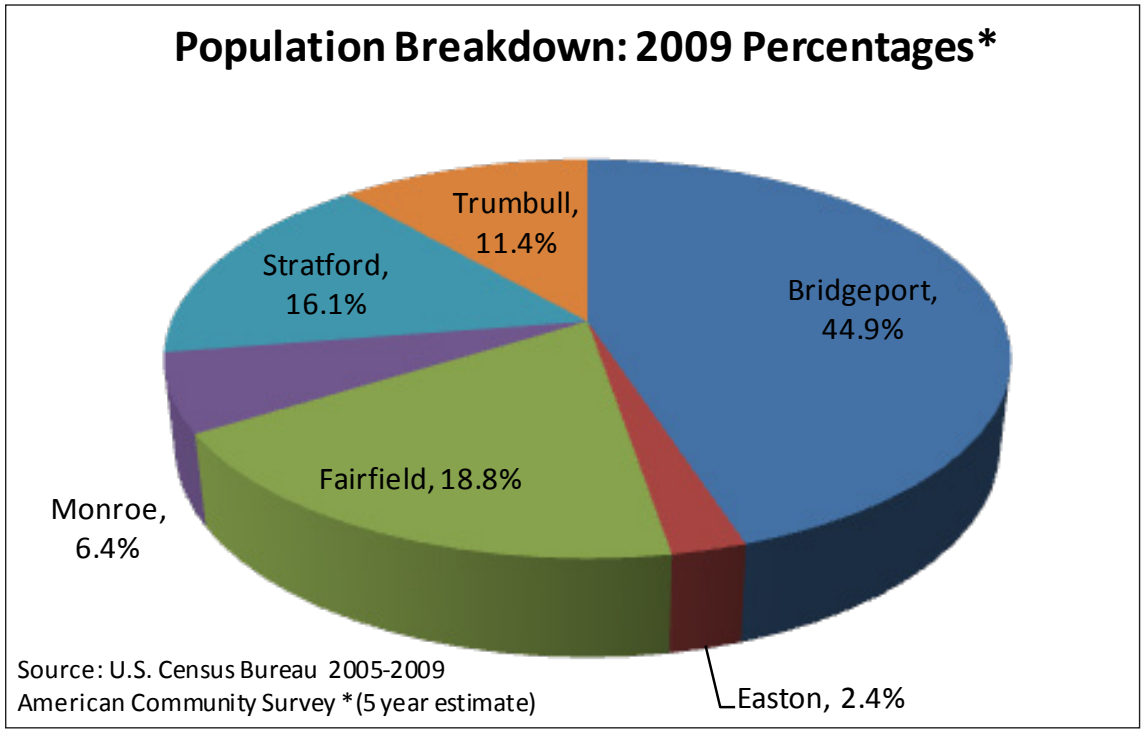
The MPO endorsed the long range plan at its April 14th, 2015 meeting.

Section 2: Planning Assumptions & Data

Population

The Greater Bridgeport Region is located in southwest Connecticut, fifty miles east of New York City and 150 miles west of Boston, Massachusetts. Together, the municipalities of Bridgeport, Easton, Fairfield, Monroe, Stratford and Trumbull encompass 145.5 square mile. Based on the 2005-2009 estimates from the American Community Survey (ACS; through the U.S. Census Bureau) the estimated population of the region was 304,256, a slight decline since 2000, but an increase when compared with the Region's 1990 population. The combination of population and area results in a population density of ±2,166 persons per square mile. This density is the highest of any region in the state. This is reflected in the high proportion of the Region that lies within the Census-defined urbanized area. About 98% of the Region's residents live in areas designated as urban (based on the 2000 Census).

The latest available demographic data, for the most part, remain what were available from the 2000 Census; therefore the base transportation data and planning assumptions have not changed drastically since the last update of the LRP. The Connecticut Department of Transportation (CTDOT) calculates future population, housing and other transportation-related data for input to the statewide travel demand model and air quality emissions analyses. These data were incorporated in the updated LRP.



Similar to many metropolitan areas, the region experienced rapid growth through the middle part of the century, with the population peaking at 311,130 in the early 1970s. This was followed by population shifts from the center city of Bridgeport to the suburban towns, accompanied by a decrease in total regional population. Based on the 2005-2009 ACS, Easton, Monroe and Trumbull are estimated to have had a slight population increase,

Regional Population Trends: 1990-2009				
	1990	2000	2009*	% Change 2000-2009
Bridgeport	141,686	139,529	136,715	-3.5%
Easton	6,303	7,272	7,371	16.9%
Fairfield	53,418	57,340	57,229	7.1%
Monroe	16,896	19,247	19,340	14.5%
Stratford	49,389	49,976	48,930	-0.9%
Trumbull	32,016	34,243	34,671	8.3%
Region	299,708	307,607	304,256	1.5%

*Source: U.S. Census Bureau, Census 1990, Census 2000 and 2005-2009 American Community Survey *(5 year estimate)*

Population Trends & Projections, 2010-2040					
	2010	2020	2030	2040	% Change 2010-2040
Bridgeport	141,560	143,590	145,600	147,623	4.28%
Easton	8,010	8,740	9,500	10,243	27.88%
Fairfield	57,530	57,730	58,230	58,529	1.74%
Monroe	20,320	21,560	22,840	24,037	18.29%
Stratford	50,400	50,810	51,230	51,648	2.48%
Trumbull	34,800	35,740	36,640	37,441	7.59%
Region	312,620	318,170	324,040	329,521	5.41%

Source: ConnDOT Series 29A Projections

while Bridgeport, Stratford and Fairfield each had a slight decrease. Bridgeport is estimated to have had the largest decline of about 2.0% since 2000, a loss of just over 2,800 people.

The largest municipality in the region remains the city of Bridgeport, with an estimated 2009 population of 136,715. The city accounts for about 44.9% of the region's total population. The next largest communities are the towns of Fairfield and Stratford, with estimated populations of 57,229 and 49,930, respectively. Although Trumbull experienced a slight increase (about 1.2%), its population has been relatively stable over the last 20-to-30 years. By contrast, the two smallest municipalities have seen rapid increases in population growth since 1990. Easton, the most rural of the region's municipalities, has a current population estimated at 7,371, while Monroe's population is just under 20,000. These totals indicate population grew by 16.9% and 14.5% since 1990, respectively for Easton and Monroe

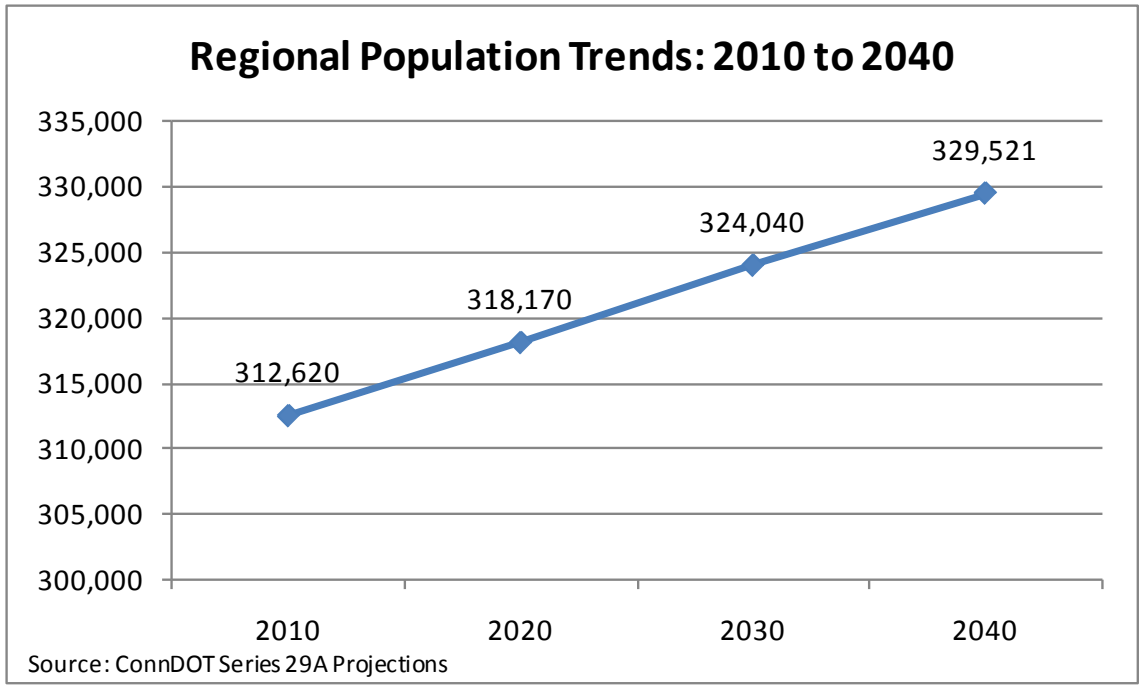
Based on the most recent population estimates developed by CTDOT for its travel demand model, the population of the region is expected grow at a steady, but modest rate, over the next 30 years. The largest projected increases are

Population Density: 2009*		
	Total Land Area (sq. miles)	Persons per square mile
Bridgeport	16.00	17
Easton	27.42	70
Fairfield	30.03	25
Monroe	26.13	106
Stratford	17.59	85
Trumbull	23.29	93
Region	140.46	67

*Source: 2005-09 American Community Survey, *5 year estimate*

2000 Population Urban/Rural Split			
	Urban	Rural	% Urban
Bridgeport	139,529	0	100.0%
Easton	2,968	4,304	40.8%
Fairfield	57,042	298	99.5%
Monroe	17,852	1,395	92.8%
Stratford	49,976	0	100.0%
Trumbull	34,243	0	100.0%
Region	301,610	5,997	98.1%
Bridgeport - Stamford UA	846,174	36,779	95.8%

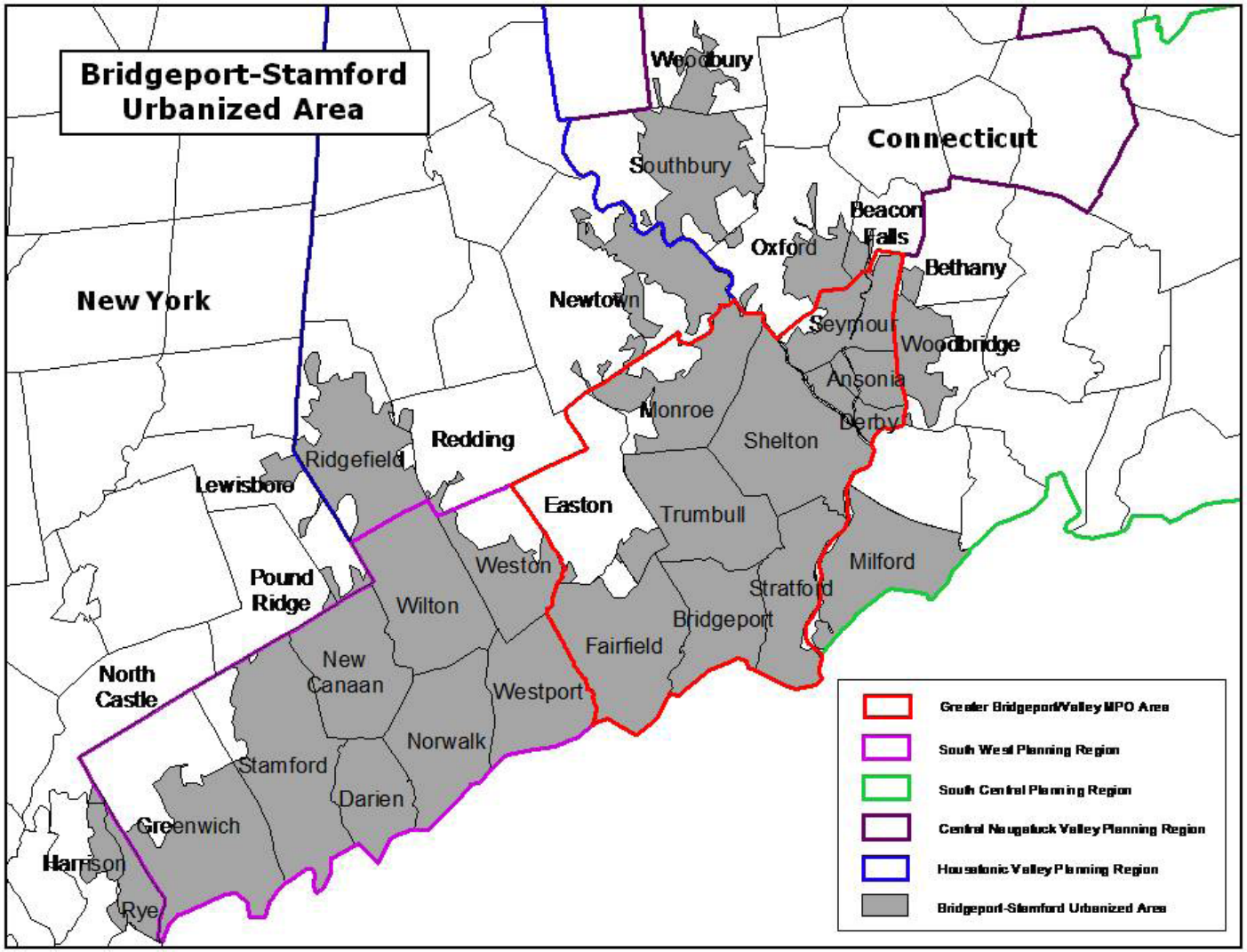
Source: U.S. Census Bureau, Census 2000



for Easton and Monroe at 27.9% and 18.3%, respectively. Population growth will be small in Fairfield and Stratford, with only modest increases in Bridgeport and Trumbull. Overall, the projected population of the region in 2040 is estimated at 329,521 persons, a growth of 5.4% over the 2010 level.

After the 2000 Census, the Bridgeport Urbanized Area was expanded and consolidated with the Norwalk and Stamford urbanized areas to form the new Bridgeport-Stamford Urbanized Area. This urban area encompasses the whole or parts of five planning regions and 28 municipalities, with a total population of 846,174 (2000 Census). The Greater Bridgeport Region lies wholly within this Census-designated area and its population accounts for 35.6% of the urban area's total.

The population density of the region is the



highest of any planning region in Connecticut. Based on the 2009 population estimates, the density is 2,166 persons per square mile. It varies from a high in Bridgeport of ± 8,545 persons per square mile to a low for Easton of only 269 persons per square mile. The urban, coastal area is much more densely developed than the more suburban/ rural inland area. The three communities of Bridgeport, Fairfield and Stratford have an average population density of 3,695 persons per square mile, while the three northern suburbs have an average density of only 799 persons per square mile.

Based on the ACS, there was an estimated 41,024 persons who were 65 years of age and older, about 13.5% of the region's

population. Trumbull had the highest proportion of its population in this age cohort at 20.4%, while Bridgeport had the lowest, with only 10.4%. Eligibility for senior services vary between towns, however, not all who are over 65 years old require special transportation services. Therefore, the number of people in this age bracket is not indicative of special transportation needs.

The municipalities in the region sponsor senior centers to provide activities and services to older residents. These programs typically include special transportation services to and from the center, shopping and medical appointments.

The Americans with Disabilities Act (ADA) requires operators of fixed-route bus services, Greater Bridgeport Transit (GBT), to provide supplemental paratransit service to those who, because of their disability, are not able to get to a bus stop or board or ride a fixed route bus. This service fills individual transit needs and promotes equality of mobility for all. A wide range of trip purposes are provided by the operator, including shopping, personal business and medical. In addition to the service offered by GBT, several social service organizations, including municipal and private, non-profit, provide special transportation for clients. Trips are typically limited to a narrow range of trip purposes, typically based on the type of service provided by the agency.

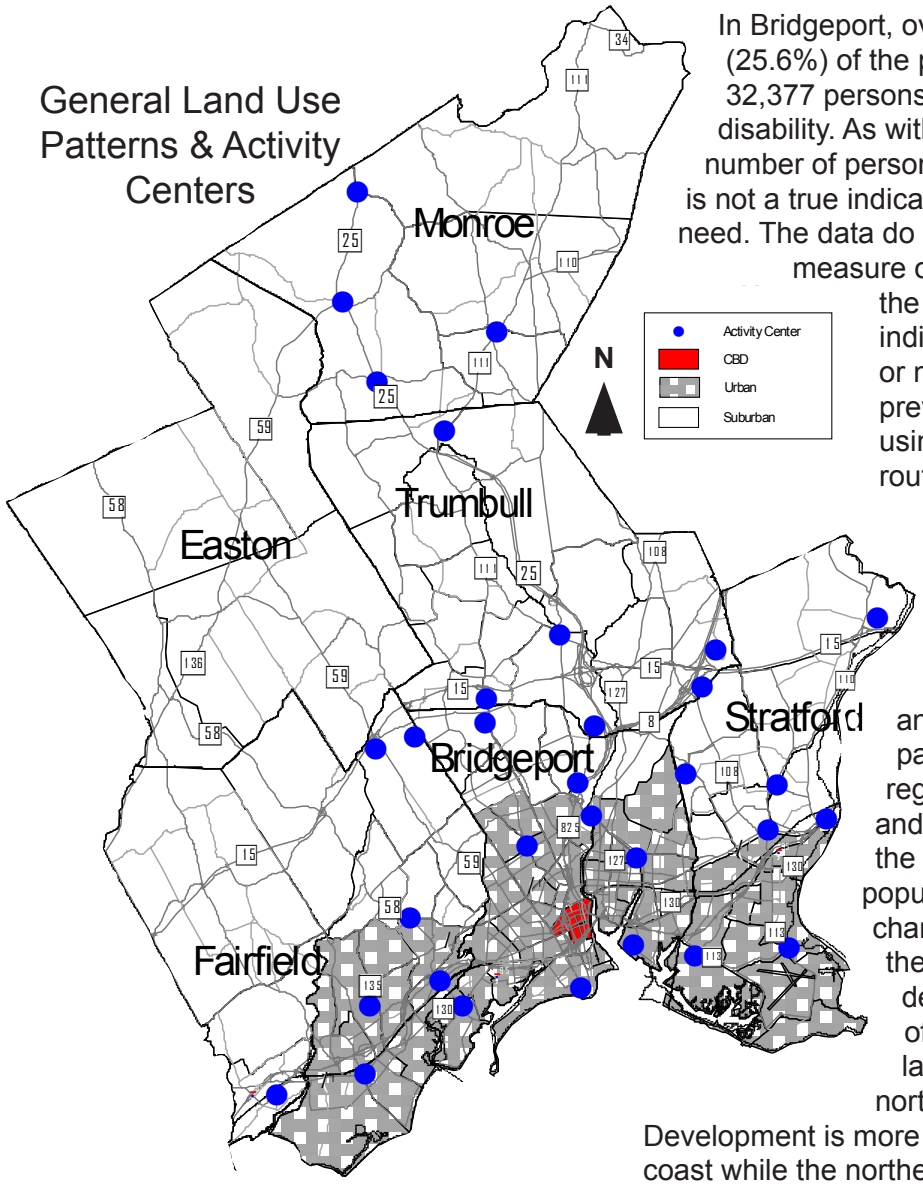
The Census form asks respondents whether they or other members of the family had any long lasting conditions (over six months) that made it difficult to perform certain activities. These include sensory (blindness, deafness or other sight impairment), self-care, mental, employment, going outside-the-house, or physical (walking, climbing, carrying or lifting) disabilities. The data were tabulated for non-institutionalized persons five years of age or older. The data indicate about 19.5% of the region's non-institutionalized population had one or more disability, a total of 54,918 persons.

Population 65 Years & Older			
	<65 Years	Total	Percent
Bridgeport	14,227	136,715	10.4%
Easton	923	7,371	12.5%
Fairfield	7,834	57,229	13.7%
Monroe	2,507	19,340	13.0%
Stratford	8,451	48,930	17.3%
Trumbull	7,082	34,671	20.4%
Region	41,024	304,256	13.5%

*Source: U.S. Census Bureau, 2005-2009 American Community Survey *(5 year estimate)*

Non-Institutionalized Population* With One Or More Types Of Disability					
	1 Disability	2+ Disabilities	No Disability	Total Disabled	% Disabled
Bridgeport	16,819	15,558	94,007	32,377	25.62%
Easton	484	264	5,962	748	11.15%
Fairfield	3,967	2,771	45,442	6,738	12.91%
Monroe	1,263	740	15,753	2,003	11.28%
Stratford	5,151	3,731	37,874	8,882	19.00%
Trumbull	2,574	1,596	27,236	4,170	13.28%
Region	30,258	24,660	226,274	54,918	19.53%

*Source: U.S. Census Bureau, Census 2000 *Non-institutionalized population 5 years and older*



In Bridgeport, over one-quarter (25.6%) of the population, or 32,377 persons, had some type of disability. As with the age data, the number of persons with disabilities is not a true indicator of paratransit need. The data do not provide a measure of the severity of the disability nor an indication of whether or not the disability prevents a person from using regular fixed-route bus service.

Land Use and Development Patterns

The land use and development patterns of the region are diverse and are reflected in the distribution of its population and urban character. Much of the region is already developed with most of the undeveloped land located in the northern suburbs. Development is more intense along the coast while the northern reaches are more characteristic of rural patterns.

The region's core is Bridgeport, a traditional blue collar manufacturing city, with areas of intense development radiating from the downtown area. Although the 1980s saw an increase in commercial and industrial development, mostly light industrial, in the suburban areas, Bridgeport remains the regional center for offices, banking, government, education and associated activities. In addition, there is a substantial amount of unused and underused industrially and commercially zoned land that is primed for revitalization. In recent years, several former commercial properties in the downtown have been converted to residential uses and new construction has also taken place. With access to the deep-water of Long Island Sound, Interstate 95, and the New Haven rail line, vacant land parcels along the shore and remediation of Brownfield and Superfund sites, Bridgeport could experience a substantial growth in residential, commercial and manufacturing activity over the next twenty years. Bridgeport is also the transportation focal point for the region and serves as a transfer center between local and intercity bus, commuter rail, passenger ferry, and an interstate highway.

Aside from Bridgeport, higher density

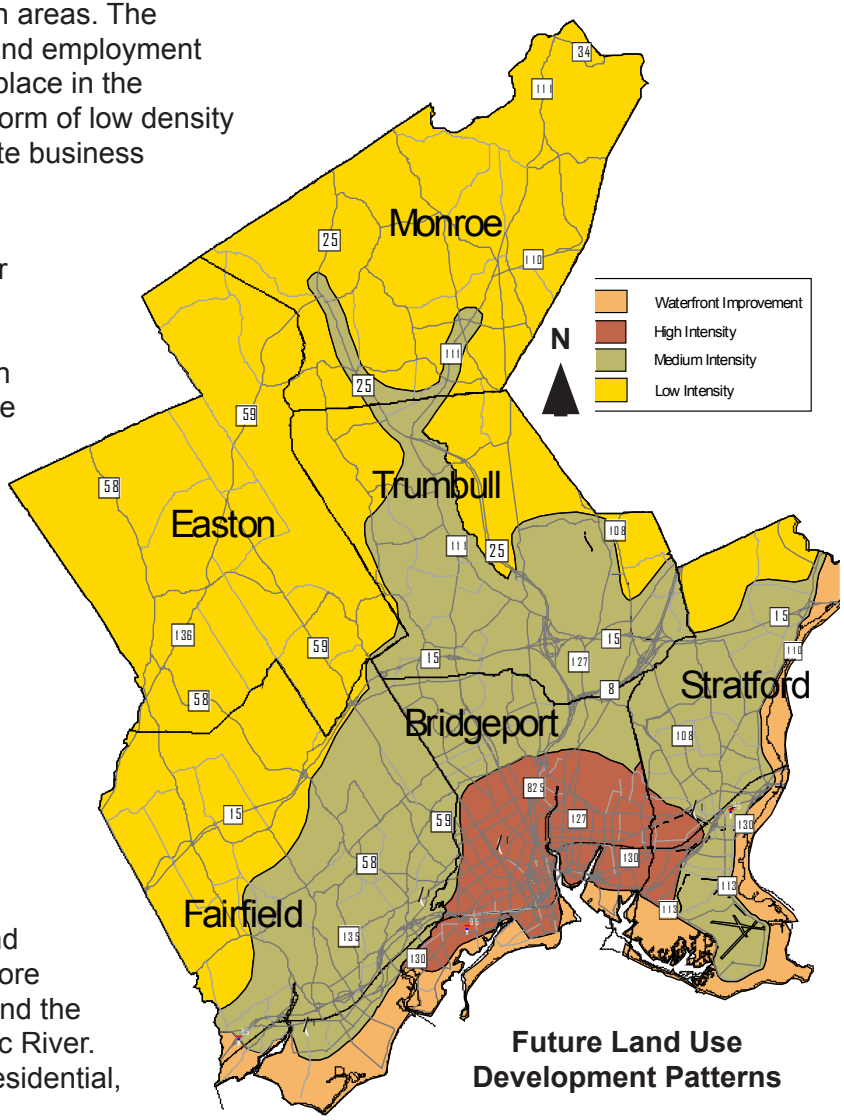
development is also located along the southern portions of Fairfield and Stratford. Most of the region's remaining open areas, recreation uses and farmlands are located in Easton, northern Fairfield, Monroe and Trumbull. Community activity centers for shopping, professional services, local government, and various other functions are found in all towns except Easton. These activity centers are generally located near a limited access highway or a major state route, such as Route 25, Route 58 or Route 111.

Overall, the region's land-use characteristics closely parallel municipal zoning districts established by respective planning and zoning commissions. The existing generalized land-use map of the Region shows residential land use patterns that display similarities with an area wide distribution of municipal zoning classifications. Likewise, industrial uses closely approximate established zoning district boundaries within the more developed southern portion of the region and are emerging within established zoning district boundaries within Monroe and Trumbull to the north.

Future development patterns are likely to follow current configurations with in-filling occurring in more intensely developed areas and low density developments locating in the suburban areas. The majority of population and employment growth is likely to take place in the suburban areas in the form of low density residential and corporate business parks.

For the long range transportation plan, four basic zones of different land use intensities of development have been identified. Many of these future development sites are in the vicinity of existing activity centers. Some of the future development areas correspond to former industrial sites in Bridgeport that are being marketed for redevelopment. These zones are:

Waterfront Improvement: This land is situated along the shore of Long Island Sound and the banks of the Housatonic River. Here, are a variety of residential,



Future Land Use Development Patterns

commercial, industrial and recreational land uses. Although some new development may occur as former industrial lands are re-used for other purposes, the environmental sensitivity of much of the waterfront suggests there will not be much new development, and any development that does occur will likely have a water dependent or port-related use.

High Intensity Development: This area includes most of the southern half of Bridgeport. Land use includes high density and multi-family residential, high rise office developments and heavy manufacturing. Density is high with little or no open space. For the foreseeable future, this zone will probably remain constant in its extent, and its population is likely to remain steady or decline. New development opportunities may present themselves in the form of re-use of former industrial sites.

Medium Intensity Development: This area is characterized by a mixture of single family and multi-family residences and apartments. Lot sizes are relatively small (one-quarter acre to half-acre). Commercial and retail activities are located in strips adjacent to major roadways or in self-contained shopping centers and office and corporate parks. Industrial activities are less intense, typically involving light manufacturing. This zone also includes the smaller downtown urban cores of the area. This is a mature area which is unlikely to expand its extent much farther, nor is its population expected to grow extensively. Future development within this zone will likely continue existing patterns of strip commercial and retail developments and light manufacturing facilities. However, as land farther away from the main roads is developed, the existence of office and corporate parks will increase.

Low Intensity Development: This area is dominated by single family residential units on large lots (greater than one acre) and other suburban, rural and semi-rural land uses. It is in this zone where most growth is now occurring and is projected to take place in the future. Despite expected growth, development in this area will continue to be less intense than in the more urban areas.

These future land development patterns are consistent with the Connecticut Conservation and Development Policies Plan. The generalized area typology in the state Plan, for the most part, corresponds to the areas shown on the future development map. The Regional Center category on the state Plan overlays the high intensity development

Persons per Housing Unit

	2009* Population	2009* Housing Units	Persons per Unit
Bridgeport	136,715	57,683	2.4
Easton	7,371	2,517	2.9
Fairfield	57,229	19,995	2.9
Monroe	19,340	6,842	2.8
Stratford	48,930	19,868	2.5
Trumbull	34,671	11,930	2.9
Region	304,256	118,835	2.6

*Source: U.S. Census Bureau, 2005-2009 American Community Survey *(5 year estimate)*

Trends in Number of Housing Units

	1990	2000	2009*	Percent change 1990-2009
Bridgeport	57,224	54,367	57,683	0.8%
Easton	2,215	2,511	2,517	13.6%
Fairfield	20,204	21,029	19,995	-1.0%
Monroe	5,596	6,601	6,842	22.3%
Stratford	20,152	20,596	19,868	-1.4%
Trumbull	11,095	12,160	11,930	7.5%
Region	118,476	119,264	118,835	0.3%

*Source: U.S. Census Bureau, Census 1990, Census 2000 and 2005-2009 American Community Survey *(5 year estimate)*

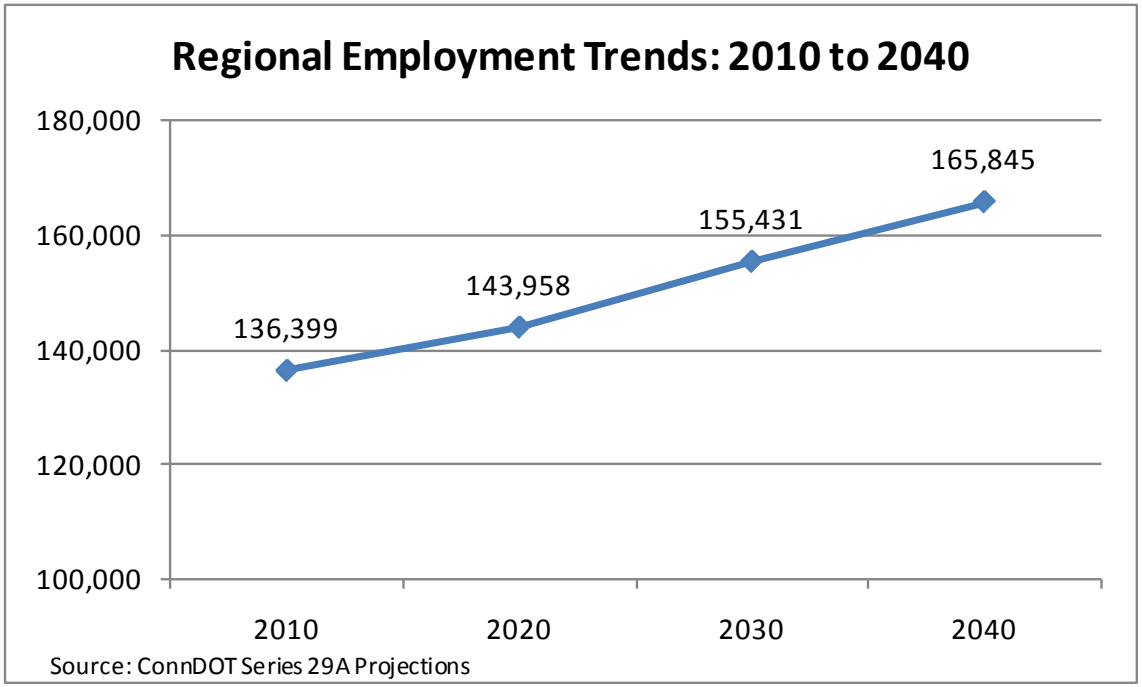
zone on the future land development map. This area includes downtown Bridgeport and the areas immediately adjacent to downtown. The other areas on the Conservation and Development Plan show similar consistency:

Growth Area and Neighborhood Conservation Areas on the Conservation and Development Plan overlay the medium intensity zone on the future development map. Conservation Areas overlays the low intensity zone.

Housing

The number of housing units in the region remained steady during the 19-year period from 1990 to 2009, growing only by only 0.3%. The growth in the number of housing units mirrored population trends. Since 1990, the housing stock was grown substantially only in Easton, Monroe and Trumbull. Over the same time period, the number of housing actually decreased slightly in Fairfield and Stratford.

Since 2000, the average number of persons per housing unit has remained steady, at 2.6 persons per housing unit. The larger household sizes are found in less densely populated towns, such as Easton, Monroe, Trumbull and Fairfield.



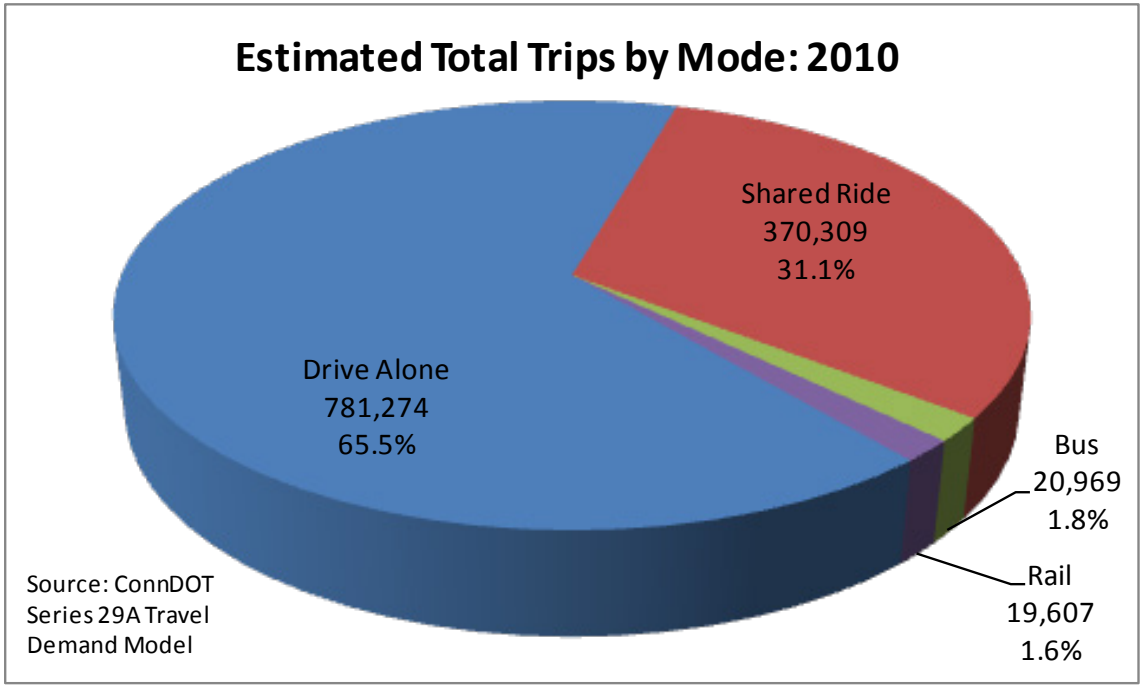
This contrasts with the 2.4 persons per unit average for Bridgeport and the 2.5 persons per unit average for Stratford, the two most urban and densely populated municipalities of the Region.

Employment

Employment is one of the key determinants of trips used by CTDOT in its travel demand modeling. Over the next 30 years, total employment in the region is expected to grow by about 21.6% and reach ±168,845 jobs, an overall increase of 29,446 jobs. For Stratford, employment is expected to increase by 37.0% and, for Bridgeport, the increase is estimated at 24.6%. These municipalities are the two largest employment areas in the region. By contrast, job growth in Trumbull is expected to be about 7.8%, with slight job growth projected in Fairfield and Monroe,

Estimated Employment Trends & Projections, 2010-2040					
	2010	2020	2030	2040	% Change 2010-2040
Bridgeport	57,135	59,545	65,497	71,175	24.57%
Easton	934	976	1,037	1,116	19.49%
Fairfield	24,505	25,266	26,206	26,988	10.13%
Monroe	7,361	7,645	7,937	8,224	11.72%
Stratford	28,302	31,932	35,662	38,763	36.96%
Trumbull	18,162	18,594	19,092	19,579	7.80%
Region	136,399	143,958	155,431	165,845	21.59%

Source: ConnDOT Series 29A Projections



10.1% and 11.7%, respectively.

These forecasts are based on current trends and a review of development plans to CTDOT for traffic impact assessment; however, unanticipated developments throughout the region may have a substantial impact on these estimates. For example, in Bridgeport, two large scale redevelopment projects – the Lake Success Business Park and Bridgeport Landing (Steel Pointe) – are being considered that would create manufacturing, office and retail jobs well beyond those estimated by CTDOT. Similarly, a large office/corporate development in Fairfield is advancing that would generate both jobs and trips that are not accounted for in the CTDOT forecasts. The estimated future employment levels were used for planning purposes and to simulate future trips at the regional (macro) level. The potential impacts from future development projects on a more localized level will be assessed on a site-specific basis as the projects become more defined.

Estimated Vehicle Trips

CTDOT maintains a computer travel demand model to estimate person trips and simulate travel patterns. The model is used to help determine future traffic

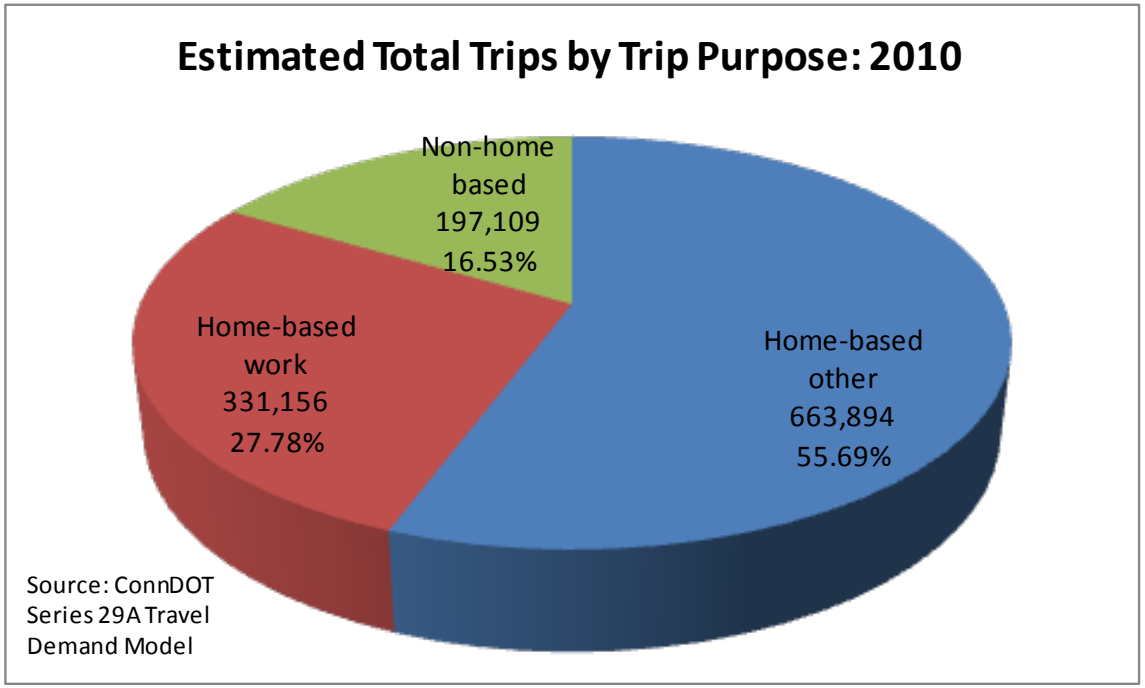
problems, assess possible changes in travel patterns due to major transportation improvements and develop the inputs to air quality models as part of the air quality conformity requirements. The number of trips made to, from and within the Greater Bridgeport Region was extracted from the statewide transportation model for the base year (2010) and horizon year (2040) for the LRP.

Trips are calculated based on historical relationships between person trips and population, employment, retail development, income, and vehicle ownership. Trips are estimated by trip purpose: home-based work, home-based other, and non-home based trips; and by mode: drive alone, shared ride, bus and rail.

Overall, it is estimated that, on a typical weekday, about 1,192,159 vehicle trips are made to and from the region. Work-related trips comprise 27.8% of the total, while non-commuting trips to or from the home account for about 55.7%. The remaining trips are non-work trips that do not involve a trip end at the home. As would be expected, the larger cities and places with more jobs and higher population have the higher number of trips.

The vast majority of vehicle trips are made using a private vehicle. Overall, about 96.6% of all trips involve the use of private vehicles, with the majority of these in the drive alone category. Shared ride use accounts for about 31.1% of all trips, and only about 3.4% of all trips are made by a form of public transportation (bus or train). Note that the statewide travel demand model does not estimate or consider non-motorized trips (bicycle and walking) because the typical length of trips made by these modes is below the sensitivities of the model.

As discussed above, the region is expected to grow slowly over the next twenty-to-thirty years, with an estimated increase in population of only about 5.4% between 2010 and 2040. However, over roughly the same time period, the growth in employment is estimated at 23.7%. The combination of larger population and job growth, plus the trend toward smaller household size, results in an increase in the number of trips. Based on CTDOT's travel demand model, total vehicle trips in the region are expected to grow by about 12.7% over base year levels and total over two million by 2040. Despite



efforts to promote alternative modes of travel and ridesharing, the trend is toward increasing reliance on the private vehicle with only one occupant. By 2040, the drive alone mode will account for about 70.2% of all vehicle trips, up from about 65.5% as indicated by the base year data.

The breakdown of vehicle trips by trip purpose is expected to remain statistically unchanged from current travel patterns. Only about 24% of trips will be home-based work trips, while non-work trips will continue to account for ±60% of all trips.

Estimated Total Vehicle Trips, To & From Greater Bridgeport Planning Region: 2010							
	Bridgeport	**Easton**	**Fairfield**	**Monroe**	**Stratford**	**Trumbull**	**Total**
Bridgeport	373,624	3,984	76,833	6,037	59,035	44,352	563,865
Easton	3,984	8,054	3,157	1,878	738	3,871	21,682
Fairfield	76,833	3,157	178,486	2,075	11,018	11,489	283,058
Monroe	6,037	1,878	2,075	39,926	1,982	16,320	68,218
Stratford	59,035	738	11,018	1,982	114,724	14,685	202,182
Trumbull	44,352	3,871	11,489	16,320	14,685	110,358	201,075
Subtotal for Region:	563,865	21,682	283,058	68,218	202,182	201,075	1,340,080
Southwest Region	61,113	10,714	69,069	10,195	20,878	19,050	191,019
Valley Region	21,663	903	6,042	11,206	20,441	23,289	83,544
Housatonic Valley	6,072	1,551	2,841	8,442	2,149	6,520	27,575
Central Naugatuck	6,752	409	2,980	3,073	3,155	4,441	20,810
South Central	48,324	1,144	15,235	4,194	50,615	16,179	135,691
Remainder of CT:	5,209	114	1,831	679	2,425	1,957	12,215
Subtotal for CT outside of region:	149,133	14,835	97,998	37,789	99,663	71,436	470,854
New York	17,891	1,881	17,597	673	6,011	3,993	48,046
Other State	1,783	6	22	2	1,126	280	3,219
Subtotal Other States:	19,674	1,887	17,619	675	7,137	4,273	51,265
Total:	732,672	38,404	398,675	106,682	308,982	276,784	1,862,199
	Bridgeport	**Easton**	**Fairfield**	**Monroe**	**Stratford**	**Trumbull**	**Total**
Home-based other:	421,397	24,868	229,042	65,125	183,654	158,634	1,082,720
Home-based work:	182,092	8,530	92,528	25,217	74,353	58,593	441,313
Non-home based:	129,183	5,006	77,105	16,340	50,975	59,557	338,166

Estimated Total Vehicle Trips, To & From Greater Bridgeport Planning Region: 2040							
	Bridgeport	**Easton**	**Fairfield**	**Monroe**	**Stratford**	**Trumbull**	**Total**
Bridgeport	463,108	5,455	80,937	9,713	71,925	47,020	678,158
Easton	5,455	11,196	3,809	2,462	1,003	3,989	27,914
Fairfield	80,937	3,809	168,446	2,373	10,646	10,507	276,718
Monroe	9,713	2,462	2,373	46,838	3,043	17,170	81,599
Stratford	71,925	1,003	10,646	3,043	140,290	16,420	243,327
Trumbull	47,020	3,989	10,507	17,170	16,420	102,382	197,488
Subtotal for Region:	**678,158**	**27,914**	**276,718**	**81,599**	**243,327**	**197,488**	**1,505,204**
Southwest Region	73,056	14,857	78,670	13,295	23,022	22,838	225,738
Valley Region	26,276	1,169	5,932	12,942	24,449	24,433	95,201
Housatonic Valley	8,253	2,030	2,856	10,521	3,043	6,563	33,266
Central Naugatuck	8,505	526	2,844	3,349	4,166	4,424	23,814
South Central	59,787	1,492	14,870	5,330	61,766	17,557	160,802
Remainder of CT:	6,486	164	1,783	903	3,294	2,055	14,685
Subtotal for CT outside of region:	**182,363**	**20,238**	**106,955**	**46,340**	**119,740**	**77,870**	**553,506**
New York	15,500	1,717	12,615	568	5,776	2,908	39,084
Other State	355	16	0	0	259	44	674
Subtotal Other States:	**15,855**	**1,733**	**12,615**	**568**	**6,035**	**2,952**	**39,758**
Total:	**876,376**	**49,885**	**396,288**	**128,507**	**369,102**	**278,310**	**2,098,468**
	Bridgeport	**Easton**	**Fairfield**	**Monroe**	**Stratford**	**Trumbull**	**Total**
Home-based other:	512,408	33,136	238,681	82,064	220,075	165,334	1,251,698
Home-based work:	215,509	10,734	89,384	28,738	89,168	62,024	495,557
Non-home based:	148,459	6,015	68,223	17,705	59,859	50,952	351,213

Section 3: Local Bus System

Greater Bridgeport Transit Bus Services and Operations

Greater Bridgeport Transit (GBT) provides fixed-route and demand response public bus service in the Greater Bridgeport region, serving Bridgeport, Fairfield, Stratford and Trumbull with additional local and express services extending into Monroe, Shelton and Derby. Interregional services (the Coastal Link) extend into Norwalk, Westport, Milford, and accommodate transfers with other transit systems, including Connecticut Transit (CT Transit New Haven and Stamford Divisions), Norwalk Transit District (NTD), Milford Transit District (MTD) Housatonic Area Regional Transit (HART) and Valley Transit District (VTD).

The local, fixed-route bus system consists of 19 routes, with various route extensions and branches to extend coverage. Two routes (19X and 22X) provide limited stop and express service during the morning and evening peak hours. GBT also operates the Coastal Link (CL) service, jointly with the MTD and NTD. CL provides a one-seat ride between the Wheels Hub in Norwalk and the Connecticut Post Mall in Milford. Transfers to local NTD and CT Transit bus routes and the 7 Link express route to Danbury are available at the WHEELS Hub and to MTD and CT Transit routes at the Connecticut Post Mall. Other service extensions provide job access enhancements to destinations along Bridgeport Avenue in Shelton, along the route 110 corridor in Stratford and Shelton, to the Derby rail station and along Route 25 and Route 111 in Monroe.

The GBT fixed route system is radial in that most routes begin, end, or pass-through downtown Bridgeport stopping at the downtown terminal. Annually, about 5.9 million passengers are carried and service is operated for over 187,000 hours (7 days/week including holidays). It is noteworthy that ridership has grown from 5.2 million boardings annually in FY

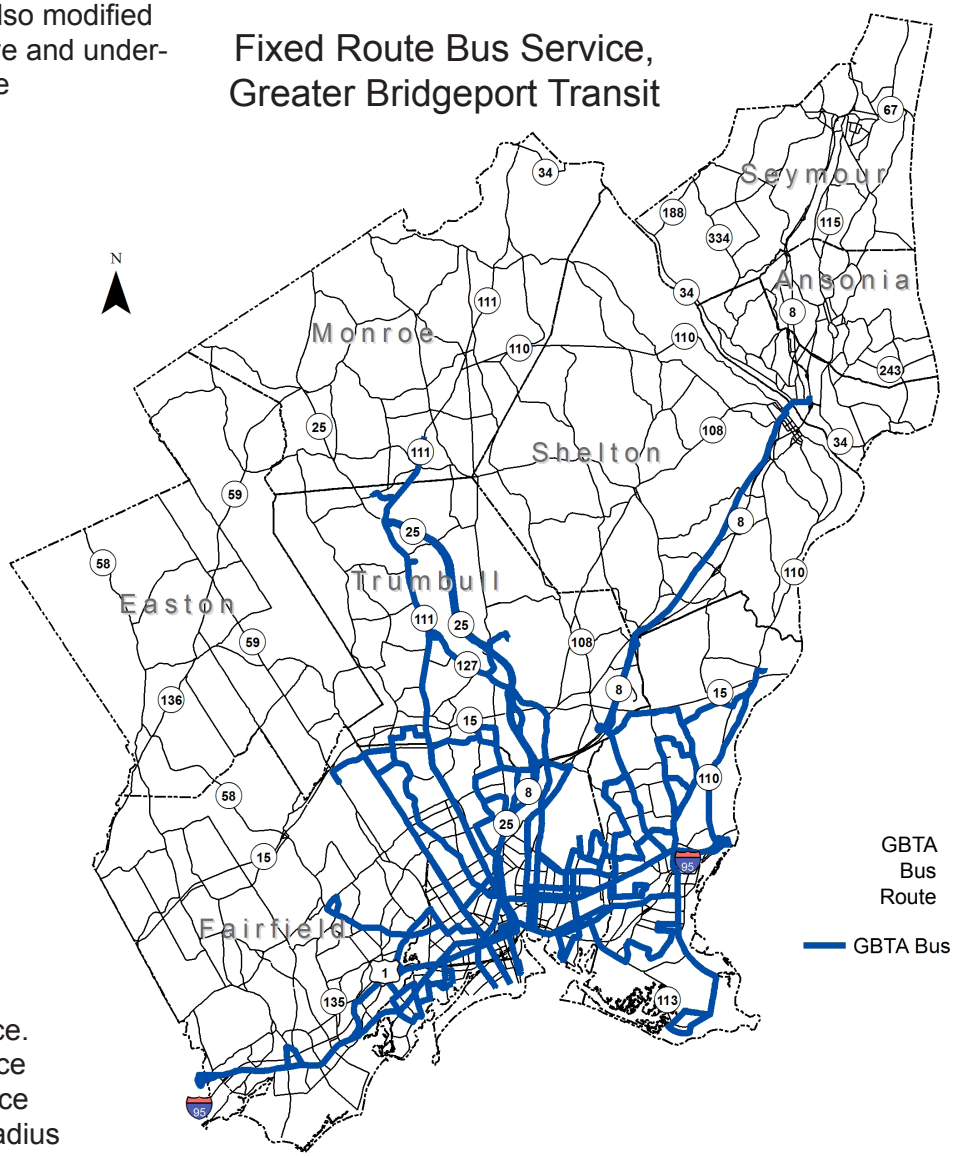
2011 to 5.9 million boardings in FY 2014. Ridership is expected to surpass 6 million in FY 2015.

In August 2007 a new bus terminal was opened in downtown Bridgeport along Water Street just north of the Bridgeport rail station. The station is part of the Bridgeport Intermodal Transportation Center and consists of a 3,000 square foot in-door waiting area with ticketing and information office and seventeen individual bus bays, designated for specific routes including interstate bus services. Advanced transit traveler information systems were installed in 2009 and linked to GBT's automated vehicle location system. The dynamic message signs at each bus bay and inside the terminal provide information on next bus arrival and estimated time to arrival. GBT has made real-time bus arrival and departure available on its website: gogbt.com and uses social media, such as Facebook and Twitter, to extend its outreach in the service area. All outreach is in English and Spanish as perscribed by GBT's Limited English Proficency (LEP) Program.

With the opening of the new bus terminal, GBT restructured its services and instituted a timed-transfer, pulse-point at the terminal to better coordinate service and facilitate transfers between routes.

The route structure was also modified to eliminate less productive and under-utilized routes, consolidate duplicative routes and eliminate and shorten circuitous alignments to reduce travel times. The intent of the restructuring was to improve reliability and better serve the residents and businesses in the region.

The GBT also operates paratransit services in compliance with the Americans with Disabilities Act, known as GBT Access. GBT Access provides door-to-door service for persons who, because of their disability, are unable to use fixed-route bus service. A variety of trip purposes are provided by the service, but trips need to be scheduled in advance. Because paratransit service is limited to the GBT service area (three-quarter mile radius



of a fixed bus route), some of the region's elderly and disabled population is not reached or under-served.

While there have been successful efforts to enhance fixed route bus services,

efforts to expand service remain limited and somewhat constrained. Investment by the State of Connecticut has grown over the past several years and , coupled with increase revenue through the fare box, has allowed for the continuation of service levels and several minor service improvements including additional CL service on Sunday mornings and frequency improvements on Route 8 on Saturdays. However, funding for the GBT's next proposed round of improvements has not yet been secured. Proposed modifications are included in the table on the right side of this page.

In addition, job access enhancements are funded by special Federal Transit Administration (FTA) program funds that are not guaranteed to remain at current levels. Other system improvements, including frequency, service span and the introduction of service to new geographic areas that will better meet the needs those living in the region are currently beyond the available operating investment.

To address the financial constraints issue, GBT will continue system planning efforts to identify the optimal reallocation of existing resources to make the system more efficient, enhance on-time performance, and ensure that route coverage is commensurate with existing and future land use. In addition, GBT will continue to pursue new funding and funding sources for service improvements.

Proposal Number	Routes Impacted	Service Day	Description of Proposed Modification
1	8	Saturday	Adjust Saturday schedule to reflect weekday travel times.
2	1	Saturday	Continuation of 30 minute frequency until 9:00 PM.
3	13	Weekdays	Continue 30 minute frequency throughout the day.
4	CL	Weekdays	20 minute service all day from Norwalk to Milford.
5	15	Weekdays	30 minute service from downtown Bridgeport to Derby, during peak travel times.
6	23	Weekdays	Close midday gap in this schedule.
7	16	Saturday	90 Minute Route 16 service on Saturdays
8	10	Saturday	Extend Route 10 service on Saturdays by 1 hour.
9	9	Saturday	Extend Route 9 Service on Saturdays by 1 hour
10	CL	Sunday	Earlier Sunday Departures
11	17	Weekdays	One additional trip on Route 17 Weekdays

The proposed actions included in the regional long range transportation plan focus on:

1. Maintaining the system in a state-of-good repair.

2. Maintaining existing service levels.

3. Expanding service to meet growing demand.

4. Pursuing resources for reaching new markets.

Additionally, GBT is incorporating sustainable development elements, promoting energy efficiency and reducing the use of non-renewable resources. As of this writing, GBT has secured a grant of $13.5 million for the purchase of up to 19 new hybrid (diesel-electric) buses as part of its planned fleet replacement program.

Coastal Corridor Bus Study

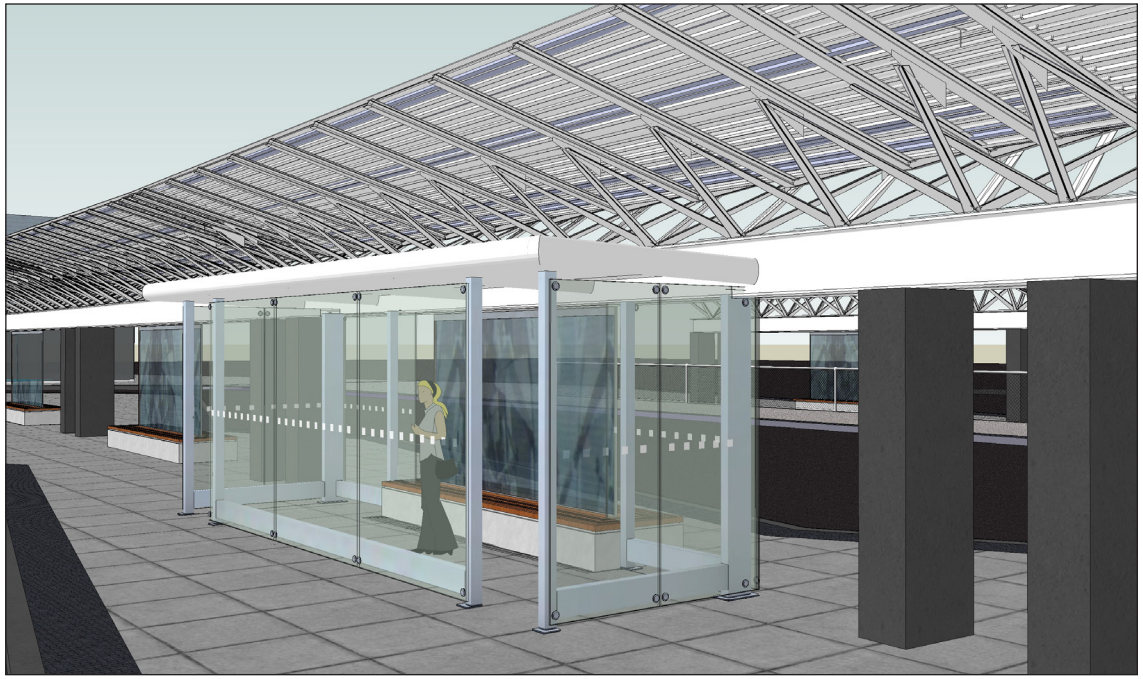
In 2012, a Coastal Corridor Bus Study was undertaken by a consortium of regional planning organizations and local bus operators in Fairfield and New Haven counties, including the Greater Bridgeport Regional Planning Agency, South Western Regional Planning Agency, GBT, MTD, NTD, and CT Transit (New Haven and Stamford divisions). The intent of the study was to determine the approaches and strategies necessary to improve bus service and increase ridership across Connecticut's Coastal Corridor and design a more cohesive, expanded and effective service plan that improves delivery of bus services and maximizes operational efficiency. Recommendations from the project which are currently being explored include:

Short-term implementation:

- Realign Route 11A through Greenwich and de-interline Routes 11 and 41.
- Modify Coastal Link routing through The Dock Shopping Center.
- Incorporate Route S into Route F; provide new express trips to Guilford and Madison.
- Consolidate bus stops to decrease travel time; tighten schedules and adjust running times to improve reliability (ensure coordination where possible, prioritizing coordination between Routes 11 and 41 in Stamford, the Coastal Link and Route 41 in Norwalk, and the Coastal Link and Route O in Milford).
- Encourage passengers to exit to the rear to decrease dwell times.
- Frequency and span improvements on the Coastal Link.
- Addition of a backup vehicle to the Coastal Link to cover for breakdowns or other extenuating circumstances.
- Branding and marketing initiatives (logo, consistency in public information, signage, etc.)

Mid-term implementation:

- Splitting of the Coastal Link at Bridgeport and incorporation of Route OS into the Coastal Link East. Simultaneously, re-alignment of service through New Haven and incorporation of the segment within New Haven into Route OW or Route B. Some



branding/marketing improvements must correspond to these changes.

- Re-tooling of schedules to ensure schedule coordination where appropriate, particularly at Bridgeport, Norwalk and Stamford). Any remaining proposed frequency/span enhancement would ideally be implemented at this time.
- Implementation of Coastal Link East Express Route between Bridgeport and Hamden, replacing Route 55x.

Long-term implementation:

Implementation of Coastal Link West Express route between Bridgeport and Stamford.

Ongoing:

- Traffic and technology improvements would take place gradually, as money becomes available and intersections are improved.
- Implementation of smart (proximity) card technology.
- Provision of real-time schedule information at stops.

Transit Oriented Development Pilot Project

GBT and GBRC are currently collaborating on a comprehensive regional transit initiative called the Regional Transit Oriented Development Pilot Project which includes five tasks. While all of the tasks have transit elements, the three which include the most bus related transit work include:

- The East Bridgeport Development Corridor
- The Alternative Modes Evaluation.
- The Long Range Transit Plan.

The study is expected to complete in 2015 and represents a system-wide planning project to assess the needs and opportunities for service growth throughout the region. The scope of this project was jointly crafted by GBRC and GBT.

Clean Technology Actions

In 2012, the GBT, in partnership with the Connecticut Department of Transportation, received two 40 foot buses with hybrid diesel-electric

propulsion systems for operational testing in the Bridgeport region. CTDOT has operated hybrid buses since 2003 with great success. Mobile emissions testing and real-world experience indicate that the fuel economy of a hybrid bus is 20%-to-25% greater than a conventional diesel bus. GBT's tests also indicate an efficiency in the use of these vehicles. The two pilot buses were operated in advance of GBT's replacement of 73% of its fleet planned for 2015 and 2016. GBT is also investigating the possible deployment of buses for its fixed route fleet with full electric propulsion systems.

In February 2015, GBT received a grant of $13.5M for the purchase of the first 19 of 40 replacement buses. This funding was flexed from the CMAQ program to FTA 5307 funding and will be used for the purchase of cleaner, more efficient hybrid (diesel-electric) buses. GBT is also considering full electric vehicles and is currently investigation several types of electric buses.

GBT Facility Expansion and Improvement Project

The GBT has initiated a project to expand and improve its administrative and maintenance facility located at One Cross Street in Bridgeport. The project will expand the maintenance garage to accommodate a larger fleet and complete a comprehensive and much needed rehabilitation of the entire facility. The improvements are essential for the GBT's sustained growth and for operational and safety purposes. The current facility was built in 1987 and houses all of the administrative, bus maintenance and bus storage activities of the GBT. Because of its age and growth of the GBT operations, the facility can no longer adequately accommodate all GBT functions and is in need of a major rehabilitation and expansion.

While the GBT operates in an efficient manner, the facility is beyond capacity and its physical constraints hinder further operations and growth. The project will provide the additional space needed for vehicle maintenance, indoor storage, training, operations and administration. To date, GBT has completed several elements of this project including the design and replacement of the roof on its

maintenance facility (80,000 s.f.) and the preparation of construction documents for the replacement of five separate in-ground fuel tanks (three 20,000 gallon diesel, one 10,000 gallon gasoline and one 4,000 gallon waste oil tank). Construction fo the fuel tank replacement project is expected to commence in the late spring of 2015 and complete in the late autumn 2015.

Downtown Bridgeport Bus Terminal Weather Protection Enhancement Project

The new downtown Bridgeport bus terminal provides designated bus bays for each fixed bus route and outdoor waiting areas. Passengers are protected by canopies over the waiting platforms. During the first year of operation, it was determined that additional weather protection would benefit riders waiting on the exterior platforms. The proposed project, which was based on rider input, enhanced the waiting areas by incorporating five heated enclosures at select locations along the platforms. These were completed in 2012. While the original project was also to include the widening of the canopies at all of the bays, GBT has determined that the platform canopies, the newly added heated enclosures on the platform and the interior 3,000 S.F. passenger waiting area provide appropriate protection for passengers waiting on the platforms. Some conceptual designs have been prepared for a canopy widening. However, GBT is not advancing that portion of the project at this time.

GBT Bus Shelter Replacement Program

In an effort to improve amenities for riders, GBT has embarked on a major shelter replacement program throughout its service area. The project includes the installation of up to 60 passenger waiting shelters throughout Bridgeport and the region. To date, GBT has procured a shelter manufacturer, a shelter installer and an engineering firm for the preparation of shelter location site plans and the requisite permitting. The first three of these shelters have been installed and GBT expects an additional 20 installed in the spring/summer of 2015 with the project completing by the end of fall 2016.

New Trumbull Mall Bus Hub

Working with the management of a regional mall, GBT has constructed a new, expanded bus hub at the northern terminus of its routes 3, 4, 6, 8, 14 and 20. This hub replaces an aging, smaller facility and provides new lighted shelters and space to accommodate up to four buses at one time. This project also reduces the travel on the mall property by more than 100 miles each day by providing sufficient turning radii to negate the need for buses to travel on the property ring road.

GBT Bus Capital Improvement Program

The GBT develops and regularly updates its 20-year capital program to maintain the local bus system (fleet/facilities/equipment) in a state-of-good-repair and

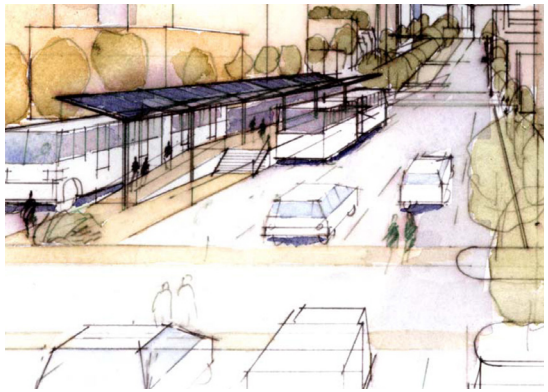
ensuring that federal assets are properly maintained and that the replacement of rolling stock, support vehicles, facilities and other equipment on kept on appropriate life-cycle schedules. The capital plan is incorporated in the regional transportation improvement plan are grouped into several categories:

Fixed-Route Bus Replacements: The GBT owns and maintains a fleet of 57 large buses for its fixed-route operations. Of the current fleet, 42 were purchase in 2003 and 2004 and 15 were purchased in 2013. The recommended useful life of a transit bus is 12 years or 500,000 miles. Extended use of the vehicles beyond the 12-year life can significantly increase maintenance costs and out-of-service times. GBT buses are deployed on a schedule which ensures quality service and avoids equipment shortages due to servicing needs. GBT's next procurement of large city buses is in the pre-procurement/specification development phase and an RFP for procurement over a five year period is expected to be released in mid 2015. It is noteworthy that GBT is conducting this procurement jointly with CTDOT.

Small Capital Vehicles: The GBT uses small vehicles to supervise and monitor bus operations as well as for maintenance purposes, such as service vehicles and tow trucks. Vehicles need to be replaced as they reach the end of their useful lives.

Paratransit Vehicles: This project will replace the GBT's fleet of small vans and mini-buses used for its specialized ADA and other Demand Response Services. These vehicles have an FTA defined useful life of 5 years.

Administrative Capital Equipment: This project involves the replacement and upgrade of administrative capital equipment at the GBT's central office and downtown bus terminal. The need for this action is to maintain efficient, reliable and state-of-the-art operations. About $300,000 is allocated each year for this project.



Source: Madison Downtown Design Professionals Workgroup

Maintenance Capital Equipment (Ship Tools and Equipment): To maintain fixed-route buses and paratransit vehicles in a state-of-good-repair, the GBT's maintenance facility has programmed $150,000 annually. This funding is used for a wide range of maintenance tools and equipment and the list of required items is updated annually.

Computer Software and Hardware: GBT maintains an extensive computer system extending to all of its facilities and includes basic office needs, operational needs in support of an automatic vehicle location system, fuel tracking, fleet maintenance, and safety/security systems. It is noteworthy that both demand response and large buses also include the procurement of AVL and other on-board equipment.

Mid-life battery Replacement: GBT is currently operating two hybrid (diesel-electric) large buses which will require battery replacement at mid-life (approximately 6 years) estimated at $75,000 per unit.

Shelter Capital Improvement: The GBT designates bus stops with a custom sign that includes GBT's logo, route numbers

of buses stopping at the location and other service information. Additionally, GBT is currently placing or replacing up to 60 bus shelters throughout the service area under an existing FTA Grant. GBT has placed in its capital program for 2019 additional funding for capital repairs to its bus amenity infrastructure.

Bridgeport Intermodal Transportation Center Bus Station: GBT operates a passenger facility located on Water Street in Downtown Bridgeport. GBT has considered ongoing facility and equipment repairs and replacement at the facility.

Bus Rapid Transit (BRT) Service and Routes

Bus rapid transit (BRT) systems are a “flexible, rubber-tired rapid-transit mode that combines stations, vehicles, services, running ways, and Intelligent Transportation System (ITS) elements into an integrated system with a strong positive identity that evokes a unique image.” While the design elements and complexities of various BRT systems vary among the systems under design or constructed, several common features distinguish BRT from a conventional, fixed route bus system. These include:

1. Providing limited stop operations.
2. Priority along the right-of-way.
3. Well-designed and dedicated transit stops or stations.

The intent is to mimic the operation and levels of service of a fixed-rail system at a lower cost.

The South Western Regional Planning Agency completed a BRT study to determine the feasibility of implementing operational improvements along US Route 1 from Greenwich to the Norwalk transit hub. The study recommended a number of service and infrastructure enhancements and amenities associated with BRT.

To further facilitate bus service and operations in lower Fairfield County, it is recommended that a similar feasibility study be conducted by the GBRC and infrastructure and operational enhancements be implemented through the Greater Bridgeport Region to realize an enhanced bus system extending from Greenwich to New HAven. The probable BRT route would follow US Route 1 through Fairfield serving the Town Center and Fairfield Metro Center rail stations, along Route 130 in Black Rock to downtown Bridgeport, on the Route 8/25 expressway to US Route 1 through the Bridgeport east side and Stratford.

Depending on the outcomes of a Greater Bridgeport BRT study, the likely improvement actions would include:

- Appropriate span of service (hours of operation);
- Improved schedule reliability through implementation transit signal priority and intersection improvements;
- Limited stop service and/or segments of express bus service;
- Improved dissemination of real-time traveler information linked to the GBT advanced communications system;
- Designated passenger waiting areas and facilities; and
- New vehicles with a specific service and brand identity

The development of a BRT system within the Route 8 corridor from the city of Derby to downtown Bridgeport is also being considered. A joint, collaborative study is being initiated by the Valley Council of Governments (VCOG) and GBRC to examine alternative modes for the corridor. The two cities are linked by Route 8, a six-to-ten lane expressway that provides a high speed, high level of service automobile-depended connections. However, operations on Route 8 are constrained during the peak travel periods at the Commodore Hull

Bridge, especially in the southbound direction during the morning time frame. Recurring congestion and safety concerns may necessitate the replacement of the bridge at a $500 million-to-$1 billion price tag. The Route 8 corridor is a vital piece of the transportation system in south western Connecticut, connecting the Waterbury metropolitan area with Bridgeport, Norwalk and Stamford, linking I-84, Route 15 and I-95, and providing the main access between the affordable housing markets of the Naugatuck Valley to the employment opportunities of lower Fairfield County. At present, there are limited alternatives to driving this corridor:

- Commuter rail service is provided along the Waterbury branch but offers minimal service and the line is located east of the Housatonic River providing indirect connections to Bridgeport and destinations to the west;
- GBT Bus Route 15 runs between the Derby rail station and downtown Bridgeport via Bridgeport Avenue in Shelton but the travel time is nearly one hour (56 minutes) and operates almost exclusively on local roads.

The alternative modes study will explore alternatives to driving the Route 8 corridor, evaluate infrastructure improvements to support alternative modes and determine the feasibility of implementing new alternate transit modes, such as BRT or some form of fixed rail. The service will be operated primarily within the Route 8 corridor, either as part of the existing facility or on a new, exclusive right-of-way. Station stops would be provided along Bridgeport Avenue in Shelton, and in Stratford, Trumbull and Bridgeport.

Downtown Bridgeport Bus Terminal Pedestrian Enhancements

The new downtown bus terminal opened in August, 2007. It is located at the intersection of Water Street and Stratford Avenue, about 900 feet from its former site and two blocks from the Main Street commercial corridor of downtown. The new location poses several safety concerns for pedestrians wanting to access the terminal. While sidewalks are present along all adjacent roads serving the site, Water Street in front of the terminal provides four travel lanes and a left-turn lane and is a median-divided, six-lane facility on the far side of intersection. The approach on Stratford Avenue also accommodates multiple lanes and movements. Pedestrians coming from the downtown area must cross this wide, heavily trafficked intersection. An elevated pedestrian walkway connects the bus terminal to the Bridgeport rail allowing pedestrian to cross Stratford Avenue separated from traffic.

After the terminal opened, concerns about the safety of pedestrians accessing the terminal arose. Pedestrians have been observed crossing Water Street at undesignated locations. Because the entrance to the terminal is offset from the intersection and the bus bays are positioned at the far end of the site, bus riders tend to cross at a more mid-block location rather than use the designated crosswalks and available pedestrian signals.

To address this situation, the GBRC examined pedestrian movements in vicinity of the terminal and assessed pedestrian safety. The proposed actions would convert the section of Water Street in front of the bus terminal into a pedestrian friendly environment with features that clearly designate the area as a shared space. Suggested enhancements include:

Install a raised pedestrian table along Water Street in front of terminal. The table would provide sloped ramps on either end and would be raised to match the height of the curb. It would be constructed with

concrete pavers or textured pavement to accentuate the area as different from the road. Raised tables basically make the entire section pedestrian territory and can be effective in increasing motorist compliance with pedestrian laws and yielding to pedestrians;

Narrow Water Street to eliminate at least one travel lane and extend the raised median to Stratford Avenue. The narrower road width will shorten the walk distance for pedestrians and the median will provide a refuge for pedestrians when crossing; and

Installed enhanced pedestrian actuated signal equipment, including countdown displays, audible warnings and possibly embedded lighting in the pavement. When a pedestrian activates the signal, the lights flash at a constant rate to warn motorists.

GBT Fixed-Route Bus Operations

The GBT implemented many route and schedule revisions as part of the new bus terminal project and to rationalize the system. GBT relies on the state of Connecticut to provide an operating investment to fully cover expenses with only limited contributions from local municipalities.

Paratransit Services

The GBT is required by federal regulations to supplement its fixed-route operations by offering specialized ADA transportation for persons who have a mobility impairment that prevents them from using a regular fixed-route bus. State and federal operating subsidies are provided to the GBT for this service and capital needs, including the acquisition of ADA accessible vehicles, are eligible under the FTA bus capital program. In addition, other provisions in MAP-21 authorize federal funding assistance to support specialized paratransit service to the elderly and disabled. The FTA Section 5310: Formula Program provides funding to non-profit service providers for capital costs associated with providing ADA services, primary for accessible vehicles. 5310 funds may also be used to increase opportunities for the mobility impaired population group for enhanced services above and beyond those required by the ADA.

Projects and activities funded under these programs must come from and be included in a locally-developed human service transportation coordinated plan, referred to LOCHSTP. The GBRC participates in an urban area working group, a consortium of three RPOs and five transit operators, to prepare and update the LOCHSTP plan and select projects for funding. A new initiative is underway by a regional Mobility Manager to provide assistance to persons with disabilities facing mobility issues, by providing outreach to prospective riders with disabilities, identifying barriers preventing people with disabilities from using existing services, and assisting with development and planning of new services.

Facilities Operation: Water Street Station: GBT also maintains a budget for the operation of the downtown Bridgeport Bus Station. This funding is used for general repairs and replacement of equipment.

Section 4: Rail

Commuter Rail Service

Commuter rail service offers a vital alternative for travel within and beyond Connecticut, especially lower Fairfield County and New York City. The Metro-North Railroad, a subsidiary of the New York Metropolitan Transportation Authority, operates commuter trains through the Region on the electrified New Haven main line (NHL-ML). The NHL-ML is one of five commuter rail lines operated by Metro-North Railroad in the New York Metropolitan area. Combined, they are one of the busiest commuter railroads in North America.

The NHL-ML runs east-west along the southwestern shoreline of the state between New Haven and New York City. This area is the most heavily developed and populated portion of the state. Commuter rail service is oriented towards travel to and from New York City. Peak service consists of trains headed inbound toward New York City (Grand Central Terminal) in the morning and outbound from New York City during the evening.

The State of Connecticut owns and maintains the portion between the state line and New Haven. There are 19 stations along the NHL-ML, five located in the region: Stratford, Bridgeport, Fairfield Metro, Fairfield Downtown, and Southport. The right-of-way is comprised of four main tracks (three in one section), constructed with continuous welded rail. The NHL-ML is electrified using overhead catenary wires. It is maintained at Federal Railroad Administration (FRA) Class 4 track standards.

Metro-North Railroad operates commuter rail services along the New Haven rail line.

In addition to main line service, three branch lines provide access from the Danbury and Waterbury areas and several adjoining communities. The region is served by the Waterbury Branch Line (NHL-WTY) extending from

Waterbury to the interlocking on NHL-ML at Devon. Waterbury branch line trains continue on the main line making stops at Stratford and Bridgeport. The NHL-WTY is non-electrified and single-track. These line features limit and constrain the level of service that can be effectively provided regardless of demand.

Several Shore Line East trains, operated by the Connecticut Department of Transportation (CTDOT) east of New Haven, continue past New Haven and make stops at Bridgeport and Stamford. Amtrak operates inter-city and inter-state service over the NHL-ML under an agreement with CTDOT, making stops at Bridgeport.

Based on data from CTDOT's state rail plan, ridership on the NHL has increased significantly over the past several years, partly in response to significant increases in gasoline prices. Between 2005 and 2009, total ridership increased about 7.0% to an annual total ridership of about 9.4 million passengers. Passenger boardings from the region's rail stations total about 8,100 persons per day. The busiest stations are Bridgeport and Stamford.

Inbound Weekday Rail Boardings Greater Bridgeport Rail Stations			
	2005	2008	% Change
Stratford	1,126	1,562	38.70%
Bridgeport	3,120	3,258	4.40%
Fairfield	2,641	2,955	11.90%
Southport	277	341	23.10%
Total	7,164	8,116	13.30%

Source: ConnDOT

Parking for rail commuters at NHL-ML stations has been a critical issue for many years. The amount available is constrained at almost every station and actions to expand the supply have been difficult to implement. Increasing parking capacity at stations along the NHL-ML is a vital objective of the state's strategy to attract and maintain riders on Connecticut's commuter rail network. Efforts have been completed or are underway to address commuter parking needs. A parking garage was built at the Bridgeport rail station as part of the Intermodal Transportation Center project and a new surface lot was created under the I-95 viaduct. The new Fairfield Metro station includes a 1,500-space parking lot. Plans are also being formulated to expand the parking supply at the Stratford rail station. However, the cost of parking remains a concern, as high parking rates are a disincentive to using the train and makes it a less desirable option, despite travel time savings, over using the congested I-95 corridor. Further complicating the issue is that each host community sets the parking policies and rates at their respective stations.

Although commuter rail service is oriented to New York City, intrastate trips have increased steadily over the years and account for a larger proportion of total ridership. The state has implemented services and programs that better accommodate and better serve intrastate commuter rail trips. Examples include extending Shoreline East service to Bridgeport and Stamford, instituting Uni-Ticket and Uni-Rail passes, and holding costs on rail fares within Connecticut.

Cost containment and efficient ways to deliver rail service will depend on resource identification, process improvement, technology advances, tracking human resources and financial data.

The long range transportation plan includes state actions to maintain, improve and modernize the New Haven rail line, facilities and rail cars, and focuses on efforts within the region to rehabilitate station infrastructure, expand parking opportunities and develop new rail-related facilities.

New Haven Rail Line Infrastructure Improvement Program

The long range plan recognizes the importance of commuter rail services to a balanced transportation system and its complementary role in serving the mobility needs of travelers in southwestern Connecticut. It is essential to preserve and maintain commuter rail services, maintain the New Haven line right-of-way in a state of good repair, and modernize, rehabilitate and replace equipment and train consistently. Over 8,100 commuters board New Haven line trains from the region bound to points west and the line is critical to the economic wellbeing of the region and provides a critical link to the core of the New York metropolitan area and the global market. The region's economy relies on this connection and linkage. The following projects represent the locally preferred alternatives to be funded using the FTA's Fixed Guideway Capital Investment Grant, State of Good Repair Grant and Urbanized Area Formula Grant programs as identified from an Alternatives Analyses in accordance with 49 U.S.C. 5309 and 49 CFR Part 611.

Rolling Stock Replacement: New M8 Electric Multiple Unit (EMU) Rail Cars: In 2006, CTDOT initiated the purchase of a new fleet of electric multiple unit rail cars,

designated as M8s. The manufacturer is Kawasaki Rail Car. The new rail cars replaced first generation multiple unit vehicles that were over thirty years old. Deployment of the new fleet is close to completion.

East Bridgeport Rail Yard Expansion: The project improved and expanded the infrastructure at the East Bridgeport Rail Yard. Additional yard storage tracks were installed for the light servicing of rail cars and storage of existing rail cars that were displaced by the reconstruction of the New Haven yard and to accommodate the new fleet of M8s. The upgrades included electrifying some tracks for revenue service and relocation of several Maintenance of Way tracks.

Rail Communications and Signalization Program: The state is implementing various enhancements and signalization modernization projects to replace and update the technology of the signal system and provide Positive Train Control (PTC). The PTC project is required by the federal act and needs to be completed by the end of 2015. The project will also include installing new radio systems and equipment. Currently, the Waterbury Branch does not have a signal system, which limits service along the line. Installation of a signal system would improve safety on the line and is needed to implement PTC along the branch line.

Catenary and Power Systems Replacement Program: CTDOT has been replacing the overhead wire or catenary system that supplies power to the NHL-ML's electric trains. The existing catenary system, , was 75 to 80 years old and in need of replacement as maintenance costs were increasing rapidly and reliability was continually declining. Speeds were restricted to 75 mph because of the age and condition of the wire, and speeds were further reduced at certain curves and during extreme hot or cold weather. The new "constant tension" system is more reliable and allows trains to take advantage of the maximum speeds on the Line.

The Catenary Project was divided into sections in order to run train service while making a full overhead wire replacement. Four sections have been completed. The final phase of construction for the remaining sections is underway with an estimated completion of 2017. This will complete the entire Catenary replacement from the state line to New Haven. In addition to replacing the catenary system, existing power supply substations will also be retrofitted. The substations are 75-to-80 years old and overdue for replacement.

Annual Track Program: The project involves construction of various improvements to the New Haven line track structure, including new ties and ballasts, renewal of interlocking, continuous welded rail and maintenance of the right-of-way. This is an annual, on-going program.

Rail Bridge Rehabilitation Program: The project will rehabilitate fixed and moveable structures along the New Haven line that are in poor condition and will eliminate all open ballast decks. As part of this program, the PECK moveable bridge in Bridgeport will be maintained in a state of good repair. As a result of a competitive grant opportunity under the Hurricane Sandy Resiliency Program, CTDOT was awarded approximately $161 million in federal emergency relief funding for the design and replacement of the NHL-ML's Walk Railroad Bridge in Norwalk. Built in 1896, the Walk Bridge is the oldest movable bridge along the New Haven Line/Northeast Corridor in Connecticut. The bridge will be replaced with a more resilient "bascule" or vertical lift bridge that opens for marine traffic from one side with a counterweight system. This $465 million project will significantly enhance the reliability of commuter and intercity passenger service along the Northeast Corridor.

Station Improvement Program: CTDOT has completed and will continue to complete evaluations and inspections of all NHL-ML stations to identify maintenance issues and needed improvements. Under the ARRA program, immediate repair actions were initiated. Overall needs far exceeded the funding available under ARRA and a long-term maintenance program that was proposed. Improvement categories include maintenance repairs (repair and painting of steel structures, guardrails, and handrails), state-of-good-repair, platform improvements, amenity upgrades (benches, trash receptacles, bicycle racks, and waiting shelters), and major, large-scale capital projects, including ADA compliant pedestrian bridges, installation of platform canopies, extension of platforms, and parking improvements and expansions.

Regional Station Improvement Projects

The Greater Bridgeport Region is served by five stations along the NHL-ML. The infrastructure and facilities at each are in need of improvement and upgrades to maintain them in a state-of-good-

repair. Insufficient parking has also been identified as a critical needs for the region's station. Projects included in the long range transportation plan are highlighted in the following sections.

Stratford Rail Station Improvement Project: The Stratford rail station is located in the town center and lies about 4.3 miles west of the Milford station and 3.6 miles east of Bridgeport. The station consists of two wooden structures that date from the time of when the New Haven line was built. A small, in-door waiting area is provided in the inbound station building. No ticket office is available and passengers need to use a ticket vending machine to purchase tickets or buy them on the train at a premium. High level platforms provide direct boarding access to the trains. A canopy along the inbound platform has recently been installed to replace bus-type shelters. Service at Stratford includes a total of 75 trains stopping each day. Parking at the Stratford station consists of two surface lots. Commuters also park in adjacent private lots and along several nearby streets. As with most NHL-ML stations, parking usage is high, a parking waiting list is maintained and commuters complain about the lack of parking.

The electrical, mechanical and structural elements at the station, due to age and use, are in need of repair and rehabilitation. These problems have been documented by CTDOT and are programmed for remediation as part of the system wide station rehabilitation project. The town has also requested extension of the platforms to accommodate longer train sets and installation of a canopy on the outbound side platform. Both platforms would be extended by 340 feet so that eight-car train sets can be accommodated. To address parking needs, the town, in conjunction with CTDOT, has expanded the outbound side lot by about 124 spaces. A parking garage within ¼ to ½ mile of the train station has been identified as an alternative to future surface parking expansion. Pedestrian walkways and enhanced bus access are planned for as well.

Bridgeport Intermodal Transportation Center (ITC) Project: The Bridgeport

Rail Station is located in Downtown Bridgeport about 3.6 miles west of the Stratford station and 1.5 miles east of Fairfield Metro. The station is housed in a concrete air-rights structure over Water Street. It was constructed in the early 1970s and is a component of an intermodal transportation district that includes commuter parking facilities, the new GBT bus terminal and the Water Street Dock (passenger ferry services). Elevated walkways connect the train station with the bus terminal and parking garage. A large passenger waiting area, rail offices and ticket sales office are located on the second level and provides direct access to inbound (New York) service. A third tower is located on the east side of the main line and contains a small waiting area for outbound (New Haven) passengers. High level platforms provide direct boarding access to the trains and are sufficiently long to handle a 10-unit train. The inbound platform is covered to provide protection from the weather. The outbound platform is unprotected.

The Bridgeport Rail Station is one of the busiest stops on the NHL-ML and is served by 92 trains each day. Four of these trains are extensions of the Shoreline East service operating between New Haven and New London.

The City of Bridgeport initiated construction of a regional, multi-modal transportation center in Downtown Bridgeport several years ago. The project is intended to replace and modernize the rail station and bus terminal, expand commuter parking opportunities, and physically and functionally integrate the various intermodal components. Several elements have been completed and the facilities are connected by an elevated walkway. The concept for a new rail station is being reviewed and a decision will be made to either continue with the project or reallocate funds to other aspects of improving and enhancing the downtown environment in and around the Intermodal Transportation Center (ITC). If the replacement of the rail station is deferred, the existing facility needs to undergo a major renovation and upgrade to ensure its maintenance in a state-of-good-repair. Various electrical, mechanical and structural elements at the station are being repaired as part of the state's station rehabilitation program. However, additional elements need attention, including installing a canopy along the outbound platform.

In addition to the rehabilitation of the rail station, the area around the station and other components of the ITC need to be enhanced to promote non-motorized modes, foster mobility, facilitate access to multi-modal transportation modes and enhance the aesthetic, visual, physical environment in and around the downtown area. The following actions support the vision of transforming the downtown Bridgeport area into a unique and functioning transit oriented district:

1. Develop, design and implement a comprehensive sign program for identification, information and wayfinding.
2. Install static and dynamic information kiosks at the rail station, bus terminal and ferry terminal.
3. Develop and implement a real-time, dynamic traveler information system for the ITC facilities for bus, rail and ferry services, including delay information,

arrivals and departures.

4. Develop, design and implement decorative lighting within the downtown area that complements and supplements existing efforts and illuminates, accentuates and highlights key facilities.

5. Streetscaping and landscaping enhancements along Water Street, Main Street, North and South Frontage Roads, State Street, John Street and Fairfield Avenue.

6. Complete and construct a harbor walk along the Pequonnock River and Bridgeport Harbor.

7. Create a pedestrian friendly and inviting linkage along Main Street, Water Street and Broad Street from the Transit Garage and Harbor Yard Arena area and the ITC, and install lighting that makes these spaces more appealing and less uninviting.

8. Improve the pedestrian safety and access to the Bridgeport Bus Terminal from the downtown area by constructing various traffic calming enhancements including texture pavement treatments, raise table along Water Street, pedestrian refuge island and reducing the number of traffic lanes.

9. Improve and enhance the existing rail underpass leading to the Water Street Dock.

10. Install new fencing around the surface parking lot under I-95 and reconstruct and reconfigure the diverge area between Water Street and North Frontage Road, add new sidewalks, provide handicapped parking spaces and install a more accessible connection with the rail station.

11. Refurbish and renovate the existing rail station building.

12. Install artwork on large expanses of concrete walls.

13. Develop and create bicycle access paths to the ITC district, such as bicycle routes, lanes and separate trails radiating east, west, north and south, and install decorative, functional and distinctive bicycle.

Fairfield Rail Station Improvement Project: The Fairfield Rail Station is located in the town center area, about 4.8 miles west of the Bridgeport station and 1.7 miles east of Southport. Unlike the Stratford and Bridgeport stations, which are located along and have direct access to a state highway, access to the Fairfield rail station is via several short, narrow local roads from US Route 1. The station consists of two wooden structures that date from the time of when the New Haven line was built. The inbound building provides an in-door waiting area and ticket office. However, the ticket office is only open during the morning peak period. High level platforms provide direct boarding access to the trains. Only bus-type shelters are in place along the platforms to protect passengers waiting for trains. New staircases were built in recent years to provide an improved connection between the inbound and outbound platforms.

A total of 80 trains stop at the Fairfield station each day, providing a good level of service. The town provides rail commuters a variety of parking options, including two, large surface lots, one on each side of the tracks, and a nearby satellite lot. A limited amount of on-street parking is available near the station. The town over-subscribes its parking permits and maintains an extensive waiting list.

There are a number of non-designated parking areas and private pay facilities in the vicinity of the Fairfield station to supplement the official rail commuter parking lots and handle excess demand.

Because of the high number of passenger boardings at the Fairfield Rail Station and the level of service provided, the station had been designated as a “key” station for ADA purposes. Instead of improving the existing station, the town and CTDOT developed plans to construct a new, ADA compliant station to serve as the “key” station. Despite this, the lack of accessible paths for mobility impaired persons using the Fairfield Rail Station needs to be addressed. In addition, the electrical, mechanical and structural elements at the station, due to age and use, are in need of repair and rehabilitation. These problems have been documented by CTDOT and are programmed for remediation as part of the System Wide Station Rehabilitation Project. Platforms need to be lengthened to accommodate longer train consists and canopy on the inbound platform needs replacement and one needs to be installed along the outbound platform.

Fairfield Metro Center Rail Station Project: The Fairfield Metro Center Rail Station Project finished construction and was placed into service in the Fall of 2011. The Rail Station was constructed on a vacant industrial parcel near the intersection of Commerce Drive and Black Rock Turnpike and at the Bridgeport City Line. It is only about 1.5 miles from the Bridgeport Rail Station. A 1,500-space parking lot for rail commuters was built as part of the project. Longer platforms were provided to accommodate train-sets of eight (8) to ten (10) cars.

The existing station at the Fairfield Town Center continues to function as a major stop and continues to receive Metro-North trains at current service levels. Boarding counts and geospatial assessment of permit holders and those on the waiting list indicate each station will serve a different market and high use is expected at both stations.

The key elements of the Fairfield Metro Center Rail Station Project were as follows:

1. Fully ADA compliant rail station with accessible platforms and elevators.
2. A 28,000 square-foot terminal consisting of customer waiting area, ticket office and retail space.
3. ±1,500 space surface parking lot.
4. A new four-lane access road and bridge from Kings Highway East, over the New Haven line and to the development's internal road.
5. "Kiss-and-ride" drop-off areas and short-term parking areas.
6. Covered, high-level platforms that could handle 10-unit train-sets.

Southport Rail Station: The Southport rail station is located in the Southport section of Fairfield, in a predominately residential area. It is about 1.7 miles west of the Fairfield town center station and 1.7 miles east of the Greens Farm station in Westport. The station consists of two wooden structures that date from the time of when the New Haven line was built. The buildings are offset by about 700 feet and the pedestrian connection between them is via Railroad Street and underpass along a narrow sidewalk. No indoor waiting area is provided and passengers need to purchase tickets on the train. High level platforms provide direct boarding access to the trains, but they can only accommodate four cars at a time. Only bus-type shelters are in place along the platforms to protect passengers waiting for trains.

Service to and from the Southport station is more limited with only 48 trains stopping each day. Two surface parking lots, one on each side of the tracks, accommodates rail commuters and a nearby church parking is designated as a satellite lot. The lots at the rail station are well utilized but excess space is available at the satellite location.

Despite the limited service and low ridership levels the Southport rail station is an important transportation facility and needs to be maintained in a state-of-good-repair. The electrical, mechanical and structural elements at the station, due to age and use, are in need of repair and rehabilitation. These problems have been documented by CTDOT and are programmed for remediation as part of the System Wide Station Rehabilitation Project. Platforms need to be lengthened to accommodate longer train consists and canopies need to be installed along the platforms. A pedestrian walkway between the inbound and outbound platforms needs to be improved and made more accessible for persons with mobility impairments.

Commuter/Passenger Rail ITS Elements: ITS involves "the application of advanced technologies to improve the safety and efficiency of the surface transportation system". GBRC addressed the applicability of advanced technologies to commuter rail operations when developing the Regional ITS Architecture. Two principle transportation user services are pertinent to commuter rail operations: transit traveler information and transit security.

Transit traveler information systems provide real-time information on travel operating conditions from a variety of sources to the public so that travelers can alter their travel decisions, either by altering their mode or time when they travel. Currently, rail operating information is limited. Announcements on the platforms consist of synthesized, audio delay or track change information with little substance. The intent of the transit traveler information system would be to provide more detailed and reliable information regarding train status, delays, next arrival and direction of travel. The proposed system would be linked to a transit monitoring and information center and vehicle location system to provide real-time information on where trains are

and an estimate of the time to the next station. Proposed elements include:

1. Dynamic Message Signs – To provide variable and changeable information regarding transit status, delays and next arrival. These signs would be installed at various locations at each of the region's rail stations. The initial deployment would be at the BITC and then to the other regional rail stations, as the effectiveness of the system is demonstrated.

2. Voice Annunciation Systems – To provide an audible report on the status of rail service to supplement the DMS. Audio messages would be made only on platforms and in the lobby or central waiting areas.

3. Information kiosks – To provide interactive information for travelers at remote locations. The information kiosks would consist of touch screens to allow travelers to search for transit service information, including schedules, fares, policies, and route maps. The information kiosks would be installed at central and strategic locations, including the lobby of the Bridgeport Rail Station.

The security of passengers waiting at a rail station or walking between the station and parking area is becoming a more important issue. Video cameras have been installed along the platforms and the elevated walkway at the Bridgeport Rail Station to monitor activity. Emergency aid call-boxes have also been installed along the walkway to allow travelers to request assistance in the event of an incident or emergency. These systems need to be installed at the other rail stations in the region.

Section 5: Highway System Program

Highway System

Even though a number of different transportation modes are available, travel to, from and within the region predominately involves use of the highway network. The street system is used not only by persons in private vehicles but also by local bus operators, bicyclists and for the movement of freight and goods. Because of this almost universal use of the highways, it is critically important that the network function at an acceptable level of service with minimal congestion and provide optimal safety.

The region's highway system is comprised of diverse road types that handle differing amounts of traffic and serve differing functions, ranging from the high-volume, high speed interstates to low volume collector and residential streets. This interconnected network of expressways, highways and roads totals about ±1,280 miles. The highways and roads are either owned by the state or by the municipality in which the roads are located. Most roads are owned and maintained by a local jurisdiction, accounting for about 88.8% of total road mileage.

Most travel involves movement through a network of roads. To understand how travel is channeled through the network, highways and roads are categorized into classes. There are three broad classes of roads.

Arterials, including interstates, expressways and other primary arteries, are geared toward a high level of service and high level of mobility between activity centers. Interstate highways and other expressways provide the highest level of service and mobility with no access to adjacent land uses. The region is crossed by almost 40 miles of expressways that serve to move traffic quickly and efficiently between areas. Other arterials, both principal and minor, total about 185 miles of roads. These highways facilitate travel within and through the region, but also provide access to higher density developments. Collector streets are balanced between level of service and access to land and collect traffic from the local neighborhoods and distribute it to the arterial system. There are roughly 151 miles of collector streets in the region, including those located in the rural areas. Local streets provide lower levels of service but a high level of access to land. They comprise the largest portion of the road network (71.8%).

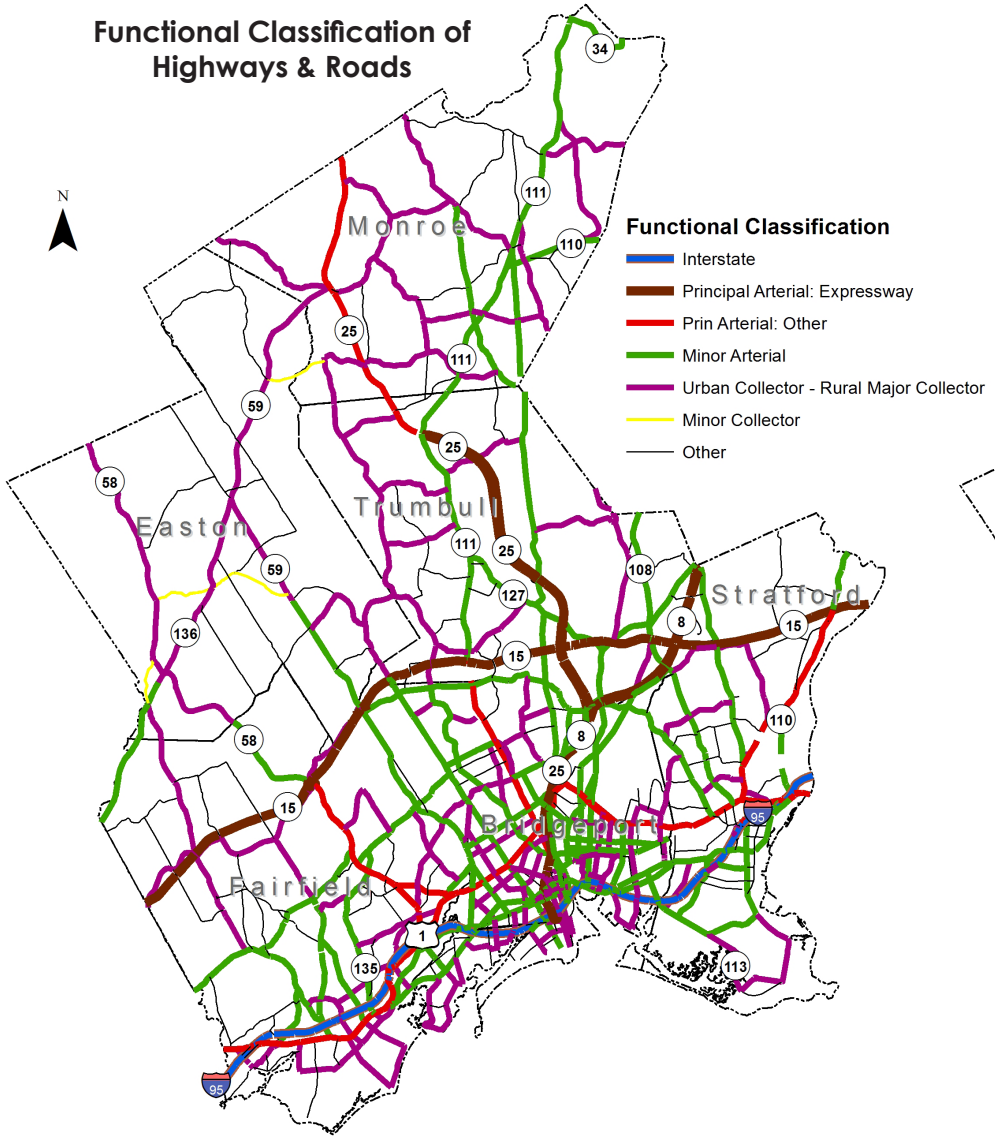
Federal transportation acts, under the direction of the US Department of Transportation, have designated a federal aid highway system and provide funding assistance to states and regions to implement transportation improvements. In total, about 341

Breakdown of Road Miles by Functional Classification and Jurisdiction

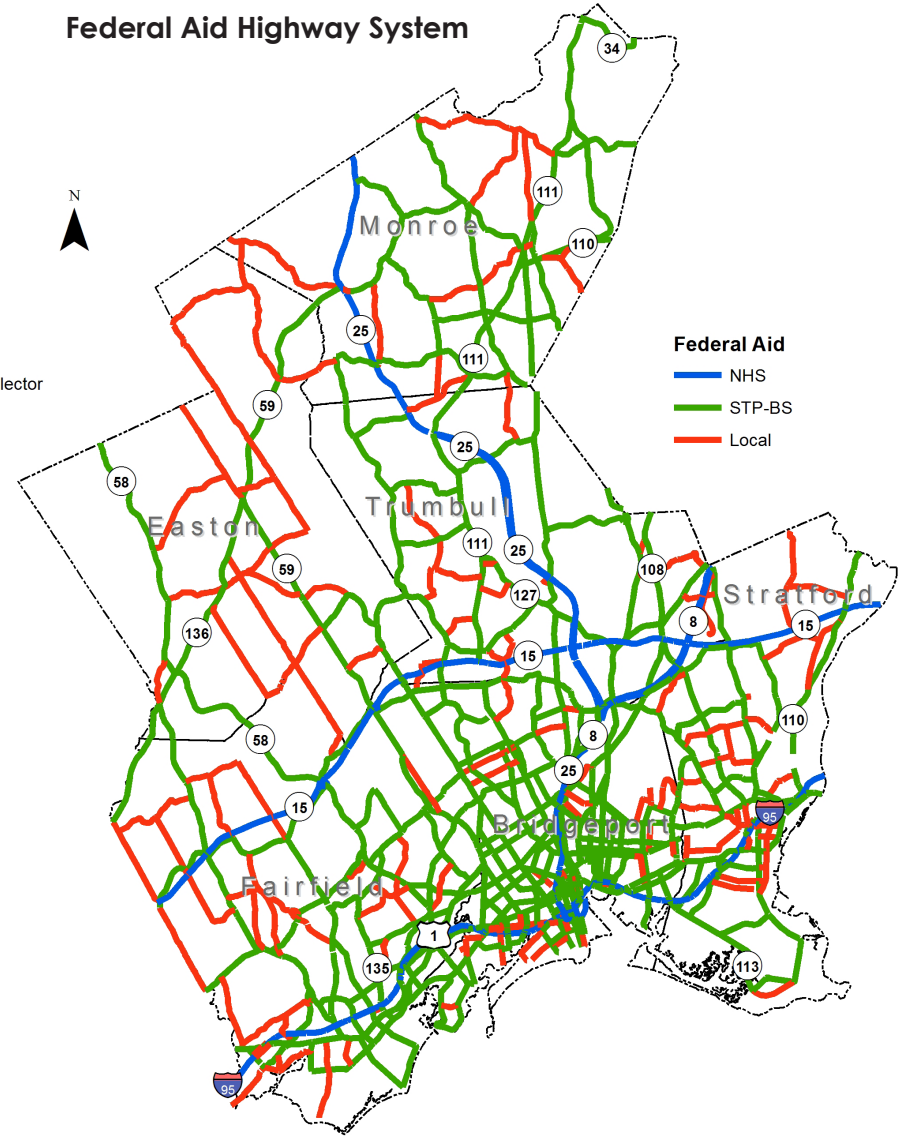
	Total Miles	Percent
Interstate	12.16	0.90%
Prin Arterial: Xway	27.42	2.10%
Prin Arterial: Other	27.25	2.10%
Minor Arterial	158.45	11.20%
Urban Collector	130.77	10.20%
Major Collector	14.97	1.20%
Minor Collector	5.32	0.40%
Local	851.02	66.50%
Rural Local	67.75	5.30%
Total	1,280.23	
State	143.99	11.20%
Local	1,136.24	88.80%

Source: Connecticut Department of Transportation and based on revisions to functional classification by GBRC.

Functional Classification of Highways & Roads



Federal Aid Highway System



miles of roads are on the federal-aid highway system, or about 26.8% of the regional total. The federal aid highway system is essentially comprised of two categories of highways: those classified as at least an urban collector or rural major collector and those higher classed highways (interstates, expressways and many principle arterials) designated on the National Highway System (NHS). Nationwide, the NHS is comprised of the approximately 45,530 miles of interstate highways and about 105,000 miles of arterials and other important roads for a total of ±155,000 miles. About 46 miles of highways in the region are on the NHS, representing 3.6% of the total.

There are five major facilities and several short sections of local streets in Bridgeport included on the NHS:

Interstate Route 95;

Route 8 Expressway, including the overlap section with Route 25;

Route 15 -- Merritt Parkway; and

Route 25 including both the expressway portion and the two-lane arterial from the end of the Route 25 Expressway to the Newtown town line.

Railroad Avenue, Ferry Access Road, North Frontage Road, South Avenue, and South Frontage Road in the vicinity of I-95, Interchange 27A to provide a continuous NHS connection to the Water Street Dock ferry terminal from I-95. These roads total only 0.85 miles.

Average Daily Traffic (ADT) Volumes

Use of the highway system is monitored through the conduct of a comprehensive traffic count program. The CTDOT program focuses on state routes, while the count program conducted by GBRC concentrates on local roads. Average daily traffic (ADTs) volumes were extracted from CTDOT's traffic log and GBRC files, and adjusted, as necessary, to reflect 2008 base year conditions. CTDOT estimates future traffic trends through the use of a travel demand model. Data on plan horizon year volumes were extracted from CTDOT's "Congestion Screening and Monitoring Report".

Base and future year volumes on the expressways through the region are presented in the table on this page. CTDOT modeling indicates that travel on these highways is expected to grow by nearly 35% between 2008 and 2040.

Average Daily Traffic Volume on Expressways

Expressway	2001	2008	2040	Change: 2008-2040
Interstate 95	129,600	134,900	182,000	34.90%
Route 15	64,000	68,800	92,800	34.90%
Route 8/25	74,100	70,000	94,400	34.90%
Route 8	53,000	59,300	80,000	34.90%
Route 25	32,900	35,100	46,200	31.60%

Source: ConnDOT Traffic Logs and 2010 Congestion Screening and Monitoring Report.

I-95 is the most heavily travel highway through the region, and, by 2040, it is estimated that about 182,000 vehicles will be carried each day. ADTs between 80,000-and-94,400 vehicles per day (vpd) will be experienced along Route 15 (Merritt Parkway), Route 8 and the overlap section of Route 8 and Route 25 through Bridgeport.

Generally, principal arterials provide connections to and between the region's expressways, as well as to other urban areas. They also typically serve developed commercial areas. Because of these functions, principal arterials tend to carry higher levels of traffic each day, with many sections approaching or exceeding 20,000 vpd. Growth is projected at between 24.1% and 39.2%. By 2040,

Route 25 through Trumbull and Monroe is expected to reach 30,400 vpd.

Minor arterials supplement the principal arterial network and provide connections between principal arterials or connect collector streets to the high class system. On average, these roads accommodate less traffic than the volumes carried by principal arterials; however, some sections carry high volumes of traffic, especially those that pass through a commercial corridor or have an intersection or interchange with a principal arterial or expressway. Daily volumes range between 10,000-and-20,000 vpd, but several minor arterials handle substantially more, including Route 111 in Trumbull and Monroe and the short section of Chopsey Hill Road (SR 722) in Bridgeport that provides a connection between Route 8/25 and US Route 1.

Other locations where high volumes occur include:

Route 58: in the vicinity of the commercial area between Burroughs Road and Fairfield Woods Road.

Route 108: in the vicinity of the Hawley Lane Mall and near the ramps to Route 8 and Route 15.

Route 110: in the vicinity of the Sikorsky Aircraft plant and the ramps to Route 15 – 31,900 vpd.

Route 113: through the Lordship section of Stratford – 21,900 vpd.

Route 127: from the Route 25 interchange through the Trumbull Center commercial area – 23,500 vpd.

Route 130: through the Black Rock section of Bridgeport – 22,100 vpd.

Collector streets connect neighborhoods with the arterial network and traffic volumes tend to reflect this function. The average ADT on an urban collector is about 4,200 vpd, with a range between 400 vpd and 16,200 vpd. The anticipated growth in the volumes on collector streets is projected to range between 11% and 27%. This translates into an average ADT of about 5,300 vpd by 2040.

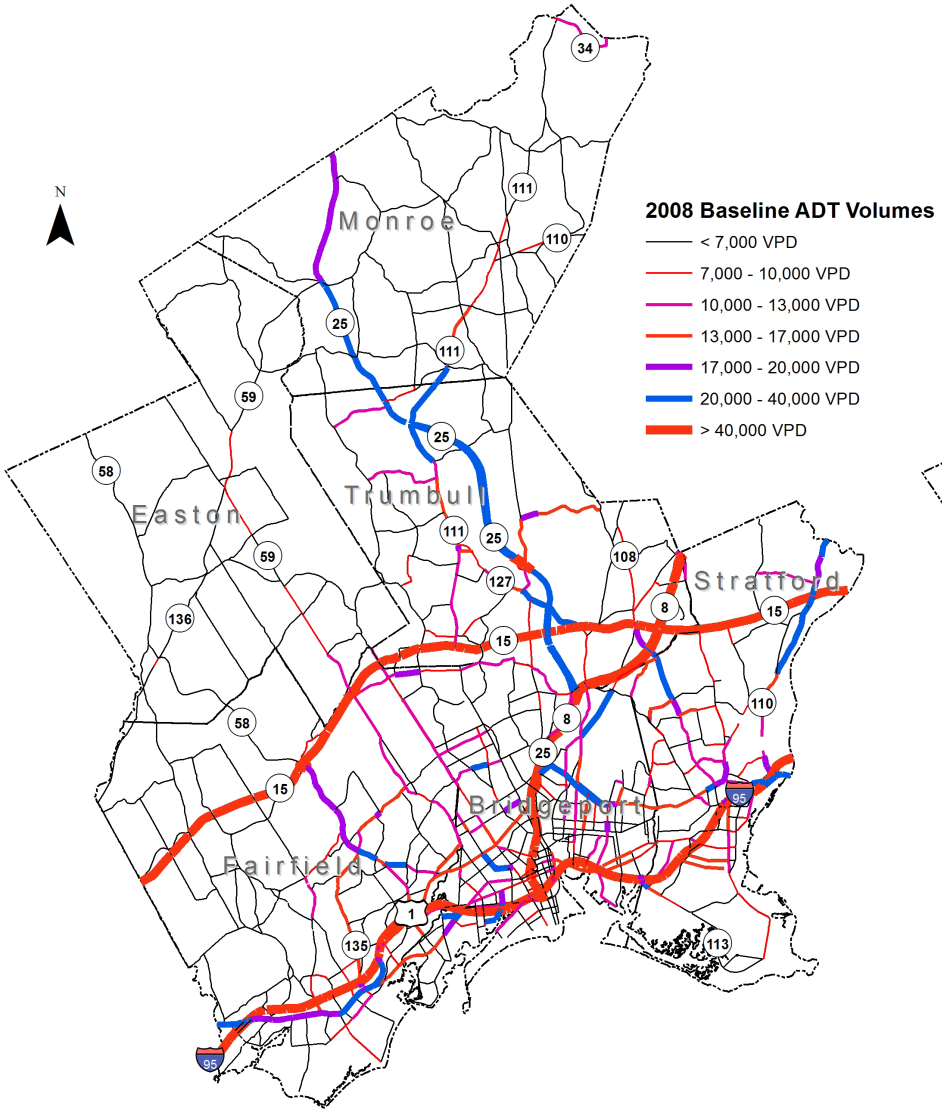
In rural areas, collectors are divided into major and minor categories. Major collectors tend to function more like an urban minor arterial by providing a higher level of service than a collector street and serving to move traffic between urban areas, but volumes tend to be less because of the nature of land development. The average ADT on these highways is ±6,900 vpd. Included in this category are three state maintained routes – Route 58, Route 59 and Route 136. By 2040, the volumes on these roads is projected to increase to about 8,300 vpd

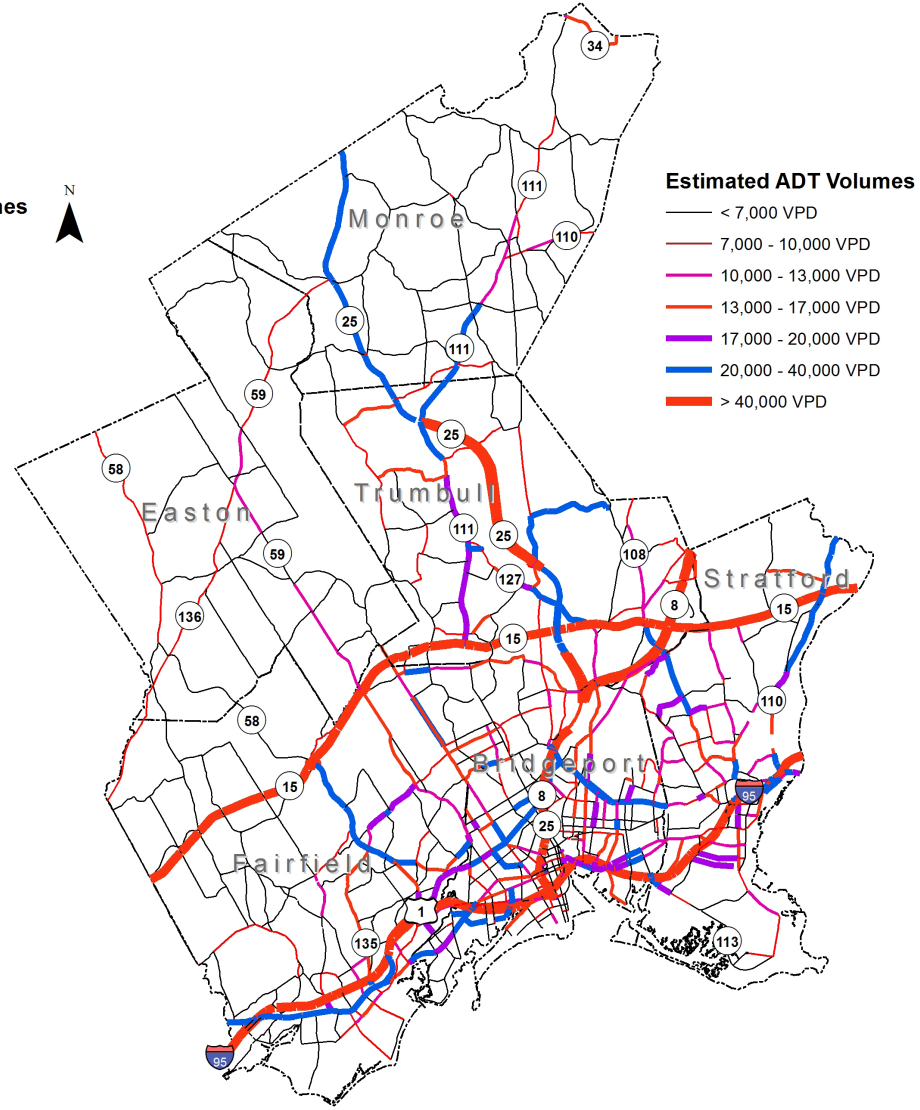
Rural minor collectors serve to collect and distribute traffic from neighborhoods to the major collector system. Because of the predominant urban nature of the region, there are only three streets classified as a minor collector. The volumes on these roads are higher than on a local street, but are still relatively low, averaging about 2,400 vpd. The average 2040 volume on the minor

Average Daily Traffic Volume on Principal Arterials

Principal Arterial	2001	2008	2040	Change: 2008-2040
US Route 1	19,700	19,100	23,700	24.10%
Route 25	20,800	22,400	30,400	35.70%
Route 34	9,200	10,200	14,200	39.20%
Route 110	16,800	17,700	22,400	26.60%
Route 113	16,400	16,100	20,300	26.10%
SR 731	29,700	23,200	30,600	31.90%
Main Street	18,100	18,600	24,000	29.00%

Source: ConnDOT Traffic Logs, GBRC Traffic Files and 2010 Congestion Screening and Monitoring Report.

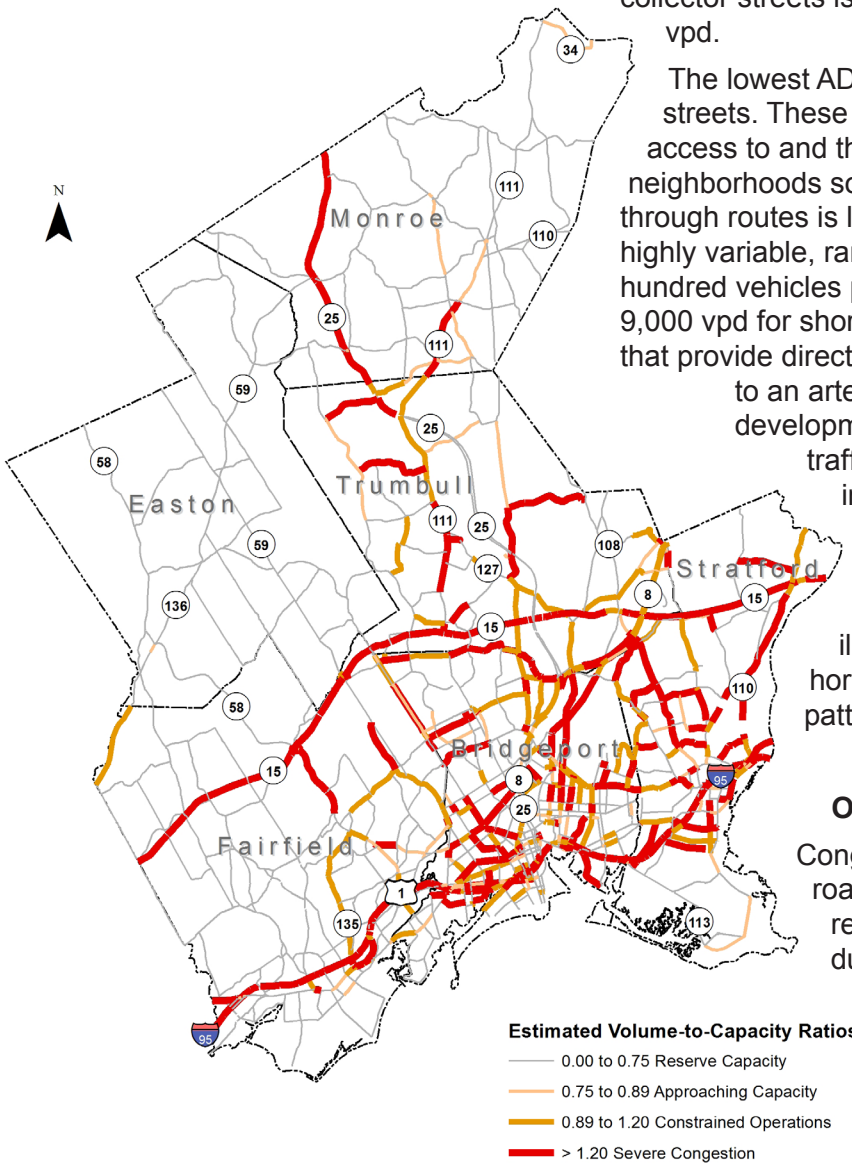

N
2008 Baseline ADT Volumes
< 7,000 VPD
7,000 - 10,000 VPD
10,000 - 13,000 VPD
13,000 - 17,000 VPD
17,000 - 20,000 VPD
20,000 - 40,000 VPD
> 40,000 VPD
Monroe
Easton
Trumbull
Stratford
Bridgeport
Fairfield
34
111
110
25
59
58
136
127
108
8
15
1
135
113
95


N
Estimated ADT Volumes
< 7,000 VPD
7,000 - 10,000 VPD
10,000 - 13,000 VPD
13,000 - 17,000 VPD
17,000 - 20,000 VPD
20,000 - 40,000 VPD
> 40,000 VPD
Monroe
Easton
Trumbull
Stratford
Bridgeport
Fairfield
34
111
110
25
59
58
136
127
108
8
15
1
135
113
95

collector streets is estimated at 2,800 vpd.

The lowest ADTs occur on local streets. These roads typically provide access to and through residential neighborhoods so their function as through routes is limited. Volumes are highly variable, ranging from a few hundred vehicles per day to close to 9,000 vpd for short sections of local roads that provide direct access or connection to an arterial or serve a major development. Generally, the traffic on local streets is in the range of 1,000 to 2,000 vpd.

The maps on the previous page illustrate base and horizon year traffic volume patterns.



Operating Conditions

Congestion on the principal road network is generally recurring with its location, duration and timing somewhat predicable. Variation occurs depending on day of week and season.

Incidents may also influence congestion. Traffic operates at relatively good levels of service during most times of the day. However, peak travel periods tend to operate at poorer levels of service, with the worst congestion coinciding with the daily morning and evening commute times. Data indicate a pronounced diurnal traffic pattern with between six and ten percent of the daily traffic volume occurring during each of the AM or PM peak hours. Typically, traffic flows are not evenly split during the peak hours, with heavier flows exhibited in one direction. CTDOT has determined that about 55% of the peak hour flow moves in the peak direction.

The determination of operating conditions was based on data from CTDOT's congestion screening and monitoring report and traffic data collected and maintained in GBRC databases. Operating and performance data were downloaded in the GBRC's Geographic Information System (GIS). The mapping capabilities of the GIS allowed for the quick identification of operating deficiencies.

To assess operating conditions, peak hour traffic demand was compared to the estimated capacity of each road segment. Capacity was based on roadway

functional classification, number of lanes, area characteristics and presence of traffic signals while peak hour traffic was obtained from available count sheets or calculated by applying a derived peak hour factor. It was assumed that 55% of the peak hour traffic traveled in the peak direction. Operating conditions were then determined by dividing the peak hour volume by the capacity. This measure is referred to as the volume-to-capacity (V/C) ratio. Calculated V/C ratios of between 0.90 and 1.20 indicate constrained operations, equivalent to an LOS E condition, and moderate to significant congestion with excessive congestion indicated by V/C ratios greater than 1.25, equivalent to LOS F. While the use of calculated V/C ratios may not provide a complete and accurate method for identifying congestion, it provides a good macro-level perspective of congestion on the region's roads and forms a basis for identifying needed enhancements.

The results for base and horizon year conditions are shown in this page's table and the level of congested roads expected in 2040 is depicted in the map on the previous page.

Most roads in the Region operate at a good level of service during the peak

ESTIMATED CONGESTED ROAD MILEAGE BY FUNCTIONAL CLASS BASE YEAR (2008) AND HORIZON YEAR (2040)

Facility	Total Miles	Base Year Congested Miles		Percent	Horizon Year Congested Miles		Percent
		LOS E	LOS F		LOS E	LOS F	
I-95	12.16	11.45	0.15	95.4%	0.56	11.60	100.0%
Route 15	14.00	6.95	6.17	93.7%	0.88	13.12	100.0%
Route 8/25 Overlap	3.75	0.18	0.11	7.7%	0.65	0.29	25.1%
Route 8 Xway	3.55	1.26	0.00	35.5%	2.29	1.26	100.0%
Route 25 Xway	6.12	0.00	0.00	0.0%	0.00	0.00	0.0%
US Route 1	12.57	2.98	0.95	31.3%	2.70	3.80	51.7%
Route 25	5.33	0.00	4.55	85.4%	0.25	4.55	90.1%
Other Principal Arterials	9.35	2.51	3.58	65.1%	0.95	6.04	74.8%
Other Minor Arterials	143.57	23.65	21.22	31.3%	31.34	40.52	50.1%
Urban Collectors	130.77	3.45	0.22	2.8%	5.98	2.29	6.3%
Sub-Total Urban On-System	**341.17**	**52.43**	**36.95**	**26.2%**	**45.60**	**83.47**	**37.8%**
Rural Collectors	20.29	0.00	0.00	0.0%	0.00	0.00	0.0%
Urban Local	851.02	1.02	0.00	0.1%	1.57	1.02	0.3%
Rural Local	67.65	0.00	0.00	0.0%	0.00	0.00	0.0%
Total All Roads	**1,280.13**	**53.45**	**36.95**	**7.1%**	**47.17**	**84.49**	**10.3%**

Replacement of the Sikorsky Memorial Bridge alleviated congestion along Route 15.

hours. Only about 7.1% of all roads in the region currently experience some level of congestion on a daily basis. However, for higher function and higher class roads, the problems are substantially worse. About 26.2% of all roads on the federal aid system operate at some level of congestions. By 2040, the percentage is projected to increase to 37.8% of the total and affect about 129 miles of road.

The three most congested highways in the region are currently I-95, Route 15 (Merritt Parkway) and the arterial section of Route 25. These facilities operate under very constrained conditions over almost their entire lengths. By 2040, traffic volume increases will cause the entire section of Route 8 to become congested.

Congestion on I-95 is severe and extensive during the peak commute periods. Almost the entire stretch of the interstate is congested based on the modeling approach. Base year conditions indicate about eleven miles operate at an LOS E (moderate congestion) with only a short segment at severe levels. By 2040, the entire length of I-95 will operate under severe levels of service.

Observations suggest operating congestion is worse than indicated by the calculated V/C ratios. Conflicts from vehicles entering and exiting the interstate exacerbate operations and cause impedance within the traffic flow. Minor incidents can result in substantial delays. In addition, the high proportion of large trucks on I-95 further constrains operations and worsens congestion.

Congestion on Route 15 (Merritt Parkway) is also severe through the region. It is estimated that 93.7% of its 14-mile length through the region operates at poor to severe levels of service. The alignment, cross section and ramp configurations affect operations along Route 15. Several interchange projects have been completed to eliminate stop controlled access points and provide good acceleration and deceleration lanes. However, based on projected increases in traffic volumes,

operations will continue to deteriorate and by 2040 nearly the entire length of the Parkway will experience severe congestion.

Route 25 continues as a two-lane arterial from the terminus of the expressway section through the northern part of Trumbull and Monroe. From the end of the divided highway, the road experiences severe (LOS F) peak hour congestion and delays, with backups extending sometimes for over one mile. The congestion is caused by the high volume of traffic and commercial land use patterns characterized by numerous and closely spaced driveways. The need to widen Route 25 has been determined and plans are being advanced to reconstruct Route 25 to four lanes. However, there are substantial land use and environmental factors that may prevent the project from being implemented. In the interim, several intersection improvements are programmed to help reduce delays and back-ups. In addition, an access management program has been suggested to reduce the number of commercial driveways. However, these actions will not be sufficient to address the congestion that occurs along the corridor each day during the peak hours. Operations are projected to worsen as traffic continues to increase.

Congestion on the Route 8 and Route 25 expressways is limited to a few short sections or critical areas. The Route 8/25 overlap section experiences morning peak hour congestion along the southbound approach to the interchange with I-95. Although the recently completed I-95 project rebuilt the interchange and operating problems have been substantially reduced, the ramp configuration cannot handle the high volume of traffic that moves through the area each day. Problems also result from the poor ramp design at Interchanges 1 and 2 on Route 8/25. In addition, operating problems occur along Route 8 northbound in the vicinity of the split from Route 25, as only two lanes are provided for Route 8 traffic, and along the section of Route 8 between Route 15 and the Shelton town line. By 2040, most of the overlap section will continue to operate with good levels of service, although the percentage of the highway operating under congested conditions will increase. However, north of the split, the Route 8 expressway section will deteriorate to poor to severe levels of service.

Congestion on I-95 extends throughout the morning and evening peak periods.

Other congested road sections in the region are scattered among a number of arterials, especially along several sections of US Route 1, Main Street in Bridgeport, Route 108 in the vicinity of the Stratford-Trumbull town line and Route 111. About 31.3% of US Route 1 through the region operates at poor levels of service. By 2040, the portion of US Route 1 experiencing congestion will increase to about 51.7% of the road mileage. Other principal arterials, especially Main Street through Bridgeport and the continuation of Main Street in Trumbull to the Merritt Parkway, operate at poor levels of service. Currently, about 65.1% of these roads experience daily congestion. This is expected to increase and affect about 74.8% of the principal arterial road mileage by 2040. Nearly one-third of the minor arterials in the region currently operate at poor-to-severe conditions and, by 2040, over half will experience congestion.

Highway Safety

CTDOT collects accident data on state roads and maintains the Traffic Accident Surveillance Report (TASR) Database. The TASR contains the number of accidents by town and route and can be used to identify locations where improvements may be warranted and provide a cursory overview of highway safety in the region.

The TASR data indicate over 40% of all highway accidents in the region occurred on two facilities: I-95 and US Route 1.

Safety problems along US Route 1 are mostly related to intersections. The close spacing of intersections, the number of commercial driveways and the frequency of traffic signals contribute to the incidence of accidents along US Route 1. The non-uniform lane configuration, that is, the cross section alternates between two and four lanes, is also a factor.

CTDOT has prepared a State Highway Safety Plan (SHSP) to meet the requirement of past SAFETEA-LU guidance and the current Moving Ahead for Progress in the 21st Century (MAP-21) guidance to prepare and implement strategic highway safety plans and develop a safety data system that provides timely and accurate accident information. The SHSP was developed in consultation with the state's MPOs and Councils of Governments, as well as various other stakeholders. It is consistent with the goals and objectives of the LRP for the Greater Bridgeport Regional Council and integrated into the LRP.

The "Mission" of the SHSP is to:

"Provide a safe, efficient and cost effective transportation system that meets the mobility needs and safety of its users."

The "Vision" of the SHSP is to:

"All users of the transportation system arrive safely at their destinations."

The "Goal" of the SHSP is to:

"See a continual decline of combined serious crashes and fatalities."

The SHSP focuses on eight emphasis areas that were identified and selected after an in depth assessment of accident data and trends. The primary outcome of each area is a reduction in the rate of fatalities and severe injuries that occur because of motor vehicle accidents and will result in a safer and more roadway system. Achieving this outcome will be through strategies that embrace the 4E's of Education, Engineering, Enforcement, and Emergency Medical Services (EMS). The emphasis areas are:

Traffic Records and Information Systems: Develop a delivery system to provide timely, complete, accurate, uniform, integrated, and accessible traffic records (safety data) to manage highway and traffic safety programs.

Roadway Departure: To institute a systematic program of lane departure accident countermeasures 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: To provide a safe environment for pedestrians and bicyclists, reduce fatalities and serious injuries and examine the causes of bicycle and pedestrian accidents and develop and implement effective counter measures.

Work Zones: To reduce the number of rear-end collisions through work zones, enhance the ability of motorists to detect differences in roadway alignment, grade and readily maneuver through work zone patterns, especially at night, and reduce distractions to motorist from headlights, strobes and work lights during nighttime construction.

The "Purposes" of the SHSP are to:

"Clearly identify the State's critical safety needs and direct allocated resources to achieve significant reductions in fatalities and serious injuries on highways and all other public roads.

Provide the mechanism for all highway safety programs in the State to work together in a coordinated effort to maximize its resources and position the State and all its safety partners to address the State's traffic safety challenges.

Provide the comprehensive framework which coordinates statewide safety initiatives and is a data-driven, four or five year comprehensive safety plan that integrates the 4E's – engineering, education, enforcement, and emergency medical services (EMS).

Provide an organizational structure that will allow for the integration of the agencies involved in transportation safety.

Provide a formal management process that will direct the activities of these agencies in a manner that will efficiently achieve the mission and vision.

Provide flexibility to customize the structure and process according to external and internal factors and allow the Plan to be periodically updated and otherwise revised."

Driver Behavior (Alcohol, Occupant Protection and Speeding): To significantly reduce the number of alcohol-related crashes, injuries and fatalities; increase safety belt use rates and remain at a level that is consistently above the national average; and reduce the number of speed-related crashes.

Motorcycle Safety: Reduce motorcycle injury and fatality rates, decrease the percentage of motorcycle operator fatalities with a blood alcohol concentration (BAC) above legal limits, and train beginning, intermediate, and experienced motorcycle operators.

Commercial Vehicles: Reduce the number and severity of crashes involving commercial motor vehicles and hazardous materials incidents.

Incident Management: Continually improve traffic incident response and recovery time by all responding agencies and support the goal with policies, programs, projects, and funding.

Highway System Improvement Program

The assessment of the region's highway system identified current and future operating deficiencies and safety problems. The general goals of the highway system improvement program are to address congestion through better management and operation of the highway system, implement selected capacity enhancements and reduce the frequency and severity of accidents. Major capacity enhancement projects that would significantly expand arterials and expressways to handle more vehicles are viewed as having a detrimental impact on the surrounding land area, the environment and the character of the community. However, it is necessary to consider some major widening and reconstruction projects as alternative actions would not be sufficient to eliminate or alleviate current and future

I-95 operates under very congested conditions during both the morning and evening peak periods. It is not uncommon for traffic to be "bumper-to-bumper" from Stratford to Stamford each morning. This level of congestion cannot be alleviated without widening the highway.

congestion to acceptable levels.

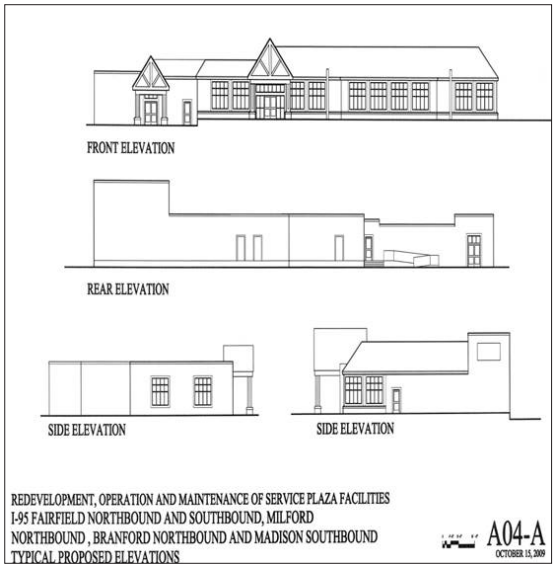
Despite the need to consider capacity enhancement projects to address recurring congestion, the intent of most of the recommended highway system improvement program projects is to preserve and maintain the system in a state-of-good-repair through intersection improvements, minor widening that adds turn lanes or to provide uniform and standard road width, full-depth reconstruction, resurfacing and various bridge and safety actions. In addition, the LRP also identifies and recommends various CMS and ITS actions to better "manage" traffic congestion without substantially increasing roadway capacity.

Interstate 95 Improvement Actions: I-95 through the Region operates under constrained operations with levels of service ranging from poor to severe. Worsening the problems are closely-spaced on- and off-ramps and geometric deficient interchange areas. Although operations would benefit from closing, consolidating and redesigning on- and off-ramps, these types of actions could cause operating problems on nearby and parallel roads, as well as affect mobility and access.

Proposed improvements include:

1. Interchanges 24 in Fairfield: Reconstruct and reconfigure the southbound on-ramp and the northbound off-ramp and eliminate US Route 1 traffic circle.

2. Lane Continuity: In some areas, operating problems are worsened by the lack of sufficient acceleration and deceleration lanes. Lane continuity provides auxiliary or operational lanes between interchanges or on- and off-ramps to reduce conflicts between entering, exiting and mainline traffic. This action includes reconstruction, realignment and lengthening of ramps to make movement onto and off of the highway much more efficient and help reduce impedance induced congestion.



3. Interchanges 31 and 32 in Stratford: These two interchanges are close together, with all ramps intersecting with local roads. To reduce the number of ramps and provide separation of the interchanges, consider consolidating these interchanges and relocating and constructing a new diamond interchange at Route 130. The new interchange would be located between the existing ramps.

4. Interchange 33 in Stratford: Reconstruct the partial interchange and replace it with a full-directional, diamond interchange. Several local roads would be reconstructed and realigned to provide better access to I-95 from the adjacent commercial centers. Work would include additional lanes, turning lanes, minor widening and traffic signal improvements.

5. Fairfield Service Plaza: The Service Plazas are located on both sides of I-95 between the off-set ramps for Interchange 22. The Project included demolishing the existing facilities, constructing modern service plazas with a full range of traveler amenities and reconfiguring the land to provide more parking capacity for both passenger vehicles and commercial trucks and better separation with and access to the fuel pumps.

Route 15 Improvement Actions:

Because of its historic nature and aesthetic qualities, Route 15, commonly known as the Merritt Parkway, is listed on the National Registry of Historic Places. Over the years, efforts have been made to preserve and enhance the Parkway's historic qualities while constructing various improvements to address safety and congestion. A current project is under construction to repave the parkway, provide wider and uniform shoulder areas, remove hazardous fixed objects within the right-of-way and enhance the median.

Traffic congestion on Route 15 remains poor and volumes continue to overwhelm the ability of the highway to efficiently handle demand. As volumes increase, operations are expected to worsen. Given the need to minimize impacts to the Parkway, options for relieving congestion are limited and need to focus on high occupancy vehicle alternatives.

The interchange area at Route 15 & Route 111 was reconfigured from a diamond to a single-point interchange. The new design alleviated congestion on the ramps and along Route 111, as well as improved safety.

The proposed improvements include:

1. Interchange 46 in Fairfield: The only interchange area on the Parkway in the region that has not undergone reconstruction is Interchange 46 in Fairfield. The northbound ramps provide adequate ramp geometry and sufficient acceleration and deceleration lanes. However, the southbound ramps consist of short ramps segments, with the exiting movement along a tight radius loop ramp and the entering movement along a short on-ramp that is stop controlled. Complicating exiting and entering is the proximity of the slip ramps for the rest area located between the ramps. These ramps should be realigned, lengthened and, if possible, relocated to provide a more efficient connection with Congress Street and Route 59, as well as the service area.

2. Fairfield Service Plaza: The existing service plaza is located on both sides of Route 15 at Interchange 46. The facility is undergoing reconstruction.

Route 8 and Route 25 Expressways Improvement Actions: These expressways begin with an overlap section from I-95. Near the Bridgeport-Trumbull town line, the highways split., with Route 8 continuing as a limited access highway for ±54 miles in a north, northeast direction toward Stratford and Shelton and ending in the Town of Winchester. The Route 25 Expressway continues northward through Trumbull, ending in about six miles at Route 111 near the Monroe town line.

Proposed improvements include:

1. Along the Southbound Approach to I-95: Reconstruct and modify the southbound approach I-95 project to eliminate the weave section created by the entrance to Route 8/25 from Washington Avenue followed by the exit to Myrtle Avenue. The proposed project would close the on-ramp from Washington Avenue and off-ramp to Myrtle Avenue to eliminate the weave section and conflicts between entering, exiting and mainline traffic.

2. At the Split between Route 8 and Route 25: Three travel lanes carry Route 25 north while only two handle Route 8 traffic. Congestion occurs because of the higher traffic volumes on Route 8. To facilitate diverging traffic, construct a third lane for Route 8 northbound from the split to the vicinity of off-ramp to Route 15.

3. Route 25 at Whitney Avenue: Construct a partial interchange to provide access to and from Whitney Avenue and divert some traffic from Daniels Farm Road to access Route 25.

US Route 1 Improvement Actions: US Route 1 parallels I-95 over most of its length through the Region and provides an alternative for local traffic. However, congestion, numerous traffic signals and a high incidence of accidents induces motorists to use I-95 for local travel and avoid US Route 1 as much as possible. The cross section inconsistently

Route 25 Expressway operates delay-free, but a new partial interchange at Whitney Avenue would alleviate traffic congestion on Daniels Farm Road.

alternates between two and four lanes. Turn lanes are provided at some but not all intersections. The accident rates indicate higher than expected accident experience, owing to the frequency of signalized intersections and non-uniform lane configuration.

Proposed improvements include:

1. Provide lane continuity over its entire length by widening US Route 1 to a uniform four travel lanes with left turn lanes at signalized intersections.

2. Eliminate the US Route 1 and Route 130 traffic circle and widen the westbound section to provide bi-directional travel. Route 130 would be realigned to a form a “T” intersection with US Route 1.

3. Construct intersection improvements, including minor widening and installing turn lanes, at various locations in Fairfield, Bridgeport and Stratford.

Route 25 Improvement Actions: The Route 25 Expressway ends at Route 111 and “dumps” a high volume of traffic onto the two-lane Route 25 arterial. Peak hour congestion is severe. The numerous commercial driveways and narrow road width contribute to the higher than expected accident rates at several intersections and mid-block locations.

Short-term, intersection improvements to address recurring congestion and improve traffic flow have been identified and are being constructed. Long term congestion relief will require increasing roadway capacity and major widening to four travel lanes. However, the potential environmental and cultural impacts of the project need to be addressed and mitigated.

Proposed improvements include:

1. CTDOT is reconstructing and realigning the Purdy Hill Road and Judd Road intersection in Monroe to provide wider/longer turn lane approaches and installing new left turn lanes, installing traffic signals at Green Street, closing Pepper Street and widening at Route 59 to provide dual left turn lanes.

2. Major widening to four lanes with turn lanes at major intersections from the end of the divided section north of Route 111 to the Monroe-Newtown town line.

Route 111 Improvement Actions: Route 111 is a main travel corridor through Monroe, providing a connection with the Route 25 Expressway and access to many commercial activities. In Trumbull, it was reconstructed to four lanes from the Route 25 Expressway to the vicinity of Purdy Hill Road. Current volumes cannot be handled by the two-lane roadway and

Congestion occurs along several arterials throughout the region, especially along US Route 1.

The Route 25 Expressway “dumps” large volumes of traffic onto the two-lane arterial creating substantial congestion and back-ups.

peak hour congestion occurs. Future levels of service are expected to worsen and longer sections will experience moderate to severe congestion. Potential environmental and cultural impacts

preclude major reconstruction and widening projects. Instead, it is important to ensure that any improvements that are implemented are sensitive to the adjacent neighborhoods and are in context with the more rural quality of Monroe.

Proposed improvements include:

1. Minor widening of a 40-foot cross section with turn lanes at key intersections from the vicinity of Purdy Hill Road to Elm Street.

2. Minor widening to a 32-foot cross section with drainage improvements from Cross Hill Road to Fan Hill Road.

3. Reconstruct and realign the intersection at Route 110 to create a standard “T” type intersection with 90-degree angles and investigate and determine the need to install a traffic signal.

Route 130-Stratford Avenue Reconstruction Project, Bridgeport: Reconstruction and rehabilitation of Route 130 from Water Street to the Yellow Mill Channel as part of the Bridgeport Landing (Steel Pointe) redevelopment project. Includes major widening to provide four travel lanes, plus turn lanes and construction of bicycle and pedestrian facilities.

Route 130 Reconstruction Project, Bridgeport: Reconstruction and rehabilitation of Route 130 from Fairfield Avenue to the vicinity of Park Avenue; including the possibility of converting the one-way street into a two-way facility and installing a modern roundabout at the intersection with Fairfield Avenue. Drainage and sewer systems need replacement and upgrade.

SR 700 Reconstruction Project, Bridgeport: Reconstruction and rehabilitation of SR 700 from State Street to the vicinity of Park Avenue; including installing a modern round-about at the intersection with Fairfield Avenue. Drainage and sewer systems need replacement and upgrade.

Daniels Farm Road in Trumbull Improvement Actions: Daniels Farm Road is a main north-south arterial connecting Monroe and the east side of Trumbull with the Route 25 Expressway. Because of the residential land use, it serves a commuter function, with peak operating problems in the morning and evening. Complicating operations are the locations of Trumbull, Hillcrest Middle School and Daniels Farm Elementary School along the corridor. Vertical and horizontal alignment deficiencies along the southern section add to the operating problems.

Proposed actions include minor widening to provide a uniform 32-foot road and installing turn lanes.

Systems Preservation

The highway system preservation projects are intended to maintain the system in a state-of-good repair. Actions include strategic repaving and rehabilitation of roadways and hazard elimination projects. Spot intersection improvements are included in this category.

Proposed actions include:

1. Construct intersection improvements at Route 108 (Nichols Avenue), Connors Lane and Second Hill Lane, including safety improvements and realignment.

2. Construct roadway drainage improvements along Barnum Avenue in Stratford.

3. Construct intersection improvements at West Broad Street and Linden Avenue, including safety improvements at the I-95 southbound ramp at Linden Avenue, and minor roadway improvements from Linden Avenue to California Street.

4. Resurface and rehabilitate several

Daniels Farm Road in Trumbull carries up to 17,000 vpd and is a narrow road with some steep grades.

local Downtown streets including North Frontage Road, John Street, Lafayette Boulevard, Water Street and Broad Street as part of a strategic paving and resurfacing program

5. Resurface and rehabilitate Merritt Boulevard in Trumbull from overpass of Woodcrest Avenue to the end of town maintenance.

6. Construct general rehabilitation projects to maintain system in state-of-good repair, including repaving and safety projects throughout the region. Projects to be determined.

Seaview Avenue Transitway Projects

Seaview Avenue, in Bridgeport, extends from US Route 1 southward to Bridgeport Harbor and connects commercial wharves in the south with I-95, US Route 1 and other industrial parcels. The condition of the roadway is poor, and operations are restricted at several points including the New Haven Rail Line overpass. The City of Bridgeport has identified the relocation and/or rehabilitation of Seaview Avenue as essential to facilitating redevelopment of Bridgeport's East Side and East End neighborhoods. The corridor will form the spine for a major revitalization effort that transform the East Side/East End into a Transit Oriented Development (TOD) District with a mix of housing, offices, industrial and commercial activities. The proposed project will be also anchored by a new rail station.

The East Side of Bridgeport includes a collection of transit-accessible brownfields that are prime for sustainable redevelopment. The intent is to link the agglomeration of redevelopment opportunities to the proposed rail station with improved pedestrian connections, shuttles, or enhanced bus service. This project presents a perfect opportunity to demonstrate the combined benefits of site remediation, redevelopment, and transit provision to eliminate blight, improve neighborhood amenities and enhance mobility options. The proposed roadway improvements are essential to this redevelopment project. The following actions are proposed:

Construct a new four-lane, limited access highway west of the existing Seaview Avenue and along the east edge of the Yellow Mill Channel.

Install new traffic signal equipment at several intersections and provide turn lanes

Develop an attractively landscaped linear park along the west edge of the new roadway between it and the Yellow Mill Channel. The linear park would include bicycle and pedestrian pathways.

Create a new underpass of the New Haven Rail Line, maintaining the existing elevation and grade of the viaduct.

Reconstruct several intersecting street approaches to meet the new roadway's alignment and grade.

Widen and reconstruct the existing New Haven rail line underpass and provide increased vertical clearance for Seaview Avenue.

Highway Bridge Improvement Projects

The condition of the state's bridges has been an important issue since the collapse of the Mianus River Bridge

Seaview Avenue corridor

on I-95 in Greenwich. As a result, Connecticut embarked on an extensive effort to evaluate bridge sufficiency and implement necessary rehabilitation. The State bridge inspection program identified 1,620 State bridges rated as being in fair or poor condition. The majority of the deficient structures were on I-95. Over the years, most of the deficient structures have been replaced or rehabilitated with design underway or programmed for the remaining bridges.

Two major state bridge projects are planned and programmed for construction within the next five-to-ten years.

1. Replacement of I-95 Bridge (State Bridge Number 00135) over the Housatonic River and Naugatuck Avenue between Stratford and Milford. The superstructure is in poor condition and needs to be replaced. I-95 will be widened to provide wider shoulders. The project is under construction.

2. Replacement of the Route 34 Bridge (State Bridge Number 01843) over the Housatonic River between Monroe and Oxford. The bridge is currently located on the Stevenson Dam and its deteriorated condition requires it to be repaired. Because of the sharp curves along the approaches to the bridge and need to remove the bridge from the dam, the project would construct a new bridge upstream of the dam. This will eliminate the sharp curves in advance of the bridge and provide a straighter alignment. The project (project number 0084-0093) is in design; however, because of financial constraints, it is not included in the current TIP/STIP.

Local bridges are inspected on a regular basis by CTDOT. Improvements can be funded under the Local Bridge Program. Major bridge projects can be transferred to the State Bridge Program to facilitate replacement. Age has caused many local bridges in the region to deteriorate and need to be replaced. The following actions are proposed:

1. Replace, rehabilitate and restore various highway bridges determined to be deficient. Includes both the State Bridge and Local Bridge programs. Bridges and project locations to be determined.

2. Replace the Congress Street Drawbridge over the Pequonnock River in Bridgeport. Scouring and shifting of bridge abutments has caused a misalignment of bridge decks and has forced the closure to vehicular traffic. Under the ARRA Program, funds were provided to demolish and remove the leaf sections. The City of Bridgeport has committed to constructing a new bridge

within the next ten years.

3. The New Haven rail line passes through the region. All railroad crossings are grade separated, with either the road passing under the rail line or a bridge carrying the street over it. There are a total of 47 crossings of the New Haven rail line, 35 are underpasses and 12 are bridges. The vertical and horizontal clearances of many of these structures restrict traffic flow and cause congestion and constrained operations. The vertical clearance under some of these rail structures also creates traffic problems. At many locations, the vertical clearance is not enough to accommodate heavy-duty, commercial trucks, which forces them to travel farther to use an underpass that is sufficiently high. The rail underpasses are also prone to flooding and ponding of rain water as the road under the railroad bridge structure often forms a bowl or swale profile with the approaches at a higher elevation. This potential for flooding causes safety and traffic problems when it rains. These bridges need to be replaced, repaired and rehabilitated to eliminate flooding and provide increased vertical and horizontal clearances. Project needs, scope and locations to be determined.

Context Sensitive Solutions (CSS)

The Context Sensitive Solutions (CSS) concept emphasizes a need for flexibility in highway design and more consideration of the possible impacts to the surrounding environment of a highway project. It advocates project designs that are in character with the surrounding land use, enhance the area and avoid or minimize environmental and cultural impacts. Early and proactive public involvement is seen as an important element of CSS. Engineers should meet with the public before developing design plans, not after.

As defined above, CSS is a collaborative,

The Congress Street Bridge has been closed to vehicular traffic and its closure has cause congestion on parallel roads and restricted access to the East Side.

interdisciplinary approach to designing a transportation action that involves all stakeholders. To be successful, CSS requires the designer to understand the values placed on a project area by the community. At the same time, the community must be able to identify the resources and features that need to be preserved and provide a vision of the area. The first step in the CSS process is to clearly and accurately define the purpose and need for the project. A general misconception about CSS is that the process will result in a project that is not safe. Although the intent is to design a project that is in harmony with the community and preserves environmental, scenic, aesthetic, historic and natural resource values of the area, safety is not compromised and design standards are not relaxed. Instead, by focusing on the specific purpose and needs for the project, impacts to valued resources can be avoided or aesthetic and environmental features preserved.

The basic characteristics and techniques of the CSS process are:

Public Involvement: A major part of the project scoping and development phase, needs to be started early and continued throughout the project stages.

Establish a Multi-Disciplinary Team: A multi-disciplinary team must be established early, with disciplines based on the needs of the specific project and inclusion of the public.

Define the Context of the Project Area: This involves looking at the transportation context (accidents, traffic data, speed, local or regional significance, functional class), environmental context (ecological, wetlands, noise receptors, farmland, parks, and scenic resources) and the community context (cultural and historic resources, access to downtown/ waterfront, public facilities, community's vision, and neighborhoods).

Sensitive Design and Flexible Design: Project scoping needs to be sensitive to community and flexible in applying guidelines. Although safety should never be compromised, the AASHTO and CTDOT design guidelines provide sufficient flexibility to ensure a safe design that is in context with the area.

Reach Consensus on Preferred Alternative: Through the scoping process, the preferred alternative would be determined by stakeholders.

Include Aesthetic Treatments: These features help soften the altered roadway and mitigate impacts to the surrounding area. Streetscape improvements make an area more interesting while the choice of a median treatment will influence how a project is perceived. A painted median has little aesthetic value, while a landscaped, raised median results in a more pleasing environment. This action provides an opportunity to mitigate and compensate for potential impacts.

Visualization: It is valuable to employ a full range of tools to communicate project alternatives.

Flexibility in highway design can be achieved through the use of sound engineering judgment that considers all factors and related tradeoffs. It does not mean a reduction of geometric criteria and safety should never be compromised. When the design results in substandard features, mitigation is required and the designer needs to document the rationale behind the decisions. After

design it is important to make sure the project is constructed as designed and what is constructed is maintained. Many liability issues stem not from allowing a substandard design but from not maintaining the facility after it is built.

Access Management Program

The basic objective of an Access Management Program is to preserve the integrity of arterial traffic while maintaining essential access to adjacent property. A strong correlation exists between the number of driveways per mile and accidents, therefore, if the number of driveways can be reduced, accident incidence will also decline. The number and frequency of driveways also affects roadway capacity; the more driveways located along the arterial the lower its capacity and worse the operating level of service. Capacity is affected in a number of ways by the presence of driveways. Vehicles entering the arterial from an adjacent land use do so at a slow travel speed. This impedes in-stream traffic and causes a general slowing of travel speeds. Similarly, a vehicle waiting to turn into a driveway may cause a blockage, temporarily preventing traffic behind it to move. At a minimum, a slowdown in the vehicle stream is caused even if traffic is able to by-pass the stopped vehicle. In contrast to an arterial with frequent driveways, highly managed arterials have fewer accidents and operate at better levels of service.

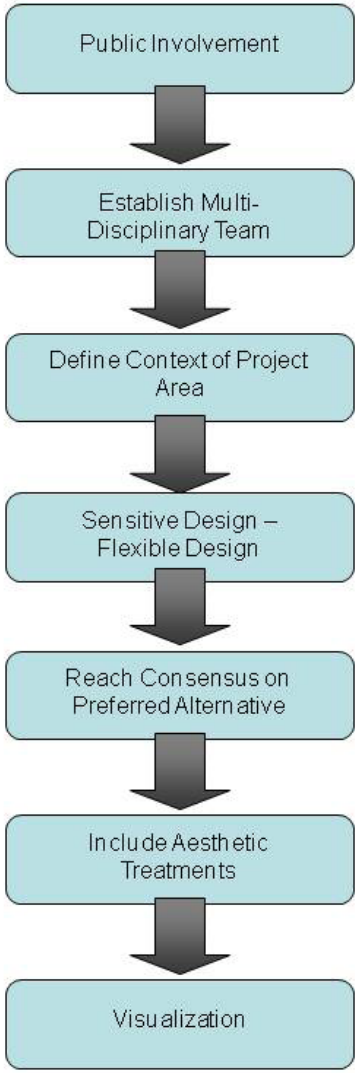
The various access management techniques can be categorized into major functional objectives, which should be codified and enforced. Key to a successful Access Management Program is to enhance access to the commercial property and not to be so restrictive that people are no longer willing to frequent the business. The intent of the program is to make access safer and easier, even though the closure or reduction in access points may appear to make it less convenient. Another consideration, especially for smaller parcels, is the accommodation of delivery trucks. Some smaller parcels may need two access points solely for the purpose of handling deliveries. A large truck can enter at one driveway and exit the other, thereby avoiding the need to maneuver in a small, confined parking lot. The interconnection of parking lots may avoid some of the truck access and maneuvering problems.

Possible access management actions include:

Close driveways;

Consolidate driveways;

Techniques to Achieve CSS



Narrow driveway openings and better define entrance and exit points;

Limit allowable movements such as right-turn only entrances and exits;

Reduce curb radii;

Provide shared access for adjacent properties.

The best access management applications will most likely involve a combination of the above actions. For instance, as driveways and access points are realigned, relocated or modified, adequate curb radii should be provided and the construction activity needs to be completed in such a way as to ensure internal conflicts between entering, exiting and parking vehicles are not created. Also any special on-site conditions need to be considered before a preferred action is implemented. Finally, an Access Management Program is locally developed and implemented. It requires the commitment of the local municipality and full cooperation of the affected property owners and businesses.

Environmental Mitigation

Certain transportation improvement actions can result in impacts to the natural and cultural environment of the area. For most projects, an environmental assessment needs to be conducted so that the environmental consequences of the proposed action are understood and appropriate actions can be taken that to protect, restore, and enhance the environment. For large scale projects and major transportation investments, environmental impact statements are required that fully document feasible alternatives and describe the impacts to the affected environment.

MAP-21requires the long-range transportation plan to “include a discussion of the types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.” In addition, the Connecticut General Statutes require the preparation of an Environmental Impact Evaluation (EIE) whenever a planned action has the potential to significantly affect the environment (Section 22a-1b(c)). The EIE is “a written evaluation of the potential environmental impacts of the proposed action, and includes a detailed description of the proposed action and the need for the action, the direct and indirect impacts of the action, both positive as well as adverse, alternatives to the proposed action which were considered, the consistency of the action with the state Conservation and Development Policies Plan, and the economic, social, and environmental costs and benefits of the proposed action.”

The LRP addresses environmental mitigation by supporting regulations that require the conduct of an EIE, environmental assessment or EIS for most highway projects and encouraging the design of projects that follow a flexible design approach as embodied in the Context Sensitive Solutions techniques.

In general environmental mitigation includes:

Avoiding the impact altogether by not taking a certain action or parts of an action.

Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation of potential impacts from a proposed action requires careful study and assessment to determine the extent of impacts, the possibility of altering alignment or scope to avoid impacts, and consultation with resource and environmental agencies and managers, including the Connecticut Department of Energy & Environmental Protection (DEEP), State Historic Preservation Office (SHPO), State Archaeologist, United States Environmental Protection Agency (EPA), and United States Army Corps of Engineers. Depending on the size and scope of the project, mitigation actions include the following:

Property acquisition: Provide just compensation based on market value and certified appraisal and provide relocation assistance.

Noise: Assess noise impacts from construction and post construction; limit construction activities to daytime hours and standard work schedules; and consider effectiveness of and need for noise barriers.

Air quality: Assess air impacts and adjust project design to ensure improvement in auto-related emissions, if necessary.

Surface water: Install erosion and sedimentation controls during construction; and install stormwater management system to capture, detain and treat storm flows before discharge.

Groundwater recharge and water supplies: Provide temporary, on-site treatment of possible groundwater containments, including heavy metals; and implement primary treatment to remove sediments and secondary treatment to remove heavy metals.

Topography: Minimize alterations to existing grades and provide contours within project area that result in no impact to adjacent properties.

Environmental Justice (Social/ Neighborhood): Ensure action has a positive and beneficial impact on the neighborhood and does not result in a disproportionately high impact on the area.

Soil and geology: Remediate any impacts on soils and geology within the project area and minimize contamination of soils.

Floodway: Develop alignment options that cause the least impact to the 100-year floodway and create new flood storage to compensate for any volumetric flood storage loss in the 100-year flood zone caused by the action on a 1:1 basis.

Wetlands: Develop alignment options that cause the least impact to wetlands; loss or impact to wetlands would be mitigated through enhancement, restoration and creation efforts and focus not only on replacing lost wetland types but also for loss of function and value; and efforts would incorporate a combination of hydrologic, vegetative and soil features.

Natural environment: Assess the potential and probable impacts to various elements of the natural environment, including biodiversity, fisheries, aquatic, reptilian, amphibian, avian and mammalian resources, threatened and endangered species, and species habitats, and implement mitigation measures, especially avoidance, as appropriate.

The new boardwalk provides a pleasant walkway along the Dock and connection between ferry terminal building (below) and the Bridgeport rail station.

Passenger Ferry Services

The Bridgeport Port Authority operates and maintains the Water Street Dock (formerly the Union Square Dock) on the westerly shore of the Bridgeport Inner Harbor just below the P.T. Barnum Bridge carrying I-95 over the Harbor. Facilities include a docking berth for passenger and vehicular ferries, additional berthing space for small vessels, passenger terminal, and vehicle staging area. The Dock has about 255 feet of berth space with 16-to-20 feet of depth. The Ferry Terminal was originally established in 1883 for the commercial exchange of industrial products made in Connecticut for agricultural products of Long Island. Passengers were also transported from the Dock via ferries.

The Water Street Dock is strategically located in Downtown and is functionally connected to the Bridgeport Intermodal Transportation Center, the City of Bridgeport's transportation hub. The Ballpark at Harbor Yard and the Arena at Harbor Yard are adjacent to the dock area. The Dock has undergone several renovations over the last ten to fifteen years, including construction of new ferry terminal. The terminal houses the offices of the Bridgeport Port Authority, a cafeteria, and ferry information center. Other improvements and enhancements include reconstruction of the dock and bulkhead, construction of a new access road, rehabilitation and restoration of the timber piers, expansion of ferry berth, and enhancement and development of a pedestrian walkway along the dock.

The Bridgeport and Port Jefferson

Bridgeport-Port Jefferson ferry leaving the Water Street Dock.

Steamboat Company operates passenger and vehicle ferry service to Long Island and leases the Water Street Dock for loading and unloading. The Company operates three vessels daily to cross the Long Island Sound, providing eleven round trips Monday through Thursday, 16 round trips Friday and Saturday and 15 round trips on Sunday. A cross-sound trip (26 miles) takes about one hour and fifteen minutes. The fleet ranges in age from eleven years to 28 years. Use of the ferry service has been increasing over the years. About 996,000 passengers and ±470,000 vehicles are currently carried annually.

The Water Street Dock and its associated passenger ferry service is an important

transportation facility and contributes to Downtown Bridgeport's designation as a regional transportation hub. Renovations have made the Dock an attractive destination for residents and visitors alike and were essential in providing and maintaining an efficient waterborne service. However, the Dock needs to be maintained and enhanced to accommodate future service demands and needs. A critical planned project is the construction of parking on site. Currently, almost all passenger parking is handled off-site. Accommodating parking on site will be more convenient for customers and make the ferry service more accessible. In addition, the dock has only one berth for passenger ferry service. This limits service and operating hours.

Proposed improvements at the Water Street Dock include the following actions:

Second Vessel Berth Facility: The proposed secondary offload ramp/ berthing facility would accommodate berthing a vessel in one of three configurations at the same location. The configuration would depend on the type of vessel and the vessel operator's preference. The proposed berth would be located along the southern section of the Water Street Dock. The location would border the site of the proposed parking garage. The berth would be able to handle vessels with up to a 40-foot beam, 280-foot length and 18-foot draft and would accommodate loading and unloading of passengers, freight, trucks and passenger vehicles.

Rehabilitate Ramp and Apron Area: Despite regular maintenance, the reinforced concrete decking of the ramp and apron is in a chronic state of disrepair. The deteriorated conditions are due to high traffic volume (about 470,000 vehicles are loaded and unloaded annually) and the saltwater environment impact on the deck materials. The planned project will rehabilitate and upgrade the ramp and apron structure using materials better suited for a marine environment and for high traffic volumes. It will ensure a stable and safe loading operation into the future.

Parking Garage: The Bridgeport Port Authority acquired the land needed to construct the garage from the adjacent power generating facility. The project will provide about 200 parking spaces for ferry customers at the dock with a pedestrian connection to the terminal building.

Extend Waterfront Park: The Waterfront Park extends from Stratford Avenue to the stair access to the outbound platform of the Bridgeport Rail Station. This project would extend the boardwalk along the Pequonnock River to link with the Water Street Dock, completing the gap in the Waterfront Park behind the New Haven bound side of the railroad tracks. It would improve and enhance the existing waterfront park and Water Street Dock.

New Water Street Dock Access: The proposed project would enhance and improve the existing rail underpass leading to the Water Street Dock and re-open it as a secondary egress point for passenger vehicles. The location was the original access roadway to the Dock but it was closed when a new access road was opened to the south of the Dock. Low vertical clearance limits the use by larger trucks, buses and recreational vehicles, but passenger vehicles would use it during peak time to avoid conflicts with Harbor Yard related traffic and improve downtown circulation. The rail bridge would be painted and a "Welcome to Downtown Bridgeport" sign would be installed. Other enhancements would include textured pavement treatments, dynamic message signs, directional and wayfinding signage, plantings, wooden guardrails and decorative lighting. Pedestrian walkways would also be provided and enhanced to provide separation from vehicles.

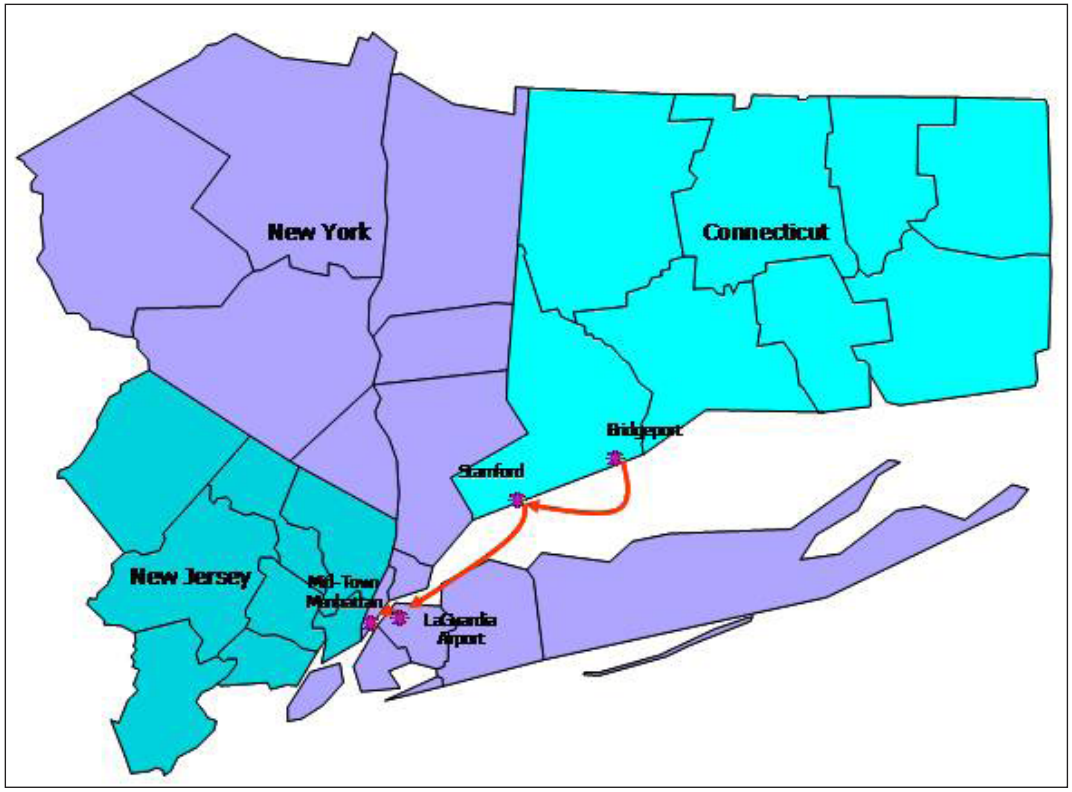
Source: Bridgeport Downtown Special Services District.

High

Speed Ferry Service

The Bridgeport Port Authority has been working with other organizations on planning for and developing a high-speed ferry service that would operate between Bridgeport, Stamford and New York City. Market studies have demonstrated that the cost to commute by high speed ferry would be competitive with other modes and that the service would attract a sufficient number of passengers that no operating subsidies would be required. Travel times would also be comparable to both rail and auto. Initial concepts have identified three possible landing sites on the East Side of Lower Manhattan (the Financial District): 34th Street Pier, Pier #11 and Pier #5. An intermediate stop at LaGuardia Airport is also being considered.

The proposed service would be run by a private operator, using next generation boats – very maneuverable, state-of-the-art navigation and advance radar plotting aids, computer-controlled, able to achieve stable movement in all weather conditions, low noise water-jet propelled engines and low emissions. Other passenger amenities include fully reclining airline-style seating, large screen TVs, food services and computer data ports. In first class, seats are arranged in clusters with tables. The BPA



has released a Request for Proposals to operate the high speed ferry service.

Two terminal locations are being considered:

Water Street Dock: The existing demarcation and embarkation point for traditional ferry service operated by the Port Jefferson Steamboat Company.

A second loading berth would need to be built to handle the high speed ferry boats and the existing terminal would need to be expanded to accommodate joint operations. A key disadvantage of this location is time lost to travel from the Sound, up the outer and inner harbor to the Water Street Dock. Once the high-speed vessels enter the harbor, speeds are lowered substantially and result in a 10 to15 minute delay in travel time.

60 Main Street: This site is located at the south end of Main Street with direct access to Long Island Sound. It formerly housed the Remington Shaver manufacturing plant and was recently purchased by a private developer. The site has a good location for docks, parking and service buildings. Access to I-95, Route 8/25 and local arterials is good and it would be feasible to improve these connections.

The 60 Main Street parcel is the preferred location because of its proximity to the deep water of Long Island Sound and the travel time advantage that provides. To facilitate operations the development of land side infrastructure is required:

Dredging and maintaining channel at an appropriate depth;

Constructing and installing new piers, docks and waterside bulkheads;

Constructing secured, on-site parking;

Constructing a passenger terminal with climate controlled waiting area, ticket and information office and cafeteria; Landscaping of the grounds;

Developing a physical connection between the Water Street Dock and the proposed high-speed ferry terminal; and

Ensuring good access to the high-speed ferry terminal via local roads from I-95 and Route 8/25 by improving road infrastructure and installing directional and information signage

Sikorsky Memorial Airport

The Igor I. Sikorsky Memorial Airport is the Greater Bridgeport Region's aviation gateway, serving the needs of the area's general aviation users, as well as a substantial amount of corporate activity. It provides aviation opportunities not only for the residents of the region but also to neighboring parts of southwestern Connecticut. It is an important transportation facility and the quality of its facilities attracts many area and out-of-area travelers and pilots. However, the Airport faces strong competition from other nearby airports with similar services, especially Tweed-New Haven and Westchester County Airports and as a result has a relatively small market shed.

The Sikorsky Memorial Airport is owned and operated by the City of Bridgeport but it is located in the Lordship section (South End) of Stratford, which has made it

difficult for the airport to upgrade and enhance services, facilities and infrastructure and has created some land use and zoning incompatibilities.

The service area, as defined in the state airport plan is depicted in the following map.

The three-letter Federal Aviation Administration (FAA) code for Sikorsky Memorial Airport is BDR. The State airport plan defines BDR as primarily a general aviation airport accommodating a significant amount of corporate activity, as well as, some regional-type charter service. Scheduled air service was suspended in 1999. The FAA also classifies airports based on their ability to safely accommodate certain types of aircraft. The Airport Reference Code is based on the approach speeds to the airport and the minimum and maximum wingspan of aircraft that can safely land at the airport. The ARC for Sikorsky is C-II indicating approaches between 121 knots and 140 knots with wingspans of 49-to-79 feet. The airspace around the airport is controlled by the tower when it is open and extends to 2,500 feet above ground level for a radius of five miles. When the tower is closed, the airspace is extended and covered by radar.

The Airport consists of about 800 acres.

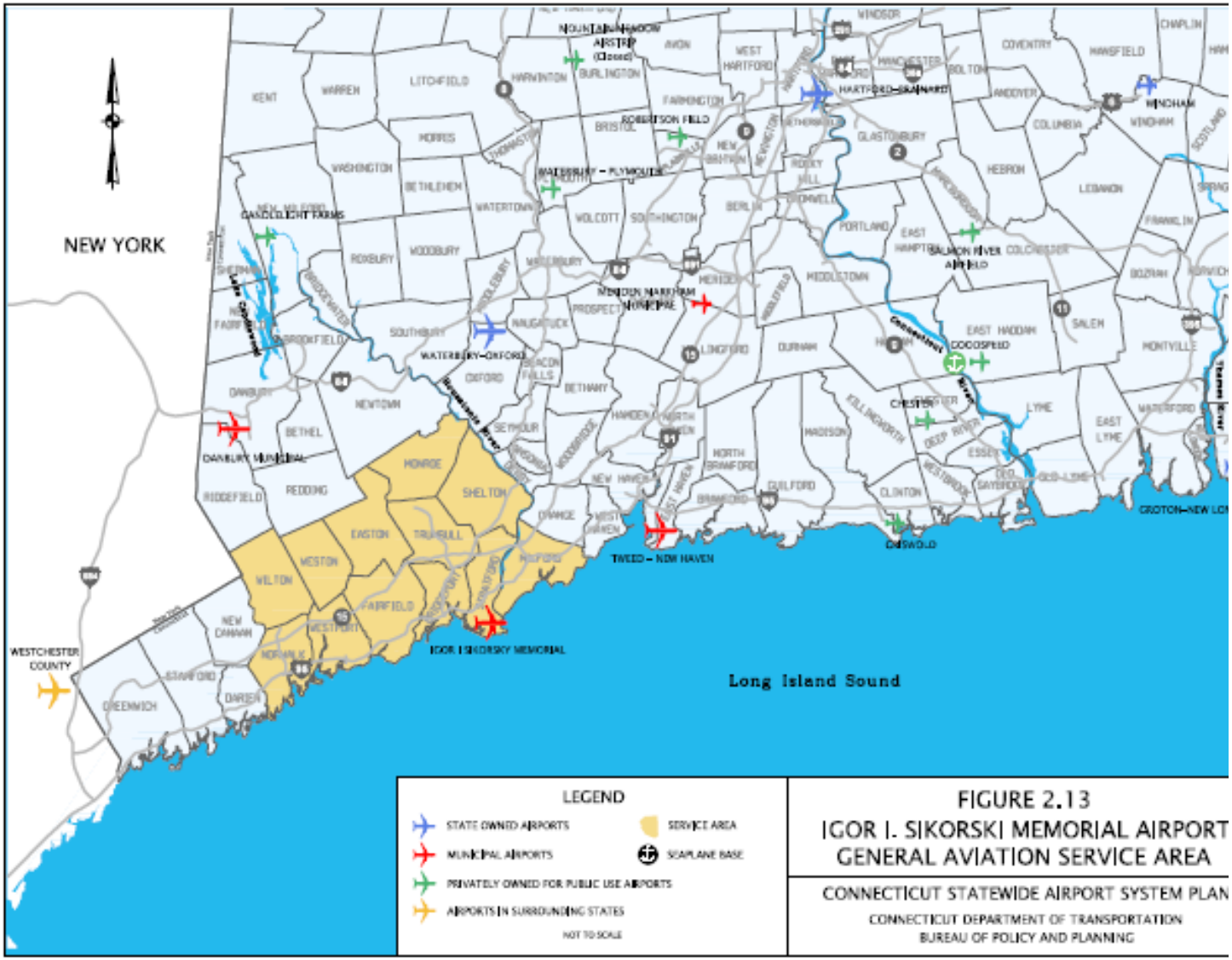


FIGURE 2.13
IGOR I. SIKORSKI MEMORIAL AIRPORT
GENERAL AVIATION SERVICE AREA

CONNECTICUT STATEWIDE AIRPORT SYSTEM PLAN

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING

Facilities and infrastructure include two runways, taxiways, aprons, tie-down areas, hangars, terminal, control tower and a number of related buildings and businesses. Runway 06-24 is 4,677 feet long with a displaced threshold, on the 24 approach, of 320 feet. Runway 11-29 is 4,761 feet long with a displaced threshold, on the 29 approach, of 364 feet.

A Runway Safety Area (RSA) is the land at the ends of the runways that provide a place for aircraft that undershoot, overrun or veer off the runway to safely come to a stop. The FAA has established standards for RSAs and requires all federally certified airports to conform to the RSA requirements to the extent practical. At BDR, the required size of the RSA is 1,000 feet long by 500 feet wide for both runways. The current RSAs for BDR runways meet FAA standards for width, but have substandard lengths measuring 100 feet and zero feet for Runway 06-24 and 250 feet and 149 feet for Runway 11-29.

The Master Plan Study and Airport Layout Plan (ALP) Update identified deficiencies that affected the ability of the Airport to fulfill its role as a regional corporate and general aviation airport for the New England Region. Deficiencies include: deteriorated pavement on Runway 06-24; non-standard RSAs on Runway 06-24; absence of a standard runway approach lighting system for the Runway 06-24 instrument approach; and insufficient runway length on Runway 06-24. The runways are regularly crack sealed and a thermoplastic seal coat was applied in 2007; however, no reconstruction or rehabilitation of the pavement of Runway 06-24 has taken place and the pavement structure continues to deteriorate.

The critical needs and recommendations at the Airport are:

Improve and rehabilitate the pavement structure on Runway 06-24 to provide a 20-year design life to accommodate existing and projected aircraft types and levels of operations. The existing pavement is rated as “fair” but is experiencing accelerating deterioration;

Extend the RSA on Runway 06-24 to substantially meet FAA standards. The existing runway safety areas do not meet federal standards with respects to area, grade and objects in the area. The preferred alternative would provide an RSA of 300 feet in length at the end of the Runway 24 threshold and installation of an Engineered Materials Arresting System (EMAS). The action will necessitate the realignment of a short section of Route 113 (Main Street) at the Runway 24 approach;

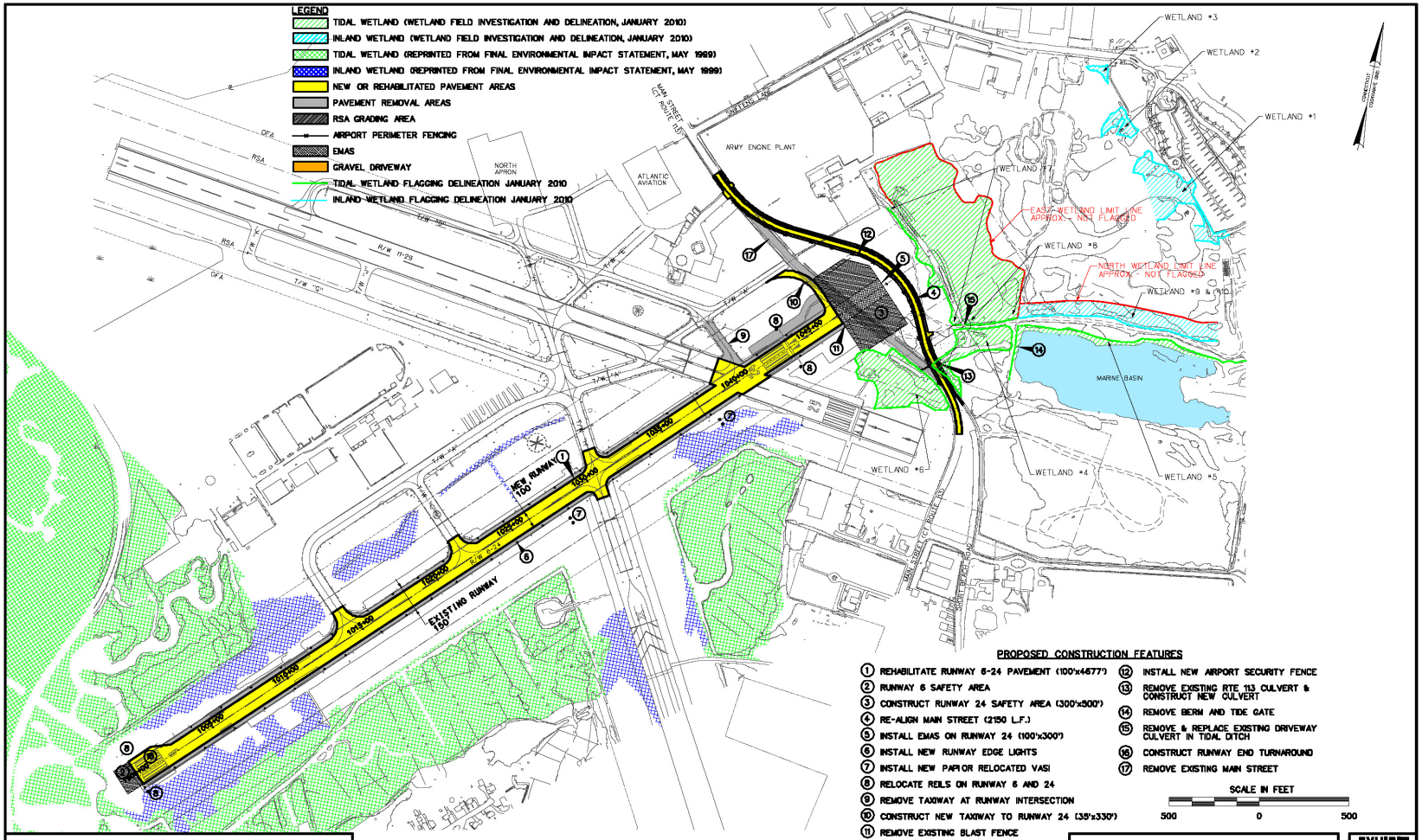
Enhance visual guidance systems for the Runway 06-24 instrument approach to address the absence of a standard runway approach lighting system;

Provide sufficient runway length of ±5,000 feet on Runway 06-24 to accommodate existing and projected air transportation demand. The existing runway lengths require aircraft to restrict their weight on take-offs and landings;

Construct various taxiway and runup apron improvements;

Construct new ramp areas and hangars; and

Purchase various capital equipment.


LEGEND
TIDAL WETLAND (WETLAND FIELD INVESTIGATION AND DELINEATION, JANUARY 2010)
INLAND WETLAND (WETLAND FIELD INVESTIGATION AND DELINEATION, JANUARY 2010)
TIDAL WETLAND (REPRINTED FROM FINAL ENVIRONMENTAL IMPACT STATEMENT, MAY 1999)
INLAND WETLAND (REPRINTED FROM FINAL ENVIRONMENTAL IMPACT STATEMENT, MAY 1999)
NEW OR REHABILITATED PAVEMENT AREAS
PAVEMENT REMOVAL AREAS
RSA GRADING AREA
AIRPORT PERIMETER FENCING
EMAS
GRAVEL DRIVEWAY
TIDAL WETLAND FLAGGING DELINEATION JANUARY 2010
INLAND WETLAND FLAGGING DELINEATION JANUARY 2010
WETLAND #3
WETLAND #2
WETLAND #1
CONNECTICUT COORDINATE GRID
ARMY ENGINE PLANT
NORTH APRON
ATLANTIC AVIATION
MAIN STREET (CT ROUTE 113)
SHERMAN LANE
WETLAND #7
EAST WETLAND LIMIT LINE APPROX - NOT FLAGGED
WETLAND #8
NORTH WETLAND LIMIT LINE APPROX - NOT FLAGGED
WETLAND #9 & #10
MARINE BASIN
WETLAND #6
WETLAND #4
WETLAND #5
R/W 11-29
T/W "A"
T/W "B"
T/W "C"
T/W "D"
T/W "E"
T/W "F"
T/W "G"
RSA
OFA
NEW RUNWAY 10/24
EXISTING RUNWAY 15/33
1012+00
1009+00
1006+00
1003+00
1000+00
997+00
994+00
991+00
988+00
985+00
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34+00
31+00
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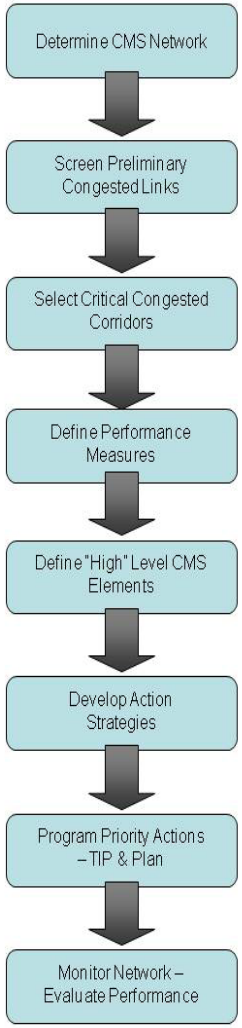
25+00
22+00
19+00
16+00
13+00
10+00
7+00
4+00
1+00
PROPOSED CONSTRUCTION FEATURES
1 REHABILITATE RUNWAY 6-24 PAVEMENT (100'x4677')
2 RUNWAY 6 SAFETY AREA
3 CONSTRUCT RUNWAY 24 SAFETY AREA (300'x500')
4 RE-ALIGN MAIN STREET (2150 L.F.)
5 INSTALL EMAS ON RUNWAY 24 (100'x300')
6 INSTALL NEW RUNWAY EDGE LIGHTS
7 INSTALL NEW PAPI OR RELOCATED VASI
8 RELOCATE REILS ON RUNWAY 6 AND 24
9 REMOVE TAXIWAY AT RUNWAY INTERSECTION
10 CONSTRUCT NEW TAXIWAY TO RUNWAY 24 (35'x330')
11 REMOVE EXISTING BLAST FENCE
12 INSTALL NEW AIRPORT SECURITY FENCE
13 REMOVE EXISTING RTE 113 CULVERT & CONSTRUCT NEW CULVERT
14 REMOVE BERM AND TIDE GATE
15 REMOVE & REPLACE EXISTING DRIVEWAY CULVERT IN TIDAL DITCH
16 CONSTRUCT RUNWAY END TURNAROUND
17 REMOVE EXISTING MAIN STREET
SCALE IN FEET
500 0 500
NOTES:
1. CONSTRUCTION FEATURES INCLUDED IN RTE 113 REALIGNMENT STATE PROJECT NO. 15-336 INCLUDE 4 11 12 13 14 17.
2. CONSTRUCTION FEATURE 15, CULVERT DRIVEWAY, TO BE PERFORMED PRIOR TO STATE PROJECT NO. 15-336.
IGOR I. SIKORSKY MEMORIAL AIRPORT
STRATFORD, CONNECTICUT
URS
ALTERNATIVE 1G MODIFIED WITH INSTALLATION OF EMAS
EXHIBIT
4.5-1

Section 7: Congestion Management Process Program

Congestion Management System Program



Congestion Management Process (CMP) Elements

The Intermodal Surface Transportation Efficiency Act (ISTEA) required states and Transportation Management Areas (TMA) to develop, establish and implement a Congestion Management System (CMS), a requirement that continues under MAP-21. The "system" is defined as "...a continuous activity of considering and implementing actions that enhance mobility and reduce congestion on designated systems or in targeted areas, appropriate to the magnitude and scope of desired system performance." The Bridgeport urban area is classified as non-attainment for air quality and designated as a Transportation Management Area (TMA) with a population over 200,000. Based on this classification, the GBRC developed a Congestion Management Process (CMP) to integrate congestion mitigation planning into the transportation planning process and consider congestion relief actions in all planning efforts. The CMP was established in cooperation between the Greater Bridgeport and Valley MPO and the Connecticut Department of Transportation (CTDOT).

The CMP entails a two-tier process. Tier 1 is a statewide system of annual reporting and monitoring with a focus on congestion issues that affect travel statewide, such as interstate highways, major expressways, commuter rail and incident management. Tier 2 consists of separate regional congestion management programs that provide for regional evaluation and implementation of congestion reduction strategies. The proposed system became operational on October 1, 1995.

The basic objectives of the CMS are:

Strive to alleviate both existing and future congestion.

Enhance mobility of both people and goods.

Evaluate performance of the system to identify areas and causes of congestions – data collection and performance measures.

Identify and assess alternative actions – needs analyses and strategy identification.

Evaluate the effectiveness of those actions – post-project evaluation.

To realize these goals and objectives, the GBRC instituted a systemic process for assessing highway performance

and identifying alternate solutions. These performance data and analyses assist decision makers in selecting cost effective strategies for alleviating recurring congestion.

The regional CMS Program consists of various elements that result in a clear understanding of congestion in the region and the actions necessary to address and alleviate congestion. These elements begin with determining the regional scope included in the CMS and ending with monitoring and evaluation of implemented actions. These elements are:

CMS Network: Although the transportation system of the region is diverse and offers its residents an integrated range of options, the movement of people and goods most often takes place on the highway network, whether it is in a private vehicle, a local bus or truck. Because of this almost universal use of the highway network, it is critically important that it function at an acceptable level of service with minimal congestion and delay. Therefore, for the purpose of the CMS process, the focus is on the highway portion of the transportation system.

Preliminary Congested Links: The GBRC identifies the congested links and corridors based on the CTDOT congestion screening report. Transportation demand modeling techniques are also used to simulate travel patterns and assess performance.

CMS Strategies Studies: From the list of congested corridors, critical priority corridors are selected for more in-depth analyses and a CMS strategies study is conducted. This involves a structured process that documents the congestion problem, assesses traffic operations, defines possible "high" level congestion mitigation strategies, identifies specific actions and estimates the potential operating improvement from implementing the recommended actions.

Performance Measures: In addition to computer modeling, the GBRC monitors highway performance by conducting a traffic count program, turning movement counts, travel speed and vehicle gap studies, and travel time surveys. From these field data, traffic operations can be assessed in much greater detail and may provide a better understanding of the extent and causes of congestion. Performance measures include: level of service, travel time, average speed, stop delay, running delay, 85th percentile speed and 10-mph pace speed.

- Level of Service
- Corridor Travel Time & Average Speed
- Stop Delay
- Running (Non-Stop) Delay
- 85th Percentile Speed
- 10-mph Pace Speed

"High" Level CMS Elements: The CMP identifies feasible and effective short term improvements that would alleviate recurring congestion. Typically, the proposed actions from the CMS studies fall into one of seven general categories:

Transportation Demand Management (TDM)

Transit Service Improvements

Intelligent Transportation Systems (ITS)

Traffic Signal Optimization & Installation Program

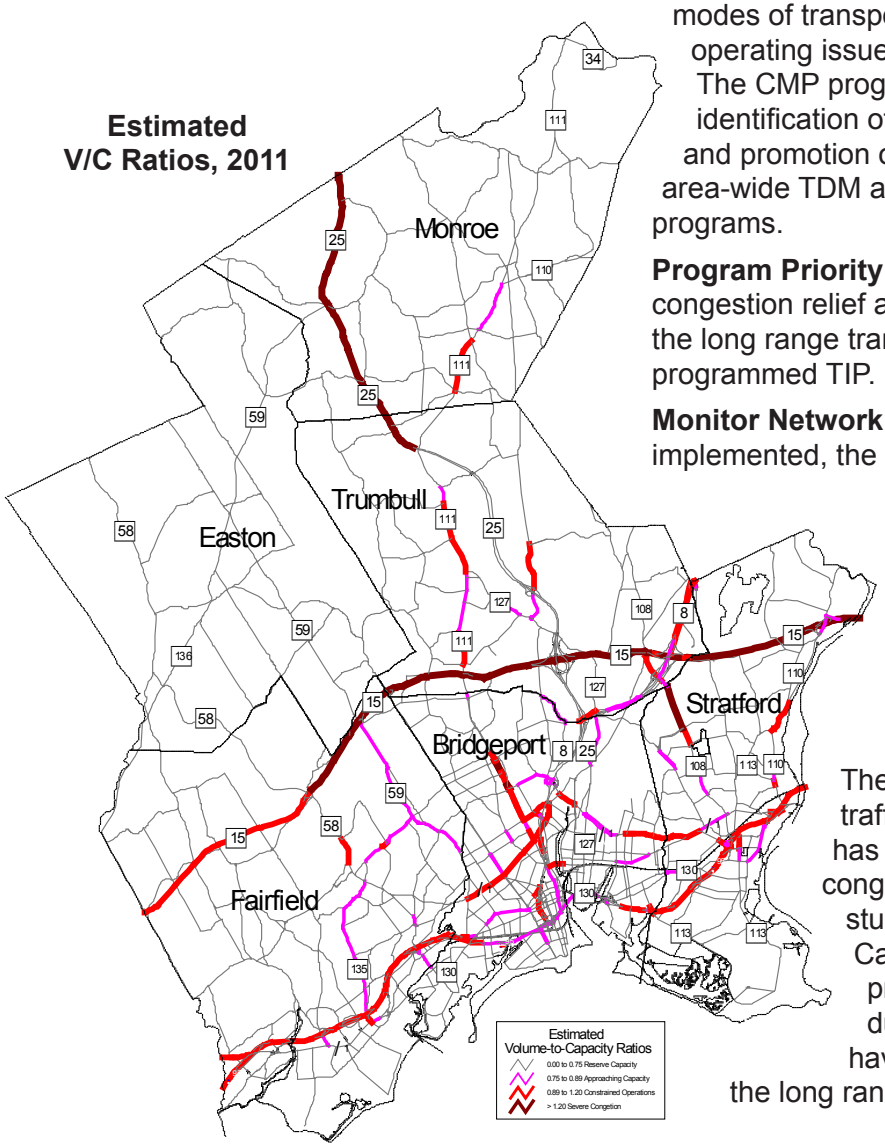
Intersection Improvements

Corridor Capacity Improvement Program

Access Management Program

Action Strategies: The selection of improvement actions is based on a thorough understanding of the causes and extent of congestion in the area, the environment of the area (land use,

Estimated V/C Ratios, 2011



context), the availability of alternate modes of transportation and specific operating issues and concerns. The CMP program balances the identification of site specific projects and promotion or enhancement of area-wide TDM and public transit programs.

Program Priority Actions: Selected congestion relief actions are added to the long range transportation plan and programmed TIP.

Monitor Network: After a project is implemented, the performance of the corridor is reevaluated and compared to pre-build conditions.

Regional Transportation Plan

CMS Actions

The GBRC monitors traffic operations and has completed several congestion strategies studies as part of the CMP. Capital improvement programs developed during each CMP study have been included in the long range transportation plan. Recommended intersection improvements along Route 25 in Trumbull and Monroe were programmed on the TIP with improvements for two intersections implemented. These projects represent immediate and short-term actions to mitigate recurring congestion, better "manage" traffic, and reduce land use impacts and the amount of traffic generation. However, it is likely that these actions will not eliminate all congestion on these roadways, nor will they be able to accommodate future growth in volume. Long term solutions are required.

The proposed CMP actions included in the long range transportation plan are:

Route 25 Corridor Actions: The Route 25 corridor experiences severe congestion during the morning and evening commute periods. The short-term congestion relief program for Route 25 focused on traffic signal optimization and intersection improvements:

1. Traffic Signal Optimization and Installation: Adjust and optimize the traffic signal timing and phasing at the Route 25 and Green Street in Monroe.

2. Intersection Improvement Program: Minor widening along Route 25 in both directions at the Purdy Hill Road and Judd Road intersection in Monroe to provide exclusive left turn lanes.

Optimizing existing signals and installing new signals will improve traffic and reduce delay.

3. Access Management Program: Included in the proposed improvement program was the recommendation for implementing an access management program to consolidate, close or relocate commercial driveways along the various sections of Route 25.

Route 58 Corridor Actions: The CMP study identified various traffic signal and intersection improvements along the upper portion of Route 58 from the vicinity of SR 732 to Samp Mortar Drive. The proposed improvements included the following actions:

1.Traffic Signal Revisions: Revise and modify the traffic signal timing and phasing at several locations.

2. Intersection Improvements: Minor widening of Route 58 at several intersections, including at the Turnpike Shopping Center, Fairfield Woods Road and Samp Mortar Drive, to provide three lane approaches, with one left turn lane, a through lane and a shared, right turn and through lane. Turn lanes would also be installed on several minor cross street approaches, including Route 135, Brookside Drive and Samp Mortar Drive.

3. Arterial Improvements: Minor widening of Route 58 from the vicinity of SR 732 to Burroughs Road to provide two travel lanes in each direction and match the exiting two-lane cross sections and eliminate the need for traffic to form a single line from two lane approaches.

4. Access Management Program: Implementation of an access management program to consolidate, close or relocate commercial driveways along the section of Route 58 between Burroughs Road and Samp Mortar Drive.

US Route 1 Corridor Actions: US Route 1 is a main east-west arterial through the Region with traffic volumes reaching and exceeding 20,000 vpd along many sections. There are 57 traffic signals over its length. Although the signals operate under a series of computer-controlled, closed-loop systems to facilitate traffic flow, the signals impact traffic flow, reduce travel speeds, contribute to recurring congestion and minimize the frequency of stops and overall delay. Many intersections along US Route 1 have been identified as high hazard locations with accident rates higher than would be expected.

1. Intersection Improvements: Minor widening at various intersections to provide exclusive left turn lanes, realign intersections to improve operations and consolidate/relocate commercial driveways to reduce conflict points.

2. Fairfield Town Center Area: The CMP study identified various traffic signal and intersection improvements to improve traffic flow while enhancing pedestrian safety and maintaining the current supply of on-street parking.

Travel Demand Management (TDM) Programs: Current TDM programs focus on the promotion of ridesharing and several incentive-based activities that provide “rewards” to those who commute to work using an alternate mode of transportation. Federal transportation funds are allocated to these incentive programs, including Deduct-a-Ride and the NuRide Program, as well as general rideshare marketing, promotion and matching services. In addition, Uni-ticket and uni-rail programs are in place that provide reductions in the cost of purchasing combinations of bus

or train fares. These various programs are intended to improve mobility and air quality by reducing the number of single occupant vehicles during peak commuting periods through the use of carpools, vanpools, trains, buses, telecommuting, and alternative work-hour programs. MetroPool, Inc. (the Region's rideshare brokerage) provides rideshare services to the general public, individual employers, multiple employer facilities, and municipalities. The CMP proposes implementation of enhanced TDM programs that would expand employer-based and area-wide actions:

1. On-going TDM Programs: Continue to provide funding support for the statewide TDM programs and regional rideshare incentive programs.

2. Employer Based Actions: These actions are implemented by employers at specific sites. Enhanced activities would provide in-house ridesharing matching and information services, preferential parking, a policy of flexible work hours, a part-time transportation coordinator, vanpool development and operating assistance.

3. Alternate Work Schedules: These actions are implemented by employers at specific sites and allow employees to modify their work schedules to less congested time periods. It also includes telecommuting programs.

4. Area-wide TDM Strategies: These strategies are implemented by the public sector, and are at the area-wide level, not site specific level. All commuters can take advantage of these programs and availability is not limited by employer participation.

5. Personalized Public Transit: Under this system, small electric vehicles would be provided at the rail stations for reverse commute trips. Commuters would pre-register and access the vehicles using a Smart Card. Computerized dispatch systems and advanced GIS applications would be developed to facilitate ridesharing and reservation of vehicles.

Traffic Signal Modernization and Management System: Within the Greater Bridgeport Region there are approximately 350 intersections controlled by traffic signals. Roughly 220 traffic signals are located on a state road with the remaining signals owned and maintained by a local jurisdiction, with the vast majority located in the City of Bridgeport. Over the last five to fifteen years, an extensive traffic signal modernization and replacement program has been underway to replace, modernize, interconnect and place under computer control traffic signals throughout the region. These upgraded, closed-loop systems allow the jurisdiction to remotely control operations and adjust timing and phasing plans and to better respond to time-of-day conditions.

The proposed traffic improvement program involves installing/upgrading traffic signal equipment to reduce congestion and adapt to variable traffic conditions throughout the day. The program also would implement the necessary modifications to bring the signals up-to-date and in compliance with MUTCD guidelines. The specific proposed improvements include:

1. Bridgeport Traffic Signal Modernization Project: This project would complete the traffic signal replacement and modernization program for the city. It entails replacement of all signal components, including traffic controller, signal heads and span wires/poles, new pavement markings, installation of coordination equipment, and revision of signal timing and phasing. Fiber optic communication links are also a part of the project.

2. Region-wide Traffic Signal Enhancement Program: This action involves upgrading, modernizing and replacing traffic signal equipment to

maintain a state-of-good-repair. Actions involve replacing all signal heads with LED lenses, installing detection equipment, providing coordination equipment, revising and optimizing the signal timing and phasing plans and minor modifications to the lane arrangement.

Intelligent Transportation Systems: The implementation of various ITS elements would be effective in making the transportation system operate more efficiently and reducing congestion. The key ITS concepts that would support an improvement in traffic operations include the following:

1. Archived Data Management (ADM) System: To collect, store, manipulate and disseminate historical data for all relevant ITS systems in the region

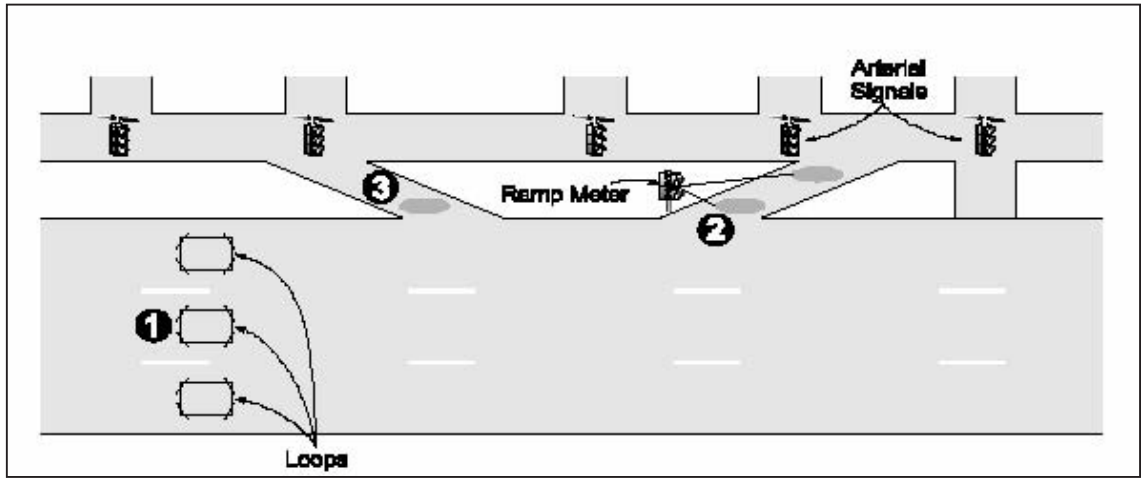
2. Enhanced Corridor Highway Operations (ECHO): This proposed program would integrate existing and planned traffic control devices and roadside equipment to expand incident management, enhance and coordinate arterial traffic signal control, develop integrated "Smart" corridors involving traffic monitoring and management, and incorporate transit priority into traffic signal systems. The system would also monitor the operation of drawbridges and more efficiently manage traffic flow while the bridges are open.

3. Parking Route and Event System for Traffic Operations (PRESTO): The proposed program would provide route guidance to the Harbor Yard district and the BITC and manage traffic flow for events and during peak travel periods.

I-95 Congestion Relief Strategies: Congestion on I-95 occurs over almost its entire length through the region and is the most pressing transportation problem. Existing volumes exceed 140,000 vehicles per day and future volumes are projected to be over 200,000 vpd. Poor operating levels of service are not confined to a well defined morning and evening "rush hour," but congestion extends over longer periods of time. The 20-year strategic plan developed by Coastal Corridor TIA recommends several actions aimed at reducing congestion on I-95, including modification of interchanges, ramp metering, HOV Lanes and congestion (value) pricing. These concepts, summarized below, are considered long term options and require a significant amount of study before they will be implemented. In addition, to be effective, the actions need to embrace the entire I-95 corridor from the New York state line to at least New Haven. I-95 congestion relief strategies cannot focus on only one region:

1. Ramp metering to regulate the entry of vehicles into the traffic stream. Ramp metering regulates the flow of vehicles from the local street system onto a limited access highway. It allows vehicles to enter the highway when a sufficient gap is available and prohibits movement when the density on the highway would prevent unimpeded entry. The intent is to minimize the turbulence on the highway caused by entering vehicles. This would help traffic on the highway to maintain speed and limit slowdowns at ramp-mainline merge areas. Ramp metering projects have been successful, but ramp

Ramp metering controls access to an expressway.



Loop detectors embedded in the highway monitor vehicle flows and speeds and provide information to the signals to control when vehicles can enter the highway. Source: FHWA.

geometry is critical to that success. One critical consideration is the storage capacity of the on-ramp to be metered. If the volume is too high or the ramp is too short, queues can form and extend onto the local streets, causing operating problems at those points.

2. Dedicated high occupancy vehicle (HOV) lanes. HOV lanes are auxiliary lanes on or adjacent to limited access highways that restrict use to vehicles with a specified number of passengers. These lanes can be provided in a number of ways, such as adjacent to the general purpose travel lanes separated by a divider, reversible lanes located in the median of the highway, or by designating a general purpose lane as a diamond lane.

3. Ramp closures and consolidations: The frequency and spacing of ramps on I-95 is not conducive to good traffic flow as impendence from vehicles exiting and entering the highway worsens congestion. Given the proximity of the ramps, it may be feasible to consolidate several of the interchange areas and reduce the number of ramps. It may also be possible to build service frontage roads off the main line that connect two adjacent interchanges. The feasibility and potential impacts of closing ramps and/or consolidating interchanges needs to be investigated in more detail.

4. Electronic Tolling and Congestion Pricing: This concept involves re-introducing tolls along I-95 from the New York state line to and through New Haven. The Transportation Strategy Board (TSB) investigated various alternative tolling options and evaluated traffic demand changes, revenues and costs (economics), regional equity, environmental impacts and safety. The study also looked at where the tolls would be located (border tolls, expressways only, bridges or all roads), which facilities would be tolled (all lanes or special purpose lanes only), who would be charged a toll (all vehicles, single occupant vehicles only, trucks), and whether different tolls would be charged for different time periods (static tolls, peak hour surcharges, demand-based toll). Under any scenario, the toll system would be 100% electronic and not involve any

manned toll booths. Most vehicles would be equipped with radio transponders that would register when they passed a toll collection point. Video surveillance would be used for those vehicles without transponders. In this way, traffic flow would be maintained and no barriers would be placed across the mainline.

The rationale for reinstituting tolls is based on two critical needs facing I-95: increase revenues (funding issues) and reduce congestion. Connecticut relies heavily on federal aid to operate, maintain and improve its transportation systems, especially highways. This over reliance on federal dollars has resulted in deferring some improvements, while, at the same time, not even considering many much needed enhancements. Electronic toll collection would provide a better and more stable source of revenues to implement improvement projects along I-95. Coupled with the concept of congestion pricing, whereby a higher toll would be charged during peak, congested time periods, electronic tolling would also support a shift from using the interstate to other alternative modes.

Section 8: Intelligent Transportation Systems

Greater Bridgeport Regional Intelligent Transportation Systems (ITS) Architecture

The Greater Bridgeport Regional Planning Agency developed and adopted a regional architecture for Intelligent Transportation Systems (ITS) in 2005. The architecture is a framework for the early deployment of advanced traffic and transit management systems and for determining applicable longer term systems, identifying system interconnects and ensuring system integration. It was derived from and is consistent with the National ITS Architecture, and complies with the federal Rule/Policy.

The regional architecture is functionally oriented not technology specific. It defines the functions that must be performed to implement a given user service, the physical entities or subsystems where these functions reside, the interfaces and information flows between the physical subsystems, and the communication requirements for the information flows. In addition, it identifies and specifies the requirements for the standards needed to support national and regional interoperability, as well as product standards needed to support economy of scale considerations in deployment. The regional architecture does not specify how a user service will be done (technology). In this way, the architecture can remain valid and current even as technology changes.

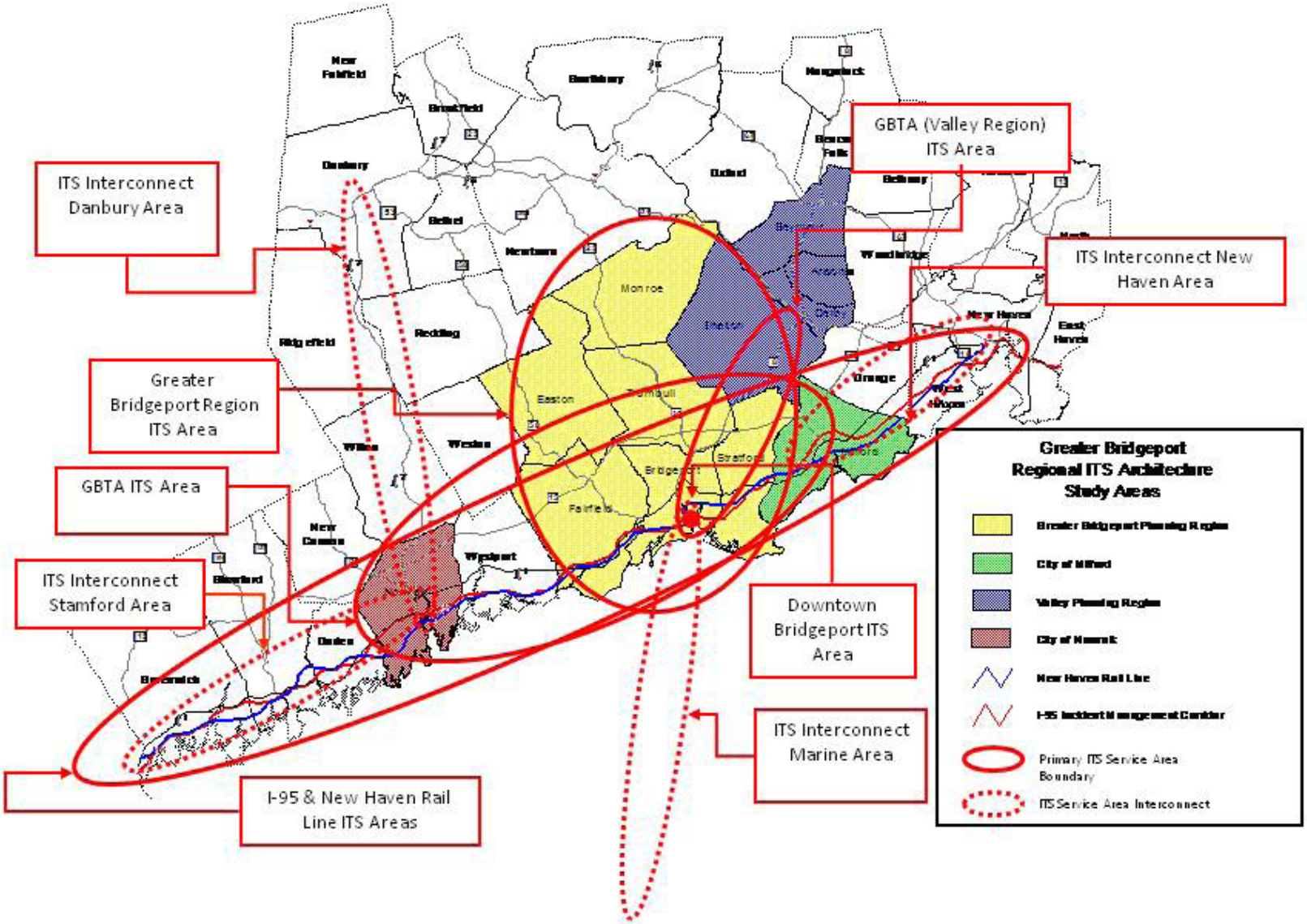
The following map highlights the geographic area for the Greater Bridgeport Regional ITS Architecture:

The intent of the regional ITS architecture is to realize a more “seamless” transportation system with reduced delays due to overlap of system services or conflicts with transit operational services. Integration of these services and seamless communication among operators offers the opportunity of increased traveler efficiency, better management of transportation resources and results in numerous traveler benefits.

The regional architecture identified seven advanced ITS concepts. Each is comprised of a number of individual elements integrated into a system to deliver transportation services. These advanced concepts address the transportation issues facing the region, especially those relating to preserving and maintaining highway and transit systems, and enhancing of safety and security.

GBT Advanced Communications System

The GBT has completed the full deployment of the Advanced Communications System (ACS). The system consists of several ITS elements to integrate voice, data, and automated vehicle location (AVL) into a seamless transit communications system. It is a GPS based Automatic Vehicle Location System (AVL) system along with Automatic Passenger Counters (APCs), automatic interior and exterior audio stop announcements and interior scrolling LED signage announcing upcoming stops. The AVL component determines and monitors GBT the location of fixed-route buses and paratransit vehicles in real-time. The GBT is using the data collected from the system to make service revisions and improvements. In addition to service improvements, GBT has made real-time bus arrival and departure information available to the riding public through its website (www.gogbt.com) using a system known as “Webwatch”. Webwatch provides internet access to bus location information, estimated crossing times of every GBT stop and custom rider alerts. Real–time bus departure information is also available in the GBT’s Downtown Bridgeport Bus Station and at


ITS Interconnect Danbury Area
GBTA (Valley Region) ITS Area
ITS Interconnect New Haven Area
Greater Bridgeport Region ITS Area
GBTA ITS Area
ITS Interconnect Stamford Area
Downtown Bridgeport ITS Area
ITS Interconnect Marine Area
I-95 & New Haven Rail Line ITS Areas
Greater Bridgeport Regional ITS Architecture Study Areas
Greater Bridgeport Planning Region
City of Milford
Valley Planning Region
City of Ansonia
New Haven Rail Line
I-95 Incident Management Corridor
Primary ITS Service Area Boundary
ITS Service Area Interconnect

each of the 17 bus berths.

The information will eventually be integrated into the ARTIST customer information system and disseminated to transit users via kiosks, the Internet, wayside and from call centers. The GBT is investigating deployment of additional on-street signage at various locations throughout the service area along with the delivery of real-time information via personal communication devices (Applications or "Apps").

"Smart Bus" technologies consist of in-vehicle subsystems (GPS receivers, CPUs, driver interfaces) and include functions that provide for automated customer information services, passenger counting, emergency alarms processing, and interfaces with other subsystems, such as maintenance.

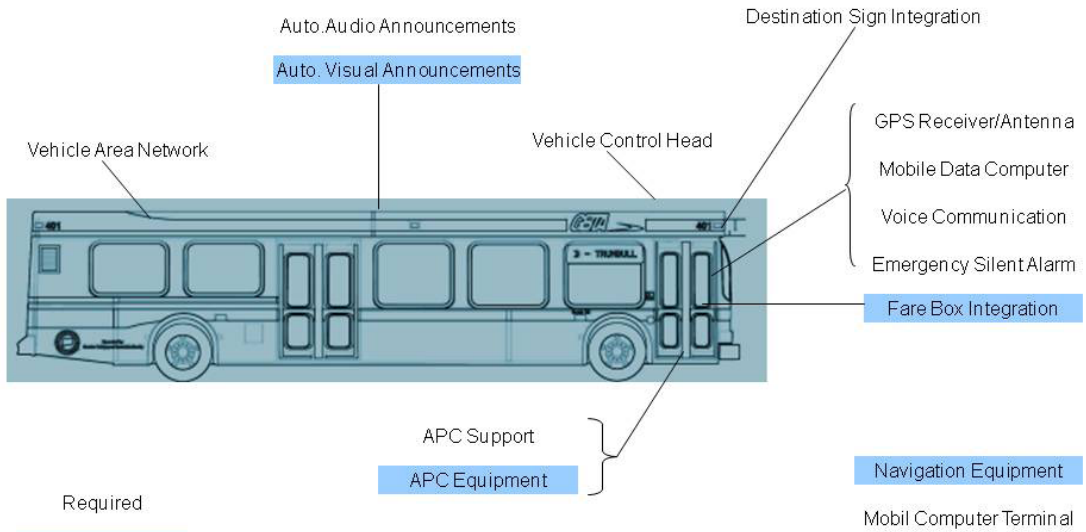
Additionally, GBT has received a New Freedoms Program grant for $75,000 to implement a bus arrival alert system for ADA passengers on its GBT Access Service. These alerts would automatically call or text riders with disabilities fifteen minutes in advance of their bus arriving providing a more convenient service.

The planned expansion of the ACS will be comprised of various communications and vehicle location elements that will be joined into an integrated system:

- "Smart" bus technologies – Vehicle Control Heads (VCU), Intelligent Vehicle Control Units (IVCU), radio, fare box, odometer and destination sign interfaces, mobile computer terminals (MCTs), automatic passenger counters and emergency alarm activation and covert monitoring;
- Silent alarms – Operator activated to alert the dispatch office of an on-board incident;
- Wireless communications – Wireless LAN nodes, and radio console and base station equipment; provides both voice and data communications; and
- Probe surveillance vehicle – Provide road network performance conditions.
- FFY 2011 – 2015: GBT Advanced Communications System, $9,375,000

Archived Data Management (ADM) System

The proposed concept plan envisions development of a program to collect, store, manipulate and disseminate historical data for all relevant ITS systems in the region. It would create a data warehouse archived in a computer server and linked to users via a wide area network and personal computing devices via the internet. Archived databases would be developed

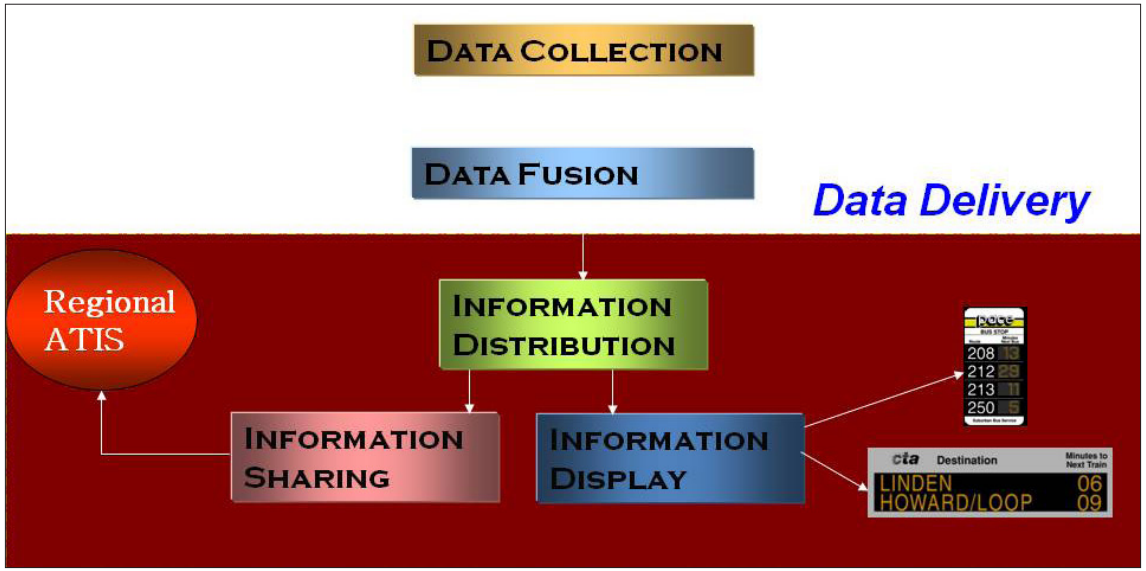


"Smart" Bus Vehicle Equipment Configuration

for traffic volume count data, transit (bus and rail) ridership data, parking management (occupancy and availability) data, and highway incidents. The regional databases would be used for performing traffic management and transportation planning, as opposed to real-time operations.

The system would be implemented, operated and maintained by the Greater Bridgeport Regional Planning Agency, in cooperation with the Connecticut Department of Transportation, City of Bridgeport and Greater Bridgeport Transit (GBT), as well as various associated stakeholders. Field equipment would be deployed by others and raw data generated by these devices would be transmitted to the GBRPA for tabulating into a useable form. The component elements include:

- Computer server and workstations
- Local area network (LAN) and wide area network (WAN) equipment.
- Computer operating and network software
- Relational database management and application software.
- FFY 2011 – 2015: Archived Data Management System $3,750,000



Active Real-Time Information System for Transit (ARTIST):

The proposed system would provide real-time information to transit travelers on vehicle location, schedule adherence and delays. The GBT's Advanced Communications System (ACS) represents the initial deployment of the system and the

ARTIST will enhance the dissemination of real-time vehicle location and arrival information for public transit users by expanding it to include all transit modes, stations, stops, other fixed sites along travel routes (e.g., rest stops), and major trip generation locations. The system will use dynamic information displays – passive and interactive – to provide traveler information.

The proposed transit information system would be developed over time, initially at the new bus terminal (completed) and

eventually at the region's commuter rail stations and ferry terminal. The framework for the information process is depicted in the following diagram:

The elements of the planned ARTIST include:

•Transit Information and Monitoring Center (TIMC);

•Dynamic Message Signs:To provide variable and changeable information regarding transit status, delays and next arrival;

- "Big" board displays: To show system-wide operations and status;
- Way-finding displays: Static way-finding signs at key transfer points; and
- Information kiosks: To provide interactive information for travelers at remote locations.
- FFY 2011 – 2015: Traveler Information System, $4,800,000

Enhanced Corridor Highway Operations (ECHO)

The proposed ECHO program would integrate existing and planned traffic control devices and roadside equipment to expand incident management activities along I-95, Route 8, Route 15 and Route 25, enhance and coordinate arterial traffic signal control, develop integrated "Smart" corridors involving traffic monitoring and management, and incorporate transit priority into traffic signal systems. The system would also monitor the operation of drawbridges and more efficiently manage traffic flow while the bridges are open. The goals of the program are to enhance traffic operations, surveillance (video cameras), management, incident detection and traffic information dissemination along local and state-owned arterials that run parallel to I-95 or serve as feeder routes the region's expressway network.

The ECHO system would be developed over time and be comprised of various field equipment initially deployed as stand-alone products, then linked and integrated into a seamless traffic management and surveillance system. The components of the ECHO system include:

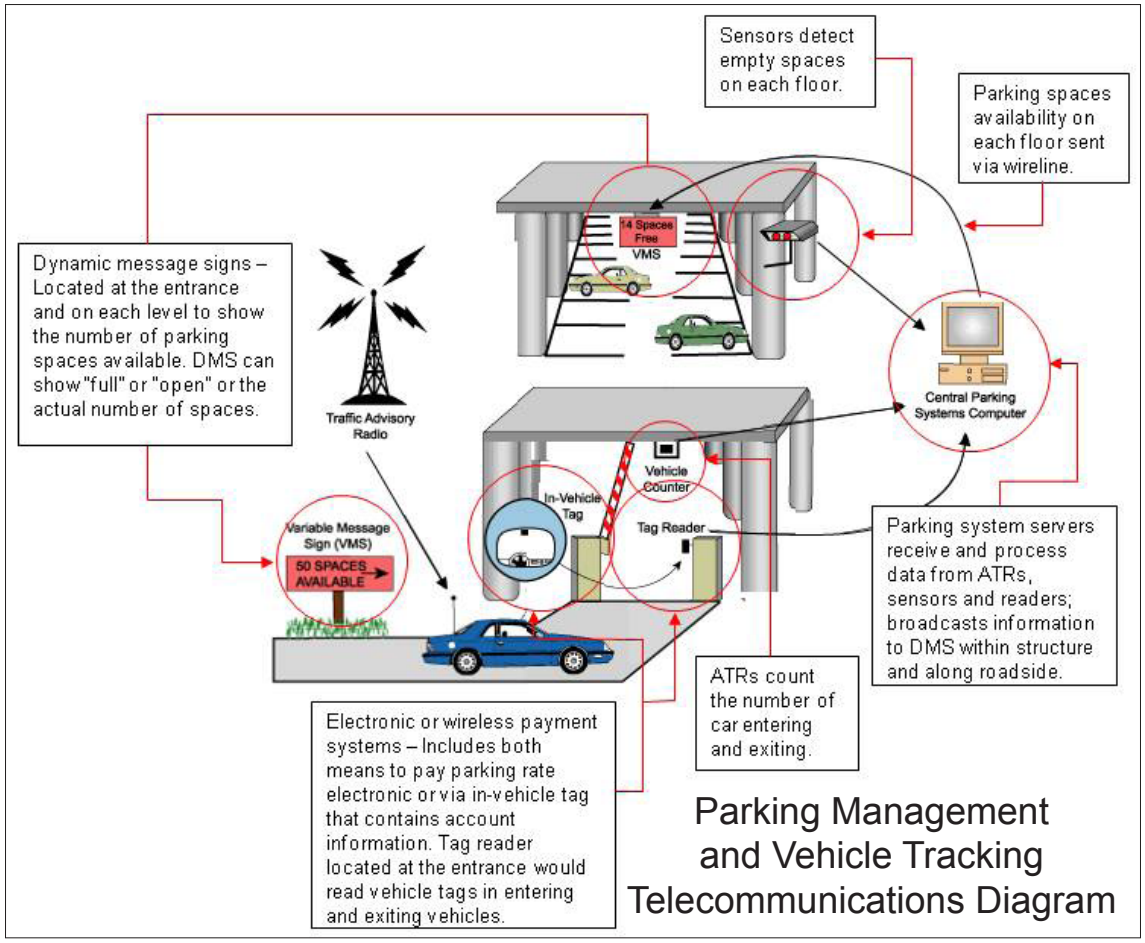
- Regional traffic signal system coordination: Computerized traffic signal systems operated by the Bridgeport and ConnDOT and eventually lead to the development of "smart" corridors;
- Closed-circuit television, video cameras: To monitor traffic flow and safety;
- Traffic surveillance using road-based detectors: Loop detectors and video cameras to monitor roads network conditions and determine traveler advisories;
- Dynamic Message Signs: To disseminate road condition information and advisories to travelers;
- Transit signal priority:To provide special treatment to buses at signalized intersections to reduce delay and improve on-time performance;
- Drawbridge management – To coordinate drawbridge gates and signals of several downtown Bridgeport drawbridges with nearby traffic signals and DMS signs; and
- Expand I-95 Incident Management – Expand the coverage of the ConnDOT I-95 incident management program to include portions of the Route 8/25 Expressway, the Merritt Parkway and the Route 25 terminus at Route 111 and link proposed arterial DMS with the I-95 center.
- FFY 2011 – 2015: Enhanced Corridor System $10,500,000

Parking Route and Event System for Traffic Operations (PRESTO):

The proposed PRESTO program would provide route guidance using wayfinding signs and DMS to the Harbor Yard sports and entertainment district, the bus terminal, rail station, ferry terminal and

commuter parking garages and manage traffic flow for events and during peak travel periods. It would integrate various field and roadside equipment, including road-based loop detectors, lane control signals, video cameras, parking facility counters and other vehicle sensors, into an automated monitoring and surveillance system. The component elements include:

- Event traffic operations plan: To determine how to manage traffic flow and parking during events;
- Harbor Yard and commuter parking management: Enhance parking management systems, including automatic traffic recorders, CCTV cameras, DMS, electronic or wireless payment systems and system computer servers to receive and process data;
- Dynamic Message Signs: To direct travelers to available parking facilities and indicate whether the facility was open or closed; located at decision points;
- Reversible lane management: Lane control signals to allow reversible traffic flow during peak arrival and discharge periods and reassign lane use, including overhead lane signals and warning signs; and
- Closed-circuit television, video cameras: Video cameras to monitor traffic flow and safety and allow adjustment of traffic signal timing and phasing.



Parking Management and Vehicle Tracking Telecommunications Diagram

- FFY 2011 – 2015: Parking/Route Management System, $5,670,000

Regional Electronic Transit Fare and Integration System (RETFIS):

The GBT operates local bus service within the region and service enhancements in recent years have expanded opportu-

nities for bus riders to transfer between the GBT system and those operated in adjacent regions. However, transit fares remain discrete, with each operator setting their own fare policies and structure. To overcome interoperability and compatibility obstacles, an electronic transit fare and integration system is being proposed. The system would enable transit users to pay fares electronically and create multi-modal and multi-provider transportation networks that link together the fare collection of different operators and modes of transit. Because of the different fare policies and rates, establishing fare parity and integration among various bus operators would be necessary.

The proposed Regional Electronic Transit Fare and Integration System would be comprised of two elements:

- Fare integration with participants designating a common type of fare media and data transmission devices; and
- Electronic fare payment technologies and implementation of regional "Smart" card application.

The fare integration system would be integrated into GBT's ACS as well as the proposed ARTIST element.

- FFY 2011 – 2015: Fare Integration System,$3,500,000

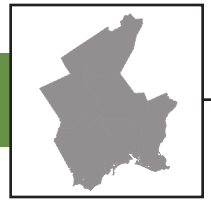
Transportation Emergency and Personal Security (TEPS) System

The proposed TEPS system supports development of enhanced emergency and law enforcement response activities to provide increased safety for transit patrons, both while on-board vehicles and at waiting areas. The system involves installation of security surveillance and monitoring equipment (CCTV video cameras) and emergency phones and aid call boxes on rail station platforms, at commuter parking facilities, and along pedestrian walkways. On-board vehicle systems include video surveillance and silent alarms. It would integrate various security and surveillance equipment into a seamless emergency detection and response system for transit travelers.

The proposed TEPS system would be integrated with other emergency management and homeland security projects. Several components have been implemented at the Bridgeport bus terminal and rail station, including emergency aid call boxes and video surveillance. TEPS elements include:

- Security offices – On-site offices in the bus terminal and rail station for enhanced incident and emergency detection and response;
- Institutional agreements – Agreements to establish the roles and responsibilities of each participating transit operator and law enforcement agency;
- Closed-circuit television, video cameras – Video cameras at critical areas;
- Emergency phones and aid call-boxes – Call boxes located at critical areas and along primary walkways;
- On-board transit vehicle surveillance – Silent alarms and video monitoring to allow transit security personnel to assess the incident, determine appropriate response and acknowledge the incident.
- FFY 2011 – 2015: Emergency Monitoring System $3,750,000

Section 9: Transportation Security



Overview

The security of the surface transportation system and infrastructure has become a critical issue in recent years due to concerns that these facilities are attractive targets to terrorist attack and vulnerable to a natural disaster. The surface transportation system can also play a key role in responding to an emergency, evacuating affected populations and providing alerts and advisories to travelers. The loss of a critical asset could hamper emergency response efforts, as well as disrupt daily travel patterns.

Transportation assets are also essential for informing travelers about emergencies and advising them regarding natural and manmade threats. Wide area alerts use driver and traveler information systems, such as dynamic message signs, highway advisory radio, in-vehicle systems, transit displays, 511 traveler information systems, and traveler information web sites, to alert the public in emergency situations. Evacuation and re-entry information can also be transmitted via these devices.

While research suggests that the surface transportation system, in general, has a low attractiveness value as terrorist targets, there remains a need to emphasize protection of critical mobility assets, such as bridges, tunnels and interchange areas, and transit resources, including rail lines, terminals and vehicles. It is equally important to ensure that alerting and advising systems are secure and available when they are needed and that the information provided is accurate, reliable and comes from an authorized source.

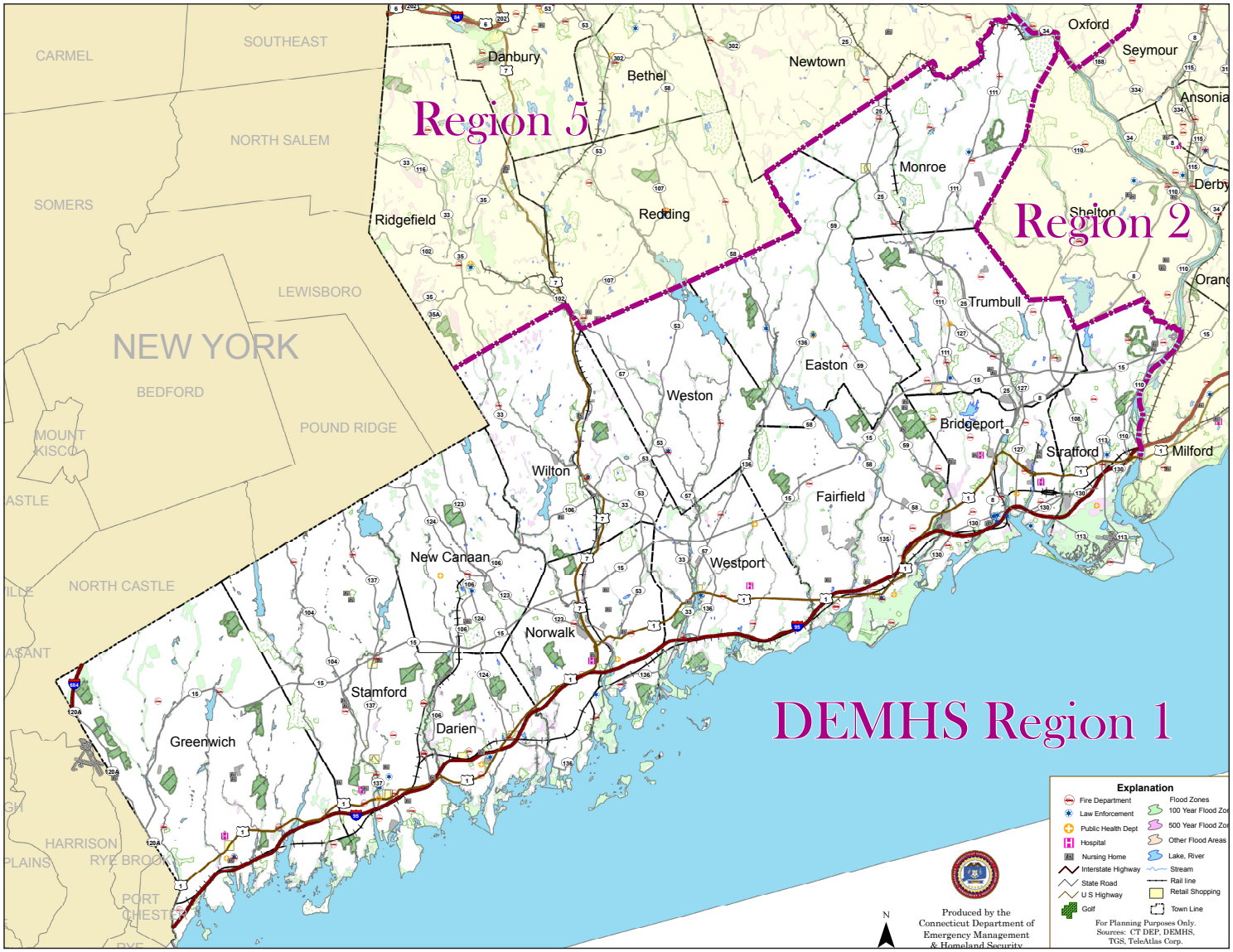
Region 1 Emergency Planning Team (R1EPT)

The Connecticut Department of Emergency Management and Homeland Security (DEMHS) has divided the state into five emergency planning regions. The Greater Bridgeport Regional Council has been combined with a portion of Western COG to form the DEMHS Region 1. This region is depicted in the following map.

The mission of R1EPT is to provide the highest level of emergency preparedness and protection to the citizens of the region as they face new emergency management challenges. The intent is to bring together persons, agencies, first responders and other organizations to better understand the emergency management issues, concerns and threats and better plan and coordinate responses to natural and man-made events. By coming together, the DEMHS Region 1 will be better equipped to respond to and handle a large scale emergency event. The planning effort has significantly advanced resources, training and capabilities of the Bridgeport-Stamford area to effectively plan, prepare for and respond to manmade and natural disasters. The program has also enhanced interoperable communications among all public safety personnel in DEMHS Region 1 to more effectively coordinate response activities.

A key component of the R1EPT is the convening of various Emergency Support Function Groups, referred to as ESFs. These ESFs focus their attention on critical discipline-oriented areas. These are working groups tasked with advising and making recommendations to the Regional Emergency Planning Team relative to their specialized area of expertise. The Federal Emergency Response Plan has identified 17 specific ESF areas. In Region 1, the REPT has convened 17 RESFs.

The GBRC is a member of the R1EPT


Region 5
Region 2
DEMHS Region 1
NEW YORK
CARMEL
SOUTHEAST
NORTH SALEM
SOMERS
LEWISBORO
BEDFORD
POUND RIDGE
MOUNT KISCO
NORTH CASTLE
HARRISON
RYE BROOK
PORT CHESTER
Danbury
Bethel
Newtown
Oxford
Seymour
Ansonia
Derby
Ridgefield
Redding
Monroe
Shelton
Trumbull
Easton
Weston
Bridgeport
Stratford
Milford
Wilton
Fairfield
New Canaan
Westport
Norwalk
Stamford
Darien
Greenwich
Explanation
Fire Department
Law Enforcement
Public Health Dept
Hospital
Nursing Home
Interstate Highway
State Road
U S Highway
Golf
Flood Zones
100 Year Flood Zone
500 Year Flood Zone
Other Flood Areas
Lake, River
Stream
Rail line
Retail Shopping
Town Line
For Planning Purposes Only.
Sources: CT DEP, DEMHS, TGS, TeleAtlas Corp.
Produced by the Connecticut Department of Emergency Management & Homeland Security
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and participates in bi-monthly meetings, as well as emergency planning workshops. It also is involved in working on and providing technical assistance to appropriate ESFs, primarily RESF-1: Transportation and RESF-3: Public Works. The purpose and scope of RESF-1 is as follows:

Regional Emergency Support

Function 1 – Transportation

Purpose: The purpose of RESF-1: Transportation is to facilitate communication and coordination among regional jurisdictions and agencies concerning transportation issues and activities during a major disaster in Region 1.

Scope: The RESF-1 function is intended to focus on disruptions of the regional transportation system requiring inter-jurisdictional coordination and information sharing. Transportation disruptions can occur as a result of direct impacts upon the transportation infrastructure (e.g. disasters and evacuations) or from surges in requirements placed on the system by emergencies in other functional areas. The system developed will be a component of the Region 1 Regional Evacuation and Shelter Guide as well as facilitating interaction with the State Disaster Plan, and National Response Framework (NRF).

Regional Emergency Support

Function 3 – Public Works

Purpose: The purpose of Public Works and Engineering: RESF-3 is to develop and implement a system of resources and response capability for handling regional emergencies concerning water supply, wastewater, solid waste, and debris management during and after a potential or actual regional emergency.

Scope: RESF-3 is intended to focus on the coordination and communication related to the following situations:

1. Potential or actual disruptions of critical services that have a regional impact.

2. Coordination of emergency restoration of critical public facilities, including the temporary and permanent restoration of water supplies, wastewater treatment systems, and waste management facilities.

3. Coordination of emergency contracting to support public health and safety, such as providing for potable water, ice, power, and/or other temporary support to public health and safety.

4. Coordination of monitoring, tracking and modeling of water and wastewater events, including debris removal that may affect the water supply.

Natural Hazard Mitigation Planning

The GBRC sponsored the preparation of a Regional Natural Hazard Mitigation Plan (NHMP) that assessed and evaluated the threats to the region from a major natural event. A major event refers to an extreme natural event that poses a risk to people, infrastructure, or resources. In the context of natural disasters, hazard mitigation is commonly defined as any sustained action that permanently reduces or eliminates long-term risk to people, property, and resources from natural hazards and their effects. The primary purpose of a Natural Hazard Mitigation Plan is to identify natural hazards and risks, existing capabilities, and activities that can be undertaken by a community or group of communities to prevent loss of life and reduce property damages associated with the identified hazards. The primary goal of the hazard mitigation plan is to reduce the loss of or damage to life, property, infrastructure, and natural, cultural and economic resources from natural disasters. This includes the reduction of

public and private damage costs.

The NHMP was first adopted in 2006 and annexed the hazard mitigation plan for the Town of Stratford in 2008. An updated NHMP was adopted in 2014. The following natural hazards that can potentially affect the region were identified in both versions of the NHMP:

Inland and Coastal Flooding

Sea Level Rise

Summer and Winter Storms

Earthquakes

Dam Failure

The vulnerability of municipal assets related to the natural hazards were assessed in the original plan and update. It identified actions and strategies to protect assets from the impacts of major natural events, as well as to mitigate the most severe impacts.

Climate Change

In addition to natural hazards, the potential effects of climate change on the Greater Bridgeport Region are addressed in the Long Range Transportation Plan. Many of the proposed sustainability, growth management and congestion mitigation actions and strategies are intended to change the way people travel and reduce greenhouse gas (GHG) emissions from transportation sources. It is estimated that about 29% of all GHG emissions nationwide are attributable to transportation sources, with about 58% of that amount emitted by light duty passenger vehicles.

Climate change has been defined as an alteration of the global atmosphere due to direct and indirect human activity beyond natural climate variability. While climate change is most associated with concerns about rising sea levels, it is also manifested in more severe flooding, hotter and drier weather patterns, more intense summer and winter storms and higher precipitation amounts during a one-time event.

Connecticut is one of several states to address climate change. In 2005, the state adopted its “Connecticut Climate Change Action Plan, 2005.” This plan was developed In accordance with the provisions of Public Act 04252 and under the direction of the Governor’s Steering Committee on Climate Change (GSC). The vision of the plan is to stabilize GHG emissions in the short term to 1990 levels and realize a 10% reduction below 1990 levels by 2020. The long term goals are to reduce regional GHG emissions sufficiently to eliminate any dangerous threat to the climate.

The plan includes 55 recommended actions that would help Connecticut attain these goals. Nine are related to transportation sources:

Adopt California LEV II Standards for Connecticut;

Institute a GHG Feebate Program whereby purchasers of high emitting CO2 vehicles would pay a fee;

Establish incentives and initiatives to encourage acquisition of low-GHG vehicle fleet – public, private and state;

Adopt tailpipe GHG standards;

Conduct a public education initiative on the benefits of low-GHG vehicles;

Support research on low-GHG technology and alternate fuel infrastructure;

Increase availability of low-GHG travel choices, such as, transit, ride-sharing, walking and biking, and support complimentary land use policies, such as Smart Growth and sustainability;

Develop infrastructure for providing alternative to freight trucks and work towards a multistate intermodal freight initiative; and

Provide incentives to accelerate the use of ultra-low sulfur diesel (Clean Diesel) and reduce “Black Carbon” emissions.

The LRP supports these actions and strategies and includes project consistent with the goals and objectives of the Climate Change Plan.

Critical Transportation Assets

Critical transportation assets can be divided into four categories:

Infrastructure: Arterial roads, interstates, bridges, overpasses/interchanges, roads on dams, and fixed guideway/rail line.

Facilities: Fuels storage areas, maintenance yards, ports, rest areas, traffic operations centers, terminals (bus and rail stations), parking garages, vehicle inspection stations, and weigh stations.

Equipment: Roadway monitoring equipment, traffic signal control, variable message signs, vehicles (buses and rail rolling stock), and communications systems.

Personnel: Municipal personnel, emergency responders, CTDOT personnel, and rail and bus passengers.

The overall objective of transportation security is to discourage terrorist attack as opposed to providing full protection of all systems. However, it is not practical or cost effective to safeguard all infrastructure, facilities and equipment.

Preliminary List of Critical Transportation Assets, Greater Bridgeport Planning Region

Infrastructure Assets	Municipality
I-95/P.T. Barnum Bridge over Pequonnock River & Bridgeport Harbor	Bridgeport
I-95/Moses Wheeler Bridge over Housatonic River	Stratford-Milford town line
I-95 & Route 8/25 Interchange and Overpass	Bridgeport
Route 8 & Route 15 Interchange and Overpass	Trumbull
Route 15 & Route 25 Interchange and Overpass	Trumbull
Route 15/Sikorsky Memorial Bridge over Housatonic River	Stratford/Milford town line
Route 34 on Stevenson Dam	Monroe-Oxford town line
Stratford Avenue – Route 130) Drawbridge over Bridgeport Harbor/Pequonnock River	Bridgeport
Stratford Avenue – Route 130) Drawbridge over Yellow Mill Channel	Bridgeport
PECK Drawbridge New Haven Main Rail Line over Pequonnock River	Bridgeport
DEVON Drawbridge New Haven Main Rail Line over Housatonic River	Stratford-Milford town line
New Haven Main Rail Line Catenary System	Fairfield, Bridgeport and Stratford
Connecticut Highway Assistance Motorist Patrol Vehicles	I-95 Corridor

Preliminary List of Critical Transportation Assets, Greater Bridgeport Planning Region	
Facility Assets	**Municipality**
GBTA bus maintenance yard and garage	Bridgeport
Rail Stations and Platforms	Fairfield, Southport and Stratford
Bridgeport Transportation Center (rail station)	Bridgeport
I-95 Operations Center	Bridgeport
Bridgeport Emergency Operations Center	Bridgeport
GBT Bus Terminal	Bridgeport
Water Street Dock and ferry terminal	Bridgeport
Cilco Terminal (maritime)	Bridgeport
Regional Maritime Center (container barge terminal – future)	Bridgeport
Commuter Parking Garage at Harbor Yard	Bridgeport
Stratford Rail Station – Commuter Parking Garage (future)	Stratford
I-95/Fairfield Service Plazas (northbound and southbound)	Fairfield
Route 15/Fairfield Service Plazas (northbound and southbound), Fairfield	Fairfield

Preliminary List of Critical Transportation Assets, Greater Bridgeport Planning Region	
Equipment Assets	**Municipality**
Computer Traffic Signal Systems and Controls	Bridgeport
Computer Traffic Signal Systems and Controls (state route arterials),	Fairfield, Bridgeport and Stratford
Bus Transit Vehicles – Fixed-route System	Greater Bridgeport Transit Authority
Commuter Rail Transit Vehicles	MTA-Metro-North Railroad
Maintenance of Way Rail Facility, East Bridgeport Rail Yard	MTA-Metro-North Railroad & ConnDOT
I-95 Incident Management Field Equipment (Variable Message Signs, video cameras and speed detectors)	I-95 Corridor
Connecticut Highway Assistance Motorist Patrol Vehicles	I-95 Corridor
Personnel Assets	**Municipality**
Municipal Personnel – Public Works, Emergency Responders	Region Municipalities
ConnDOT Personnel – Incident Operations Center, CHAMP Service Patrol	Statewide
Public Transit Passengers – Rail, Bus and Ferry	GBTA, MTA-Metro-North Railroad & Port Jefferson Ferry
Connecticut State Police	Statewide

The focus of transportation security varies depending on the transportation asset and the environment in which it is located.

A preliminary listing of critical transportation assets in the Greater Bridgeport Region are shown in the tables on the previous page

Countermeasures

Countermeasures are actions installed at or around a transportation asset to make it less attractive to terrorist attack. In general, actions can be grouped into one of four categories:

Deterrence: This category involves countermeasures that increase the possibility of capture and detection through the use and installation of visible countermeasures;

Detection: This category encompasses measures that provide increased patrols and enhanced remote surveillance and increase the likelihood that unauthorized persons would be detected before an act of terrorism could be carried-out;

Defend: This category includes actions that increase the standoff distance to an asset, that is, limiting how close unauthorized persons can get, and helping to protect the facility from the effects of an explosion; and

Design: These actions involve the redesign or retrofit of the transportation assets to make them stronger and better able to withstand the effects of an explosion.

ITS Security Actions

Intelligent Transportation Systems, or ITS, security countermeasures are intended to protect transportation assets using advanced technologies and systems. The deployment of ITS-related countermeasures will enhance the security of transportation infrastructure and facilities and provide information to users and travelers during an emergency. A critical concept of ITS is the integration of systems and sharing of information. Because of this it is necessary for the information and interconnections to be secured as well. It is vital to protect information flow and access to ensure that ITS applications are reliable and available when they are needed.

Based on the National ITS Architecture, the following ITS security elements are recommended for implementation:

Disaster Response and Evacuation: This security area uses intelligent transportation systems to enhance the ability of the surface transportation system to respond to and recover from natural disasters (hurricanes, earthquakes, floods, winter storms), terrorist acts (nuclear, chemical, biological, and radiological weapons attacks), and other catastrophic and technological events (hazardous materials incidents, nuclear power plant accidents). The elements improve access to the scene for response personnel and resources, provide better information about the transportation system in the vicinity of the disaster, support resource coordination and sharing of current situation information, and provide more efficient, safer evacuation for the general public if needed.

Broad inter-agency coordination is critical in all disaster scenarios, with transportation professionals performing well-defined roles in the larger context of the multi-agency response to the disaster. Initial implementation of this action has occurred with the State of Connecticut establishing five emergency management and homeland security regions under the Connecticut Department Emergency Management and Homeland Security. The goals of these regions are to assist with coordinating emergency management and homeland security efforts and funding and to provide the highest level of emergency preparedness

and protection to the citizens of the region as they face new emergency management challenges. The Greater Bridgeport Regional Council is included in Region 1 which also includes a portion of the Western COG.

Freight and Commercial Vehicle Security: The area of freight and commercial vehicle security considers the awareness aspect of security through the surveillance of either commercial vehicles or freight equipment. Freight equipment includes containers (with or without chassis), the chassis, or trailers. The interface with intermodal facilities is another aspect of this area as is the automatic tracking of commercial vehicle or freight equipment to determine if an asset has deviated from its planned route.

HAZMAT Security Area: This security area consists of ITS elements designed to reduce the likelihood of a successful hijacking of security sensitive HAZMAT cargo and its subsequent use as a weapon. Commercial vehicles carrying security sensitive HAZMAT cargo are tracked and unexpected and significant deviations from planned routes or operations on restricted roadways are reported to public safety agencies. The operational tracking and the determination of a significant route deviation is done by a commercial carrier's operations center. Security sensitive HAZMAT cargoes on commercial vehicles are also detected by remote sensing and imaging from the roadside. By also reading electronic tag information (carrier ID, vehicle ID and driver ID) from a sensed commercial vehicle, any detected security sensitive hazmat can be correlated with existing credentials, to determine if the cargo being carried is a permitted operation.

ITS Wide Area Alert: The systems included in this security area notify the traveling public about emergency situations, including child abductions (AMBER Alert), severe weather watches and warnings, natural and human-caused disasters, military operations, and civil emergencies where lives and/or property are at stake. It utilizes ITS driver and traveler information technologies to immediately provide information and instructions to the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies supplement and support other emergency and homeland security alert systems. The alert is broadcast to the traveling public using Dynamic Message Signs, Highway Advisory Radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information web sites. In the region, many of the wide area alert capabilities are in place and operational as part of the I-95 incident management program.

Rail Security Area: Rail security ITS systems relate to the movement of freight by rail as opposed to passengers and monitor and secure trains, rail cars, fixed assets (track, wayside equipment and highway-rail intersections) and personnel.

Transit Security Area: This area of transit security addresses passenger, facility, and asset security for passenger rail and bus transit systems. The area addresses surveillance and sensor monitoring of transit stations, stops, facilities, infrastructure, and vehicles. The surveillance includes both video and audio surveillance. The sensor monitoring includes threat sensors, such as chemical agent, toxic industrial chemical, biological, explosives, thermal, acoustic and radiological sensors, object detection sensors, motion or intrusion detection sensors, and infrastructure integrity sensors. It also includes analysis of sensor or surveillance outputs for possible threats and need for response. Interfaces with the appropriate security agency, either in-house or public safety agency, are specified.

These ITS systems support traveler or transit vehicle operator initiated alarms and allow the transit agency to respond to an onboard incident. The systems are also capable of providing emergency information to travelers using the transit system by visual (signs) or audio messages onboard the transit vehicle, at transit stops, or in transit facilities.

Several of these devices have been deployed in the Greater Bridgeport Region, primarily at the downtown Bridgeport bus terminal and rail station. These devices include emergency aid call boxes, security video cameras, voice annunciating systems and variable message signs.

Transportation Infrastructure Security Area: This security area integrates a broad array of ITS technologies to monitor and protect transportation infrastructure, such as bridges, tunnels and management centers. It includes monitoring for potential threats using sensors and surveillance equipment. Threats to infrastructure can result from acts of nature (such as hurricanes and earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (such as a stray barge hitting a bridge support or a tanker truck accident creating an explosion and intense fire). Barrier and safeguard systems are used to preclude an incident, control access during and after an incident or mitigate the impact of an incident. Information on threats is shared among emergency management, traffic operations and maintenance and construction management centers.

Traveler Security Area: The purpose of the traveler security ITS elements is to increase the safety and security of travelers in public areas including public transit facilities, bridges, tunnels, parking facilities and (major) intersections and other roadway features. These ITS technologies provide for traveler security through surveillance and sensor monitoring to warn of hazardous situations as well as allowing travelers to report emergencies. Drivers and travelers are alerted in emergency situations that pose a threat to life and property and provided disaster-related information, including evacuation and reentry information and other information (possibly responsive to specific traveler requests) concerning the operation of the transportation system during a disaster.

Section 10: Freight & Goods Mobility

Overview

The movement of freight and goods impacts every aspect of our lives. Over nineteen billion tons of commodities, valued at over $13 trillion, are moved across the US transportation system each year. This suggests that, on one typical day, some 53 million tons of freight and goods, valued at $36 billion, are moved around the country.

Freight planning has been integrated into the transportation planning process to better understand how the movement of goods works in the region and identify the principal modes used to move freight into, out of and through the region. The overall objective of this effort is to recommend capital projects, policies and programs to enhance goods movement and improve physical infrastructure, encourage multi-modal shipments and expand alternative modes and access to freight terminals and to the port.

One of the fastest growing freight segments is the rail-truck intermodal shipment. Increasingly, containers are being loaded onto and shipped via rail and transferred to trucks at a large intermodal yard. Other intermodal movements are also increasingly being used, including truck-water and rail-water combinations.

Public roads make up the largest component of the nation's transportation infrastructure, totaling nearly four million miles and consisting of interstates, expressways, and other arterials. Historically, railroads were a vital transportation mode, but with the development of the interstate highway system and the low costs offered by the trucking industry, railroads suffered substantial losses of shipments to trucks. However, rail is a very efficient mode on ton-mile basis and is capable of carrying very heavy loads long distances and there remains a strong and competitive market for freight rail shipments by long-haul Class I railroads and their regional and short-line partners.

The maritime transportation system is comprised of waterways, ports and land-based infrastructure (roadways, railroads and pipelines) that connects the waterborne system to the rest of the nation. Waterborne commerce is somewhat concentrated at the top 50 ports, handling about 82% of the total annual waterborne domestic and foreign shipments by weight.

Pipelines are essential in transporting raw petroleum and gas products, as well as, refined products.

The Regional Context

The Greater Bridgeport Region is located between New York City and Boston, Massachusetts; placed along New England's main travel corridor. Freight and goods are moved and shipped using a diverse transportation system, with a range of modal options. The freight transportation system consists of:

Interstate Route 95 for the transportation of goods by motor carriers, plus the Route 8 and Route 25 Expressways and several principal arterials.

Port of Bridgeport, a commercial harbor, and related land side facilities and infrastructure that provide access to Long Island Sound and connection with the nation's maritime transportation system.

Rail lines consisting of the New Haven main rail line running between New York City and New Haven, with connections to the Northeast Corridor, and the Derby Branch freight rail line operated by the Housatonic Railroad.

Sikorsky Memorial Airport, a regional general aviation airport that supports a variety of air carrier services.

Surface Roads

Motor truck carriers are by far the most important and critical transportation mode for moving freight. The goods and freight shipped into, from and through the region by trucks rely on the surface transportation network comprised of interconnected interstates, highways and other public roads. How well the surface transportation system operates affects the cost and efficiency of freight movement.

The majority of commercial trucks travel on the higher classed arterials that are geared toward a high level of service and high level of mobility between activity centers. These include I-95, Route 8, Route 25, and US Route 1. Trucks are prohibited from using Route 15 (Merritt Parkway) which reduces the principle arterial route mileage open to commercial trucks to ±56 miles. Of this total 45 miles are included on the National Highway System.

The FHWA, as part of the Freight Analysis Framework (FAF), has estimated truck traffic on I-95 at about 19,800 trucks per day, with fewer numbers of trucks on Route 8 and Route 25, estimated at 3,300 trucks per day and 2,000 trucks per day, respectively. The FAF projects truck volumes will increase over time and at a faster rate than passenger vehicle volumes.

Trucks carry a high proportion of the goods and freight that originates in the area (Connecticut part of the NY-NJ-CT-PA Combined Statistical Area, or CSA) as well as those goods shipped to the area. Shipments are somewhat evenly divided between origins and destinations. About 74.4% of all shipments into and from the area were moved by commercial trucks, with a value of about $78.8 billion.

The vast majority, about 95% by weight, of shipments moved by motor carries was domestic. Although some long distance trucking occurs, most truck shipments have a relatively short travel distance. Data from the Commodity Flow Survey indicated that, on average, truck shipments originating in the Connecticut

part of the CSA traveled only about 116 miles and only 4.4% of the shipments by weight were moved over a distance greater than 500 miles. By contrast, the average travel distance by all modes was approximately 1,187 miles. The same travel pattern is evidenced for shipments to the area.

Trucks were also the primary mode used to move foreign freight and goods to and from ports of entry. About 48.1% of foreign freight that moved through a domestic port was distributed by motor carriers, although a higher proportion was moved by unknown modes.

The diversion of goods movement to other modes may be difficult despite the various alternatives. The region's proximate location to one of the largest and most active ports in the nation (Port of New York and New Jersey) limits how much freight would be shipped directly to Bridgeport by water. Containerized goods and break-bulk cargo from foreign ports or moved along the intercoastal waterway are more efficiently shipped to the Port of New York and New Jersey for off-loading and regional distribution. Regional freight movement will most likely continue to be dominated by motor carriers and any diversion of goods to other modes is likely to have only a marginal impact on modal share and minimal effect on highway congestion. Therefore, the focus of freight and goods mobility is on improvements to the surface road network.

In many ways, actions that enhance operations on and the management of the region's highways will also have beneficial impacts on freight movement. The key elements include the following actions:

Modest Infrastructure Investments: Targeted at the critical freight corridors to facilitate movement along I-95 and other principal truck routes through the region, improve access to key commercial and industrial areas, including Bridgeport Foreign Trade Zone and Urban Enterprise Zone, and enhance connections to the Port of Bridgeport. Actions include rehabilitating pavement structure and markings, retiming, interconnecting and placing traffic signals under computer control, installing large curb radii along truck corridors and installing directional signs.

Long Term Infrastructure Investments: I-95 is considered a Strategic Freight Corridor and is critical to the movement of goods into, from and through the region. However, the capacity of I-95 is restricted and congestion is recurring and exacerbated by weaving conflicts, inadequate acceleration areas, and lane use allocation. The congestion encountered by commercial trucks degrades predictability and reliability of freight shipments. In addition, truck traffic worsens congestion because of their size and operating characteristics – trucks occupy more space on the highway, need to begin slowing down on the highway when exiting and take a longer time to attain travel speed of traffic when entering the highway. Also, the overuse of the center lane creates a pronounced wear pattern in the pavement structure.

Proposed medium to long term actions are intended to enhance truck operations along I-95 by rehabilitating and reconstructing several interchange areas and provide lane continuity where feasible. Other actions include: service area expansion and enhancement of the incident management system. While I-95 facilitates inter-regional and interstate freight movement, the US Route 1 corridor runs parallel to I-95 over most of its length through and serves as a freight corridor within the region. Various enhancements are proposed over the next twenty years, including minor widening to provide uniform four-lane cross section, traffic signal upgrades, access management actions, and intersection improvements. Other projects include the construction of truck staging

areas to streamline truck processing, and the development of a model, which can be used to evaluate alternative improvement projects.

Dedicated Truck-only High Occupancy Toll (HOT) lane: As congestion on I-95 continues to worsen and truck volumes increase, the feasibility of constructing special purpose truck lanes needs to be investigated. A user fee would be applied to the special purpose lanes to pay for their construction and maintenance. A possible concept would involve the reconstruction of the median area along I-95 to provide a reversible, two-lane corridor to separate trucks from passenger vehicles. Access would be controlled and limited to only a few key points, thereby, encouraging use by long-haul, through truck traffic as opposed to local service.

The Seaview Avenue Corridor Project: The City of Bridgeport has developed plans to relocate Seaview Avenue on a new alignment to better accommodate truck movement and provide better access to industries in the area. Seaview Avenue is an important local freight and intermodal connector between I-95 and the marine terminals of the Port of Bridgeport, however, access to industrial sites, including the Foreign Trade Zone and the Lake Success Business Park area, is constrained by the physical condition of the road, especially by the low vertical clearance under the New Haven rail line. The project will construct a new limited access arterial and provide a new under pass of the rail line. The project will also become the main travel corridor of the proposed east side transit oriented redevelopment project and link the Steel Pointe area with the Lake Success Business Park.

Freight and Fleet Management ITS Initiatives: Various freight and vehicle ITS services have been identified to enhance goods movement by motor truck carriers. Many of these systems would be implemented by fleet and freight management and located on commercial vehicles. These include: fleet and freight administration systems that track the movement of cargo, electronic clearance systems that provide automated clearance at roadside check facilities (such as weigh stations), roadside and on-board safety and security systems, and HAZMAT tracking and security systems. Some public sector ITS elements would also benefit commercial trucking, such as, incident management systems and traveler information systems.

Bridgeport Harbor

The Port of Bridgeport is one of three deep water ports in Connecticut. Petroleum products are currently transported to a fuel terminal and tank farm via the port. Other activities within the harbor include recreational boating and support facilities, commercial fishing, dry dock and boat repair facilities, tug boat docking and passenger and vehicle ferry service.

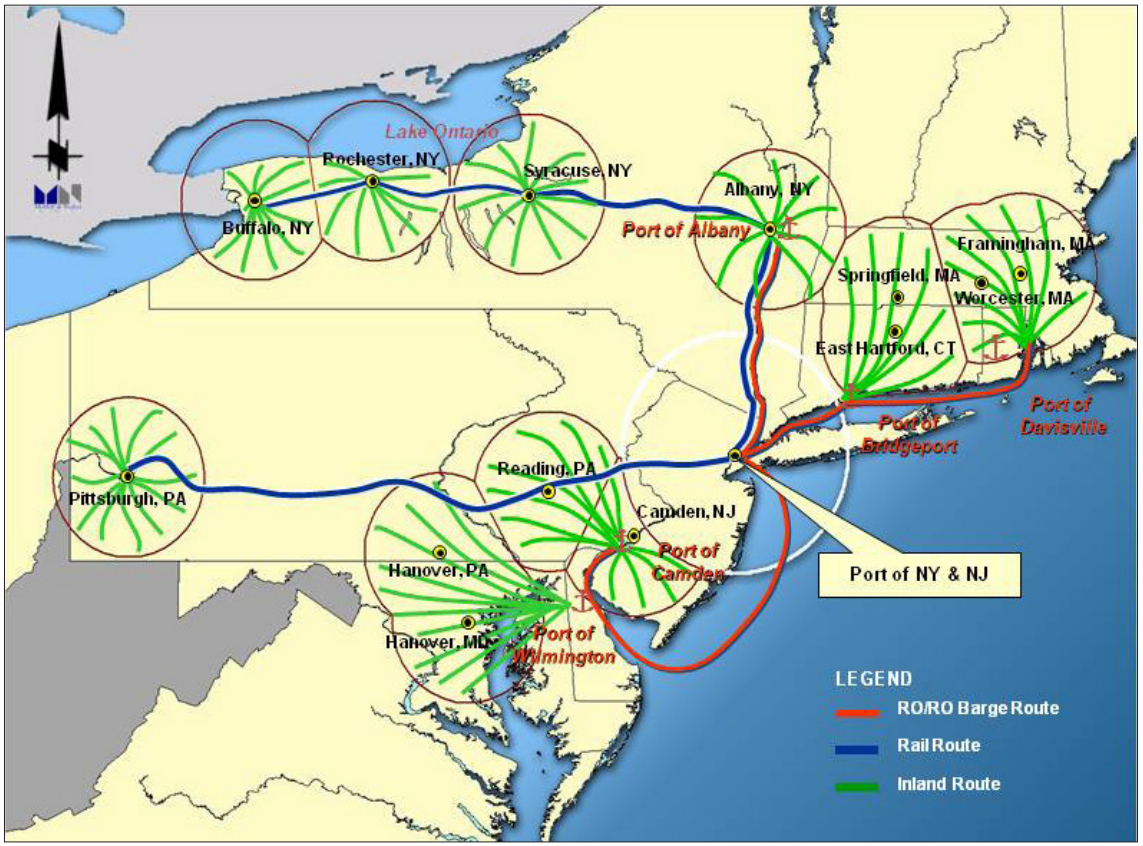
The Port of Bridgeport is classified as a Commercial harbor and is divided into an inner and outer harbor. The outer harbor extends one mile from the mouth at Long Island Sound and is protected by two breakwaters. The inner harbor extends from Tongue Point and Pleasure Beach and includes the navigable reaches of the Pequonnock River, Yellow Mill Channel and Johnson's Creek (Lewis Gut). It is roughly triangular in shape and about one mile wide.

The depth and size of the channel within the harbor and the turning basin are the result of an US Army Corps of Engineers navigation project. According to official specifications, the authorized depth of the main channel is 35 feet and 400 feet wide, and the turning basin is about 900 feet wide. The channel of the Pequonnock River is 18 feet deep and

between 125 feet and 200 feet wide. The navigable portion extends about one mile to just below the Berkshire Avenue dam. Eighteen foot and 15 foot deep channels are maintained along the Yellow Mill Channel and Johnson's Creek, respectively.

The authorized depths of Bridgeport harbor were established in the River and Harbor Act of 1958. Federal dredging projects to attain these depths were completed in 1964. However, there has not been dredging within the harbor since then and shoaling has reduced the actual depths by four to seven feet less than the authorized depths. The reduced depth of the navigable channels increases the transportation costs for shippers and limits the harbor's attractiveness. As the Harbor slowly fills, the draft of vessels that could safely be brought into the harbor would decrease, limiting the range of possible uses for the Harbor. In addition, a shallower harbor risks deep-draft vessels running aground or requiring the vessels to time their entrances and exits into the harbor based on tidal fluctuations

The city has proposed a Federal Navigation Project to perform maintenance dredging of Bridgeport harbor, its entry channel, turning basin and connected channels, illustrated in the map on the following page. The project would remove the material that is located above the authorized depths. The US Army Corps of Engineers has estimated that about 1.78 million cubic yards of dredge material would be removed. Three disposal methods and locations have been proposed for the dredge material. About 670,000 cubic yards have been deemed suitable for open water placement in a designated area within Long Island Sound. The remaining material has been deemed unsuitable for open water placement and alternative, protected sites need to be used. The plan proposes to dispose of about 913,000 cubic yards of dredge material (51.3% of the total) by creating



Source: Port Authority of New York and New Jersey

two Confined Aquatic Disposal (CAD) cells within Bridgeport harbor. CAD cells are deep underwater pits constructed beneath the harbor bottom and used for the disposal of unsuitable material. Once the dredged material is placed in the CAD cell, they are capped with clean, typically harbor sediments, to minimize any future exposure of the unsuitable material. The development of CAD cells in Bridgeport harbor places the disposal site close to the dredge operation. The remaining unsuitable material (about 197,000 cubic yards or 11.1% of the total) is proposed for disposal in existing borrow pits in Morris Cove in New Haven harbor.

In addition to the shoaling that has reduced the depth of the navigable channel, there are a number of sunken vessels, including multiple coal barges that pose hazards to navigation.

The GBRC and the Bridgeport Port Authority, with the cooperation of the Port Authority of New York and New Jersey (PANY&NJ), have been working toward the implementation of a feeder barge operation for containerized freight from the New York and New Jersey ports to Bridgeport. The proposed operation would offload containers at the New Jersey ports onto barges and transport the barges to Bridgeport for offloading onto trucks. It is estimated that between 60 and 80 containers could be shipped each day, totaling between 150,000 and 200,000 annually. This would remove about 33,000 trucks from I-95 through Fairfield County each year.

The container terminal site in Bridgeport is strategically located near several major highways, which would facilitate movement of goods to their final destination. Interstate 95 is only about one-quarter mile from the BRMC.

Truckers could travel east about 17 miles to reach I-91 and travel north to Meriden, Hartford and Springfield, or west a few miles to access the Route 8/25 Expressway, which leads to Shelton, Waterbury and I-84. Continuing east on I-95 connects with New London, Providence and Boston, as well as I-395 to Norwich, Worcester and Massachusetts Turnpike (I-90).

There is a need to develop the land-based infrastructure in Bridgeport to accommodate the new service. Although it would initially use the Cilco Terminal, permanent facilities would need to be constructed on the adjacent BRMC property. Land based improvements include bulkheads (alignment of adjoining property), terminal improvements (paving, utilities, buildings, rolling equipment and ramps), scales and gatehouse, security fencing and storage areas. Additional property may be needed and the port area reconfigured as the system develops and expands. Complementary facilities may need to be developed to support additional services required for a port feeder service.

Freight Railroads

While Connecticut is home to eight freight railroads that operate on about 330 miles of track, rail freight infrastructure in the Greater Bridgeport Region is limited to the New Haven rail line and a short section of the Derby Branch line that passes through the Town of Monroe.

The majority of freight carried by railroads in the region is made up of bulk materials with a value to volume ratio, including waste and scrape, stone, gravel and sand, lumber, iron, steel and chemicals.

CSX is the only Class I railroad operating in Connecticut and has trackage rights along the NHL-ML from New York to New Haven to provide both local and through service. CSX must pay for using the NHL-ML which increases its shipping costs and reduces its competitiveness. About 10,900 carloads are handled by CSX each year in Connecticut. An intermodal yard is located in North Haven for the transfer of freight to and from trucks and consolidated onto rail cars. The Providence and Worcester Railroad can only operate through service along the NHL-ML. The Housatonic Railroad (HRRC) provides through and local service on the Derby Branch Line.

The opportunities to expand freight services in the region are limited. Conflicts with passenger rail service restrict when freight railroaders can use the track and the frequency of freight rail movements. In addition, the costs of using the NHL-ML make it more likely that CSX would move freight along company-owned rail lines north of the region to access other Connecticut and New England markets. Similarly, the Providence and Worchester railroad has rights to travel on the New Haven rail line but can only provide through service; no local service is permitted.

The trend in rail freight industry is to concentrate on fewer core lines and focus on long-haul, through traffic. Longer and larger consists are also seen as a strategy to lower costs and increase the competitiveness of rail. New equipment allows double stacking of containers; however, modern double-stacked rail cars require minimum vertical clearance of 22 feet 6 inches. The New Haven rail line, because of limited vertical clearance with road bridges and catenary system, cannot accommodate double-stacked equipment.

To expand and accommodate rail freight into and through the region, the following actions are included in the plan:

The state of Connecticut needs to investigate and determine whether to support the New York City Economic Development Corporation (NYECD) plans to construct an exclusive rail freight

tunnel under the New York Harbor, known as the Cross Harbor Tunnel.

Investigate and determine the feasibility of facilitating the use of RoadRailer technology to move goods and freight through Penn Station in New York and along the New Haven rail line.

Improve rail overhead and side clearances to better accommodate newer rail freight equipment and industry innovations.

Investigate the feasibility and economic viability of constructing a rail spur link between Bridgeport harbor and the New Haven rail line, especially as it could relate to the short-sea container barge service and Seaview Avenue Corridor Project.

Develop a rail siding for intermodal transfer between truck and rail at the East Bridgeport yard.

Air Cargo Services

The air cargo industry has experienced a high rate of growth in recent years, transporting a wide range of commodities, primarily those with a high value or time sensitivity. In Connecticut, air cargo mostly passes through Bradley International Airport in Windsor Locks. It is the only airport in the state that has regularly scheduled commercial freight service. Other regional and general aviation airports may receive occasional small deliveries, primarily for local businesses.

Air cargo services involve shipments by air, but include ground transportation by truck, either motor carriers or air cargo affiliates that operate their own fleet of trucks (UPS, FedEx, etc.).

The Sikorsky Memorial Airport is a general and commercial aviation airport serving general and corporate activity. However, because of its size and function, it is unlikely that air cargo services will expand greatly and account for a larger portion of freight movement in the region. In addition, the proximity of the region to the New York airports and Bradley Airport north of Hartford will limit

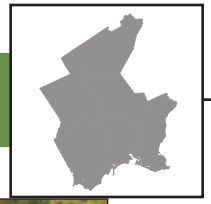
the amount of air cargo flown directly to and from the region. These nearby airports offer a substantial amount of scheduled air cargo services, numerous freight forwarders and commercial airline services.

Other Multiple Modes

Freight movement often involves multiple transportation modes, especially between long haul carriers, such as shipping, rail and air, short haul modes, primarily motor carries and parcel services. The primary multiple-mode category is comprised of freight and goods shipped via parcel services (U.S. Postal Service or Courier). In total, about 453.1 million tons of freight were moved using multiple modes, mostly domestically. Overall, this category accounted for only small percentage of total goods movement, about 0.5% of the all domestic shipments, 0.3% of all foreign shipments and 1.7% of all border shipments. The value of goods totaled about $17.4 billion.

Since shipments using multiple modes use the surface road network, actions that preserve and maintain these services are included in that category.

Section 11: Regional Non-Motorized Transportation



Non-Motorized Transportation Policy

Streets are an integral part of our cities and towns, providing and facilitating the movement of people and goods. The road network in the Greater Bridgeport Region is extensive, totaling about 1,276 miles. It connects neighborhoods and provides access to businesses, jobs, schools and a wide range of public and private services. Connections to neighboring cities and towns, regions, as well as interstate travel are facilitated by an expressway system consisting of Interstate Route 95 (I-95), the Merritt Parkway (State Route 15), Route 8 and Route 25.

The goal of transportation improvement programs has usually been to make the highway system as efficient as possible, with efficiency defined as making the flow of traffic better. This has resulted in overbuilt roadways, exclusive turn lanes that increase the walk distance across an intersection, additional travel lanes that reduce shoulder area available to bicyclists and traffic signal timing and phasing that favors vehicle movements. The needs of pedestrians and bicyclists have often been either ignored or only considered minimally. However, streets are an important part of a community's livability and help define it as a special place. The emphasis on vehicle movement has resulted in street environments unfriendly to bicyclists and pedestrians and land uses dependent on the automobile.

There is a concern that motorized travel is being improved at the expense of accommodating bicyclists and pedestrians. At the same time, bicycling and walking have become recognized as important non-motorized modes of travel. To address this concern the Greater Bridgeport Regional Council (GBRC) has taken an active role in providing technical assistance to its member communities

in developing bicycle and pedestrian plans and implementing complete streets policies. These efforts are in addition to the development of a regional bicycle and pedestrian plan that establishes a comprehensive framework for developing new biking and walking facilities and maintaining and improving existing facilities.

The vision for bicycling and walking opportunities is:

"The Greater Bridgeport Regional Council recognizes the need to encourage walking and bicycle travel for transportation, recreation, exercise and quality of life. Walking and bicycle use conserves energy, improves air quality, reduces traffic and the need for parking, improves health and fitness, and improves the local economy through a better quality of life, increased access to local businesses, and greater potential for tourism in the area. These goals will be achieved through education, encouragement, enforcement, and infrastructure."

A critical element of realizing this vision is adoption, acceptance and implementation of "complete streets" concepts and actions. The aim of the "Complete Streets" concept is to achieve regional sustainability goals and fight climate change. Strategies include the conversion of roadways to accommodate all users, not just automobiles, thus making the street environment more livable and safer for all. Changing how the street environment is planned, designed and built also changes how the street environment is used. In essence, the street environment is altered from one where vehicles dominate to one where all users are accommodated.

The basic objectives of the regional non-motorized transportation programs are to encourage and promote the increased use of bicycling and walking as modes of transportation while enhancing safety and livability. If provided safe environments, people would bike and walk more. To achieve these objectives, the long range transportation plan focuses on efforts to:

Accommodate current bicycle use on the existing highway system in a safe manner;

Connect activity centers and provide connections between where people live and where they want to go with well-defined pathways;

Make sure facilities are connected and ensure that there are no broken connections – paths should be direct – and providing sidewalks that are well maintained and meet width needs;

Promote the idea that all trips involve some time walking, especially at the destination;

Not all bicyclists and pedestrians are the same – some are advanced, some are novices; some walk fast, some walk slow – different skills and abilities need to be accommodated;

Do not treat all places the same – different places will have different needs and require different actions and approaches;

Slow traffic down – traffic calming actions, including using textured material at crosswalks, bumping-out intersection curbs to shorten the walk distance, and installing center refuge islands;

Enhance the streetscape environment, including planting urban appropriate trees, landscaping, installing bio-swales and rain gardens, using permeable paving material, and providing a buffer between the street and sidewalk;

Installing pedestrian enhancements, including highly visible crosswalks, upgrading pedestrian signal equipment – countdown clocks, emit audible sounds, vibrotactile devices and increasing walk intervals;

Adding on-street parking treatments, including designated spaces delineated

by a unique pavement treatment (textured material, concrete pavers) and curb/sidewalk bump-outs; and

These objectives are enumerated in the "Bicycle, Pedestrian and Complete Streets Policy Statement for the Greater Bridgeport Planning Region." The policy statement is consistent with the US Department of Transportation guidelines and policies related to bicycle and pedestrian facilities and mirrors nationally recognized complete streets concepts. The policy also involves establishing design guidelines for bicycle and pedestrian facilities and complete streets elements.

Regional Bicycle Programs and Projects

The Greater Bridgeport Regional Council recently prepared regional bicycle plan and also provides technical assistance to member communities on bicycle issues and opportunities. This plan forms the basis for recommended actions on the long range transportation plan. The focus is on continuing regional bicycle facilities planning, developing and implementing a regional bicycle route network and constructing a regional network of shared-use trails.

Regional Bicycle and Pedestrian Planning: Efforts have been expanded to encompass the concepts and principles of complete streets. The following planning activities have been completed or are underway in the region:

Pequonnock River Trail Project: The GBRC has been an active participant in efforts to plan, design and construct a multi-use trail through the region from Bridgeport to the Newtown town line. Preliminary project planning and coordination was provided early in the process and continues. Recent planning activities have included assessing a by-pass alternative for crossing the Route 15 and Route 25 interchange area, evaluating on-road segments, developing an amenities and signage plan, including creating a unique logo for the trail, identifying locations for trail parking lots, preparing an operations and management plan and supporting the design to align the trail through the Trumbull Center shopping plaza. The GBRC served as the project administrator for the design of a 4.1 mile extension of the trail.

Housatonic River Greenway: The town of Stratford enlisted the assistance of the GBRC to study and plan a multi-use greenway within the corridor of the Housatonic River from the south end of town at Long Beach to Roosevelt Forest in the north end. The GBRC identified a 16-mile pathway consisting of off-road sections and on-road bicycle routes. Connections to the Merritt Parkway walkway and adjacent towns were also included in the plan. The plan was adopted by the town's planning commission and a trail section has been completed

City of Bridgeport Complete Streets Plan: The GBRC assisted the city's sustainability office on preparing a "complete streets" policy and plan. Several corridors were evaluated for the feasibility of installing bicycle lanes and the practicality of using permeable paving material instead of non-pervious asphalt. The plan recommended several immediate actions to serve as demonstration projects for the effectiveness of implementing complete streets city-wide.

Town of Fairfield Bicycle and Pedestrian Plan: The GBRC assisted the town's bicycle and pedestrian advisory committee in developing a town-wide plan to install, enhance and provide bicycle and pedestrian facilities. The planning effort was expanded to include complete streets concepts and principles. The committee sponsored an opinion survey of town residents on their concerns regarding biking and walking in

town, the need to improve facilities and willingness to support construction of new facilities. Public charettes were be conducted to identify critical target areas and develop near-term demonstration projects.

Regional Bicycle Route System: To a varying extent, bicycles will be ridden on all roadways where they are permitted; therefore, the most common bikeway is a shared roadway facility. All roads open to bicyclists should incorporate design treatments that will enhance bicycle riding qualities. 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. The types of shared-road bicycle facilities include:

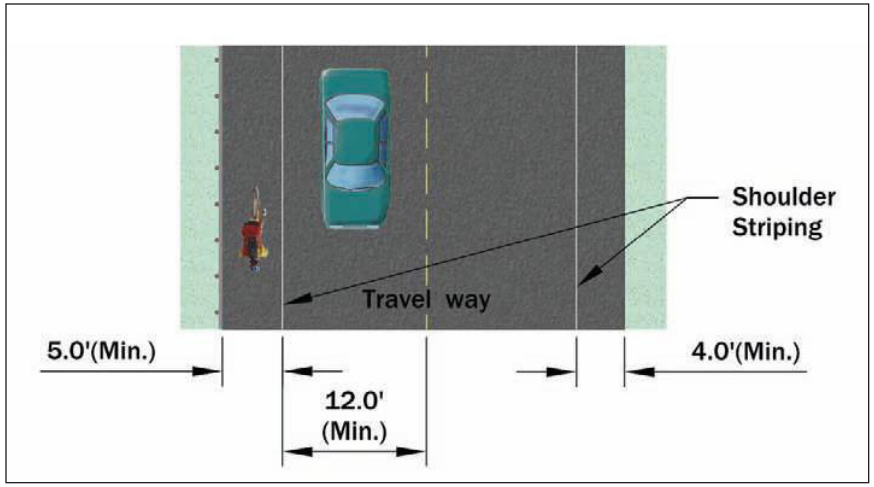
Bicycle Route: Provide the minimum level of route designation and separation from motorized vehicles. Bicyclists share the road with motorized traffic and are carried in the same direction of traffic. No special treatments are made at intersections or where there is on-street parking. These facilities are most often designated with a standard bicycle route sign along both sides of the road and need to be at least four feet wide. A five-foot width is necessary if a guard rail is present.

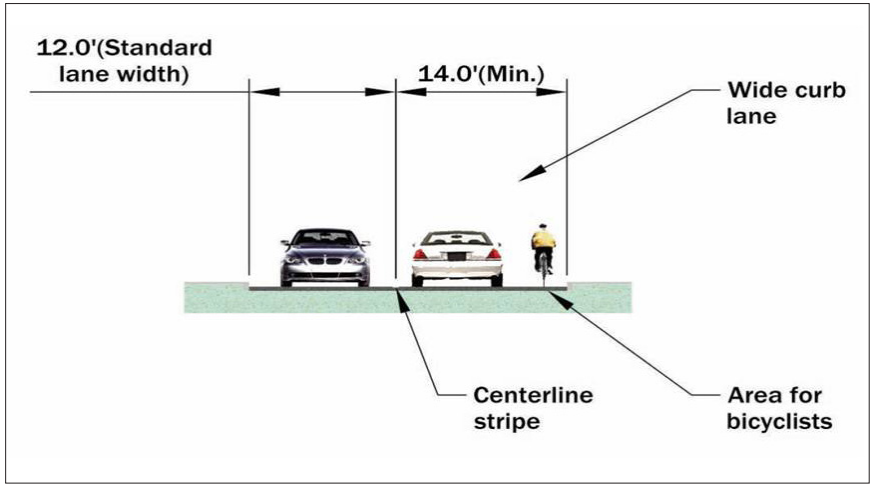
Shared Roadway: The bicycle uses the same lane as motorized vehicles and are acceptable in low volume, low speed neighborhoods. These generally do not require special signing unless the road is used to connect special bicycle facilities.

Wide Shoulder Lane: The bicycle uses the curb edge of an outside travel lane that is sufficiently wide (at least 14 feet) to accommodate both motorized vehicles and bicycles in the same.

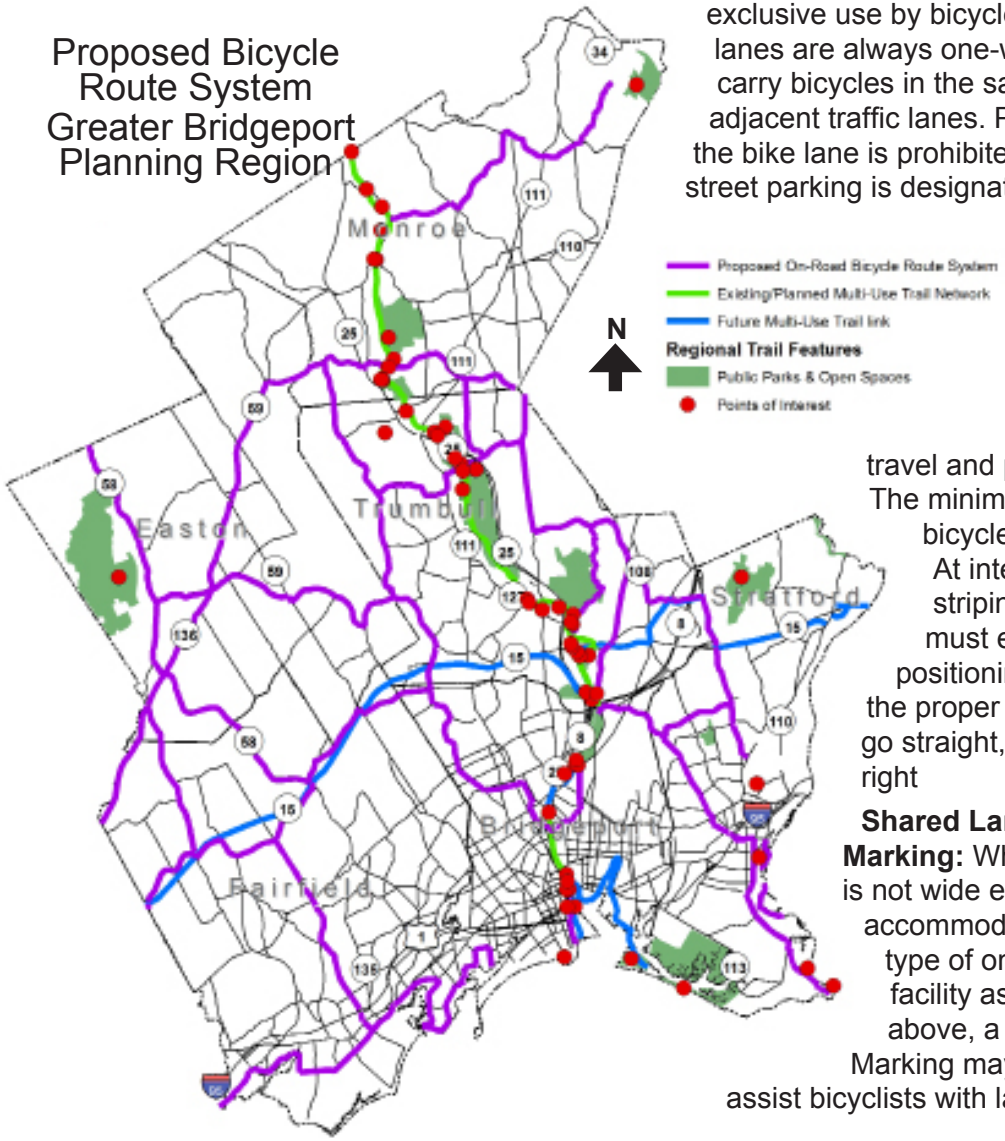
Shoulder Bikeway: The bicyclist uses the paved portion of the road to the right of the edge line. The shoulder lane provides some level of separation between traffic and bicycles because of the edge line.

Bicycle lane: Defined as the portion of the road specifically designated by



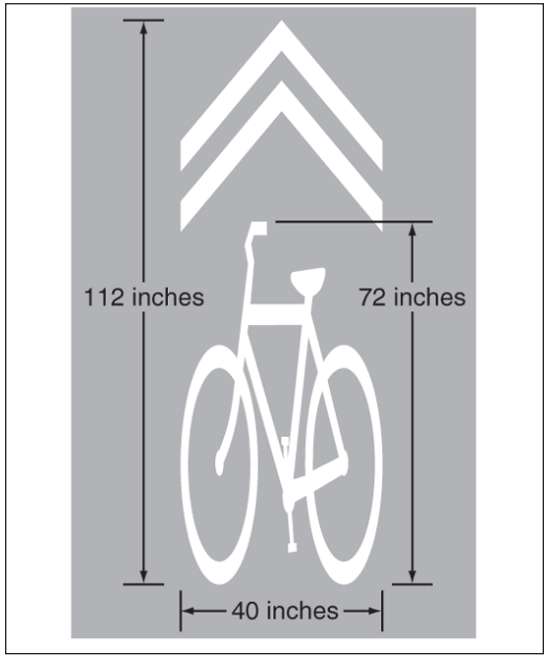


Proposed Bicycle Route System Greater Bridgeport Planning Region



striping and signing for preferential or exclusive use by bicycles. Bicycle lanes are always one-way facilities and carry bicycles in the same direction as adjacent traffic lanes. Parking within the bike lane is prohibited. Where on-street parking is designated, the parking lane should be located to the right of the bicycle lane with the bicycle lane between the travel and parking lanes. The minimum width of a bicycle lane is five feet. At intersections, the striping and signing must encourage positioning bicyclists in the proper lane whether to go straight, turn left or turn right

Shared Lane Pavement Marking: When the lane is not wide enough to accommodate another type of on-road bicycle facility as described above, a Shared Lane Marking may be used to assist bicyclists with lateral positioning



in a shared lane that is too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane. The marking also alerts road users of the lateral location bicyclists that are likely to be sharing the traveled way, encourages safe passing of bicyclists by motorists, and reduces the incidence of wrong-way bicycling. It is commonly referred to as a “sharrow.” The MUCTD provides guidance on the appropriate use of the shared lane marking. The symbol should not be placed on roadways that have travel lanes at least fourteen feet wide or where the speed limit is above 35 mph. The symbol should not be used on shoulders or designated bicycle routes or lanes.

The regional transportation planning process identified a bicycle route system. The proposed network consists of roads that can safely accommodate current bicycle use and provide access to various activity centers. The candidate bicycle routes were evaluated relative to accessibility, directness, continuity, attractiveness, and level of conflict.

Traffic volume on the candidate route and geometric characteristics such as operating speeds, traffic mix, parking, travel lanes, pavement width, and commercial activities were also considered in the planning process. Topographical information was reviewed to identify road segments with steep grades which may make the segment inappropriate for bicycle use. Selected routes and trails reflect bicycle desire lines.

The proposed bicycle routes represent an illustrative network that will be developed and implemented over time. The network may be adjusted to accommodate local needs and desires. Existing conditions

vary and improvements such as minor widening and removal or relocation of adjacent fixed objects may be required. Bicycle route signs will be installed at periodic intervals to inform motorists that the road is a designated bicycle facility and to share the road. The shoulder area needs to be maintained with a smooth, clear surface and kept free of debris.

Key to the selection of bicycle routes was continuity and interconnection. Routes that lead somewhere and provided access to an attraction was another important concept in the plan. The preliminary selected routes (presented in the following map) provide numerous connections with the regional Pequonnock River Trail. The proposed bicycle route network is depicted in the map on the folowing pages.

Regional Shared-Use Trail Network: A shared-use trail or path is physically separated from the road and follows an independent right-of-way. Two-way flow is provided and a range of users, including bicyclists, walkers, in-line skaters, wheelchairs and strollers are accommodated. Although these trails provide a low stress and safe area separated from motorized vehicles, the mix of different users and varying skill levels often creates a challenging environment with a variety of potential

conflicts. Care and attention need to be given to the design, and user rules need to be established and enforced.

Shared use paths are the highest form of facility and require special design considerations. The guidelines developed by the American Association of State Highway Transportation Officials (Guide for the Development of Bicycle Facilities) should be used and followed when designing and building these facilities. However, sound engineering judgment is also important to provide flexibility in design when the guidelines cannot be met. The basic design guidelines include a minimum trail width of ten feet with adequate shoulders and clear zones, good separation from a roadway (at least five feet or an acceptable barrier), minimal grades (maximum of 3%-to-5%), horizontal alignment to provide adequate stopping sight distances, a minimum eight-foot vertical clearance, and special treatments at intersections to slow bicyclists down and prevent incursion onto the trail by motorized vehicles.

To ensure maximum use of the trail system, various amenities need to be installed along all trail sections, including directional and informational signs, posting of the rules and regulations for trail use, preparing and making available trail maps and guides, and installing benches and other rest areas at periodic intervals along the trails. Adequate parking at convenient locations is also essential. Regulatory, warning and information signs, as well as any pavement markings, in terms of size, style, color and placement, must conform to the Manual on Uniform Traffic Control Devices (MUTCD).

Sidewalks are not considered acceptable for use by most bicyclists and designating a sidewalk as a bicycle path is not a satisfactory policy. Sidewalks are

designed for pedestrians and for their speed and maneuverability. The higher speeds of bicycles cannot be safely accommodated on sidewalks. The commingling of pedestrians and bicyclists can result in conflicts; sudden changes in direction by pedestrians leave bicyclists little time to react and pedestrian are sometimes uncertain where on-coming bicyclists are going.

The GBRC has assisted and continues to assist the city of Bridgeport and towns of Monroe, Stratford and Trumbull on developing several shared-use trails. Several sections have been constructed along the north-south route of the Pequonnock River valley and a section of the Housatonic River Greenway has been constructed.

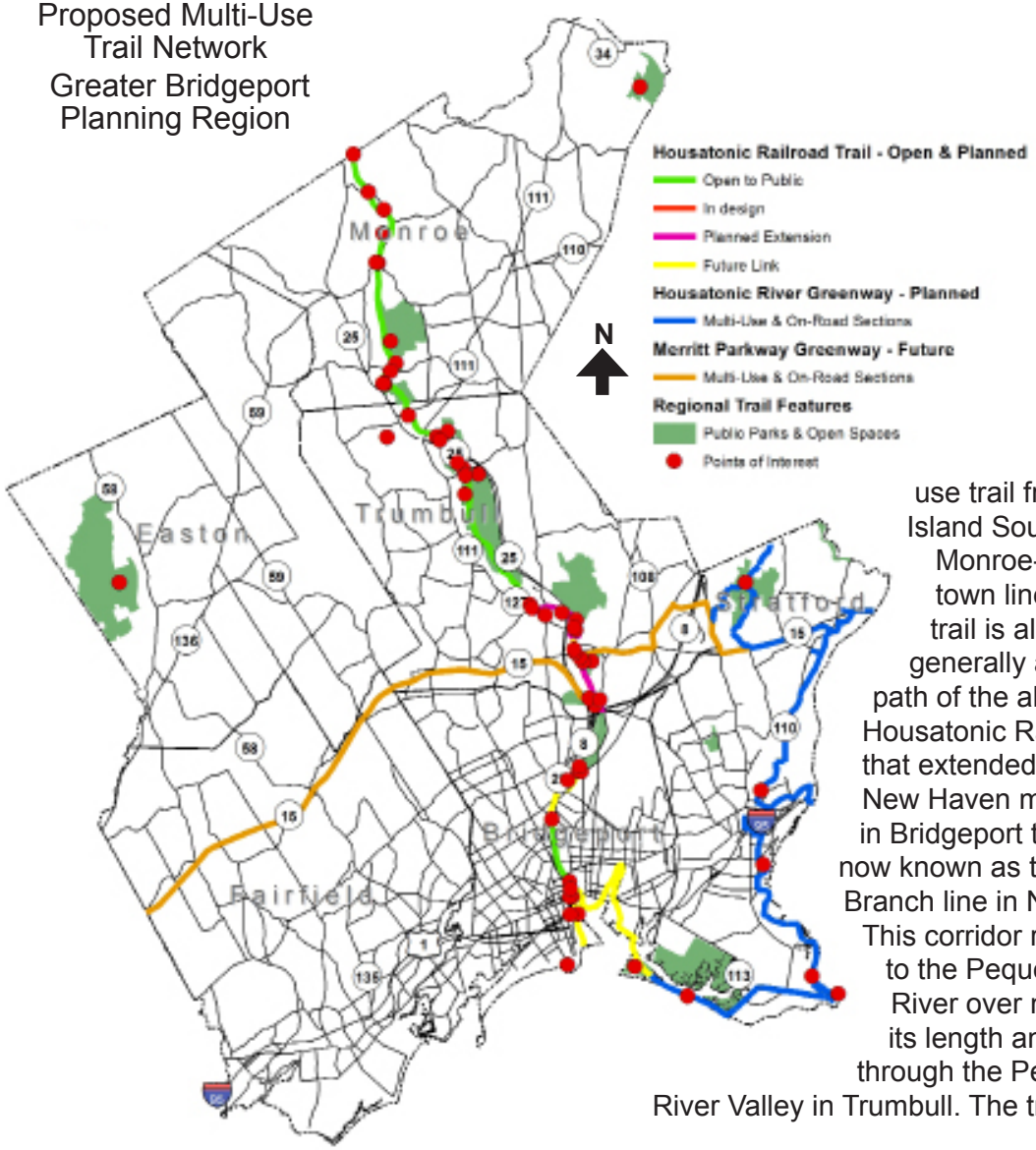
Examples of shared-use paths in the Greater Bridgeport planning region – paved section under the Route 25 expressway in Trumbull (top) and an urban section in Bridgeport along Housatonic Avenue (previous page).

The regional trail and path projects are intended to complement the on-road bicycle route system and provide a high quality facility for non-motorized traffic. Past, current and future designs adhere to the design approach discussed above and meet minimum AASHTO guidelines as much as practical

The regional trail network consists of three primary corridors, with implementation expected over immediate, mid-term and long-term timeframes.

1. Pequonnock River Trail (PRT): This project consists of a continuous shared-

Proposed Multi-Use Trail Network
Greater Bridgeport Planning Region



use trail from Long Island Sound to the Monroe-Newtown town line. The trail is aligned generally along the path of the abandoned Housatonic Railroad line that extended from the New Haven main line in Bridgeport to what is now known as the Derby Branch line in Newtown. This corridor runs parallel to the Pequonnock River over much of its length and passes through the Pequonnock River Valley in Trumbull. The trail will extend a distance of about 16 miles, provide access to a number of activity centers, municipal and state parks, Beardsley Zoo, downtown Bridgeport and Trumbull Center. The trail will also connect to a variety of public transit operations – Metro-North commuter railroad, GBT's local bus service, Port Jefferson ferry service, and interstate rail and bus service. About 10.2 miles of the trail are open to the public and a 4.1 mile section is close to completion. Future extensions will bring the trail directly to the Water Street Dock and connect to Seaside Park in the south end. Concepts also envision aligning the tail through the east end and providing access to Pleasure Beach with a connection to Stratford.

The PRT crosses Route 111 in Trumbull at grade. This is a four-lane state arterial the carries over 22,000 vehicles per day. Pedestrian actuated flashing lights and a raised median have been installed to provide protection and refuge for trails crossing at this location. However, because of the high volume and speed of traffic, a grade-separated crossing is being investigated. The proposed structure will be either a tunnel under the highway or an elevated walkway.

2. Housatonic River Greenway:
The greenway would run along the

Housatonic River in Stratford from Stratford Point at the south end of town to Roosevelt Forest in the north end. Trail extensions would be made to Long Beach in the Lordship area and to the bicycle/pedestrian path on the new Sikorsky Memorial Bridge carrying the Merritt Parkway over the Housatonic River. Connections would also be made to trails and bicycle routes in Bridgeport, Trumbull and Milford. Because of the development patterns in Stratford, the facility would consist of a combination of separate trails on exclusive rights-of-way and designated on-road bicycle routes and adjacent sidewalks. The town has completed the construction of a short section in the Hunter Haven and Birdseye boat launch area.

3. Merritt Parkway Greenway Trail: The Merritt Parkway is a four lane, limited access highway designed for the exclusive use by passenger vehicles. Commercial vehicles are prohibited from using the Parkway. Constructed in the 1930s as a “parkway” type facility, its alignment blends with the countryside and follows the terrain. Many unique features were incorporated into its design. The entire trail is envisioned as a 37.5 mile continuous path adjacent to the Merritt Parkway. It would also become a component of the proposed East Coast Greenway, a planned non-motorized corridor that would extend from Maine to Florida. Feasibility needs to be determined and environmental constraints, such as, variable grades, wetlands, and exposed need to be addressed.

The planned multi-use trail system in the region is shown in the map to the left

Pedestrian Enhancement Program

All trips involve some time walking. However, often little consideration is given to the safety and needs of pedestrians. The GBRC prepared a regional pedestrian plan recently and continues to provide technical assistance on pedestrian issues and opportunities to member communities. The pedestrian plan assessed accident experience involving pedestrians and conducted field surveys to determine the condition of pedestrian facilities. While the accident experience in the region is not significantly dissimilar to other urban areas in Connecticut, the frequency and severity of pedestrian injuries are sufficiently high to warrant action. The field observations identified relatively widespread problems with the condition of existing crosswalks and non-compliance to MUTCD guidelines related

to pedestrian signals.

Short-term Pedestrian Enhancement Program:

To improve the pedestrian environment and safety, an enhancement program is needed. The basic immediate actions include:

Rehabilitating and improving sidewalks, paths and crosswalks and closing gaps in the network;

Upgrading and modifying traffic and pedestrians signals, including installing countdown signals, vibrotactile warnings and audible indicators, and making sure they are in working order; and

Installing and modifying regulatory and warning signs (no right turn on red and pedestrian crosswalk signs).

Long-term Pedestrian Enhancement Program:

To address longer term needs, the entire streetscape environment requires enhancement. Proposed actions include:

Modifying road design to better accommodate pedestrians – narrowing the road, reducing the number of lanes and reallocation of the right-of-way;

Constructing intersection treatments – bulb-outs, curb extensions and median barriers;

Implementing pedestrian-related traffic calming projects – raised cross walks, raised intersections and textured pavement;

Constructing new and extended sidewalks and walkways

Enhancing traffic signals – leading pedestrian interval, ITS applications that automatically detect the presence of pedestrians;

Embedding warning lighting in mid-block crosswalks to enhance visibility and alert motorists of the presence of pedestrians; and

Modifying commercial driveways – consolidating, closing, narrowing and reducing curb radii.

Pedestrian Bridge and Walkway Project: The proposed project would construct a pedestrian bridge and walkway, connecting the Black Rock neighborhood of Bridgeport with the Fairfield Metro rail station in Fairfield. On the Bridgeport side, the Black Rock neighborhood primarily consists of a variety of higher density residential units. Residential areas are in proximity to the Fairfield site and the town has identified this area as prime for redevelopment as a transit oriented district. Pedestrian access to the new rail station area is constrained, unsafe and limited to walking along Brewster Street and across the narrow, vehicle bridge over Ash Creek. The pedestrian bridge will provide a safe and convenient path for residents of the Black Rock neighborhood to walk to the new rail station without having to travel along

an uninviting Brewster Street.

Safe Routes to School Program

The Safe Routes to School Program (SRTS) was a standalone program under SAFETEA-LU and now falls under the Transportation Alternative Program in MAP-21. SRTS provides federal aid funds to communities to implement infrastructure improvements to encourage students to walk or bicycle to school, provide a safer environment in which to walk or bike, substantially improve the ability of students to walk or bicycle to school and make walking and bicycling to school safer and more appealing. The focus of the SRTS program is on the school environment and the travel paths of students from home to school.

Source: www.pedbikeimages.org, Margaret Gibbs, 2009

The SRTS program is very local in nature and is targeted at an individual school. It requires the active participation and commitment of parents, teachers, and school administrators, as well as a local transportation or traffic engineer who can offer technical skills. It is this group that understands and knows the impediments to students walking or bicycling to school and who has a good sense of what is needed and which actions would be appropriate and successful.

A good SRTS program has a strong connection to the neighborhood and relies on a complete understanding of the environment (that is, field conditions) in which the school resides. Because the SRTS projects for a school may involve non-infrastructure activities, the Safe Routes to School team is responsible for operating or managing the program once it is implemented. This may involve organizing promotions, participating in training and education, and volunteering to safely guide students along the “safe route” path.

Due to the local nature of the program, it is not possible to develop a region-wide plan. Instead, the proposed improvements reflect the issues, concerns and needs of the students walking and bicycling to specific schools. Possible SRTS physical improvements encompass a wide range of pedestrian enhancements and traffic calming actions as well as education and encouragement programs.

Complete Streets Program

Streets are an integral part of our cities and towns, providing and facilitating the movement of people and goods. The highways, streets and roads serve to connect neighborhoods, provide access to businesses, jobs, schools and a wide range of public and private services, and facilitate movement to, from and through the region. However, the emphasis on vehicle movement has resulted in street environments unfriendly to bicyclists and pedestrians and land uses dependent on the automobile. The needs of pedestrians and bicyclists have often been either ignored or only considered minimally.

The intent of a Complete Streets Policy is to effect 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. It also encompasses not just the area between the curbs but extends beyond the pavement to include

space along the roadway as well. Wide streets with little or no landscaping induce drivers to travel quickly through the area and provide no sense of place. The planting of trees, bushes and flowers has the effect of “visually” narrowing the road and providing a more pleasant street environment for all.

While a complete street embraces many common elements, each application is unique and the features selected reflect the land use, needs and characteristics of the area.

Key elements of the regional “Complete Streets Program” include:

Bicycle facilities – bicycle routes and lanes, signage, bicycle racks, appropriate pavement markings and symbols;

Bus features and amenities – bus pull-outs, shelters, clear and accessible paths;

Pedestrian enhancements – crosswalks, pedestrian signal enhancements, curb ramps, and sidewalks;

Traffic calming actions – using textured material, intersection bump-outs, curb extensions, center refuge islands, and raised intersection tables;

Streetscape environment – appropriate urban trees, landscaping, bio-swales and rain gardens, permeable paving material, and buffers between the street and sidewalk to dramatically alter the “atmosphere” of the street environment;

ADA compliant features – curb ramps, detectable tactile cues and warnings, accessible pedestrian signals, and longer walk intervals;

On-street parking treatments – delineated parking spaces and curb/sidewalk bump-outs; and

Access management actions – driveway consolidations, modifications and closures.

Downtown Urban Enhancement Program

In the City of Bridgeport’s Master Plan, Downtown Bridgeport is described as a relatively small and compact area that offers a wide range of activities and businesses. The Downtown also serves as the transportation hub of the region. The size of the downtown and closeness

of various attractions lends itself to convenient and comfortable pedestrian circulation. The city codified the character of the Downtown area by designating it as a Downtown Village District. The intent of this zoning designation is to promote the area as a transit oriented district.

Within Downtown Bridgeport, travelers have the option of using local and intercity buses, commuter and interstate rail, and passenger ferries. All three modes are located within close proximity of each other, making transfers easy and convenient. In addition, the Pequonnock River Trail begins in Downtown andallows access by bicycle. To take advantage of these travel options, the City of Bridgeport initiated the Bridgeport Intermodal Transportation Center (ITC) project. A new bus terminal and commuter parking garage have been built and an elevated walkway was installed to connect the modal components of the ITC. The rehabilitation of the rail station is expected to be completed over the next several years and will complete the project.

Despite the improvements associated with the ITC project, the area around the rail station, bus terminal, ferry dock and parking garage needs to be enhanced and connections need to be made between the ITC and the adjacent downtown. These connections will be made physically, aesthetically and functionally and will promote non-motorized modes, foster mobility, facilitate access to multi-modal transportation modes and enhance the overall environment in and around the downtown area.

The following actions support the vision of transforming the Downtown Bridgeport area into a unique and functioning transit oriented district:

Develop, design and implement a comprehensive sign program for identification, information and wayfinding.

Install static and dynamic information kiosks at the rail station, bus terminal and ferry terminal.

Develop and implement a real-time, dynamic traveler information system for the ITC facilities for bus, rail and ferry services, including delay information, arrivals and departures.

Develop, design and implement decorative lighting within the downtown area that complements and supplements existing efforts and illuminates, accentuates and highlights key facilities.

Streetscaping and landscaping enhancements along Water Street, Main Street, North and South Frontage Roads, State Street, John Street and Fairfield Avenue.

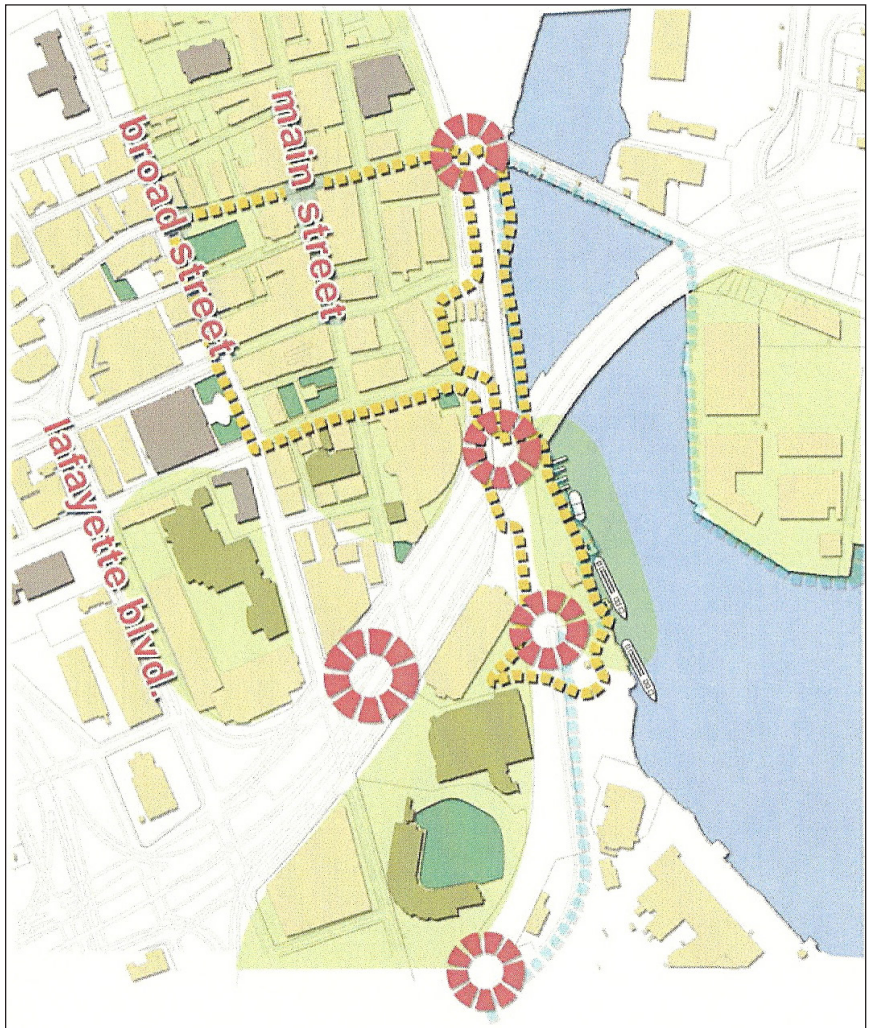
Complete and construct a harbor walk along the Pequonnock River and Bridgeport Harbor.

Create a pedestrian friendly and inviting linkage along Main Street, Water Street and Broad Street from the Transit Garage and Harbor Yard Arena area and the ITC, and install lighting that makes these spaces more appealing and less uninviting.

Improve pedestrian safety and access to the Bridgeport Bus Terminal from the downtown area by constructing various traffic calming enhancements including textured pavement treatments, a raised table along Water Street, pedestrian refuge island and reducing the number of traffic lanes.

Improve and enhance the existing rail underpass leading to the Water Street Dock.

Install new fencing around the surface parking lot under I-95 and reconstruct and reconfigure the diverge area between Water Street and North Frontage Road, add new sidewalks, provide handicapped parking spaces and install a more accessible connection with the rail station.



Bridgeport's Downtown Connections

Refurbish and renovate the existing rail station building.

Install artwork on large expanses of concrete walls.

Develop and create bicycle access paths to the ITC district, such as bicycle routes, lanes and separate trails radiating east, west, north and south, and install decorative, functional and distinctive bicycle.

Traffic Calming Program

Traffic problems are perceived differently depending on the location and function of the road. Motorists want good operations and to able to travel at a good rate of speed. However, these objectives are counter to good quality of life and livable communities. The perception is that the road is designed to only accommodate vehicles. To balance the needs of the residents who want slower speeds, fewer cars, quieter streets, and feel they own the road with those of motorists who want short travel times, no congestion and feel that roads, communities can implement physical changes to the roads to slow or calm traffic. Traffic Calming actions offer an engineering approach to slow traffic speeds and/or divert traffic. The physical devices are installed in the roadway to cause a change in driver behavior and improve the conditions for non-motorized street users.

Each traffic-calming project is different and addresses specific concerns of the area's residents. It is critical that projects be implemented only after thorough investigation and adherence to an explicit process. The key elements of a Traffic Calming Program are:

Volume control measures that divert some or all of the traffic in a different direction – street closures, diverters, median barriers and forced turn islands;

Vertical speed control measures that force traffic to slow down – speed humps, speed tables, raised crosswalks, raised intersections and textured pavement;

Horizontal speed control measures that deflect the movement of traffic – mini traffic circles, chicanes, lateral shifts and realigned intersections;

Road narrowing speed control measures that affect the driver's perception of road width – neck downs, center islands and chokers;

Modern roundabouts

Reallocation of roadway width – converting one-way streets to two-way, creating "gateways" and installing bicycle lanes.

Source: www.pedbikeimages.org, Dan Burden, 2006

Section 12: Growth Management

Introduction

This section of the long range transportation plan will use the framework of sustainability to discuss the relationships between transportation and land use. The locations of affordable housing, jobs, education, businesses, shopping, entertainment and services, as well as the networks of streets in our region's communities, heavily influence the mode of transportation, the chosen route and travel time. Currently, private vehicles and the highway system offer the most convenient access between our region's housing and economic activities/opportunities. The reliance on this single mode of transportation has caused severe highway congestion and poor air quality in the Greater Bridgeport Region. To counter these trends, a planning approach that coordinates transportation infrastructure investments with long term land use considerations is necessary. Through Regional Growth Management, and the use of alternatives to private vehicular transportation, the livability of our region's communities are strengthened and enhanced.

The land use patterns in our region have been significantly impacted by a transportation system that is oriented primarily to private vehicle use. A household no longer needs their residence to be in close proximity to economic activity for the opportunity to participate. Rather, private vehicle ownership, and the heavy investment in our highway and road networks has made employment, retailers and services accessible to households located some distance away. Through the convenience of car availability and the supporting transportation infrastructure, the true spatial distances between residential development and economic activity are often overlooked and/or dismissed.

The increasing distances traveled, corresponding time spent in the car and the sheer magnitude of highway/street utilization can be described with measurements of travel time, Average Daily Traffic (ADT) volumes and estimates of total vehicle trips. The impacts to quality of life and the environment caused by the high usage of our region's highways and streets can also be described quantitatively, by monitoring levels of particulate matter and ozone as well as measuring traffic related congestion with Volume to Capacity (V/C) Ratios.

Developed Land* by Town						
	1985		2006		1985-2006 Change	
	Acres Developed	Percent of Town	Acres Developed	Percent of Town	Acres Developed	Percent of Town
Bridgeport	9149	87.5%	9289	88.8%	139.8	1.5%
Easton	3245	17.7%	4156	22.7%	910.6	28.1%
Fairfield	11610	59.8%	12327	63.4%	716.9	6.2%
Monroe	4447	26.4%	6035	35.8%	1589	35.7%
Stratford	7609	65.8%	8021	69.4%	411.5	5.4%
Trumbull	8786	58.2%	9593	63.5%	807.4	9.2%

** High density, built up areas with impervious surfaces & maintained grassy areas (such as lawn)*

Source: CLEAR, 2009

Because much of the residential development outside of the City of Bridgeport is at a very low density, the region's residents have farther commutes to their jobs, drive more miles, and spend more time on the road. 88% of the region's workers, over 117,000 people, use a private vehicle to get to and from work; of these commuters, 38,000 have a travel time to work of a half hour or more. Most commuters, over 100,000 people, drive to work alone.

Congestion on the region's highways and roads is worsening as traffic volumes increase. While most of the congestion is recorded on the higher class highways such as I-95, Route 15 and Route 8, local road travel is being affected as unacceptable travel delay is being experienced on many minor arterial and collector streets.

The region's air quality has also been affected by the high volume of vehicles that utilize highways and roads and their subsequent release of pollutants. The Greater Bridgeport Region, like the rest of Connecticut, has been designated as non-attainment areas for the 8-Hour Ozone and fine particulate matter (PM 2.5) by the EPA.

The spatial disconnection between residential and commercial development

Agricultural Land* by Town

	1985		2006		1985-2006 Change	
	Acres Agricultural	Percent of Town	Acres Agricultural	Percent of Town	Acres	Percent
Bridgeport	0	0.0%	0	0.0%	0	0.0%
Easton	1158	6.3%	781	4.3%	-376.7	-32.6%
Fairfield	579	3.0%	365	1.9%	-214.4	-37.0%
Monroe	551	3.3%	339	2.0%	-212.6	-38.5%
Stratford	16	0.1%	16	0.1%	0	0.0%
Trumbull	40	0.3%	32	0.2%	-7.8	-20.0%

** Areas used for crop production, active pasture or abandoned agricultural sites*

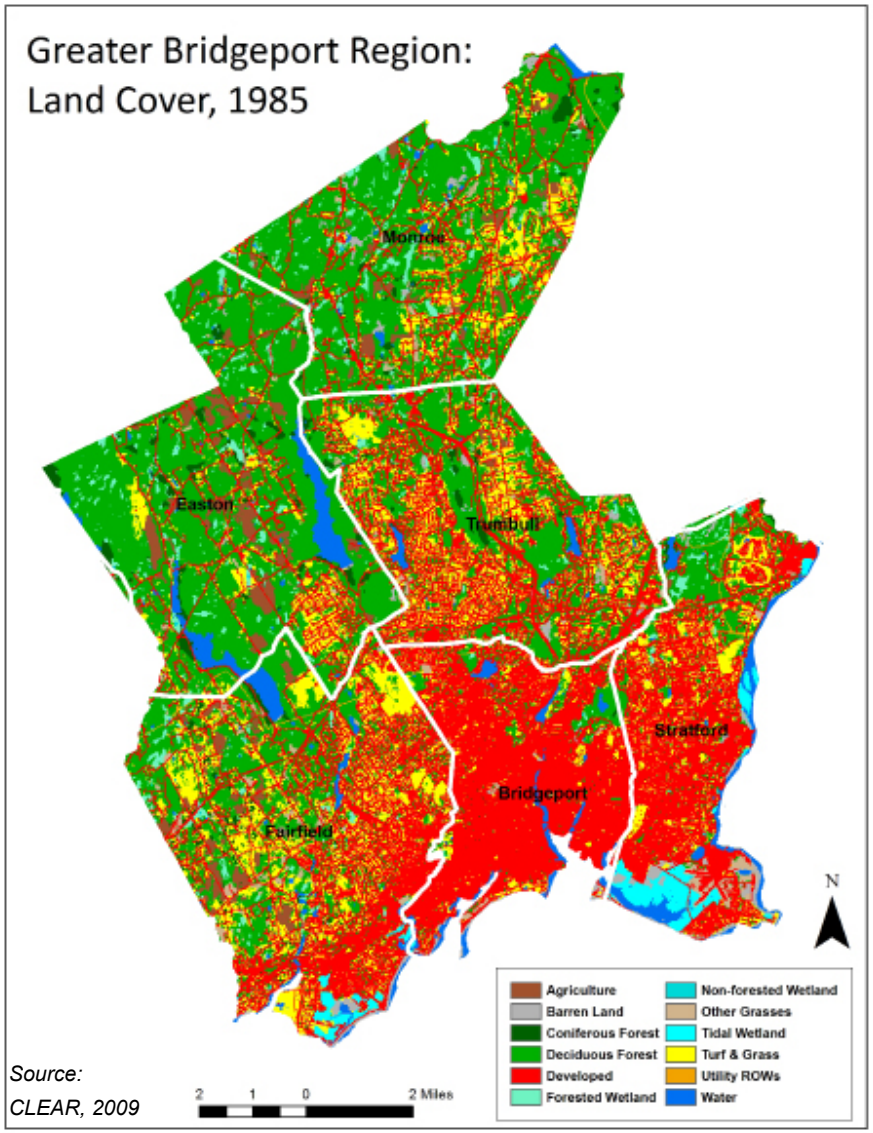
Source: CLEAR, 2009

Forests, Grass Lands & Wetlands* by Town

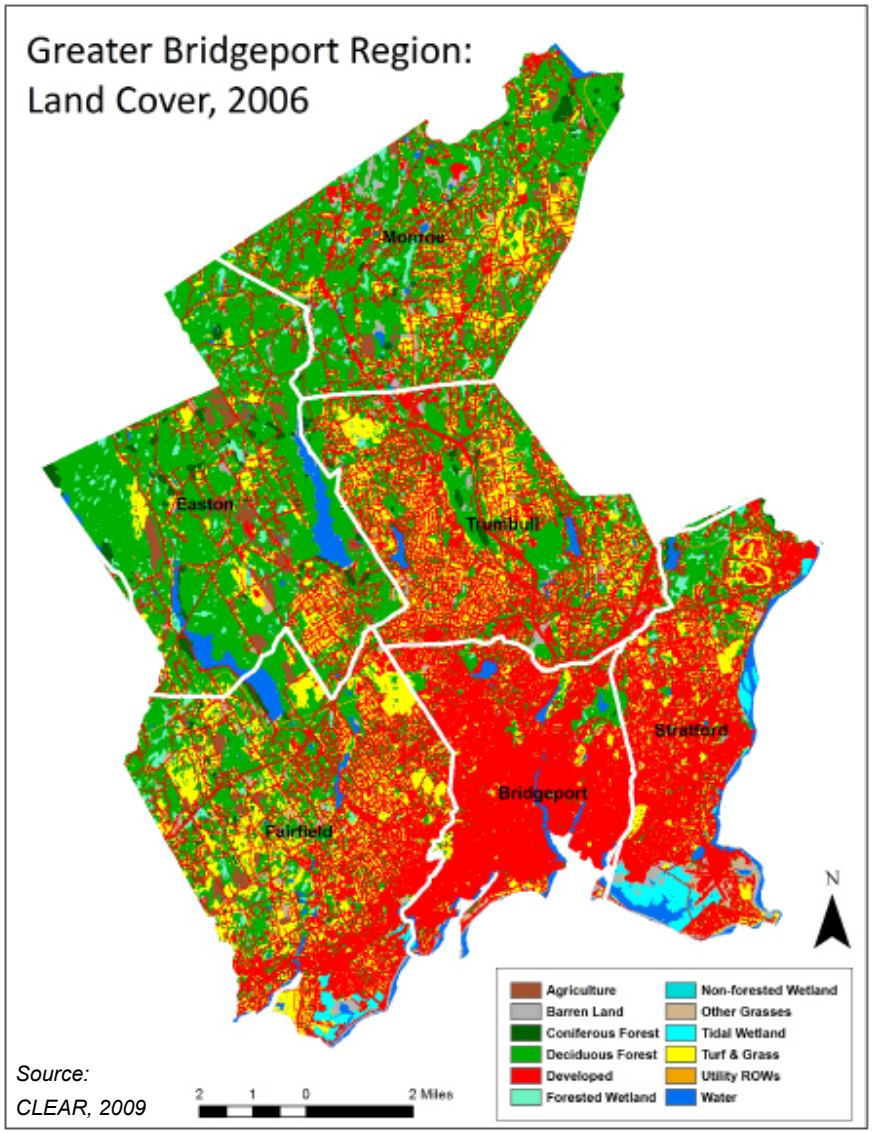
	1985		2006		1985-2006 Change	
	Acres	Percent of Town	Acres	Percent of Town	Acres	Percent
Bridgeport	939	9.1%	789	7.4%	-150.6	-16.0%
Easton	12941	70.8%	12396	67.7%	-544.7	-4.2%
Fairfield	6574	33.7%	6043	31.1%	-529.8	-8.1%
Monroe	11357	67.5%	9926	59.0%	-1431.1	-12.6%
Stratford	3018	26.1%	2619	22.5%	-400.2	-13.2%
Trumbull	5909	39.1%	5094	33.7%	-813.9	-13.8%

** Deciduous & coniferous forests, non-maintained grassy areas, non-forested, forested & tidal wetlands*

Source: CLEAR, 2009



Source:
CLEAR, 2009



Source:
CLEAR, 2009

has been reinforced by the continued development of rural lands for low density housing. Between 1985 and 2006, the Town of Easton lost 377 acres of agricultural land, while both Monroe and Fairfield each lost over 200 acres. All towns in the region lost forests, grass lands, and/or wetlands during this period as well. Monroe lost over 1400 acres of forest and grass lands. Trumbull lost over 800 acres of forest, and both Easton and Fairfield each lost over 500 acres of forest. The net decrease of these town's undeveloped lands is almost an inverse match to the increase in developed land and lawn cover (CLEAR).

Beyond their inherent value, agricultural land, forests, grass lands and wetlands, as well as species diversity, habitats, clean air and clean water make up the natural infrastructure of our region. Like our transportation and utility systems, the region's natural infrastructure provides the components that maintain and enhance human well being and quality of life. Coordinated land use and transportation planning decisions that value our region's natural infrastructure will prevent the degradation of soils, air and water, and also protect species habitat and diversity.

Compact neighborhoods, with employers, retailers and services in close proximity to one another, a mix of housing options, and a population large enough to support public transit, have been neglected in favor of large lot sizes on previously undeveloped land. This shift has affected access to economic opportunities and activities for a significant percentage of our region's residents. In the 2000 Census, over 11,900 households in the City of Bridgeport, almost 24% of all households in the City, did not have any vehicles available. In the One Coast Comprehensive Economic Development Strategy, with data from the Connecticut Department of Labor, the City of Bridgeport was estimated to have lost well over 15,000 jobs between 1990 and 2006. City residents have fewer job opportunities within the city than they had 20 years ago, and, compared with residents outside of Bridgeport, are more likely to not have access to a car – the mode of transportation relied on by most of the region's workers to get to and from work.

In conclusion, the Greater Bridgeport Region is losing open space and farmland (the region's natural infrastructure) at the same time the existing, manmade infrastructure in our urban areas is underutilized. The land use and transportation relationship focuses on past spatial mismatch between development patterns and transportation investments. In the past, land development and transportation investments have not been done in a coordinated manner and have led to some of the problems the region is currently facing. By realizing the land use-transportation relationship, transportation options, future development and redevelopment that are not based on car ownership can be more effectively planned. By realizing the land use/transportation relationship, transportation options, future development and redevelopment that are not based on car ownership or availability can be more effectively planned.

Sustainable Communities Initiative Consortium

The Sustainable Communities Initiative (SCI), an interagency partnership through HUD, the US DOT and the US EPA, supports an integrated, regional approach to planning for transportation, land use, housing, infrastructure and workforce development. In 2010, the New York-Connecticut Metropolitan Region was a recipient of a $3,500,000 grant through the Sustainable Communities Regional Planning Grant Program. This

collaboration of regions and metropolitan areas is called the New York-Connecticut Sustainable Communities Consortium. Both the Greater Bridgeport and Valley regions, as part of the New York-Connecticut Metropolitan Region, are members of this consortium.

The goal of the New York-Connecticut Sustainable Communities Consortium is to align existing sustainability plans with HUD's Six Livability Principles, to link strategies throughout the region so as to develop mixed income housing, infrastructure and employment in areas presently served by commuter rail. Emphasis is placed on engagement with residents and stakeholders for project planning and the development of implementation strategies. The Six Livability Principles are listed in the box below.

Six Livability Principles

1. Provide more transportation choices. Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.

2. Promote equitable, affordable housing. Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.

3. Enhance economic competitiveness. Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.

4. Support existing communities. Target federal funding toward existing communities, through such strategies as transit-oriented, mixed-use development and land recycling, to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.

5. Coordinate policies and leverage investment. Align federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

6. Value communities and neighborhoods. Enhance the unique characteristics of all communities by investing in healthy, safe and walkable neighborhoods; rural, urban or suburban.

Existing Conditions

The Greater Bridgeport Region has conditions conducive to a mix of land uses around transit oriented development. Development that utilizes existing infrastructure, such as infill development and the adaptive reuse of buildings reduces the need for costly infrastructure investments in undeveloped areas. Farmland, the natural environment and open space are protected from the sprawl and degradation caused by development.

The New Haven main rail line runs through Stratford, Bridgeport and Fairfield. While rail service has historically been a valuable asset to these communities, several recent initiatives have proposed additional train stations in the region. These plans emphasize a mix of land uses, affordable housing and bicycle/pedestrian friendly access around the train stations. Infill development at these sites would reclaim vacant lots and brownfields for a more productive use.

The historic core of the Greater Bridgeport Region, downtown Bridgeport, demonstrates many of the qualities emphasized in the TOD concept. Multiple choices of transportation are available in the downtown, giving residents, workers and visitors a number of convenient

alternatives to driving. The Bridgeport Train Station offers both Metro North and Amtrak rail service. The Bridgeport Intermodal Transportation Center Bus Station is located on the same street as the train station. Not far from the train station, ferry service transports passengers between Bridgeport and Port Jefferson, Long Island.

Residents, workers and visitors can walk or bicycle to Downtown Bridgeport and/or between these transit stations. A recent update to the City's zoning code has designated Downtown Bridgeport as a Downtown Village District. These regulations emphasize the role of transit in the Downtown, and promote compact infill development that can utilize transit services – such as housing, employment and entertainment.

Overall, the City of Bridgeport has made a commitment to planning for sustainability with the BGreen 2020 Plan. In this plan, the City of Bridgeport and the Bridgeport Regional Business Council have identified strategies at the local level that address both environmental and economic sustainability in the City of Bridgeport. BGreen links land use and transportation planning with one another to accomplish such goals as reducing automobile trips, vehicle emissions and miles travelled, to redevelop underutilized or vacant sites, and to provide residents, workers and visitors with a range of less carbon intensive mobility options.

Realizing the Land Use/ Transportation Connection

The key to linking transportation and land use development is adhering to the livability principles adopted by HUD, US DOT and EPA and ensuring that transportation infrastructure investments are consistent with these principles. Furthermore, sustainability and growth management principles are fundamental to linking transportation and land use planning and are based on the following:

Sustainable Development is based on policies and actions that meet the present needs of society but do not compromise the ability of future generations to meet their needs. Sustainable development does not preclude economic growth. Rather, sustainable development is growth that provides for the well being of all society in a manner which does not degrade the environment or limit the availability of natural resources for future generations.

Regional Growth Management is a coordinated set of policies for sustainable land use and transportation planning. Placing an emphasis on sustainability in transportation planning realizes that the transportation system affects, and is affected by, land use, housing choices, employment and environmental conditions.

The framework of sustainability encompasses economic growth, the maintenance and protection of the natural environment, as well as the equitable access to opportunities and resources for the region's long term well being. Each dimension of sustainability – the environment, equity and the economy receives equal consideration. Managed growth occurs in a manner that utilizes or reuses existing infrastructure, protects open space and reduces the use of non-renewable energy. Housing is built at a high enough density to support the use of public transit, and non-motorized access to employment, services, retailers and entertainment. Since growth is managed with a regional focus, the advantages and disadvantages of development are equitably distributed throughout communities. The development (or lack of development) that occurs in one community does not cause disadvantages in another.

Initial planning efforts by Bridgeport,

Fairfield and Stratford have identified catalytic projects that will effectuate a fundamental change in how land is developed. These projects involve the creation of transit oriented districts that provide convenient alternatives to driving and offer opportunities for people to live and work in the same area. They demonstrate the commitment in the Greater Bridgeport Region to increasing the range of transportation options for residents, workers and visitors.

Each project, while varying in scope, intensity and scale, is based on redevelopment and revitalization principles that reuse existing land forms and infrastructure. The TOD concept is described as follows:

Transit-Oriented Developments (TODs) are high-density, mixed use, walkable neighborhoods that are typically within a half mile of a transit station. TOD neighborhoods have a mix of housing types and sizes, with both affordable and market rate housing options available. Residential access to transit and a mix of businesses reduce the number of vehicle trips made for work, shopping and entertainment. In turn, the region's roads and highways are less congested and the pollution caused by automobiles is reduced.

Fairfield Commerce Drive Area: The Commerce Drive concept builds upon the recently constructed Fairfield Metro rail station. Within walking distance of the train station, both housing and a mix of services and retailers would be available to commuters and residents. An interconnected network of streets, a pedestrian footbridge to the station and sidewalks would encourage pedestrian and bicycle activity. Site plans also call for some affordable housing, low impact storm water management and opportunities for renewable energy.

Stratford Town Center: Stratford Town Center, located adjacent to the rail station, offers a realistic opportunity for transit oriented development. The recently completed Choices for Stratford: Transit Centered Development Feasibility Study, investigated the existing land use within a half mile radius of Stratford Town Center and assessed the potential for a mix of land uses in the area. Large parcels of land north of the station could be used for mixed use development while parcels along Main Street and Barnum Avenue would be used for infill development. Contingent to the success of the TOD concept are streetscape improvements that will strengthen pedestrian and bicycle access between the town center and rail station.

Bridgeport: Seaview Avenue & East Side Train Station: The East Side of Bridgeport offers multiple opportunities to realize sustainable economic growth, environmental remediation and more equitable access to transit for the neighborhood's residents. Hundreds of acres of vacant, previously developed land and brownfield sites would be reused for a mix of uses, including a new train station. Plans for Seaview Avenue include a Complete Streets component, which would allow for convenient pedestrian and bicycle access to the train station. Street trees, ornamental lighting and calming traffic would encourage a more pedestrian friendly, neighborhood with a variety of retailers and services available to residents.

The concept for the Bridgeport East Side Train Station is well aligned with the Six Livability Principles. The 10,000 Bridgeport residents who live within walking distance of the proposed site would have greater access to transit and employment opportunities. Some of the congestion on local roads could be reduced as well, since Bridgeport Hospital, a large employer, is located a few blocks from the train station site.

Overview of Plan Goals and Objectives

The Regional Transportation Plan for the Greater Bridgeport Planning Region (LRP) will effectively meet its goals and objectives and will address the major deficiencies in the transportation system, preserve and maintain highway and public transit system integrity, promote better operation and management of critical systems, enhance transportation systems where necessary, and support economic vitality of the region. The LRP considers all modes of transportation and focuses on alternatives to the private, single occupant vehicle. It emphasizes and promotes the use of public transportation, including local bus services, commuter rail, and passenger ferry, as well as other non-motorized modes, such as bicycling and walking. The LRP addresses the mobility of not only people, but also freight and goods.

Safety and security of travelers continues to be an important aspect of the LRP, and the security of critical transportation infrastructure has become a more immediate concern. The LRP identifies critical assets, assesses vulnerabilities to both natural disasters and manmade attacks, and identifies possible appropriate countermeasures. This is an on-going effort that will continue over the next five-to-ten years and will involve a wide range of transportation and emergency management personnel. A focus area will be on identifying appropriate advanced technologies to detect security problems, alert the public and travelers regarding natural and man-made disasters, track vehicle location of critical cargo, including HAZMAT, and authenticate authorized personnel.

In addition the LRP expounds on several policies and programs that will enhance safety, promote a better balanced transportation system, address how transportation improvements are developed, ensure transportation projects are considered in context with the surrounding environment and mitigate possible environmental and cultural impacts. The intent is to protect and enhance the environment, mitigate the potential impacts to the environment from transportation improvements, promote energy conservation and improve quality of life.

Key aspects to this approach to transportation planning include:

Sustainable communities initiatives that link land development with investments in transportation infrastructure and support the development of transit oriented districts anchored by a transportation hub;

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.

Implement a collaborative, interdisciplinary approach to the design of a project (Context Sensitive Solutions);

Traffic calming programs to traffic speeds and/or divert traffic from neighborhood and residential streets.

Assess the potential environmental, social and cultural impacts of planned transportation improvements and requiring that any impacts are minimized and mitigated

The GBRC consulted with a wide range of other planning agencies and officials during the development of the LRP, including the Connecticut Department of Environmental Protection, the state Office of Policy and Management and municipal planning and zoning departments, conservation commissions and economic

development agencies. Efforts were also made to solicit input from various groups that represent the elderly and disabled, pedestrians and bicyclists. Consultation with these organizations, agencies and person was intended to ensure consistency with the state Conservation and Development Policies Plan, environmental protection goals, municipal plans of development and economic development activities, and to consider the needs of travelers using non-traditional modes of transportation.

Federal-Aid Transportation Funding Sources

The principal sources of funds to implement recommended LRP programs and projects 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%.

Principal FHWA programs are:

National Highway Performance Program (NHPP): Provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in the State's asset management plan for the NHS. Highways and principal arterials classified on the NHS in the Greater Bridgeport Region include I-95, Route 15, Route 8 and Route 25.

Surface Transportation Program (STP): Provides flexible funding for improvements to any highway on the federal aid system, including NHS and interstate highways. 50% of funds are suballocated to areas based on population while the remaining funds may be used anywhere in the state. The program is broken-down into the following sub-categories:

Urban Areas allocated by population (STP-Urban): Provides funds for improvements to eligible roads in urban areas. Funds can be used for a wide range of projects, such as roadway widening, roadway reconstruction, transit projects and ridesharing projects. An apportionment from STP-Urban is allocated to the Bridgeport-Stamford Urbanized Area.

Rural areas (STPR): Provides funds for rural areas, excluding roads classified as rural minor collector or rural local.

Anywhere in the state (STPA): Remaining STP funds can be used anywhere in the state.

Highway Safety Improvement Program (HSIP): Provides flexible funds to the states to address their most critical safety needs.

Congestion Mitigation and Air Quality Program (CMAQ): Provides flexible funding for transportation projects and programs to help meet the requirements of the Clean Air Act, including traffic signal system improvements, travel demand management programs and transit projects.

Transportation Alternatives Program (TAP): provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning,

designing, or constructing boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

Bridge Replacement and Rehabilitation Program (HBRR): Provides funds to the states to improve the condition of eligible bridges. At least 15% of the funds must be used for off-system bridges.

Principal FTA programs include:

Section 5307 Urbanized Area Formula Program (5307): Provides funds for public transportation capital investments in urbanized areas. The program also supports the implementation of transit enhancements to provide transportation for low income individuals who may live in the city core and work in suburban locations.

Section 5337 State of Good Repair Formula Program (5337): Provides funds to repair and upgrade rail transit systems along with high-intensity motor bus systems that use high-occupancy vehicle lanes, including bus rapid transit (BRT). Ensures that public transit operates safely, efficiently, reliably, and sustainably so that communities can offer balanced transportation choices that help to improve mobility, reduce congestion, and encourage economic development.

Section 5339 Bus and Bus Facilities (5339): Provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities.

Section 5310 Formula Program for Elderly Persons and Persons with Disabilities (5310): Provides funding through a formula to increase mobility for the elderly and persons with disabilities. Grants to support services and facility improvements to address the transportation needs of persons with disabilities that go beyond those required by the Americans with Disabilities Act are also funded through the 5310 Program.

Section 5309 Fixed Guideway Capital Investments (5309): A competitive program that provides grants for major investments in new and expanded rail, bus rapid transit (BRT), and ferry systems.

Because the Bridgeport-Stamford urbanized area is greater than 200,000 in population, FTA formula grant funds cannot be used by local bus operators to subsidize operations. However, the state is committed to providing subsidies to cover 100% of operating deficits for local fixed-route bus service. In addition, state grant funds are made available to municipalities to expand and enhance specialized paratransit services already provided in the community.

Anticipated Financial Resources & Implementing the Plan

Federal regulations require the long range transportation plan to be financially constrained and be based on a reasonable expectation of funds. The time frame of the LRP, as dictated by CTDOT, is from 2015 through 2040. Over the timeframe of the LRP, the funding needs to implement the transportation improvements are substantial. The proposed LRP reflects a financial need of over $2.12 billion (outlined in the Estimated Project Costs table). An additional $1.2 billion is estimated for projects outside of the financially constrained portion of the plan. Not included in either of these figures are rail operating costs, rail capital projects past 2019 and bus and paratransit operating investments past 2018.

Funds from federal, state and local sources will be utilized to implement recommended projects. As part of CTDOT's financial planning responsibilities, the Department provides an estimate of the total resources likely to be available to implement the highway portion of the LRP. Funds needed to

construct major projects of statewide significance were extracted from the total with the remaining funds allocated to the regions based on proportionate weight of vehicle miles of travel, congested vehicle miles of travel and lane miles.

Generally, project and program estimates represent order of magnitude costs based on unit prices supplied by CTDOT (from the 2011 LRTP) and illustrative project concepts; those projects with known schedules were inflated to the expected year of implementation. For local bus transit capital needs, only the future year costs detailed in the TIP, CT Transportation Capital Plan (2015-2019) or GBT Capital Plan (2015-2030) were included. For some projects, on-going or completed design and environmental assessments activities were the basis for the cost estimates.

Resources for the highway system are broken down into two categories: funds to preserve and maintain the system in a state of good repair and funds for system enhancements. In the Greater Bridgeport Region, about $913.6 million is planned for system improvements (enhance safety, improve mobility, increase system productivity or promote economic growth) and about $381.9 million for system preservation (resurfacing, bridge rehabilitation and replacement, and reconstruction) through 2040; a total of $1.24 billion. About $353.1 million has been allocated to complete the three major projects of statewide significance. These projects include the replacement of the I-95 bridge between Stratford and Milford (00135), the reconstruction of interchange 33 on I-95 in Stratford and the replacement of the bridge on Route 34 over the Stevenson Dam in Monroe (001843).

These resources can be compared with the $978 million in proposed highway system improvements and preservation, CMS, non-motorized transportation enhancements and freight projects. Including major state highway projects in the Greater Bridgeport Region, $1.3 billion in costs are anticipated. These costs are summarized in the next table, “Estimated Project Costs” and detailed later in this section. The estimated funds needed to implement the LRP are within the expected financial resources available to the region. Unallocated funds provide a sufficient cushion to accommodate unforeseen costs and needs, cover inflation of project costs beyond what is currently assumed, and provide for the periodic restoration, rehabilitation and resurfacing of the region’s highways and roads.

For the public transportation share only those resources or projects specified in the 2015-2018 TIP, State of Connecticut’s 2015-2019 Transportation Capital Infrastructure Program and GBT Capital Plan have been included in estimates. For Greater Bridgeport Transit, state

Anticipated Financial Resources
(2015-2040, unless noted)

Funding Category	Estimated Funds
Highway	**$1,650,329,767**
Highway System Improvements	$913,686,758
Highway System Preservation	$381,908,065
Subtotal	$1,295,594,823
Major State Highway Projects	$354,734,944
Rail Capital*	**$529,000,000**
Transit (Bus & Paratransit)	**$98,908,000**
Bus Operating Subsidies**	$55,465,000
Bus Capital Projects*	$35,824,000
Subtotal	$91,289,000
Bridgeport-Stamford UZA funds**	$7,619,000

* These estimates reflect projects listed in the 2015-2018 TIP and 2015-2019 Capital Plan and do not include outer years.

** Bus operating subsidies reflect programmed costs detailed in the 2015-2018 TIP and do not include outer years.

Estimated Project Costs, 2015-2040	
System Category	Estimated Cost
Transit	
Local Bus Capital Program (2015-2029)	$104,842,390
Local Bus Operating Investments (2015-2018)	$58,581,000
Regional Rail Projects	$60,168,000
Major State Rail Projects	$529,000,000
Passenger Ferry Actions	$33,752,000
Total Public Transportation:	**$786,343,390**
Highways	
Highway System Projects	$558,766,000
Congestion Management System Actions	$159,263,000
System Preservation	$160,773,000
Non-Motorized Transportation Enhancements	$77,620,000
Freight & Goods Mobility	$22,500,000
Subtotal Highways:	$978,922,000
Major State Highway Projects:	$354,734,944
Total Highways:	**$1,333,656,944**
Total financially constrained LRP:	**$2,120,000,334**
Projects outside of the financially constrained portion of the LRP:	
Seaview Ave Transitway	$197,400,000
Sikorsky Memorial Airport	$51,402,000
Transportation Security Actions	$152,500,000
Intelligent Transportation Systems (highways & transit)	$68,170,000
Freight Projects	$77,502,000
Unfunded rail projects	$752,000,000
Subtotal:	**$1,298,974,000**
Total:	**$3,418,974,334**

operating investments and those capital projects listed in the TIP are included from 2015 through 2018 in the "Anticipated Financial Resources" table. These obligated resources can be compared with the projects listed in GBT's capital plan through 2030, which are summarized in the next table, "Estimated Project Costs" and further detailed toward the end of this section. Federal and local funds allocated to the Bridgeport-Stamford urbanized area for the Jobs Access Reverse Commute (JARC, 5307) and New Freedoms (5310) programs from 2015 to 2016 and the funds to nonprofit and municipal providers of services to the elderly and disabled (5310E) for 2015 through 2018 are included in the "Anticipated Financial Resources" table as well. Total resources for both capital and operations costs for bus and paratransit services from 2015 to 2018 are estimated to total $98.9 million. From 2015 to 2030, GBT anticipates a need of $104.8 million for capital projects.

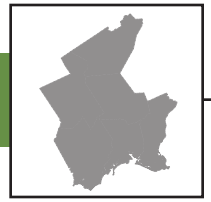
Programmed funds for rail capital projects from 2015 through 2018 and a portion of the costs for the Devon movable bridge project (programmed for 2019) have been summarized in the "Anticipated Financial Resources" table. These $529 million in funds will be dedicated to infrastructure improvements along the New Haven main line and Waterbury branch line, but will not address many of the capital improvements that have been recommended for the New Haven line, such as the total cost of the Devon bridge, an estimated $850 million. In addition, improvements for many of the region's rail stations are necessary; they are estimated to cost over $60 million. Further details of these projects and unprogrammed projects can be found later in this section.

Also excluded from the allocation of available resources are improvements to Sikorsky Memorial Airport, ferry services and Bridgeport Harbor, the implementation of Intelligent Transportation Systems and transportation security countermeasures and other unfunded project needs. These projects are well beyond the financial resources of the region. However, they are recognized in the LRP as consistent with the LRP's goals and objectives. Estimated costs for some of these projects have been included in the "Estimated Project Costs" table and are detailed later in this section.

Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost*
Regional Rail Station Projects	**Bridgeport ITC**	
	Station rehabilitation	$4,500,000
	Canopy	$2,500,000
	Traveler information systems	$4,800,000
	Fairfield	
	Lengthen platforms & install canopies	$8,000,000
	Accessible paths	$2,500,000
	Station rehabilitation	$5,500,000
	Southport (Fairfield)	
	Lengthen platforms & install canopies	$5,000,000
	Accessible paths	$2,500,000
	Station rehabilitation	$3,500,000
	Stratford	
	Lengthen platforms & install canopies	$8,000,000
	Station rehabilitation	$5,500,000
	Station parking	$7,868,000
	All GBR rail stations: security monitoring systems	$3,750,000
	Total Regional Rail:	$60,168,000

Sector	Recommended Project Description	Estimated Cost*
New Haven Line Projects **	Positive train control, including the Waterbury branch line, 2015-2018	$171,000,000
	Annual track improvement & maintenance program, 2015-2018	$145,000,000
	Catenary replacement program (2015)	$80,000,000
	Signal system replacement program, 2015-2018	$35,000,000
	Subtotal: 2015-2018:	**$431,000,000**
	Devon movable bridge replacement, 2015-2019	98,000,000
	Devon movable bridge replacement, 2019-2040***	752,000,000
	Total New Haven line (2015-2019):	**$529,000,000**
	* estimated costs are from 2011 LRP	
	** estimates reflect projects listed in the 2015-2018 TIP and 2015-2019 Capital Plan and do not include outer years	
	*** not included in financially constrained portion	



Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost**
Ferry & Harbor Projects*	Water Street Dock: Preserve & Maintain Dock, 2015-2020	$500,000
	Extend Waterfront Park, 2015-2020	$2,077,000
	Water Street Dock: Second Berth, 2015-2020	$2,300,000
	Water Street Dock: Parking Garage, 2015-2020	$16,800,000
	New Water Street Dock Access, 2015-2020	$950,000
	High Speed Ferry Infrastructure, 2015-2020	$11,125,000
	Subtotal:	**$33,752,000**
	* not included in financially constrained portion	
	** estimated costs are from 2011 LRP	

Sector	Recommended Project Description	Estimated Cost*
Programmed Transit Projects (Bus/ Paratransit)	**Greater Bridgeport Transit (2015-2018)**	$91,289,000
	Fixed route operations	$45,417,000
	Paratransit operations	$10,048,000
	Capital projects	$35,824,000
	Bridgeport-Stamford Urbanized Area	$7,619,000
	New Freedoms & JARC (2015-2016)	$3,116,000
	Accessible vans and small buses for private and municipal non-profit elderly and disabled transportaion providers (2015-2018)	$4,503,000
	Total:	**$98,908,000**
	* These estimates reflect projects listed in the 2015-2018 TIP and 2015-2019 Capital Plan and do not include outer years.	

Sector	Recommended Project Description	Estimated Cost*
Detailed Capital Projects	Coastal Corridor Enhancments,TBD	TBD
	GBT Facility Expansion and Improvements, 2015-2040	TBD
	BRT System-US Route 1, 2015-2025	TBD
	BRT System-Route 8, 2015-2025	TBD
	TOD Pilot Pilot Program, Planning Study, 2015	$443,750
	19 Hybrid-Electric Buses, 2015	$13,500,000
	Fuel Tank Replacement Project, 2015	$1,200,000
	Midlife battery replacement, 2018	$150,000
	Shelter Replacement Program, 2015-2017	$1,250,000
	Bus Stop Shelter, signs and Amenities, 2019	$150,000
Fixed Route Bus Replacements	42 Replacement Buses, 2015-2016	$24,000,000
	15 Replacement Buses, 2024	$11,800,000
	40 Replacement Buses, 2028	$35,500,000
Small Capital Vehicles	3 Supervisor/Maintenance Support Vehicle Replacement, 2020	$198,000
	4 Supervisor/Maintenance Support Vehicle Replacement, 2023	$330,000
	2 Supervisor/Maintenance Support Vehicle Replacement, 2024	$132,000
	3 Supervisor/Maintenance Support Vehicle Replacement, 2025	$217,000

Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost*
Paratransit Capital Vehicles	26 Replacement Vans, 2017	$520,000
	5 Replacement Vans, 2019	$470,000
	26 Replacement Vans, 2022	$964,000
	5 Replacement Vans, 2024	$605,000
	26 Replacement Vans, 2027	$3,432,000
	5 Replacement Vans, 2029	$700,000
Computer	Computer Hardware & Sofware, 2015	$355,185
	Computer Hardware & Sofware, 2017	$76,655
	Computer Hardware & Sofware, 2019	$298,800
Annual Capital Costs	Administrative Capital, 2015-2040	$200,000/yr
	Maintenance Capital Equipment, 2015-2029	$150,000/yr
Bridgeport ITC Bus Station, 710 Water St	710 Water Street Capital Program, 2015	$150,000
	710 Water Street Capital Program, 2017	$150,000
	710 Water Street Capital Program, 2018	$200,000
	710 Water Street Capital Program, 2020	$200,000
	Bus Terminal/Train Station Pedestrian Enhancements, 2015-TBD	$400,000
	Total:	**$104,842,390**
	* These estimates reflect projects detailed in GBT's 2015-2030 Capital Plan	

Anticipated Financial Resources (2015-2040, unless noted)	
Funding Category	**Estimated Funds**
Highway	**$1,650,329,767**
Highway System Improvements	$913,686,758
Highway System Preservation	$381,908,065
Subtotal	**$1,295,594,823**
Major State Highway Projects	$354,734,944
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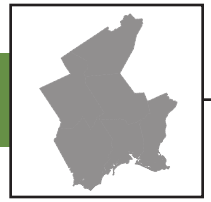


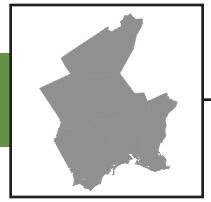
Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost, 2015*
Highway Projects	Expressway Improvement Projects	
	I-95: Operational Lanes & Lane Continuity, 2016-2040	$98,900,000
	I-95: Reconfigure Interchange 24, 2016-2025	$55,400,000
	I-95: Consolidate Interchange 31 & 32, 2016-2025	$63,200,000
	I-95: Improve/Replace Fairfield Southbound Service Plaza 2015	$Private
	Route 15: Improve Interchange 46, 2016-2025	$19,800,000
	Route 8/25: Modify Approach to I-95, 2016-2025	$14,200,000
	Route 8: Widen NB Section at Split with Route 25, 2016-2025	$23,200,000
	Route 25: Partial Interchange at Whitney Avenue, 2016-2025	$11,800,000
	Subtotal:	**$286,500,000**
Arterial Improvement Projects	US Rte 1: Provide Lane Continuity & Realign Circle at Black Rock Turnpike, 2016-2040	$38,000,000
	US Rte 1: Realign Circle at Route 130, 2016-2040	$12,200,000
	US Rte 1: Intersection Improvements at various locations, 2016-2040	$18,200,000
	Route 25: Intersection Improvements, 2015-2016	$8,000,000
	Route 25: Major Widening to 4 lanes, 2025-2040	$83,300,000
	Route 111: Minor Widening to 3 lanes to Elm Stree, 2025-2040	$10,416,000
	Route 111: Minor Widening to Fan Hill Road, 2025-2040	$7,795,000
	Route 111: Intersection Improvements at Route 110, 2025-2040	$4,225,000
	Route 130: Bridgeport Landing (Steel Pointe), 2015-2016	$10,000,000
Arterial Improvement Projects	Route 130: Reconstruction, Bridgepor, 2016-2025	$17,000,000
	SR 700: Reconstruction, Bridgeport, 2016-2025	$18,000,000
	Daniels Farm Road: Minor Widening, 2016-2025	$5,130,000
	Subtotal:	**$232,266,000**
Bridge Rehabilitation & Replacement Program	Replace Congress Street Bridge over Pequonnock River in Bridgeport, 2016-2025	$40,000,000
	Subtotal Improvements:	$558,766,000
Highway System Preservation	Route 108 intersection project, Stratford, 2016-2020	$880,000
	Barnum Avenue drainage project, Stratford, 2015-2020	$2,350,000
	West Broad Street safety improvements, Stratford, 2015-2020	$1,900,000
	Downtown Bridgeport strategic repaving project, 2015-2020	$2,700,000
	Merritt Blvd repaving project, Trumbull, 2015-2020	$1,330,000
	Implement & construct general rehabilitation projects to maintain arterial system in state-of-good repair, TBD	$101,613,000
	Replace, rehabilitate & restore various highway bridges determined to be deficient - State Bridge Project & Local Bridge Program, TBD	$25,000,000
	Replace, rehabilitate & restore various railroad bridges determined to be deficient -- State Bridge Program, TBD	$25,000,000
	Subtotal:	**$160,773,000**

Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost, 2015*
Congestion Management System Projects	Route 25: Intersection Improvement Program, 2015-2018	$7,650,000
	Route 58: Intersection Improvements, Minor Widening & Traffic Signal Revisions, 2015-2018	$6,089,000
	US Route 1: Intersection Improvements & Traffic Signal Revisions, 2015-2020	$30,390,000
	US Route 1: Fairfield Center Improvement Program, 2015-2020	$6,763,000
	Enhanced TDM Program, 2015	$4,350,000
	Personalized public transit, 2015-2040	$26,875,000
	Traffic Signal Modernization Program - Bridgeport, 2015-2018	$9,571,000
	Traffic Signal Enhancement Program - Regionwide, 2015-2040	$9,375,000
	Future Traffic Signal Replacement Program, 2015-2040	$15,625,000
	I-95: Ramp metering, 2020-2040	$39,575,000
	I-95: HOV lanes study, 2020-2025	$1,500,000
	I-95: Ramp closures study, 2020-2025	$1,500,000
	I-95: Ramp closures, 2025-2040	$TBD
	Electronic tolling & congestion pricing, 2020-2040	$TBD
	I-95: HOV lanes, 2025-2040	$TBD
	ITS elements - 2015-2040	included in ITS
	Subtotal:	**$159,263,000**
	Total Highways	**$878,802,000**
Seaview Avenue Transitway Project**	Construct new, limited access arterial from Route 130 to US Route 1, including new rail bridge, extend new arterial from US Route 1 to Lake Success Business Park & develop transitway, 2015-2020	**$197,400,000**

Sector	Recommended Project Description	Estimated Cost, 2015*
Major State Projects	I-95: Replace bridge (#00135) over the Housatonic River & Naugatuck Avenue at Stratford-Milford town line	$241,734,944
	I-95: Improve/Reconstruct Interchange 33 - 2016-2025	$22,000,000
	Route 34: Replace bridge (#01843) carrying Route 34 over the Stevenson Dam & relocate upstream	$91,000,000
	Hartford, Interchange 29 on I-91	TBD
	Waterbury TIGER project	TBD
	Waterbury Rt 69 improvements	TBD
	Subtotal:	**$354,734,944**
Intelligent Transportation Systems Projects (highways & transit)	GBTA Advanced Communications System--CAD/AVL, TBD	$9,375,000
	Active Real Time Information System for Transit, TBD	$4,800,000
	Archived Data Management System, TBD	$3,750,000
	Enhanced Corridor & Highway Operations (ECHO), 2015-2018 (TIP)	$37,325,000
	Parking Routing & Event System for Traffic Operations, TBD	$5,670,000
	Regional Electronic Transit Fare Integration System, TBD	$3,500,000
	Transportation Emergency & Personal Security, TBD	$3,750,000
	Total:	**$68,170,000**
	* most cost estimates are from 2011 LRP	
	** not included in financially constrained portion	



Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost*
Freight Projects	Construct modest infrastructure improvements: Freight Corridors, 2015-2040	$15,000,000
	Construct landside infrastructure improvements: Short-sea container barge operation, 2015-2040	$7,500,000
	Long-term freight infrastructure investments, 2015-2040	Included Above
	Dedicated truck-only HOT lane, 2025-2040**	$22,560,000
	Freight fleet management ITS actions, 2015-2040	$TBD
	Maintenance dredging: Bridgeport Harbor, 2015-2040**	$54,942,000
	Rail freight enhancements (TBD), 2015-2040	$TBD
	Air freight enhancements (TBD), 2012-2040	$TBD
		$22,500,000
* most cost estimates are from 2011 LRP		
**not included in financially constrained portion		

Sector	Recommended Project Description	Estimated Cost*
Non-motorized Transportation	On-going regional bicycle-pedestrian planning (funded through GBRC planning funds), 2015-2040	$PL
	Develop regionwide bicycle route network - 2015-2025	$8,628,000
	Construct PRT extensions, 2015-2020	$6,374,000
	Construct PRT Route 111 crossing, 2015-2018	$2,500,000
	Construct final sections of PRT (Bridgeport), 2015-2020	$1,850,000

Sector	Recommended Project Description	Estimated Cost*
Non-motorized Transportation	Construct final sections of PRT (Monroe), 2015-2020	$300,000
	Construct final sections of PRT (Trumbull), 2015-2020	$6,794,000
	Construct Housatonic River Greenway, 2015-2020	$7,463,000
	Construct Merritt Parkway Greenway, 2020-2040	$11,958,000
	Short-term Pedestrian Enhancement Program, 2015-2018	$3,699,000
	Long-term Pedestrian Enhancement Program, 2016-2020	$10,754,000
	Pedestrian bridge/walkway project, Bridgeport, 2017-2020	$2,600,000
	Safe Routes to School Programs - 2015-2040	$5,200,000
	Downtown (Bridgeport) Urban Enhancements, 2015-2018	$9,500,000
	Complete Streets Programs, 2015-2040	$Variable
	Traffic Calming Programs, 2015-2040	$Variable
	Total Non-Motorized Transportation Programs:	$77,620,000
	* most cost estimates are from 2011 LRP	

Estimated Project and Program Costs

Sector	Recommended Project Description	Estimated Cost**
Aviation*	Realign Route 113 & improvements to runway 6/24 (safety & rehabilitate pavement structure), 2015-2016	$14,200,000
	Construct runway safety area improvements and rehabilitate pavement structure for runway 11/29, TBD	$13,000,000
	Construct various taxiway and runup apron improvements, TBD	$5,827,000
	Construct new ramp areas, TBD	$8,927,000
	Construct new hangars, TBD	$8,088,000
	Purchase various capital equipment, TBD	$1,360,000
	Total Aviation Services:	**$51,402,000**
*not included in financially constrained portion		
**most cost estimates are from 2011 LRP		

Appendix 1: Regional Transportation Plan for the Valley Planning Region

Please see attachment for the Regional Tranportation Plan for the Valley Planning Region: 2015-2040