

CONNECTICUT

STATE RAIL PLAN

2012-2016



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CONNECTICUT STATE RAIL PLAN

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State of Connecticut Department of Transportation



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EXECUTIVE SUMMARY

The Connecticut State Rail Plan 2012-2016 (SRP) is produced in compliance with the guidelines of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Public Law 110-432. The SRP contains the Connecticut Department of Transportation's (Department) mission, vision, and values for rail transportation in Connecticut.

The vision for rail transportation in Connecticut is a system that provides high-speed, intercity, regional commuter and freight services that will be a catalyst for smart growth, encourage greater mobility, promote the state and regional competitive advantage in the global economy, decrease highway and aviation congestion, reduce energy use, and improve air quality. Connecticut is a state situated in a critical part of the northeast transportation network, in a region dealing with congestion on the existing transportation network. The volume to capacity ratio of highways is projected to grow at a faster pace than the rate at which the state can fund and add lane-miles to the highways. Rail offers a safer, greener, and healthier alternative to highway travel, one that requires 35 percent less energy per passenger-mile and generates corresponding lower levels of Greenhouse Gas (GHG) emissions.

The SRP provides an overview and inventory of the commuter, intercity, and freight rail system and facilities in Connecticut, the services provided, and the asset condition and constraints. It aims to support Connecticut's role in developing a growing, interconnected rail system with adjoining states, and with the New York and Boston metropolitan centers. Intermodal connections to maritime, air, bus transit, and highway modes as well as improved transit and bike/pedestrian links are important elements of an efficient and effective rail transportation system. It recognizes the significant extent to which information and eases of access and use impact the productivity of the entire transportation system.

The SRP presents strategies and programs aimed first at ensuring that the existing passenger and freight rail infrastructure is maintained in a state of good repair. It is critical that existing assets be sustained through a regular maintenance and replacement program to ensure safe, fast, reliable and efficient passenger and freight services. This fundamental set of investments represents a significant challenge given the extensive and very old rail assets owned by both the state of Connecticut and by private freight operators.

Another tier of investments is aimed at maximizing the potential of current rail services. The New Haven Line (NHL) is a top priority given the importance of connecting our state's economy with New York City and the Northeast Corridor (NEC). Key strategic investments in the NHL are focused on increasing speed and capacity as well as expanding parking and access to the passenger rail network. The second priority is upgrading existing branch lines and Shore Line East (SLE) services with a focus on areas that will leverage the most employment growth and economic development through transit-oriented development (TOD). Significant opportunities exist to increase rail market and encourage smart and needed economic growth on these lines. These existing lines are assets that can be expanded very cost-effectively in already established rail corridors, and are critical to the near-term economic and mobility vitality of the state.

At a regional scale, Connecticut is central to a partnership among all northeast states to advance high-speed, intercity and freight investments, focusing on the Springfield Line rail corridor. Investments in Connecticut on this line will lay the foundation for a significantly expanded and improved intercity passenger rail system that will return passenger rail to the

interior of New England, providing the citizens of the region with a travel choice that it has not had for decades. This will also provide much-needed employment for a region that has lost manufacturing jobs in recent years. The service development plan for the entire region envisions restoring the Springfield Line to a full double-track configuration, an investment that can support high service frequency; add capacity and simultaneously improve maximum authorized speeds to 110 mph. This corridor can achieve this in an existing right-of-way, saving the need for massive and time-consuming investment in new earthworks and infrastructure as well as avoiding potentially challenging environmental mitigation measures. The resulting line improvements will prepare it for both the expansion of intercity service and the introduction of commuter service. It will improve the reliability and trip times for *Vermont*er service supported by Vermont, which connects St. Albans and Burlington with New York, Philadelphia, and Washington, DC, and is itself the beneficiary of millions of dollars in grant awards for improvements north of Springfield. Finally, it will ready the Springfield Line to accommodate reintroduction of new “Inland Route” corridor services to Boston via Worcester, Massachusetts.

Connecticut is also the owner of the NHL, a critical link along the NEC between Washington, D.C., and Boston. Consistent with the commitment to high-speed, intercity services, Connecticut has collaborated with all the NEC states in requesting planning funds from the Federal Railroad Administration (FRA) to initiate a multi-state planning project for the future of the NEC.

There are ten freight railroad companies operating in Connecticut. Encouraging and supporting approaches that maximize the amount of freight that moves by rail while minimizing tonnage moving over state highways will help reduce wear on the state’s road system and help reduce the growing cost of maintaining the state’s road system. This plan outlines a series of investments the freight railroads provided to the Department that would bring the freight system to a state of good repair. The current standards must be addressed to allow modern freight cars to utilize the network in key corridors to expand the reach of the national rail freight network.

The SRP outlines a Long-Range Service and Investment Program that will provide federal, state, and local policy makers, planning agencies, other stakeholders, and interested parties strategies and steps for maintaining and expanding the passenger and freight system in Connecticut, utilizing a twenty-year planning horizon (2012-2032). The Department will produce the SRP at intervals of five years or less and may amend or update it as conditions change or strategies become further developed.

The draft final SRP reflects input received from stakeholders in the rail system during numerous collaborative meetings with these stakeholders. The Department conducted an additional round of meetings with stakeholders to obtain comments on this draft final SRP. By statute, the General Assembly is required to review the draft SRP. The Department will present a final SRP after those reviews are complete for approval of the Secretary of the United States Department of Transportation.

CHAPTER 1 – STATE RAIL VISION, GOALS, AND OBJECTIVES

The SRP is a long-range planning document with a regional context developed in accordance with the mission of the Department. The SRP outlines the state's passenger rail service objectives in relation to several important federal and state transportation planning mandates, and the state's guiding transportation principles, strategies, and overall transportation goals. The Department developed these objectives in coordination with stakeholders, and gave the public notice and opportunity to provide input and comment throughout the process of developing this plan.

1.1 MISSION STATEMENT, VISION, AND VALUES

OUR MISSION:

The mission of the Connecticut Department of Transportation is to provide a safe and efficient intermodal transportation network that improves the quality of life and promotes economic vitality for the state and the region.

OUR VISION:

The vision of the Department of Transportation is to lead, inspire, and motivate a progressive, responsive team, striving to exceed customer expectations.

OUR VALUES:

- **Measurable Results:** We will endeavor to utilize the latest technology and preserve the integrity of our current assets to provide a safe, efficient, integrated, multimodal, transportation system that offers options for mobility.
- **Customer Service:** We are committed to consulting with our internal and external stakeholders in an open and transparent decision-making process; and to being responsive by providing timely information on services and programs.
- **Quality of Life:** We will strive to maintain and enhance the quality of life in the state and the region by maintaining the character of our communities, supporting responsible growth, and by enhancing and being sensitive to the environment.
- **Accountability & Integrity:** We will prudently manage and invest the human and financial resources entrusted to the Department using sound criteria and efficient, cost-effective methods that put safety and preservation first.
- **Excellence:** We will demand excellence in all we do to fulfill our mission by being solution-oriented and focused on project delivery. We will continuously re-evaluate our mission, values, performance, and priorities to ensure that the Department and its employees are innovative and responsive to changing needs.

Vision of Rail Transportation in Connecticut and in the Northeast

Connecticut is located in the middle of the northeast region stretching beyond New England and strategically located within the NEC. The economic health of the state will depend upon the ability of the Northeast region to grow as part of an interconnected region. This will require planning, formulation, and development of new interconnected and more comprehensive rail services through regional collaboration.

Expansion of mobility options to the extent a given system segment can deliver high quality frequent rail service is a highly desirable goal for the state and the region. The Department shall continue to collaborate with rail stakeholders to promote aggressive growth of existing rail corridors to expand service, and to develop new rail corridors to improve the quality of life through the movement of people and goods that is consistent with the state-designated growth plan.

Regional collaboration, cooperation, and development are essential to link major urban centers. Local, state, regional, and federal partnerships are essential to building a regional network that will drive regional mobility improvements. Within the region, the goal is to double intercity and commuter ridership region-wide by year 2030.¹ To achieve this ambitious goal, states in the region are engaged actively as partners in a regional working group that is undertaking a system-wide capacity analysis.

1.2 GOALS AND OBJECTIVES FOR RAIL SERVICE IN CONNECTICUT

The Department's goals are consistent with its mission statement and values:

Passenger Rail / Passenger Intermodal Connections

- Exceed customer expectations and provide a high quality, safe, and secure rail system;
- Achieve and sustain a state-of-good repair on the current rail system;
- Double intercity and commuter ridership region-wide by 2030;
- Provide frequent and convenient passenger rail service, connecting cities across the state as an energy and timesaving alternative to driving or flying;
- Increase system capacity;
- Reduce public expenditures due to improved transportation efficiency and infrastructure preservation;
- Reduce travel time and achieve on-time performance of at least 95 percent for all passenger rail services through equipment and capital investments;
- Improve rail system reliability and increase competitive travel and shipment options;
- Provide seamless passenger trip planning and service information among all modes;
- Provide programs and services that increase mobility of people or goods, increase freight rail usage, and enhance trade and economic development;
- Improve the utility of the rail transportation system through communications and access to increase ease-of-use in connection with other modes; and
- Integrate transport system networks to maximize the achievement of energy, environmental, and climate change mandates.

¹ Coalition of Northeastern Governors, The Northeast Corridor Network: The Corridor of the Future
A Governors' Vision for Rail in the Northeast - http://www.coneg.org/programs/policies/2008-02-23-NEC_Rail_Vision.pdf

Freight Rail / Freight Intermodal Connections

- Increase freight rail usage by 20 percent to reduce truck traffic and energy consumption;
- Promote port connectivity by removing existing obstacles and through capital infrastructure improvements;
- Explore alternative freight corridor options; and
- Identify public funding resources.

System *objectives* that support these goals are:Passenger Rail / Passenger Intermodal Connections

- Invest in projects such as the New Haven Rail Yard and the M8 rail cars to support increased system capacity needs;
- Improve and construct new stations and parking facilities to support service expansion and allow for increased ridership;
- Consolidate parking management at the stations;
- Expand and/or extend service on existing passenger rail corridors;
- Study the feasibility and cost of implementing new commuter rail service where viable on existing corridors that do not currently provide passenger service;
- Investigate new bus way, light rail, and trolley systems to integrate with rail stations;
- Support bus service expansion and improve integration with passenger rail stations and terminals;
- Create a unified new branding, information, and marketing message;
- Invest in technology for real time information and communication;
- Pursue federal funding in collaboration with Amtrak to allow for investments in the Springfield Line to improve intercity and freight service and initiate a New Haven-Hartford-Springfield (NHHS) commuter rail service;
- Provide efficient and effective connections to Bradley International Airport from the NHHS service;
- Construct intermodal connections and facilities integrating the New Britain-Hartford Busway with NHHS service;
- Collaborate with adjacent states and produce a development plan to introduce regional high-speed rail service;
- Continue dialogue with Rhode Island to facilitate SLE service to meet or overlap with the MBTA in Rhode Island;
- Collaborate with municipalities and businesses to invest in areas that will leverage the most employment growth and economic development through TOD;
- Introduce service delivery models for rail and bus;
- Study new generation rail and bus vehicles; and
- Promote the use of bicycles and alternative means of transportation to connect to rail stations.

Freight Rail / Freight Intermodal Connections

- Develop a strategic plan for rail freight movements;
- Form partnerships with Class 1 railroads and short haul operators;
- Partner with northeast states to develop a vision for rail freight;
- Support a rail freight investment program;
- Continue to support improvements at public Highway/Rail Grade Crossings to maintain safe conditions;

- Develop a new Connecticut Railroad Bridges Management Program to evaluate bridges' routes to determine the feasibility of loading rail cars to the 286,000 pound full potential in Connecticut to promote economic growth, reduce fuel use, and reduce truck traffic on the state's highway system.
- Support efforts to increase clearances to 19' 6 " or above on rail lines not encumbered by overhead catenary wire to permit the movement of larger cars in Connecticut that would allow a railroad with the ability to increase service or capture additional markets; and
- Revitalize intermodal facilities/and inland ports in the state to serve the rapidly growing container segment of rail traffic that will help remove long-haul trucks from highways and deliver products to consumers faster.

The Department's strategies as means to achieve its stated goals and objectives for the rail system in Connecticut are translated into projects contained in the Long-Range Investment Plan in Chapter 11 and Appendix A and B.

CHAPTER 2 – FEDERAL AND STATE MANDATES

Connecticut recognizes that national transportation policy ultimately guides and strongly influences the success of state rail policy. This State Rail Plan (SRP) was developed to comply with the structure, organization, and contents specified by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Public Law No. 110-432 which was enacted in 2008.

State legislation requires the SRP to be reviewed by the Connecticut General Assembly's Transportation and Finance, Revenue and Bonding committees before the Connecticut Department of Transportation (Department) submits it to the federal government as required under federal law. The Department must submit the plan to these committees at least 60 days before submitting it to the federal government. In doing so, the Department must describe the process it used to prepare the plan, the people and entities it consulted, any recommendations it received from municipalities and regional planning organizations regarding the plan, and how it responded to these recommendations. The committees must hold a joint hearing on the plan within 30 days after receiving it and, within 14 days after the hearing, they must advise the Department about any suggested modifications to the plan.²

The Department developed the SRP in coordination with the State's long-range transportation plan³ (LRP) and the Department's Master Transportation Plan⁴ (MTP) and the SRP complements its content. As such, the SRP shall not conflict with either plan, but represents an addition to those plans in both its policies for growth, and the strategies recommended achieving the growth goals. Cross-referencing of all state transportation plans will continue in an iterative fashion.

During the development of the State's LRP published in June 2009, the Department solicited and considered public and agency input on transportation issues, concerns, and needs. The public input received in developing the 2009 LRP is reflected in the SRP in that the SRP presents and builds on the rail-related strategies and actions identified in the 2009 LRP.

The Department developed the SRP to be consistent with the Department's Strategic Five-Point Action Plan that is contained in Chapter 11 of the SRP that identifies major areas for prioritizing and emphasizing investments for all modes of transportation. The points were determined after careful consideration of available resources, and federal and state mandates and initiatives.

Each plan is based upon planning at and in collaboration with the State's Regional Planning Agencies and Metropolitan Planning Organizations. Strategies contained in the SRP shall be aligned in the next iteration and/or amendment of the LRP, the MTP, and other system condition, performance metrics, and trends plans that are in its development cycle.

² September Special Session, Public Act No. 09-2, Section 65

³ <http://www.ct.gov/dot/cwp/view.asp?A=1383&Q=431792>

⁴ <http://www.ct.gov/dot/cwp/view.asp?a=3529&q=430714>

2.1 FEDERAL LEGISLATION AND PLANNING REQUIREMENTS

Federal Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Public Law 110-432
The SRP is presented to assist in the formation of principled, purposeful, and strategic national transportation and rail policy. PRIIA tasks states with establishing or designating a state rail transportation authority that will develop statewide rail plans to set policy involving freight and passenger rail transportation within its boundaries, establish priorities and implementation strategies to enhance rail service in the public interest, and serve as the basis for federal and state rail investments within the state [§303]. State rail plans are to address a broad spectrum of issues and include an inventory of the existing rail transportation system, rail services, and facilities within the state. It must also include an explanation of the state's passenger rail service objectives, an analysis of rail's transportation, economic, and environmental impacts in the state, and a long-range investment program for current and future freight and passenger infrastructure in the state. The plans are to be coordinated with other state transportation planning programs and clarify long-term service and investment needs and requirements. The United States Department of Transportation is to establish minimum standards for the preparation and periodic revision of state rail plans.⁵

Statewide Long-Range Transportation Plan (LRP)

Section 450.214 of the Code of Federal Regulations (CFR) requires each state to develop transportation plans and programs for all areas of the state to carry out a transportation planning process that provides for consideration of projects and strategies that will:

- Emphasize the preservation of the existing transportation system;
- Promote efficient system management and operation;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Enhance transportation security for motorized and non-motorized users;
- Protect and enhance the environment, promote energy conservation, and improve the quality of life;
- Increase the accessibility and mobility options available to people and for freight;
- Enhance the integration and connectivity of the transportation system across and between modes throughout the state, for people and freight; and
- Support the economic vitality of the United States, the states, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.

The Department addresses the aforementioned factors in the State of Connecticut's federally mandated statewide LRP that is prepared and updated pursuant to CFR Section 450.214 that implements Section 135 of Title 23 of the United States Code. This intermodal plan, which must cover at least a 20-year time horizon, outlines the state of Connecticut's transportation policy and serves as a framework for future, more project-specific transportation plans such as the Department's Master Transportation Plan and the State Transportation Improvement Program. The Department updates the LRP every three to five years. The current statewide LRP entitled, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, outlines the Department's transportation policies, which include a five-point strategic investment plan for prioritizing and meeting the state's goals and identifies general strategies and actions for achieving them.

⁵ Federal Railroad Administration, Overview, Highlights and Summary of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (Public Law No. 110-432, Division B, enacted Oct. 16, 2008, Amtrak/High-Speed Rail, Prepared March 10, 2009.

Integration with Statewide Transportation Improvement Programs (STIP)

The investment program incorporated in this SRP includes both the currently funded projects supported by the planning regions for transportation system maintenance, safety, and improvement, as well as unfunded projects that may not have received regional or state review. Projects to implement unfunded strategies are the key elements of focus with respect to increasing the capacity of the rail system to accommodate increased rail ridership and freight tonnage. As part of this plan, the Department presented these strategies to the regions for support and acceptance into the future funding-eligible projects listing. The PRIIA specifies the necessity of identifying those projects in the STIP so that if funding becomes available through PRIIA, they may be considered eligible for federal funding.

The Department has advanced some funding, with the STIP requirement removed, to distribute federal Stimulus funding.

2.2 STATE LEGISLATION AND PLANNING REQUIREMENTS**Department's Statutory Responsibility**

Section 13b-3 of the Connecticut General Statutes states that the Department "shall be responsible for all aspects of the planning, development, maintenance, and improvement of transportation in the state." The Department has responsibilities pertaining to airports, highways, highway safety, bus systems, rail systems, port operations, ferries, and facilities for bicyclists and pedestrians.

Master Transportation Plan (MTP)

Section 13b-15 of the Connecticut General Statutes requires the Commissioner of the Department to publish a MTP. The purpose of the MTP is to provide the Governor, the Connecticut General Assembly, local elected officials, and other interested parties with an understanding of the projects and programs that the Department is proposing to undertake. The Department updates this document and submits it to the Governor on or before January 31 of each odd-numbered year.

State Conservation and Development Policies Plan (C & D Plan)

The State of Connecticut's Office of Policy and Management (OPM) developed the Conservation and Development Policies Plan (C & D Plan) in accordance with Section 16a-24 through 33 of the Connecticut General Statutes (CGS) as shown in Figure 1, 4 and 5.⁶ It serves as a statement of the development, resource management, and public investment policies for the state. OPM updates the plan every five years and submits it to the Connecticut General Assembly for review and adoption.

Section 16a-31 of the CGS requires state agencies in Connecticut to consider the C & D Plan when it prepares agency plans. In addition, agency-prepared plans, when required by state or federal law, must be submitted to the OPM for a review of conformity with the State's C & D Plan.

In Connecticut, state agencies must implement its plans and actions in a manner consistent with the following growth management principles set forth in the C & D Plan.

⁶ http://www.ct.gov/opm/cwp/view.asp?a=2990&q=383182&opmNav_GID=1807

GROWTH MANAGEMENT PRINCIPALS IN CONSERVATION & DEVELOPMENT POLICIES PLAN⁷

1. Redevelop and revitalize regional centers and areas with existing or currently planned physical infrastructure
2. Expand housing opportunities and design choices to accommodate a variety of household types and needs
3. Concentrate development around transportation nodes and along major transportation corridors to support the viability of transportation options
4. Conserve and restore the natural environment, cultural and historical resources, and traditional rural lands
5. Protect and ensure the integrity of environmental assets critical to public health and safety
6. Promote integrated planning across all levels of government to address issues on a statewide, regional and local basis

Figure 1. Growth Management Principles in Conservation & Development Policies Plan**DEVELOPMENT AREA POLICIES⁸**

- 1 **Regional Centers**—Redevelop and revitalize the economic, social, and physical environment of the state's traditional centers of industry and commerce.
- 2 **Neighborhood Conservation Areas**—Promote infill development in areas that are at least 80 percent built up and have existing water, sewer, and transportation infrastructure to support such development.
- 3 **Growth Areas**—Support staged urban-scale expansion in areas suitable for long-term economic growth that are currently less than 80 percent built up, but have existing or planned infrastructure to support future growth in the region.
- 4 **Rural Community Centers**—Promote concentration of mixed-use development such as municipal facilities, employment, shopping, and residential uses within a village center setting.

Figure 2. Development Area Policies (In order of priority)**CONSERVATION AREA POLICIES⁹**

Existing Preserved Open Space—Support the permanent protection of public and quasi-public land dedicated for open space purposes.

Preservation Areas—Protect significant resource, heritage, recreation, and hazard-prone areas by avoiding structural development, except as directly consistent with the preservation value.

Conservation Areas—Plan for the long-term management of lands that contribute to the state's need for food, water and other resources and environmental quality by ensuring that any changes in use are compatible with the identified conservation value.

Rural Lands—Protect the rural character of these areas by avoiding development forms and intensities that exceed on-site carrying capacity for water supply and sewage disposal, except where necessary to resolve localized public health concerns.

Figure 3. Conservation Area Policies (In order of priority)

⁷ Source: Office of Policy & Management, *Conservation and Development Policies Plan for Connecticut, 2005-2010*. Published in Connecticut Department of Transportation, *Transportation in Connecticut: The Transportation Planning Process – Federal and State Requirements*, November 2006.

⁸ Id.

⁹ Id.

State agencies must be consistent with the C & D plan when undertaking the following actions:

- The acquisition of real property when the acquisition costs are in excess of \$200,000;
- The development or improvement of real property when the development costs are in excess of \$200,000;
- The acquisition of public transportation equipment or facilities when the acquisition costs are in excess of \$200,000; and
- The authorization of any state grant for an amount in excess of \$200,000 for the acquisition, development, or improvement of real property or for the acquisition of public transportation equipment or facilities.

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CHAPTER 3 – DESCRIPTION OF RAIL SYSTEM IN CONNECTICUT

The Connecticut SRP provides an overview of the role of rail transportation within the state's surface transportation system, a general overview of the system, and a history of Connecticut railroads.

Role of Rail Transportation within Connecticut's Surface Transportation System

The Connecticut transportation system infrastructure includes a broad array of multimodal elements that are both publicly and privately owned and operated. The transportation system consists of pedestrian and bicycle facilities, local roadway and highway facilities, private and public transit systems, freight and passenger railways, seaports, and airports. This system is interconnected with the national transportation system and economy, and provides for efficiency in freight and personal mobility.

Connecticut enjoys a significant rail freight and passenger system that is strategically located between the major northeastern urban centers of New York City and Boston. On an annual basis, the rail system moves 3.6 million gross tons of freight over 10 freight railroads that operate in the state, 3.5 million intercity rail passengers over the NEC lines owned and operated by Amtrak, and 20 million commuter rail passengers over the NHL and SLE services.

In addition to the benefits of being in a strategic location, Connecticut has rich resources that place it in the forefront of the national economy in science and technology, aviation manufacturing, and financial services. Key to the state's competitiveness in the global economy is stewardship and development of a transportation network that can keep pace and maintain a competitive edge in an attractive business environment, quality of life, living standards and services, and mobility options. Government has an important responsibility to maintain and invest in the transportation network to keep Connecticut moving forward with a vital and modern rail transportation system that can sustain and support growth.

The role of the railroads in the state represents an essential opportunity for people and goods movement that is strategically connected to other modes. Improving the productivity of the rail transportation network is essential to the competitive advantage of Connecticut and the region of which it is a part.

3.1 GENERAL OVERVIEW OF THE RAIL SYSTEM

Connecticut is served by a number of railroads, both passenger and freight as shown in Figure 4. The Connecticut rail system consists of 628.5 miles of active rail segments that private rail carriers, Amtrak, and the state of Connecticut chiefly own and operated. The passenger rail network in Connecticut consists of commuter and intercity passenger rail. The commuter rail services consist of the NHL and SLE services. The Department owns these services, Metro-North Railroad (MNR), and Amtrak, respectively, operate them under contract with the Department. Amtrak operates intercity passenger rail service in Connecticut. There are numerous freight railroads, ranging from a large Class 1 railroad to shorter regional and local railroads. Valley Railroad and Naugatuck Railroad provide excursion passenger service oriented to serve the tourist.

CONNECTICUT STATE RAIL PLAN

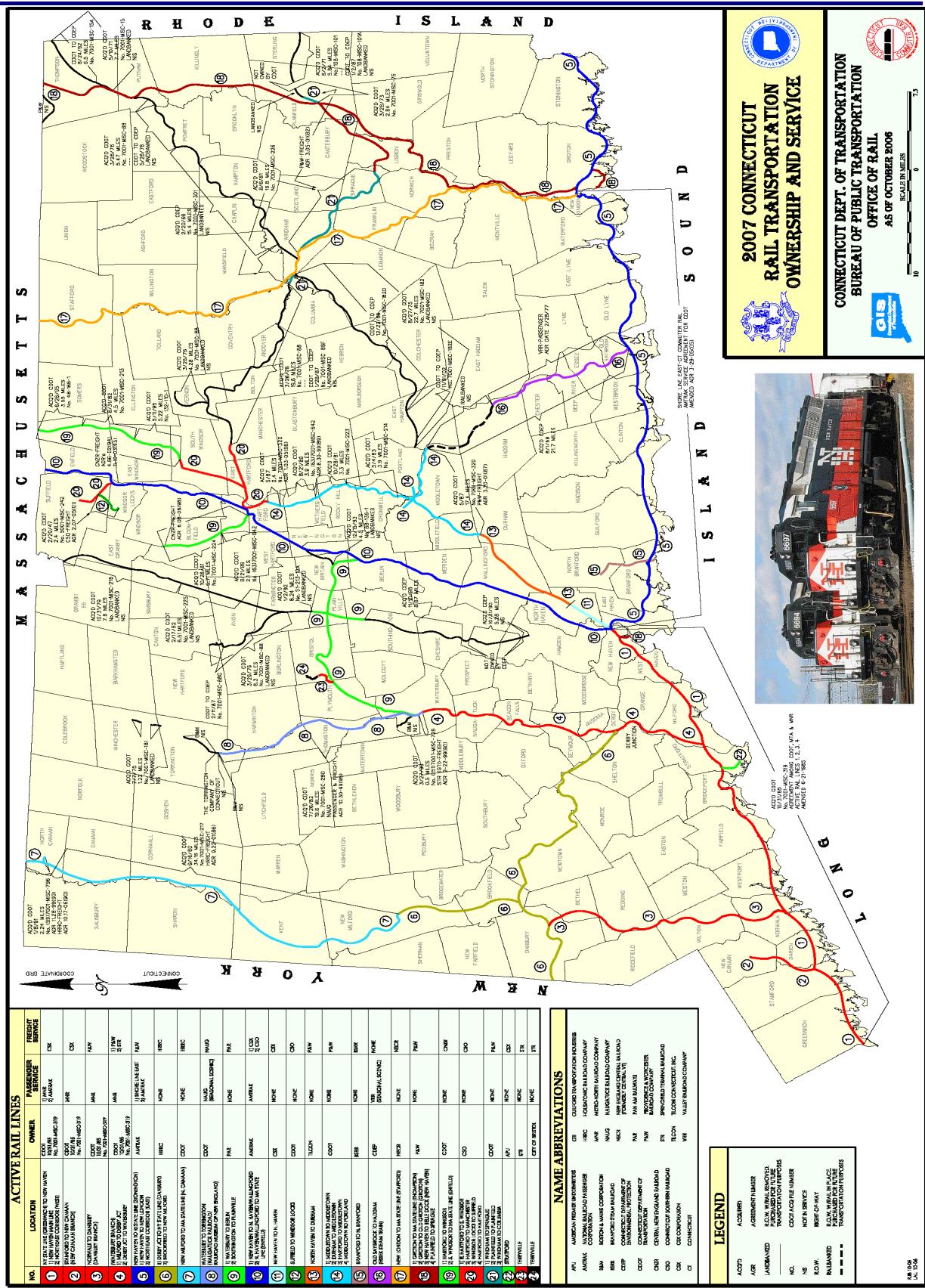


Figure 4. Connecticut Rail Ownership and Service Map

3.2 HISTORY OF CONNECTICUT RAILROADS - SUMMARY¹⁰

Penn Central Files for Bankruptcy - The Department Saves Commuter Rail

In the late 1960s, with decreasing revenues and increasing costs, Penn Central Transportation Company was unable to operate profitably. The railroad was caught in a downward spiral affecting all of its services -- commuter rail, intercity passenger rail, and freight rail.

Aware of the railroad's dim financial prospects and decreasing levels of service, the Connecticut General Assembly in 1969 enacted the Connecticut-New York Railroad Passenger Compact to ensure continuation of the essential NHL commuter rail service. This compact authorized the Connecticut Transportation Authority (that year absorbed into the new Connecticut Department of Transportation), individually or in cooperation with the Metropolitan Transportation Authority (MTA) of New York, to acquire railroad assets, repair and rehabilitate assets, operate a rail service, or contract that service out for operation.

In 1970, when Penn Central filed for bankruptcy, the Department and the Metropolitan Transit Authority (MTA) of New York entered into agreements to operate the service with the trustees of the now bankrupt Penn Central. By October 1970, four agreements were executed providing the framework for the preservation and improvement of the commuter rail service, effective January 1, 1971. Highlights of the agreements included provisions for the Department to lease, with an option to buy, all Connecticut rights-of-way leading to New Haven, New Canaan, Danbury and Waterbury, for a term of 60 years; for the Department and the MTA to share operating deficits on an equal share basis and for both entities to set schedules, fares and standards; and for the Department and MTA to jointly purchase and rehabilitate 97 of Penn Central's existing electric cars, and to purchase 144 new cars.

The 1970 agreements established a commitment to a number of infrastructure improvement projects on the NHL. Improvements have included conversion of the electric traction power system from the unreliable, antiquated Cos Cob Power Plant to the more reliable commercial power source; signal system replacement; programmed bridge rehabilitation and replacement; roadbed rehabilitation; rehabilitation and purchase of rolling stock; and construction of maintenance facilities as needed.

On April 1, 1976, almost two months after the enactment of the Railroad Revitalization and Regulatory Reform Act (4R Act), the Consolidated Rail Corporation (Conrail) became an active railroad, taking over the profitable assets of Penn Central and other bankrupt railroads. Since the 4R Act preserved terms of the 1970 NHL agreements, Conrail was required to replace the Trustees of Penn Central as the operator of the NHL commuter rail service.

The Department's involvement with the NHL intensified in 1981 when Congress passed the Northeast Rail Services Act. The act relieved Conrail of its obligation to operate commuter rail service. The Department and the MTA of New York immediately stepped in, electing to take over commuter rail operations themselves. The MTA created the MNR to operate two commuter lines within New York State for the MTA and to operate the NHL in Connecticut and New York for the Connecticut Department of Transportation-MTA partnership. MNR assumed operations on January 1, 1983.

¹⁰ Source: Connecticut Department of Transportation, <http://www.ct.gov/dot/cwp/view.asp?A=1380&Q=259706>

Amtrak and Conrail

To maintain the unprofitable intercity passenger service around the country, Congress passed the Railroad Passenger Service Act of October 30, 1970, which established the National Railroad Passenger Corporation (Amtrak), to run the service. Intercity service on Amtrak's NEC running through Connecticut connects Boston and New York City and Washington, D.C. via the Connecticut shoreline route and connects Springfield, Massachusetts, to New York City on the Inland Route through Hartford. Amtrak's intercity operations continue to run at the expense of the federal government, with no subsidies from Connecticut or the Department.

The decline of Penn Central was not an isolated case in the railroad industry. Other railroads were also failing. The bankruptcy of the Penn Central and six other railroads in the northeast and Midwest regions of the United States prompted Congress to pass a series of acts to prevent the complete collapse of rail freight service in the region.

The Regional Rail Reorganization Act of 1973 (3R Act) established the United States Railway Association (USRA) to plan the formation and structure of a new railroad, Conrail, using the assets of the bankrupt railroads. Congress created Conrail as a private, for-profit corporation that the federal government (85 percent) and rail employees (15 percent) initially owned. The USRA's Final System Plan for Conrail was to include only the profitable freight lines of the bankrupt railroads.

The 3R Act also established the Local Rail Service Assistance (LRSA) Program to assist financially the states in the northeast and Midwest regions to preserve rail freight services on light density lines, which were excluded from the Conrail system but were considered by the states to be essential for its economies. The LRSA Program, which was administered by the FRA (within the U.S. DOT), provided funds for both operating subsidies and capital improvement projects for the excluded lines. The Department initially utilized LRSA funds to rehabilitate four light density lines and subsidize its operations to ensure, at least temporarily, continued service.

The 4R Act of 1976 expanded the LRSA Program from a northeast and Midwest program to a national program, since there were freight railroads failing in other parts of the nation. In 1978, Congress amended the program's project eligibility criteria to include capital assistance for marginally profitable lines before (rather than after) abandonment. Effective September 30, 1980, use of LRSA funds for freight operating subsidies was excluded. In addition to applying what LRSA funds were available toward rehabilitation programs, the Department used such funds to acquire various active and inactive rail rights-of-way.

As the 1970s ended, there were indications federal LRSA funding would continue to diminish and possibly be eliminated. The Department took action to continue its support of the rail freight industry serving Connecticut. To further its rail preservation and improvement goals, the Department used state funds to augment the diminishing federal funds. The evolving capital assistance program for freight railroads provided 70 percent of the cost of projects approved by the Department from state or state-federal sources and 30 percent from the participating railroads.

The Connecticut General Assembly indicated its continued support for the preservation and improvement of rail freight service. With the support of the Department, the General Assembly in 1978 amended the Railroad Tax Exemption statutes (originally enacted in 1961 for the New Haven Railroad). These amendments made all railroads serving Connecticut eligible to

participate in the Program, focused the eligible tax exemption projects on physical plant improvements, and transferred the rail regulatory authority to the Department. Under this revised Tax Exemption Program, if a railroad expends an amount of money equal to its railroad gross receipts tax liability on capital projects approved by the Department, the Department would approve a tax exemption. The logic of this major change in the statutes was that allowing Connecticut's railroads to make investments in improving its plant would improve the service provided to Connecticut rail users and improve the survivability of the railroads, which would be more beneficial to the state in the long run than receiving the tax revenue.

Despite Congressional actions and billions of federal dollars, Conrail was unable to achieve financial success. Like Conrail, other major U.S. railroads were unable to operate efficiently and profitably within the restrictive and time-consuming regulations of the Interstate Commerce Commission. In 1980, Congress enacted the landmark Staggers Act, which essentially deregulated the freight railroad industry for the first time in almost 75 years, since the 1906 Hepburn Act. Deregulation meant that, with few exceptions, railroads could charge whatever rates the competitive transportation environment would allow. In those cases where shippers were adaptive to the railroads, rates were somewhat constrained but fully covered operational costs and provided a reasonable profit. Within the year and during the years that followed, Conrail, like the rest of the railroad industry, made significant financial gains. Conrail's financial success after the Staggers Act was also influenced by the Northeast Rail Services Act of 1981, which relieved Conrail of its obligation to operate various commuter rail services, including the NHL. The act also set in motion the process to determine whether the 85 percent federal ownership of Conrail could be or should be sold, and if so, how and to whom.

Beginning in the 1970's, the Department developed a policy of acquiring abandoned rail lines to preserve them for future transportation use. This policy continues today when a rail right-of-way that exhibits potential as a future transportation corridor is abandoned or offered for sale. Some 60 miles of the abandoned rail lines acquired by the Department have subsequently been transferred to the CDEEP to be used for recreational purposes. The transfer of these lines included the right of the Department to retake ownership of the lines if it was needed for transportation purposes. In addition to the 60 miles of rights of way acquired by the CDEEP from the Department, CDEEP has acquired another 50 mile of abandoned rail rights of way. About 22 miles of that is leased by CDEEP for use as an excursion railroad by the Valley Railroad Company.

In the mid 1980's, the Department began to look at providing commuter rail service along Amtrak's NEC between New Haven and New London as a means of reducing highway congestion in the I-95 corridor. In May 1990, the new SLE commuter rail service began between New Haven and Old Saybrook, operating only during peak hours, inbound to New Haven in the morning and outbound to Old Saybrook in the afternoon. The Department provided the equipment and entered into an agreement with Amtrak to operate the service. In 1996, the Department extended service to New London. A long-term goal of the Department is the extension of SLE service into Rhode Island to allow a connection to commuter service run by Massachusetts Bay Transportation Authority (MBTA) that currently extends to West Warwick, Rhode Island and will soon reach southward to Wickford. This could result in commuter rail over nearly the whole NEC.

The Department continues to be actively involved in the provision of rail service as it undertakes a Federal Environmental Assessment (EA) for the institution of new and expanded high-speed, intercity, commuter, and freight rail service in the New Haven, Hartford, and Springfield, Massachusetts corridor.

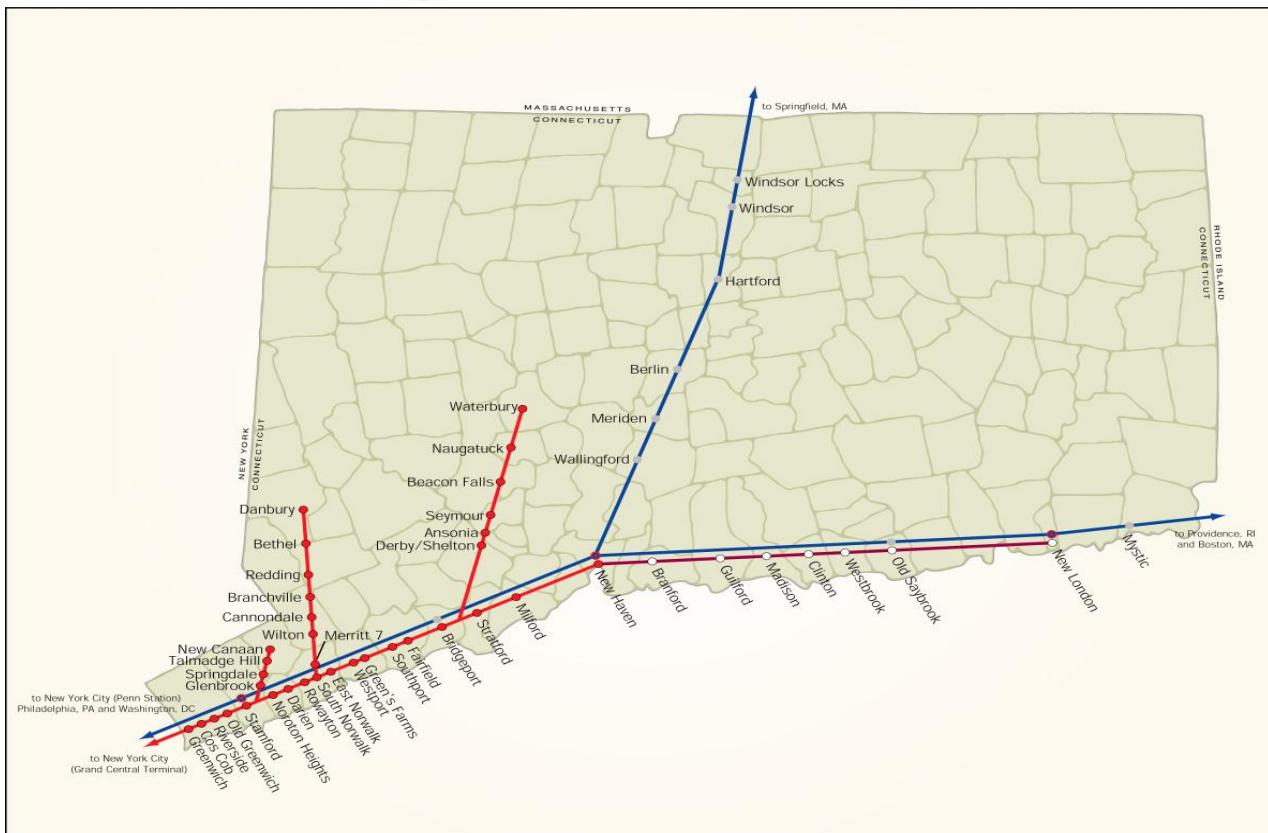
CHAPTER 4 – COMMUTER PASSENGER RAIL NETWORK

Connecticut provides commuter passenger rail services on the NHL from New Haven into Grand Central Terminal, New York, and on SLE along the shoreline from New Haven to New London with select extensions to Bridgeport and Stamford.

In 1985, the Department entered into a three-party service agreement with New York MTA and MNR to provide for operation of the NHL service by MNR. SLE commuter operations began in 1990 and the state has a contract with Amtrak to provide daily rail operations of the service.

These services are shown in Figure 5.

Connecticut Passenger Rail Service



New Haven Line Commuter (Red), Shore Line East Commuter (Purple), Amtrak Intercity (Blue)

Figure 5. Passenger Rail Services in the State

4.1 INVENTORY OF COMMUTER RAIL NETWORK

New Haven Line

The NHL includes the Main Line and three branch lines.

Main Line

The Main Line of the NHL runs east west along the southwestern shoreline of the state, through the most heavily developed and populated area of the state and is the main line for the commuter service between New Haven and New York City (Grand Central Terminal). The state of Connecticut owns the portion between Greenwich and New Haven that is 46.8 miles. The NHL connects to the New York Hell Gate Line.

The 19 Main Line stations in Connecticut include New Haven – State Street, New Haven - Union Station, Milford, Stratford, Bridgeport, Fairfield Metro, Fairfield, Southport, Green's Farms, Westport, East Norwalk, South Norwalk, Rowayton, Darien, Noroton Heights, Stamford, Old Greenwich, Riverside, Cos Cob, and Greenwich.

The Main Line has four main tracks (three in one section), which are constructed with continuously welded rail. The service is electrified and maintained at FRA Class 4 track standards. The Main Line connects with the New Canaan Branch Line in Stamford, the Danbury Line in Norwalk, the Waterbury Line in Milford, and the Springfield Line and SLE Line in New Haven.

Amtrak provides Acela express service with stops in Stamford and New Haven; and Northeast Regional service with stops in Stamford, Bridgeport, and New Haven. CSX Transportation (CSX) and Providence and Worcester Railroad Company (P&W) provide through freight service; CSX provides local freight service.

New Canaan Branch Line

The New Canaan Branch Line extends 7.9 miles inland from the Main Line in Stamford and terminates in New Canaan. The four stations on the line are located at New Canaan (New Canaan and Talmadge Hill) and Stamford (Springdale and Glenbrook). Connecting service is available at the Stamford station. The state owns the New Canaan station and the town maintains it. The state and town partially own the parking. The state owns the Talmadge Hill platform and the town maintains it, except MNR maintains the platform lights. The town owns and operates all parking at the station. At Springdale and Glenbrook, the Department owns the platforms and certain parking, and MNR maintains the platforms. The City of Stamford owns the balance of the parking, and operates and maintains it. The service is electrified and maintained at FRA Class 3 track standards.

There is no through freight service on this line and local freight service is provided by CSX.

Danbury Branch Line

The Danbury Branch Line traverses 24.2 miles inland from the Main Line in South Norwalk and operates between Norwalk and Danbury. It connects with the Maybrook Line, which Housatonic Railroad operates on, in Danbury. The seven stations on the line are located in Danbury, Bethel, Redding, Ridgefield (Branchville), Wilton (Cannondale and Wilton), and Norwalk (Merritt 7). Connecting service is available at the South Norwalk and Stamford stations. The Department owns the Branchville, Redding, Bethel, and Danbury stations and the town/city operates and maintains them, under agreement. The Department owns the Merritt 7, Wilton,

and Cannondale stations and a management company operates and maintains them on behalf of the Department. Merritt 7 is provided with a low-level platform. The South Norwalk platforms and all other platforms on the Danbury Branch are high-level platforms. There are parking fees at the three most northerly stations along the branch line that include the Danbury, Bethel, and Redding stations. The state owns the right-of-way of the branch line and it is maintained at FRA Class 3 track standards. This line does not have overhead catenary so the rail equipment is diesel-hauled.

There is no through freight service on this line and P&W provides local freight service.

Waterbury Branch Line

The Waterbury Branch Line extends 27.1 miles inland from the Main Line in Milford to Waterbury, where it connects with the Terryville Secondary Line and the Torrington Branch. The six stations on the line include Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia, and Derby/Shelton. Connecting service is available at Bridgeport Station. The Department owns all the stations except the Seymour station building that the Town owns and maintains. MNR provides lighting, trash and snow removal services at all platform locations except at Seymour where the town maintains the lighting. The towns maintain the parking lots at Beacon Falls, Seymour, and Ansonia, and Derby. At the Naugatuck station, the Department leases the parking from the town and maintains it. At Waterbury, the Department owns and maintains the parking lot. The branch line is maintained at FRA Class 3 track standards. This Line does not have overhead catenary so the rail equipment is diesel-hauled.

There is no through freight service on this line and P&W provides local freight service from Milford to Derby, and by the Springfield Terminal Railroad from Derby to Waterbury.

Infrastructure

The Department owns the Main Line track from the New York state border to New Haven, the branch line tracks, maintenance facilities, most stations, and over 60 percent of the equipment. The infrastructure includes station buildings, platforms, tracks, communications, and the railroad's power system (substations, catenary, and signalization). Rail yards and equipment maintenance facilities are located in New Haven, East Bridgeport, Stamford, and Danbury and a warehouse is located in Springdale. Under the operating agreement, MNR maintains the right-of-way, maintenance facilities, and the equipment. The Department uses a combination of state, Federal Transit Administration (FTA), and Federal Railroad Administration (FRA) funds to upgrade the right-of-way, build and rehabilitate the maintenance facilities, and purchase the equipment.

Shore Line East

The SLE service operates along the 68.2-mile segment of the Amtrak owned NEC between New Haven and New London. The Department makes payments to Amtrak for use of the Amtrak-owned NEC facilities and provides other funding on the NEC, including capital funds for infrastructure and/or stations.

The Shore Line connects with the Branford Steam Railroad (Tilcon) in Branford, the Valley Line in Old Saybrook, the New England Central Line in New London, and the Plainfield Secondary Line in Groton. P&W provides through and local freight service and Amtrak provides intercity passenger service on this line.

Infrastructure

Stations on SLE are located in New London, Old Saybrook, Westbrook, Clinton, Madison, Guilford, Branford, and New Haven's State Street Station and Union Station. The Department, with state and FTA funding, has projects planned at the Westbrook, Branford, Guilford, and Clinton stations. The new stations include passenger amenities such as high-level platforms to allow for level boarding on trains, track infrastructure modifications, a commuter shelter area, a convenient commuter drop off area, increased parking, enhanced lighting, security cameras, and passenger information systems.

The Department owns the SLE train equipment and the Department's contract with Amtrak provides for the associated maintenance and mechanical functions of the equipment by Amtrak in a Department-funded car and diesel shop in New Haven.

4.2 COMMUTER RAIL SERVICE OVERVIEW

New Haven Line

The NHL service in 2011 (Main Line and branch lines) consisted of 287 weekday trains, 178 Saturday trains, and 147 Sunday and holiday trains with the majority of the ridership heading to Stamford or further west into New York City. There were 38,240,133 annual passenger rides¹¹ and 25,677,446 Connecticut interstate and intrastate passenger trips¹². In 2011, the total passenger miles were 1,223,076,121 and Connecticut interstate and intrastate passenger miles were 1,002,949,338.

Bicycles are permitted on certain trains during certain times and are generally not permitted during peak times, as seating is limited. Bus service from residential areas to/from station and commuter connection bus between the train station and local work sites is available at multiple locations. The NHL Timetable contains information on schedule, connections, Federal Americans with Disabilities Act (ADA) access, and other services.

Shore Line East

SLE trains run primarily inbound from Old Saybrook and New London in the morning and primarily outbound from New Haven in the evening. The SLE service in 2011 consisted of 26 daily weekday trains (16 between Old Saybrook and New Haven and 10 between New London and New Haven) and 4 through service trains to Bridgeport and Stamford on the NHL. Since April 2008, SLE multi-ride ticket holders have been able to ride on six Amtrak trains between New Haven and New London. The Department began special SLE weekend service in 2007 and since July 2008, has operated weekend and holiday service consisting of 16 trains on Saturdays, Sundays, and holidays. In 2011, SLE service totaled 614,089 annual passenger trips and 13,520,923 passenger miles.

Bicycles are permitted on-board SLE trains between New Haven and New London. SLE trains connect with Commuter Connection bus service at State Street Station in the morning and at New Haven – Union Station in the evening. Connecting service is available to Metro-North NHL trains.

¹¹ This figure includes New York passenger trips.

¹² This figure only includes Connecticut passenger trips.

Operating Statistics

On the NHL, the state and MTA/MNR divide the operating subsidy. Connecticut's share is 65 percent of the expense and New York's share is 35 percent, in accordance with the NHL Service Agreement. On SLE, the state is responsible for 100 percent of the deficit. The operating statistics for fiscal year 2011 are contained in Figure 6.

NEW HAVEN LINE (includes three branch lines)	Fiscal Year 2011
Annual Passenger Trips	37,680,289
Expenses	\$368,309,103
Revenue (fare box and other)	\$268,875,268
Net Deficit (expenses less revenue)	\$99,433,835
The Department's Share	\$71,478,494
New York's share	\$27,955,341
Cost Per Passenger (total expenses / total passenger trips)	\$9.77
Deficit Per Passenger (total deficit / total passenger trips)	\$2.63
Operating Ratio (revenue / expenses)	73.00%
SHORE LINE EAST	Fiscal Year 2011
Annual Passenger Trips	601,708
Expenses	\$25,113,178
Revenue (fare box and other)	\$1,964,782
Net Deficit (expenses less revenue)	\$23,148,396
The Department's Share	\$23,148,396
Cost Per Passenger (total expenses / total passenger trips)	\$41.73
Deficit Per Passenger (total deficit / total passenger trips)	\$38.47
Operating Ratio (revenue / expenses)	7.82%

Figure 6. Operating Statistics¹³

4.3 COMMUTER RAIL FACILITIES, SYSTEMS, AND EQUIPMENT

Rail Stations

Over fifty stations serve various passenger rail lines in Connecticut. Ownership, maintenance responsibility and other conditions vary among the NHL, SLE, and Amtrak intercity rail stations. The Department owns most NHL stations and leases them to the city or town where it is located. The SLE-only stations are a combination of the Department-owned or Amtrak-leased properties. A private facility management contractor and railroad forces provide maintenance. The Department does not currently charge for parking at SLE stations. The ownership, maintenance responsibility, conditions, and parking fees vary at Amtrak intercity facilities. The Department does not routinely maintain a conditions assessment or detailed parking data for Amtrak intercity facilities.

Each station allows for a certain degree of motor vehicle access, although not every location offers parking. Most stations do offer taxi service. Most major rail stations (Greenwich, Stamford, South Norwalk, Westport, Bridgeport, and New Haven) are well supplied with

¹³ Source: Connecticut Department of Transportation, Bureau of Finance and Administration, 2012.

connecting bus service, both local services and dedicated feeder/distributor routes. Feeder/distributor bus service known as Commuter Connection service is coordinated with trains, mostly in the peak hours. At others, such as Hartford, Waterbury, Norwalk, New London, and Fairfield, only one or two bus routes provide access to and from the rail stations. Schedules of MNR trains are subject to change every four months and are typically coordinated with other carriers so buses are ready to meet trains. The Commuter Connection schedules are typically adjusted as necessary with changes in NHL schedules changes. Three of seven fixed route bus systems along the NHL, New Haven, Stamford, and Bridgeport, operate into the late evening (approximately 11:30 p.m.) and provide good connections with the train. The other four, Milford, Norwalk, Danbury, and Westport, cease operations between 6:30 p.m. and 7:30 p.m. thus serving trains less well.

Rail Station Parking

More than 24,000 parking spaces are available among the passenger rail stations located in Connecticut. The number of parking spaces at each station varies from zero at State Street Station in New Haven, to over 1,000 each at the New Haven, Bridgeport, Fairfield, Fairfield Metro, Westport, Stamford, and Greenwich stations.

Stamford, Norwalk, Bridgeport, and New Haven offer structured parking (garages), but the majority of the stations have surface lots constructed adjacent to or in close proximity of the rail lines. Similar to the stations, the Department owns most parking facilities, but individual towns operate most lots under a lease agreement. Parking fees typically cover upkeep, snow removal, and policing. The state typically funds capital improvements, such as major rehabilitation and construction.

On the Main Line, the parking utilization rate is extremely high, exceeding 80 percent. On the Waterbury Branch Line, utilization ranges from a high of 72 percent to a low of 10 percent. On the Danbury Branch Line, utilization ranges from a high of 90 percent to a low of 58 percent. On the New Canaan Branch Line, utilization ranges from 88 percent to 82 percent. On SLE, utilization ranges from a high of 113 percent to a low of 22 percent.

NEW HAVEN LINE - MAIN LINE PARKING INFORMATION

Rail Station Name	Rail Station Parking Costs					Permit Parking Capacity	Daily Parking Capacity	Comments
	Semi-Annual	Annual	Monthly	Daily	Hourly			
New Haven State St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No parking, bus queue only.
New Haven Union Station	n/a	n/a	\$80.00	\$11/6am-10pm \$13/24hr	\$1.00	340	852	Shuttle to Temple St. garage available.
Milford	\$175.00	\$275.00	n/a	\$5.00	n/a	593	83	
Stratford	\$175.00	n/a	n/a	\$5.00	n/a	205	80	
Bridgeport-Garage	n/a	n/a	\$67/Reg. \$45 multi-ps	\$6.00	n/a	1000	400	Permit renewals halted temp.
Bridgeport-Lot	n/a	n/a	\$35.00	n/a	n/a	181	7 handicap	CDOT lot under I-95
Fairfield Metro	\$210.00	n/a	n/a	\$6.00	n/a	1000	369	Subject
Fairfield	\$170.00	n/a	n/a	\$6.00	n/a	861	355	
Southport	\$115.00	n/a	n/a	\$6.00	n/a	146	32	Nearby church lot included
Green's Farms	n/a	\$225.00	n/a	\$4.00	n/a	384	90	
Westport	n/a	\$225.00	n/a	\$4.00	n/a	1,030	277	
East Norwalk	n/a	n/a	\$43.00			250	2	Nearby church lot included
South Norwalk	n/a	n/a	\$80.00	\$8.00		650	154	Municipally owned garage
Rowayton		\$315.00		\$5.00		291	28	
Darien		\$345.00		\$3.00		543	317	
Noroton heights		\$345.00		\$3.00		431	341	
Stamford South State Street Lot	n/a	n/a	\$70.00	n/a	n/a	118	2	
Stamford Garage	n/a	n/a	\$70.00	\$8-10/Hr.	\$1.00/First hr.	1,350	555+/-	
Old Greenwich	n/a	\$279.00		\$5.00		520	74	
Riverside	n/a	\$279.00		\$5.00		282	37	
Cos Cob	n/a	\$279.00		\$5.00		521	59	
Greenwich Plaza	n/a	\$488.00		\$5.00		370	8	Privately owned
Greenwich -outside		\$242.00		\$5.00		605	215	Municipal lots

New Haven Line - Main Line Parking Capacity

State-owned Total 53% 10,437

Municipal/Non-State Total= 47% 9,295

Total Parking Spaces= 100% 19,732

Figure 7. New Haven Line - Main Line Parking Statistics¹⁴¹⁴ Source: ConnDOT, Office of Rail, 2011. Note: Number of permits issued range from 100-130 percent of permit capacity

NEW HAVEN LINE - BRANCH LINES PARKING INFORMATION

Rail Station Name	Rail Station Parking Costs			Permit Parking Capacity	Daily Parking Capacity	Comments
	Monthly	Daily	Hourly			
Waterbury	n/a	n/a	n/a	n/a	156	
Naugatuck	n/a	n/a	n/a	n/a	125	
Beacon Falls	n/a	n/a	n/a	n/a	28	
Seymour	n/a	n/a	n/a	n/a	22	Additional highway parking nearby
Ansonia	n/a	n/a	n/a	n/a	50	
Derby Shelton	n/a	n/a	n/a	n/a	75	
Danbury		\$6.00	\$0.25/15 min	129	17	Hourly parking is metered
Bethel			\$0.25/hr.	165	32	Hourly parking is metered
Redding		\$5.00		65	17	
Branchville	n/a	n/a		0	168	
Cannondale	n/a	n/a	n/a	0	140	
Wilton	n/a	n/a	n/a	0	212	
Merritt 7	n/a	n/a	n/a	0	88	
New Canaan	\$396 annual	\$5.00	n/a	350	156	
Talmadge Hill	\$396 annual	\$5.00	n/a	270	98	Municipal lots
Springdale	\$42.00 Res \$84.00 Non Res	\$5.00	n/a	148	62	
Glenbrook	\$42.00 Res \$84.00 Non Res	\$5.00	n/a	56	93	

New Haven Line - Branch Lines Parking Capacity

State-owned Total=	52%	1,522
Municipal/Non-State Total=	48%	1,392
Total Parking Spaces=	100%	2,914

Figure 8. New Haven Line - Branch Lines Parking Statistics ¹⁵

¹⁵ Source: ConnDOT, Office of Rail, 2011.

SHORE LINE EAST PARKING INFORMATION

SLE STATION NAME	PARKING CAPACITY	COMMENTS
New Haven State Street	0	There is no parking at this station (only a turnaround area for buses and pick up/drop offs).
Branford	473	
Guilford	179	
Madison	199	
Clinton	125	
Westbrook	40	
Old Saybrook	128	This count is only for the CDOT commuter lot adjacent to the station parking area.
New London	906	The city owns the garage.
TOTAL	1776	

Note: Parking on SLE is free except the New London parking garage the City operates. There are no parking permits or waiting lists.

Figure 9. Shore Line East Parking Statistics

Rail Yards

The Department owns four rail yards that support NHL service. MTA MNR, as the Department's contracted operator of the NHL, operates and maintains most facilities at each yard location. Amtrak maintains the SLE equipment in the New Haven Yard.

New Haven Yard

This yard supports NHL EMU as well as diesel equipment, and will support the newly purchased M-8 rail equipment. Most Main Line trains are comprised of EMU equipment. Service lines using the rail yard include the NHL and Waterbury Line both run by MNR, the SLE, currently run by Amtrak. Amtrak also has a small facility that allows for equipment storage and permits basic running repairs to intercity trains.

Stamford Yard

This yard supports NHL EMU as well as diesel equipment. Danbury and Waterbury Branch Line service is provided with diesel powered equipment. The repair facility is three floors with offices and two tracks that can accommodate three cars on each for six cars total. Cars are driven into the repair facility for short term repairs so that it may be returned to the fleet quickly and put back into service. Damaged trains are repaired at this location in a separate building. The Stamford Yard has the only car wash operation for NHL and has coach-cleaning operations.

East Bridgeport Yard

This yard has a two-story facility housing MNR offices for Track, Structures, Communications and Signals, and coach cleaning operations. Bridgeport yard supports NHL EMU as well as diesel equipment for the Waterbury Branch Line.

Danbury Yard

This yard supports diesel equipment operated on the Danbury Branch Line.

Projects planned in these yards are included in the discussion on Asset Condition and Needs and in Appendix A and B.

Rail Tracks

Rail tracks are maintained at FRA standards. As of January 2006, tracks in Connecticut ranged in FRA classification from class 7 (maximum allowable operating speeds of 125 m.p.h. for passenger trains) along the Amtrak NEC route between New Haven and Boston to Class 1 (maximum allowable operating speeds of 15 m.p.h. for passenger trains and 10 m.p.h. for freight trains) on some freight line segments. Factors affecting track condition are volume of traffic, type of traffic, drainage, and curvature.

Lines with limited freight service are usually maintained to FRA Class 1 or 2 standards, while passenger lines owned by the Department or Amtrak are maintained at Class 3 through Class 7. Classification of the NHL Main Line is Class 4 that has a maximum allowable operating speed of 80 mph for passenger trains. The classification of the three branch lines is Class 3, which has maximum allowable speeds of 60 mph for passenger trains.

On SLE, the two tracks are constructed with continuously welded rail, the service is electrified, and it is maintained at FRA Class 6 and 7 track standards. The Shore Line is capable of 125 mph operations but the equipment's allowable operating speed is 80 mph.

Power Systems

The entire Main Line and New Canaan Branch Line have an overhead catenary system that provides the primary source of electric power for over 90 percent of the trains operated in daily service. In Connecticut, it is 100 percent overhead catenary (A.C) power collection. The system is a nominal 13.2 kV (kilovolts) at 60 Hz (hertz). The electric utility company supplies power to three points at 115 kV. Transformers reduce the voltage to a level acceptable for train operations and it is distributed by thirteen railroad wayside substations.

From the Connecticut/New York state line until approximately 16 miles outside of Grand Central Terminal, it is overhead catenary. At this point, the third rail (D.C.) power collection system begins and the operating engineer is responsible for the changeover from overhead current collection to third rail current collection. Essentially, while on the fly, the roof-mounted pantographs are dropped and securely latched down and the mode switches from A.C. to D.C. In third rail territory, current collection "shoes", which are mounted on either side of all the rail cars' trucks, conduct power from the wayside substations to the rail car, for auxiliary and propulsion power. The M-8's are equipped to take power from both overhead catenary and third rail.

The electric traction system was originally constructed in 1906 from New York to Stamford and about ten years later from Stamford to New Haven. Power was originally self-generated by the railroad's coal burning (later gas fired turbines) power plant at Cos Cob for the entire NHL. In the mid-1980's, the system was converted to commercial power.

The three supply points that replaced the generating plant are named Cos Cob, Sasco Creek, and Devon located in Greenwich, Westport, and Milford, respectively.

The Cos Cob West Supply Substation Upgrade Project (Project No. 0301-0134)

This project includes Phase 1 and Phase 2 of the necessary upgrades to the Cos Cob West Supply Substation. The recent SYSTRA computer modeling runs of the NHL traction system indicated the Cos Cob West power supply that feeds the Cos Cob to Harrison segment is almost at capacity and will be compromised when M-8 operations commence. Phase 1 includes the design of the signal power feeders, additional feeders, preliminary design, and procurement for two transformers and the design of modifications to the MNR/CDOT signal power yard. Phase 2 includes construction of the Signal Power feeders, final design activities associated with the outage coordination/staging and construction of additional feeders to the signal power yard and to substation 309, as well as the construction of the necessary modifications to the signal power yard. This project is under design and is estimated to be completed in 2013.

The thirteen wayside substations are spaced approximately five miles apart over 72 miles of the NHL. These facilities also allow the entire traction power system to be sectionalized. Desired sections can be taken out of service for maintenance, emergencies, and capital enhancements to the NHL whether electrical, operational, or structural in nature. Originally, oil filled circuit breakers were used at the waysides to interrupt fault current sensed by relays to prevent overload conditions that could damage the electric traction system. The Department has replaced these with state-of-the-art circuit breaker technology.

It is the Department's goal to have all commuter rail lines electrified. Electrification of all commuter rail lines would have fleet management and environmental advantages, and it would increase reliability, reduce commute times, and allow for more one-seat rides into New York and other employment centers. Currently, the New Haven Main Line, the New Canaan Branch Line, and the Shoreline are electrified and the Waterbury and Danbury branch lines and the Springfield Line are not electrified.

Signal and Communications Systems

The Signal Control System on the New Haven Main Line is Centralized Traffic Control (CTC) with signal control passage of trains at interlockings.¹⁶ Cab signals and Go-No-Go automatic train control indicate train speeds. The New Canaan Branch line is a continuation of CTC with automatic train control, cab signals, and Go-No-Go signals. The Danbury and the Waterbury branch lines are manual block territory. The design of a CTC system for the Danbury branch was completed in 2009 and construction is underway with estimated completion in 2012.

The first signal system upgrade took place along with the 60-cycle conversion of the traction power system between 1980 and 1985 in Connecticut. Subsequent system modifications and component upgrades have been ongoing.

Railroad Bridges

The Department is responsible for ensuring the safety of the traveling public and protecting the state's capital investment in railroad bridges. The Department inspects, evaluates, and inventories the structural condition, strength, and functional capacity of several hundred structures. Figure 10 contains a summary of the bridges maintained by the Department.

¹⁶ An interlocking is one or more pairs of switches used to allow trains to transfer between parallel tracks.

Location	Owner	Railroad	Total
New Haven Main Line Greenwich to New Haven	ConnDOT	Metro-North	134
New Canaan Branch Stamford to New Canaan	ConnDOT	Metro-North	5
Danbury Branch - Norwalk to Danbury	ConnDOT	Metro-North	26
Waterbury Branch – Milford to Waterbury	ConnDOT	Metro-North	36
New Milford to North Canaan	ConnDOT	Housatonic	23
Waterbury to Torrington	ConnDOT	Naugatuck	20
Windham to Sprague - Plainfield to Plainfield	ConnDOT	Providence & Worcester	37
South Windsor to Enfield	ConnDOT	Central New England	10
Waterbury	ConnDOT	Springfield Terminal	4
East Hampton, Plainfield, Vernon	ConnDOT	Abandoned	5
New Britain, Winchester	ConnDOT	Inactive	4
		TOTAL	304

Figure 10. Connecticut Railroad Bridge Inventory¹⁷

Commuter Rail Passenger Rolling Stock

The Department owns 537 vehicles (rolling stock units); 513 of the vehicles are passenger vehicles, 24 are diesel locomotives. Of the passenger vehicles, 118 are M-2 coaches, 34 are M-4 coaches, 30 are M-6 coaches, and 272 are M-8 coaches for 454 Electrical Multiple Unit (EMU) coaches and 83 are diesel hauled push/pull coaches. These figures do not include vehicles owned by New York.

This first generation of M-2 cars operate in a married pair configuration, while the second and third generation M-4 and M-6 cars, operate in married triplet configuration.

Mafersa and Bombardier-built cars are individual coaches that are added as a single unit to locomotive-hauled train consists.

The M-8's are configured to operate in a configured pair, except 25 of the M-8 cars are single and will be operated in the middle of pairs.

Figure 11 contains a summary of the Connecticut owned rolling stock. It should be noted that the Department plans to retire between 6 and 10 M-2 EMUs per month beginning in March 2012. The M-4 and M-6 will be gradually retired at a later date.

¹⁷ Source: Office of Rail, Bridge Design Unit, 2011.

Connecticut-Owned Rail Rolling Stock Unit Summary

<i>Equipment Type</i>	<i>Book Count</i>	<i>Average Age</i>	<i>Unit Size</i>	<i>Unit Seating</i>
M-2 EMU (NHL)	108	35.5	PAIR	A&B UNIT – 230/232
M-2 EMU (NHL)	10	35.5	CAFÉ PAIR	A&C UNIT – 144/146
M-4 EMU (NHL)	34	24	TRIPLET	A,B,D UNIT – 350
M-6 EMU (NHL)	30	17	TRIPLET	A,B,D UNIT – 341/344
M-8 EMU (NHL)	272	1	PAIR	A&B UNIT – 110/101
ELECTRIC COACHES	454			
Bombardier Push/Pull Coach (NHL)	20	24	COACH	Cab 113, Tr. 131
Bombardier Push/Pull Coach (NHL)	20	19.5	COACH	Cab 113, Tr. 131
Bombardier Push/Pull Center Door Coach (NHL)	10	8	COACH	Cab 99, Trailer 115 Trailer w/ toilet 103
Mafersa Push/Pull Coach (SLE)	33	18.5	COACH	Cab 100, Tr. 109
PUSH-PULL COACHES	83			
TOTAL PASSENGER VEHICLES	537			

<i>Equipment Type</i>	<i>Book Count</i>	<i>Average Age</i>	<i>Year Rebuilt</i>
GP-40-2H Locomotive (SLE)	6	39	1996
P-32AC-DM Locomotive (NHL)	4	9	N/A
P-40 Locomotive (SLE)	4	18	N/A
P-40 Locomotive (SLE)	4	18	N/A
BL20-GH Locomotive (NHL/Branch)	6	2	N/A
TOTAL PASSENGER DIESELS	24		

Figure 11. Connecticut-Owned Rail Rolling Stock Unit Summary¹⁸**New Haven Line Equipment**Electrical Multiple Unit CoachesM-2, M-4, and M-6 Rail Equipment

The states of Connecticut and New York jointly purchased the core NHL fleet M-2 series electric rail cars in 1973-1976. The M-4 and M-6 were purchased later and the respective manufacturers – General Electric (1970), Tokyu Car (1987), and Morrison-Knudson (1994) – built all three generations of EMU cars to a common design specification. The alternating current/direct-current (AC/DC) EMU cars operate under either 12.5 kilovolts alternating current/60 Hertz overhead catenary wire or the 700 volts direct current third rail power system leading into GCT.

¹⁸ Connecticut Department of Transportation, Office of Rail, February 2011. Note: These figures do not include New York-owned vehicles.

M-8 Rail Equipment

In August 2006, MNR acting on behalf of the Department awarded a contract to Kawasaki Rail Car to manufacture up to 380 M-8 EMU equipment as seen in a photograph in Figure 12.



Figure 12. M-8 Rail Car Photograph

This new fleet of cars is critical to the commuter rail service since the oldest of the 241 M-2 EMU cars are over 30 years old and must be retired. The new cars, which meet requirements of the ADA, will increase reliability and address service and ridership demand. The rail cars can presently store two bicycles per M-8 rail car. The open space areas adjacent to the vestibules are equipped with anchored eyelets, enabling passengers to fasten securely their bikes inside the rail car. This open area is also the same space that passengers traveling by wheelchair will be positioned while onboard.

The Bond Commission authorized funding for the procurement of 300 M-8 cars in 2006. Deliveries of the first rail cars for the 300 cars ordered began arriving in December 2009 and the remainder of those cars will be delivered through December 2013. In January 2011, the State Bond Commission authorized funding for the remaining 80 rail cars under the contract with Kawasaki Rail Car for 380 cars.

On July 29, 2011, the Bond Commission authorized funding for an additional 25 M-8 rail cars. These 25 M-8 cars are single cars that will be operated in the middle of pairs. These additional cars will provide operational flexibility to have some odd car consists. It will also provide the Department and MNR the ability to retire the remaining EMU fleet. The M-2 cars are beyond its useful life, the M-4 cars are at the end of their useful life, and the M-6 cars are near the end.

The other alternative was to do a critical system overhaul of the M-4 and a mid-life overhaul to the M-6 fleet. The M4 EMU fleet was manufactured in 1987 and the M6 EMU fleet was manufactured in 1994. Both fleets are relatively small in numbers 54 – M4's and 48- M6's.

MNR acting on behalf of the Department has contracted with a company to handle the disposal of the EMU equipment. As more M8 rail cars enter revenue service, the older EMU equipment will be disposed of in stages. The Department and MNR realize a benefit with the M8 being the only EMU equipment operating on the NHL, by maintaining an inventory of equipment for one type of EMU fleet versus maintaining inventories to support four different equipment types (M2-

4-6-8). Benefits will also be realized in providing the tooling and training of the railroad Mechanical Department staff for the maintenance of the M8 fleet versus the maintaining for four equipment types. With recent changes in Positive Train Control (PTC) regulations mandated by the FRA, the Department and MNR will not have to outfit the older EMU equipment types with new radios and other related safety appliances.

Shore Line East, and Danbury and Waterbury Branch Lines

Of the Connecticut owned vehicles, 33 Mafersa passenger units and 14 locomotives are assigned to SLE service, with provisions for some run-through service onto the NHL.

Mafersa Fleet

The Department purchased rail rolling stock from Virginia Railway Express (VRE). The Mafersa fleet includes 10 cab cars and 23 coaches for 33 cars total. VRE made these cars available to the Department for a purchase price of \$13.4 million. The Department spent an additional \$7.1 million to repair/modify the cars for SLE service, bringing the total cost to \$20.5 million. The VRE cars were assigned to the SLE service, including run-through service to Stamford, and the Waterbury Branch Line.

Locomotives

The six GP-40 and eight Genesis Locomotives (P-40) that operate on SLE are diesel-electric. The diesel engine is directly coupled with an alternator that generates electricity that is distributed to each traction motor located on each wheel set. The Department has hired a consultant to perform construction engineering and oversight for the overhaul of these locomotives.

The Genesis Locomotive (P-32DM) is the primary locomotive used on the Danbury Branch. General Electric manufactures these locomotives in 2001. It is a dual mode diesel-electric/electric locomotive since it operates under diesel power in Connecticut until it nears New York City, where truck mounted third rail shoes collects DC power from the third rail. However, it does not have the capability to operate on the overhead catenary on the NHL in Connecticut.

MNR has contracted on behalf of the Department with General Electric Company to perform a mid-life overhaul of the four Genesis P-32DM locomotives. This overhaul will provide a "Tier 0" compliant engine to meet U.S. Environmental Protection Agency (EPA) requirement for locomotive engine emissions. This overhaul work is part of the manufacturer's recommended maintenance practices in addition to proper scheduled maintenance that will maximize the full useful life expectancy for locomotives of twenty-five years. This project is expected to be completed in 2012.

The Department operates six Connecticut-own new reduced-emission locomotives manufactured by Brookville Locomotive Company that are known as Brookvilles (BL-20). The BL-20s are used on the branch lines or as switcher locomotives. All the diesel locomotives used on the NHL and SLE service use ultra-low sulfur diesel fuel.

4.4 COMMUTER RAIL ASSET CONDITION AND NEEDS

The state rail system has a variety of infrastructure issues that need to be addressed to maintain properly the existing system and to accommodate the regional goals of doubling the passenger system volume and increase rail freight volume by 20 percent over the next 20 years.

This Chapter will discuss major infrastructure issues and constraints of the existing rail system. The Long Range Investment Plan contained in Chapter 11 and Appendix A and B contains projects needed to address these needs and attain state maintenance goals and growth goals previously noted.

Major Infrastructure Constraints and Needs

The rail passenger system in Connecticut is an important resource in meeting transportation demand. The state of the commuter rail system infrastructure remains strong, and is adaptable to increased traffic levels. To ensure that the Department manages and monitors all transit assets to provide safe, reliable, and efficient public transportation, the Department developed performance measures as part of the Public Transportation Management System (PTMS).

The Department oversees the maintenance of the rights-of-way infrastructure, over 235 track miles, catenary, signals, stations, rail yards, and associated structures on the New Haven main line and the three branch lines (New Canaan, Danbury, and Waterbury). The goal is to bring the entire network to a state-of-good repair through a cyclical replacement of infrastructure elements.

Rail Parking

Parking constraint at rail stations is a significant issue for the Department as the NHL and SLE rail services continue to expand schedules and grow in ridership and popularity. The need for affordable, adequate, and convenient parking and other station access remains a challenging issue for the Department to address. The Main Line in Fairfield County has the largest need for expanded parking and potential sites are unavailable or extremely limited in that area.

Another issue is the varied parking ownership. Typically, all state owned rail parking on the NHL system is leased to local government for operation and maintenance. However, the Department operates parking at the Bridgeport and Stamford Transportation Centers, through a contracted facility management company. Municipalities and private businesses own and operate other commuter parking supporting many of the NHL stations.

The varied parking ownership issue has led to a wide range of parking rates being charged as well as policies in place to regulate the same. Examples include local resident only parking at certain town owned properties and higher fees charged at privately owned locations. Most station parking areas do not have parking access and revenue control systems in place and limited use of technology to support lot operations. Structured garage facilities do have PARC systems in place but are not standardized from one location to another. Improvements are needed to develop policies and regulate parking statewide.

Parking and TOD must be balanced appropriately. Stations located in a walkable distance to a downtown suitable for a mixture of land uses are suitable for TOD. These locations will add ridership to the system and maximize the economic benefits of rail access. Stations with easy

highway and road access in low-density areas are best suited for expanding surface parking areas and building structured parking.

Rail Stations

The Department programs funding annually in the Department's Capital Plan to ensure that all facilities owned or controlled by the Department are maintained, upgraded, or overhauled as industry standards and equipment life cycles require. The municipal leases for the NHL rail stations require that the towns maintain the facilities in a state-of-good-repair. Parking revenues and rental fees are used to offset operating expenses. The Department generally funds major building improvements and repairs.

Over the past two decades, the state has expended millions of dollars to upgrade many NHL and SLE rail station facilities. Part of this effort was a result of the Federal ADA of 1990 that required accessibility improvements while the Department initiated other projects to expand parking and address facility related life cycle and code compliance issues.

Typically, long-term maintenance needs of NHL and SLE rail stations will include bituminous pavement renewal/replacement, platform canopy repairs and painting, concrete related repairs and replacement (sidewalks, station platforms, stairs), lighting upgrades (parking lots/garages, station buildings and platforms), comprehensive parking garage improvements, including electrical, revenue/access control, security and structural systems, as well as other station building elements (roofs, HVAC systems, flooring, exterior siding, elevator and escalator systems).

Rail Yards – Maintenance Facilities

Maintenance facilities are a critical element to maintaining, servicing, and storing the rail fleet. The four yards are located in New Haven, Stamford, Bridgeport, and Danbury. Having adequate maintenance facilities is an important parallel path in the fleet replacement plan. The planned projects at the rail yards are further detailed in Appendix A and B.

New Haven Rail Yard

The present New Haven Maintenance Facility ("EMU Shop") is 30 years old and was designed to maintain the initial order of 144 EMU cars. It is severely over-burdened and is operating 24/7 (around-the-clock). After extensive study by the Department and MNR, the preferred approach and location was determined to be further expansion of the existing maintenance facilities complex in the NHRY.

The New Haven Rail Yard Facilities Improvements Program (the Program)

The Program is the transform the existing NHRY into a fully functional facility that provides for efficient and effective storage, dispatching, inspection, maintenance, and cleaning of an increasing fleet of rail cars. The improvements will provide the space, equipment, and administrative support structures needed to operate and maintain a new generation of rail cars and will coordinate the new facilities with existing facilities. The facilities are being built on approximately 74 acres of state-owned land that comprises the existing NHRY.

The major objectives of the Program include:

- Provide inspection and repair facilities for the increasing rail fleet that will allow for efficient and safe replacement and repair of components and sub systems, storage and retrieval of parts, and inspection and testing of components and vehicles.
- Increase the wheel truing capacity.
- Provide the offices, shops, and facilities required for support of the rail car fleet and service lines by MNR and the Department.
- Increasing the number of electrified and non-electrified storage tracks needed for the increasing rail fleet.
- Modify the yard to main line connections that will facilitate efficient train movement by all service line.
- Install the utility systems, roads and site work required to support the overall campus.
- Provide the infrastructure and systems to ensure a safe and secure facility.
- Provide a wash facility for the rail cars.

The Program status as of November 2011 includes:

Maintenance Function: Achievements to date towards improving the train maintenance and repair capabilities at the yard include:

- Renovations to existing Electrical Multiple Unit (EMU) and the Critical System Replacement (CSR) Shops are complete. These renovations were needed to meet the current State building code, improve the working environment in the shops and offices, enhance safety, and extend the life of buildings.
- The Component Change Out Shop (CCO) project is under construction and is scheduled for completion in 2013. The major (293,000 square foot) new facility will provide the main shop and office complex for the New Haven Rail Yard, and will provide the major maintenance functions for Connecticut's commuter rail fleet, as well as housing administrative and security functions. Design is proceeding for the Central Distribution Warehouse, which will be built adjacent to and concurrently with the CCO and will employ a state-of-the-art Automated Storage and Retrieval System (ASRS) to improve the efficiency of the warehousing and stores operation in the yard.
- The Independent Wheel Truing Facility (IWT) construction contract has commenced construction, and is scheduled for completion in spring 2013 (see Appendix B). The IWT will be used to reprofile the steel wheels on the new and existing New Haven Line and Shoreline East rolling stock, and will provide a needed increase in maintenance capacity to support the expanding rail fleet.

Train Storage Capacity: Achievements to date towards expansion of the train storage capacity at the yard include:

- The M-8 Acceptance facility was completed in July 2009. Four tracks were installed at the east end of the yard and are being used for acceptance of the new incoming fleet of M-8 rail cars for the New Haven Rail Line by the M-8 car builder, Kawasaki, Inc. Once M-8 acceptance is completed, the tracks will be used for train storage and shop staging.

- The Diesel Storage Yard was completed in December 2010. Three new tracks were installed adjacent to the existing Shoreline East storage tracks, and provide for storage of Shoreline east and Waterbury Branch Diesel/ Coach Train sets.

Yard Infrastructure Improvements: Achievements to date towards improving the yard infrastructure include:

- The Traction Power Substation 1086 project is under construction and is scheduled for completion in 2012 (Project No. 0301-0038). The electrical substation will provide a new power source for the New Haven Line traction power (overhead catenary) system to provide increased voltage levels required by the expanding fleet, efficient train acceleration, and more reliable operation of M8 cars.

The remainder of the projects that are planned for the Program is discussed in Appendix A and B. The Department posts up to date information on the status of these projects on its website at www.ct.gov/dot under "Major Project Updates."

East Bridgeport Rail Yard

The East Bridgeport Rail Yard requires additional storage tracks.

East Bridgeport Rail Yard Improvements (Project No. 0300-0130)

The purpose of the East Bridgeport Rail Yard improvements is to provide additional yard storage tracks for the light servicing and storage of revenue rail cars. This additional storage is required to house cars that will be displaced from the New Haven Yard during construction of facilities there and to accommodate the expanded NHL fleet including the new fleet of M-8s. Five existing tracks will be upgraded and electrified for revenue service. Maintenance of Way tracks and storage will be relocated and expanded. Construction is estimated to be completed at the end of 2012.

Stamford Rail Yard

At the Stamford Yard, an upgrade is needed to existing maintenance systems and equipment as well as code compliance elements. A security project is also underway to include the installation of a guard booth and other security elements.

Rail Tracks

Maintenance of the track infrastructure is critical to providing a safe operating environment, allowing maximum train operations within FRA regulations, and a comfortable ride for the public. Maintaining the track structure on the NHL is a cyclical program and is a significant expenditure. The Department bases maintenance of these components on the useful life of the material and FRA CFR 49 Part 213 regulations for maintaining the track structure.

For the NHL, the Department has condition measures for evaluating rail track structure. The Department bases these measures on a cyclical program for replacement of track, ties, and surfacing. Rail replacement on tangent track and curves, 1 degree and under have a 40-year replacement cycle: track with curves over 1 degree has a 20-year replacement cycle. The Department has a seven-year renewal program for maintaining and replacing existing ties on the Main Line and a ten-year renewal program for addressing existing ties on branch lines. There is a 30-year replacement schedule for new wood ties and a 50-year replacement schedule for new concrete ties. On average, 50 percent of the track will need resurfacing after 4 years.

Power System

The catenary wires (conductors) between New Haven and the Connecticut-New York state line are 100 years old. New catenary wire auto-tension (constant-tension) technology has been implemented to preclude the continually declining reliability of the catenary system and the lack of replacement components. Additionally, the space between wires supporting the contact wire (system depth) will allow a lower contact wire elevation thus, reducing the number and severity of hard-spots. The catenary replacement the Department is undertaking along 46 miles of the NHL has been divided into four major sections and is discussed in Appendix B.

Signal System

Factors affecting the condition of the signal system are the characteristics and reliability of the signal power feed, the environment, electromagnetic fields (introduced by 115/345 kV transmission line and 13.8 kV traction power systems), limited access to components, normal wear and tear, and limited forward compatibility of hardware and software components.

A mechanical relay system traditionally lasts about 30 years. Technological advances have demanded the use of electronics for more recent system modifications. These components can be expected to have an operating life of 15 years. The following are the expected and useful life of some of the other signal components: a switch machine should be rebuilt every 9 years and replaced every 30 years; signal cable can last about 30 years; batteries, battery chargers, and related systems last about 15 years. For the CTC office equipment, the following applies: cathode-ray tubes (CRTs) last about 4 years before it needs to be replaced; the centralized processing unit (CPU) needs to be replaced every 5 years; uninterrupted power supply (UPS) batteries last about 10 years; the control software and program logic, about 10 years; and the operating consoles, about 5 years.

There are other high-cycle replacement parts such as continuous-working code relays, 100 Hz converters, code-following relays, flasher relays, lights, and control panels. Wayside buildings and cases need repair and support every 15 years with possible replacement at 30 years of age.

The current system is sufficient to operate according to the rules and regulations in effect with the present train sets. The new M-8 train sets will be equipped with appropriate signal code to reach its full operating potential.

Assuming the thirty year expected life, replacement should commence by the 2011-2015 period. Many components will continue to require maintenance and/or replacement at shorter periods as previously noted.

Positive Train Control (PTC)

The Railroad Safety Act of 2008 (RSIA) has mandated the widespread installation and operation of Positive Train Control (PTC) systems on all rail main lines, meaning intercity and commuter lines. While the statute vests certain responsibilities with the Secretary of the U.S. Department of Transportation (USDOT), the Secretary has since delegated those responsibilities to the FRA Administrator.¹⁹ In the legislation, Congress established very aggressive dates for PTC system build-out completion. As required by statute, MNR submitted to FRA by April 2010, a PTC

¹⁹ See 49 CFR § 1.49 (oo); 74 FR 26,981 (June 5, 2009); see also 49 U.S.C. 103(g).

Implementation Plan (PTCIP) indicating where and how it intends to install PTC systems by December 31, 2015.

PTC does not currently exist on Metro-North territory and although it is in use by Amtrak on sections of the NEC, existing equipment must be modified to allow for PTC. The Department has been working with MNR to implement this new federal mandate on such a short timeframe. This project will be a significant capital expenditure.

Railroad Bridges

The bridge program is a significant expenditure in the Department's capital program. The purpose of the bridge program is to develop a comprehensive schedule of maintaining the structural integrity and safety of the railroad bridges.

Railroad Bridge Inspections

The FRA has established federal safety requirements for railroad bridges. Federal Register 49 CFR PART 237 requires the track owner to implement a Bridge Management Program that includes annual inspection of railroad bridges. The Office of Rail has required that each railroad perform a safety inspection of each bridge annually and the Department will continue inspections and prepare a report. The owner must have adopted the new FRA regulations by March 14, 2011. The Department utilizes consultant selection services to inspect railroad structures. The primary goal of the inspection program is to identify deficiencies and recommend repairs, rehabilitation, or replacement in a timely manner.

Railroad Bridge Ratings

The Department rates the bridges primarily by structural condition and strength. Rating a bridge's structural condition involves a careful inspection and evaluation of the two main components: (1) superstructure (structural supports); and (2) the substructure (piers and abutments).

Each of the two major components is comprised of a number of sub-elements. The evaluation of the sub-elements results in a numerical rating from zero (failed condition) to nine (excellent condition). The lowest rating between the two main components becomes the bridge's overall rating. Figure 13 provides a summary of bridge condition ratings.

Bridge Condition Ratings

<u>CODE</u>	<u>DESCRIPTION</u>
N	NOT APPLICABLE
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION – no problems noted.
7	GOOD CONDITION – some minor problems.
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.
4	POOR CONDITION – advanced section loss, deterioration, spalling, or scour.
3	SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures possible. Fatigue cracks in steel or shear cracks in concrete may be present.

2	CRITICAL CONDITION – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	“IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components, or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put bridge back in light service.
0	FAILED CONDITION – out of service; beyond corrective action.

Figure 13. Bridge Condition Ratings

Factors Affecting the Condition of Railroad Bridges

The primary factors that lead to deterioration of bridges are weather, loads, volume of railroad traffic, and deicing operations. As bridges deteriorate its condition ratings over time and gradually decline to a poor rating. Preventative maintenance can extend the useful life of a structure substantially; however, major repairs, rehabilitation, or replacement will ultimately be required.

When a structure receives its initial poor rating, the Department identifies the bridge as a candidate for major repair, rehabilitation, or replacement and takes steps to ensure that it programs the bridge for rehabilitation or replacement. Very often, this takes several years since there are environmental, right-of-way and railroad traffic related concerns that the Department must address before construction can commence. Experience has shown that initiating this process when the Department identifies the first poor rating allows sufficient time for design and construction of the required repairs, rehabilitation, or replacement. Figure 14 contains the railroad bridge condition by location.

Railroad Bridge Condition Rating by Location

Railroad / Location	Very Good 8	Good 7	Satisfactory 6	Fair 5	Poor 4	Serious 3	Critical 2	N/A	Total
Metro-North / New Haven Main Line Greenwich to New Haven	2	22	20	56	30	2	0	2	134
Metro-North/ New Canaan Branch Stamford to New Canaan	0	1	0	2	2	0	0	0	5
Metro-North/ Danbury Branch Norwalk to Danbury	0	4	4	12	5	1	0	0	26
Metro-North/ Waterbury Branch Milford to Waterbury	0	2	8	12	14	0	0	0	36
Housatonic/ New Milford to North Canaan	0	1	12	9	3	0	0	1	26
Naugatuck/ Waterbury to Torrington	0	3	10	7	3	1	0	0	24
Providence & Worcester/ Windham to Sprague Plainfield to Plainfield	0	3	7	21	7	0	0	0	38
Central New England/ South Windsor to Enfield	0	0	0	7	3	0	0	2	12
Springfield Terminal/ Waterbury	0	0	0	2	2	0	0	0	4
Abandoned/ East Hampton Plainfield Vernon	1	1	4	1	0	1	1	9	18
Inactive/ New Britain Avon Winchester	0	2	1	1	2	0	0	0	6
TOTAL									329

Figure 14. Railroad Bridge Condition Rating by Location²⁰²⁰ Source: ConnDOT, 2010 Bridge Inspection Report

Radio System Upgrade

A significant capital project the Federal Communication Commission (FCC) has mandated is the migration of the current railroad analog radio frequencies to a digital format, effective December 31, 2012. The FCC's overall goal is to reorganize the radio spectrum so there is more room for all of the wireless equipment being put into use today, and to try to create more interoperability between various services. This new mandate necessitates the replacement of the existing radio equipment system wide. The Department and MNR are working together and to identify which cars need to be outfitted.

Rail Rolling Stock

The majority of train cars on the New Haven Main Line are EMU rail cars. The average age of the rail cars is 26.6 years as shown in Figure 15. Considering that the useful life of a rail car is typically 25 years, the purchase of the M-8 railcars was critical to the overall viability of Connecticut's commuter rail service, since the "backbone" of the fleet are the M-2 EMUs that were built in the mid-1970s. Most of the M-2 fleet will be retired on a gradual basis with the purchase of M-8 EMUs. The Department chose to purchase 25 additional single M-8 rail cars instead of overhauling the M-4 and M-6 fleet.

Average Age of Connecticut-owned Rail Fleet

Equipment Type	Service	Number of Units	Built	Average Age
<i>Locomotives</i>				
P-32 (Genesis Dual Mode)	NHL	4	2001	10.0
P-40 (former Amtrak)	SLE	8	1992	19.0
GP-40	SLE	6	1971 – Rebuilt in 1996	15.0
BL-20 (Brookville)	NHL	6	2008	3.0
TOTAL		24		11.75
<i>Coaches</i>				
Bombardier – 19	NHL	20	1985 - 87	25.0
Bombardier – 34	NHL	20	1990 - 91	20.5
Bombardier – 38A	NHL	10	2002	9.0
Mafersa	SLE	33	1991 - 92	19.5
TOTAL		83		18.5
<i>EMU</i>				
M-2	NHL	118	1973 - 76	36.5
M-4	NHL	34	1985 - 87	25.0
M-6	NHL	30	1991 - 94	18.5
M-8	NHL		2010 - 13	
TOTAL		182		26.66
TOTAL FLEET		289		18.9

Figure 15. Average Age of Connecticut-Owned Rail Fleet in 2010²¹

²¹ Source: Office of Rail, February 2011. Note: These figures do not include New York-owned equipment.

The initiation of the New Haven-Hartford-Springfield commuter rail service will require the Department to purchase additional rail cars to operate on this line. This would be a significant expenditure and the Department has not determined the best option to proceed at this time.

Additionally, the new M-8 rail cars will be scheduled for its mid-life overhaul sometime in the 2023-2025 timeframe.

4.5 STUDIES AND SERVICE EXPANSION PLANNING

The strategic development of the state's commuter rail program requires evaluation of the rail corridors to identify future needs and establish priorities for implementing improvements. The recommendations for rail corridor improvements normally evolve from studies coordinated with various local, state, and federal agencies and the public. The primary goal is to develop strategies that focus on resolving the most critical rail asset needs by using resources in the most effective manner.

There are financial constraints, environmental considerations, and other factors that will have an impact on a project. Public participation is encouraged through a variety of mechanisms including interactive web site, newsletters, and public information meetings scheduled throughout the study.

The Department, as part of its continuing effort to improve rail service, has recently completed and initiated a number of studies to identify and address several aspects of the state's rail system current and future needs.

Major Studies

Danbury Branch Electrification Feasibility Study (Project No. 302-0008)²²

The purpose of *Danbury Branch Electrification Feasibility Study* is to evaluate a range of infrastructure and service improvements to determine its potential to enhance significantly the Branch's attraction as a competitive alternative to driving in the Route 7 corridor and other adjacent north/south corridors or commuting on the Harlem Line. The will study include a list of recommended infrastructure and service improvements that will include an evaluation of the costs and benefits of the recommended improvements. The results of this study provide decision-makers with the information necessary to determine how the needs of the Danbury Branch fit in an overall statewide transportation strategy that must balance needs and funding ability.

Phase I of this study was completed in January 2006, with the completed review of preliminary alternatives and identification of "candidate alternatives" for detailed analysis in Phase 2. Phase II of the Study began in November 2007, and includes further refinement of selected improvement alternatives, performance of a detailed Environmental Impact Statement (EIS), and selection of a preferred alternative(s).

Phase I recommended the following alternatives for further study:

²² <http://www.danburybranchstudy.com/>

Alternative A - No Build. This alternative assumes no major new investments other than what has already been approved or required for regular maintenance of the Danbury Branch Line.

Alternative B - Transportation System Management (TSM). This alternative encompasses everything that can be done without new construction or new vehicle procurement including service improvements such as new outbound service, express service, and skip stop service.

Alternative C - South Norwalk to Danbury Improvements (Build Options). This option includes electrification, passing sidings, curve realignments, and station improvements.

Alternative D - Danbury to New Milford Extension and Improvements. This option includes extending diesel service to New Milford, track reconstruction, curve realignments, passing sidings, new stations, and electrification.

Alternative E – Option for partial electrification from South Norwalk to the vicinity of the Route 15 (Merritt Parkway). This option would electrify the line from South Norwalk to an area near Route 15 and the Wilton Station.

The Record of Decision for the EIS will be published in the summer of 2012. The infrastructure improvement requirements along the study corridor have also begun. The projects are discussed in Appendix B.

Waterbury and New Canaan Branch Needs and Feasibility Study (Project No. 170-2562)²³

The *Waterbury and New Canaan Branch Needs and Feasibility Study* produced an assessment of the deficiencies and needs associated with the Waterbury and Canaan Branch corridors and evaluated a range of transit service options and infrastructure requirements to determine its potential to significantly enhance the corridor's transit attraction as a competitive alternative to driving in the Route 106 and Route 8 and other adjacent north/south corridors. The result of this analysis was a recommendation of a comprehensive set of transportation improvements arrived at through a collaborative effort. The recommended improvements were developed to fit within an overall statewide transportation strategy that must balance needs and funding ability.

The study identifies a short list of service and infrastructure improvements on the two branch lines.

Waterbury Branch Line Improvement Alternatives

Recommendation 1: Beacon Falls Passing Siding - Even without signalization, a passing siding in Beacon Falls would improve flexibility and allow additional service by enabling more than one train to operate on the branch at once.

Recommendation 2: Full Signalization - Adding a passing siding and signalizing the branch would provide an even greater benefit, enabling multiple trains on the branch at once.

Recommendation 3: Waterbury Storage Yard - The ability to store trains at the northern end of the branch would improve operational flexibility, allowing staging of trains at both ends of the branch.

²³ <http://www.waterbury-newcanaanrail.org/>

Recommendation 4: Three Additional Passing Sidings - Adding passing sidings at Devon, Derby, and Waterbury—in addition to a passing siding at Beacon Falls—enables increased service, as well as operational flexibility in case of breakdown.

Recommendation 5: Increased Train Length with High-Level Platforms - Initially, capacity is not an issue on the branch, but it is likely that ridership would increase if Recommendations 1-4 were implemented. Lengthening platforms to allow for longer train consists could increase capacity on the branch to serve the ridership generated by improved service. Longer, high-level platforms would also improve safety and decrease boarding time.

Recommendation 6: Devon Station - Ultimately, the way to increase substantially service on the branch without degrading Main Line service is to build a new station that provides Waterbury Branch customers with frequent access to NHL trains, without taking up Main Line schedule slots.

Station Improvements Package 1 - Improving station facilities along the branch would improve the customer experience and enable better multi-modal connections.

Station Improvements Package 2 - In addition to the improvements included in Package 1, Package 2 would provide an operational benefit by allowing longer trains and would improve safety.

Shuttle Bus Service - Until funds are available for capital improvements, supplemental bus service could fill service gaps in the Waterbury Branch schedule.

These alternatives will be brought forward to the National Environmental Policy Act (NEPA)/Connecticut Environmental Policy Act (CEPA) environmental documentation phase when funding becomes available. Appendix B contains additional information on projects planned along this branch line.

New Canaan Branch Line Improvement Alternatives

Recommendation 1: New Canaan Station Signalization - Extending the signal system to New Canaan Station and providing remote switch operations would reduce the time required to enter and leave the station.

Recommendation 2: Springdale Passing Siding - Adding a passing siding at Springdale would enable multiple trains to operate on the branch at the same time.

Recommendation 3: New Canaan Station Signalization, Springdale Siding, and Two-platform Springdale Station - Adding New Canaan Station signalization, a passing siding, and a second platform at Springdale would enable additional service on the branch and allow reverse-peak trains to pick up and discharge passengers at Springdale while waiting on the passing siding.

Station Improvements Package - Extending platforms at New Canaan and Springdale and adding a second platform at Talmadge Hill would alleviate platform crowding, decrease boarding time, improve passenger safety, and improve the customer experience.

Appendix B contains additional information on projects along this branch line.

Westport Rail Parking Study²⁴

The Southwestern Region Metropolitan Planning Organization is conducting a parking study that will evaluate existing commuter parking facilities at and near the Westport and Green's Farms rail stations in Westport; identify and assess potential improvements; and develop implementation and operational strategies that are context sensitive, promote energy efficiency, and recommend state of the art technologies.

The primary study objectives are to develop an implementation strategy that will:

- Increase rail commuter parking capacity;
- Improve utilization of existing and added parking capacity;
- Improve multi-modal access to both stations
- Decrease traffic congestion on streets connecting to stations;
- Evaluate rail parking operations and governance, identify alternatives and assess cost and benefits of each;
- Preserve and enhance the character of the surrounding business district and residential neighborhoods;
- Enhance the inter-modal connectivity between the Town of Westport and the surrounding Region; and
- Increase the level and quality of service at the Westport and Green's Farms rail stations.

The project will conclude in 2012.

South Western Region Rail Station Parking Study, Update 2011²⁵**Overview and Highlights**

The 2011 Rail Station Parking Update provides a regional overview and detailed analyses of rail station parking in the region. The report is organized by municipality and station, for ease of use. Topics discussed in the report include:

- **Regional Overview** of rail station parking for comparison purposes;
- **Roles and responsibilities** related to managing and operating rail station parking and parking facilities;
- **Cost** of rail station parking (annual/monthly permits, daily/hourly rates);
 - Permit Rates 2010-11
 - Daily Parking Rates 2010-11
- **Permitting process** used to manage wait lists, issue permits and enforce parking/permit rules and regulations;
- **Capacity** of rail station parking facilities (structures and surface lots);
- **Utilization** which spaces are being used each day and how many;
- **Issues and findings** based on data collected and observations made; and
- **Recommendations** based on findings.

²⁴ <http://www.swrpa.org/default.aspx?Transport=256>

²⁵ <http://www.swrpa.org/Uploads/2011%20Rail%20Parking%20Update%20Full%20Report.pdf>

Service Expansion

Expanding Rail Service on Shore Line East²⁶

Public Act 06-136, Section 2(d) required the Commissioner of the Department to identify obstacles to improved rail service on SLE, including, but not limited to, increased frequency of service, bi-directional commuter service, and weekend service. In the report, the Department proposed three phases of expansion to the SLE service.

The Department implemented the first phase of expansion in July 2009. In this phase, the Department added eight round trips per day on weekends, and one mid-day round trip and one late evening off-peak outbound train per day on weekdays (47 new trains per week) between New Haven and Old Saybrook.

An initially proposed second phase of expansion would extend all trains east to New London. One major obstacle to increasing SLE service east of Old Saybrook to New London is the three moveable bridges that Amtrak has responsibility for maintaining; the Connecticut, Niantic, and Shaws Cove bridges. The U.S. Coast Guard and CDEEP regulate the Connecticut waterways and marine traffic activities. The Department extended one round trip to New London in February 2010 and an additional five revenue round trips in the spring of 2010. Additional weekday or weekend service is on hold pending evaluation of the success of the additional trains to New London.

A third phase of expansion proposed to introduce bi-directional service on weekdays between New Haven and New London. Bi-directional service at the many of the stations would not be possible until high-level platforms are constructed on the north sides. A pedestrian bridge or tunnel linking the north to the south side of the tracks with elevators would also have to be constructed at all stations.

The Department has initiated the design of these station improvements (i.e. north side platforms and overpasses) at the SLE stations. Once funding is in place for construction and these projects are completed, all SLE stations will have high-level platforms on the north and south sides and will be capable of handling bi-directional commutation. Parking capacity is an obstacle at the stations since SLE continues to experience ridership growth.

The long-term rail plan on SLE includes operating electric trains. Once SLE becomes electric, the Department could utilize the current diesel equipment on the proposed NHHS service or the branch lines. Both the diesel locomotives and former VRE coaches are in need of either an overhaul or major component replacement to maintain operating efficiencies. Ultimately, the NHHS service would need replacement equipment with modern locomotives and coaches.

The Department is working with Amtrak to assess the impact on the electric traction overhead system infrastructure. Infrastructure improvements would be needed to improve operating flexibility and capacity, such as electrifying the track 4 siding at Guilford Station and track 3 in Old Saybrook. Operating to New London may also require the electrifying of track 6 at New London Station, a south side high-level (track 6) platform.

²⁶ Expanding Rail Service on Shore Line East, http://www.ct.gov/dot/lib/dot/SLE_Service_Expansion_Report.pdf. Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

4.6 INITIATION OF SERVICE AND NEW STATION PLANNING

Service Initiation

New Haven-Hartford-Springfield (NHHS) Rail Corridor Development²⁷

2030 Vision for High-Speed and Intercity Passenger Rail Service in New England Environmental Assessment (Project No. 0170-2296)

An original proposal for commuter rail service was based on the *New Haven-Hartford-Springfield Commuter Rail Implementation Study* that was completed by the Department in June 2005. The Implementation Study recommended a Start-Up Commuter Rail service between New Haven and Springfield. Figure 16. NHHS Corridor Map.

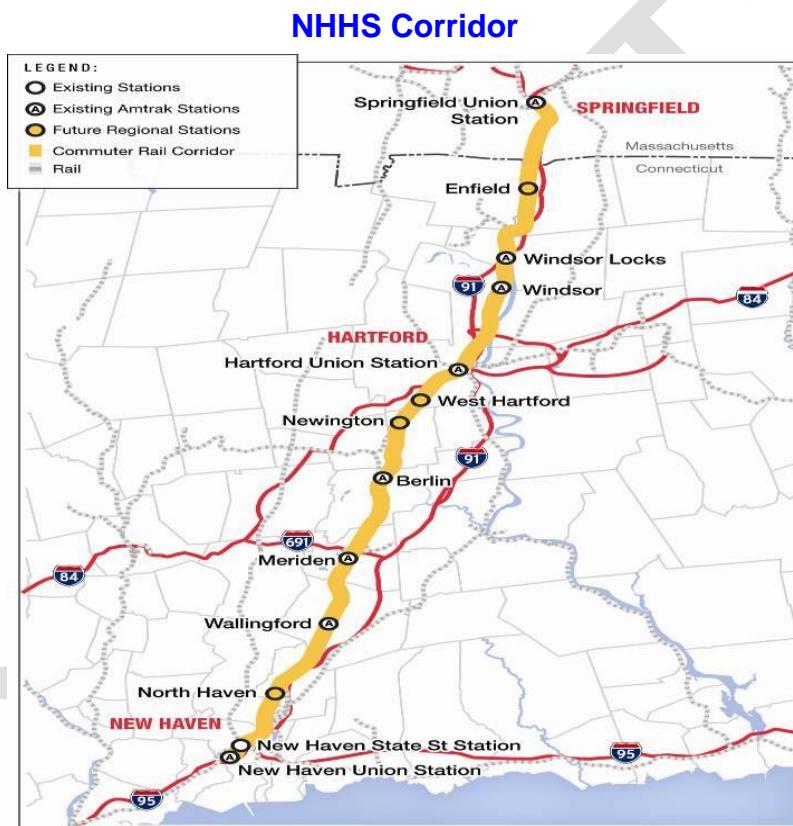


Figure 16. NHHS Corridor Map

Amtrak owns the corridor that runs between Springfield, Massachusetts and New Haven, Connecticut. This segment is one of the federally designated high-speed rail corridors. The corridor runs through the municipalities of Springfield, Massachusetts, Longmeadow, Massachusetts, Enfield, Windsor Locks, Windsor, Hartford, Newington, New Britain, Berlin, Meriden, Wallingford, North Haven, and New Haven. Current Amtrak service is provided at the following stations: Springfield, Massachusetts, Windsor Locks, Windsor, Hartford, Berlin, Meriden, Wallingford, and New Haven.

²⁷ Up to Date information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

The original project would have added 18 miles of double track, upgraded nine existing stations with high-level platforms and pedestrian overpasses, and added three new stations. The project also would have established 30-minute frequency in the peak hours.

In early 2008, the Department had begun an EA of proposed rail improvements to provide commuter rail service along the rail corridor. During the study process, \$8 billion in federal funding became eligible to develop and implement High-Speed and Intercity Passenger Rail (HSIPR) projects through the American Recovery and Reinvestment Act of 2009 (ARRA). This afforded a real opportunity to secure federal funding for rail improvements in Connecticut that would lead to the development of intercity passenger, regional, and freight rail service throughout New England. The EA did not advance further and the focus of the study then became how to address intercity passenger, regional, and freight service improvements on a much larger scale.

Because the corridor between Springfield and New Haven is owned by Amtrak and the HSIPR funding was available only to state transportation departments, the Department and Amtrak, along with the Commonwealth of Massachusetts and the State of Vermont, partnered to apply for HSIPR funding to invest in a 2030 Vision for Rail involving short and long term infrastructure improvements along the greater regional rail corridor from New York City to Montreal via New Haven and Springfield and also from Springfield to Boston via Worcester.

Currently the corridor supports 10 daily freight train and 12 daily intercity train movements. As part of Amtrak's 2030 Service Plan, it is proposing a level of service resulting in 36 trains per day by 2030 (includes both intercity and high-speed trains). In addition, the state of Connecticut desires to run commuter rail service that would provide local train service every 30 minutes during the rush hours. The combination of these services along with an estimated increase in freight service along the corridor is the basis for the required infrastructure investment along the rail line.

The NHHS corridor is 62 miles long, of which 56 miles are in the state of Connecticut. Of the 62 miles, only 23.7 miles are doubled tracked, the remainder is single tracked. Development of this rail corridor to the desired levels will require full restoration of the two-track system over the 62-mile length of the corridor and possibly three tracks in some areas. Because the line was once double tracked, sufficient right-of-way exists for the restoration of a second track. There are 54 railroad/highway grade crossings that will require signalization and grade crossing warning device improvements. The maximum authorized speed is 80 mph. Currently many temporary speed restrictions are due to track conditions. Recently, Amtrak has invested \$18.5 million in infrastructure upgrades (mainly tie and rail improvements) to maintain the line. This program will upgrade track structure to provide up to 110 mph maximum authorized speed and will improve or install universal interlockings where required.

The plan to develop the corridor for expanded intercity rail service and the introduction of commuter rail service is considering additional stations in Newington, West Hartford, Enfield, and North Haven, and will include improvements to the existing stations. Additional land will be required to provide the associated station improvements (i.e., up and over platforms and increased parking). The stations in Newington and West Hartford would provide multimodal connections with the New Britain Hartford Busway. The towns of Wallingford and Windsor Locks are seeking the relocation of its stations to encourage transit-orientated-development. The plan also includes an improved bus service connection to and from the Windsor Locks station and Bradley International Airport.

In January 2010, the Department was awarded \$40 million in ARRA funding under the Track 1A HSIPR grant to be used for a ten-mile section from the Meriden-Berlin town line to Newington. Connecticut also authorized \$26 million in State Bonds. This funding will be used for the NEPA documentation (a Categorical Exclusion is being reviewed by FTA), preliminary engineering and construction activities to restore a second track along 10 miles of Amtrak right-of-way from the Meriden-Berlin town line northward to just north of Route 175 in Newington. Amtrak is anticipated to construct the double tracking. The NEPA documentation and preliminary engineering tasks are currently underway.

In August 2010, the Department was awarded \$120.9 million in ARRA funding under the Track 2 HSIPR grant. Connecticut also authorized \$260 million in State Bonds. This funding will be used prepare an EA/State Environmental Impact Evaluation (EIE), for the design, and construction of double tracking the remainder of the 62-mile corridor entire corridor from New Haven to Springfield, bridge rehabilitation and culvert replacement, station modifications, construction of new stations, and signalization and grade crossing warning device improvements.

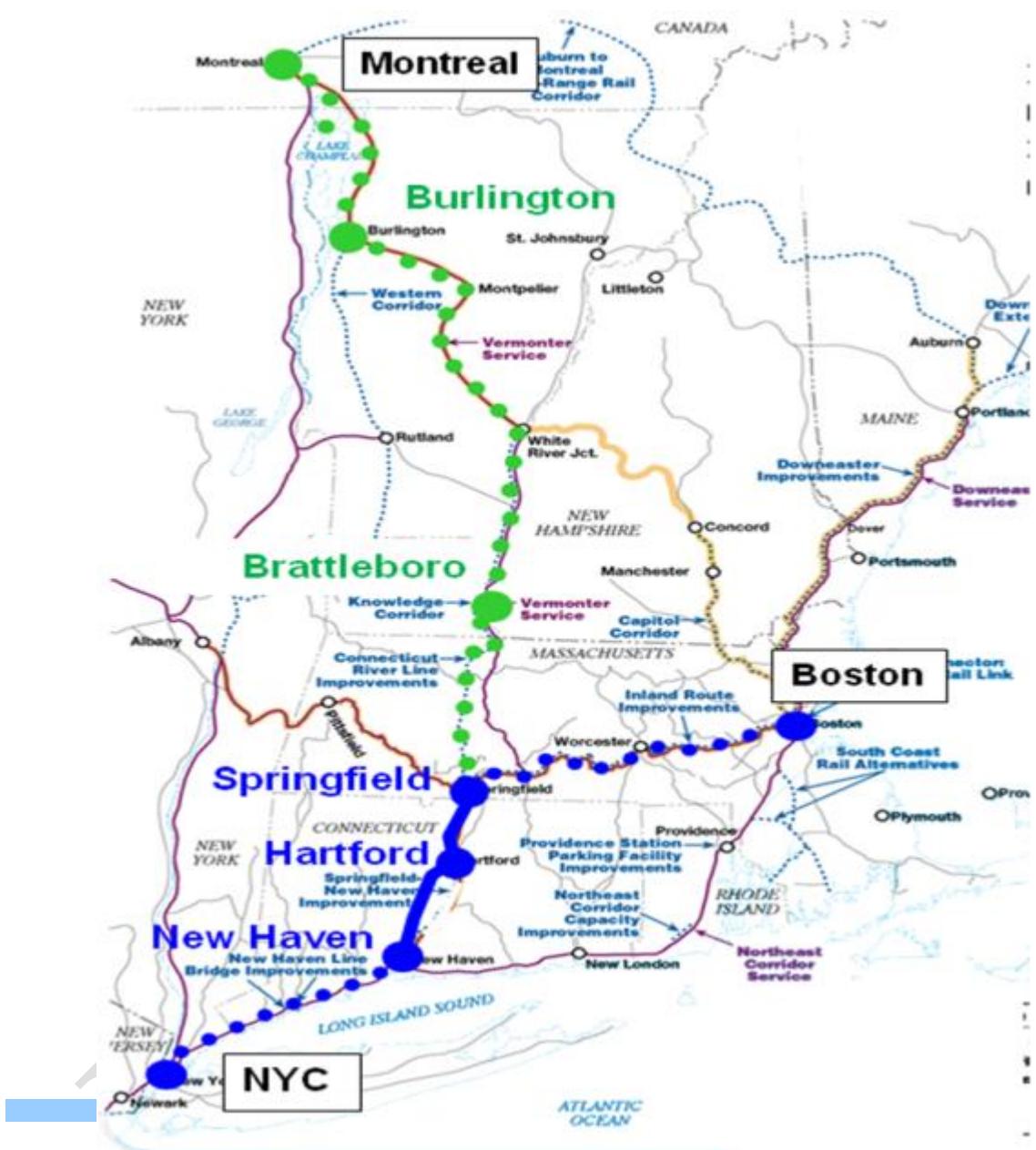
In May 2011, the Department was notified from FRA that it would receive an additional \$30 million for this project that will be used for improvements from Hartford-Windsor. This means the FRA has now committed \$190 million to this project. Connecticut has been awarded the eight highest amount of High-Speed Rail funding in the nation. Coupled with the \$286 million committed by the State Bond Commission, the Department has outstanding resources to sustain progress on implementing this major program initiative.

The NEPA process is underway and the Department is aiming for Finding of No Significant Impact (FONSI). Additional future FTA funding will need to be sought to construct the four new train stations (North Haven, Newington, West Hartford, and Enfield), as well as, improvements to the State Street station as these are not High Speed and Intercity locations. It is estimated that \$300-\$400 million additional will be needed for rail fleet.

Connecting the Region and Beyond

The proposed rail infrastructure improvements are one phase of a set of inter-related projects that will ultimately result in the development of high-speed and intercity passenger rail service throughout New England as shown in Figure 17. The Department has been working closely with the Massachusetts Department of Transportation (MADOT) and the Vermont Agency of Transportation to extend HSIPR service northward to Montreal, Canada and eastward from Springfield to Boston. A key component of the 2030 vision for high-speed, intercity, and regional rail service in New England collectively being developed by the Departments of Transportation in the six New England States is double tracking and station improvements along the NHHS portion of the rail corridor. These improvements will provide the foundation for a regional rail network.

Upon completion, these improvements will provide single-seat through service between Springfield, Hartford, and New Haven (including the intermediate stations) and along the NEC from New Haven to New York and on to Washington. With new high-speed and intercity passenger rail service along this heavily populated route, increased ridership is expected due to more frequent and reliable service and improved travel times. This service will also provide significant reductions in congestion (both vehicular and air traffic) and carbon emissions, along with opportunities for significant economic development. These improvements will also increase the capacity of train service between New York and Boston by creating the inland route.



Connecticut Service to Pennsylvania Station New York

The implementation of commuter rail service into Pennsylvania Station New York (PSNY) presents opportunities to provide significant mobility improvements for the residents of and visitors to this region. Improvements to the region's economy can also be expected because of the additional rail service that will provide some traffic congestion relief along the I-95 corridor. It is possible to operate service from the NHL directly to PSNY via existing infrastructure on Amtrak's Hell Gate Line that splits from the NHL at New Rochelle, New York. There are however, institutional, technical, and fiscal challenges that must be addressed and resolved. This requires the collaborative effort of several jurisdictions and railroad operators.

The Department is collaborating with the Long Island Railroad, MNR, Amtrak, and New Jersey Transit on a plan for access to PSNY. Key for Connecticut is access for high-speed and intercity trains in the Springfield Line corridor.

In September 2009, a new service from major NHL stations to the Meadowlands (via Secaucus Junction) for football games was initiated. Shuttle trains bring fans to the new Meadowlands Station and the game.

Other Corridors

The Department has identified several corridors as candidates for potential future commuter rail service. With increased demand for passenger service within Connecticut, there may be added benefit to initiating service on connecting rail lines near major cities. Many cities had rail lines that radiated outwards from the city similar to spokes on a wheel.

Hartford has many rail lines that connect to Amtrak's Springfield Line. Potential service that could be operated on these rail lines includes the Griffin's Line, Manchester Secondary (link Hartford with major stations at Mansfield (University of Connecticut) and Uncasville (Mohegan Sun Casino), Armory Branch Line, Terryville Secondary (Waterbury-Bristol-Berlin-Hartford), Middletown Secondary, and Suffield Line (Bradley Airport connection). Planning for improved service on the NHHS Line has included development of a transit connection from the Windsor Locks station on the NHHS line to Bradley Airport. Currently plans include a shuttle bus connection from the station to the airport terminal. Over the long term, the Department plans to assess the feasibility of creating a rail connection to the terminal.

Other cities such as Danbury, Waterbury, New Haven, Middletown, New London, and Willimantic have potential for future rail service on multiple rail lines that do not currently have passenger service operated on them. There has been interest and discussion on a few of these lines in particular, such as Danbury-New Milford²⁸, Waterbury-Bristol-Berlin-Hartford, New London-Willimantic-Palmer, Massachusetts, and Groton – Worcester.

The Department has met with the Rhode Island Department of Transportation (RIDOT) to discuss RIDOT's plan to extend commuter rail service south of Providence to Kingston and/or Westerly. Connecticut is keeping an open dialog with RIDOT on this proposed expansion because there would be potential to expand the SLE service east of New London to connect with the RIDOT service.

In April 2011, the State Bond Commission authorized \$1 million for the Department to conduct a *Central Connecticut Rail Study*. The feasibility study will include the implementation of a fixed-guideway rail or bus transit service in the Central Connecticut Corridor, directly serving the cities of Waterbury, Bristol, and Hartford and adjacent towns of Plainville, Berlin, and Plymouth.

The potential for added service on a connecting line would need to be evaluated both individually and collectively as a system servicing the city. This would require a study that would address transportation between residential and employment centers, TOD, improved rail freight service, opportunities for improved public transportation services and facilities, and the feasibility of creating a commuter rail service. A study should include operating schedules and costs, ridership, fare structure, subsidies, connections to other public transportation, required facilities and equipment, trackage rights issues and costs, a preliminary evaluation of environmental sensitivity, and coordination with other states and authorities. Any expansion

²⁸ Note: HRRC operates freight service on this corridor. The potential for passenger service on this corridor was included in the Danbury Branch Study <http://www.danburybranchstudy.com/index.html>

would come at considerable capital expense due to the need for a new signal system, track and structure upgrades, new stations, parking, high-level platforms, access roads, lighting maintenance facilities, and rolling stock requirements. For every system, there are sets of environmental and federal regulations that have to be adhered to as well. There may be some cost benefit with integrating with existing adjacent passenger service currently being operated.

Light Rail/Trolley

It would be beneficial for Connecticut to have a light rail or streetcar system linked to commuter rail stations supporting passenger travel especially in areas where passenger volumes are high, such as Stamford, New Haven, and Hartford. These light rail services would reduce congestion in the cities and help with parking constraints. The feasibility of establishing light rail or streetcars in these locations would require further study and evaluation.

New Station Locations and Station Planning

Fairfield Metro Railroad Station (Project Nos. 0301-0060 and 0301-0096)

This project is located on a 35-acre site near the Fairfield- Bridgeport town line. The Department has moved this project forward in coordination with the Town of Fairfield. Construction began on this new ADA-accessible railroad station featuring 1,020-foot-long canopy-covered, high-level platforms; a pedestrian bridge; and a vehicular bridge over the tracks in the summer of 2008. The project includes an entry road, environmental cleanup of a former foundry site, and the creation of up to 1,440 new surface parking spaces for rail commuters. The Department's project is funded by a combination of FHWA, FTA and state money. Service began in December 2011.

West Haven Railroad Station Project (Project No. 0106-0116)²⁹

The Project consists of the construction of a new railroad station in the city of West Haven. The station will consist of two platforms capable of accommodating 12 cars each linked by a pedestrian overpass; a station building that includes ticket office space, a waiting area, restrooms, and concession space; and surface parking lots on either side of the tracks. The platforms will be constructed of both precast and cast-in-place concrete with steel canopies that extend the entire length of the platform. The canopy columns are accented with brick and the platforms include seating, semi-enclosed shelters, steel guardrails, and other amenities such as ticket vending machines and waste receptacles. The station building is integral with the pedestrian overpass and is constructed of steel with glass and masonry walls. Elevators are provided to meet the requirements of the ADA. Electrical power, lighting, HVAC, fire alarm, CCTV security, and plumbing are included in the project.

Site work will consist of site demolition and grading to establish surface parking on both sides of the track. A storm water collection and treatment system is included in the project along with landscaping, site lighting, revenue collection, sidewalks, pavement, striping, and way finding and information signs. This facility will be constructed to conform to Connecticut's regulations regarding high performance buildings. The project is under construction with an estimated completion date of December 2012.

²⁹ Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

Other Station Locations

Adding additional stations along the NHL and SLE rail corridors would be beneficial but costly. The Department recently chose the Town of West Haven as the preferred site of a new rail station over the location in the Town of Orange. However, should funding become available, Orange is still a feasible site for a new rail station. The town received a federal grant to prepare a NEPA document for that location.

The Waterbury and New Canaan Branch Needs and Feasibility Study recommended a new station be built in Devon (Milford). This new station would substantially increase service on the branch without degrading Main Line service by providing Waterbury Branch customers with frequent access to NHL trains, without taking up Main Line schedule slots.

In the longer-term, Amtrak believes a potential plan calls for a new station in the vicinity of South Lyme.³⁰ Capital investments would be needed before service could be initiated at that station. Other towns along the shoreline would benefit from stations along the SLE corridor.

State legislation requires the Department to study the feasibility of establishing a passenger train station in Niantic. The study shall examine all steps necessary for the establishment of such station and shall include an estimate of the time and funding required for the completion of each such step and a projected date for completion of such station.³¹

³⁰ Northeast Corridor Infrastructure Master Plan, May 2010, page 11.

³¹ Public Act 11-256, Section 44.

CHAPTER 5 – INTERCITY PASSENGER RAIL NETWORK

Amtrak provides intercity passenger rail service on the NEC between Washington, DC and Boston, Massachusetts.

5.1 INTERCITY PASSENGER RAIL SERVICE OVERVIEW

Amtrak Service and Ridership

Amtrak Service & Ridership

Amtrak operates approximately 46 trains daily in Connecticut. These include *Acela Express*, *Regional*, and *Vermonter* (Washington, D.C.-New Haven-St. Albans, Vt.) services along the coast, and *Vermonter* and *Springfield Shuttle* services between New Haven, Hartford, and Springfield, Mass.

During FY11 Amtrak served the following Connecticut location:

City	Boardings + Alightings
Berlin	23,465
Bridgeport	76,653
Hartford	173,554
Meriden	34,582
Mystic	23,091
New Haven*	740,902 – <i>New Haven is the 10th busiest station in the national Amtrak System</i>
New London	165,819
Old Saybrook	65,937
Stamford	385,069
Wallingford	15,583
Windsor	10,269
Windsor Locks	15,503

Total Connecticut Station Usage: 1,730,427 (up 3.7% from FY10)

Figure 18. Amtrak Ridership in Connecticut by Station³²

Service Coordination

Amtrak trains operating on the NEC between New Rochelle and New Haven come under the Amtrak/MNR NHL Operating Agreement. Under this agreement, MNR dispatches Amtrak trains; Amtrak contributes to mutually beneficial capital projects. This agreement was amended in 2002 to allow for the introduction of the *Acela* service as seen in Figure 19.

The Central Electric Train Control (CETC) Dispatching Center in Boston dispatches the Amtrak *Acela*, *Regional*, and SLE trains operating on the SLE rail line. The CETC in Boston dispatches the Springfield Line trains.

Amtrak, MADOT, and the Department developed a *Springfield Line Memorandum of Agreement Principles* listing various condition precedents. The goal of Amtrak, MADOT, and the

³² Source: Amtrak Fact Sheet, Fiscal Year 2011, State of Connecticut

Department is to work cooperatively to study current and future operations on the Springfield Line with a goal of maximizing passenger rail service to benefit both commuters and intercity rail passengers, while also protecting current and future freight use of this line.



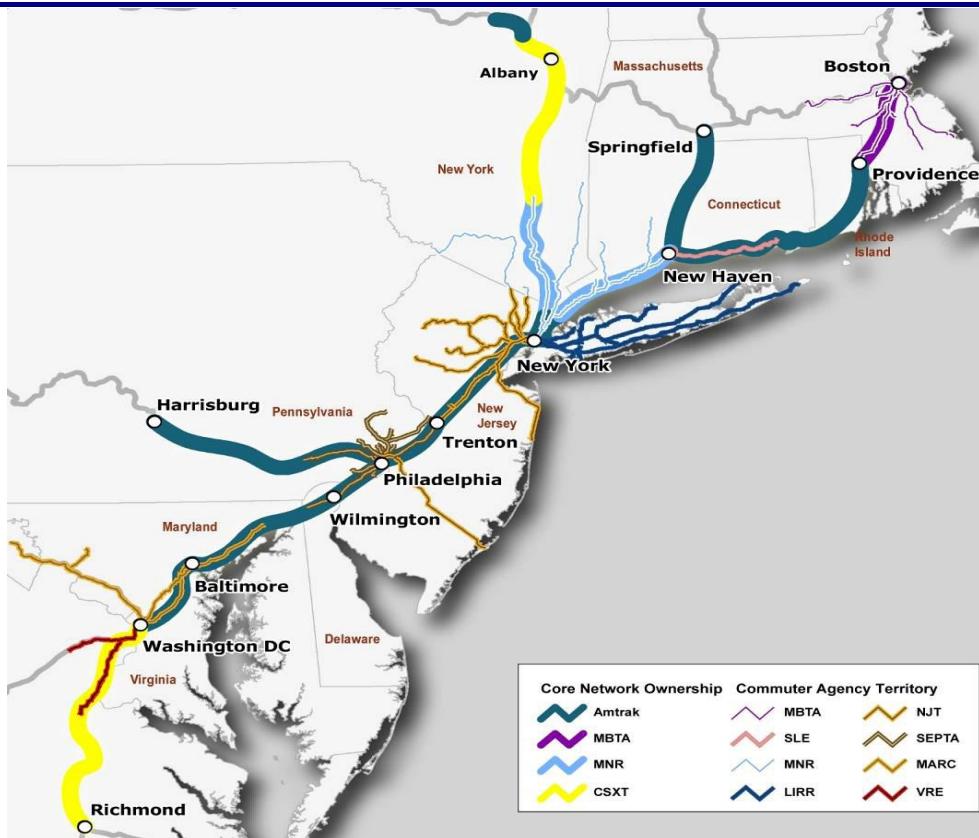
Figure 19. Amtrak Acela Service (photograph)

5.2 INVENTORY OF INTERCITY PASSENGER RAIL NETWORK

Northeast Corridor

The NEC is one of the busiest rail lines in the United States linking all major cities in the Northeast. The NEC core network and feeder lines are shown in Figure 20. In Connecticut, the NEC runs along the state's coast from New York to Rhode Island. The state of Connecticut-owned portion of the NEC runs from the New York State line to New Haven and is used jointly by Amtrak and Metro-North Commuter railroad. Amtrak owns Connecticut's portion of the NEC east of New Haven.

In 2009, on a given day there are 2500 passenger trains and 50 freight trains that operate over the NEC. The prediction is that in the year 2030 this number would increase to 3600 passenger trains, an increase of 59 percent, with a 38 percent increase in train movements. Amtrak Regional trains will increase in size and frequency and plans are underway to begin the process of evaluating a new generation of Acela train sets.

Figure 20. NEC Core Network and Feeder Lines³³

Springfield Line

Amtrak owns this 54.3-mile segment in Connecticut between New Haven and Enfield that extends to Springfield, Massachusetts. This segment is a branch of the NEC and connects to the NEC Main Line at Mill River Junction north of New Haven and CSX in Springfield. The USDOT has designated this line as a High-Speed Rail Corridor in Connecticut. The segment is a single track between Union Station Springfield and the Cedar Interlocking in Connecticut with passing sidings and has two tracks between Cedar Interlocking and the Mill River. This segment used to have two tracks in Connecticut and funding is in place to restore two tracks in a section of this line.

Amtrak Regional, Springfield Shuttles, and the Vermonter serve this line and operate six round trip intercity trains daily New Haven and Springfield per day. The following freight lines connect with the Springfield Line: the Terryville Secondary, the Griffin Line, the Manchester Industrial Track, the Wethersfield Secondary, and the Suffield Branch. CSO, PAS, and CSX provide Springfield Line freight service. Currently, commuter service does not operate on this segment although the Department has legislative approval and plans to initiate service in the future when funding becomes available.

Inland Route

The Inland Route is comprised of the Springfield Line from New Haven to Springfield, and CSX's Boston and Albany Line from Springfield to Boston Back Bay Station, where a train would connect back to Amtrak's Shoreline Route for the final few miles to Boston South Station. This

³³ Source: The Northeast Corridor Infrastructure Master Plan, May 2010, Page 1.

route is an alternate route to Boston, in between New Haven and Boston Back Bay Station. It serves a number of inland cities, among them Hartford, Springfield, Worcester, and Framingham. Figure 21 contains a photograph of an Amtrak train traversing the Connecticut River Bridge.

Amtrak provides regional passenger service, although the cutbacks of a few years ago have reduced this route to one train per day in each direction. This train runs from Boston to Chicago, and joins at Albany-Rensselaer, New York with a train that originates at PSNY. There is a lengthy connection off Amtrak's Springfield Line at Springfield Station. MBTA runs commuter rail service over this route from Worcester and Framingham to Boston. The Boston and Albany route through Springfield toward Boston is a heavily congested freight route operated by CSX. It experiences between sixteen and eighteen freight trains per day.



Figure 21. Amtrak Train Traversing the Connecticut River Bridge - Photograph

Westerly, Rhode Island – New Haven

Amtrak owns the 70-mile segment along the Connecticut shoreline between New Haven and the Rhode Island state line. The segment is primarily 2-tracks with passing sidings near Guilford, Old Saybrook, and Groton. The Springfield Line joints this segment at Mill River Junction, which is north of New Haven. In Connecticut, Amtrak trains have station stops at Mystic, New London, Old Saybrook, and New Haven Union Station. Amtrak Regional, Vermonter, and Acela Express intercity services, as well as MNR and SLE commuter rail services, shares Union Station, which is the tenth busiest station on the Amtrak national system.

Amtrak, SLE, P&W, and CSX operate on this segment. Amtrak operates 38 trains (19 daily round trips) to Boston, New York and south, providing Acela Express and Regional service approximately hourly in the peak and bi-hourly in off peak periods. P&W operates at least daily through freight trains serving industries in the region including several large quarries.

Amtrak is the operator of Connecticut's SLE commuter service; this service is expected to double in size between New Haven and Old Saybrook by the year 2030. SLE expansion will require up-and-over high-level platforms at all stations, and will require an agreement with CDEEP regarding the number of trains operating over the movable bridges.

New Haven – New Rochelle, New York

This 56-mile segment along the New Haven Line is part of the NEC and the Department owns the right-of-way in Connecticut. Amtrak operates 42 daily Acela Express, Regional, and Vermonter intercity trains on this segment through a trackage rights agreement. In Connecticut, Amtrak trains have stops at Union Station New Haven, Bridgeport, and Stamford stations.

Additional information on this segment is discussed in Chapter 4.

5.3 INTERCITY PASSENGER RAIL FACILITIES

Stations

Connecticut NEC stations that Amtrak provides service to include Stamford, Bridgeport, New Haven, Old Saybrook, New London, and Mystic.

Connecticut Springfield Line (branch line of NEC) stations include Wallingford, Meriden, Berlin, Hartford, Windsor, and Windsor Locks.

Yards and Facilities

New Haven Parcel G is used to store and service Amtrak Shuttle trains, work engines, electric and diesel locomotives. Parcel G has a pit track, equipped with oil/water separator. Diesel, lube oil, and traction sand are dispensed from this location. Approximately 30 Amtrak employees work in the facility that is equipped with restrooms and locker rooms.

Amtrak has operating rights in the Department owned New Haven Rail Yard. This Yard is utilized for turning Amtrak equipment on the MNR controlled Loop Track.

The Department owns the SLE commuter rail facility in New Haven Yard and Amtrak operates it to maintain SLE diesel locomotives, cab cars, and coaches. Approximately forty-two Amtrak mechanical/technical employees work at this facility. Amtrak SLE train and engine crews report to this facility.

Cedar Hill Yard, located east of New Haven, straddles parts of New Haven and North Haven. Formerly a classification yard, Amtrak uses this yard primarily as a storage base for maintenance-of-way equipment. Approximately one hundred employees work from this base. Cedar Hill is the headquarters of the New England Division engineer, radio shop, and material control.

At Groton Midway maintenance-of-way base, approximately one hundred engineering employees work out of this facility.

5.4 INTERCITY PASSENGER RAIL ASSET CONDITION AND NEEDS

Springfield Line

The Springfield Line, which is a branch line of the NEC, has been designated a high-speed rail corridor and a potential candidate for electrification. In 2008, Amtrak completed an extensive tie replacement project on this line and replaced over forty thousand wooden ties.

There have been significant discussions between the Department, Amtrak, and MADOT for commuter service on the Springfield Line. Several infrastructure requirements must be met to allow for increase speed and operating flexibility for a new commuter service and increased intercity services on this line. The Department is advancing a NEPA process to identify infrastructure needs and this discussion is contained in Chapter 4. Amtrak's *Northeast Corridor Infrastructure Master Plan* also contains a capital program by segment and these projects are contained in Appendix A.

Westerly, Rhode Island – New Haven

This segment in Connecticut is part of Amtrak's NEC Main Line. Major needs on this segment include the five movable bridges located that include the Niantic River Bridge (East Lyme-Waterford), Thames Bridge (New London-Groton), Connecticut River Bridge (Old Saybrook-Old Lyme), Shaw Cove Bridge (New London), and Mystic River Bridge (Mystic). CDEEP and coastal regulations limit the moveable bridge openings to protect the maritime industries. This restricts the number of trains that can operate on this segment.

Amtrak replaced the Thames Bridge in 2008. The remaining bridges are about 100 years old and in need of serious repair or replacement to improve reliability and decrease the chance of failure. The Niantic and Connecticut River bridges have been especially prone to failure. The Connecticut River Bridge has some serious structural deficiencies that need to be addressed and a feasibility study is currently underway to determine whether the bridge should be repaired or replaced.

Amtrak has a project to replace the 103-year-old Niantic River Bridge in East Lyme. The new bridge will improve reliability, reduce the chance for operational failure, and help minimize train and river traffic delays. The new bascule (rolling-girder type) bridge will replace the existing bascule bridge. The project will also include the replacement of East Lyme's Niantic Bay Overlook Walkway and replenishment of a portion of the beach. The project, estimated to cost \$105 million, is scheduled to be complete in 2013.³⁴

Amtrak's *Northeast Corridor Infrastructure Master Plan* released in 2010 identifies capital projects that will be necessary to reduce choke points and capacity constraints. Connecticut infrastructure projects on this line in addition to Niantic and Connecticut River Bridges include state of good repair projects at four stations, track and catenary improvements, interlocking upgrades and reconfigurations, new passing siding and layover yard. Additional information on these projects can be found in Appendix A and B.

New Haven – New Rochelle, New York

The asset condition and needs of this segment is discussed in Chapter 4 since the Department owns this right-of-way.

5.5 NORTHEAST CORRIDOR AND HIGH-SPEED RAIL AND PLANNING

Northeast Corridor Infrastructure Master Plan

Amtrak developed the NEC Infrastructure Master Plan to be an all-encompassing service plan for the NEC and based it on 2030 schedules, capital projects, and train movements. The

³⁴ Source: Amtrak Fact Sheet, Fiscal Year 2010, State of Connecticut, p. 2-3.

planning of the NEC Master Plan was a collaborative effort of NEC states and commuter partners and was released in May 2010.

High-Speed Rail Designations

Designation of high-speed rail corridors has taken place over the last decade, codified in federal transportation legislation. The map in Figure 22 identifies the corridors receiving the high-speed designations as indicated in green.



Figure 22. Designated High-Speed Rail Corridors Map³⁵

Although the NEC rail line in Connecticut operates with the high-speed Acela rail service at 125 miles per hour in the Guilford shoreline section, the NHL and Shoreline portion of the NEC currently is not a designated high-speed corridor. This circumstance results in the NEC being ineligible for ARRA High-Speed and Intercity Passenger Rail grant funding.

High-Speed Service Planning on the Northeast Corridor

Connecticut, as owner of a 46-mile section of the NEC, has participated in high-speed rail corridor planning on a continuous basis since the inception of high-speed service by Amtrak on the NEC in 1997. The Department, in coordination with the Northeast states and Coalition of New England Governors has participated in various studies and reports on high-speed rail corridor development and advancing projects that benefit the region.

Connecticut has planned, organized, and implemented intercity and high-speed corridor improvement projects as part of Connecticut stewardship of the 46-mile, state-owned section of the NHL from Port Chester, New York to New Haven, Connecticut. These projects, and the program of line improvements have been an ongoing program over several decades, and this corridor is capable of 79 mile per hour speeds in several sections.

³⁵ <http://www.fra.dot.gov/Pages/203.shtml>

Connecticut has been a partner with Amtrak in development of high-speed operations along the NEC. This partnership has helped produce significant speed improvements through curve modifications, interlocking and yard separations from high-speed traffic, power system replacement, and island platform configurations that together have produced significant intercity travel time improvements of 15 minutes in the Connecticut section alone.

Connecticut has been strong supporter of the Amtrak Acela high-speed rail initiative and has been an important partner in facilitating Amtrak's NEC Rail Improvement Program, planning and assisting implementation for the electrification of the Corridor on the New Haven to Boston section concurrently with SLE commuter operations. Connecticut will support the NHL, Westerly, Rhode Island to New Haven segment, and the Springfield Line for both its intercity and high-speed rail growth potential.

Regional Planning and Coordination

The states of Connecticut, Massachusetts, New Hampshire, and Vermont share a vision of a high-speed corridor from New Haven to Springfield, Worcester, and Boston and Montreal through direct or Boston-hub routing. These are high-speed rail designated corridors, and each state wishes to develop those corridors as part of the regional growth strategy expressed by the Coalition of Northeastern Governors.

"With Boston as its hub, the Northern New England Corridor as seen in Figure 23 would serve destinations in Maine, Massachusetts, Connecticut, New Hampshire, Vermont, and the Canadian province of Quebec. The corridor currently includes routes from Boston to (a) Portland, Maine; (b) Montreal, Canada; and (c) Albany, New York, via Springfield, Massachusetts, with an extension from Springfield to New Haven, Connecticut. Frequent passenger service currently links Boston with Portland, and New Haven with Springfield. Less-frequent service connects Boston with Springfield and Albany; there are no passenger trains today between Boston and Montreal."³⁶



Figure 23. Northern New England Corridor Map³⁷

³⁶ Source: FRA <http://www.fra.dot.gov/rpd/passenger/654.shtml>

³⁷ Source: FRA <http://www.fra.dot.gov/rpd/passenger/654.shtml>

Connecticut is very committed to collaborating in the development of the Northern New England Corridor and the variations under study regionally. Investment in the north-south New Haven-Springfield-St. Albans corridor will be essential to regional growth in passenger operations, and significant to rail freight.

Rail freight shared use of the north-south New Haven-Springfield-St. Albans corridor is also of key importance, as indicated elsewhere in this Plan. The common corridor access of both the west-east CSX and Norfolk-Southern corridors are very important to the state of Connecticut, and offer an ability to reduce congestion with passenger rail operations through several linkages at Ayer, Worcester, Hartford, and Pittsfield.

New England Governors Pursuing Joint Regional Vision for High-Speed Rail

The New England states and governors in coordination with the Coalition of Northeastern Governors (CONEG) have been working together for decades to promote passenger rail service in the Northeast.

The completion of the electrification of the NEC in 2000 is an example of the region's successful long-term advocacy for passenger rail. The goal is to double passenger rail ridership in the Northeast by 2030 with a vision for development of the Northern New England high-speed rail corridor that will connect major cities and airports, and support economic growth throughout the region. The Vision for the New England high-speed and intercity rail network lays out key projects to strengthen passenger and freight rail service along new and existing rail corridors.

The New England states key projects in the states' vision are:

- Through Connecticut's leadership, the group will work to double track and replace bridges on the Springfield Line that serves the cities of New Haven, Hartford, and Springfield to provide the foundation for the larger rail network. Expanded train service will provide key connections between New York City and Bradley International Airport, and will allow further development of the inland high-speed rail line between Boston and New York.
- The Downeaster service that operates on a route included in the Northern New England high-speed rail corridor between Boston and Portland is a national model for the successful introduction of new intercity passenger rail service. The states along the Downeaster Route are working together to improve the infrastructure with the goal of reducing the travel time between Boston and Portland to two hours and increasing capacity to support 7 daily round trips.
- New Hampshire's Capital corridor will create easily accessible passenger rail service for more than 500,000 residents of southern New Hampshire with stops in the cities of Concord, Manchester, Nashua, and Boston. The rail line will also stop at Manchester-Boston Regional Airport, creating a much-needed connection for tourists and travelers from across northern New England. Eventually, this service will extend north to White River Junction, Vermont and to Montreal fulfilling the vision of this designated High-Speed Rail Corridor.
- Vermont's Western Corridor will provide direct service down the western side of the state connecting Burlington, Rutland, and Bennington with Albany and New York City via the Empire Corridor.
- Massachusetts will return the Vermonter to its original route through western Massachusetts via the Knowledge Corridor. This effort, supported by the state of Vermont, is a vivid

example of the ongoing collaboration of two states working together to improve service and increase the number of rail passengers. The Knowledge Corridor between Springfield and White River Junction provides a connection between the Boston to New Haven and the Boston to Montreal legs of the Northern New England high-speed rail corridor.

Other projects the states will pursue include the development of corridor plans for the Boston to New Haven and Boston to Montreal segments of the Northern New England high-speed rail corridor via the Inland Route through Worcester and Springfield. The Inland Route is also important as New England's largest freight rail corridor. Maine, New Hampshire, Vermont, and Massachusetts will develop corridor plans for the northern half of the Northern New England high-speed rail corridor, which extends from Boston to Portland and beyond and from Boston through Concord, New Hampshire, Vermont and terminating in Montreal. Massachusetts will continue its investment in the South Coast Rail project and continues to be supportive of building a connection between the North and South regional rail networks.

A Vision for High-Speed Rail in the Northeast Corridor

Amtrak's report "A Vision for High-Speed Rail in the Northeast Corridor", dated September 27, 2010, presents a concept for a Next-Gen-High-Speed Rail project to connect the major hub cities in the Northeast (Boston, New York, Philadelphia, and Washington, D.C.), along with smaller cities, airports, and suburban hubs such as Hartford, New Haven, and Stamford. The completed project would provide significant travel times savings and is estimated to increase ridership by five times the current Acela levels on a new dedicated alignment, with equipment, and stations. The study examines a variety of potential alignments, including one that parallels the major interstate highways (Highway Alignment), one that parallels the existing NEC (Shore Alignment), and one heading east of New York traversing Long Island Sound (Long Island Alignment).

CHAPTER 6 – FREIGHT RAIL NETWORK

The SRP contains an inventory of the freight rail network and an overview of the facilities and service provided by the ten freight railroad companies that operate in the state. It also reviews the rail asset condition, the constraints and needs of the system, and concerns expressed by the operators.³⁸ The long-term investment program submitted by the operators is contained in a spreadsheet in Appendix A and the accompanying narrative in Appendix B.

Connecticut legislation encourages strategies to achieve connectivity in access to the regional, national, and global economies.³⁹ It promotes the expansion of modal choices for freight, working towards access to the ports of New York and New Jersey and to the corridor related to the North American Free Trade Agreement.⁴⁰ One goal of the state is to support ways in which freight can move seamlessly from truck to rail and rail to truck to use the most cost efficient, fuel efficient and environmentally efficient way of moving freight to and from Connecticut industries.

Connecticut, like other states, struggles with the mounting costs of maintaining its highway infrastructure. A single intermodal freight train can carry the same load as 500 trucks. Nationally, freight shippers would have to add 50 million additional trucks on the roadways.⁴¹ Encouraging and supporting approaches that maximize the amount of freight that moves by rail while minimizing tonnage moving over state highways will help reduce wear and maintenance costs on the state's road system.

Railroads are the most fuel-efficient means of surface transportation, and are becoming more efficient and "green" at a much faster rate than long-haul trucking. Moving freight by rail reduces the consumption of diesel fuel, reduces heavy truck traffic, and reduces carbon emissions. The railroad track structure allows for the passage of wildlife and only experiences traffic a few times per day, as opposed to roads and highways, which see nearly constant movement of vehicles.

6.1 FREIGHT RAIL SERVICE OVERVIEW AND FACILITIES

Unlike public transit and the public highway network, the rail freight industry is operated by the private sector for profit. There are ten privately owned freight railroad companies operating in Connecticut. These companies own most of the rail freight infrastructure in the state and all of the rail freight equipment operating within the state. Figure 4 is the Rail Transportation Ownership and Service map that includes the freight lines in the state.

Branford Steam Railroad

The Branford Steam Railroad is an industrial railroad serving the Tilcon Connecticut, Inc. stone quarry and provides service between its trap rock quarry in North Branford and its barge loading facility on Long Island Sound in the Stony Creek section of Branford. The railroad has an interchange with P&W on the shoreline in Branford, and loads ballast trains for Amtrak. Most of the carloads of stone products are destined for Tilcon/Buchanan Marine barges that ultimately deliver the stone products to Long Island, New York, although significant amounts are shipped

³⁸ Note: CSX Transportation and Tilcon/Branford Steam did not respond to requests to provide input into the SRP.

³⁹ Connecticut General Statutes, Sec. 13b-57g (5).

⁴⁰ Connecticut General Statutes, Sec. 13b-57g (3).

⁴¹ State of Nation's Intercity Rail, Surface Transportation Policy Project, Decoding Transportation Policy & Practice series #12 (February 2004).

by rail to metropolitan New York City. Tilcon also supplies its asphalt and concrete plants in Connecticut from the North Branford quarry.

Central New England Railroad

Central New England Railroad (CNZR) is a short line railroad that operates in Connecticut over the Department's Griffin Industrial Track between Hartford and Windsor (8.7 miles), and over the Department's Armory Branch Line between South Windsor and the Massachusetts State Line in Enfield (13.5 miles). It interchanges with the Connecticut Southern Railroad (CSO) and Pan Am Southern Railroad (PAS) in Hartford. On the Griffin Line, trains run twice a day, five to six days per week totaling over 2,000 rail cars a year and on the Armory branch, it moves 125 cars a year for a total combined equivalent of 17,000 truck trips removed from local roads and highways.

The company's major customers include Home Depot USA, Hartford Lumber, Crop Production Services, and Blakeslee Wood Pellets. Primary rail commodities include lumber, chemicals, fertilizer, and wood pellets. The two branch lines are maintained at FRA Class 1 and Class 2 standards, and CNZR desires to replace the lighter rail sections dating back to the late 1800's and increase crosstie replacement.

The major impediment to the revival of this route is the removal of track in East Longmeadow and Springfield during the 1990's, and the selling off portions of the right-of-way for parking areas. The State of Massachusetts Department of Transportation and the Pioneer Valley Planning Commission (PVPC) would likely be involved in discussions regarding future restoration of rail service on the former track bed of the Armory Branch.

CSX Transportation

CSX Transportation (CSX) operates over a 21,000 route-mile rail network. CSX serves 23 states, the District of Columbia, and the Canadian provinces of Ontario and Quebec. It serves every major population center east of the Mississippi River, including the New York, Philadelphia, and Boston markets in the northeast and mid-Atlantic; the southeast markets of Atlanta, Miami, Memphis, and New Orleans; and the Midwestern cities of St. Louis and Chicago. It also serves 70 ocean, river, and lake ports along the Atlantic and Gulf Coasts, the Mississippi River, the Great Lakes and the St. Lawrence Seaway.⁴²

In Connecticut, CSX operates nearly 70 miles of railroad and maintains 11 public and private grade crossings. In 2009, CSX handled more than 9,500 carloads of freight and employed seven people in Connecticut. Products shipped include lumber, municipal and construction waste, plywood, limestone, and wood pulp. In Connecticut in 2009, the company invested more than \$1.3 million in the network and in partnership with state and local economic development agencies, businesses invested \$1.75 million in new or expanded rail-served facilities on CSX Transportation or its connecting regional and short lines. CSX has a TRANSFLO terminal in North Haven that provides transloading (transfers of freight between railcars and trucks), materials management, and logistics services.⁴³

⁴² <http://csx.com/?fuseaction=about.network>

⁴³ http://www.csx.com/share/wwwcsx_mura/assets/File/About_CSX/State_Fact_Sheets/Conn_Fact_Sheets_0506.pdf

Housatonic Railroad Company

Housatonic Railroad Company (HRRC) is a regional short line that operates in the western part of Connecticut along the Berkshire Line (50.0 miles), and to Derby/Shelton via its Maybrook Line (33.5 miles) and in western Massachusetts. The Department owns the northern 36.4 miles of the Berkshire Line between Boardman's Bridge in New Milford and the Massachusetts State line. HRRC owns the southern 13.6 miles of the Berkshire Line between Boardman's Bridge and Brookfield, as well as the Maybrook Line to Derby. HRRC interchanges with CSX in Pittsfield, Massachusetts, and has the potential to interchange with CSX in Beacon, New York. The HRRC has an opportunity to interchange with Pan Am Southern Railway in Derby, should the potential for this particular routing present itself.

HRRC operates trains between Pittsfield and Canaan on Monday through Friday, and between Canaan and New Milford on Sunday through Thursday. It operates a local switching operation in the New Milford-Danbury-Newtown area on Monday through Friday. There are switching yards in N. Canaan, New Milford, Danbury, and Hawleyville/Newtown, along with an engine and railcar maintenance facility in Canaan.

HRRC handle approximately 6,000 railcars a year of commodities that include lumber, limestone, pulp, paper, and waste. This is the equivalent of approximately 24,000 truckloads. In addition to serving several large industrial customers and smaller shippers, Housatonic also moves a considerable volume of the traffic through its bulk transfer facility located at the intersection of I-84 and Route 25 in Newtown. The Newtown facility has the capacity to load/unload cars within its lumber terminal and on its bulk track with total capacity of approximately 30 car spots as well as additional capacity for car staging.

Naugatuck Railroad Company

Naugatuck Railroad Company (NAUG) is a common-carrier short line railroad that operates over the Department's Torrington Branch between Waterbury and Torrington (19.5 miles). It is primarily a historic tourist passenger railroad, operating out of Thomaston, providing sightseeing tours along the Naugatuck River. The regular operating season runs from May to October, and trains operate on Tuesday and Sunday. Additionally, independent charter tours are available throughout the year.

The NAUG formerly moved regular shipments of lubricating oils to Waterville (section of Waterbury), and recent (September 2011) indications point to an early resumption of this traffic. NAUG handled a series of special overweight and over-dimension transformer shipments for CL&P, to Watertown and Torrington. Along the NAUG line in Watertown, a major Construction and Demolition ("C&D") transload facility has completed the permitting process, being authorized to handle up to 2500 tons of outbound C&D daily. The preliminary site work for this facility has commenced as of September 1, 2011.

In addition, the railroad has been the location for filming portions of several major motion pictures in the past few years. It has a maintenance shop in Thomaston and has the capacity to perform contract maintenance for other railroads and rail car fleets.

Pan Am Southern Railway

Pan Am Southern

Pan Am Southern Railway (PAS) (Spring 2009) is a freight railroad jointly owned by Pan Am Southern (PAR) and Norfolk Southern Railway (NS). Under the PAS operating structure, the Springfield Terminal Railway provides all rail services for the joint venture. PAS operates on

105.7 miles of track in Connecticut over the Waterbury Branch (24.9 miles + 17.2), the Waterbury Industrial Track and Watertown Branch, the Canal Branch (3.4 miles), and the Springfield Line (59.2 miles). To service its Connecticut operations, PAS operates trains between East Deerfield, Massachusetts, and Plainville via Amtrak's Springfield Line to Berlin, and then over PAS track to Plainville.

Norfolk Southern Railway is a subsidiary of Norfolk Southern Corporation, and operates approximately 21,000 route miles in 22 states and the District of Columbia. Norfolk Southern services every major container port in the East and is North America's largest rail carrier of metals and automotive products.

Pan Am Railways (PAR) is the Northeast's largest regional railroad. With operations in Maine, New Hampshire, Massachusetts, Vermont, Connecticut, New York, and Canada, PAR interchanges traffic with fifteen railroads throughout its network.

PAS has general-purpose rail yards in Waterbury, Plainville, and New Britain. PAS has centralized its' Connecticut operations out of the Plainville yard, which serves as the logistical support center for track and signal maintenance forces, as well as a location for light mechanical repairs to railcars and locomotives.

PAS transports carloads of propane, lumber and construction materials, steel, plastics, chemicals, stone, paper, and scrap. PAS is experiencing increased car loadings from several recent local business expansions and new industrial facilities. Perma-Treat Company, a railroad crosstie manufacturer owned by Pan Am Railways, loads several hundred carloads per year of new railroad crossties out of New Britain yard, shipping primarily to northern New England and Atlantic Canada.

Tilcon's quarry in New Britain/Plainville is connected to the rail line, but is not presently shipping by rail. The Canal Branch in Plainville and Southington has three active clients: J.W. Green ships outbound scrap metals, Forestville Lumber receives carloads of both plywood and dimensional (structural) lumber, and a new Amerigas Distribution Center receives significant inbound shipments of propane in tank cars for final distribution by truck. Another new rail customer is Clark Western, a manufacturer of steel building studs who receives carloads of steel coils. Clark Western modified and updated a portion of the former New Departure building in Bristol. Firestone's Roofing Products Division occupies a large section of the New Departure plant that receives significant inbound shipments of liquid raw materials and chemicals for manufacturing. In Waterbury, Albert Bros. Scrap Metals ships several hundred carloads of outbound scrap steel. The Waterbury Republican-American newspaper receives occasional carloads of newsprint.

PAS connects at Waterbury to the Naugatuck Railroad, which receives inbound shipments of oversize and over-weight electrical transformers for Connecticut Light & Power. Hubbard Hall Chemical in Waterbury receives inbound chemicals in tank cars. Occasional carloads of wood stove pellet fuel are shipped to a distributor at Beacon Falls. Kerite Co. in Seymour manufactures and ships oversized underwater cable that is too large and too heavy to ship by truck.

A Construction & Demolition (C&D) transfer facility in Waterbury is completing a sidetrack for loading several outbound carloads of material each day. This facility alone will require PAS to increase the frequency of service to Waterbury. Additionally, a second large C&D facility along the Naugatuck Railroad's Torrington Branch is in the final stages of permitting. This project would drastically increase outbound car loadings in the Waterbury area.

Presently, PAS runs a round trip from East Deerfield, Massachusetts to Plainville once per week. East Deerfield is PAS' primary connection to the North American rail network. On alternate days, PAS runs out of Plainville to Southington, New Britain, Bristol, or Waterbury, as demand warrants. New customers coming on line in the Waterbury area will likely require a second locomotive and second train crew to be assigned to PAS' Connecticut operations.

Providence and Worcester Railroad Company

The Providence and Worcester Railroad Company (P&W) is a regional FRA designated Class 2 railroad⁴⁴ operating in Massachusetts, Rhode Island, Connecticut, Long Island, and as far south as the New York area. In Connecticut, P&W operates over 238.5 miles of track, consisting of 67.9 miles of its own lines, 85.5 miles of line over which it has operating rights and provide service, and 85.1 miles of track over that it operates through trains only. It operates on track it owns in the eastern part of the state, including the Plainfield Secondary Line (53.2 miles) and part of the Willimantic Secondary Line (10.8 miles). It has rights to move trains over the NHL (46.8 miles), over the southerly 4.8 miles of the Middletown Secondary, and over the Maybrook Line from Derby to Danbury (33.5 miles). P&W recently reconstructed the line between Middletown and Hartford (13.6 miles) on the state-owned right-of-way. P&W has exclusive operating rights over the Wethersfield Secondary. The Willimantic Branch line has recently been reconstructed from the Versailles yard to the Willimantic yard for restoration of local and through freight service. P&W plans to upgrade the Branch to permit 40 M.P.H. operations.

P&W has classification yards in Plainfield and Willimantic, and operates an intermodal facility in Worcester, Massachusetts, where it interchanges with CSX Transportation (CSX). It interchanges with Pan Am Railways (PAR) in Gardner, Massachusetts, and the New England Central Railroad (NECR) at Willimantic. The connections at Willimantic and New London provide access to the Canadian Pacific Railway and Canadian National Railway. P&W interchanges with the Connecticut Southern Railroad in North Haven and Hartford, and with the New York and Atlantic Railway in Fresh Pond, Long Island, New York.

P&W serves many industrial facilities and supports a large number of rail and industrial jobs in Connecticut. Among its dozens of clients, P&W serves the Frito-Lay production facility in Killingly, a chemical and bulk plastic transfer facility in Plainfield, several rock quarries and gravel pits, a construction and demolition debris facility in Portland, and metal transfer facilities in New Haven and Middletown. It has a maintenance-of-way equipment repair facility in Plainfield; along with a fully equipped spray-paint facility for locomotives and rolling stock.

P&W operates trains between Plainfield and North Haven and between North Haven and Middletown on Monday through Friday, with trains to Danbury as needed. P&W also operates trains between Plainfield and Groton and between Plainfield and Putnam on Monday through Friday, and to Willimantic nightly for the newly re-activated interchange with New England Central Railroad.

⁴⁴ A Class II railroad in the United States is a mid-sized freight-hauling railroad, in terms of its operating revenue. As of 2006, a railroad with revenues greater than \$20.5 million but less than \$277.7 million for at least three consecutive years is considered a Class II railroad. Switching and terminal railroads are excluded from Class II status. Railroads considered by the Association of American Railroads as "Regional Railroads" are typically Class II railroads. http://en.wikipedia.org/wiki/Class_II_railroad

In 2010, the company transported nearly 35,000 carloads of freight that included a mix of chemicals, plastics, and minerals, and nearly 24,000 intermodal shipments, some of which originate or terminate in Connecticut, and estimates it diverts more than 100,000 truck trips from Connecticut's highway system annually.

RailAmerica, Incorporated

RailAmerica, Inc. is a holding company that owns and/or operates 13,200 miles of track on 43 separate railroads in 28 different states and 3 Canadian provinces. RailAmerica, Inc. has two subsidiaries that operate in Connecticut: Connecticut Southern Railroad (CSO), and the New England Central Railroad (NECR).

Connecticut Southern Railroad / RailAmerica, Incorporated

Connecticut Southern Railroad (CSO) is a subsidiary of RailAmerica Inc., operating on CSX from West Springfield to Springfield, Massachusetts, and on Amtrak from Springfield to North Haven (53 Miles). CSO owns and operates the Manchester Secondary Line (9.6 miles), the Windsor Branch Line (6.8 miles), the Wethersfield Branch Line (3 miles) and the Suffield Branch Line (4.4 miles). CSO also operates on the spur track to Bradley Airport that the State of Connecticut owns (2.4 miles) and operates trains between Springfield and Hartford and between North Haven and Hartford on Monday through Saturday, and out of Hartford daily. CSO interchanges traffic with CSX Transportation at their West Springfield, Massachusetts yard. CSO also moves traffic for CSX between West Springfield, Massachusetts, and North Haven under a haulage arrangement.

The major commodities carried are construction and demolition debris (C&D), road salt, lumber, steel, grain, paper, chemicals, cullet, pulp and consumer goods. It estimates it diverts more than 80,000 truck trips per year. It has switching yards in Hartford (30 acres) and East Hartford (10 acres). CSO provides the only physical interchange access to the Central New England (CNZR) isolated state-owned branch lines – the Griffin Industrial and the Armory Branch. The CSO also has an interchange with the Providence & Worcester Railroad at Hartford via the Wethersfield Branch that is currently inactive.

CSO has two major projects that are under active development. A paving stone manufacturer is interested in constructing a sidetrack in North Haven (off the Amtrak mainline), and a major C&D transfer station is under construction in Berlin (off the Amtrak mainline).

The CSO's route to Bradley International Airport connects with the New Haven-Springfield Amtrak mainline at Windsor Locks. This route could be upgraded for direct passenger rail access to the airport and should be included in studies involving future rail and intermodal passenger options for Bradley. This route also serves the Connecticut National Guard's Camp Hartell facility.

The CSO's customers are in need of 286,000 pound freight rail capacity. This is the current North American standard, in place since 1995, according to the Association of American Railroads. Currently Amtrak's New Haven-Springfield line is not rated for 286K weight limits, with a limit of 263,000 pounds gross on rail weight. The major impediment to upgrading this route to 286K standards is Amtrak's Connecticut River bridge near the Connecticut/Massachusetts border. Amtrak has done a study of this bridge and what is needed for its upgrade but lacks funding. South of the CSO's Hartford yard, Amtrak's Hartford Viaduct structure is also restricted to 263,000 lbs. and requires upgrade. CSX's route through Springfield, Massachusetts, which is CSO's connecting interchange partner, is currently rated

for 286K over heavier loads. Thus, if the Amtrak route were upgraded, immediate connection is available for the movement of 286K cars into and out of Connecticut. The majority of CSO's customers are in need of the higher weight standard, including C&D, road salt, feed ingredients, and cullet. Significant traffic growth for Connecticut and the region can be achieved with the completion of this heavy haul corridor. Without upgrading to modern 286K weight standards, Connecticut will become an "island" that no longer conforms to the equipment and shipping standards of the North American rail network, thus directly affecting Connecticut businesses by limiting their shipping access and competitive options.

The Connecticut Resources Authority (CRRA) at Hartford generates high volumes of ash that could be transported by rail. The facility once had freight rail infrastructure in place. The CRRA could have the rail freight infrastructure restored and convert its existing truck shipments to rail, thus eliminating truck trips along Connecticut's urban highway system.

New England Central Railroad / RailAmerica, Incorporated

New England Central Railroad (NECR) is a subsidiary of RailAmerica, Incorporated and operates on its own line between New London and Stafford (55.8 miles) and on to East Alburg, Vermont, and a distance of 326 miles, where it connects with the Canadian National Railway. It also interchanges with CSX at Palmer, Massachusetts, Pan Am Southern at Millers Falls, Massachusetts and Canadian Pacific via Bellows Falls, Vermont. The NECR is unique in that it offers Connecticut businesses access to all four Class I railroads. It also interchanges with the Providence & Worcester Railroad at Willimantic and New London. NECR transports more than 19,000 carloads annually in Connecticut, consisting of paper, plastics, lumber, copper, wood products, corrugated paper, coal, ethanol, and fly ash.

The NECR directly services the Port of New London, Connecticut and provides access to the Port of Montreal via the Canadian National Railway (CN). The NECR is interested in working with the State of Connecticut and their selected port operator to grow rail freight business at New London.

The NECR is currently cleared for Phase I modified double-stack container movements (one domestic and one international container stacked), after a coordinated effort by the NECR, State of Vermont, and USDOT to remove clearance obstacles. The route needs to be cleared for Phase II containers. CN currently markets its container service to New England customers via this route, utilizing P&W's Worcester, Massachusetts terminal that is reached via the Willimantic NECR-P&W interchange connection. Increased rail freight business can be achieved by opening up the route to Phase II container capacity. This route is listed as a high priority in the Massachusetts and Vermont State Rail Plans as a continuous corridor. The clearance project has also allowed the movement of modern tri-level auto carriers moving via this route.

Customers served in Connecticut include Freeport-McMoran Copper at Norwich; Kof Koff feed ingredients at Franklin, and AES Thames power plant at Thamesville. The Willimantic interchange with the P&W has been a source of growth for Connecticut and regional New England businesses and is in need of upgrade. The route is also a growing through route for freight moving to and from the NECR's four Class I railroad connections, such as ethanol, road salt, finished autos, and coal.

In 2012, the NECR will complete its High Speed Rail project in Vermont and New Hampshire. As part of that project, all bridge and track structures will be upgraded to handle the modern 286,000 pound gross weight railcar. A small portion on the north end of Vermont and all of Massachusetts and Connecticut remain in need of similar upgrades to create New England's

first heavy haul 286,000 K multi-state corridor. 286,000 pound upgrades to the NECR corridor are listed as high priorities in the Massachusetts and Vermont State Rail Plans, thus forming a continuous corridor. Significant traffic growth for Connecticut and the region can be achieved with the completion of this heavy haul corridor. Without upgrading to modern 286,000 K weight standards, Connecticut will become an “island” that no longer conforms to the equipment and shipping standards of the North American rail network, thus directly effecting Connecticut businesses by limiting their shipping access and competitive options.

Communities along the NECR in Connecticut and Massachusetts have become interested in re-establishing rail passenger service along the line. This group, the Central Corridor Line Coalition, is actively working together to explore the opportunities that passenger rail service could provide. The Central Corridor Line links Amtrak's Northeast Corridor at New London with the Mohegan Sun Casino at Uncasville, the University of Connecticut at Storrs/Mansfield, the University of Massachusetts at Amherst, and Amtrak's Vermonter service at Brattleboro, Vermont. In addition, a casino is likely to be built in the Palmer, Massachusetts area within the next three years. The service could be provided by a private rail operator under contract with the Corridor.

Valley Railroad Company

Valley Railroad Company (VRR) is a tourist railroad that operates between Old Saybrook and Haddam along the right-of-way owned by the Connecticut Department of Energy and Environmental Protection. The company began operations on July 29, 1971. It has authority to operate up to the southern end of the P&W's Laurel Branch in Middletown.

From May through the Christmas season, the VRR runs up to five round trips per day, three to seven days per week, on various segments of the line from Old Saybrook to the current end of usable track at Mile Post 12.75 in Haddam. During some special events up to 40 trips per day may operate. Many patrons additionally make a riverboat connection with company facilities in Deep River. There are additional excursion services provided on a smaller scale during the winter and early spring months. The company's positive economic impact on the lower Connecticut River valley community is significant, regularly drawing 140,000 visitors per year, with almost half being from out-of-state.

Most public highway/rail grade crossings have been upgraded rail weighing 107 pounds per yard or heavier, and many are in very good condition. Most private crossings are smaller rail, with several being 100-year-old 74 pound rails. Twelve of the fourteen public crossings are equipped with active warning devices. Most of these systems were designed, constructed, and funded by the VRR, and are maintained to FRA standards at the Company's expense.

6.2 INVENTORY OF FREIGHT RAIL NETWORK

There are over 628 miles of freight railroad right-of-way in the state consisting of public and privately owned property as shown in Figure 24.

FREIGHT RAILROAD RIGHT-OF-WAY MILES	
Public	ROW Miles
<u>Freight Railroad Operating Rights</u>	
Federal – Amtrak owned	122.5
<i>Shore Line and Springfield Line</i>	
State of Connecticut owned	128.2
<i>New Haven Line, Branch Lines and misc.</i>	
<u>Freight Railroad Lease Agreements</u>	
State of Connecticut owned	129.1
Municipal - city of Bristol owned	2.0
Total Public	381.8
Private	
Freight Railroad Companies (privately owned)	
Total Private	246.7
TOTAL	628.5

Figure 24. Freight Railroad Rights of Way Miles in Connecticut

Armory Branch Line

The Armory Branch Line traverses 20.1 miles through suburban and rural areas serving retail customers between East Hartford and Enfield. In the past, the line continued to Springfield, Massachusetts, but was discontinued north of the state line. CSO owns this line from East Hartford to South Windsor (6.8 miles), and the State of Connecticut owns the line from South Windsor to Enfield (13.3 miles). The Line is maintained as FRA Excepted Track. There is no passenger or through freight service on this line and local freight service is provided by CSO from East Hartford to South Windsor, and by CNZR from South Windsor to Enfield.

Berkshire Line

The Berkshire Line traverses 50.0 miles between Danbury and North Canaan. It runs from a junction with the Maybrook Line in Brookfield to the Massachusetts State line in North Canaan. HRRC owns this line from Brookfield to New Milford, and the State of Connecticut owns it from New Milford to North Canaan. It is maintained at FRA Class 1 and Class 2 track standards. The HRRC provides through service for freight gathered in central and western Connecticut and provides local freight service to customers between Danbury and North Canaan. HRRC owns the line north of North Canaan to Pittsfield and interchanges traffic that moves over the Berkshire Line with CSX in Pittsfield. There is no passenger service on this line at present, though the railroad company has recently expressed interest in establishing passenger service.

Branford Line

The Branford Line and industrial track, traverses 7.2 miles between Branford and North Branford. Tilcon Connecticut, Inc. owns this line and uses it to move trap rock from its quarry in North Branford to its barge loading dock on Long Island Sound in the Stony Creek section of Branford, or to a connection with Amtrak's Shore Line in Branford. The Branford Steam Railroad provides freight service. It is maintained at FRA Class 2 track standards. There is no passenger service on this line.

Canal Line

The Canal Branch traverses 3.9 miles between Southington and Plainville. It connects with the Terryville Secondary at Plainville and runs south into the extreme north end of Southington. It crosses at grade and connects with the Waterbury Branch at Plainville Yard. PAS owns this line and maintains it to FRA Class 1 track standards. There is no passenger or through freight service on this line and Springfield Terminal Railway provides local freight service.

Griffin's Industrial Track

The Griffin's Industrial Track Line (Griffin Line) traverses 8.7 miles through urban and suburban areas, serving customers between Hartford and Windsor. The State of Connecticut owns this line and it is maintained at FRA Class 2 track standards. There is no passenger or through freight service on this line and local freight service to the Home Depot Regional Distribution Center is provided by the Central New England Railroad (CZNR).

Manchester Secondary Line

The Manchester Secondary Line traverses 9.6 miles through urban and suburban areas serving retail customers between Hartford and Manchester. CSO owns this line and it is maintained at FRA Excepted Track. There is no passenger or through freight service on this line and local freight service is provided by the CSO.

Maybrook Line

The Maybrook Line traverses 33.5 miles between Derby and Danbury. It connects with New York's Beacon Line in Danbury, the Danbury Branch in Danbury, the Berkshire Line in Danbury, and the Waterbury Branch Line in Derby. It connects with PAS at Derby, located immediately south of Metro-North's Derby/Shelton passenger rail station. Housatonic Railroad Company (HRRC) owns this line and it maintains it at FRA Class 1 track standards. HRRC provides local freight service and under a trackage rights agreement, P&W has rights to operate on this Line. There is no passenger service on this line.

Middletown Cluster

The Middletown Cluster system consists of four lines (E. Berlin, Portland, Middletown Secondary and Laurel Tracks) that traverse 1.1 miles north from Middletown toward East Berlin, 1 mile east across the Connecticut River to Portland, and 5.5 miles south along the river to the Laurel section of Middletown. This group includes 7.3 miles of the north end of the Middletown Secondary. Additionally, the Wethersfield Secondary Line, which was recently restored to service, begins at the crossing diamond in Middletown and goes to Hartford. The Laurel Track to the south connects with the Valley Line, which is out of service between Middletown and Haddam. The State of Connecticut owns these lines and they are maintained to FRA Class 1 or Class 2 track standards. There is no passenger or through freight service on these lines and local freight service is provided by the P&W.

Middletown Secondary Line

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

ships crushed stone to Old Saybrook utilizing a circuitous route southwest from Durham to New Haven, then east on Amtrak's Shore Line to Old Saybrook. The State of Connecticut owns the line from Durham to Middletown (See the Middletown Cluster, below). It is maintained at FRA Class 2 track standards. There is no passenger or through freight service on this line and local freight service is provided by the P&W.

Palmer Line

The Palmer Line traverses 55.8 miles between New London and Stafford. It runs from the Shore Line in New London to the state line in Stafford. It serves the State Pier in New London and connects to the Willimantic Secondary Line in Willimantic. This line is owned by New England Central Railroad (NECR) and is maintained at FRA Class 3 track standards. Through and local freight service is provided by the NECR. There is no passenger service on this line.

Plainfield Secondary Line

The Plainfield Secondary Line traverses 53.2 miles between Groton and Thompson. It runs from a connection with Amtrak's Shore Line in Groton to the Massachusetts state line in Thompson. It connects with the Willimantic Secondary Line in Plainfield. It is maintained at FRA Class 3 track standards (40 mph freight operations). P&W owns this line and provides through and local freight service. There is no passenger service on this line.

Suffield Branch Line/Bradley Spur

The Suffield Branch Line/Bradley Spur traverses 4.4 miles through suburban and rural areas serving customers between Windsor Locks and Suffield. The 2.4-mile Bradley Spur connects at Suffield and serves industries adjacent to Bradley Airport in Windsor Locks. Connecticut Southern Railroad (CSO) owns this line from a connection with Amtrak's New Haven-Hartford-Springfield Line in Windsor Locks, to Suffield. The line is maintained to FRA Excepted Track Standards. The State of Connecticut owns the line from Suffield to Bradley Airport, which crosses back into Windsor Locks. There is no passenger or through freight service on this line and local freight service is provided by CSO.

Terryville Secondary – Waterbury Branch

The Terryville Secondary is the common collective name for the freight-only Berlin Branch (2.6 miles), the New Britain Secondary (4.5 miles), and the Terryville Secondary Line (17.2 miles), which together traverse 24.3 miles between Berlin and Waterbury. The Terryville Secondary, running from Berlin westward through New Britain, Plainville, Bristol, Plymouth, and Waterbury is owned and operated by Pan Am Southern Railway (PAS). The Terryville Secondary connects with Amtrak's Springfield Line in Berlin, the Canal Branch in Plainville, and with MNR's Waterbury Branch and Naugatuck Railroad's Torrington Branch in Waterbury. The line is maintained to FRA Class 2 track standards. There is no passenger service on the line. The Springfield Terminal Railway provides PAS through freight service and local freight service for PAS.

MTA MNR operates passenger service over the Waterbury Branch, and is responsible for maintenance of the track structure. PAS has the local freight operating rights on the northern portion of the Waterbury Branch, in the towns of Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia, and Derby. The P&W, which holds the local freight operating rights on the southern end of the Waterbury Branch, also connects with PAS at Derby.

Torrington Branch

The Torrington Branch traverses 19.5 miles between Waterbury and Torrington. It runs from the Waterbury Branch Line in Waterbury to Torrington, where it terminates. The Naugatuck Railroad Company (NAUG) runs a seasonal tourist passenger service on this line. The State of Connecticut owns this line and it is maintained at FRA Class 1 and 2 track standards. There is no through freight service on this line, and local freight service is provided by the NAUG.

Valley Line

The Valley Line traverses 22.5 miles from a connection with Amtrak's Shore Line at Old Saybrook to a connection with the Laurel Track in southern Middletown. The Valley Railroad Company has operated as a tourist passenger service attraction for the past 40 years between Old Saybrook and Haddam by the Valley Railroad, regularly carrying in excess of 130,000 passengers per year.

The line is out of service between Mile Post 13.25 in Haddam and Mile Post 22 in Middletown, although this portion is maintained clear for maintenance of way equipment, vegetation control, and property surveillance. The State of Connecticut owns this line and it is administered by the Connecticut Department of Energy and Environmental Protection (CDEEP). The Department strongly supports maintaining this section of the Valley Line as a rail corridor and not converting the line into a trail. CDEEP strongly supports maintaining this section of the Valley Line for potential future scenic excursion service or other recreational or tourist uses. The Valley Line is a critical piece to a complex puzzle that should be preserved. It provides the only practical direct rail route between New London/Groton and the greater Hartford area.

The Line is maintained at FRA Class 1 and Class 2 track standards. There is no commuter or regional passenger or through freight service on this line. Valley Railroad is authorized to provide local freight service.

Wethersfield Secondary Line

The Wethersfield Secondary Line traverses 16.6 miles through urban and suburban areas serving customers between Hartford and Middletown. In Middletown, it connects to the Middletown Cluster. CSO owns the northern 3 miles of this line and the State of Connecticut owns the remainder. It is maintained at FRA Excepted Track standards. The line had been out of service south of Hartford, but P&W and the Department restored the track in 2002. There is weekly through freight service on this line between Middletown and Hartford. Local freight service on the northern three miles of the line is provided by the CSO. P&W provides local freight service south of Hartford. There is no passenger service on this line.

Willimantic Secondary Line

The Willimantic Secondary Line traverses 23.3 miles between Plainfield and Willimantic. It runs from the P&W's Plainfield Secondary Line in Plainfield to the New England Central's Palmer Line in Willimantic. This line is owned by P&W from Plainfield to Sprague, and by the State of Connecticut from Sprague to Willimantic. It is maintained at FRA Class 2 and Class 1 track standards, and is being upgraded to FRA Class 3 standards. Through and local freight service is provided by the P&W. There is no passenger service on this line.

Rail Line Mileage		Ownership		
DESCRIPTION	LENGTH	PUBLIC	PRIVATE	
New Haven Line	46.8	46.8		
New Canaan Branch	7.9	7.9		
Danbury Branch	24.2	24.2		
Waterbury Branch	27.1	27.1		
Shore Line	68.2	68.2		
Derby Branch (Maybrook)	33.5		33.5	
Berkshire Line	50.0	36.4	13.6	
North Canaan Ind., Track	0.5	0.5		
Torrington Branch	19.5	19.5		
Terryville Secondary (Waterbury Branch)	24.3	3.0	21.3	
Waterbury Industrial Track (Tilcon) + Watertown Branch	0.5+0.5		0.5	
Canal Line	3.9		3.9	
Springfield Line	54.3	54.3		
Middletown Secondary – 1	4.8		4.8	
Bradley Spur	2.4	2.4		
Middletown Secondary – 2	10.2		10.2	
<u>Middletown Cluster</u>				
Middletown Secondary – 3	7.3	7.3		
Wethersfield Sec. (HFD) – 1	13.6	13.6		
East Berlin Track	1.1	1.1		
Portland Track	1.0	1.0		
Laurel Track	5.5	5.5		
Branford Steam	7.2		7.2	
Valley Line	22.5	22.5		
Palmer Line	55.8		55.8	
Plainfield Secondary (Norwich)	53.2		53.2	
Groton Old Main	3.1		3.1	
Belle Dock/Waterfront St.	2.2	1.4	0.8	
Willimantic Secondary – 1	10.8		10.8	
Griffins Industrial Track	8.7	8.7		
Armory Branch (E. Windsor Sec)	20.3	13.5	6.8	
Manchester Secondary	9.6		9.6	
Suffield Branch	4.4		4.4	
Wethersfield Sec. (HFD) – 2	3.0		3.0	
Regional Market (HFD)	1.5	1.5		
Willimantic Secondary – 2	12.5	12.5		
Plainfield Spur	1.0	1.0		
Windham to Columbia	0.4	0.4		
Stratford Industrial Track	2.7		2.7	
Bristol – Terryville Loop Track	1.0		1.0	
Bristol Spur (city of Bristol) – Terryville Loop Track	2.0	2.0		
TOTAL	628.5	382.3	246.2	

Figure 25. Rail Line Mileages in Connecticut⁴⁵⁴⁵ Source: Connecticut Department of Transportation, Bureau of Public Transportation - Rail Operations, February 2010.

Freight Movements and Tonnage

Freight rail service is an important component of American industry's supply chain and a critical component of the state's economy. In Connecticut, the use of bulk transfer facilities is, and will continue to be, an important element in attracting freight from our highway system to the railroads. In this type of service, commodities are trucked to and from a rail terminal where it is loaded into or unloaded from rail cars and transferred to trucks for delivery to its ultimate destination. The use of bulk transfer facilities enables Connecticut industries that are not directly connected to rail to benefit from the flexibilities of short haul trucking, and from the economic efficiencies of moving freight long haul by rail. The growth of bulk transfer operations offers a significant potential for Connecticut to reduce long haul heavy trucking on its roads, while offering an environmentally friendly way to move our products to and from the global marketplace.

Significant tonnage is moved each year by the ten freight railroads that serve Connecticut. Figure 26 illustrates the annual freight tonnage moved over a five-year period. All of these freight railroads are connected to the North American rail network. CSX Transportation handles the vast majority of long-haul rail freight traffic into and out of Connecticut. It has developed and expanded a freight hub at a large rail yard in Selkirk, New York, near Albany. Trains from all across the country are routed direct to Selkirk, much like the hub-and-spoke concept utilized by airlines and FedEx. From Selkirk, large blocks of railcars are sent to direct connections with Connecticut short line and regional railroads at Pittsfield, Massachusetts, W. Springfield, Massachusetts and Worcester, Massachusetts. In addition, significant rail freight traffic from Atlantic Canada, the Midwest, Gulf Coast, and Pacific Coast enters Connecticut at Stafford Springs, over the New England Central Railroad. High-value chemical and plastic pellet rail traffic that originates in the Gulf Coast region is routed to Chicago and Montreal, and then to a connection with the New England Central Railroad, as that has proven to be a fast, reliable and economical routing.

The major categories of freight rail traffic terminating in Connecticut include crushed stone, gravel and sand; primary metal products; grain and food products; lumber and wood products; pulp and paper products; chemicals; and petroleum and coal products. The major categories of freight rail traffic originating in the state include scrap metal and paper; crushed stone, gravel and sand; concrete, clay, products; pulp and paper products; and chemicals.

A large source of outbound rail traffic in Connecticut is a commodity known as Construction & Demolition Debris, or C&D. This commodity, which is not to be confused with common garbage or municipal waste, is composed of wood debris, roofing and flooring material, broken cinder blocks, pieces of insulation, and other similar materials resulting from building demolition, remodeling of commercial space, or waste from new construction projects. In the past, these materials were buried in local landfills. These materials, which are produced in surprisingly large quantities, are processed to recover recyclables. The remaining debris is loaded into railcars for permanent disposal in massive regional landfills established in former coal mines in the Midwest.

There are at least ten C&D truck-to-rail facilities currently operating in Connecticut, with several additional sites under construction or being designed. These railcar-loading facilities collectively eliminate tens of thousands of long-haul trucks that would otherwise congest our local roads and highways. The C&D Industry's reliance on rail freight also reduces carbon emissions, conserves diesel fuel, and holds down the cost of waste disposal. Other major types of commodities shipped out of the state by rail include waste materials such as paper; chemicals such as plastics, soaps, and cleaners; primary metal products such as steel and zinc,

nonmetallic minerals such as stone, and hazardous waste. There is some intrastate shipment of stone and pulp products.

A new rail commodity is ethanol, shipped in tank cars. From almost zero loads only one year ago, Connecticut now sees 340 carloads per month over two rail lines. As the federal minimum requirement for this gasoline additive has been raised from 10 percent to 15 percent, the state should see a 50 percent increase in ethanol shipments in the short term.

Annual Connecticut Rail Freight Tonnage

Freight Carrier	2005	2006	2007	2008	2009	2010
Pan Am Southern Railway (estimate)	223,860	223,860	223,860	223,860	223,860	223,860
Providence & Worcester RR	1,850,000	1,850,000	1,850,000	1,850,000	1,853,000	2,005,000
CSX Transportation	1,105,000	1,081,200	994,500	956,250	810,000	810,000
Central New England RR	181,730	181,220	181,730	172,321	189,000	162,000
Connecticut Southern Railroad Co.	2,210,000	2,252,500	2,210,000	2,125,000	1,710,000	1,710,000
Housatonic RR	513,480	530,880	512,040	412,560	305,880	339,240
New England Central RR	1,066,700	1,160,600	1,024,427	1,085,782	950,000	980,000
Tilcon/BSRR (estimate 2009/2010)	2,500,000	2,200,000	1,800,000	1,600,000	1,400,000	1,300,000
Total	9,650,770	9,480,260	8,796,557	8,425,773	7,441,740	7,530,100

Note: Naugatuck RR currently hauling less than 10,000 tons/year. Valley RR currently hauls for internal use only.

Figure 26. Annual Rail Freight Tonnage⁴⁶

The economic analysis and additional information on freight commodities movement is located in Chapter 8 (Economic Impact and Development). Additional information on freight at the three deep-water ports located in New London, New Haven, and Bridgeport is discussed in Chapter 7 (Intermodal Rail Connections and Facilities).

6.3 FREIGHT RAIL ASSET CONDITION AND NEEDS

The needs of the rail freight system in Connecticut generally focus on maintaining national system access by maintaining and improving local infrastructure. Critical areas that need to be addressed are the condition of bridge components, rail, and crossties.

Loading Restrictions

The North American rail network has largely standardized on shipments of 286,000 pounds per carload, which typically translates to approximately 110 tons (222,000 pounds) of cargo on four axles. This provides for improved long-distance efficiency. In some markets, that standard is being expanded to a gross weight of 315,000 pounds. Figure 27 contains railroad freight car limits and goals for each rail.

Rail lines that do not meet the 286,000 pound weight limit operate at a significant economic disadvantage, as the rail cars cannot be loaded to their full potential. This causes freight to move at a higher cost per ton, creating a disadvantage to shippers while undermining the

⁴⁶ Source: Connecticut Department of Transportation, Office of Rail, Feb. 2010.

inherent efficiencies of rail versus truckload. Shippers will tend to move more traffic via truck or favor areas where it can take full advantage of 286,000 pound loading. Connecticut's economy generally, and its freight railroads in particular, to have most rail lines brought up to the 286,000 pound per carload loading capacity, and maintained at that level, to maintain a competitive economic advantage.

Factors for Determining Weight Limits

The weight-bearing capacity of a rail line is determined by several factors. First, the soil directly beneath the railroad track must be strong enough and dry enough to support the weight of train traffic without significant settling or lateral (sideways) movement. This is largely not a big factor in Connecticut, as the state's rail lines were built largely on a gravel bed (containing small rocks), or have been built over wet areas on roadbeds that consist of several feet of gravel. An example of this is the NHL, which runs through many wet, swampy locations along the coast.

Next, the track structure should be sitting directly on relatively clean ballast, usually consisting of crushed rock. This provides support, drains away rainwater, and holds the track in place. The sharp, broken edges of the stone ballast bite into the edges of the crossties, minimizing lateral track movement.

Crossties of treated hardwood or pre-stressed concrete are placed in the ballast and hold the track structure in place, maintaining elevation and alignment, ideally for several years before the track must be re-aligned and raised, where necessary. An adequate number of crossties must be in good enough condition to hold the track in gauge (4' 8 1/2" rail-to-rail) and within elevation and alignment tolerances, for the track to meet FRA Track Standards, which limit the speed and, in some cases, the carrying of hazardous materials over the track in question.

The running rail actually supports the rail cars. The rail cars of today are largely constructed to carry 286,000 pounds spaced over four axles (eight wheels). This includes the weight of the empty rail car. The weight of the empty rail car and its capacity in cubic feet and pounds is stenciled on the side of each rail car, so that shippers know exactly how much product can be put on board each car. Running rail comes in several different sizes, and is measured in pounds per yard, not pounds per foot, as is sometimes thought. Generally, rail sized 100 pounds per yard or bigger is capable of handling railcar weights of 286,000 pounds, with some notable exceptions. Some railroads with smaller rail of 90 or even 80 pounds per yard will carry 286,000 pounds freight cars at slow speeds provided it has exceptionally good crosstie condition, good track ballast, and consistent track elevation and alignment. This is generally done for a relatively short term, with a goal of upgrading to stronger, heavier rail within a few years.

Most importantly, all drainage culverts and bridges along a particular rail line must be built to withstand at least 286,000 pounds weights, and maintained adequately. Some degradation of bridge conditions is allowed, as many railroad bridges were built to withstand far more than 286,000 pounds. New rail bridges are designed and built to E-80 standards, which tolerate a loading in excess of 315,000 pounds spaced over four axles. Professionally trained bridge engineers, who examine all of the load-bearing components of a bridge and rate its current strength, based on a standard format, rate the current load-bearing capacities of bridges. Some bridges might need light-to-moderate component replacement to bring them up to 286,000 pounds standards, while some bridges may have suffered extensive corrosion or impact damage, in which case replacement of all or part of the structure is in order.

The most critical factor in determining which rail lines can be brought up to 286,000 pounds standards is usually the condition of -- along with the cost to repair -- bridges and culverts along

its route. Crosstie and running rail replacement, along with the application of good stone ballast -- all common tasks when maintaining a rail line -- can also carry moderate to significant costs, depending on the linear mileage of the project.

Railroad Freight Car Weight Limits and Goals in Connecticut

<u>Owner</u>	<u>Connecticut Rail Lines</u>	<u>Weight Limit (Pounds)</u>	<u>Weight Goal (Pounds)</u>	<u>Freight Operator</u>
CT	New Haven Line (1)	263,000	286,000	CSX, PWRR
CT	New Canaan Branch	263,000	263,000	CSX
CT	Danbury Branch (1)	263,000	286,000	PWRR
CT	Waterbury Branch - Lower (1)	263,000	286,000	PWRR
CT	Waterbury Branch - Upper (1)	263,000	286,000	STRR
Amtrak	Springfield Line (WL/Enfield - Springfield) (2)	263,000	286,000	CSO, STRR, CNZR**
Amtrak	Springfield Line (Hartford - WL/Enfield) (2)	263,000	286,000	CSO, STRR, CNZR**
Amtrak	Springfield Line (New Haven - Hartford) (2)	263,000	286,000	CSO, STRR, CSX
Amtrak	Shore Line (Groton - Stonington)	286,000	286,000	PWRR
Amtrak	Shore Line (New Haven - Groton)	286,000	286,000	PWRR
C	Berkshire Line - North Section	286,000	286,000	HRRC
Freight	Berkshire Line - South Section	286,000	286,000	HRRC
Freight	Maybrook Line	286,000	286,000	HRRC
CT	Torrington Branch (3)	263,000 *	286,000	NRR
CT	Terryville Secondary - South Section (4)	263,000 *	286,000	STRR, NRR
Freight	Terryville Secondary - North Section (4)	263,000	TBD	STRR
Freight	Lower Middletown Secondary	263,000	TBD	CSX
Freight	Stratford Industrial Track	263,000	263,000	CSX
Freight	Armory (East Windsor Sec.) - South Section	286,000 *	286,000	CSO
Freight	Manchester Secondary (5)	286,000 *	286,000	CSO
Freight	Suffield Branch	286,000 *	286,000	CSO
CT	Bradley Spur	286,000 *	286,000	CSO
Private	Middletown Secondary - Middle (6)	263,000	TBD	PWRR
CT	Middletown Secondary - Upper (6)	263,000	TBD	PWRR
Freight	Plainfield Secondary (Norwich) (7)	286,000 M	286,000	PWRR
CT	Willimantic Secondary (8) - West Section	263,000	TBD	PWRR
Freight	Willimantic Secondary (8) - East Section	263,000	TBD	PWRR
Freight	Branford Line (9)	263,000	263,000	BSRR
CT	Valley Line (10)	263,000	263,000	VRR
Freight	Palmer Line	263,000	TBD	NECR
CT	Armory (East Windsor Sec.) - North Section	286,000 *	286,000	CNZR
CTDOT	Griffins Industrial Track	286,000	286,000	CNZR

*Requires bridge upgrades on adjacent rail lines to haul 286,000 pound cars.

** CNZR is connecting railroad to Amtrak Springfield Line.

(1) PWRR (and NRR on upper WBL) request for higher weight limit of 286,000 pounds.

(2) CSO request for higher weight limit of 286,000, affects other freight lines.

(3) Bridge and culvert repairs will allow weight limit increase to 286,000 pounds.

- (4) Review of infrastructure needed to upgrade weight limit to 286,000 pounds.
 (5) Bridge repair (Hartford-East Hartford) needed to maintain 286,000 pound weight limit.
 (6) Reconnection of rail line plus bridge work needed for higher weight limit of 286,000 pounds.
 (7) Higher weight limit of 286,000 pounds allowed with alternating cars (M = "Modified" 286,000);
 (8) Bridge analysis and repairs needed to allow weight limit increase to 286,000 pounds.
 (9) Rt. 1 bridge repair needed to upgrade weight limit to 286,000 pounds.
 (10) Bridge repairs will allow weight limit increase to 286,000 pounds

Note: Blue highlight shows state priority for 286,000 pound weight limit upgrades.

Figure 27. Railroad Freight Car Weight Limits and Goals⁴⁷

The following Connecticut rail line sections (Connecticut and Amtrak owned) are currently listed at a 263,000 pound weight limit. The goal in the Department's Rail Plan is to increase the weight limit to 286,000 pounds first on these lines due to high freight usage. Connectivity to the regional and national rail system is critically important. Each of these segments individually will improve freight rail movement as they are upgraded to 286,000 pound capacity. Each line can be evaluated by segments (and individual tracks) for 286,000 pound per carload capacity routes. Figure 28 is a map of the freight railroad weight limit routes and priority segments for upgrade.

Segments Listed at 263,000 pounds - Priority Upgrade

New Haven Line

- New Haven to Devon (Waterbury Branch Wye)
- Devon Movable Bridge
- Stratford to South Norwalk (Danbury Branch)
- South Norwalk (Walk) Movable Bridge
- South Norwalk to Greenwich (Connecticut - New York State Line)

Waterbury Branch Line

- Devon to Derby (Derby Wye)
- Derby (Derby Wye) to Waterbury

Terryville Secondary (north of Waterbury Branch)

- Waterbury to Waterbury (north of Highland Junction)

Danbury Branch Line

- South Norwalk to Danbury

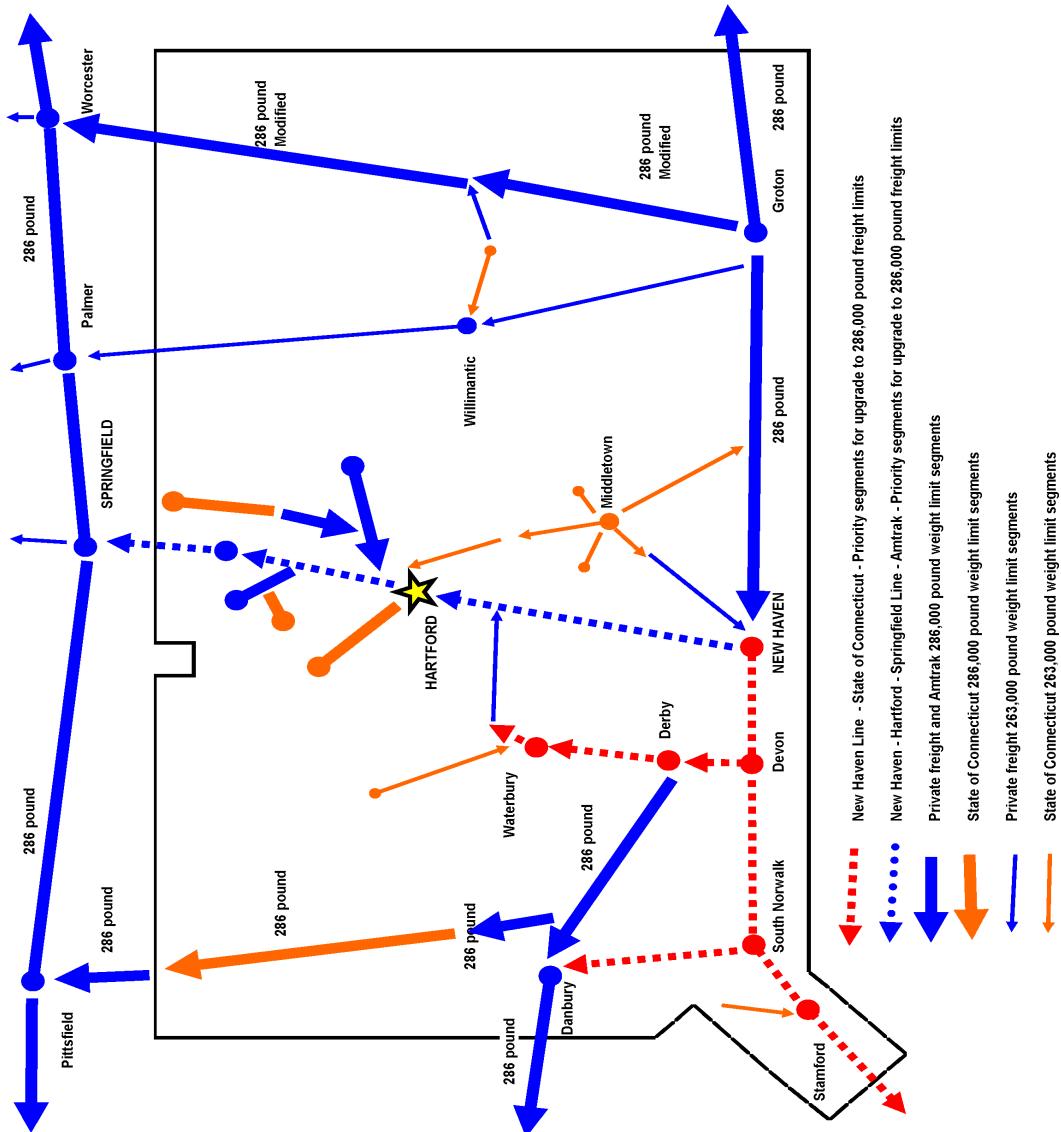
New Haven – Hartford – Springfield Line

- New Haven to Berlin
- Berlin to Hartford
- Hartford Viaduct
- Hartford to Windsor Locks
- Amtrak Connecticut River Bridge
- Enfield to Springfield

The development of a new Connecticut Railroad Bridges Management Program is integral in upgrading rail line segments from 263,000 pound weight limits to the modern 286,000 pound weight limits. Evaluations of bridges are needed to determine the feasibility of 286,000 pound routes in Connecticut to promote economic growth, reduce fuel use, and reduce truck traffic on the state's highway system.

⁴⁷ Source: Connecticut Department of Transportation, Office of Rail, Jan. 2011.

Freight Railroad Weight Limit Routes and Priority Segments for Upgrade Map

Figure 28. Freight Railroad Weight Limit Routes and Priority Segments for Upgrade Map⁴⁸

⁴⁸ Source: Office of Rail, January 2011. Note: "Modified" 286,000 pounds - This weight is allowed with alternating cars.

Dimensional Restrictions

Clearances

Template (Plate) clearances are expressed in terms of Plate C, Plate F, Plate G, etc. Each individual rail line (or portion of a rail line) has a particular Plate Clearance. The higher into the alphabet, the bigger the minimum clearance is along a particular route. Oversized freight cars have a label on the side, stating Plate F, for example. This indicates a very tall boxcar (or other car), and reminds the train crew and yard personnel to check their paperwork to avoid hitting an overhead bridge or other structure with the oversized car.

Vertical or horizontal clearances issues affect several rail routes in Connecticut. These clearance issues may restrict the railroad's ability to increase services or capture additional markets. While moving to a full overhead clearance of 22' 8" may be difficult, and possibly not cost-effective in the near term, supporting clearances of 19' 6" on lines not encumbered by overhead catenary wire could permit the movement of larger cars in many areas of Connecticut.

A significant amount of freight now moved in North America utilizes very high cubic capacity (high-cube) rail cars. In intermodal markets, the double-stack configuration of transporting containers on specially built rail cars is pervasive. These rail cars make a direct impact on reducing truck traffic, as they haul the very same equipment that runs on the road. Cost savings when using double-stack equipment range from 20-40 percent. These double-stack cars require a clearance of 20' 6" above the rail, although 22' 8" is ideal. In some markets, the use of high-cube cars, particularly for shipping lighter materials, helps make rail competitive with alternative modes, such as heavy, over-the-road trucks.

Freight railroad companies across North America have spent several years raising highway bridges, enlarging tunnels, and lowering tracks to accommodate double-stack service on key main lines. Double-stacks can currently travel from several points on the West Coast and Gulf Coast as far east as northern New Jersey and Massachusetts. NECR is cleared for high/low double stack containers from East Alburg, Vermont to the P&W connection at Willimantic. The P&W is cleared from Willimantic east to Plainfield and then north to Thompson and on to the Worcester rail yards and ultimately to the Ports of Providence and Davisville.

Another important method of shipping uses the tri-level auto rack, a specialized rail car that carries new automobiles on three levels. The first rail route in Connecticut with adequate overhead clearance (20'2") for auto racks is via the NECR, from Montreal south to Willimantic, where the cars can be handed off to the P&W. It can travel east to Plainfield, then north to Worcester, Massachusetts and southeast to Davisville, R.I. for unloading. The rail cars are then occasionally reloaded with European automobiles bound for Canada and the Midwest.

Track and Operating Speeds

Freight railroads that operate over passenger lines generally operate over newer, heavier-weight rail designed for higher speeds, while railroads that exclusively focus on freight generally operate on rail that was manufactured 60 to 100 years ago. That older rail will need to be replaced with a newer, heavier-weight rail. In many cases, the earnings of short line railroads, the predominant carriers in Connecticut, cannot support large investments in rail. Programs under which new or used rail can be provided to regional and short line railroads should be developed. Assistance will also be needed to upgrade bridges to support heavier loads.

Freight railroads are categorized as Class 1, Class 2, or Class 3. Generally, Class 2 and 3 railroads serve local and regional markets, feed traffic to larger trunk line carriers, and operate at slower speeds than Class 1 railroad companies operate. Unless operating over passenger lines, these smaller carriers generally maintain their track for speeds of 10-25 mph. The withdrawal of Class 1 carriers from most of Connecticut over the past three decades has resulted in a resurgence of the smaller railroads in the state and presents a challenge as smaller carriers seek to restore track that predecessor owners generally ignored.

The FRA has established regulations that govern the operation of trains over track conditions and these are illustrated in Figure 29.⁴⁹ These regulations establish the 10 different speeds based on the track conditions.

Track Class	Maximum Allowable Operating Speeds (miles per hour)	
	Freight Trains	Passenger Trains
Excepted Track	10	NA
Class 1	10	15
Class 2	25	30
Class 3	40	60
Class 4	60	80
Class 5	80	90

NA – Not applicable; Passenger train operation is not permitted on Excepted Track.

Figure 29. FRA Class of Track and Operating Speeds

The Track Class highlights the general maintenance condition and infrastructure issues for Connecticut railroads.

Railroads in Connecticut that only handle freight traffic and that operate on freight- only track are presently operating at slower speeds, generally associated with track conditions that meet Class 1 or Class 2 FRA standards. These conditions generally support speeds ranging between 10 and 25 MPH. Except on very short sections of track, speeds as slow as 10 mph, while safe, severely impact railroad operating efficiencies, and need to be addressed to support cost-sustaining operations. Freight railroads operating over lines used for passenger services that either Amtrak or the state of Connecticut owns benefit from the higher speeds associated with passenger services. Freight rail carriers generally do not pay directly for track maintenance on passenger lines, but contribute a share of the cost of maintaining the tracks to higher standards (and speeds) through the payment of track usage fees.

Recent State Legislation requires the Transportation Commissioner to offer rail or track material to freight railroad companies for upgrading state-owned rights-of-way.⁵⁰

Positive Train Control (PTC)

Legislation in 2008 requires the installation and operation of PTC systems as discussed in Chapter 4. This requirement also affects some of the freight railroad companies operating in Connecticut, if it operates on freight-only rail lines when it is part of a Class 1 railroad system, carrying at least 5 million gross tons of freight annually, and carrying any amount of poison- or toxic-by-inhalation (PIH or TIH) materials. The railroads that meet these criteria were required to submit to FRA by April 16, 2010, a PTC Implementation Plan (PTCIP) indicating where and how it intends to install PTC systems by December 31, 2015.⁵¹

⁴⁹ Track Safety Standards, 49 CFR, Part 213.

⁵⁰ September Special Session, Public Act No. 09-2, Section 66.

⁵¹ See 49 CFR § 1.49 (oo); 74 FR 26,981 (June 5, 2009); see also 49 U.S.C. 103(g).

Highway/Rail Grade Crossings

Many highway/rail grade crossings are located on the freight rail network. Many of these crossings are not fully outfitted with advanced protection. Many of these crossings need to be replaced or repaired to maintain safe conditions. The railroad is responsible for the track and pavement within the street for public crossings.

Issues Relating to the New Haven Line

The ability of the Metro-North-operated New Haven Line to accept certain modern rail freight equipment is constrained by overhead catenary wire, which limits the height of rail freight cars to Plate E clearances (less than 17 feet). Connecticut does not have a DC traction power distribution system (3rd rail); thus, there are no low-level clearance issues such as those found in the New York metropolitan area.

The New Canaan Branch Line also has overhead catenary wire (with its height limitations); however, freight trains do not operate on this branch.

The Danbury Branch Line has overhead wire on its southernmost portion. It connects with the NHL (and its overhead wire) at South Norwalk and passes through an area that is undergoing a transition away from an industrial economy to residential and commercial properties. The large Tilcon asphalt facility and the construction/demolition reload facility in Danbury are served from freight rail lines radiating east and north from Danbury.

The Waterbury Branch connects to the Main line at Devon (Milford) and with the Maybrook Line at Derby (to Danbury). It also connects with the Torrington Branch and the Terryville Secondary (PAS' Waterbury Branch/Terryville Secondary) at Waterbury. Again, the overhead catenary lines on the main line restrict the height of rail cars that would enter or leave the Waterbury Branch at Devon.

Issues Relating to Amtrak Lines

Shoreline Route

The entire Amtrak Shoreline route, from New Haven east to Stonington, has overhead catenary wire, with its height restrictions, as well as five moveable bridges with weight and clearance restrictions. The Thames River Bridge connecting New London to Groton has undergone a replacement of the moveable structure. The entire drawbridge at Niantic is being replaced with a moveable span that meets modern weight and clearance standards.

The use of rail freight corridors such as Housatonic's in the west and P&W/NECR in the east may offer opportunities to move heavy tonnage freight into portions of the state without negatively affecting efficient higher speed passenger services.

Springfield Line

Amtrak's Springfield Line is a major freight railroad corridor. It serves a high concentration of rail freight users along its entire length, with goods movement impacts on all major Connecticut highway corridors and metropolitan areas (I-95, I-84, Route 8, etc.). It connects with the Terryville Secondary (and thus the Waterbury and Torrington Branches) at Berlin, and serves as the freight route to and from the Naugatuck Valley. In addition, the Springfield Line connects

CSX to its significant inland operation at New Haven, along with its local freight service between New Haven and the New York State Line.

The Springfield Line is presently restricted to a maximum weight of 263,000 pounds total per carload due to issues with the Connecticut River Bridge at Windsor Locks and with the Hartford Viaduct at Hartford Station. There are several height and width restrictions, among them the Albany Avenue overhead bridge in Hartford (height restriction), the Asylum bridge abutment (width restriction) in Hartford, the I-91 overpass (height restriction) in Windsor Locks, and the overhead power lines in Windsor. The removal of much of the second main track on the Hartford Line places significant limitations on train schedule flexibility and restricts the overall capacity of the line.

The ability of Connecticut's high-traffic commuter and regional passenger rail lines to accept slower-moving freight trains must be dealt with on a case-by-case basis. The freight railroads that operate on the Springfield Line have an immediate need for the line to be rated at 286,000 pounds north of the Hartford station viaduct. This will allow modern freight cars to be loaded to its full capacity for several high volume rail shippers.

Factors Affecting Demand for Rail Freight Service in Connecticut

The success of the rail freight industry in the Connecticut is less dependent upon the condition of the local rail freight infrastructure and more dependent upon the condition of the economy and the nature of the manufacturing industries in the state. Certainly, not all commodities are suited to movement by rail. The decision to utilize rail freight service is a business decision made solely by a manufacturer based upon the commodities received or sent; the manufacturer's proximity to rail service; the cost of the service, as compared to truck; and the timeliness of the service, again as compared to truck.

The following factors affect or have affected the volume of freight transported in Connecticut by rail. The location of rail freight routes and intermodal terminals in adjacent states has an impact on the mode of freight movement in Connecticut. One of the major container ports in the world, and one of the largest intermodal rail yards in the country are located in northeastern New Jersey, within one hundred miles of central Connecticut. Large intermodal yard with connections to the west are located just over the state line in West Springfield and Worcester, Massachusetts. The close proximity of these facilities to businesses and industries in Connecticut results in a significant percentage of the goods originating in or destined for Connecticut being handled at these intermodal facilities and transported to or from Connecticut locations by truck.

The weakening and dilution of the state's industrial base and the shortening and tightening of the product stream have led to fundamental changes in the way goods are manufactured, shipped, and received. Rarely do plants receive rail cars full of materials to be converted into finished products, with all phases of manufacturing and assembly taking place under one roof. Rather, manufacturing is dispersed over several locations with any one plant having a limited role. The changes in materials management, specifically just-in-time delivery, mean that sites are getting smaller, which requires more frequent delivery of materials.

While these changes may influence how freight moves in various markets, a coordinated approach using warehousing and bulk transfer may enable railroads to offer competitive services, particularly as fuel prices increase and environmental standards mandate the reduction of diesel emissions.

The increase in the use of just-in-time delivery requires a high degree of sophistication and cooperation, but it drastically reduces the amount of supplies needed to be kept on hand, thus limiting the amount of inventory and warehousing needed.

Connecticut is a net consumer of goods. That is, the state receives and consumes more commodities than we produce and ship out. Connecticut is increasingly oriented to businesses and service activities that do not generate large volumes of freight. The railroads are changing in response to the new dynamics affecting supply logistics. In Connecticut, the arrival of Pan Am Southern (PAS) and strengthens established connections to western rail carriers. Norfolk Southern, a partner in PAS, operates the most extensive intermodal network in the East.

6.4 FREIGHT RAIL OPERATORS' CONCERNS

The freight railroad companies provided the concerns contained in this section to the Department for inclusion in the SRP.

Central New England Railroad

- Clearance issues and weight restrictions on Amtrak's Springfield Line in Hartford inhibit the movement of certain types of freight.
- A new Interchange Agreement with PAS at Hartford is offering a competitive rail option to shippers in the Hartford/Bloomfield area.
- Griffins Industrial Track and Armory Branch need additional new cross ties and the installation of heavier rail.

Connecticut Southern Railroad

- The CSO's Connecticut River Bridge between Hartford and East Hartford is in need of over \$5.3 million in critical repairs.
- CSO pays \$1.8 million annually to Amtrak in car-mile fees for use of the Springfield Line, which is a financial burden on the company and presents a problem with generating new business.
- Amtrak's Springfield Line must allow freight cars to be loaded to 286,000 pounds on four axles, the national standard, for tenant freight carriers to remain competitive and to divert heavy truck traffic off Connecticut's roadway system. The weight limit of 263,000 pounds per car is due to the Amtrak-owned Connecticut River Bridge in Windsor Locks, but structural repairs to the Connecticut River Bridge are not programmed into Amtrak's capital improvement program.
- PTC is an issue for CSO running on Amtrak.
- So-called "paper barriers"⁵² are an impediment for improving connecting rail freight business on the Wethersfield Line.
- The former tie and rail program that the Department used to distribute old crossties and rail to the freight railroads was very beneficial.
- CSO will need to acquire and install PTC equipment on six locomotives.

Housatonic Railroad Company

- Replacing or enlarging culverts is a big financial burden.
- The bridge in Derby over the Housatonic River needs repair soon.
- Public investment in crossing repair has virtually disappeared in the past 10 years. While rail in highway grade crossings lasts 30 or more years, crossing surfaces on major roadways last 10 or less. A program to address crossing maintenance needs to be developed.

⁵² Paper barriers are contractual limitations on the interchange of freight between carriers.

- Support for improvements in rail terminal efficiency could strengthen the ability of the railroad to attract new transload business.
- Programs that promote conversion of brownfields to productive industrial development sites that could support rail freight customers should be developed.
- Other states such as Maine and Pennsylvania have developed successful rail freight access programs enabling new and existing industries to connect to the rail freight network. Support for siding and other loading facilities to promote new rail business will not only support rail growth but job growth in the state.
- While HRRC is rated as a 286,000 pounds railroad, work will be necessary to upgrade and strengthen bridges and strengthen track structure to maintain the 286,000 pounds classification.
- Rail on the Housatonic Railroad (HRRC) is generally 60-100 years old. In one location, rail dates to 1876. Over the past years, HRRC has begun replacing the older, lighter weight rail with a heavier section. That work must continue, particularly on sections of its Berkshire Line that are owned by the state of Connecticut and sections of the Maybrook line that carry heavy stone trains.
- Work must be performed to upgrade tie conditions to maintain re-institute unit train service over the Maybrook Line.

Naugatuck Railroad Company

- Capital projects to repair/replace culvert and bridges are needed due to 100+ year old structures. There are also a number of smaller culvert structures located on the railroad that will need attention/replacement with modern culvert piping materials.
- NAUG bridge inventory is composed primarily of three major structures. One is 110 feet long, two-span ("Hancock Brook" ID #9106R), built 1902 that is in fair condition and should be considered for replacement. The second is 234 feet long, 4-span ("Chase Bridge" ID #9108R), built 1907 that is in good condition and needs a replacement wood tie deck. The third is 267 feet long, 4-span ("Jericho Bridge" ID #9110R), built 1907 that is in good condition and needs a replacement wood tie deck. All of these structures also need concrete/masonry pier and abutment repairs and some associated steel repairs. The coating systems of all of these structures has long since failed (last documented painting was in the early 1950s). Three smaller steel deck spans (20-22 feet each) have been re-decked by NAUG over the last 9 years, and are in good condition (with the exception of failed coating systems). One short bridge should be replaced due to age and condition.
- Capital tie and surfacing projects are needed, especially on northern section of railroad.
- Most of the NAUG line is New Hampshire 107 pound rail, dating from 1918-1929. About 9 miles of the railroad was relocated in 1959 as part of the Thomaston Dam construction project. The new railroad was built with 115RE rail. Penn Central removed approximately 2 miles of this almost-new rail in 1970. In its place, heavily worn 100-pound rail was installed, and should be replaced with good-quality relay 115RE rail.
- The southern end of the NAUG line, which is expected to have the highest freight traffic density, with heavyweight cars, has numerous sharp curves. This section should be re-laid with heavier rail on the curves.
- Interchange yard tracks in Waterbury must be rehabilitated to accommodate current and near-future inbound and outbound traffic needs.
- There is a desire for a regular interchange area/yard in Waterbury with PAS that does not involve leaving interchange cars on the Naugatuck Main Line. This is critical to NAUG operations, as interchange cars left on the Main Line prevent NAUG from completing regular, federally mandated track and switch inspections.
- Existing car storage side tracks are not sufficient to accommodate freight customers.

- Upgrading is needed for crossing signals and road surfaces at heavily traveled crossings. SR 262 highway grade crossing in Watertown needs full protection including gates and modern lights.
- As the C&D transload operation becomes an active freight customer in the near future, there will be an increased need for car storage tracks at Waterbury Yard. A number of former and existing side tracks can be extended/reconstructed to provide this storage, and assistance would be needed for this work.
- NAUG has a serious on-going problem with trespassers riding all-terrain vehicles and off-road bikes along the rail line and destroying the railroad roadbed, and endangering passengers and themselves. Need to have better law enforcement and damage repair.

New England Central Railroad

- A matching grants program for capital projects should be established.
- All-terrain vehicles trespass onto the rail right-of-way and chew up the shoulders of the rail bed, which poses a safety issue.
- Funding is needed for washouts.
- Reaching full double stack clearances is a priority.

Pan Am Southern

- High Amtrak car-mile charges financially affect the generating of new business.
- Need acceptable windows for freight traffic in conjunction with the necessary infrastructure and capacity improvements along the NHHS project limits.
- Enhance resources available for grade crossing and trespassing programs.
- Revise the Rail Preservation and Improvement Program.
- Maintain and Improve the Railroad Tax Exemption Program.
- Provide access for freight rail goods movement projects that promote economic development (Note: include third party-initiated candidate projects, industrial sidings etc.).
- Provide freight rail transportation with a seat at the table in the state and federal, development, planning, and strategy process.

Providence & Worcester Railroad

- Sellers of rail lines may place restrictions called “paper barriers” on users of the line. Sometimes only one rail carrier is allowed to use the line.
- Plate F cars, measuring 17 feet tall, cannot be run under the overhead electrical system along the NEC.
- Norwich Truss Bridge over the Shetucket River in Norwich needs repair.
- Weight restriction of 263,000 pounds restricts freight movement along Metro-North’s NHL and the Waterbury and Danbury branch lines.

Valley Railroad Company

- Maintenance of roadway sight on the approach to grade crossings require annual inspections by the responsible highway jurisdiction to ensure vegetation is cut back and warning devices can be clearly observed by motorists.
- Motorists need to be educated on rules for grade crossings. More pedestrian trespass education and enforcement is needed.
- Valley Railroad Company (VRR) and CTDECD funded the rehabilitation of seven major bridges/track carrying structures between 1999 and 2002 between Old Saybrook and Haddam. Two short girder deck bridges dating from the 1920’s were rehabilitated, three bridges were replaced outright, two culverts were replaced, and one cast in place arch culvert was rehabilitated. On the out-of-service portion, a girder deck bridge requires

rehabilitation prior to service. A through girder bridge in Higganum requires extensive renovation prior to service. Two minor deck bridges appear to be serviceable with minor renovations. A small wooden cattle pass requires removal and replacement with either a culvert pipe or pre-cast sections. A missing overpass (filled in) in Haddam needs to be addressed either by construction of a new bridge or rerouting of traffic (possible).

- The company desires to step up improvements to the track and roadbed, especially for possible future movement of freight. Most bridges on the active line were upgraded to Cooper's E-80 loading during extensive bridge rehabilitations in the late 1990's and early 2000's in anticipation of future possible freight service.
- The company has several concerns regarding people riding all-terrain vehicles along the southern portion of the rail line and destroying the railroad embankment. Additionally, it is concerned with the public's behavior at highway/rail grade crossings, especially at the numerous private crossings on the line. The company has worked diligently with CDEEP on property encroachment issues, particularly on the out-of-service portion of the line in Haddam and Maromas (south Middletown).
- The VRR has expressed concerns about the significant portions of sub 100 pound rail on the line. The track from Old Saybrook to Essex is mostly 78 pound rail maintained to Class 1 standards. From Essex to Chester there are significant portions of 107 pound rail and stone ballast, all installed and funded by Valley Railroad Company. This portion is maintained to Class 2 standards. From North Chester to Middletown, 78-pound rail prevails, with some sections of 80 pound; active track on this portion is maintained to Class 1.

6.5 RAIL LINE ABANDONMENTS AND REOPENINGS

Connecticut's rail network was significantly compromised by wholesale rail line abandonments during the twentieth century. This practice was essentially halted by the Department's policy of purchasing virtually all rail corridors that became available, and either rail banking them or land banking them. Rail banking involves the acquisition of the tracks, structures, etc., as well as the right-of-way, whereas land banking involves the acquisition of only the rail right-of-way with tracks removed but bridge structures in place. The goal of rail banking and land banking is to preserve contiguous portions of rail right-of-ways for future transportation use.

The Department acquires abandoned rail lines when it connects major urban centers, is part of a line that connects urban centers, or has potential for future freight use. Railroads are the most fuel-efficient means of surface transportation, and are becoming more efficient and "green" at a much faster rate than long-haul trucking. Moving freight by rail reduces the consumption of diesel fuel, reduces heavy truck traffic, and reduces carbon emissions. The railroad track structure allows for the passage of wildlife and only experiences traffic a few times per day, as opposed to roads and highways, which see nearly constant movement of vehicles.

Figure 30 contains the rail line segments not in service, which should be preserved because there may be future opportunities for freight service development.

Rail Line	Ownership	Miles	Status
Southbridge Secondary	P&W	2.0	NIS-connected to Massachusetts trail
Manchester-Willimantic	State	19.6	Trail
Portland-Willimantic	State	22.7	Trail
Willimantic-Putnam	State	37.6	NIS-Land banked
Middletown-Old Saybrook	State	8	NIS-Rail banked
Plainville-Suffield	State	22.3	NIS-Land banked
Farmington-Canton	State	8.3	Trail
Hamden-Cheshire-Southington	State/PAS	14.2	NIS-Land banked
Plainfield-Sterling	State	6.8	NIS-Land banked
Torrington, Watertown, Cheshire, Plainville	B&M	Various	NIS
NIS – Not in service.			

Figure 30. Rail Line Segments Not In Service

6.6 REGIONAL CONNECTIVITY AND CORRIDOR PLANNING

A fully functional transportation network must meet the mobility needs of individuals and businesses in Connecticut, other states and other parts of the world in an efficient and cost-effective manner. It must be intermodal and provide connections and transportation services that enable and facilitate the efficient movement of people and freight on land, air, and water.

Connecticut's freight rail carriers are connected to the North American rail network via three primary routes.

CSX Boston and Albany Main Line

The primary route, by a considerable margin, is over the CSX Boston and Albany (B&A) Main Line, which crosses southern New England via a route that runs essentially parallel to the Massachusetts Turnpike. Rail cars are interchanged to three north-south rail lines that feed the rail network in Connecticut. The Berkshire Line runs south into Connecticut from a connection with the B&A at Pittsfield, Massachusetts. The Springfield Line carries the largest portion of Connecticut's rail freight via a connection with the B&A at West Springfield, Massachusetts. In addition, the Norwich Branch connects with the B&A at Worcester, Massachusetts.

Palmer Line

An important and rapidly growing connection to the North American rail network is the NECR's Palmer Line. The Palmer Line runs north from New London and connects directly with the Canadian National Railway (CN) network in St. Albans, Vermont and to Montreal, Canada. CN's T-shaped network spans North America, coast to coast, with a main line running from Chicago to New Orleans. This provides many Connecticut industries with a competitive choice for shipments of chemicals and plastics from the heart of America's "Chemical Coast" in Louisiana and Texas. In addition, the CN offers access to numerous seaports such as Prince Rupert, BC, Montreal, PQ, and New Orleans, LA.

The Palmer Line is an over-dimension route that connects with the P&W's Willimantic Branch at Willimantic. This is a rapidly growing route for modified double-stack containers (both inbound and outbound), tri-level automobile carriers (both inbound and outbound), coal, and other

freight, from chemicals to raw plastics, animal feed, and lumber. The Palmer Line also connects with the P&W at New London. Freight car interchange at New London has been reduced in favor of the recently re-opened interchange at Willimantic. The Willimantic interchange relieves congestion along Amtrak's Northeast Corridor route between Boston and Washington, DC (also used by SLE service). Upgrading of the route to handle full double-stack service is a priority.

The NECR's Palmer Line offers regional connections to four Class 1 railroads: Canadian National Railway, Canadian Pacific Railway, CSX, and Norfolk Southern Railway (via its connection with PAS). The NECR also links the Class 1 railroad connections to other New England short line routes, such as the P&W.

The recent ARRA Stimulus Grant award to the state of Vermont and the NECR will include funding to upgrade the route in Vermont and New Hampshire to handle 286,000 pounds gross weight railcars. As the main line runs on into Massachusetts and Connecticut, this offers an opportunity for the other New England states to become connected to this heavy load route. Upgrading the NECR's Palmer Line in Massachusetts and Connecticut to 286,000-pound capacity would allow higher capacity loading for Connecticut's shippers. The Palmer Line can offer a core corridor to serve not only its own Connecticut and New England customers, but also connections to other regional and short line railroads.

Central Corridor Rail Proposal/Palmer Line

NECR is proposing a \$100 million plan to enhance the Palmer Line to allow for the restoration of passenger service and to attract potential freight customers. The Port of New London and Norwich Harbor are locations for the transfer of freight between rail and water transportation modes. The passenger service is proposed to make stops in New London, Uncasville (Mohegan Sun), Norwich, Willimantic, Mansfield/Storrs (UConn), and Stafford Springs. The train would continue to Massachusetts with stops at Palmer, Amherst, and Millers Falls and then to Brattleboro, Vermont where passengers could connect to Amtrak trains to Vermont and ultimately Canada. A study that will identify funding sources and potential freight customers along the line is needed. The Connecticut cities along the route are involved and support this development of both freight and passenger business through the Central Corridor Coalition.

Armory Branch Line

Economic development opportunities exist in North Central Connecticut including the generation of additional rail freight traffic if the missing segment of the Department's Armory Secondary Track was restored to Springfield, thereby providing a freight rail connection to the CSX Boston and Albany Main Line. The existing track currently ends in Enfield at the Massachusetts State line. The Armory Branch could provide a valuable alternate route for certain freight trains operating between Hartford and Springfield, especially during peak commuting timeframes. The Armory Secondary could also be used to provide an alternative route for freight trains and Amtrak work trains during the reconstruction and double tracking from New Haven to Springfield. Due to the need to maintain existing Springfield Line Amtrak and freight rail service, operations will experience service delays due to track outages required for the track and signal system reconstruction to implement Commuter and High Speed Rail service.

Patriot Corridor

The lowest-volume, yet competitively important, route is the newly-improved PAS Railway's Patriot Corridor that roughly parallels the Boston and Albany route from the Albany area eastward through Massachusetts. The Connecticut River Line, running south from East

Deerfield, Massachusetts to Springfield, connects it to Connecticut's rail network. PAS' trains run on Amtrak's Springfield Line through Hartford to Berlin.

PAS is a joint venture between PAR and Norfolk Southern (NS), a major carrier in the eastern half of the United States. Effective April 2009, governmental approvals were granted for this PAS venture, clearing the way for more than \$87 million in rail infrastructure investment designed to enhance the service capabilities and commercial offerings that NS and PAR provide in upstate New York and New England. This corridor now provides Connecticut shippers a viable competitive option to the current Boston to Albany Main Line through Pittsfield, and Springfield, Massachusetts. This joint venture is expected to improve the rail connections between New England and the rest of the North American rail network.

As the rail transportation network evolves in New England, rail freight infrastructure maintenance and upgrades should be discussed alongside commuter and intercity passenger rail needs.

New York Cross-Harbor Tunnel⁵³

A significant regional study that may affect Connecticut is the Cross-Harbor Tunnel Project undertaken by the New York City Economic Development Corporation (NYCEDC), in coordination with the Federal Highway Administration (FHA) and the FRA. The study involved the rigorous examination of alternatives based on the engineering requirements, capital and operating costs, environmental impacts and benefits, transportation issues, and opportunities and economic benefits.

Currently freight trains between New York City, Long Island, and southwest Connecticut must cross the Hudson 140 miles north of New York City at Selkirk, New York. As a result, less than 3 percent by weight of the areas freight moves by rail.

This project would build a rail tunnel underneath New York harbor between the Greenville Yard in Jersey City, New Jersey, and the Bay Ridge Branch in Brooklyn, New York (the "New Jersey alignment"). The Tunnel Alternative, which is also the NYCEDC preferred alternative, would also include improvements to rail infrastructure, such as increasing clearance heights along the Bay Ridge Branch and Montauk Branch of the Long Island Rail Road and/or the Staten Island Railroad, and the expansion of an existing rail yard in West Maspeth, Queens.

The Cross Harbor Tunnel could divert roughly ten million tons of New Jersey and Staten Island traffic annually from truck to rail, of which NYCEDC estimates 7 percent would benefit southwestern Connecticut. This equates to a 357,000 vehicle-miles-traveled reduction, mostly from a diversion of heavy truck traffic running through Connecticut, and not originating or terminating in the state. The P&W Railroad is projected to handle the diverted through-traffic by two daily trains that would operate via the NHL to New London and north to New England points. Most freight shipped into Connecticut currently moves via the more northerly Boston to Albany route, where there is reduced congestion, and this is not expected to change appreciably. A draft EIS was published in 2004 and the Port Authority of New York and New Jersey is conducting a public scoping process and preparing the EIS.

⁵³ www.panynj.gov/about/cross-harbor

CHAPTER 7 - INTERMODAL RAIL CONNECTIONS AND FACILITIES

The Department is committed to enhancing integration and connectivity of the state's transportation system to address the mobility needs of its residents. To cost-effectively meet these current and future mobility needs, Connecticut must maximize the use, efficiency and productivity of its existing transportation system, make strategic improvements to the system, and better coordinate land use planning with transportation planning to provide and facilitate access to bus and rail passenger facilities, rail freight, ports, and airports.

Intermodal transportation hubs located at critical points in the state's transportation network have been identified for improvement and/or expansion to further integrate and provide more efficient connections for the movement of people and freight between modes. When maintaining the existing system, the Department will also identify and consider, in a collaborative effort with stakeholders, opportunities to enhance the existing system by integrating existing transportation services and improving intermodal passenger and freight connections.

The following rail-related intermodal strategies and actions are identified in the State's 2009 Long Range Plan⁵⁴:

- Promote competitive passenger movement options between high-density population centers by promoting, advocating for resources, and implementing transportation projects that will support intermodal connection of water, rail, bus and highway systems.
- When reconstructing roadways, identify and consider opportunities to enhance mobility options and improve or create intermodal connections for people and for freight.
- Continue to support programs that use advanced technology and coordinated efforts to maximize the efficiency of the existing rail system and improve intermodal connections, with particular attention to highly congested corridors.
- Promote state, regional, and municipal planning efforts that support existing transportation infrastructure and services and make improvements that provide greater integration and connectivity both between modes and within modes.
- Improve intermodal connections at locations with high-density, mixed-use development.
- Expand bus services in the state to connect urban areas and to provide connections to existing rail services and facilities in Connecticut and in adjacent states.
- Encourage and facilitate integration and coordination of route planning for public transportation both between modes and among providers.
- Support development efforts that address commodity movements at the state's, seaports, and airports and along its rail system.
- Support the development of a GIS database and map showing all transportation facilities and services in the state on a common data platform that can be shared and updated by

⁵⁴ Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-22.

all transportation providers and accessed by the public to identify connecting services.

- Work to establish a statewide fare revenue collection system that supports the latest technology, enabling the implementation of a seamless, regional multi-modal fare system within Connecticut and surrounding states.
- Work to establish a statewide real-time transit information system offering riders a regional multi-modal transit information system within Connecticut and surrounding states.

7.1 MAJOR PASSENGER RAIL INTERMODAL CONNECTIONS AND FACILITIES

The portal to/from the rail system is a critical element of the decision to utilize the rail mode for passenger travel or freight shipments.

For rail passenger stations, a number of factors drive the quality of the intermodal facility, including:

1. Access: Direct roadway access for ease of driving/riding to the station.
Enhance supply of parking at passenger stations.
2. Non-Automobile Accessibility: Pedestrian access and connections to surrounding areas, availability of convenient connecting bus services, availability of bike racks, etc.
3. ADA access with regulation ramps and level boarding, and sidewalk cut accessibility facilitating wheel chair, stroller, and other assisted-mobility pedestrian access.
4. Amenities: The amount and quality of services that serve the traveling public at the passenger rail facility, including train frequency, parking availability, complementary commercial development, etc.
5. TOD: Contributing to a transit-oriented and mixed-use land use conducive to walking access to stations, consistent with Governor Rell's Executive Order #15.⁵⁵

Major Passenger Rail Intermodal Connection Points

Bridgeport Station - ADA-compliant station served by commuter rail (NHL and SLE), Amtrak intercity passenger rail, 16 Greater Bridgeport Transit bus routes, intercity bus routes, and taxi services. The station is in close proximity to the Port of Bridgeport. The Water Street dock and terminal (next to train station), located in the Bridgeport Harbor, offers year-round ferry service for pedestrians and vehicles between Connecticut and Port Jefferson, Long Island, New York.

Hartford Union Station - ADA-equipped station served Amtrak intercity passenger rail, six CTTransit Bus routes, the CTTransit-operated Star Shuttle downtown circulator, intercity bus routes, Greyhound Bus terminal that offers bus service to Boston, New York City, and other points, and taxis.

New Haven Union Station - ADA-equipped station served by commuter rail (NHL and SLE), Amtrak intercity passenger rail, three CTTransit Bus routes connecting with the 17-route system on the Green, two CTTransit Commuter Connection bus routes, a CTTransit operated downtown shuttle that includes a recently initiated circulator service between Union Station and the New Haven Green that operates at twenty-minute headways. The station is also served by

⁵⁵ "Reviewing transportation policies and projects to increase opportunities to promote mass transit and roadway design that support state and local economic development while preserving and enhancing the character, as well as the "walkability," of our communities." See Executive Order # 15: <http://www.ct.gov/governorrell/cwp/view.asp?A=1719&Q=320908>

intercity bus routes, taxis, rental car service, and private shuttle bus systems (including the extensive Yale University bus system). The City has initiated a project to introduce a fixed rail streetcar system between Union Station and Yale's central campus. New Haven Union Station is closely connected to Tweed Airport and the Port of New Haven. New Haven is also served by the Mohegan Sun and Foxwoods casino bus services, and part of the MNR Getaways combination travel package.

Because of increased bicycle utilization and requests from the public, the New Haven Parking Authority commissioned the design of a dedicated bicycle parking area at New Haven Union Station to be located at the north end of the parking garage. The project includes new decorative lighting, fencing, racks and shelters.

New London Station - ADA-equipped station served by commuter rail service (SLE), Amtrak intercity passenger rail, eight Southeast Area Transit District bus routes, Greyhound bus lines, intercity bus routes, and taxis. The station is adjacent to Port of New London, the Cross Sound and Fisher's Island ferry terminals offering year-round ferry service to Orient Pt. Long Island, Fisher's Island, New York, and Block Island, RI (seasonal). The Mohegan Sun and Foxwoods casino bus services also serve the Cross Sound terminal.

South Norwalk Station – ADA-equipped station served by commuter rail (NHL), 3 bus routes and 8 shuttle routes, 2 electric vehicle chargers inside and outside, taxi service, private vans, Connecticut Limo pick up and drop off, bike racks inside and outside, café for both east and westbound commuters, payment options through onsite pay stations, website alerts and convenient monthly permit options through www.norwalkpark.org, computer generated space availability inside garage, train schedule computer and video boards, state of the art closed circuit television video (CCTV) camera security system and customer service patrols.

Stamford Station - Full ADA-compliant station served by commuter rail (NHL and SLE), Amtrak intercity passenger rail, 16 CTTransit bus routes, 3 CTTransit Commuter Connection bus routes, intercity bus routes, taxis, privately operated corporate shuttle bus services. There are four areas at the station with bicycle racks. The first holds up to 20 bikes and is located adjacent to the taxi stand on the New Haven bound side of the tracks. The second rack can hold up to 16 bikes, and is located on South State Street on the New York bound side of the tracks. The third bike rack is located underneath I95 and contains two racks that can hold up to 30 bikes. The fourth location is further down South State Street and can hold up to 10 bikes.

Passenger Intermodal Planning and Initiatives – Rail Connections

New Britain - Hartford Busway⁵⁶

The New Britain - Hartford Busway (Busway) will be a dedicated Bus Rapid Transit (BRT) facility along a 9.4-mile corridor between downtown New Britain and downtown Hartford as illustrated in Figure 31. The Busway will be constructed in an abandoned railroad right-of-way from New Britain to just south of Newington Junction (a distance of approximately 4.4 miles). From this point north, the Busway corridor will be built in an easement alongside the active Amtrak railroad right-of-way for approximately 5.0 miles, ending at Asylum Street and Spruce Street adjacent to Hartford's Union Station. AMTRAK and the Department have signed the Easement Agreement for this project, providing the essential right-of-way to construct and operate the Busway.

⁵⁶ Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

The Busway project and services will include major bus rapid transit features similar to conventional rail rapid transit to improve transit travel times and service quality including exclusive right-of-way, traffic signal preference that gives buses preference getting through five at-grade intersections, level boarding from station platforms, off-board fare collection, and less frequent stops.

Up to 11 transit stations will serve the users of the Busway. The stations are being designed to allow for connections with potential future rail stations at Newington Junction and Flatbush Avenue in West Hartford. At these stations the design will include sufficient space to allow an up and over from a platform on the rail side of the corridor to the Busway landside (the southbound Busway platform furthest from the rail line) of the corridor. There will also be a stop at Union Station in Hartford. There will be amenities for passenger comfort and safety at the stations such as shelters, benches, real-time information displays, etc. On-board and station signage and announcements to provide customers with updated information on next stops, next bus arrivals, etc. will be available. Although Busway buses would not run to meet arriving or departing trains, there may be Commuter Connection buses that would meet arriving or departing trains at Union Station - and at other stations that might have commuter rail stops in the future. The Busway service plan has frequent enough service that there would be no need to adjust schedules based upon train schedules.

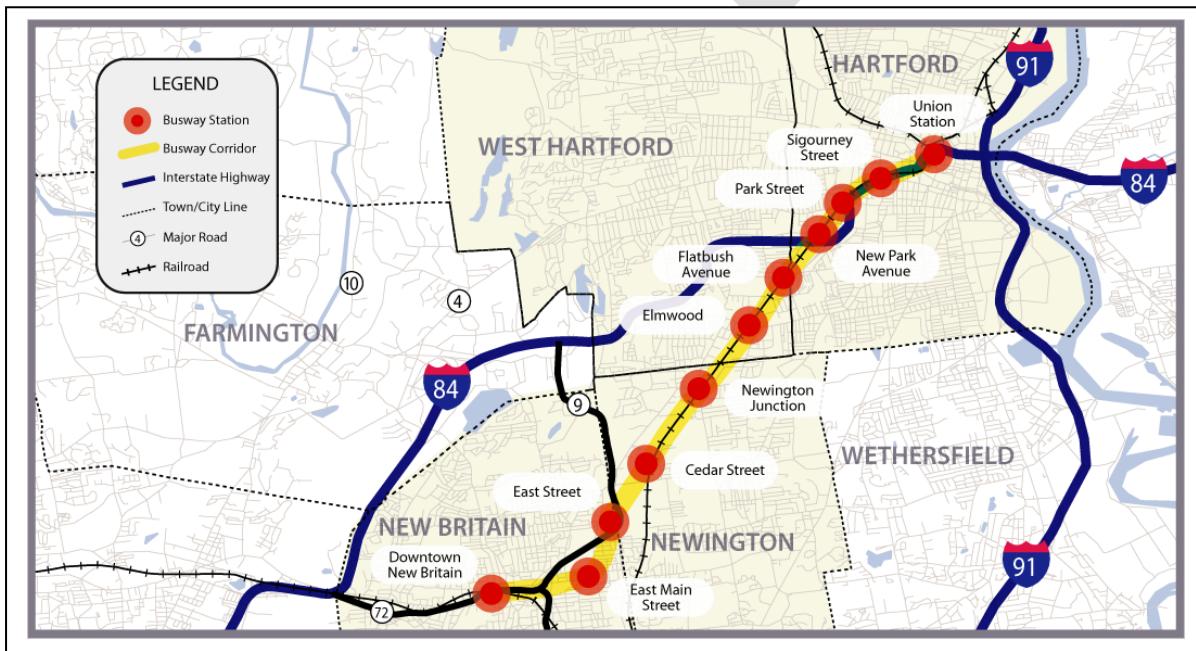


Figure 31. New Britain - Hartford Busway Route and Stops Map

The Busway service plan also includes fast, direct CTTransit Express suburban commuter bus services from Cheshire, Southington, Waterbury, and potentially other points south and west of Hartford, thereby enhancing regional mobility by extending the reach of the Busway's rapid transit services and improving the connectivity to both the communities and the potential rail stations along the route.

The Department received a Full-Funding Grant Agreement for \$275 million from the FTA in November 2011. Total costs for the Busway are expected to be \$567 million. In addition to the \$275 million from the FTA's New Starts program, the Busway will be funded by other federal and state sources. Connecticut's contribution to the Busway will be \$112 million. Construction

is currently scheduled to begin in the spring of 2012 and service should be up and running in 2014.

The Bridgeport Intermodal Transportation Center

The Bridgeport Intermodal Transportation Center (BITC) project is a multi-phased capital project begun in 1999 that includes construction of facilities to enhance access for transit riders commuting to and from Downtown Bridgeport and to ease intermodal transfers and connections. The BITC will be designed to integrate physically and functionally a variety of modes of transportation in the heart of the central business district. As part of the state of Connecticut's Transportation Strategies 2003-2020, the Transportation Strategy Board⁵⁷ had endorsed the concept of the Bridgeport ITC as one of the three Main Line multi-modal hub stations on the NHL in Connecticut. The BITC incorporates the functions of the local bus service, the Greater Bridgeport Transit (GBT); MNR and Amtrak commuter rail services; intercity bus services, such as Peter Pan and Greyhound; Bridgeport/Port Jefferson Ferry Service to Long Island, New York; and shuttle services such as Connecticut Limo to metropolitan airports.

The project goal is to bring all of the above services into one easily accessible facility with improved passenger amenities and safety. Each element of the overall ITC is designed: (1) to be funded in increments based on federal appropriations and State Bond Commission action; and (2) to be built and/or operated as separate components with an eventual tie into an overall single operating complex.

High-Speed Ferry Service to New York

In late 2009, there was a revival of effort toward the establishment of high-speed ferry service from points on Long Island Sound. While the earliest studies date back several years and envisioned services between several points, refinements that are more recent indicate that the strongest candidate for service would involve the operation of high-speed ferry service from Bridgeport and Stamford to New York City, probably involving a stop in Mid-Town Manhattan and a terminal in lower Manhattan. Additional refinement is necessary to identify specific locations for docks in Bridgeport and Stamford, as well as to specify the terminal facilities required for these locations.

Regional Intermodal Transportation Center Master Plan and Efficiency Study

Southeastern Connecticut Council of Governments commissioned the recent *Regional Intermodal Transportation Center Master Plan and Efficiency Study*⁵⁸. The purpose of this study, completed in 2010, was to evaluate fully the environmental, economic, transportation, and engineering issues associated with this site and improve the linkages between, and the operations of, the various transportation providers and facilities in the region. These include Union Station, Cross Sound Ferry, Fishers Island Ferry, Amtrak, SLE, Greyhound, Southeast Area Transit, cruise ships berthing at Admiral Shear State Pier, taxi and livery services, and parking garages and surface parking lots, while maximizing opportunities for TOD.

The study indicates that the existing rail station is in a good location in relation to the nearby, downtown business district. The district has a considerable amount of vacant building space as well as TOD improvement opportunities (such as building retrofit/expansion etc.). The rail station could be updated to provide better transportation services and amenities

⁵⁷ The General Assembly created the Transportation Strategy Board in 2001 and disbanded the Board in 2011.

⁵⁸ http://www.seccog.org/intermodalStudy/pdfs/RITC_PBLCMtg_11410FINAL.pdf

and serve as a gateway to the business district. The study has identified potential Intermodal Center site improvements that include an up and over pedestrian crossing or a tunnel under the tracks for a pedestrian crossing, and a relocation of the bus terminal. An Economic Impact Analysis was also prepared for the options that were studied. A draft master plan has been reviewed that summarizes the findings of the investigations of several issues related to improvement options as well as a series of sketches of options with a summary of advantages and disadvantages.

7.2 MAJOR FREIGHT RAIL INTERMODAL CONNECTIONS AND FACILITIES

The three deep-water ports in Connecticut are located in New London, New Haven, and Bridgeport. The state has adopted a maritime policy that promotes and supports projects that will facilitate the intermodal connection of water, rail, bus, and highway systems in cooperation with the industry, utilizing public-private resources. The creation of intermodal sea-land transportation hubs that enable existing and emerging coastline vehicular choke points to be bypassed will support the overall transportation strategy of the state. Incentives will be developed and provided to encourage private-public maritime investment projects that will facilitate interstate and intrastate freight movement between hubs and marshaling centers.⁵⁹

The Connecticut Maritime Commission recommends maritime policy to the Governor and the General Assembly and is responsible for developing and updating a long-term strategic plan for all ports and waterways in Connecticut with a focus on the three deep-water ports. State Legislation requires the Commissioner of the Department to implement a number of transportation projects and studies, including an evaluation of providing direct rail links to Connecticut ports. Among other things, the Act requires the Department to complete a rail link to the Port of New Haven.⁶⁰

The movement of containerized freight is a major component in the growth of the regional, national, and global economy. Significant amounts of international steamship containers move across the continent, largely by double-stacking them on rail cars, and many of these containers are bound for the Connecticut area. Freight is also originated in Connecticut and neighboring states and its destination may be outside of the U.S. Most significantly, domestic freight that formerly moved in trailer trucks is now being loaded into the taller domestic containers for shipment to points all across North America by rail, in a method termed Container On Flat Car (COFC). The biggest cross-country trucking carriers, such as J.B. Hunt, Swift, Schneider, and United Parcel Service of America, Inc. have all invested heavily in domestic rail containers and are increasingly moving its long-haul freight by COFC.

Many ports, inland intermodal terminals, and rail corridors in North America are rapidly being upgraded to take advantage of the economics of moving double-stacked domestic containers. This evolution of technology is holding down the cost of long-distance transportation of both raw materials and finished goods. Those states, ports, intermodal terminals, and rail lines that are upgrading its infrastructure will be at a significant economic advantage when attempting to retain jobs and attract new business investments to the region.

Major changes in international and domestic shipping patterns are forecast. The Panama Canal is being widened, and its locks are being lengthened at a cost of several billion dollars, to accommodate the larger, more efficient container ships now being used and constructed. When the Canal project is completed in 2014, a large number of the bigger Asian and European

⁵⁹ State of Connecticut Maritime Policy, 2006, <http://www.ct.gov/dot/cwp/view.asp?a=2314&Q=309828>

⁶⁰ Connecticut Public Act 06-136 - An Act Concerning the Roadmap for Connecticut's Economic Future.

container ships will call on East Coast ports to avoid the backups common on the West Coast. With the arrival of the Panamax vessels in 2015-16 focusing on only a few (four or 5) East Coast load center ports, a reordering of East Coast shipping is forecast. Establishment of container feeder and short sea shipping cargo services will be a component of this reordering.

New London Harbor - Freight and Rail Operations and Facilities



Figure 32. New London Harbor – Admiral Harold E. Shear State Pier Photograph

Admiral Harold E. Shear State Pier (State Pier), as seen in Figure 32, is the only maritime facility in New London Harbor capable of handling ships carrying dry cargo, as well as large passenger vessels. State Pier is located 12 miles west of the Rhode Island/Connecticut boundary, immediately southwest of Amtrak Thames River Lift Bridge, and I-95 Gold Star Highway Bridge. There is convenient access to I-95 at Exit 83 and I-395 is readily accessible from the Pier. Truck access into the facility is via state and local roads, through mainly industrial areas.

New London Harbor on the Thames River is the closest port to the eastern entrance to Long Island Sound (State Pier: approximately 7.5 nautical miles north of the Race). There are no vertical clearance restrictions for vessels arriving at the State Pier. New London Harbor channel is 40 feet deep and 500 feet wide. Cargoes received at New London Harbor and the Thames River includes petroleum and forest products, copper, styrene, coal, and seafood products. Depths in the approach to east side of State Pier are 36 to 40 feet, with depths of 30-35 feet alongside.

In 2008, 14 cargo vessels arrived at State Pier with 99,000 metric tons of lumber, 6,600 M.T. of copper, along with 9 port calls by passenger vessels, including Royal Caribbean's M|V Explorer of the Seas, with 3,400 passengers. Due to the broad economic slowdown led by the housing market, waterborne imports of lumber to the State Pier decreased significantly in 2009, to 30,139 M.T. There were no port calls by passenger vessels at the facility in 2009. In 2009, as marine shipping activity diminished, a considerable amount of lumber and wood products from Canada was transported into the port area by rail. Through November 2010, there were 10 port calls by cargo vessels, mostly carrying steel products, and 2 port calls by passenger vessels. The port area is fully located in an active Foreign Trade Zone.

Open hatch bulk carriers (about 46-47,000 deadweight tons; 650 foot length; 100 foot breadth) featuring two traveling 40 long ton gantry cranes have typically been used to transport, e.g. packaged lumber to State Pier, mainly from Europe and British Columbia.

The 1,000-foot main pier, adjacent finger pier and most of the upland acreage are owned by the state and are under a lease agreement with Logistec USA, Inc., a Canadian stevedoring company. Reconstruction of the east side of the State Pier was completed in 1997; rebuilding of the west side was completed in 2003. A major component of the project was the construction of on-dock rail and two sidings, one on each side of the Pier's centerline. This intermodal component, and 1,000 PSF deck load capacity, allows for the transfer of product, as well as other types of cargo between low bed/flatbed truck, rail car and ships or barges moored at the State Pier.

Berthing is available on both the east and west sides of State Pier, with the east side providing deeper controlling depths and more maneuvering room. Two warehouses, each with approximately 47,000 square feet of floor space are available on site. Both warehouses have truck and rail docks. Logistec personnel at the terminal have the capability to load trucks. Approximately 16 acres are available for outdoor storage. Ships' gear is normally used to load or off-load vessels docked at the Pier. The facility is not equipped with container or gantry cranes. Truck cranes are available by prearrangement with crane service companies.

New London City Pier, Customhouse Pier, and Waterfront Park comprise a large part of the city's waterfront property. Cross Sound Ferry and Fisher Island Ferry District own and operate terminals in close proximity to the New London Railroad Station.

Fort Trumbull State Park in New London is under the supervision of the Connecticut Department of Energy and Environmental Protection. Pier 7 at the State Park is roughly 654 feet long and 30 feet wide, with depths ranging from 26 to 35 feet alongside. The Coast Guard Bark Eagle currently moors on the north side of Pier 7, and CGC Morro Bay docks on the south side. The pier was designed and constructed in mid-1960 when Fort Trumbull was home to U.S. Navy Underwater Sound Lab. Hess Oil Corporation in Groton operates a marine terminal on New London Harbor, primarily for the receipt of petroleum products. Also in Groton, General Dynamics, Electric Boat Division, a major contractor for Navy submarine construction and repair, operates a shipyard north of the Hess Oil Terminal. The U.S. Navy Submarine Base in Groton is about two nautical miles north of the State Pier.

With enhanced rail service, the State Pier should be able to make a strong bid to participate in container feeder and short sea shipping cargo services. Many other ports in New England have been looking at optimizing its rail connections and New London has a unique competitive advantage with on dock and near dock rail capability. For example, competitive ports at Davisville and Providence, Rhode Island have marine facilities with direct rail connections and double stack rail freight capability.

For Connecticut to be competitive, it has to match this capability, not only to handle doublestack domestic container traffic but also large project cargoes such as wind power components. Marrying the cargo handling capabilities of the State Pier with the distribution capabilities of the railroad and its potential to function as an inland port offers the potential to enhance significantly the competitive position of the State Pier. A combination of public and private investment has worked in the recent past, and can work to have Connecticut remain competitive with its neighboring states.

New England Central Railroad

NECR provides freight rail service to the State Pier, with connecting access to United States and Canadian rail networks. NECR, a Rail America Company, is operationally independent from the NEC for its access. Rail America, Inc., headquartered in Jacksonville, Florida, is the largest operator of short line and regional railroads in the world. In 2010, NECR moved approximately 715 carloads to the State Pier, delivering lumber from Canada and Pacific Northwest and one over dimension transformer.

Specific clearance issues that need to be resolved between State Pier in New London and the NECR Willimantic Yard to reach full 20'6" double-stack COFC clearances (stacked 9'6" "domestic" COFC units) are the seven vertical clearances listed below. NECR has completed a double-stack clearance project from Willimantic north with the line cleared today for mixed steamship and domestic stacked COFC units. 19'6" clearance is the minimum vertical clearance to permit NECR to be able to clear mixed stacks of 8'6" steamship and 9'6" domestic COFC units tying in to the double-stack COFC rail route already cleared between CN at East Alburg, Vermont and the P&W at Willimantic. Full 20'6" vertical clearances will be achieved on this portion of the NECR line when commercial conditions warrant.

It is important that any work to be done on the five locations lower than 19'6" located between the State Pier facilities at the Port of New London and NECR's now-cleared 19'6" line at Willimantic will produce clearances to the 20'6" standard. All milepost (MP) references are on NECR's Palmer Subdivision and are calculated from Union Station at New London:

MP 0.65	overhead	19'10"	State Pier Road and Amtrak	New London
MP 1.28	overhead	19'5"	Private / USCG	New London
MP 14.15	tunnel	19'4"	Lafayette	Norwich
MP 14.77	overhead	19'2"	State Route 2 and 32	Norwich
MP 16.47	overhead	19'4"	West Town Rd. / Rte. 642	Yantic/Norwich
MP 16.80	bracing	20'3"	NECR truss bridge*	Yantic
MP 17.04	overhead	19'10"	Route 32	Yantic

XX'X' = vertical clearances below 19'6".

*May require some modest modification of its system of bracing.

Providence and Worcester

P&W, a regional freight railroad operating in Massachusetts, Rhode Island, Connecticut, and New York, interchanges freight traffic with NECR at Willimantic and New London. P&W also has the ability to interchange with NECR adjoining State Pier in New London and at the Willimantic Yard. The mixed double-stack (tall domestic container on the bottom, shorter steamship container on top) route over the P&W is from its connection with the NECR at Willimantic Yard, east over the Willimantic Secondary to Plainfield, then north up the Norwich Branch to Thompson and then on to Worcester, Massachusetts and Providence, Rhode Island. P&W does not have double-stack clearance on the east side of the Thames River from New London to Plainfield, and thus to the Willimantic Yard.

Pan Am Southern

In 2008, PAR and Norfolk Southern Railway Company (NS) announced an agreement to improve freight rail service and increase track and yard capacity in upstate New York and New England through a newly formed joint venture railroad company PAS. The focus of PAS is the Patriot Corridor, the 155-mile main line track that runs between Mechanicville, New York and Ayer, Massachusetts (about 30 miles west of Boston). The PAR and NS joint venture includes the transfer of trackage rights in Connecticut. With an improving economy and vigorous,

concerted marketing effort by the freight rail companies, stevedore operator at State Pier and the state of Connecticut, prospective customers should become aware of the intermodal advantage of doing business at the New London State Pier.

Freight Rail Planning and Initiatives

State Pier Needs and Deficiencies Planning Study⁶¹

The Department hired a consultant to conduct the *State Pier Needs and Deficiencies Planning Study (Study)*. Among the tasks included in the Study was to analyze the State Pier property and infrastructure to determine the best business use of the existing facility. The Study identified impediments and provided recommendations for infrastructure improvements.

New London has a deep-water port facility with an adjoining rail yard and rail access that connects to four Class 1 railroads as well as a host of inland intermodal and cargo handling facilities. Rail-port connectivity and collaborating with NECR and/or P&W in a public-private marketing and operation deal is critical to business success. The Study identified several potential Inland Port areas connected to the State Pier Facility by existing rail lines and evaluated them for expansion of port operations.

The Study contains a range of possibilities from no cost/no build to spending significant improvement dollars on a max build out option. A product of the Study will be a draft Request for Proposal (RFP) to be used to solicit a business or businesses to lease and develop the Admiral Shear State Pier facility. The Department's current leases with Logistec and Thames River Seafood Co-op, LLC will expire in January 31, 2013. The Study was completed in September 2011.

New Haven Harbor - Freight and Rail Operations and Facilities



Figure 33. New Haven Harbor – Port of New Haven Photograph

⁶¹ The study is available on the Department's website. The direct link is:

http://www.ct.gov/dot/lib/dot/documents/dcommunications/MajorProjectUpdates/FINAL_DRAFT_REPORT-March2011.pdf

The Port of New Haven, as seen in Figure 33, is the largest deep-water port in Connecticut. The port is located approximately one-quarter mile south of the reconfigured I-95 Interchange. New Haven Harbor channel is 35 feet deep and 400 to 800 feet wide. Maintenance dredging of the federally designed channel was last performed in 2003-2004. The facilities for deep-draft vessels are situated on the east and northeast sides of the harbor. Vehicular access to the port primarily uses local roads via access from I-95 and Route 1.

In 2007, 9,574,406 tons of waterborne commerce moved through the Port of New Haven.⁶² According to the data published by the American Association of Port Authorities, this number had grown from 10.8 million tons in 2004 and ranked 51st overall among US ports in total trade.

The Port of New Haven has a channel with deep water that could provide access for container barges without dredging required. On the east side of the channel, there are 520 feet of existing docks. There is also a dock in the inlet that is 700 feet long. On the west side of the inlet, there is an existing quay or wharf bank that is 700 feet long and has 300 feet of frontage that can be used for a quay. The water depth leading up to the inlet is 39 feet.

All tonnage is handled through nine private terminals at the port. These include Gateway Terminal, Gulf Oil Terminal, Getty Oil Terminal, New Haven/Logistec Terminal, R&H LLC, United Illuminating, Magellan, PSEG Power Connecticut, and Motiva. The Buckeye Pipeline to Ludlow, Massachusetts, is a major extension of the port's marketing reach for petroleum products, and connects the port with five inland terminals in Connecticut and two in Massachusetts.

Logistec is currently the main terminal operator at the port. For handling dry cargo, it has an inlet into its facility with a quay on the north side and a pier on the south side approximately 650 feet long. No dredging would be required for vessels to access this site, as it presently is being used by ocean-going vessels.

The types of commodities being transported into and out of New Haven include petroleum products, chemicals, scrap metal, lumber, metallic products, cement, sand, stone, salt and general break bulk cargo. There are four dry bulk berths totaling 2,470 feet, five general cargo berths totaling 3,450 feet, and eighteen liquid bulk berths totaling 9,355 feet. The bulk and break-bulk terminal operators on site are Gateway Terminal and Logistec who have seven warehouses totaling approximately 225,000 square feet. There are 40 pieces of forklift equipment.

Active, proximal rail exists at Gateway Terminal's Chapel Street Facility. Additionally, rail is active to Logistec's Waterfront Street Terminal, within the port. The P&W provides rail service with connections to Canadian National Railway, Canadian Pacific Railway, and Norfolk Southern Railway. Fifty-six acres of land are available for open storage. P&W currently accesses the port via a main track into the port area down Waterfront Street and has a connection to the Logistec facility.

The city of New Haven took a significant step toward enhancing use of the port with its establishment of the New Haven Port Authority (NHPA) in 2003. The NHPA governs the port district located on the east side of New Haven Harbor. The NHPA works closely with the privately-owned/operated terminals and the New Haven Harbor Cooperative, Inc. The City and the NHPA have joined its primary objective being to promote and encourage development of the

⁶² Army Corps of Engineers, www.iwr.usace.army.mil/ndc/wcsc/wcsc

port-related economy, maintain and expand maritime industrial employment, and enhance key port properties for active maritime uses.

Freight Rail Planning and Initiatives

I-95 New Haven Harbor Crossing (NHHC) Corridor Improvement Program

The Department's I-95 NHHC Corridor Improvement Program is a multi-modal transportation improvement program that features public transit enhancements such as building the State Street rail station and adding SLE train services, as well as roadway improvements along 7.2 miles of I-95 in greater New Haven, between Exit 46 (Sargent Drive) in New Haven and Exit 54 (Cedar Street) in Branford.

In addition to the major investment in I-95 and public transit enhancements, the NHHC program incorporates a number of improvements that specifically enhance the viability of the Port of New Haven. These improvements include improving accessibility to the port via I-95 and by re-establishing freight rail connectivity to the port. Further, additional components of these improvements include provisions for additional landside storage capacity within the port as well as inclusion of a new rail platform providing for public trans-loading capabilities at the port.

The accessibility improvements to the port include the reconfiguration of Interchange 50 to create direct access to the port area via I-95 and the new Waterfront Connector road. The added landside storage capacity will be provided by bridging the approaches to the Quinnipiac River Bridge over the land below, reclaiming the land beneath I-95 for potential storage capacity.

A rail link is being restored to the Port of New Haven (State Project No. 92-586) by constructing a rail line along the eastern side of Waterfront Street, along with a series of spur tracks and up to the private property of various terminals. Rail spur tracks have been designed for Gulf Oil, Gateway Terminal, Magellan Terminal, New Haven Terminal, Coastline Terminal, and the PSEG power plant.

The construction of the rail link was segmented into three major phases of work. Phase 1 and phase 2 construction of the rail link serve to re-establish the freight rail line from the east approach of Tomlinson Bridge to the southern terminus of Waterfront Street and are substantially complete. Phase 3 of the rail link consists of the construction of individual rail spurs extending from the rail line across Waterfront Street up to the property line of the respective port operators. The rail line and spurs provide the direct rail connection to the Port of New Haven and the respective port operators. The design of the rail spurs has been integrated into and programmed to be constructed with the city of New Haven's project for the reconstruction of Waterfront Street (State Project No. 92-541).

New Jersey Highway Initiative

A proposal is being studied to use five acres of land in the Port of New Haven, where cargo could be shipped by rail cars on barges from New Jersey and moved by freight rail connections to Springfield, Massachusetts before being switched to trucks. "The \$500 million project is part of the New Jersey Highway Initiative being studied by the federal government. It consists of a system of waterborne freight projects between five New Jersey hubs and the States of New York, Rhode Island, Connecticut, Maryland and Virginia."⁶³ This project would reduce truck trips on the congested Interstate 95 and Interstate 91 corridors.

⁶³ New Haven Register, September 1, 2010.

Bridgeport Harbor - Freight and Rail Operations and Facilities

Figure 34. Port of Bridgeport – Bridgeport Harbor Photograph

The city of Bridgeport is served by two harbors – Bridgeport Harbor and Black Rock Harbor. Bridgeport Harbor, the principal harbor, as seen in Figure 34, is located approximately 52 nautical miles northeast of New York City, 25 nautical miles southwest of New Haven, and approximately 150 nautical miles from the Port of Boston. The use of the harbor is primarily commercial, however, there is a recreational component located here. Access to Bridgeport Harbor also is approximately one-quarter mile south of I-95 at Interchange 29 or at Interchange 27 with vehicular access provided by local roads. Bridgeport Harbor is centrally located to I-95, State Routes 25 & 8 and 130, and the Merritt / Wilbur Cross Parkway.

Bridgeport Harbor is the location for several major power-producing facilities that are tied into the northeast power grid; one of the power plants generates power by burning both coal and oil, which are brought in principally by water. The other is a gas fired generating facility fed by underground high-pressure lines. There are also several fuel oil tank farms located within Bridgeport Harbor and Black Rock Harbor with supplies delivered primarily by water.

The primary commodities historically transported through the port included petroleum products, coal, seafood, sand, stone, paper products, used cars and trucks, fruits, and break-bulk cargo. The primary freight terminal is Cilco Terminal, located in Bridgeport Harbor, which is owed by Coastline Terminals of Connecticut. Bridgeport has unique warehousing assets for foodstuffs in addition to its bulk liquid-handling assets. Coastline Terminals has recently entertained several new interests in the deep-water port and related facilities involving bulk materials and cargo. The terminal area does not currently have rail access, nor is there a plan to provide rail access in the future.

Black Rock Harbor is primarily a recreational harbor. However, there are several industrial uses located there such as oil tank farms and construction companies that receive water-borne materials. There is a drop-down spur off the rail line tracks located here that previously served

the industrial users in proximity to the harbor, however, its current operational status is unknown.

The Bridgeport Port Authority is a quasi-public agency that gets its powers from State Statutes. The Authority leases a portion of its Water Street Dock and Terminal to the Bridgeport-Port Jefferson Steamboat Company that operates a year-round traditional ferry service between this terminal and Port Jefferson, New York. This ferry is within walking distance to the train station.

The Bridgeport Port Authority also owns a 44+-acre waterfront parcel on the eastern side of Bridgeport Harbor, known as the Bridgeport Regional Maritime Complex (BRMC). A portion of the BRMC property is leased to Derecktor Shipyards, a world-class ship building and service facility. Derecktor Shipyards is situated on 23 acres with unimpeded access directly on Bridgeport Harbor. Derecktor's site has been improved with a 150' travel lift pier and Derecktor operates a 600-ton travel lift on the site (the second largest in the world) as well as a dry dock facility. Derecktor's Bridgeport facility constructs and services several classes of vessels, and is approved for the construction and service of military vessels.

A direct rail-freight connection was provided to the port of Bridgeport many years ago along Seaview Avenue. The service has since been abandoned and the rail infrastructure has been removed.

Freight Rail Planning and Initiatives

Currently, there are no rail initiatives underway for the Port of Bridgeport and the reinstitution of a direct rail line is currently not planned at the port. Interviews with the terminal operators noted no strong need for rail at this port at this time for current or projected commodities. This is due primarily to the channel depth that does not allow larger vessels access that would carry the types of commodities conducive to rail transport. The Harbor has not been dredged since the early 1960's, and about half of the material to be dredged is contaminated. Authorized at a 35' depth, the harbor is silting up. The depth has been reduced in areas to 27', which restricts the type and size of vessel traffic. Disposal of the contaminated dredge material is a big and expensive issue. Without dredging, the newer supertankers likely cannot pass up into the harbor and would need to keep to the outer harbor reaches. Therefore, the procurement of various pieces of equipment such as top loaders, stackers, cranes, and yard tractors would be required.

CHAPTER 8 – ECONOMIC IMPACT AND DEVELOPMENT

The Department is committed to promoting economic vitality in the state with the aid of the transportation system. The transportation network is the foundation for local, state, regional, and national economies and the state's economic vitality is tied to its ability to meet mobility needs.

The Connecticut rail system has had a long-term beneficial impact on the state from inception to present. A boom in rail investment corridors took place 1834-1895, leading to significant accessibility enhancements in the transport of people and goods. Railroads permitted concentrations of both population and industrial settlement, while the linkage between water-powered factories and the railroad led to significant industrial expansion.

Railroad consolidation in the early 1900s created regional linkages important to widening the industrial base in Connecticut, channeling significant freight volume through the rail network hub located in New Haven. The Maybrook, New York – Derby, Connecticut rail corridor played a central role in feeding freight to and from the lower New England states of Connecticut, Rhode Island, and Massachusetts, south of Boston. The construction of the interstate highway system, which began in the 1950s, resulted in a dramatic shift in modal share away from Connecticut railroads; both freight and passenger rail traffic dwindled as the superior time delivery of parallel roadway corridors presented a significant competitive edge over rail transport.

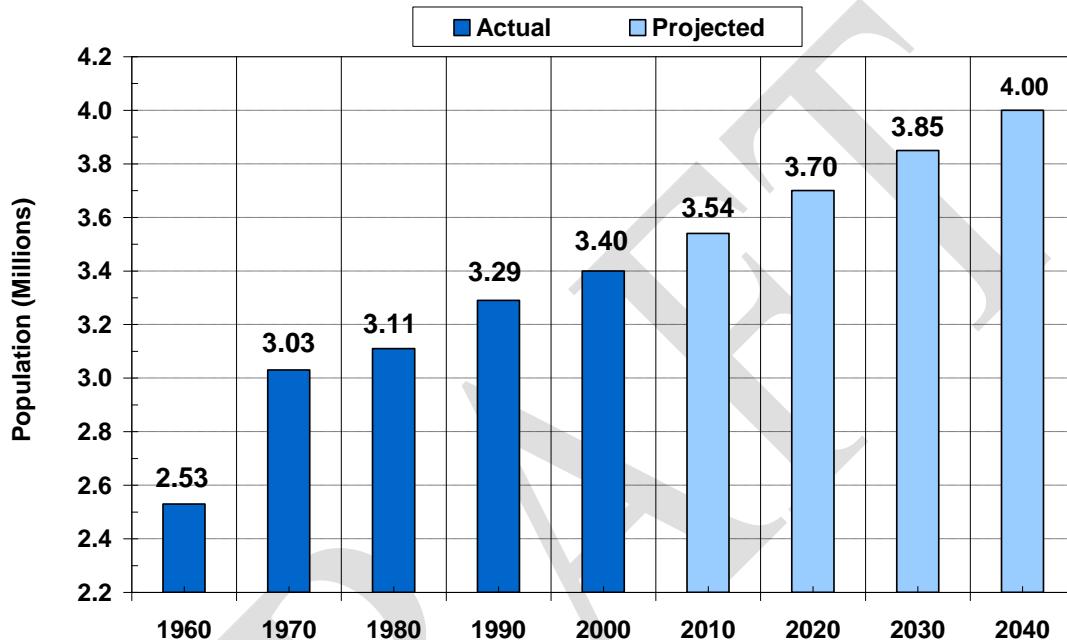
8.1 REVIEW OF DEMOGRAPHIC TRENDS AND PLANNING DATA

The demographic data presented in this chapter projects increases in population, employment, motor vehicle ownership and usage, with daily vehicle miles growing steadily through 2040. The majority of people continue to drive alone to get to their places of employment. The Department has adopted the following rail-related strategies contained in the 2009 Long Range Plan (LRP) to address these issues:

- Collaborate with the Connecticut Department of Economic and Community Development (DECD) and other stakeholders to assist in meeting the state's labor force needs.
- Support efforts to provide mobility options that enable residents of Connecticut to reduce the percentage of their household income that is spent on transportation.
- Expand, integrate, and connect the public transportation systems to provide mobility within metropolitan areas in Connecticut, between metropolitan areas in the state and between metropolitan areas in Connecticut and adjacent states.
- In conjunction with stakeholders, identify, prioritize, and seek funding for rail-related projects and initiatives that improve and expand mobility.
- Encourage innovative solutions to mobility issues that balance the needs of people and freight to promote improved regional and state economic sustainability.
- Support funding for programs and projects that address needs for accessible transportation to sites of major employment and medical, educational, cultural, retail and recreational facilities.
- Support municipal efforts to provide and expand mobility options for people and for freight through coordination of transportation planning and land use planning.
- Facilitate economic growth for the state and the Northeast region through continued maintenance and improvement of the state's and the region's transportation facilities and services through proper planning, funding, and coordination of efforts.

Population

Figure 35 presents census data for Connecticut in ten-year intervals from 1960 through 2000 and projected population growth for ten-year intervals from 2010 through 2040. Modified state population projections from OPM anticipate an 8.5 percent increase in total state population from 3,405,565 in 2000 to 3,696,560 by 2020. As presented in Figure 35 the current forecast of an average annual growth rate of 0.43 percent for the period of 2000 to 2020 indicates that this trend of slow steady growth will continue. Connecticut's population is projected to increase to an estimated 4.0 million by 2040.



Source: 1960 Census, 1970 Census, 1980 Census, 1990 Census, 2000 Census, and CTDOT Landuse 28 Projections. Data for years following 2000 is projected. Graphics revised as of September 2010.

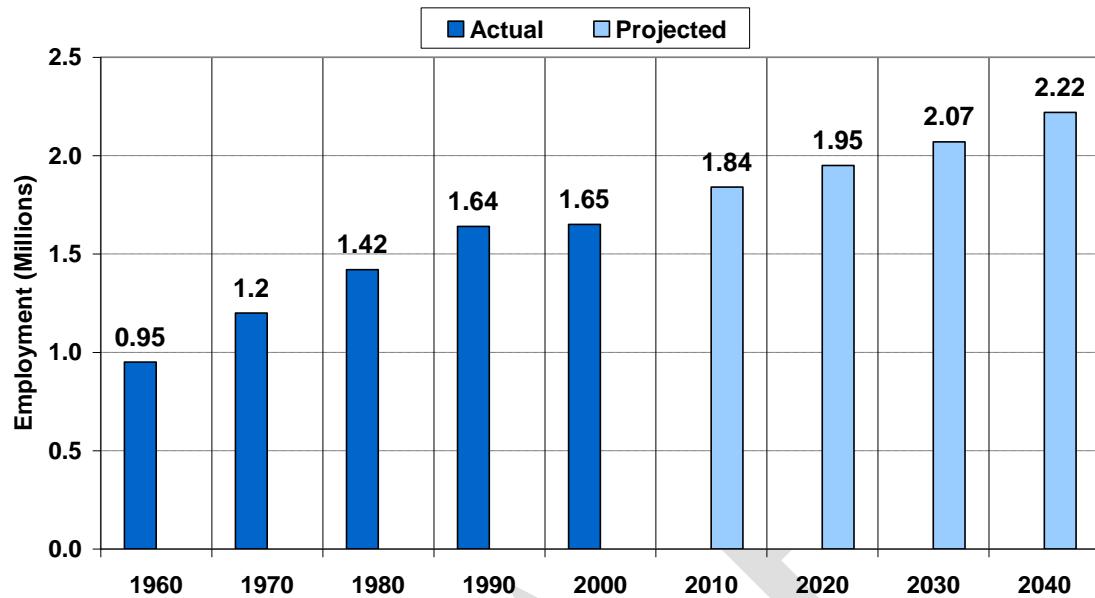
Figure 35. Population Growth in Connecticut

Employment

Employment trends, annual fluctuations in employment, and employment projections are presented and discussed in this section. This information is important because it provides insights into changes in growth in Connecticut, people's travel patterns, and current and future mobility needs and issues. The Department obtains data on existing employment from the Connecticut Department of Labor and develops 20-year statewide and regional projections of future employment to use as variables in its transportation modeling process. Employment estimates are a key part of determining the number of work trip attractions to a traffic analysis zone (TAZ) in the generative phase of the Department's travel model. Employment at any given time depends heavily on the state of the economy.

Figure 36 presents actual employment data for Connecticut in ten-year intervals from 1960 through 2000 and projected employment growth for ten-year intervals from 2010 through 2040. From 2000 to 2040, the Department is forecasting a moderate rate of growth in employment. Using the Census Transportation Planning Package, which takes into account in-state and out-of-state travel to places of employment, the Department has projected that employment in

Connecticut will increase at a slow, annual growth rate of less than 1 percent from the 2000 employment level to 1.95 million in 2020, 2.07 million in 2030, and 2.22 million in 2040. This represents a 34.5 percent increase in employment from 2000 to 2040.



Source: 1960 Census, 1970 Census, 1980 Census, 1990 Census, 2000 Census, and CTDOT Landuse 28 Projections.
Data for years following 2000 is projected. Graphics revised as of September 2010.

Figure 36. Employment in Connecticut, 1960-2040

Regional Employment

Figure 37 presents actual and projected Connecticut employment data from 1990 through 2040 by planning region. In 2000, the Capitol, South Central, and South Western regions had the greatest numbers of jobs: 445,230, 266,580, and 211,480, respectively. The total employment in these regions represented 55.9 percent of the state's total employment in 2000. The Northwestern Region had the lowest number of jobs: 9,900. With respect to employment density in 2000, the South Western and Greater Bridgeport regions had greater than 700 jobs per square mile. The Northwestern Region, comprising nine towns, had the lowest number of jobs per square mile (27) of the planning regions in 2000. The state had an average employment of 352 jobs per square mile.

The Department has projected employment increases in all planning regions through 2040. The Capitol Region is projected to experience the highest growth in employment followed by South Central, Southwestern, Southeastern, and Greater Bridgeport. The lowest employment growth is projected in the following regions: Litchfield Hills, Northeastern, Windham, Connecticut River Estuary, and Northwestern.

A long-term factor that could make this growth optimistic is the aging of Connecticut's population that could lower the overall growth of the labor force in Connecticut. The increased average age is a nationwide trend with the large group of "baby boomers" approaching retirement age.

However, changes in the Social Security system and in companies' pension plans and health benefits could result in more workers remaining in the workforce for longer periods. This situation could result in increased demand to modify and improve transportation systems to accommodate the mobility needs of older workers.

The introduction of a New Haven – Hartford – Springfield commuter rail service and the New Britain-Hartford Busway will be especially beneficial to the Capitol and South Central regions as an alternative to driving vehicles to places of employment.

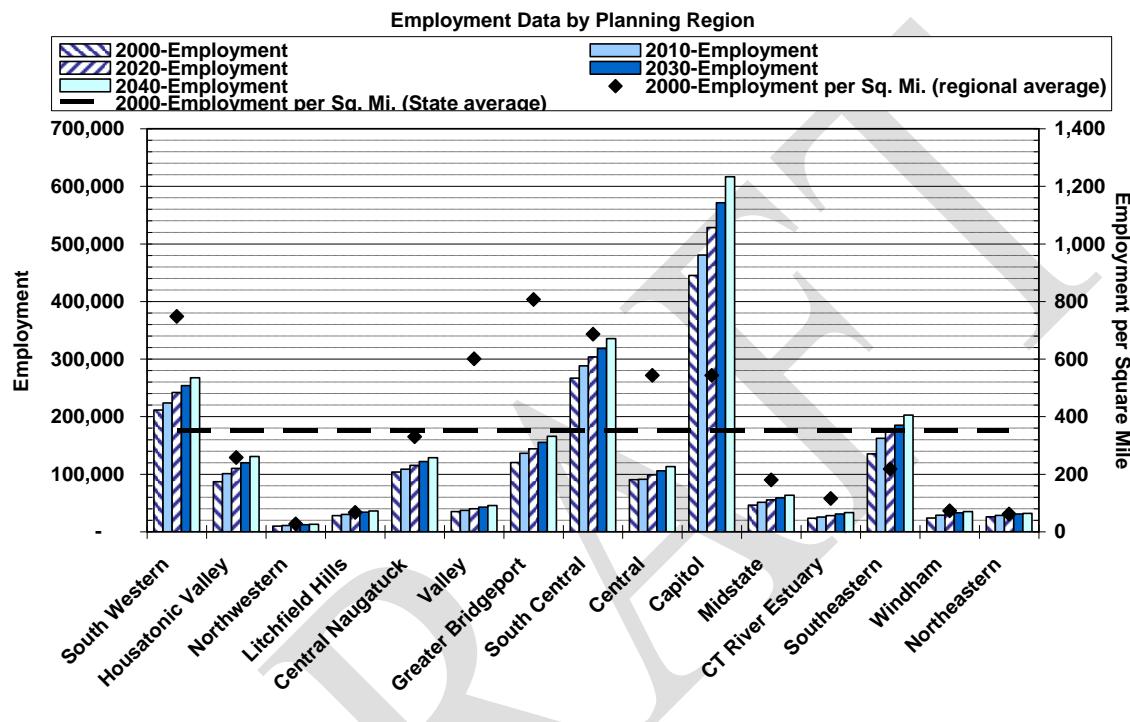


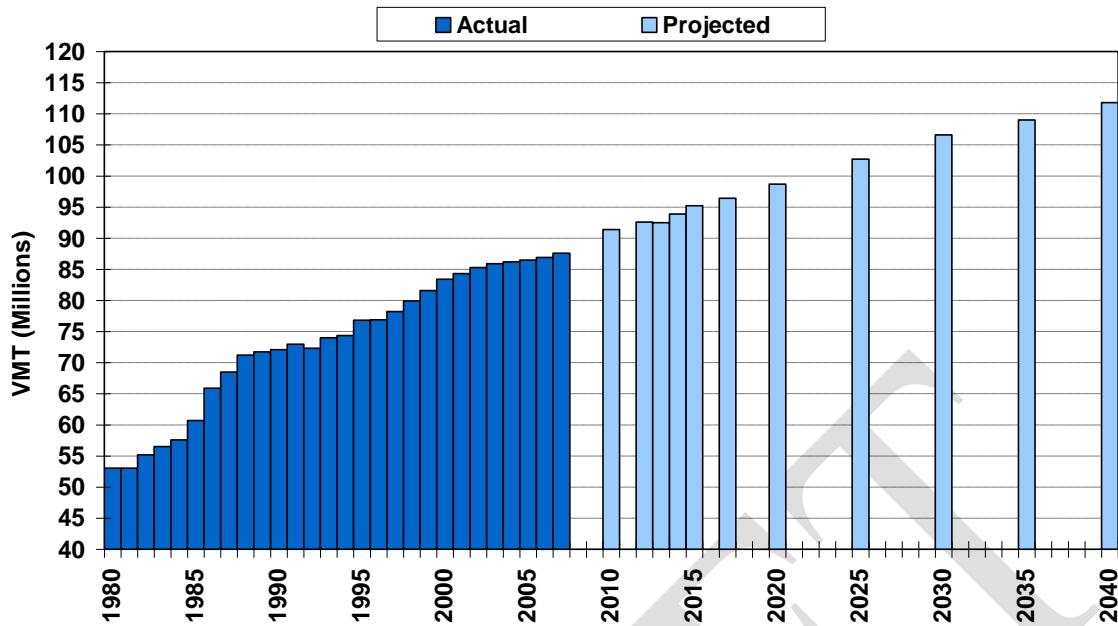
Figure 37. Employment Data by Planning Region, 2000-2040

Motor Vehicle Ownership

From 1990 to 2000, Connecticut's population increased 3.6 percent from 3,287,116 in 1990 to 3,405,565 in 2000. During this same period, motor vehicle ownership, as reflected by the number of passenger vehicles registered in the state's cities and towns, increased by over 5.9 percent from 1,963,809 to 2,080,612.

Auto Usage

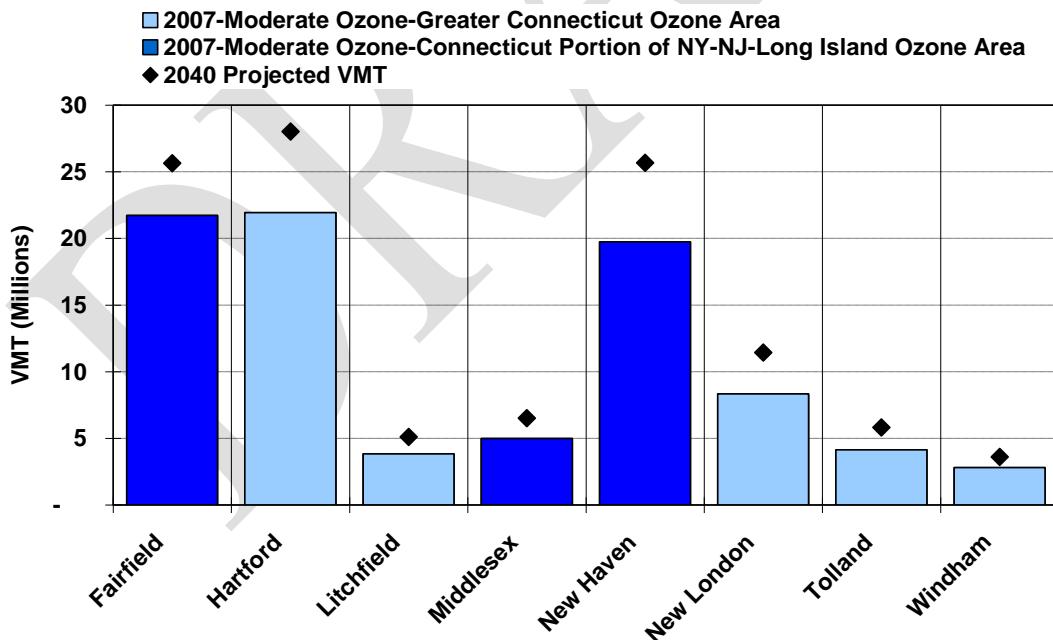
One index of vehicle use is daily Vehicle Miles of Travel (VMT). As Figure 38 illustrates, daily VMT in Connecticut has been growing steadily since 1980. In 2000, the total VMT in Connecticut was 83.4 million miles. Future projections call for continued slow growth in VMT as both the state population and the economy continue to grow. In 2040, the statewide VMT is anticipated to be 111.8 million miles. This represents an increase of 28.4 million miles or a 34.1 percent increase from the VMT in 2000.



Source: Years 1980 to 2007 from Highway Performance & Monitoring System Data; years greater than 2007 are projected with CTDOT Travel Model (Series 29). Graphic revised in November 2010.

Special Notes: Data represents the average daily vehicle miles of travel. Some years are leap years. Model projections do not include Worcester UA VMT.

Figure 38. Vehicle Miles Traveled (VMT) in Connecticut



Source: CTDOT Travel Model (Series29). Graphic revised in November 2010.

Special Notes: Data represents the Average Daily vehicle miles of travel.

Figure 39. Vehicle Miles Traveled (VMT) by County

On a county level, in 2007, as illustrated in Figure 39, Hartford County had the most vehicle miles traveled in the state: 21.9 million miles or 25.1 percent of the average daily miles traveled. Comparatively, Windham County had the fewest with slightly less than 2.8 million miles or 3.2 percent of the statewide average daily VMT.

As shown in Figure 39, the three counties with the highest VMT in 2007: Hartford County, Fairfield County, and New Haven County, are projected to have the largest increases in VMT in 2040.

Commuting

Getting people from their homes to their place of employment puts a critical demand on the transportation network. Increases in suburban employment have resulted in greater separation between home and the worksite. This has resulted in increases in suburban travel that have placed added strain on the transportation system beyond the urban center.

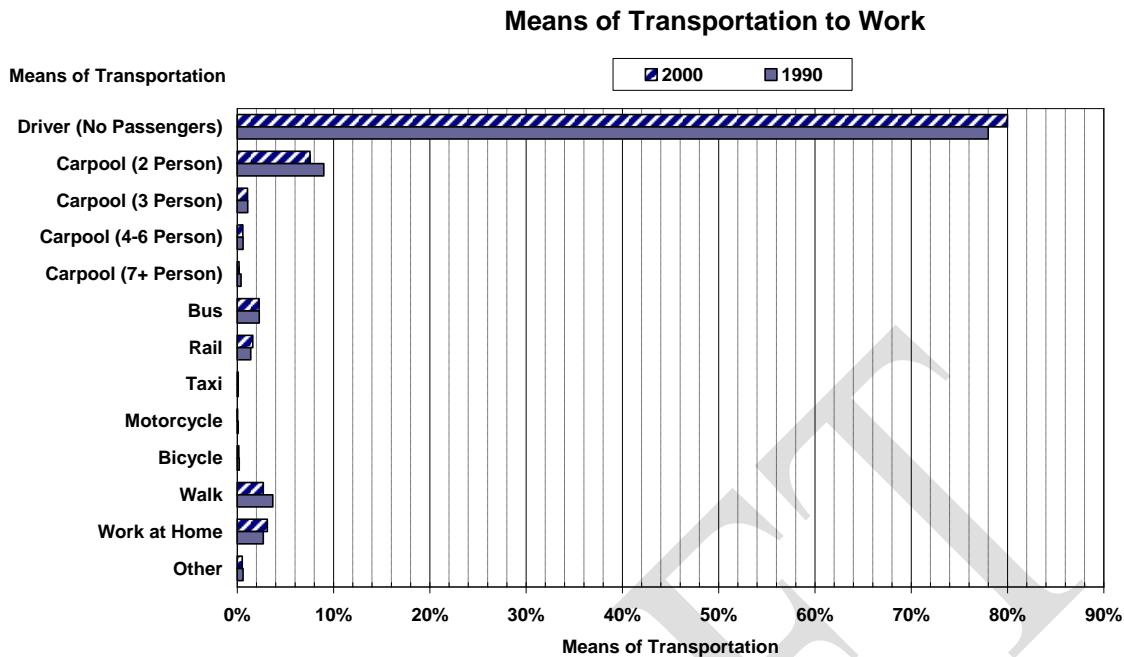
During the period 1980 through 2000, the shift of employment from central cities to suburban towns has been accompanied by an increase in the percentage of Connecticut's work force commuting to employment sites outside their towns of residence. The number of workers who commuted to a job located outside their towns of residence increased 7 percent statewide from 1,071,800 in 1990 to 1,147,898 in 2000. During the same period, the number of workers living in Connecticut whose place of employment was located within their town of residence decreased by 18.1 percent from 601,642 to 492,925.

The aforementioned demographic changes have affected the amount of time it takes commuters to make trips. The average statewide commute increased 13.74 percent from 21.1 minutes in 1990 to 24.4 minutes in 2000.

Information on the means by which persons in Connecticut travel to work is presented in Figure 40. This figure presents 1990 Census and 2000 Census data on means of transportation to work for Connecticut workers who are age 16 and over.

In 2000, 80 percent of workers drove to work alone, 7.56 percent traveled in 2-person carpools, 1.08 percent traveled in 3-person carpools, (0.59) percent participated in 4-6 person carpools, and .18 percent traveled in a carpool of 7 or more persons. After the private automobile, "Work at Home" was the next largest category (3.13 percent) followed by "Walking" (2.70 percent), "Bus" (2.20 percent), "Rail" (1.62 percent), "Other" (0.52 percent), "Bicycle" (0.18 percent), "Taxi" (0.10 percent), and "Motorcycle" (0.05 percent). Additionally, in 2000, 0.07percent of workers used a subway to get to work, 0.01percent used a trolley car or streetcar, and 0.01 percent used a ferryboat to get to work. "Subway", "Trolley Car" or "Streetcar", and "Ferryboat" are new Means-to-Work categories that were listed in the 2000 Census.

A comparison of the 1990 to 2000 Means-to-Work census data indicates that in 2000 the private automobile continued to be the primary means of transportation to work. However, there was an increase (2 percent) in the percentage of workers driving alone and a decrease (1.69 percent) in the percentage of workers using carpools as a means of transportation to work. There also were increases in the percentage of workers working at home and traveling by rail and decreases in the percentages of workers riding the bus and walking to work.



Source: 1990 Census and 2000 Census. Graphic revised as of November 2010.

Figure 40. Means of Transportation to Work in 1990 and 2000

The increase in the percentage of workers driving alone and the decrease in the percentages of workers who carpool, ride the bus, and walk to work have contributed to the growth in traffic volumes on Connecticut roads.

The increase in the number of commuters driving alone to work occurred despite the higher cost compared with carpools and transit. The continuing dispersion of employment and other services into the suburbs is a contributing factor to this behavior. Another significant and somewhat related factor is the increasing number of women, particularly women with young children, in the labor force. Women now make more trips, by all modes, than men do and they are more likely to "trip-chain" - to link together a series of trips for different purposes in one outing. The increase in "trip-chaining" associated with providing childcare and managing a household is directly related to the increase in the number of commuters driving alone.

Reducing the number of single occupancy vehicles has proved to be a difficult objective. Several factors contribute directly to a successful carpool. These include a large employer that serves as a "magnet", a long commuting distance (greater than 10 miles), and a work location where free parking is not readily available. Another factor which has been observed in other areas of the country and that may start affecting Connecticut commuters is the decision to avoid congestion and decrease travel times during the peak period by using High Occupancy Vehicle (HOV) lanes. Connecticut now has approximately 38 miles of HOV lanes in operation on I-84, I-384, and I-91 extending northward and eastward from Hartford. These lanes carry approximately 7,200 commuters toward Hartford during the morning peak period.

Local bus service tends to be centered on urban areas. Express bus service primarily connects suburban towns with urban centers. While rail ridership has increased during the past ten years, bus ridership has declined overall. The Capitol Region (Greater Hartford Area) has the

heaviest use of bus service in the state. Bus ridership in the Capitol Region accounts for nearly 35 percent of the total bus ridership in the state. The median household income for bus riders is lower than any other mode of transportation, and many bus riders have limited access to automobiles. Low household income and lack of auto availability continue to be significant factors in the use of bus service.

Rail commuters in Connecticut historically have been destined mainly for New York City. Data, however, indicates that the number of people traveling in the reverse commute direction (New York to Connecticut) and within Connecticut is increasing. The most heavily traveled segment of rail line in Connecticut is between Norwalk and Greenwich, the area of residence for the majority of the state's rail commuters who work in Manhattan. Rail service provides the most convenient means of traveling to Manhattan, and it captures most of the commuter market to that destination. Rail ridership between Connecticut towns is increasing, and, although it remains a small percentage of total rail ridership, it represents a growth component that is a priority for the state.

8.2 ECONOMIC IMPACTS OF RAIL

Developments in technology, global trading relationships, national and state public policies, funding programs, and infrastructure development will continue to shape the role and impacts of the railroads in Connecticut. The Northeast is now defined by an integrated set of continental corridors. Metropolitan regions now function as the foundation units of economic activity and hubs in the global transportation and communications network. Connecticut is located in the center of five metro economic regions. Three of the five economic regions – the New York metro region, the Hartford/Springfield metro region, and the Southern Coastal area metro region, which includes the New London, Norwich, and Mystic area and part of Rhode Island – are either partially or principally located within Connecticut. Transportation corridors linking the New York, Boston, Albany metro economic areas run through Connecticut. Many of Connecticut's residents and businesses are within 100 miles of labor markets and major passenger and freight facilities in New York, New Jersey, and Massachusetts.⁶⁴

Policy-driven initiatives concerning conservation, climate change and responsible growth and development in Connecticut that focuses on the state's strategic location in the center of these five metropolitan economic regions will be essential to supporting and promoting economic vitality in Connecticut during the next several decades. Optimization of the transportation system and the role of the rail system within the Northeastern mega-region will have a profound effect on the vitality and competitiveness in the growing international economy.

To assist Connecticut residents and companies in competing effectively in global, national, and regional markets, the state of Connecticut must take strong, decisive, and synchronized actions to maximize the benefits of its proximity to these major markets and transportation hubs and to address cost-effectively the impact of the following on mobility needs:

- Increasing demands on the highway, rail, air and water transportation systems in Connecticut and in the United States;
- Demographic changes;
- Current and future labor force needs;

⁶⁴ Michael Gallis & Associates, *Connecticut Strategic Economic Framework: A Report of the Connecticut Regional Institute for the 21st Century*, Connecticut Regional Institute, Conn., 1999, and Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-24.

- Volatile fuel prices; and
- Federal and state actions to reduce GHG emissions, conserve energy, curb sprawl, and control infrastructure costs.

Railroads play an important role in the Connecticut economy, in terms of significant passenger rail travel that supports efficient urban growth in the NHL corridor, and in goods transport delivery and capability over four lines that also represent a resource in future development. The rail passenger and rail freight transportation services, facilities, and networks in Connecticut and in adjacent states are integral to maintaining Connecticut's connection to regional and global markets. In conjunction with air, bus, taxi, and water transportation services, rail passenger services, and facilities provide access to employment, affordable housing, retail, cultural and recreational facilities, medical care, and centers for education. Rail freight services and facilities in Connecticut, in conjunction with truck and water transportation facilities in Connecticut and adjacent states, provide the ability to send and receive goods that otherwise would not be cost-effective or feasible to transport from greater distances by truck alone.

The state's rail service can play a role in spurring economic development through TOD. Cities and towns are recognizing the significant economic advantages that walkable, mixed-use activity in its community can produce. It is important for the Department to work with local and regional entities on TOD projects to leverage the state's rail service for sustainable and responsible economic growth.

In September 2009, the Governor's office released a Statewide Economic Strategic Plan (ESP). The DECD was tasked with putting the ESP together. There are several references to transportation by mode including a discussion on Connecticut's maritime industry and the economic impacts. It also includes an overview of the ferry, rail, bus, highway, and aviation system.⁶⁵

Rail Commodity Movements

The potential to divert a shipment from highway transportation to railroad or to change the time at which it is delivered depends on several factors including distance, commodity, and geographic trading partners.

Although it is possible to develop a viable intermodal service over short distance, truck movements less than 500 miles are not good candidates for potential diversion to rail. Railroad operations are most efficient when hauling heavy tonnage over long distances; conversely, it tends to lose its cost advantage over trucking, as the distances grow shorter. For intermodal operations, extra handling is needed at the ends of the rail trip to acquire and load a unit (i.e., semi-trailer or container) on a railcar at the start of the trip, and to unload and deliver the unit at the destination. This additional cost can only be outweighed on trips long enough for the rail line-haul costs to be sufficiently lower than the truck costs.

Generally, the commodities that have the greatest potential for diversion from trucks are those that have a low value to weight ratio, and do not require a lot of special handling. Commodities that have a high value or have time or other types of sensitivities are less likely to travel by modes other than truck. These include such items as perishables, tobacco products, small electric parts and appliances, wearing apparel, utensils, military or defense related products, ordinance, and live animals. These types of commodities have a low diversion potential. The

⁶⁵ http://www.ct.gov/ecd/lib/ecd/connecticut_esp-final.pdf

individual circumstances regarding each particular shipment or class of shipment must be evaluated to determine if it is a candidate for diversion. The actual amount of diversion possible depends on the susceptibility of the particular shipments.

An important consideration for transportation service is the issue of traffic balance. The two-way movement of commodities provides a much more attractive service since it minimizes the movement of empty equipment. Lack of an appropriate back-haul movement can make a particular intermodal service unprofitable and prevent its development.

A major ongoing focus in goods movement is the just-in-time method of goods transportation. This involves timing the shipment and receipt of products to coincide with production schedule needs to eliminate the need for inventory storage. This requires precise timing to insure that production lines have the raw materials it needs when it needs them.

A further development is the efforts to "compact" the logistics chain, that is, to minimize the time goods spend in transit. This is as an additional way to reduce the cost of product inventory. Previously, shippers were interested in the reliability of service to meet their production needs; now, they want to decrease the transport time to draw out the embedded value of the inventory. This trend will challenge the rail industries to increase its efficiencies and decrease transit times to be able to compete with the direct service provided by trucking.

Other company policies may affect diversion potential such as the existence of a company truck fleet. If a firm finds it necessary to own a fleet of trucks for use in its business, it could try to maximize the use of its existing capacity for the movements of other products or commodities for its operations, and this could preclude diversion to an alternate mode.

Varieties of firms are engaged in many kinds of operations, with many types of products being moved. Types of deliveries vary from home delivery, to retail store delivery, to route sales, to industrial deliveries. Industrial and retail shipper's requirements vary regarding time of shipment and time of delivery.

The cost of transportation may account for only a small part of the total cost of a product, and may not be considered a priority concern by the producer, while the traffic that this company generates may be a major concern to the transportation system that must accommodate this demand. These are the types of economic conditions that limit the potential for cooperation and consolidation of conveyance necessary to improve the overall highway goods movement system.

The freight transportation industry in the United States has undergone dramatic changes in the last twenty years. Developments in "containerization," shifts in the manufacturing industry to "just-in-time" delivery, the deregulation of the railroads, trucking and aviation industries and the development of new trading patterns in a global economy have led to consolidation and restructuring within, and partnerships between, all freight transportation modes.

The development of an extensive cross-country expressway network, the trend toward larger and heavier trucks, more time-sensitive shipping requirements, increasing competition, and railroad branch line reductions have contributed to the trucking industry attracting a large market share of goods movements. However, while the number of truck trips is increasing, the length of such trips is decreasing. Many shippers use more cost-effective rail, air, or water transport for the long-haul portion of freight delivery with trucking firms supplying the pick-up and delivery portion of trips rather than supplying end-to-end service.

Figure 41 presents data from the Federal Highway Administration's Freight Analysis Framework 2, on freight shipments to, from, and within Connecticut by mode of shipment. Trucks move a large percentage of the tonnage followed by rail and water. Although, it is projected that the mode of truck will still provide the majority of service, freight shipments by rail to, from, and within the state are projected to experience a growth in volume from approximately 2.9 million tons in 2002 to approximately 5.5 million tons in 2035.

**Freight Shipments To, From, and Within Connecticut by Weight: 2002 and 2035
(Millions of Tons)**

CONNECTICUT	2002						2035					
	Within State		From State		To State		Within State		From State		To State	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State Total	52.5	100	29.2	100	49.7	100	104.1	100	68.6	100	102.7	100
By Mode												
Truck	48.5	92	20.9	72	31.0	62	96.6	93	50.5	74	73.3	71
Rail	<0.1	<1	0.6	2	2.3	5	<0.1	<1	1.1	2	4.4	4
Water	<0.1	<1	<0.1	<1	2.6	5	<0.1	<1	<0.1	<1	1.6	2
Air, air & truck	<0.1	<1	<0.1	<1	<0.1 <1		<0.1	<1	<0.1	<1	<0.1	<1
Truck & rail	0.1	<1	<0.1	<1	0.2	<1	0.3	<1	<0.1	<1	<0.3	<1
Other Intermodal*	0.1	<1	0.4	1	0.4	<1	0.3	<1	1.2	2	1.0	1
Pipeline & unknown^	3.8	7	7.2	25	13.3	27	6.9	7	15.8	23	22.0	21

*Other intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations except air and truck.

^ Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

Note: Numbers may not add to totals due to rounding.

Figure 41. Freight Shipments To, From, and Within Connecticut Shipments by Weight: 2002 and 2035⁶⁶

According to Figure 41, approximately 2.3 percent of freight shipments in terms of tonnage to, from, and within Connecticut are attributable to rail. According to U.S. Department of Commerce data "every dollar spent on investments in our freight railroads — tracks, equipment, locomotives, and bridges — yields \$3 in economic output. Additionally, each \$1 billion of rail investment creates 20,000 jobs."⁶⁷

Additional information about freight railroads and commodities movement can be found in Chapter 6 (Freight Rail Network) and Chapter 7 (Intermodal Rail Connections and Facilities).

⁶⁶ Source: Office of Freight Management Operations, Federal Highway Administration, Freight Analysis Framework State Profiles, http://ops.fhwa.dot.gov/freight/freight_analysis/state_info/state_profiles.htm.

⁶⁷ American Association of Railroads, <http://www.aar.org/Economy/Economy.aspx>

Passenger Rail Service

Connecticut residents travel about 31.4 billion vehicle miles per year. This implies that passenger rail service represents about 3.7 percent of automobile VMT in Connecticut. In Connecticut VMT increased 20 percent from 1989 to 2009. Transit ridership on Connecticut's rail systems has been increasing. In 2006, rail passenger ridership on the NHL was 6.5 percent higher than it was in 2003. In 2010, rail passenger ridership on the NHL was 2.6 percent higher than it was in 2007. Ridership on trains and buses and trains continues to grow as fuel prices increase.

Passenger Rail Employment

New Haven Line

There were 1,367 MNR workers employed in Connecticut for the NHL service in the year 2011.

Amtrak Intercity

At the end of FY11, Amtrak employed 666 Connecticut residents. Total wages of Amtrak employees living in Connecticut were \$55,163,243 during FY11.⁶⁸

Shore Line East

For the SLE service, Amtrak employed approximately 75 employees (36 transportation, 41* mechanical and 3 managers) in 2011.

*Includes Administrative Assistant and Material Control.

Connecticut without Rail Transport

To assess the economic and fiscal impact of rail transport on the state economy, we examine the state economy without rail transport and measure the difference in the economic and fiscal outcomes between the current situation and the former scenario in which there is no rail transport.

For purposes of this analysis, we assume that the investment in physical capital including tunnels, bridges, stations, depots, rail yards, and repair and maintenance facilities is sunk cost and not recoverable. In reality, if rail transport left the state, many physical assets could be liquidated and the rail-occupied land remediated and put to other use. That analysis would account for the net opportunity cost of the next best use of land made available with the exodus of rail transport from the state. In the present counterfactual case, we consider that the built infrastructure remains intact and that all rail operations cease and all directly employed rail workers lose their jobs.

Rail transportation improves access to markets. Its absence reduces access. In addition to a smaller work force absent rail workers and rail operations, all workers and businesses face higher costs for moving goods and people to and from their work sites. The region (state) is less competitive with respect to its neighbors with rail transport and over time, some firms and workers migrate to areas with rail infrastructure. Firms and workers that remain use automobiles and trucks exclusively for moving goods and people to and from work sites. Congestion increases, the frequency of accidents increases, wear and tear on the road network increases, pollution increases, and the region suffers a reduction in the quality of life that

⁶⁸ Source: Amtrak Fact Sheet, Fiscal Year 2011, State of Connecticut. <http://www.amtrak.com/pdf/factsheets/CONNECTICUT11.pdf>

induces further out migration. In time, the state will adjust to a new (lower) level of economic activity in which sufficient firms and workers have left such that congestion and other disamenities are tolerable (to some extent the congestion problem solves itself).⁶⁹

8.3 MODELING CONNECTICUT WITHOUT RAIL TRANSPORT

For purposes of this analysis, the REMI model is used. REMI is a mathematical model of the Connecticut economy that connects to the national economy and the rest of the world through exports and imports. It models population and capital migration in response to changing local conditions all other things equal. REMI adjusts the commodity flows among the nation's more than 3,000 counties in response to changing local conditions such as employment, productivity, and access.

To model the hypothetical disappearance of Connecticut's rail operations, the direct jobs associated with the rail industry in the state are removed and the access to commodities and labor for all industries in the state is reduced. Finally, the model illustrates the disamenities associated with rail's disappearance as a reduction in the amenity or quality-of-life value of the state.

The state's rail industry consists of line-haul railroads (NAICS 482111)⁷⁰ that transport passengers and/or cargo over a long distance within a rail network (e.g., AMTRAK). Firms in this industry provide for the intercity movement of trains between the terminals and stations on main and branch lines of a line-haul rail network (except for local switching services). In addition, the state's rail industry consists of short line railroads that transport cargo over short distances on local rail lines not part of a rail network (NAICS 482112). Further, commuter rail systems (NAICS 485112) operate local and suburban rail systems over regular routes and on a regular schedule within a metropolitan area and its adjacent non-urban areas. Commuter rail is usually characterized by reduced fares, multiple ride and commutation tickets and is mostly used during peak morning and evening periods. Finally, support activities for rail transportation (NAICS 488210) is included that contains establishments primarily engaged in providing specialized services for railroad transportation including servicing, routine repairing (except factory conversion, overhaul or rebuilding of rolling stock) and maintaining rail cars; loading and unloading rail cars and operating independent terminals.

Operations such as the Essex Steam Train and the Trolley Museum included in the rail industry scenic and sightseeing land transportation sector (NAICS 487110) are omitted. In addition, railroad car rental (NAICS 532411), factory conversion, overhaul, or rebuilding rolling stock (NAICS 336510), and rail car janitorial services (NAICS 561720) is omitted.⁷¹

Modeling Strategy Summary

With the information given above, it is noted that there are 114 jobs in the rail transportation sector (NAICS 48211) and 1,991 jobs in the passenger rail sector (NAICS 485112). These jobs would disappear in the counterfactual simulation. There is no information on the number of jobs in the rail support activities sector in Connecticut (NAICS 488210). It is noted that according to Figure 41, between 7 percent and 8 percent of freight shipments in terms of tonnage to, from, and within Connecticut are attributable to rail. Therefore it is estimated that commodity access

⁶⁹ Connecticut Department of Economic and Community Development, Feb. 2011.

⁷⁰The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

⁷¹ Connecticut Department of Economic and Community Development, Feb. 2011.

would deteriorate by 0.5 percent in all industries in the state in the absence of freight rail service. There are industries that are impacted significantly more by the presence of rail freight services than others, but we believe that the commodity access of all industries is affected to some degree. In addition, we saw that about 3.8 percent of the vehicle miles plus passenger rail miles traveled in the state is attributable to passenger rail. Therefore, it is estimated that labor access in the state would deteriorate by 3 percent in all industries in the absence of passenger rail. Finally, it is estimated that Connecticut's quality of life would deteriorate by 1 percent in terms of a real (inflation-adjusted) compensation change because of increased motor vehicle and truck congestion and its concomitant effects.

Economic and Fiscal Impact Results

To determine the benefit of Connecticut's rail industry, we turn the negative results due to the hypothetical disappearance of the state's rail services positive. These appear in Figure 42.

Variable (Differences from baseline forecast)	Annual Average Level Change from 2009 through 2050	Annual Average Percent Change from 2009 through 2050
Total Employment (jobs)	60,501	2.35%
Population (people)	136,167	3.47%
Labor Force (people)	65,201	3.24%
State GDP (2008\$)	\$19,706,895,592	4.12%
Personal Income (2008\$)	\$24,584,236,612	1.89%
Real Disp. Personal Income (2008\$)	\$7,704,993,217	3.02%
Output (Fixed 2008\$)	\$32,430,804,879	4.20 April 2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2008 Executive Summary
Labor Productivity (2008\$)	\$6,452	1.98%
Relative Delivered Price	-0.01199581	98.8%
Relative Cost of Production	-0.02037831	97.96%
Exports to Rest of Nation (2008\$)	\$11,037,001,293	3.84%
Exports to Rest of World (2008\$)	\$2,020,203,838	3.17%
Ave Ann Comp Rate (2008\$)	-\$1,016	-0.32%
Net State Revenue (2008\$)	\$7,769,316	N/A

Figure 42. REMI Results – Average Annual Level and Percent Changes in Selected Economic Variables

The gain in jobs occurs in all sectors due the indirect (business-to-business) effect and the induced effect (people spending their incomes on goods and services in the state). This means that because of the existence of rail services in Connecticut, there are on average 60,500 more jobs than there would be absent such services. Similarly, there are more than 136,000 new people in the state because of rail services on average each year and the labor force is larger by more than 65,000 people on average each year because of rail services.

The State's gross domestic product is almost \$20 billion more each year on average due to the existence of rail services, while the income earned from all sources by the state's residents is greater by \$24.5 billion each year on average. The inflation-adjusted income after taxes for Connecticut residents is larger by \$7.7 billion on average each year due to the existence of rail services. Sales in all state industries are larger by \$32.4 billion on average year due to the existence of rail services. Labor productivity (GDP per worker) increases by \$6,452 on average each year because of rail services in the state. The delivered prices of commodities to all industries in the state are 98.8 percent of what they would be in the absence of rail services on average each year. The cost of production for all industries in the state is 97.9 percent of what it would be absent rail services on average each year. Because of Connecticut's rail services, exports to the rest of the nation are greater by \$11 billion on average each year and exports to the rest of the world are larger by \$2 billion on average each year because of the state's rail services. Connecticut's industry compensation per worker is smaller by \$1,016 on average each year due to the existence of passenger and freight rail services in the state. The difference between domestic state revenue from all sources and expenditure for all domestic uses is larger by almost \$8 billion each year on average due to rail services in the state.

We conclude that under reasonable and perhaps conservative assumptions, Connecticut derives a not insignificant benefit from its freight and passenger rail services. It may be true that were it not for passenger rail service in New Haven and Fairfield counties, a significant proportion of financial and back office operations would leave the state.⁷²

⁷² Connecticut Department of Economic and Community Development, Nov. 2009.

CHAPTER 9 – ENERGY AND ENVIRONMENT

Transportation policy must support both economic development and a sustainable environment. The Department carries out a transportation planning process that considers projects and strategies that will preserve the existing transportation system and promote efficient system management and operation.

As discussed in the State's 2009 LRP, the movement of people and goods can be costly in terms of money, use of natural resources and environmental well-being. In recent years, the cost of fossil fuels has been extremely volatile. There is concern about the nation's dependence on foreign oil and the impact of growing demand by developing countries. Development associated with changing travel and growth patterns has resulted in urban and suburban sprawl that has resulted in the loss of farmland, open spaces, wetlands, and animal habitats, degradation of air quality and water quality, and increased runoff and flooding. Connecticut's GHG emissions from non-renewable fuel consumption are contributing to the global climate change. The impacts of climate change may eventually affect Connecticut's transportation infrastructure.

More people and businesses are willing to change their behaviors to reduce their fuel usage and costs and to address environmental issues such as climate change issues. The state must respond by taking actions to provide the mobility options to enable people to do so.

The Department is committed to protecting and enhancing the environment, promoting conservation, and improving quality of life as well as promoting consistency between transportation improvements and state and local planned growth and economic development patterns. The Department has implemented and will continue to implement policies and actions to conserve energy, reduce fuel consumption, and reduce GHG emissions attributable to transportation.

The following rail-related strategies and actions are identified in the State's 2009 LRP:

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

- Consider potential impacts of global warming on transportation infrastructure and services, particularly along the coast, when designing, constructing, and prioritizing investments in transportation infrastructure...
 - Design and construct projects to minimize and withstand the impacts of more intense storms and flooding.
 - Identify, investigate, and set priorities for preventing and correcting hazardous or potentially hazardous situations in a timely manner.
 - Actively participate on the Adaptation Subcommittee of the Governor's Steering Committee on Climate Change in assessing the impact of climate change on the state's rail transportation infrastructure.
 - Encourage practices and policies that shorten delivery time and provide alternatives for goods movement through environmentally friendly methods that reduce fuel consumption, such as coordinated intermodal transport and improved use of the maritime highway.
 - Support efforts to implement the recommendations in the Connecticut Climate

Change Action Plan.

- Continue to evaluate and mitigate the effects of transportation projects on the natural environment and quality of life, including air quality, noise, ecological resources, water resources, environmental justice, and cultural and archaeological resources.
 - Continue to investigate the potential for improvements to the state's transportation system that will reduce GHG emissions.
 - Participate in multi-state and regional discussions on opportunities to divert a portion of the projected 70 percent growth in regional truck traffic to rail and barge modes to reduce significantly the GHG impact of freight transportation.
- Support programs and efforts that focus on minimizing fuel consumption, black carbon emissions, single-occupancy vehicle trips, and the volume of truck traffic on Connecticut highways, as well as addressing the environmental and health costs associated with non-renewable fuel emissions...
 - Continue to implement major capital investments to make the use of rail transportation and marine highway options more viable.
 - Promote, where economically feasible and justifiable, greater use of rail and water transportation to move passengers and freight through Connecticut and to and from points within Connecticut by working with the Connecticut Maritime Commission, appropriate transportation agencies, and other stakeholders.⁷³

9.1 ENERGY USE

Energy Intensity

The energy efficiency of personal travel could be increased by encouraging the use of rail passenger transport. National data for the year 2005 indicate that intercity passenger rail (Amtrak) consumes 17 percent less energy per passenger mile than airlines and 21 percent less energy per passenger mile than autos. The data available shows intercity passenger rail to be more energy efficient than either air or automobile transportation as shown in Figure 43.⁷⁴

Energy Consumption per Passenger Miles by Mode

Mode	Energy Consumption per Passenger Mile
Automobile	3,445 BTUs
U.S. Air Travel	3,264 BTUs
Passenger Rail	2,709 BTUs
Intercity Bus	932 BTUs

Figure 43. Energy Consumption per Passenger Mile by Mode

⁷³ Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009.

⁷⁴ Oak Ridge National Laboratory, Transportation Energy Data Book, Edition 26, 2007.

9.2 AIR QUALITY

Emissions of Carbon Dioxide (CO₂) are the primary GHG produced by the transportation sector. Most of the energy consumed in the transportation sector came from petroleum products. “Transportation emissions account for roughly one third of the U.S. GHG emissions.” “Currently, trucks consume more than two million barrels of oil every day and emit 20 percent of GHG pollution related to transportation.”⁷⁵ “Nearly 53 percent of the emissions resulted from gasoline consumption for personal vehicle use.” “The remaining emissions came from other transportation activities, including the combustion of diesel fuel in heavy-duty vehicles and jet fuel in aircraft.”⁷⁶

The Environmental Law and Policy Center has found that “trains pollute less than cars and airplanes, improving air quality”. Rail transport reduces the need for highway expansion, thereby promoting environmentally beneficial development. Rail emits significantly less CO₂ per passenger mile than airplanes⁷⁷ or cars.

Railroads are the environmentally friendly way to move freight, due to its lower fuel consumption and reduced GHG emissions. Through the development of new “green” technologies and environmentally responsible operating practices, railroads are committed to even greater environmental excellence in the years ahead.⁷⁸

The American Association of Railroad reports:

- A freight train moves a ton of freight an average of 457 miles on a single gallon of fuel. According to the FRA, railroads are 1.9 to 5.5 times more fuel-efficient than trucks, depending on the commodity carried and length of the haul. Railroad fuel efficiency is up 94 percent since 1980.
- Because GHG emissions are directly related to fuel consumption, railroads have a lower carbon footprint. In fact, depending on the commodity and distance traveled, moving freight by truck can emit more than 5 times more CO₂ than moving the same freight by rail.
- If just 10 percent of long-distance freight that currently moves by highway switched to rail, national fuel savings would exceed one billion gallons a year and annual GHG emissions would fall by some 12 million tons.
- From 1980 through 2008, U.S. freight railroads emitted 579 million fewer tons of CO₂ thanks to its fuel efficiency gains.
- A single freight train can take the load of 280 or more trucks — equivalent to 1,100 cars — off our overcrowded highways. Moving freight by rail also reduces the pressure to build costly new roads and helps cut the cost of maintaining the roads we already have.⁷⁹

In addition to the emissions reductions that can be achieved by increasing the market share of freight moved by rail, greater use of passenger rail services would also yield benefits in the way of emissions reductions. According to the Tri-State Transportation Commission, use of rail transit in even partially occupied rail cars can significantly reduce emissions in this region.

⁷⁵ <http://www.georgetownclimate.org/transportation/index.php>

⁷⁶ Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2008, Executive Summary – Page 8, April 2010.

⁷⁷ The damaging environmental consequences of CO₂ emissions from airplanes are 2.7 times greater due to the high altitude. The damaging greenhouse gases are injected directly into the atmosphere.

⁷⁸ American Association of Railroads, <http://www.aar.org/Environment/Environment.aspx>

⁷⁹ American Association of Railroads, <http://www.aar.org/Environment/Environment.aspx>

A comprehensive package of transit improvements and land use policies and incentives are needed to achieve VMT reductions to meet Connecticut's GHG targets. As discussed in the state of Connecticut's 2009 LRP, Connecticut has set an ambitious strategy to respond to climate change. The Governor's Steering Committee on Climate Change is composed of the agency heads of the Departments of Transportation, Energy and Environmental Protection, Administrative Services, Public Utility Control, and the Office of Policy and Management. The Connecticut Clean Energy Fund was formed in 2002 to guide Connecticut's climate change initiative and implement policy and actions. The Connecticut Climate Change Action Plan (2005) includes 55 actions to reduce GHG emissions to meet state and regional goals.

The Connecticut Global Warming Solutions Act of 2008 changes voluntary GHG goals into mandatory limits of 10 percent below 1990 levels by 2020 and 80 percent below 2001 levels by 2050. Key transportation initiatives in Connecticut's Climate Change Action Plan call for implementing a package of transit improvements and incentives to achieve a 3 percent reduction in VMT below the 2020 baseline, based on the following six complementary elements:

1. Double transit ridership by 2020;
2. Consider potential funding mechanisms for new transit investments;
3. Establish a coordinated, interagency program to promote responsible growth in Connecticut:
 - a. Establish priority-funding areas to target state investments in areas considered appropriate for growth, as established by the State Plan of Conservation and Development (PCD).
 - b. Better coordination of state planning between agencies and provide technical support for local planning.
 - c. Establish an outreach program to regional planning organizations and local planning and zoning commissions to enact smart growth locally through measures such as transportation and infrastructure planning, regulatory reform, TOD, and housing diversity.
 - d. Expand bicycle and pedestrian infrastructure.
4. Redirect at least 25 percent of new development (based on forecast population and employment) to growth-appropriate locations, as indicated by the state's conservation and development policies plan.
5. Study a potential road-pricing pilot project and implement the pilot project if it is shown to be effective.
6. Consider complementary VMT reduction incentives, such as commuter choice, location-efficient mortgages, and mileage-based insurance.⁸⁰

Improving existing rail service that already exists is the best way of reducing GHG. Running trains with greater frequency, increasing service hours, lowering fares, increasing parking capacity to allow for more riders are some cost effective ways to work toward this effort.

Air Quality Benefits of Passenger Rail Service

The use of passenger rail service allows travelers to forego driving their private vehicles for many of their travel needs. This in turn prevents not only congestion on Connecticut's roads and highways but avoids the consumption of substantial amounts of gasoline and the production

⁸⁰2005 Connecticut Climate Change Action Plan, <http://www.ctclimatechange.com/StateActionPlan.html>

of automotive emissions, including those identified as GHG. Based on the passenger miles of travel on the NHL and on SLE, an analysis was done to estimate the volume of GHG emissions, in the forms of CO₂, nitrous oxides, and methane that are avoided using these rail services as opposed to using private vehicles to make these trips.

Figure 44 converts the passenger miles of travel on the NHL and SLE for the years 2004 through 2008 to vehicle miles of travel (VMT) for private vehicles, assuming a vehicle occupancy rate of 1.2 persons per vehicle. For the resulting VMTs, the emissions of CO₂ and of combined nitrous oxides and methane are estimated based on an average vehicle mileage of 22.1 miles per gallon. This analysis is an oversimplification, as it assumes that the rail services would continue to operate even if all trips were converted to private vehicles, so it does not reflect any reduction in emissions from the cessation of passenger rail service operations. Nevertheless, the volumes of GHG emissions avoided because of the availability and use of passenger rail services in Connecticut are substantial.⁸¹

An Estimation of Avoided GHG Emissions as a Function of Rail Commuter Miles

Reporting Year	CT NHL Passenger Miles ¹ (000)	CT SLE Passenger Miles ² (000)	Total Commuter Rail Passenger Miles	Equivalent VMT (1.2 passengers / mile)	Gallons of Gasoline @ 22.1mpg ³	Carbon Dioxide (short tons) ⁵	Nitrous Oxide and Methane (short tons) ⁶
2004	638,185,107	8,058,030	646,243,137	538,535,948	24,368,142	236,371	11,819
2005	501,515,397	8,206,325	509,721,722	424,768,102	19,220,276	186,437	9,322
2006	576,334,734	8,955,183	585,289,917	487,741,598	22,069,756	214,077	10,704
2007	582,700,392	9,086,541	591,786,933	493,155,778	22,314,741	216,453	10,823
2008*	606,054,223	10,144,575	616,198,798	513,498,998	23,235,249	225,382	11,269
<hr/>							
Reporting Year	CT NHL Passenger Miles ¹ (000)	CT SLE Passenger Miles ² (000)	Total Commuter Rail Passenger Miles	Equivalent VMT (1.2 passengers / mile)	Gallons of Gasoline @ 23.9mpg ⁴		
2004	638,185,107	8,058,030	646,243,137	538,535,948	22,532,885	218,569	10,928
2005	501,515,397	8,206,325	509,721,722	424,768,102	17,772,724	172,395	8,620
2006	576,334,734	8,955,183	585,289,917	487,741,598	20,407,598	197,954	9,898
2007	582,700,392	9,086,541	591,786,933	493,155,778	20,634,133	200,151	10,008
2008*	606,054,223	10,144,575	616,198,798	513,498,998	21,485,314	208,408	10,420

¹ Per Metro-North New Haven Line NTD Reporting.

² Per CT DOT Shore Line East NTD Reporting.

^{*} Data in validation review.

³ FHWA Highway Statistics 2001 average = 22.1 MPG

⁴ EPA Mobile6.2 Model basis = 23.9 MPG

⁵ Based on 19.4 pounds of CO₂ per gallon, 2000 pounds per short ton

⁶ Estimated as 5 percent of CO₂ Emissions (<http://www.epa.gov/otaq/climate/420f05004.htm>)

Figure 44. Avoidable Emissions on EPA Mobile 6.2 Model Basis⁸²

⁸¹ Source: Connecticut Department of Energy and Environmental Protection, Nov. 2009.

⁸² Source: Connecticut Department of Energy and Environmental Protection, 2009.

Energy Reduction/Environmental Initiatives

M-8 Rail Fleet

The new M-8 rail fleet has been designed to save power through regenerative braking. Regenerative braking converts braking power into electricity that can then be fed back up into the overhead catenary system for reuse, thus reducing the net electrical usage from the utility's distribution system. The M-8 car design also allows intelligent car systems to "power down" the cars HVAC (heating and cooling) system when the rail cars are not being operated in revenue service. LED and fluorescent lighting replaced the older incandescent lighting by providing lighting that is more efficient and requires less maintenance. The new single leaf door operator system will allow for some energy savings while equipment is in Grand Central Terminal awaiting loading of passengers. Opening selected doors reduces the amount of energy expended to keep cars warm/cooled.

Ultra-low-sulfur Diesel Fuel

All the diesel locomotives used on the NHL and SLE service use ultra-low-sulfur diesel (ULSD) fuel. ULSD fuel has substantially lowered sulfur contents, which allows for the application of newer emissions control technologies that should substantially lower emissions of particulate matter from diesel engines.⁸³

Bio-Fuel

The Fuel Facility in the New Haven Yard was designed with the capability of dispensing bio-fuel⁸⁴, if the decision was made to switch to it. However, the facility does not have dual delivery/dispensing systems, etc. so only one type of fuel can be dispensed at a time. The Fuel Facility currently uses diesel fuel on the fleet on locomotives for the SLE and NHL service. Current equipment would also need to be retrofitted at a considerable cost before they would be capable of using bio-fuel.

Solar Power

There are switches⁸⁵ in the New Haven and Stamford rail yards that operate with the assistance of solar power. The switch stand has a solar panel attached that stores solar energy that is stored in a battery that is used to throw switches within the yards.

Fuel Cells

Legislation required the Department to study the feasibility of building a fuel cell power station to generate power for the NHL. The Connecticut Academy of Science and Engineering commissioned a study on using fuel cells to power the NHL Catenary and the results were that it was not feasible. Because of this study, the Department prepared a report on the feasibility of using fuel cells in the New Haven Yard.⁸⁶ This was a result of the recommendations of the

⁸³ http://en.wikipedia.org/wiki/Ultra-low-sulfur_diesel

⁸⁴ Bio-fuels are a wide range of fuels that are in some way derived from biomass. The term covers solid biomass, liquid fuels and various biogases. Biofuels are gaining increased public and scientific attention, driven by factors such as oil price spikes and the need for increased energy security. en.wikipedia.org/wiki/Bio-fuel

⁸⁵ A railroad switch, turnout or [set of] points is a mechanical installation enabling railway trains to be guided from one track to another at a railway junction. en.wikipedia.org/wiki/Railroad_switch

⁸⁶ *A Study of the Feasibility of Utilizing Fuel Cells to Generate Power for the New Haven Rail Line*
<http://www.ct.gov/dot/LIB/dot/documents/dresearch/CT-92-616-F-07-5.pdf>

overall NHL study, which found that the only feasible place to use fuel cells would be for buildings, and the CCO Shop is the largest building and was at that time in design.

The Component Change Out facility⁸⁷ under construction in the New Haven Rail Yard was designed to accommodate installation of a fuel cell in the future to provide base power and heat. However, this is a future unfunded project.

Public Plug-In Electric Vehicle Charging Stations

As a means of promoting sustainable commuting at rail stations, the cities and parking authorities of Norwalk and New Haven in coordination with the utility companies and the Department have installed public Plug-In Electric Vehicle (PEV) charging stations for free at the South Norwalk and Union Station rail stations. These first two PEV charging stations at rail stations in the state are just the beginning to think green and promote multimodal access to public transportation. Already other communities are taking creative steps to install or expand PEV charging stations along the NHL. No longer are rail customers driving a traditional passenger vehicle to the station. The public is walking, peddling, and plugging in to charge their next generation passenger vehicle – an electric car, which will be the wave of the future.

Commissioning Agent

The Department hired a Commissioning Agent for the Component Change Out Facility and Independent Wheel Truing Facility projects in the New Haven Yard. The Commissioning Agent will be responsible for implementing the Commissioning Process, which is a quality-focused process for enhancing the delivery of a project. The Process focuses on verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements. The Department decided to hire a Commissioning Agent to decrease energy use by improving the efficiency of the building's systems.

9.3 LAND USE AND COMMUNITY IMPACTS

Due to greater public demand and legislative support for better and more coordinated land use planning, there is now a focus on providing mobility options through better coordination of land use planning with transportation, better integration and coordination of transportation services, and designing and improving facilities to encourage and facilitate use by individuals using non-motorized, as well as motorized means of transportation.

The following rail-related strategies and actions are identified in the State's 2009 LRP:

- Support initiatives to improve and facilitate better coordination of transportation planning with land use planning.
- Design transportation systems to facilitate responsible growth efforts that focus on integrating land use planning with transportation, affordable housing, retail, and employment in a manner that facilitates the use of public transportation options, provides, and expands non-motorized mobility options.
- Design transit services and infrastructure in a way that is supportive of its TOD potential, and coordinate with local interests to foster such development. Support municipal efforts to promote TOD.
- Employ the use of context-sensitive solutions, including early solicitation of public input,

⁸⁷ Project description included in Appendix A.

project coordination, and well-planned construction management, for all transportation projects to ensure implementation of designs that are appropriately scaled to the community and to the need.⁸⁸

Transit-Oriented Development

The term “responsible growth” refers to development efforts that focus on integrating land use planning with transportation, affordable housing, retail, and employment in a manner that discourages sprawl. There is a focus on avoiding urban and suburban sprawl by concentrating growth in the center of a city or suburb where the required infrastructure already exists, and advocating for mixed-use residential and commercial developments in areas that are compact, higher density, walkable, bicycle-friendly, transit-oriented, and offer a range of housing choices.

Taking this concept of responsible growth and coordinated land use development one-step further, TOD is a mixed-use compact area that is designed to facilitate access and maximize the use of public transportation. In the Connecticut General Statutes, a “TOD” is defined as “development within one-half mile of public transportation facilities, including rail and bus rapid transit services, which meets supportive standards for land uses, built environment densities, and walkable environments, to facilitate and encourage the use of those services.” TODs can provide housing and transportation options that enable people to meet their mobility needs in more cost-effective and environmentally friendly ways.

Successful TOD projects include both private and public investment in this mixed-use environment. The potential benefits of TOD are social, environmental, and fiscal. Focusing growth around transit stations capitalizes on expensive public investments in transit by producing local and regional benefits. TOD can be an effective tool in curbing sprawl, reducing traffic congestion, and expanding housing choices.

TOD is an integral component of the Department's comprehensive transportation policy, plan, and strategy. Communities along the rail lines have significant opportunity to make TOD a reality. TOD implementation ideally starts with a vision, cultivated from broad-based public input, and proceeds to strategic station-area plans backed by appropriate zoning as well as policy incentives and regulations. The Department is currently engaged in discussions with municipal officials and private developers throughout the state.

Danbury Branch Improvement Program – Transit-Oriented Development Report⁸⁹

The Department in coordination with the South Western Regional Planning Agency completed the *Danbury Branch Improvement Program – Transit-Oriented Development Final Report* in September 2010. This report presents an evaluation of TOD opportunities within the Danbury Branch study corridor as a component of the FTA Alternatives Analysis/ Draft EIS (FTA AA/DEIS) prepared for the Department.

This report is intended as a tool for municipalities to use as they move forward with their TOD efforts. The report identifies the range of TOD opportunities at station areas within the corridor that could result from improvements to the Danbury Branch. By also providing

⁸⁸ Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035, Connecticut Department of Transportation, June 2009

⁸⁹ The information contained in this section was taken from the Abstract from:
http://www.danburybranchstudy.com/documents/TOD%20Report/00_Danbury%20Branch%20TOD%20Report_compressed.pdf

information regarding FTA guidelines and TOD best practices, this report serves as a reference and a guide for future TOD efforts in the Danbury Branch study corridor.

Specifically, this report presents a definition of TOD and the elements of TOD that are relevant to the Danbury Branch. It also presents a summary of FTA Guidance regarding TOD and includes case studies of FTA-funded projects that have been rated with respect to their livability, land use, and economic development components. Additionally, the report examines commuter rail projects both in and out of Connecticut that are considered to have applications that may be relevant to the Danbury Branch.

Within this framework, the report provides details and data related to the eight communities within the Danbury Branch study corridor. Demographics, market potential, existing land use, and zoning are among the topics discussed. Additionally, a matrix outlining the potential opportunities and constraints related to TOD at each station site is presented. GIS maps show the areas around each station with ongoing TOD efforts as well as those areas that have the potential for TOD. Detailed information on each community's zoning regulations is included in an appendix to this document. Data on wetlands and hazardous materials within each TOD site are presented in appendices as well.

TOD Potential Initiatives

New Haven Union Station

The City is working closely with the Department to implement the Union Station TOD, which includes the second parking garage as well as remerchandising of the station and long-term mixed-use development on the site. The Department is currently in the process of developing a conceptual design for the second garage, to accommodate a minimum of 670 vehicles. The public information and the EA are expected to be complete in 2012.

West Haven Station

The construction of a new rail station is currently underway with expected completion in the fall of 2012. The TOD project includes approximately 660 parking spaces, 12 car length platforms, a station building, and a pedestrian bridge. The site will support city/private efforts to develop the nearby Armstrong property.

Naugatuck Passenger Station

The Department is working with the Borough of Naugatuck and the Naugatuck Economic Development Corporation, and its designated preferred developer, on a large-scale mixed-use, transit-oriented, green development called Renaissance Place. Renaissance Place will have significant retail, office and housing components and will be a regional origination/destination site, thereby having a direct and positive impact on ridership on the Waterbury Branch Line.

Naugatuck River Valley

The Naugatuck River Valley has downtown stations and alternative transportation greenways in planning or construction along the Waterbury Branch Line and Naugatuck River. The City of Waterbury recently received federal funding for the design and construction of a 7.1-mile greenway along the Naugatuck River linking with its rail station and downtown. A routing study has been completed for the Waterbury Greenway, as well as a routing study for the greater regional greenway linking cities and towns along the Valley. Waterbury is in the design phase of this project.

Seymour Passenger Station

The town of Seymour with a private developer approached the Department about relocating the existing Seymour rail station north as part of a TOD project to include commercial and residential development and ample parking at the new rail station. The existing Seymour station has limited parking so the development would attract new ridership on the Waterbury Branch Line.

New London Station

The TOD concept has been included in the recent *Regional Intermodal Transportation Center New London Master Plan and Efficiency Study*⁹⁰ as discussed in the Chapter 6 (Intermodal Rail Connections and Facilities).

DRAFT

⁹⁰ http://www.seccog.org/intermodalStudy/pdfs/RITC_PBLCMtg_11410FINAL.pdf

CHAPTER 10 - SAFETY AND SECURITY

The Department is committed to providing a safe and secure environment on Connecticut's rail transportation system. Safety and security on the rail system is addressed through a combination of federal and state laws and regulations in coordination with federal, state, and local partners.

10.1 RAIL SAFETY

Transportation safety is a complex subject that concerns high-risk behaviors; traffic monitoring; system maintenance and inspection, hazard elimination and emergency preparedness. In the cases of hazard elimination and emergency preparedness, safety priorities also become linked with transportation security. Maintaining the existing system in a state-of-good-repair to ensure the safety of the traveling public on and through Connecticut's transportation infrastructure and facilities is the highest priority. Providing safe passage to all who use, work on, or travel near the rail system is essential to maintaining a high quality of life for Connecticut's residents and visitors.

Increasing the safety of the transportation system for users of the rail system and those who work on and travel within the vicinity of the rail system is a primary goal for the Department. Key countermeasures for minimizing high-risk behaviors within the travel corridors are education on the dangers, and consistent enforcement of laws to discourage persons from disobeying them.

The Department is committed to providing a safe transportation system for travelers and a safe working environment for personnel working on transportation maintenance and construction projects. Maintenance of the existing system will be pursued to ensure continued safe traveling on all modes of transportation in Connecticut. The Department will consider system modifications that have been identified as having the potential to enhance significantly transportation safety. The Department will continue to administer programs to promote and enhance the safety of users of rail transportation, as well as motorists, pedestrians, bicyclists and users of other non-motorized means of transportation.

The following rail-related strategies and actions are identified in the State's 2009 LRP:

- Recognize maintenance of the existing system as a high priority and, in so doing, develop and support various activities and programs for promoting safety through coordinated efforts; the latest available technology, practices and procedures; and optimal application of resources.
 - Update and implement
 - Department's Emergency Response Plans;
 - Department's Security and Emergency Preparedness Plans (SEPP);
 - Department's Safety and Security Management Plan (SSMP)
 - Department's principal rail equipment safety document, the System Safety Program Plan (SSPP) and other safety-related data;
 - Adhere to timely infrastructure and transportation system component inspection and maintenance schedules.
 - Identify, investigate, and set priorities for preventing and correcting hazardous or

- potentially hazardous situations in a timely manner.
- Advocate for transportation safety, including education and marketing to the public for ensuring safe travel practices.
 - Implement the Connecticut Operation Lifesaver Program to reduce the number of injuries and fatalities associated with at-grade rail crossings and trespassing on railroad right-of-way.
 - Work with stakeholders to identify and implement projects, programs, practices, and procedures to increase the safety of users of the transportation system.
 - Identify and implement practices, procedures, and projects to improve or enhance safety for passengers using rail cars, rail stations, buses, and paratransit vehicles.
 - Work with advocates of the interests of pedestrians, bicyclists, and elderly and disabled persons to improve or enhance their safety.⁹¹

Federal and State Roles

The FRA is the federal agency that is responsible for overseeing rail safety as required by the Rail Safety Act of 1970 (Public Law 91-458). This Act authorized the states to work with the FRA to enforce federal railroad safety regulations.

The FRA collects and analyzes rail-related accident/incident data from the railroads that is converted to statistical tables, charts, and reports. This data is contained on the FRA website at fra.dot.gov.

The Department addresses safety primarily through three major program areas: Railroad/Highway Grade Crossing Program (Section 130 Program), Operation Lifesaver Program under Section 13b-376 of the Connecticut General Statutes and investigation of safety issues / inspections of at-grade crossings.

Railroad/Highway Grade Crossing Program (Section 130 Program)

General Program

The Department's Division of Traffic Engineering is responsible for the implementation of the Railroad/Highway Grade Crossing Program within the Highway Safety Improvement Program (HSIP). Historically, the program's emphasis has been to provide active warning devices, as a minimum.

Successful implementation of a program depends in part upon efficient and effective procedures. The Railroad - Highway Grade Crossing Program strives to enhance the safety of these crossings at both state and town roads on a statewide basis.

There are approximately five-hundred sixty three (563) public at-grade crossings in the state with three-hundred fifty three (353) of these crossings are considered active (train movements over the crossing). Some of the 353 have active warning devices (flashing lights, gates) and some have passive warning devices (signs, pavement markings). The remaining two hundred ten (210) crossings are considered inactive (no train activity over the crossing).

Since the program's inception in 1976, two hundred seventeen (217) locations have been improved, of which seventy-five (75) were improved under programs other than the grade crossing program.

⁹¹Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-9 – 3-11.

Presently the available funding level for the Crossing Program is approximately \$1.2 million dollars per year, which can support about one or two new crossing projects per year. When projects are initiated under the crossing program, it is for a total improvement of the crossing. The improvements include signs, markings, installation, and/or modernization of railroad warning devices, track circuitry upgrade, surface improvement, and alignment and sightline improvements. The average cost of these improvements ranges between \$450,000 and \$1,000,000 depending upon the complexity of the project.

Previously, the Department determined that the design of town road railroad grade crossing projects would be either brought in-house or accomplished by consultant engineers supervised by the Department and the state who would then advertise the projects for competitive bids for construction. Town agreements were forwarded to the involved municipalities for its execution. These agreements contain language formally authorizing the state to conduct design and construction activities within the town's right-of-way and provide reimbursement to the town for engineering costs when design plans are sent to them for review and comment. For the last five years, projects have been completed in design and construction utilizing this procedure and the results have been very positive.

Project Selection

Grade crossing improvement projects are developed from an established priority list. The Division of Traffic Engineering maintains this list and, through continuing investigation and review, is updated, and revised to meet changing conditions. This list is established by use of a hazard index (HI) and is based on relative hazards for each crossing.

Priority is established by ranking the crossings by the calculated Hazard Index. In prioritizing the review of candidate locations, the Division of Traffic Engineering utilizes a highway grade - crossing priority list that accounts for vehicular traffic volumes, train counts, and vehicle/train collisions. After the priority list is established and on-site reviews are conducted, projects are initiated and recommended projects are forwarded for future design years. The Program does not include private crossings.

The Division of Traffic Engineering presently has six (6) crossing projects under design and three (3) crossing projects initiated awaiting the start of design activities. Figure 45 includes a list of these projects and its anticipated design completion fiscal year.

Project	Town	Location	Fiscal Year
017-143	Bristol	Central Street	2010
083-233	Milford	Oronoque Rd.	2011
099-114	North Canaan	Rt. 7 & 44(East Jct.)	2011
099-115	North Canaan	Rt. 7 & 44(West Jct.)	2011
116-125	Redding	Long Ridge Rd.	2012
139-103	Suffield	Harvey Lane	2012
017-140	Bristol	Emmett St.	2013
092-464	New Haven	Grand Ave.	2013
082-276	Middletown	Butternut St.	2013

Figure 45. Current List of Railroad/Highway Grade Crossing Projects

Evaluation of Previous Projects

Vehicle-train accidents are historically low in Connecticut. However, in locations where crossings have been improved under the Railroad-Highway Grade Crossing Program, there are no recorded vehicle-train crashes attributable to the crossing subsequent to the completion of the grade crossing project.

Beginning October 1, 2009, State Legislation requires the transportation Commissioner to report to the Transportation and Finance, Revenue and Bonding Committees of the State Legislature every three years on any railroad crossing at grade. The reports must:

1. List all the at grade rail crossings in Connecticut,
2. Identify those that create hazardous conditions,
3. Indicate how much it would cost to upgrade the crossing or eliminate the hazardous,
4. Identify federal and other funding sources for doing this work, and
5. Rank the upgrades or eliminations listed in the report.

Reports submitted after the initial report must also describe the progress made in upgrading or eliminating hazardous at-grade crossings.⁹²

Connecticut Operation Lifesaver (CTOL)

Connecticut Operation Lifesaver (CTOL) that was established through Section 13b-376 of the Connecticut General Statutes is a free service that provides an active public education program. CTOL is dedicated to reducing and preventing incidents at highway-rail grade crossings, and to making the public more aware of inherent dangers that may be encountered at highway-rail at-grade crossings and if trespassing on railroad property. CTOL is a charter member of the national program Operation Lifesaver, Inc. (OLI) and is funded by the Connecticut Department of Transportation. OLI is a federally funded non-profit organization.

Hundreds of people are killed and thousands are seriously injured each year in the United States at highway-rail grade crossings and while trespassing at other locations along railroad tracks. Many people are unaware that trains cannot stop quickly to avoid collisions. Others take chances by ignoring warning signs and signals, going around lowered gates, stopping on tracks, or simply not paying attention when approaching highway-rail grade crossings. Many people make the fatal mistake of choosing railroad tracks as shortcuts or as places to walk or run for recreation and do not realize how quickly a train can appear, or how long it takes a train to stop. Unfortunately, on average, every 90 minutes somewhere in the United States, there is an incident at a crossing or along a railroad right-of-way. Operation Lifesaver programs educate the public by providing vital information so these tragedies can be reduced and prevented.

Operation Lifesaver is currently active in all 50 states and in Canada, South America, and parts of Europe. Since its inception in 1972, this public education program has dramatically reduced injuries and fatalities. Program proponents consider the three E's vital to the success of rail safety: education, engineering, and enforcement, with education being the focus of Operation Lifesaver (OL). OL volunteers are certified to provide safety presentations to audiences

⁹² September Special Session, Public Act No. 09-2, Section 67.

including new drivers, professional truck and school bus drivers, school children, and community groups. Professional engineers plan, improve, and maintain the crossings nationwide. Local and state law enforcement officials and railroad police officers, who actively enforce the traffic laws concerning grade crossings and the illegal use of railroad right-of-ways, provide enforcement.

There is an OL Committee appointed by the State Legislature. The Committee administers the OL program and promotes the program on the local level by coordinating with law enforcement and educating the public. The Committee also encourages the development of engineering and safety improvements with the Department.

Rail Regulatory and Compliance Unit

The Department's regulatory authority extends to all matters pertaining to railroad construction and operations that are not specifically governed by federal law or regulation. The major statutory responsibilities of the program include, but are not limited to, matters concerning public and private railroad/highway at grade crossings, railroad traffic control signals, fencing along railroads right-of-way and railroad land rights and trespassing concerns. It is the Rail Regulatory and Compliance Unit's responsibility that all requirements as stated in chapters 245, 245a, and 245b of Connecticut General Statutes are abided.

The Rail Regulatory and Compliance Unit provides investigation and testimony for all Rail Regulatory Hearings as well as public informational meetings; performs inspections of all new and reconstructed public and private at-grade crossings; provides technical support for the State Traffic Commission (STC) for traffic generators involving at-grade railroad crossings in the state of Connecticut; performs periodic inspections of the freight lines in Connecticut; monitors railroad related accidents within the state; and provides coordination between other Department units as well as various railroad companies during planning and design as related to railroad at-grade crossings.

As mentioned above, the Rail Regulatory and Compliance Unit is responsible for the monitoring of railroad related accidents within the state of Connecticut. Figure 46 shows the number of accidents at railroad/highway at-grade crossings in Connecticut from the year 2002 to the year 2010. Figure 47 depicts the number of railroad related fatalities in Connecticut from the year 2002 to the year 2010. Figure 48 shows the type of railroad related fatality from the year 2002 to the year 2010. The data reveals that the number of accidents at railroad/highway at-grade crossings, while low, remains consistent and, that suicide and trespassing incidents, in terms of fatalities, present the greatest safety challenge on Connecticut railroads.

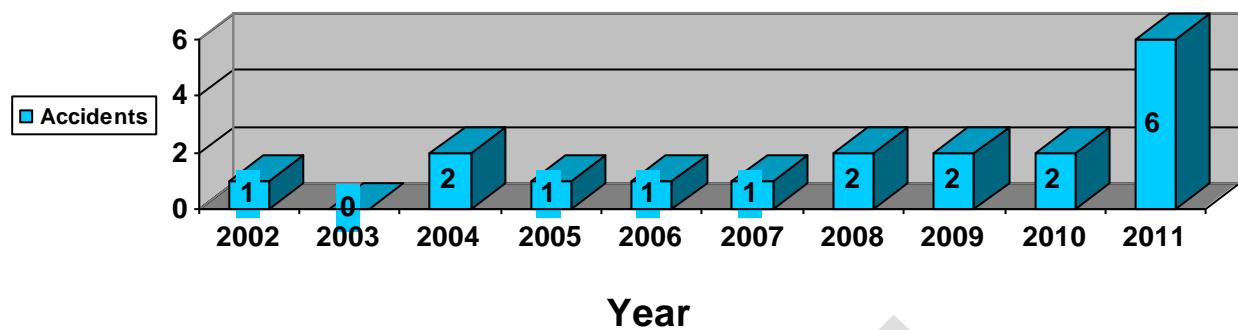


Figure 46. Railroad/Highway At-Grade Crossing Accidents in Connecticut (Statistical Graph)

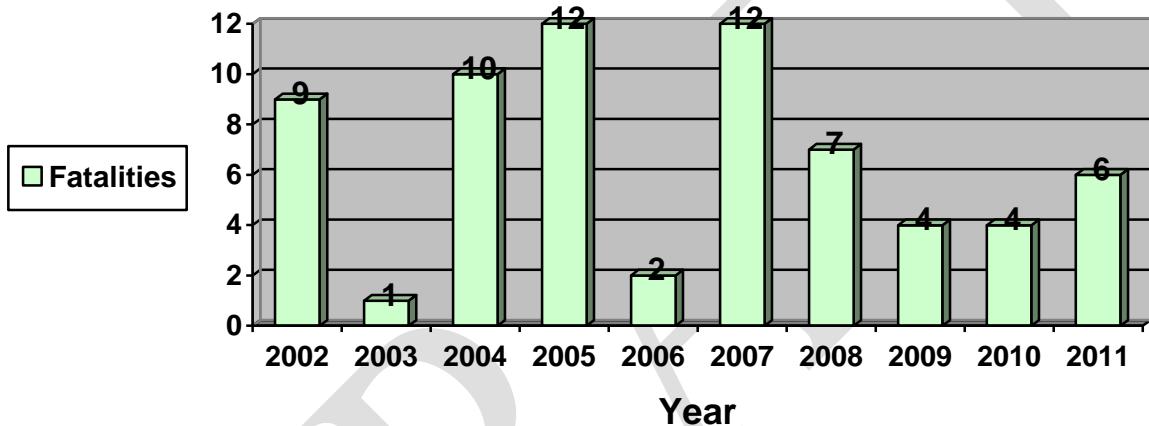


Figure 47. Railroad Fatalities in Connecticut (Statistical Graph)

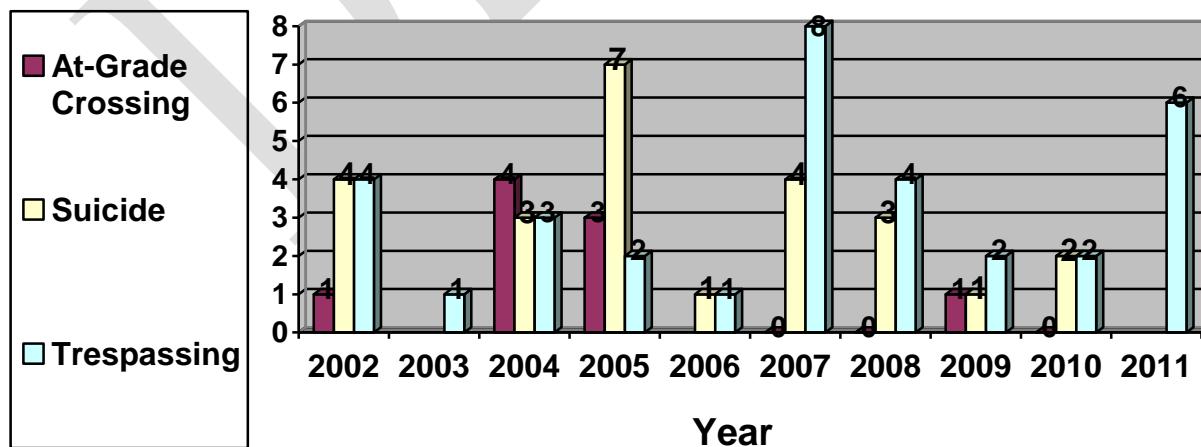


Figure 48. Railroad Fatalities in Connecticut by Type

The Department also has a System Safety Program Plan that is the Department's principal rail equipment safety document. It defines how the safety effort is implemented and identifies the staff and/or procedures required to maintain it. The plan is a living document that tracks changes in the system. Specifically, the plan addresses fire protection, inspection and testing, maintenance and repair of equipment, employee training and qualification, system modifications, configuration management, internal safety management assessment and the safety certification process. The plan ensures that safety issues are treated equally with cost and performance issues when design tradeoffs are made.

10.2 SECURING THE RAIL SYSTEM

The development of a comprehensive, all-hazards approach to domestic incident response, including the need to ensure the security of Connecticut's transportation system and its users, is a high priority for the Department, the state, and the nation. Disasters and hazards can threaten the security of our transportation infrastructure, lives, the economy, the environment, buildings, and businesses. Natural and homeland security events to which the Department must respond include but are not limited to the following: chemical hazards or accidents, dam failures, fires, floods, hazardous materials releases or spills, hurricanes, nuclear power plant emergencies, pandemics, terrorism, thunderstorms, tornados, and winter storms.

The Department's priority is to increase the security of the transportation system for users of the rail transportation system, as well as users of other motorized and non-motorized means of transportation. Prior to the September 11, 2001, terrorist attacks, the Department had several safety and security-related plans in place. Since the terrorist attacks, however, homeland security has become a high priority at both the national and state levels. In response, the Department instituted a variety of changes to address emergency management procedures and preparedness. It also developed emergency response plans that outline the Department's Homeland Security Advisory System. The plans were established in accordance with the five threat levels of risk established under the Federal Homeland Security Advisory System. These plans, which are based on the responsibilities of each of the Department's bureaus, are continually reviewed, updated, and modified.

On September 19, 2005, Governor Rell issued Executive Order No. 10 that directed all state agencies to implement a National Incident Management System (NIMS) and to adopt the standardized Incident Command System (ICS) in response to Homeland Security Directive No. 5 issued by the United States Department of Homeland Security. This system was implemented as an extension of the Statewide Incident Management System that is currently in place. The Department is committed to providing a secure transportation network. In the event of a natural disaster or homeland security emergency, the Department is committed to providing an appropriate, timely response that reduces further danger to property or lives.

The following rail-related strategies and actions are identified in the State's 2009 LRP:

- Develop the Security Planning program at the Department to provide a central resource to Department management and staff on matters relating to the security of the transportation system.
 - Review, monitor, and provide assistance analyzing potential implications of developments in homeland security planning efforts.
 - Review, monitor, and provide assistance analyzing potential implications of current and proposed best practices in the field of homeland security.

- Facilitate the coordination of transportation security projects involving multiple Department offices with Department of Emergency Services and Public Protection and other outside agencies.
- Review, monitor, and advise Department managers on the availability, related deadlines, and eligibility requirements of grant programs and other funding.
- Collaborate with the Department of Emergency Services and Public Protection, along with our federal partners, to articulate to state and federal officials the importance of adequate, stable funding sources and staffing levels to ensure the Department's capability and readiness with respect to all-hazards domestic incident response and transportation security.
 - Communicate directly with legislators in Washington, D.C. on emergency preparedness and incident response funding and staffing needs.
 - Communicate directly with legislators at the State Capital on emergency preparedness and incident response.
 - Identify, develop, and support non-traditional programs and solutions to address emergency preparedness and transportation security needs.
- Implement the National Response Framework (NRF) and continue to implement the National Incident Management System (NIMS).
 - Update and implement the Department's Emergency Response Plans.
 - Identify, investigate, and set priorities for preventing and correcting hazardous or potentially hazardous situations in a timely manner.
 - Continue to develop the Department's planning and operational capability with respect to all-hazards domestic incident response and transportation security.⁹³

Federal Roles

Securing the nation's passenger rail systems is a shared responsibility requiring coordinated action on the part of federal, state, and local governments, railroad operators, the private sector, and rail passengers who ride these systems. Since the September 11, 2001 attacks, the role of the federal government agencies in securing the nation's transportation systems, including passenger rail, have continued to evolve.

Prior to September 11, 2001, the FTA and FRA were the primary federal entities involved in passenger rail security matters. In response to the attacks of September 11, 2001, Congress passed the Aviation and Transportation Security Act (ATSA), which created Transportation Security Administration (TSA) within the United States Department of Transportation and defined its primary responsibility as ensuring security in all modes of transportation. With the passage of the Homeland Security Act of 2002, TSA was transferred, along with over 20 other agencies, to the U.S. Department of Homeland Security (DHS).

While TSA is the lead federal agency for ensuring the security of all transportation modes, FTA conducts non-regulatory safety and security activities, including safety and security-related training, research, technical assistance, and demonstration projects. Additionally, FTA promotes safety and security through its grant-making authority. FRA has regulatory authority for rail safety over commuter rail operators and Amtrak.

⁹³ Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-12 – 3-13.

Within DHS, TSA has the legal mandate to manage security programs and provide oversight for security of the transit industry. TSA also provides transit system subject matter expertise within DHS and determines the primary security architecture for the Transit Security Grant Program (TSGP).

Strategic Rail Corridor Network

The U.S. Department of Defense in coordination with the U.S. Department of Transportation ensures the rail infrastructure can support defense emergencies. The Strategic Rail Corridor Network (STRACNET) consists of 38,800 miles of rail lines nationally that is available to move essential heavy or oversized military equipment to ports and other locations. Two rail lines in Connecticut are part of the STRACNET.

Commuter Rail Security Program

The Department has implemented a security program in cooperation with MNR, Amtrak, and other federal, state, and local partners. The Department priorities include increasing public awareness of security issues, improving emergency preparedness, and investing in capital projects that enhance security and harden critical infrastructure at rail stations and facilities.

Transit Security Grant Program⁹⁴

The federal Transit Security Grant Program (TSGP) has allowed the Department to implement many of its security priorities with the supplementation of state funding. The purpose of the FY 2010 TSGP is to create a sustainable, risk-based effort to protect critical surface transportation infrastructure and the traveling public from acts of terrorism, major disasters, and other emergencies. DHS has identified priority project types and placed them into groups based on their effectiveness to reduce risk. Certain types of projects that are effective at addressing risk will be given priority consideration for funding. These groups have been prioritized based upon departmental priorities and their ability to elevate security on a system-wide level, to elevate security to critical infrastructure assets, and to reduce the risk of catastrophic events and consequences.

The Department is a member of the Regional Transit Security Working Group (RTSWG) that comprises transit agencies and their security providers in the tri-state region (Connecticut, New York, and New Jersey). RTSWGs are comprised of eligible transit agencies in the highest risk urban areas in the nation and are a requirement of DHS to apply for TSGP funding. As the highest risk transit regions in the country, Tier I regions receive the vast majority of TSGP funding. Tier I regions are Atlanta, Boston, Chicago, Los Angeles, the National Capital Region, New York, Philadelphia, and the San Francisco Bay Area. DHS meets with the RTSWG in each region to identify projects that will have the greatest security impact based on national priorities.

Through this grant program, the Department has received over \$25 million since 2005. The TSGP infrastructure projects have included the installation of fencing, access controlled gates, guard posts, and other security features at rail yards and Closed Circuit Television Video Cameras (CCTVs) at rail stations, rail yards, and bridges on rail lines. Other projects include funding to implement a public awareness campaign specific to the NHL and SLE service areas, conducting law enforcement operations dedicated to transit security, and the planning of emergency preparedness exercises. The Department has also tasked members of the

⁹⁴ <http://www.fema.gov/government/grant/tsgp/index.shtml>

Connecticut Department of Emergency Services and Public Protection (Connecticut DESPP) Critical Infrastructure Protection Unit to conduct a comprehensive physical security and vulnerability assessment of commuter rail operations and to develop risk mitigation and security planning strategies. The Department is also involved in several regional projects with New York and New Jersey transit agencies and Amtrak. One such regional interoperable communication project funded through the TSGP will link MTA communication centers to all public safety answering points along the NHL rail corridor.

The Department has also received funding through the Connecticut DEMHS through a DHS FY 2008 Buffer Zone Protection Program (BZPP) grant for infrastructure hardening of rail facilities. BZPP provides grants to build security and risk-management capabilities at the state and local levels to secure pre-designated critical infrastructure sites, including chemical facilities, financial institutions, nuclear and electric power plants, dams, stadiums, and other high-risk/high-consequence facilities.

Figure 49 contains a photograph of the public awareness campaign poster funded through the TSGP.



LEFT ON PURPOSE?

IF YOU SEE SOMETHING, SAY SOMETHING. Tell a railroad employee, tell a cop, or call 1-866-HLS-TIPS.

Figure 49. Public Awareness Campaign Poster

Customer Perception of Rail Security and Safety

A positive perception of personal safety is correlated with higher ridership and stronger commitment to public transit as a mode of travel.

New Haven Line

As a part of the NHL operating agreement, MNR annually conducts a detailed survey of riders. The results of the personal security and safety questions received from riders on the NHL are shown below (Connecticut residents only).

Security ratings (Satisfied + Very Satisfied) are:

- Personal security at your home boarding station: 88%
- Security of your car while parked at the station: 83%
- Personal security on trains: 92%
- Safety from train accidents (new question in 2010): 94%

Shore Line East

The Department conducts a survey of SLE passengers and asks the safety questions below as part of the survey.

How satisfied are you with... (Satisfied + Very Satisfied) are:

SLE trains and parking lots are safe to use – 93.9 percent

Safety of cars in the parking lot (at departing station) – 90 percent

Personal safety in the station parking lot (at departing station) – 94.6 percent

Personal safety while at the station (at departing station) – 94.7 percent

Personal safety while waiting in station area (at arrival station) – 90.8 percent

Metropolitan Transportation Authority (MTA) Police

The MTA Police Department (MTA PD) is the primary law enforcement agency for the MNR, Long Island Railroad, and Staten Island Rapid Transit System. The primary mission of the MTA PD is to ensure a safe environment within the transit system, reduce fear, and promote confidence of the riding public through station based policing.

The MTA PD is responsible for policing thirty-six rail stations in the state of Connecticut that MNR services and patrolling the railroad right-of-way in Connecticut from Greenwich to New Haven and the New Canaan, Danbury, and Waterbury branch lines. The MTA PD provides the primary response to all incidents on the NHL and coordinates response efforts with the Connecticut State Police and local police agencies in Connecticut. The MTA PD has facilities in Stamford, Bridgeport, and New Haven. Patrol officers, K-9 officers, and detectives are staffed at these locations and a detective is assigned to the Joint Terrorist Task Force in New Haven.

The MTA PD has taken proactive steps to reduce crime and to provide a safe environment. A Directed Patrol program is being used that places officers at stations at key times. Officers on Directed Patrols perform station based policing by interacting with commuters. They also perform "Step-On Step-Off" inspections of trains that arrive and depart the stations. A Random Bag inspection program is being used in which officers randomly check items such as luggage, packages, or carry-on items at various stations on the NHL.

MTA PD partners with the TSA and other law enforcement to perform VIPR team operations at various rail stations in Connecticut. The VIPR teams supplement existing security measures and provide a deterrent and detection presence to disrupt potential terrorist planning activities.

MTA officers have received Patriot training which increases the detection of possible terrorist threats. The Patriot system trains officers in behavioral assessment that enhances their ability to detect and apprehend terrorists. MTA officers are equipped with personal radiation detectors and receive the detectors after receiving training provided by FEMA.

The MTA Police also provide the traditional law enforcement services that have been provided by transit police. Uniformed Police Officers respond to calls for service that include trespassing,

thefts, assaults, disorderly persons, and other complaints. They also provide traffic enforcement at stations and railroad grade crossings. The MTA Police has taken a proactive approach to railroad crossing safety and target three crossings per month where additional enforcement is taken.

The MTA PD Detective Division has investigators assigned to Connecticut and augments them with staff from other commands. The primary function of the Detective Division is to conduct follow-up investigations of crimes. The Detective Division also investigates major rail traffic accidents, fatalities, and other incidents. The MTA PD Special Operation Division (SOD) consists of an Emergency Service Unit, Canine Unit, and Highway Unit. SOD routinely assigns units to patrol in Connecticut. The Canine Unit has explosive detection canines, some that are cross-trained for patrol that includes tracking, criminal apprehension, and evidence recovery.⁹⁵

Amtrak Police

Amtrak Police is the primary law enforcement agency for the SLE commuter service and Amtrak intercity passenger service in Connecticut on the Springfield Line and Shoreline. Amtrak has in place a program that includes a variety of security measures aimed at improving passenger rail security. Some of these measures are noted on Amtrak's website⁹⁶ and are conducted in stations or aboard trains to include:

- Uniformed police officers or Mobile Security Teams
- Random passenger and carry-on baggage screening
- K-9 units
- Checked baggage screening
- On-board security checks
- Identification checks

For several years, Amtrak has increased patrols by its police officers at its major stations and other facilities, including patrols by K-9 detection teams. In 2008, Amtrak deployed Mobile Security Teams to patrol stations and trains on an undisclosed, unpredictable basis. They also conduct random screening of passengers and inspection of their carry-on items and patrol trains. These teams consist of specially trained uniformed Amtrak Police, special counter-terrorism agents and K-9 units. Because predictable security can be exploited, the unpredictable rotation of the Mobile Security Teams adds to their ability to deter and detect potential threats.

Amtrak exchanges intelligence with the FBI's Joint Terrorism Task Force. Amtrak Police are also partnering with TSA, state, and local police to conduct VIPR operations along SLE, the Springfield Line, as well as the New Haven, Bridgeport, and Stamford stations along the NHL.

State and Local Police

State and local governments, passenger rail operators, and private industry are also important stakeholders in the state's rail security efforts. The state owns and operates a significant portion of the passenger rail system. Municipalities are directly affected by the rail systems that run within and through their jurisdictions. Consequently, the responsibility for responding to emergencies involving the passenger rail infrastructure often falls to state and local

⁹⁵ Source: Metropolitan Transportation Authority Police Department, Nov. 2009.

⁹⁶ www.Amtrak.com

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governments. State and local police participate in the VIPR initiatives in coordination with TSA, MTA PD, and Amtrak PD and respond to incidents along the rail line.

Mass Transit Security Team

Beginning in 2011, the Connecticut State Police's newly created five member Mass Transit Security Team (MTST) conducts proactive explosive detection sweeps with canines at passenger rail and bus stations/terminals and critical locations related to the mass transit system in Connecticut. The MTST liaisons and coordinates with the Department, MTA Police, Amtrak Police, various mass transit officials, federal agencies, and local police agencies involved in mass transit operations, and works to develop effective terrorism prevention strategies. The majority of this project was funded through the federal Transit Security Grant Program.

Visible Intermodal Prevention and Response Teams

The Transportation Security Administration (TSA) utilizes Visible Intermodal Prevention and Response (VIPR) teams to leverage resources quickly and to increase visible security in all modes of transportation, throughout in the country. VIPRs are DHS's top anti-terrorism initiative.

In Connecticut, VIPRs are utilized on the rails in collaboration with MTA PD, Amtrak PD, and State Police. Typical Connecticut rail VIPRs include TSA, MTA PD, Amtrak PD, State Police MTST, local police, and Connecticut National Guard personnel. VIPR teams are flexible in size and response. A VIPR at smaller platforms will consist of 4-6 personnel, while the larger stations typically consist of 10-15 personnel. In addition to visible deterrence, VIPRs in Connecticut also provide specially trained State Troopers assigned within the Office of Counter Terrorism of the Connecticut Department of Emergency Services and Public Protection who have advanced radiological and nuclear detection capabilities.

CHAPTER 11 – LONG-RANGE SERVICE AND INVESTMENT STRATEGIES AND PROGRAMS

This Plan contains a long-range service and investment program for current and future freight and passenger infrastructure in the state. This program addresses rail capital projects the state supports or expects to undertake and is based on a Strategic Five-Point Action Plan.

Rail system components include tracks, at-grade crossings, bridges, power systems, power system substations, signal systems, rolling stock, rail stations and platforms, parking lots and structures, and maintenance and repair facilities and equipment. It is usually more cost-effective to maintain continually the transportation system than it is to defer repairs and maintenance until a component of the system deteriorates to the point where it needs to be replaced. Maintaining the system in a state-of-good-repair is necessary to ensure the safety of the traveling public and the efficient movement of freight.

11.1 INVESTMENT STRATEGIES

The state of Connecticut has finite resources to invest in transportation. The Department must establish investment priorities so that available resources are effectively utilized. The Department's highest priority will continue to be to preserve, maintain, address safety issues on, and maximize the use of the existing transportation system.

Strategic Five-Point Action Plan

The Department has developed a strategic five-point action plan to meet cost-effectively the challenge to provide a safe, efficient transportation system that meets the mobility needs of people and for freight within the state and the region. This five-point action plan identifies the major areas for prioritizing and emphasizing investments for all modes of transportation. The points were determined after careful consideration of available resources and federal and state mandates and initiatives.

The following are the components of this Five-Point Action Plan:

- **Preservation - Maintain the Existing System in a State-of-Good-Repair.** The Department has identified preservation and maintenance of the existing system as its highest priority for targeting the limited available resources. The Department will invest in maintaining and repairing the transportation system before expanding it or adding new system components.
- **System Modification - Safety & Modernization.** Safety is a major concern of the Department. Modification needs identified for improving safety are a high priority when considering the allocation of staff, funding and equipment. In addition to preserving and maintaining the system to ensure the general safety of the traveling public, the Department will continue to consider areas where system modification could significantly improve safety beyond the constraints of the existing infrastructure's limitations.
- **System Productivity – Efficiency.** System productivity refers to maximizing use of the existing system by facilitating travel in and between modes. This is done by applying improved technologies, coordinating the scheduling of maintenance efforts and providing real-time travel information to the public. The development and application of new technology and improved construction practices, the continued advancement and

expansion of Intelligent Transportation Systems (ITS), and the provision of real time information to users of Connecticut's highway system and public transportation services are critical components of the Department's plan to address the current and future mobility needs of the state's residents, businesses, and visitors. The Department will continue to identify and invest in ways to maximize the use of the existing transportation system. As part of enhancing system productivity, the Department is committed to encouraging commuters to use transit and ridesharing options.

- **Economic & Environmental Impact - Quality of Life.** It is critical to the health of the state and its residents that the transportation system has a positive impact on the state's economy, physical environment and, ultimately, quality of life. The availability of multiple options for meeting mobility needs of people and for freight contributes to the development of economically vibrant, sustainable communities and provides residents with choices that have positive impacts on themselves and the environment.

It is essential that the Department assists in improving and expanding mobility options throughout the state by considering and addressing the needs of stakeholders such as pedestrians, bicyclists, and users of other non-motorized means of transportation when undertaking projects. The Department will take a context-sensitive solutions approach when undertaking projects to ensure active public participation and implementation of designs that are appropriately scaled to both the community and the need.

The Department must also facilitate the efficient and cost-effective movement of people and freight within and through the state. Additionally, the Department must ensure the security of the transportation system, as this is directly correlated to the public's safety and economic vitality. Ultimately, it is a responsibility of all state agencies to support efforts of their sister agencies in stimulating the economy and protecting the quality of life of the state's residents; the Department is committed to its part in this effort.

- **Strategic Capacity Improvements.** When necessary, the Department will pursue strategic capacity improvements to improve the efficiency of the transportation system. When the Department evaluates projects designed to enhance, expand or modify limits on system capacity, an important factor in the decision making process will be the extent to which a project contributes to providing greater mobility, accessibility and integration of the various transportation modes. Any improvements to capacity will only be undertaken after seriously considering the availability of funding and resource allocations.

Connecticut Rail Growth and Investment Strategies

Based on the Five Point Strategic Action Plan, the Department has developed the following rail-related strategies that are identified in the State's 2009 Long Range Plan.⁹⁷

Emphasize the Preservation of the Existing System

- Invest first in projects and initiatives that maintain and improve the transportation system in areas where the infrastructure is already in place.
- Correct hazardous or potentially hazardous situations to avoid magnification of associated safety issues.

⁹⁷ Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-2 – 3-3.

- Provide for routine maintenance and upgrading of components of the rail system such as tracks, bridges and structures, power systems, rolling stock, rail stations, maintenance facilities, etc.
- Work with advocates of the interests of bicyclists and pedestrians and with other stakeholders to identify and prioritize projects to maintain and repair existing facilities for bicyclists and pedestrians.

Promote efficient system management and operation

- To develop further Connecticut's Regional Transit System, address operational and infrastructure issues that are obstacles to expanding rail service along the NHL and other corridors.
- Improve Connecticut commuter rail service by addressing the challenges to improved service that are identified in the Department's August 2007 study, *Implementation of Connecticut Rail Service into Penn Station New York*.
- Address obstacles identified in the Department's January 2007 report, *Expanding Rail Service on Shore Line East*.
 - Negotiate and obtain an agreement with Amtrak, the owner of the North East Corridor, to expand service;
 - Amend the Department's 2003 Lease Agreement with Amtrak to permit expansion of service before north side rail station platforms are added;
 - Develop an amendment and revised budget tied to increased service for the NEC Access Rights; and
 - Address the operational restrictions identified in the report.

Support, when efficient and effective, expanded and improved rail passenger services, rail parking facilities and rail stations, rail freight and improved access to airports and ports

- Undertake the rail capital projects and provide the transportation services for which the Governor and the Connecticut General Assembly have authorized funding.
- Implement the recommendations outlined in the Department's New Haven Line Fleet Configuration Analysis, Danbury Electrification Study, and the New Haven - Hartford - Springfield Commuter Rail Study
- Take and facilitate actions to implement Connecticut rail service into Penn Station in New York.
- Take and facilitate actions to expand rail service on Shore Line East.
- Implement, when efficient and effective, the recommendations of the Connecticut Public Transportation Commission.
- Advocate for funding for, and provide grant programs that assist municipalities and transit providers in meeting local and regional transportation needs.
- Work with the Governor, appropriate Connecticut state agencies, Connecticut's Congressional Delegation, other states in the NEC, Amtrak and other stakeholders to negotiate changes in the services and costs of intercity rail service to make this service more affordable and more convenient for people traveling to, from and within locations in Connecticut.
- Develop a plan for expanding rail freight in Connecticut and the surrounding region, including the state's commercial ports.
- Support strategies and tactics adopted by Bradley Airport Board of Directors to strengthen passenger and freight service.
- Implement the recommendations of the Connecticut Maritime Commission with respect to all ports in Connecticut.

- Work with stakeholders to identify and prioritize needs, and advocate for funding and other resources required to support accessibility and mobility improvement projects across transportation modes for people and for freight to address the needs.
- Identify and explore opportunities to enter into public/private partnerships to identify ways to improve transportation services and facilities and to fund such projects and initiatives.

11.2 NEAR -TERM ACTIONS

Translating the above strategies to next steps, the following near-term actions are the Department's priorities.

New Haven Main Line and Branch Lines

Parking expansion on the entire New Haven Line is a top priority. Regional engagement is required to generate the additional spaces to enable regional economic growth. Achieving such capacity expansion will require the help of business groups and the regional planning agencies. Security enhancements to the stations and yards and other security initiatives will continue.

For the NHL, of key importance is to preserve and grow the existing system and to prepare all aspects of the railroad for the M-8 car delivery. These aspects include yard facilities construction, shop preparations, renewal of the signal and communications systems, power (catenary replacement and substations), and maintenance or rehabilitation of rail bridges, tracks, interlockings, and drainage systems. Station and parking improvements and development now underway at Fairfield, West Haven, Bridgeport, and other locations is a key element in doubling rail parking for this system. Overhauling existing locomotives will be required to maintain this equipment in service. Installing Positive Train Control and upgrading the radio systems are new federal requirements.

For the branch lines, initiating projects contained in the recent branch lines studies of those lines is a priority as well as the Centralized Traffic Control Systems project on the Danbury Branch Line. The priorities include parking expansion, extending or adding high-level platforms, electrification, passing sidings, and new station(s).

Shore Line East

For SLE, driving new service investment and growth east to New London and beyond is a focus. Constructing a south side high-level boarding platform at Westbrook and north side high-level boarding platforms at Branford, Madison, Clinton, and Westbrook and other modifications are priorities to allow for bi-directional service and the operation of the M-8 railcars on this line. Station development is underway at the Branford, Guilford, and Westbrook locations. Determining what needs to happen to ensure that M-8 rail cars can operate along this route is a priority for efficiency and a seamless route to the NHL. At a minimum, this will include the electrification of sidings at Guilford and Old Saybrook and a power distribution upgrade. Parking expansions are needed and development is underway at Branford, Westbrook, and Old Saybrook. For SLE expansion to New London, the Department continues to work with the stakeholders in the region to accommodate both rail and maritime traffic.

Intercity and High-Speed Rail Development

Collaborating with the Amtrak, the federal government, and adjacent states in maintaining and growing the intercity and high-speed regional rail system is a priority.

Partnering with Amtrak and the Northeast Region

Amtrak's *Northeast Corridor Master Plan* contains a project listing that identifies the infrastructure needs for a state-of-good-repair on the NEC for the current and year 2030 level of intercity and Acela service through Connecticut and the region.⁹⁸ These projects are contained in Appendix A. The state will continue to seek aggressively federal funding in coordination with Amtrak to enable the NEC to achieve its full potential as a critical component of the nation's transportation system. The Department is exploring possible new sources for funding the NHL to accommodate intercity and Acela services growth, in addition to the state-of-good-repair needs on the Amtrak's NEC east of New Haven and on the Springfield Line.

The Department will continue to coordinate with Massachusetts, Vermont and other New England states to promote high-speed rail in the region. Massachusetts received funding to improve the Connecticut River Rail Line to reestablish passenger rail service on the west side of the Connecticut River from the Connecticut border to the Vermont border. Additional funds were provided for track improvements in Vermont. This project is a key initiative for the connection of the Northern New England High-Speed rail corridor designation.

New Haven-Hartford-Springfield Service

With respect to the proposed NHHS commuter service on the Springfield Line, that has received Connecticut legislative authorization, the Department has received ARRA Stimulus funds and state funding to advance a portion of this project to support commuter, high-speed, and freight rail service on this line. Additional funding will be needed to initiate commuter service.

The Connecticut Rail Freight System

Collaborating with the freight railroads in maintaining and growing interconnectivity of the state rail freight system with the national network is a priority. The statewide rail freight and preservation program should focus on investing in capital projects on individual rail segments using a measured approach to increase overall systems capacity. Priority investments include track and bridge improvements, crossing upgrades or replacement, improvements in drainage, culverts, and clearance limits, and other improvements to strengthen first-mile/last-mile interchange, off-loading, and other shipment connection points.

Modal Connectivity

This Plan recognizes the significant importance of intermodal connections to system productivity. Chapter 7 reviews those intermodal connections that form an integral element in both the freight and passenger systems. Intermodal connections will require upgrading and improvement to achieve greater system delivery.

The New Britain - Hartford Busway (Busway) is a priority project and it is being designed to allow for connections to some rail stations. There will be a direct linkage shuttle bus to Bradley Airport and over the long term, the Department plans to assess the feasibility of creating a rail connection to the terminal. There is significant potential at the State Pier in New London to enhance cargo capabilities and increase the use of freight by allowing for full double stack

⁹⁸ The *Northeast Corridor Infrastructure Master Plan* May 2010.

container service to and from the Port. Continuing to work with municipalities and private businesses on Transit Oriented Development projects is a key component to connecting modes.

Planning Initiatives

Studying and planning for the potential of other line additions, such as Danbury-New Milford, New London-Worcester, Old Saybrook-Hartford, New London-Palmer, Massachusetts, Willimantic-Manchester, and Waterbury-New Britain linkages to the New Britain-Hartford Busway are needed to be proactive with future demand.

Pennsylvania Station New York Rail Service

The Department coordinated with MTA MNR to initiate New Haven-PSNY-Secaucus weekend service for events at the Meadowlands in New Jersey that began in the fall of 2009. This initiative set in place the institutional arrangements necessary to expand service from Connecticut to PSNY in the future. Based on the experience gained in this initiative, introducing peak commuter service in the future would be beneficial but would require further study.

Long-range service and investment program funding tables and project descriptions are included in Appendix A and B. They list additional strategies required to meet the goals for rail passenger and freight growth including rail planning studies, plans, or reports with general descriptions for planning purposes only. A number of the projects contained in the Appendix will require further study before going to preliminary design and are contingent on funding.

CHAPTER 12 – PUBLIC FUNDING FOR RAIL PROJECTS AND SERVICES

The State Rail Plan (SRP) identifies the federal and state funding program, the budget process, formation, and execution, and legislation relating to rail infrastructure development and services.

Overall Funding Program

Connecticut's combined Federal Fiscal Year 2010 highway and transit capital program funding level was approximately \$860 million, with \$207 million coming from state bonds and the remainder coming from federal program funds. With regard to its commuter rail services, in State Fiscal Year 2010, the state committed approximately \$118 million to MNR and SLE operating subsidies. Though it varies from year to year, the predominance of the \$180 million annual transit (bus and rail) capital program is invested in commuter rail improvement projects. Operating subsidies are funded from the Department's annual rail appropriation and capital projects are funded from either the federal programs (80 percent federal and 20 percent state match) or 100 percent state bond funds.

12.1 CAPITAL PLANNING PROCESS

One mechanism used to administer the capital program is the Bureau of Public Transportation's 20-year Transit Capital Project Management Plan (TCPMP). The TCPMP is a fiscally constrained plan and forecasted budget providing a detailed public transportation capital project listing which exceeds \$160 million per year (exclusive of Public Act 05-4 and Public Act 06-136). It includes all capital projects necessary to support two commuter railroads, Connecticut Transit operations in 8 urban areas and thirteen active transit districts. Capital projects as contained in Public Act 05-4 and Public Act 06-136 are estimated at \$2.3 billion. The state provides the non-federal share for most rail and bus capital improvements. The annual State bond authorization for public transportation capital projects is approximately \$41 million.

The Bureau capital planning process also recently oversaw the prioritization of \$152 million of supplemental funding made available under the ARRA. Funds received under ARRA supplemented the funding pool available for capital projects, allowed new projects to be undertaken and minimized the negative effects of cost overruns on existing projects that might otherwise have been delayed due to unavailability of funds.

The Bureau Capital Plan assigns total estimated project costs and anticipated funding sources to each project and forecasts available federal funding using levels in the most recent federal transportation authorizations. The current Bureau Capital Plan estimates federal funding levels based upon the 2005 SAFETEA-LU bill, and includes funding in the overall capital budget from all sources including Congestion Mitigation and Air Quality (CMAQ) funding, approved section 5309 discretionary grants, approved ARRA grants, etc. As a tool for conservative forecasting, the Bureau Capital Plan freezes future federal formula funding at current levels and only includes discretionary grants that are appropriated in federal budgets. However, all project cost estimates are prepared in year of expenditure dollars. The Bureau Capital Plan utilizes a spreadsheet that balances the plan by year and funding source to maintain fiscal constraint.

Funds are programmed to invest in projects that ensure safety, maintain the existing transportation infrastructure, increase the productivity of the transportation system, promote

economic development, and provide necessary capacity enhancements. The plan effectively utilizes all federal and state funds.

12.2 FEDERAL RAIL PROGRAM FUNDING

The Department is the designated recipient for all Federal Transit Administration (FTA) programs. The Department is responsible for service and planning decisions for rail, fixed-route bus, and complementary paratransit service in the urbanized areas of the state.

The Governor designated the Department as the agency responsible for administering the Sections 5307, 5309, 5310, 5311, 5316 and 5317 programs.

FTA Section 5309 Capital Funding Program

The FTA administers several transit funding programs. The Section 5309 Program provides capital funding for the establishment of new transit service projects ("New Start" - 40 percent), the improvement and maintenance of existing rail and other fixed guideway systems ("Rail Modernization"- 40 percent), and the rehabilitation of bus systems ("Bus and Other"- 20 percent).

The "New Start" funds are all awarded on a discretionary basis. Proposed new rail services must compete against proposals from other areas of the country. The FTA will pay 80 percent of the total project costs for projects funded through Section 5309. State and local governments are required to fund 20 percent of project costs, although they are permitted and expected to provide a larger local share.

The following rail projects are in a pending Section 5309 grant application:

	<u>Federal</u>	<u>Total</u>
Sound Beach/Tomac Avenue Bridges	\$ 8,000,000	\$10,000,000
Danbury CTC	\$20,000,000	\$25,000,000
Midlife Overhaul of 8 P-40 Locomotives	\$16,000,000	\$20,000,000

FTA Section 5307 Capital and Subsidy (Operating) Program

The FTA Section 5307 funds are primarily for capital assistance projects. The primary distinction of this program is that the funds are allocated to individual urbanized areas according to a formula based on the size of the population. However, the Section 5307 funds, apportioned to Connecticut's Urbanized Areas (UZAs), are pooled and then first applied to the highest priority bus needs, as reflected in the various TIPs and the STIP. The pooling of Section 5307 funds has proven to be extremely beneficial to the bus transit operators across the state, because sufficient federal and state funding has been made available in a timely manner to acquire replacement buses, when and where needed. In those years when the bus replacement and/or fixed facility needs for a particular UZA are satisfied, the Section 5307 funds are programmed for priority bus projects in other UZAs. When the priority bus needs had been satisfied, the uncommitted funds are programmed for rail capital projects. The programming of funds in the TIPs and the STIP continues to reflect this philosophy. The capital program requires a 20 percent non-federal match.

The following rail projects were recently funded with Section 5307 (grant CT-90-X510):

	<u>Federal</u>	<u>Total</u>
Sound Beach/Tomac Avenue Bridges	\$19,200,000	\$24,000,000
NHL Substation Replacement	\$20,000,000	\$25,000,000

NHL Component Change Out Shop	\$36,000,000	\$45,000,000
Mainline Catenary Replacement - C1b	\$34,175,000	\$42,718,750
NHL C-29 Track Program	\$17,600,000	\$22,000,000
NHL Positive Train Control Design	\$ 9,600,000	\$12,000,000
Waterbury Branch Bridge Rehabilitation	\$ 7,600,000	\$ 9,500,000

12.3 STATE RAIL PROGRAM FUNDING

State Budget Process

The General Assembly of the state of Connecticut has the authority to spend public funds and tax the public.

The budget cycle consists of two phases: budget formulation and budget execution.

Budget Formulation

The Office of Policy and Management (OPM) develops forms and instructions to be used by state agencies in submitting their budget requests. The state's fiscal year runs from July 1 through June 30. The agencies prepare its current services biennial budget requests to OPM. Once approved, the Governor transmits the budget document for the next biennium to the legislature. The Governor's recommended budget document is required by statute to contain four parts. These are the Governor's budget message; recommendations for appropriations for every agency for each fiscal year of the biennium (the recommendations would include the operating budgets for the biennium and bonding requirements for capital projects); a draft or drafts of the appropriations, bonding and revenue bills to carry out the recommendations made in parts one and two; and recommendations concerning the economy, and the effect of the state's budget thereon.

From February to April, the legislature's Appropriations and Finance Committees review the Governor's recommendations. The Appropriations Committee holds public hearings on each agency's budget. There is an Appropriations subcommittee for transportation. The Finance Committee and its subcommittees review the revenue and capital projects portions of the budget. There is also a Finance subcommittee for transportation bonding. The subcommittees develop recommendations for presentation to the Committee chairpersons. The recommendations are refined and reviewed with leadership, and final bills are drafted and reported for floor action.

The legislature appropriates funds to the agencies for the biennium beginning the following July 1 in its odd-numbered-year session, primarily in one bill. In even-numbered years, at least one bill that adjusts expenditures for the ensuing fiscal year must be reported. The bill is required to contain legislative revenue estimates. By law (both constitutional and statutory), the level of appropriation cannot exceed revenue estimates. Bonds are authorized for transportation purposes and other purposes.

Budget Execution

OPM administers agency appropriations through the allotment process to ensure sound fiscal management of state funds. The Governor may restrict the allotment of appropriated funds due to a change in circumstances, or if s/he determines that estimated budget resources will be insufficient to finance appropriations in full. There are other statutory requirements to restrict allotments.

The allocation of bond authorizations is the responsibility of the Bond Commission, a joint executive-legislative body composed of: the Governor, Treasurer, Comptroller, Attorney General, Secretary of OPM, Commissioner of the Department of Public Works and the Co-chairpersons and Ranking members of the Finance, Revenue, and Bonding Committee. Due to the nature of the allocation process and the time required for capital construction, a bond authorization may remain on the books for several years.

Special Transportation Fund

The Special Transportation Fund (STF) funds state transportation programs that receive revenues from transportation-related taxes, fees, and revenues as well as from the proceeds of Special Tax Obligation Bonds. The STF pays the debt service cost for state bonds issued as a means of providing funds for the state's share of transportation projects; supports a small program of Pay-As-You-Go activities; and finances the capital projects, operations, and services of the Department, excluding support of Bradley International Airport (BDL).⁹⁹ In addition, the STF finances most of the operations and services of the Connecticut Department of Motor Vehicles.¹⁰⁰

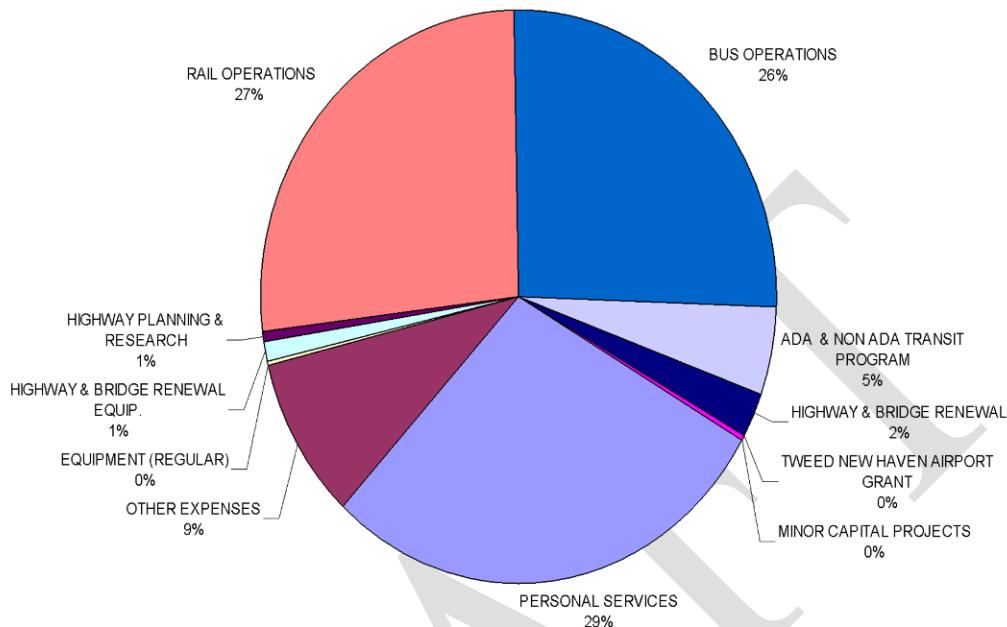
Operating Budget

The pie chart (Figure 50) is the Department's Operating Budget for SFY2011. It shows how the Department's \$517 million operating budget is allocated. It shows that 58 percent is allocated to public transportation subsidies for both bus and passenger rail (including 5 percent for ADA Para-transit programs), 29 percent is allocated to personal services, 9 percent is allocated to other expenses, 2 percent is allocated to highway and bridge renewal, 1 percent is allocated to highway and bridge renewal equipment, and 1 percent is allocated to highway planning and research. In SFY2009 and SFY2010, 51 percent and 54 percent, respectively, were allocated to public transportation. It is anticipated that demand for investments in public transportation will continue to grow if fuel prices increase.

⁹⁹ Operating and capital program costs for Bradley International Airport (BDL) are financed via the Bradley Enterprise Fund that is funded with revenues generated at the airport.

¹⁰⁰ Narrative taken from the Department's 2011 Master Transportation Plan.

CTDOT's Operating Budget for SFY 2011
Total = \$517 Million



Source: Bureau of Finance & Administration. Data based on State Fiscal Year. Graphic revised as of June 2010

Figure 50. ConnDOT's Operating Budget for SFY 2011

Expenditures

Figure 51 provides a summary of STF estimated expenditures. For SFY2011, 39 percent of the STF is allocated to pay debt on highway, rail and bus transportation projects paid for with bonds; 25 percent is allocated to operate and subsidize mass transit; 17 percent is allocated to Department operations; 11 percent is allocated to pension and fringe benefits; 4 percent is allocated to the Department of Motor Vehicles; 2 percent is allocated to renewal of state-owned and maintained highways and bridges; and 2 percent is allocated to other budgeted expenses.

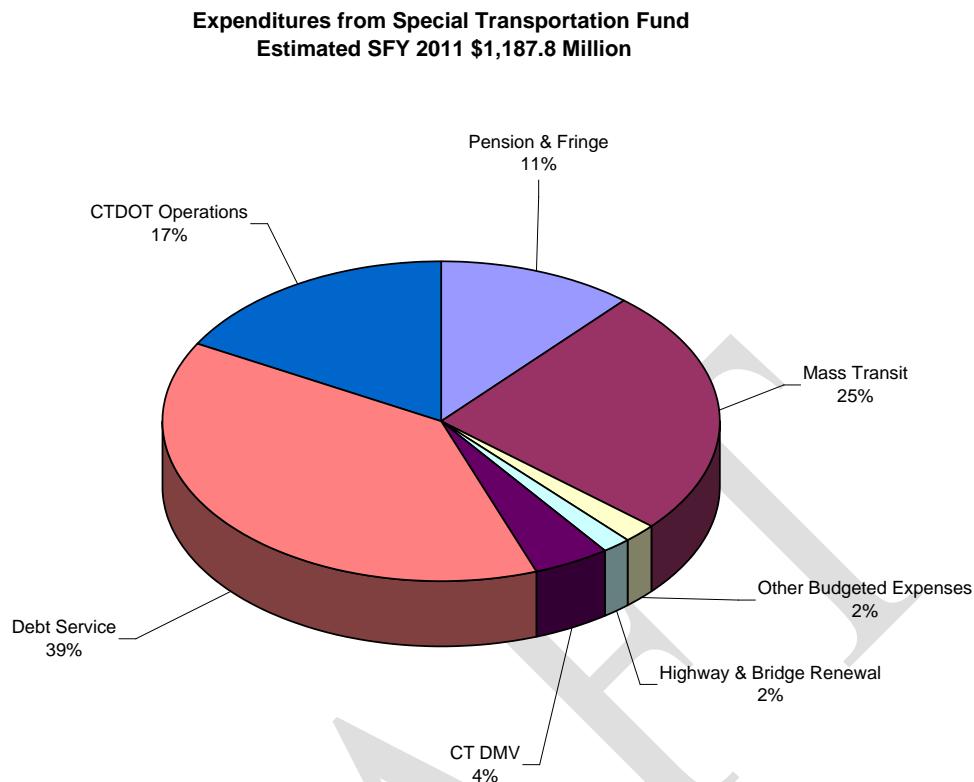


Figure 51. Expenditures from Special Transportation Fund – SFY 2011

Capital Program

In recent state fiscal years (SFY), Connecticut's total transportation capital program was between \$658 million and \$2.1 billion per year, with between \$212 million and \$1.6 billion coming from state bonds; \$12 million coming directly from STF appropriations; and the remainder coming from federal program funds. The cost of the Capital Program for SFY2011 is currently estimated at \$1,878.8 million. Of this amount, 73 percent (\$639.1 million) will come from federal program funds. The state's 25 percent share of this cost is estimated at \$218.2 million with \$21.4 million (2 percent) coming from appropriations from the STF.

Connecticut Department of Transportation Infrastructure Program

Because of the state budget process, the Department, as well as all other state agencies, is provided with an operating and capital budget. The capital budget, formulated from the Department's request to the legislature, is subdivided into several capital bond programs against which federal funds are programmed. The bond program level is legislated each year and requests for bond authorization must be made through the State Bond Commission. The state bond categories for the Transportation Infrastructure Program include the following:

- Interstate Highways
- Intrastate Highways
- State Bridges
- Local Bridges
- Transit

- Aviation (excluding Bradley International Airport)
- Resurfacing
- Department Facilities
- Safety Improvements
- Surface Transportation/Urban Systems Roads
- Other Roads and Bridges
- Hazardous Waste
- Special Projects
- Waterways

The Treasurer of the State of Connecticut issues bonds as cash flow is needed to award construction of a number of projects in the infrastructure program as a whole. Bonds are not issued for individual projects. Likewise, debt service is not detailed for any individual projects, but rather for the bond issue as a whole.

Typically, bonds for transit capital projects are issued to cover only the state share of project funds. The “Funding Sources by Year” table in the Standardized Cost Category (SCC) Workbook shows the cash flow by source and assumes the New Starts funds are received as needed by the project.

Pledged Revenue

The Department's infrastructure program for highways and transit is financed primarily through federal highway and transit funds with most of the matching funding coming from the issuance of state bonds. The bonds are supported by the State's STF. The Pledged Revenues that are credited to the STF consist of the following:

- State Motor Fuel Tax (gasoline and special fuels)
- Motor Vehicle Receipts
- License, Permit and Fee Revenues
- Petroleum Products Gross Earning Tax
- State Tax imposed on casual sales of motor vehicles, vessels, snowmobiles and aircraft
- Transit operating assistance funds received by the state from FTA
- Other receipts, funds, and moneys credited to the STF (investment earnings on moneys in the fund)

Debt service is appropriated in each annual budget at levels that conform to the bond indenture agreements explained in the next section. Typically, no revenues are “pledged” against the debt service for specific projects. However, Public Act 05-4, June Special Session, did pledge certain rail fare surcharges to the payment of specific new bonding authority used for the purchase of new rail cars.

Debt Service Coverage

Under the Prior Indenture agreements, the state has covenanted to provide Pledged Revenues in each fiscal year equal to two (2) times the aggregate principal and interest on Senior Bonds and interest requirements on Senior Notes in such fiscal year. So long as Second Lien Bonds are outstanding, the state is also covenanted in the Indenture to provide Pledged Revenue in each fiscal year equal to two (2) times the aggregate principal and interest requirements on all bonds and notes in such fiscal year.

Implementation of and Major Funding for the Infrastructure Program

The State's Transportation Infrastructure Program began on July 1, 1984. Since that time, over \$19.0 billion has been authorized. Throughout this period, the Department has successfully operated, maintained, and expanded its multi-modal transportation system.

Since the Infrastructure Program began, several changes and enhancements to the program have occurred through the legislative process. Revenue sources and expenditures have been adjusted to ensure the Program's financial soundness and successful implementation. The establishment of Bond program categories by the legislature has provided adequate bonding for each transportation mode, assuring that the Department's program administrators utilize the bonding authority for the mode intended. The State Legislature sets annual bond program limits for the Department and Bond program requests must fit within that limit. When additional funding has been required, the legislature in the past has provided new or additional revenue sources into the STF or has removed non-capital expenses from the STF.

An Act Concerning the Authorization of Special Tax Obligation Bonds of the State for Certain Transportation Purposes (Public Act 05-4, June Special Session)

This \$1.3 billion transportation initiative was the largest infusion of capital for Connecticut's roads and rails in more than two decades. This investment was significant both for its sheer size and for what it would accomplish. The \$1.3 billion represents funding over and above the approximately \$1.5 billion the Department receives annually from state and federal sources and it is available for important highway and congestion management measures. The initiative provided for the purchase of 342 rail cars for the NHL railroad, a new rail maintenance facility to maintain those cars, additional transit buses, and highway improvements.

The investment was noteworthy for the context in which it was proposed: during that time, all states faced uncertainty and delays due to the lack of action in the Congress on the federal Transportation Reauthorization Bill.

In addition to \$667 million for replacement of 242 rail cars and purchase of 100 rail cars for expanded service, and a new rail maintenance facility (\$300 million), the bill also included \$180 million for near term improvements on I-95, and \$150 million for improvements on highways other than I-95. It expanded the number of buses funded for Connecticut transit services and it funded the next steps for NHHS commuter rail. In short, it was a first step in a comprehensive and strategic package focused on short-term, high impact measures.

This additional \$1.3 billion transportation initiative could not be accomplished within the existing revenue stream provided to the STF. The legislation provides for additional revenue into the Fund. Increases to the Petroleum Products Gross Earning Tax, a surcharge on rail tickets dedicated to payment of bonds for the new railcars, and new bonding authorization were passed to accomplish the specific improvements outlined.

An Act Concerning the Roadmap for Connecticut's Economic Future (Public Act 06-136)

Public Act (PA) 06-136 is a \$2.3 billion program that requires the Department to plan, design, and implement a number of projects and studies; requires the Office of Policy and Management (OPM) to coordinate planning efforts of other state agencies with transportation planning; and makes several Transportation Strategy Board (TSB) changes. \$1 billion in Special Tax Obligation bonds (STO) was authorized over 10 years for the projects and studies outlined in the act supported by an increase for Petroleum Gross Receipts Tax revenues transferred from

the General Fund to the STF. New Grant Anticipation Revenue Vehicle (GARVEE) bonds are authorized at \$1.3 billion supported by a pledge of future federal transportation funds.

Several of the specific details of the act as it relates to rail are as follows:

PA 06-136 requires the Department to implement the rail projects and initiatives listed below. Under the act, most of the projects do not have dollar amounts listed with them. Otherwise, the dollar amounts in parentheses after each project description are the amounts discussed during bill negotiations and reflect a general understanding of the minimum funding likely to be allocated to that particular project. It is also understood that the amounts may change over time.

1. Commuter rail service on NHHS line with shuttle bus service to Bradley International Airport - (\$146 million);
2. Rehabilitation of rail passenger coaches for use on SLE, NHHS, and NHL branch lines - (\$25 million);
3. Developing a new commuter rail station between New Haven and Milford (i.e. West Haven or Orange) - (at least \$11 million);
4. Meeting costs of capital improvements on branch rail lines "not to exceed forty-five million dollars";
5. Meeting capital costs of parking and station improvements on NHL, SLE (at least four stations) and branch lines "not to exceed sixty-million dollars".
6. Completing a rail link to the port of New Haven - (No dollar amount allocated).

The act also requires the Department to "evaluate and plan the implementation of" the rail projects listed below. Several of these projects have had significant work already performed.

1. Evaluating rail links to other ports (i.e. Bridgeport and New London);
2. Developing a second rail passenger station between New Haven and Milford (i.e. West Haven or Orange); and

The act further requires the Department to recommend implementation of additional "transportation improvement projects" in consultation with the TSB.

In addition, the act requires the Department to conduct the following four studies with estimated costs of \$4 to 4.5 million:

1. A report identifying obstacles to improved rail service on SLE, including, but not limited to, increased service frequency, reverse commute service, and weekend service.
2. A study of the feasibility of building a fuel cell power station to generate power for the NHL.
3. A study of the transportation and mobility needs of residents and businesses in eastern Connecticut.
4. An assessment and plan for implementing commuter rail service between New London-Worcester, Massachusetts.

"Roadmap" Spending Plan

The Act requires the Commissioner of the Department to submit a multi-year plan of expenditures for the required projects.

The STO bonds authorized in sections 4 through 9 of the act (\$1 billion) may be used to implement any of the initiatives listed above, effective July 1, 2006.

The act authorizes the Department to enter into grant and cost sharing agreements with local governments, transit districts, regional planning agencies, and councils of governments in connection with the above projects and any additional transportation improvement projects recommended by the commissioner to implement.

To help facilitate the advancement of projects, the act allows the Department to solicit bids or qualifications for equipment, materials, or services for these projects at any time in the fiscal year even if none of the required funds may be available until later in the same or a succeeding fiscal year. This provision provides the state with the same flexibility that the federal program offer to move projects along while waiting to finalize financial arrangements.

Bond Provisions

Special Tax Obligation (STO) Bonds

Any request for issuance of bonds must identify the project for which the bond proceeds are to be used and the recommendation of the person signing the request as to the extent to which federal, private, or other money currently or soon to be available for the project should be added to the bond proceeds.

The State Bond Commission may authorize the bonds only after it finds that (1) a request for authorization signed by the appropriate state officer, department or agency has been filed with it and (2) any capital development impact statement, human services facility collocation statement, advisory report regarding the state conservation and development policies plan, and statement regarding farmland that are required by law have been filed with it. The commission may authorize the bonds without finding that all the required reports and statements have been filed with it if it has authorized its secretary to accept any required reports and statements on its behalf.

Any bond proceeds in excess of the aggregate costs of all authorized projects must be used in accordance with existing statutory requirements for such excess proceeds.

Section 16 of the act amends 2005's \$486 million STO bond authorization for the new rail cars and maintenance facilities to make the entire amount available as needed. It does not change the total amount of the bonds authorized, but it deletes the issuance schedule after the first year.

Sections 12 and 22 of the act permit the use of previously authorized Urban Action Program bonds for TOD projects.

GARVEE bonds

Sections 10 and 11 of the act authorize the State Bond Commission to issue up to \$1.3 billion in bonds that are secured by future federal transportation funds that will be paid to the state, commonly known as GARVEE bonds. It creates a special fund called the Grant Anticipation Transportation Fund into which all revenues required or permitted to secure the bonds must be deposited and held separate from all other money, funds, or accounts.

Petroleum Products Gross Receipts Tax Revenue Transfers to the STF

The \$1 billion STO bond authorization in sections 4 through 9 of the act is supported by an increase for Petroleum Gross Receipts Tax revenues transferred from the General Fund (GF) to the STF. Currently, each calendar quarter, specific amounts of the revenue generated from the

petroleum products tax is transferred into the STF. The act increases these annual transfers. The new amounts are as follows: FY 2007 - \$141 million; FY 2008 - \$164 million; FY 2009 - \$180.9 million; FY 2010 - \$180.9 million; FY 2011 - \$200.9 million; FY 2012 - \$200.9 million; FY 2013 - \$200.9 million; and FY 2014 and thereafter - \$219.4 million annually.

Under current law, if in any calendar quarter the receipts from the petroleum products tax are less than the amount required to be transferred to the TSB projects account under the act, the revenue services commissioner must certify the amount of the shortfall to the state Treasurer who must then transfer an amount equal to the shortfall from the General Fund. The act requires that beginning in FY 07 these transfers be made if the receipts from the tax are less than 25 percent of the amounts required by law.

State Grants and Loans for Transit-Oriented Development Projects and Port and Rail Freight Facilities and Services

Public Act 06-136 also authorizes the DECD commissioner, in consultation with the Department's commissioner, to use available funds, including bond funds available pursuant to the Urban Action Program, to make grants or loans to (1) support TOD projects and encourage the location of residential, commercial, and employment centers near public transportation services and (2) encourage the development and use of port and rail freight facilities and services, including trackage and related infrastructure.

TOD is defined in section 1 of the act as the development of residential, commercial, and employment centers within walking distance to public transportation facilities and services to facilitate and encourage use of those services.

The act also authorizes the Connecticut Development Authority (CDA) to make loans for these purposes subject to conditions it imposes.

Adjusting Bonds for Capital Improvements and Transit-Oriented-Development Pilot Program (Public Act 07-7, June Special Session)

Public Act (PA) 07-7, June Special Session authorizes \$275.7 million in STO bonds in FY 2008 and \$ 173.3 million in FY 2009 for the capital improvement program. It increases the STO bond authorization for rail cars, maintenance facilities, rights-of-way, other property acquisition, and related projects by \$140 million, from \$ 485,650,000 to \$ 625,650,000.

The act also created a TOD pilot program that was codified as Connecticut General Statutes Section 13b-79. The following projects have been designated as TOD development pilot projects:

- (1) Station area development in all towns on the New Britain to Hartford Busway corridor;
- (2) Station area development in Windsor and Meriden on the New Haven to Springfield rail line;
- (3) Station area development on the New Haven rail line from West Haven to Stratford; and
- (4) Station area development in New London on the SLE rail line.

In January 2011, the State Bond Commission authorized \$5 million for this pilot program. Planning and facilitation activities shall be limited to areas within one-half mile of any transit station.

New Rail Bond Provisions include the following:

1. Rail station improvements identified in the New Haven Line Train Station Visual Inspection Report (\$6 million total - \$3 million in FY 2007 & \$3 million in FY 2008)
2. Parking garage at the Stamford Transportation Center, including rights-of-way, alternative temporary parking, property acquisition, and related projects (\$35 million in 2008).
3. A competitive matching grant program for commercial freight rail lines operating in Connecticut. Grants are to be used for improving, repairing, and modernizing existing rails, rail beds, and related facilities. The Department is to adopt regulations to implement the grant program (\$ 10 million in GO bonds to DOT in FY 2009).

12.4 FREIGHT CAPITAL INVESTMENT PROGRAM

The Department oversees the following rail freight programs: the Gross Earnings Tax Exemption Program and the Rail Preservation and Improvement Program.

Gross Earnings Tax Exemption Program

In accordance with Section 12-249 of the Connecticut General Statutes (CGS), each corporation operating a railroad in the state of Connecticut shall pay a tax computed upon its gross earnings within the state as disclosed in an annual return to the Department of Revenue Services. Gross earnings have been determined to be all receipts classified as railway operating revenues by the Interstate Commerce Commission. Section 12-255 of the CGS states that the gross earnings tax shall be in lieu of all other taxes in the state, except for taxes assessed on property not used exclusively for railroad purposes.

Section 13b-226 of the CGS declares the improvement of railroads transporting freight or passengers within Connecticut or between Connecticut and other states to be a "public purpose" and that the gross earnings tax may be exempted on a dollar for dollar basis with expenditures made to effect specific improvements in a given calendar year. On or before November 1 each year, a railroad company wishing to participate in the Gross Earnings Tax Exemption Program must submit for approval a list of projects to be undertaken in the upcoming calendar year. The Rail Administrator, properly designated by the Commissioner of Transportation, will then issue an approved list of projects to the participating railroads on or before December 31.

The list of projects may be amended from time to time throughout the year at the request of the railroad. A company need not complete all of the approved projects during the year since a provision has been made for partial exemption. However, expenditures that exceed a company's gross earnings tax liability in any year may not be carried over to subsequent years.

In the administration of the program, a monthly reporting requirement has been established to track progress of each railroad's effort to complete projects from the approved list. Following year's end, an auditor's review is performed to determine each company's actual expenditures to determine the amount to be certified by the Commissioner of Transportation as eligible to be exempted. A formal certification of eligibility by the Commissioner of Transportation must be provided to the Governor and the Chairpersons of the Transportation and Revenue Finance and Bonding Committees by March 1 of the following year.

Generally, each of the freight railroads operating in the state participates in the Gross Earnings Tax Exemption Program. Amtrak and the MNR do not participate, as each enjoys its own legislative tax exemption. Of the freight companies participating, gross earnings tax liabilities (and annual exemptions) range from one thousand to several hundred thousand dollars annually.

Rail Preservation and Improvement Program

The Rail Preservation and Improvement Program was formally established in 1983. In its present form, the program is a remnant of Connecticut's many activities before, during, and after the restructuring of the rail system in the Northeast during the mid-1970s. At that time, the Department purchased abandoned rail rights of way, financially assisted railroads in rehabilitating lines, and rehabilitated and subsidized operations on branch lines that were excluded from the Final Systems Plan. (The Final Systems Plan was a congressionally mandated plan that designated which of the lines that were owned by bankrupt railroads in the Northeast would be operated by Conrail or other railroads.).

By the early 1980s, the federally funded Local Rail Service Assistance Program that was established in 1973 had been substantially revised by Congress. The level of federal funding was reduced and the use of federal funds for operating assistance was prohibited. Because of reduced federal funding, the Department developed its own capital assistance program and then subsequently eliminated it due to budget shortfalls.

Under the provisions of its former capital grant program for freight railroads, the Department provided 70 percent of the cost of eligible projects, while the participating railroad funded the remaining 30 percent. On state-owned rights of way, the Department, at its option, could prescribe an alternative funding ratio, including a higher state share.

In the early years of the program, the Department would regularly solicit projects from all freight railroads in the state. At that time, when dwindling federal funds were still being used in combination with state funds, project eligibility was generally based on a benefit to cost methodology approved by the FRA. However, when federal funds dried up projects were selected based upon obvious merits and the degree to which a project contributed to the preservation or improvement of rail freight service in Connecticut.

Though smaller scale projects had been completed under this program, the following is a listing of major projects that had been completed:

- Rehabilitate Derby/Shelton Bridge; Conrail, \$2.0 million
- Rehabilitate Poquetannuck Cove Bridge; P&W, \$2.0 million
- Install Continuous Welded Rail on Palmer on Subdivision; CV, \$780,000
- Construct run-around track in Plainfield Yard; P&W, \$230,000
- Reconstruct passing siding on Palmer Subdivision; CV, \$160,000
- Rehabilitate track from Waterbury-Berlin; GTI, \$2.5 million
- Rehabilitate Berkshire Rail Line; HRR, \$1.7 million
- Acquire and rehabilitate state-owned Middletown Cluster; CCCL \$1.5 million

Grants for Commercial Freight Rail Lines

State legislation in 2009 amended a 2007¹⁰¹ Act that authorized up to \$10 million in GO bonds to the Department to provide competitive matching grants for commercial freight rail lines operating in Connecticut. Recipients must use the grants to improve, repair, and modernize existing rails, rail beds, and related facilities. The legislation eliminates the matching requirement for these grants and requires the program to include awards for 100 percent of the funding needed for improving, repairing, or modernizing state-owned rights of way and grants for 70 percent of amounts needed to modernize, repair, or improve privately owned rail lines. The bill authorizes the Department to waive the 30 percent grant match for privately owned rail lines if the work is shown to increase rail freight traffic.

The bill also requires the commissioner to give preference to grants for freight rail projects (1) on the Department's list of project eligible for funding under the 2009 federal stimulus act, (2) that improve at-grade crossings to eliminate hazards or increase safety, and (3) that connect to major freight generators.¹⁰²

State legislation in 2010 reduced the amount of the authorization from \$10 million to \$7.5 million in GO bonds. The Act also authorizes up to \$2.5 million in STO bonds to the Department for establishing a Fix-It-First Program to repair, upgrade, or eliminate at-grade railroad crossings in Connecticut. The bonds are subject to regular STO bond requirements and issuance procedures.¹⁰³

¹⁰¹ June Special Session P.A. 07-7, sec. 56

¹⁰² September Special Session, Public Act No. 09-2, Section 68

¹⁰³ Public Act 10-44, section 29 and section 41.

CHAPTER 13 – PERFORMANCE EVALUATION OF COMMUTER RAIL

The Department is committed to making investments that result in efficient and cost-effective management and operation of the state's transportation system. As identified in the State's 2009 LRP, the Department's goal is to institute and maintain a Transportation Infrastructure Management and Performance Measures program to optimize the allocation of resources and ensure cost-effective and properly timed investments in preservation, maintenance and capital expansion of all infrastructure assets.

The State's 2009 LRP identifies the following rail-related actions:

- Develop an asset management program that focuses on commonly recognized asset-management principles including, but not limited to the following: transportation infrastructure inventory, value, condition, and serviceability; performance measures and goals; preservation; economic and tradeoff analyses; and, financial and resource allocation.
- Develop or adopt methodologies for measuring, evaluating, and monitoring condition/deterioration of rail infrastructure assets;
- Coordinate the development of performance expectations (measures) and target values (goals) for key rail transportation assets;
- Employ appropriate tradeoff analysis and prioritization techniques for budgeting between preservation, operations and capital expansion;
- Encourage decisions that are based on generally accepted engineering and economic analysis tools such as life-cycle cost, benefit/cost analysis and data integration from multiple resources;
- Develop reporting mechanisms to disseminate information on condition, costs of maintaining assets and predicted future conditions, as well as, scenario reports (e.g., What if budget increased 10 percent?); and
- Continue office reviews of staffing capabilities to implement evolving transportation-related technologies.¹⁰⁴

Performance measures translate an organizational goal or vision into a group of measurable, meaningful, and accurate performance measurements to track progress towards that goal or vision. They provide improved communication about the transportation system and track the impact of the program investment. The Department began this effort in 2009.

The Department gathers information and utilizes performance measures to make well-informed decisions, and/or as a method of assessing progress toward achieving predetermined goals. In general, performance measures should be used to monitor and improve system performance or quality of service. Specific measures can be developed to track and forecast impacts of transportation investments, monitor condition of infrastructure, allocate resources efficiently, gauge quality of services, and ensure accountability to the public.

Formal performance measurements can be both internal (delivery of service) and external (effectiveness of service provided). It also can be categorized as output-oriented, outcome-oriented, or quality/efficiency/value measures. An output measure example is the capacity of service and level of service provided (such as punctuality/on-time performance.) Outcome measures are results (ridership, occupancy rates, and safety records). Value might be the cost

¹⁰⁴ Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035*, Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-5 – 3-7.

of replacing trains, infrastructure, or providing service compared to quality of service provided, as perceived by the customer.

The official rail performance measures the Department developed thus far include train ridership on the NHL and SLE, on-time performance for the NHL and SLE, and a reliability of equipment measure, which is called mean distance between failures (MDBF).

The Department's website contains the latest updated performance measures for rail ridership, on-time performance, and MDBF.¹⁰⁵

RAIL FLEET RELIABILITY

Measure - Mean Distance between Failures

Purpose/Description of Measure

Mean Distance between Failures (MDBF) is an industry standard for measuring the reliability of a rail car fleet. This measure tracks the reliability of train service on the NHL. MDBF is calculated by dividing the total miles operated by the total number of confirmed primary failures, by car or locomotive fleet. A confirmed primary failure is defined as a failure of any duration for mechanical cause that occurs to a revenue train that is reported late at its final terminal by more than 5 minutes and 59 seconds. Generally speaking, the greater the MDBF, the better the on-time performance of train service.

Target Value:

Locomotive — 35,000
Coach — 280,000 mi
M-2 EMU — 90,000 mi
M-4 EMU — 65,000 mi
M-6 EMU — 65,000 mi
M-8 EMU — 140,000 mi

Current Value (2011 – Quarter 1):

Locomotive — 34,959
Coach — 273,473 mi
M-2 EMU — 35,392 mi
M-4 EMU — 23,841 mi
M-6 EMU — 19,726 mi
M-8 EMU — *76,826 mi

* equals total miles in service to date (no breakdown yet)

Strategic Objectives Met

- Preserve and Maintain the Transportation Infrastructure
- Improve Efficiency and Reliability

Discussion of trend

Figure 52 shows a graphic of MDBF for five types of rail vehicles for 2008 through the first quarter of 2011 along with their respective 2011 yearly target. The first of the new M-8 model EMUs are being put into service to replace and complement the existing EMUs in the existing

¹⁰⁵ See www.ct.gov/dot and Click on performance measures.

fleet. To date there has not been any reported M-8 failures, so the miles reported for this quarter equals the total number of miles in service.

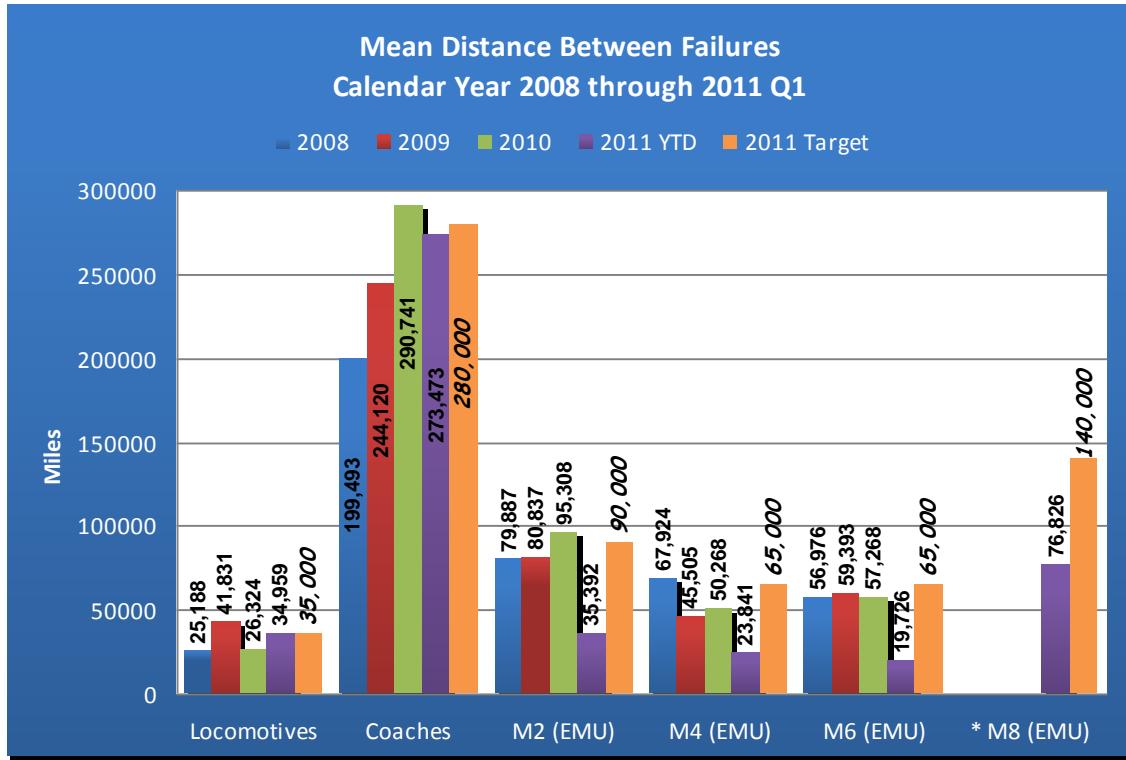


Figure 52. Mean Distance Between Failures for Rail Equipment 2008 through 2011 1st Quarter

Strategies to Achieve Improvements

Beginning in 2001, the Department began an M-2 EMU Critical System Replacement (CSR) program. The program consisted of replacing and upgrading major components to expand the operational life of the equipment by 10 to 12 years. This method appeared to be the most cost effective and prudent approach for maintaining fleet availability at the time and had improved the MDBF for the M-2 fleet. These M-2 cars are now ready to be retired and the Department is taking steps to remove these cars from service.

The M-4 and M-6 rail cars are also beyond their useful life. These cars also need to undergo a CSR if they are to remain in service. The Department and MNR have determined a better approach would be to purchase additional M-8 vehicles and retire the M-4 and M-6 rail cars gradually.

The M-8 rail cars are continuing to arrive and are being rigorously tested before being placed into service. The Department also has several projects planned in the New Haven Rail Yard that will allow for the proper maintenance of the rail cars.

The Department has a project to perform overhauls to the entire fourteen (14) locomotive fleet that operate mainly on SLE and on supplemental NHL branch lines. The six (6) GP40 were manufactured in 1971 and remanufactured in 1996 and have a high failure rate. The P-40 locomotives were built in 1992. These overhauls will provide the Department more efficient

locomotive power for operation on the SLE and New Haven Hartford Springfield (NHHS) services, until such a time when the next generation of rolling stock equipment is available.

These initiatives will dramatically improve MDBF, which will translate into an improvement in overall OTP on the NHL and the peak period 90 percent +/- train consist compliance (measures actual rail car assignments divided by programmed rail car assignments by train to ensure seating availability for customers).

RAIL PASSENGER UTILIZATION

Measure – Number of Rail Passengers

Purpose/Description of Measure

This measure tracks the usage of Connecticut's commuter rail passenger service on the NHL and SLE. The Department is committed to improving rail service through a significant investment in new equipment, new rail cars, new train stations, and improved repair facilities.

Strategic Objectives Met

- Reduce Congestion and Maximize Throughput
- Improve Efficiency and Reliability

Target Value:

Number of Rail Passengers – NHL 8,622,410

Number of Rail Passengers – SLE 137,812

Current Value (2011 – Quarter 1):

Number of Rail Passengers – NHL 8,698,549

Number of Rail Passengers – SLE 135,476

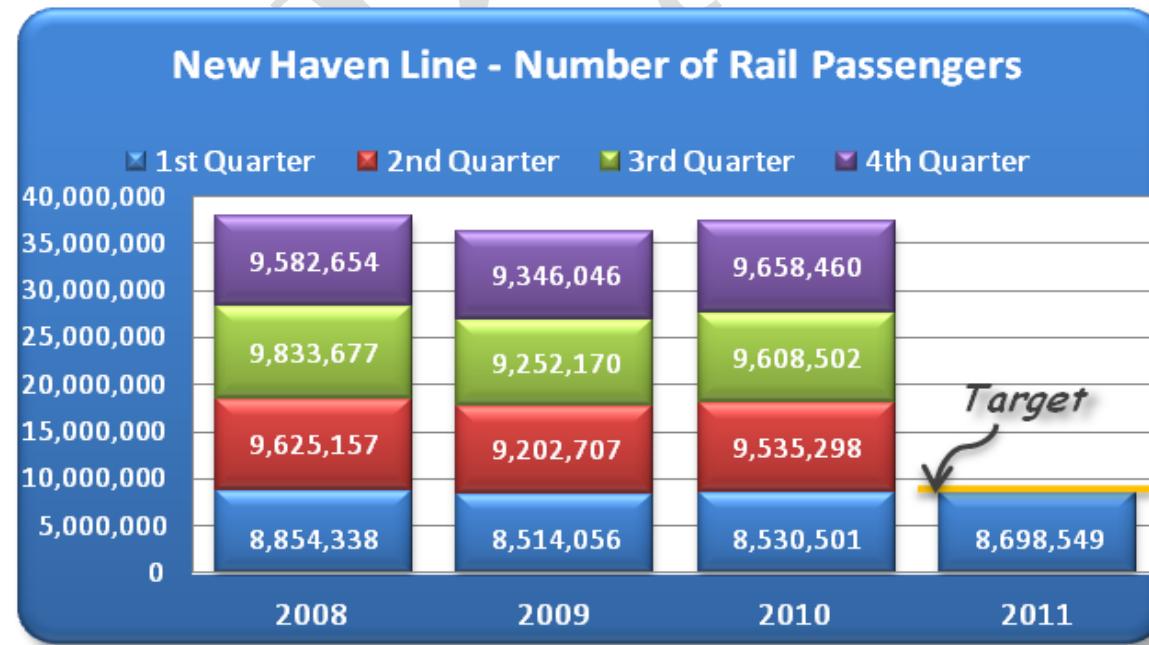


Figure 53. Graph of Quarter Comparison of NHL Ridership 2008 - Q1 2011

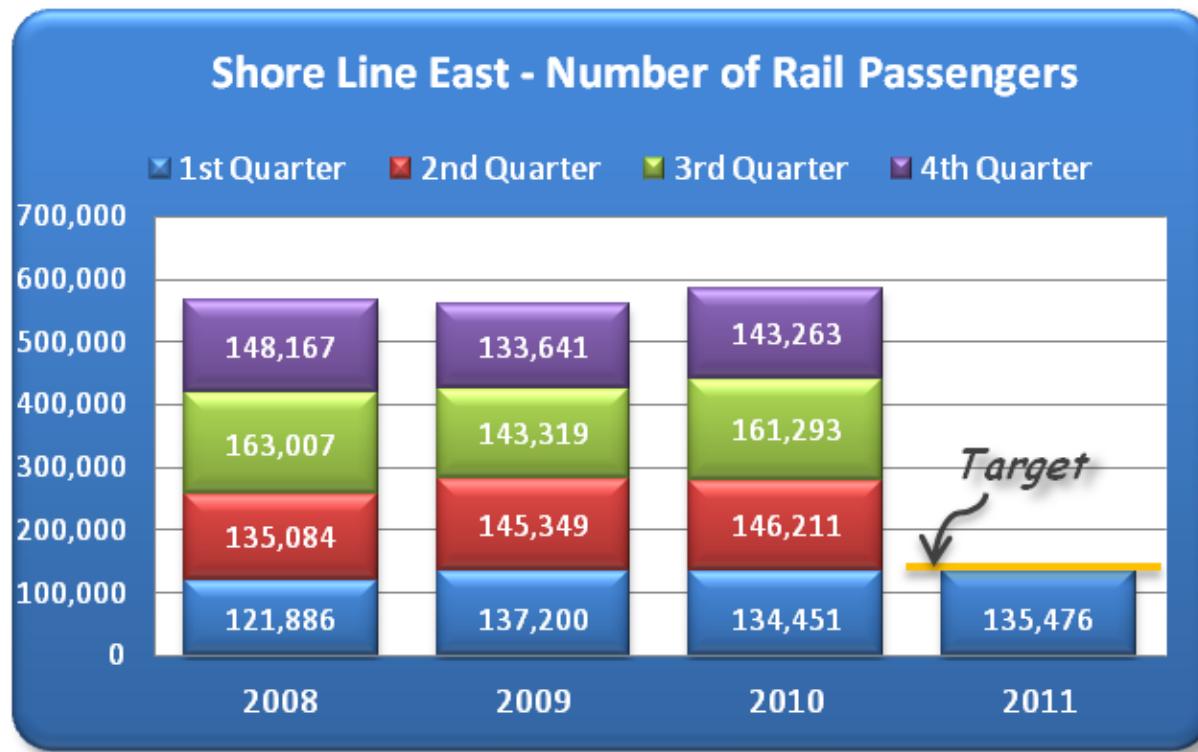


Figure 54. Graph of Quarter Comparisons of SLE Ridership 2008-Q1 2011

Discussion of Trend

Figure 53 and Figure 54 provide calendar year quarter comparisons for ridership from 2008 through the first quarter of 2011 for the NHL and SLE, respectively. This quarter ridership increased by 2.1 percent on the NHL, and by 0.8 percent on the SLE compared to the first quarter of 2010. The NHL surpassed the target by 1 percent this quarter, and the SLE was below the target by 1.7 percent. These numbers offer hope for increases in ridership in future quarters as Connecticut recovers from the economic downturn.

Strategies to Achieve Improvements

Achieving a more sustainable balance of usage across all of the modes of transportation within Connecticut remains a top priority. Adding additional capacity on the NHL and branch lines, extending SLE service to New London, and increasing parking capacity at stations throughout the state are vital elements of the Department's strategy to attract and maintain riders on Connecticut's commuter rail network. Through resource identification, process improvement, technology advances, tracking human resources and financial data, the Department strives to contain costs and find innovative and efficient ways to deliver services.

RAIL ON-TIME PERFORMANCE

Measure – Percent of Rail On-Time Performance

Purpose/Description of Measure

This measure tracks the On-Time Performance (OTP) of Connecticut's commuter rail service on the NHL and SLE. OTP is a key measure for service reliability to its customers and is the standard the industry uses to compare existing services with other similar competitors. A

commuter train is considered “on-time” if it reaches its final destination within 5 minutes and 59 seconds of its scheduled arrival time.

Strategic Objectives Met

- Provide Mobility Choice, Connectivity and Accessibility
- Improve Efficiency and Reliability

Target Value:

Percent of Rail On-Time Performance – NHL	97%
Percent of Rail On-Time Performance – SLE	95%

Current Value (2011 – Quarter 1):

Percent of Rail On-Time Performance – NHL	92.6%
Percent of Rail On-Time Performance – SLE	90.5%

Figure 1. New Haven Line - Percent On-Time



Figure 55. Graph of On-Time Performance 2008-Q1 2011– NHL

Figure 2. Shore Line East - Percent On-Time



Figure 56. Graph of On-Time Performance 2008-Q1 2011– SLE

Discussion of Trend

Figure 55 and Figure 56 illustrate the quarterly OTP of NHL and SLE for calendar years 2008 through the first quarter of 2011. The NHL OTP has surpassed the target of 97 percent on many of the quarters during the previous three-year period. In the first quarter of 2011, the 95 percent target was not met. Severe winter weather is often the cause for quarters that do not meet the target. The overall OTP record for the NHL makes this one of the most reliable heavy-rail commuter services in the U.S.

The SLE OTP has reached the target of 95 percent on four of the past 16 quarters. In the first quarter of 2011, the 95 percent target was not met. Amtrak is the contracted operator for the SLE service. SLE OTP is dependent upon AMTRAK designated speeds during track and bridge maintenance and repairs.

Strategies to Achieve Improvements

The Department has been investing heavily in capital improvements and maintenance programs on the NHL and in the rail fleet. These investments have a direct benefit for OTP. Investments include capital tie replacement programs, upgrade of Continuous Welded Rail, bridge cyclical maintenance programs, installation of new universal interlocking at CP 248, and the purchase and introduction of new M-8 rail cars. These projects reduce failure rates of the rail infrastructure and fleet and increase capacity for improved OTP.

CUSTOMER SATISFACTION**Measure – Percent of Customer Satisfaction****Purpose/Description of Measure**

Customer satisfaction is measured annually for both the SLE and the NHL rail services. The Department is responsible for conducting the customer satisfaction survey on SLE and MNR conducts the survey for Metro-North rail lines that includes the NHL.

The surveys are a very important tool to measure customer satisfaction. The Department carefully analyzes trends and uses this information to improve overall service and to ensure that the railroads meet the needs of its customers. Both surveys are conducted annually and address such topics as safety, cleanliness and condition of trains and stations, on-time performance, professionalism of staff, schedule satisfaction and overall satisfaction.

Strategic Objectives Met

- Strive for Organizational Excellence
- Improve Efficiency and Reliability

Discussion of Trend

For Metro-North Railroad, 2011 surveys provided the first year-to-year comparisons against baselines established in 2010 using the unified rating scale for all agencies.

Overall customer satisfaction slipped in 2011. This decrease in satisfaction is thought to be the result of equipment shortages caused by severe weather and an aging fleet. These shortages resulted in overcrowded trains, delays and a consolidated New Haven Line schedule operated during the month of February 2011.

Satisfaction ratings decreased primarily among peak period customers. Weekend customers continue to give Metro-North very high ratings.

Overall satisfaction (Satisfied + Very Satisfied) by time period on the NHL in 2011 was:

Overall satisfaction: 81% (down from 88% in 2010)

On-time performance satisfaction: 78% (down from 85% in 2010)

Train service overall: 80% (down from 86% in 2010)

Value of the fare using NHL: 65% (down from 69% in 2010)

Customer satisfaction with overall information and communications decreased slightly in 2011 from 91 percent to 88 percent. A comprehensive plan to upgrade the delivery of information during unplanned delays is underway.

SLE riders express a high-level of overall satisfaction with the railroad. Among all survey respondents, 78.9 percent rate their overall satisfaction as a one or a two, the highest ratings on a scale of 1 to 7. Just 2.9 percent of respondents reported overall dissatisfaction with SLE. The average rating on the 1 to 7 scale for overall satisfaction was a 2.05. This is slightly poorer rating from the previous SLE passenger survey in 2010, for which the comparable score for overall satisfaction was 1.94. Figure 57 contains a chart on the overall satisfaction with SLE taken from the 2011 survey.

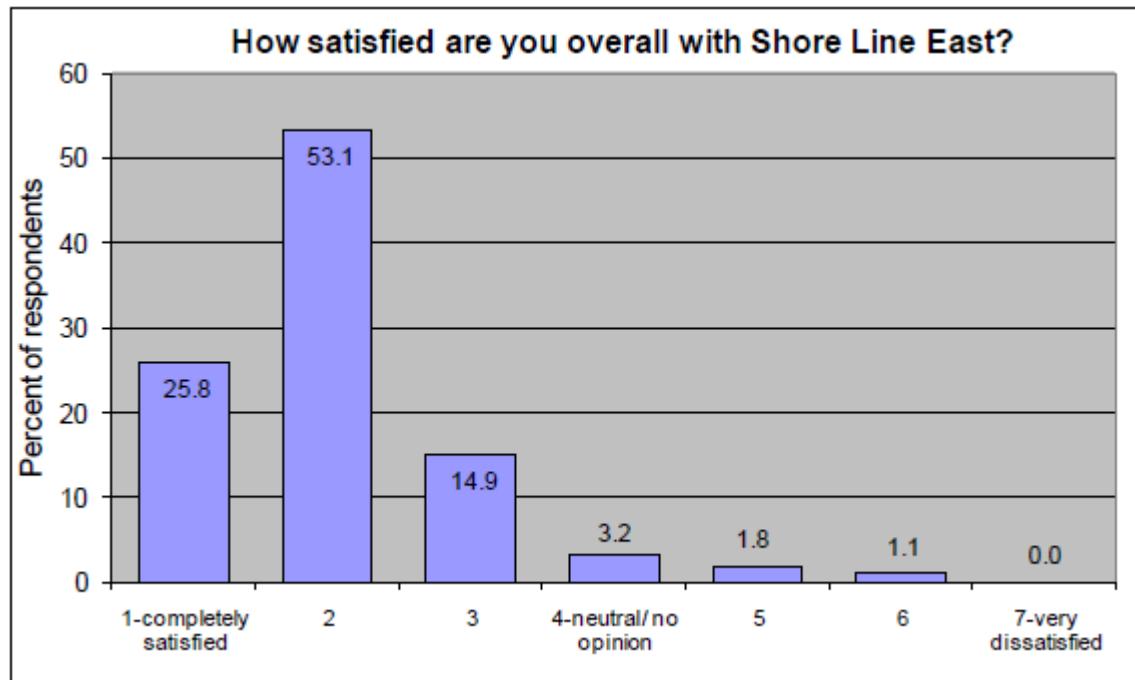


Figure 57. Overall Satisfaction with Shore Line East – 2011 Survey

The SLE survey also includes a section where passengers can rank their preferences for future improvements to the service. The most popular suggestion was “keep fares low,” chosen among the top three priorities by 56.5 percent of respondents. The comparable rate in 2010 was 76.5 percent of respondents. The full list of preferences from the 2011 survey appears in the chart below.

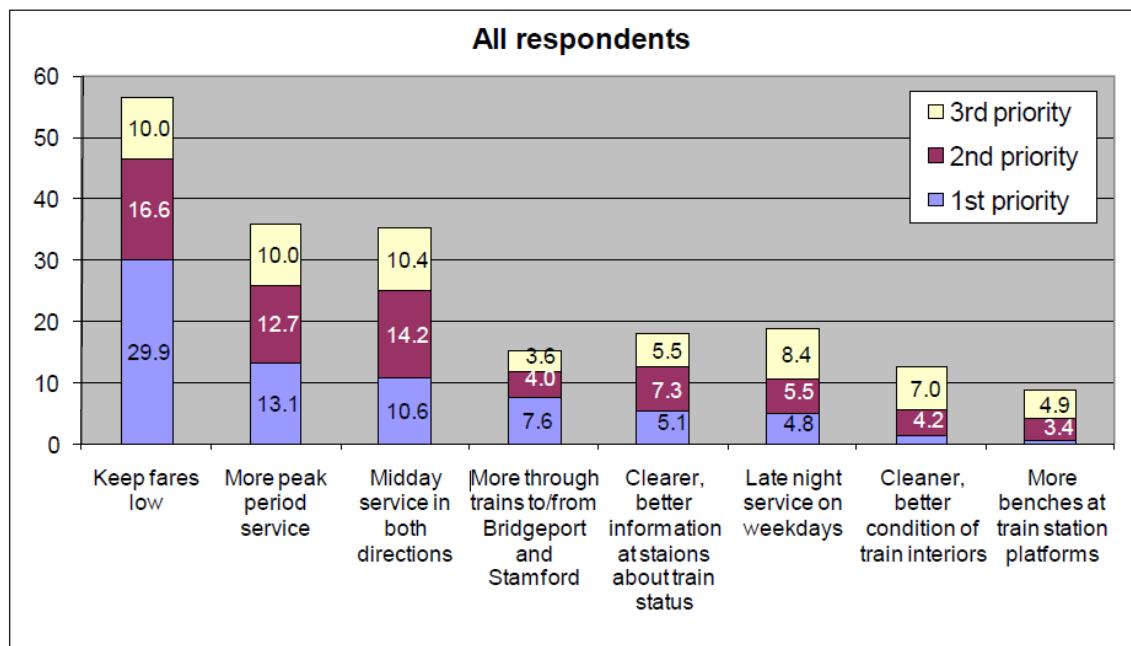


Figure 58. Preferences for Future Improvements of Shore Line East – 2011 Survey

The Department also includes a dedicated section within the SLE survey for respondents to write in detail what the service does well, where it can improve, and allows for any additional comments about the service. Each written response within these fields is recorded verbatim and becomes part of the survey results the Department analyzes. These comments are an invaluable tool to determine what improvements are necessary.

The demand for service indicated on the survey results drove recent improvements the Department initiated to the SLE service. For example, the Department in the past started weekend and holiday service, limited mid-day train service, and later trains added to the schedule. The Department is planning future upgrades based on feedback from the surveys. For example, currently there is very limited weekday service out of New London and the Department is planning expansion of the service. Better communication to the passengers at the stations is also in the process of being considerably improved.

CHAPTER 14 – PLAN OUTREACH AND DEVELOPMENT PROCESS



Process Used to Prepare the Plan

The Department developed the State Rail Plan (SRP) with significant input from and in coordination with a variety of stakeholders. While preparing the SRP, the Department followed the requirements contained in the PRIIA legislation. First, the Department conducted a series of outreach meetings with the Regional Planning Organizations, Rail Freight Association, Connecticut Public Transportation Commission, and members of the public. The outreach and collaboration process provided adequate and reasonable notice for comment and other input from the various entities in the preparation and review of the SRP.

The Department provided a background of the PRIIA legislation at these meetings and explained that all stakeholders will be provided with the opportunity to participate. Similarly, all stakeholders were encouraged to use this opportunity to participate in the process of developing the SRP prior to the draft SRP being developed. The Department explained that the SRP would be consistent with the Master Transportation Plan, the Long Range Transportation Plan.

The Department met separately with the Rail Freight companies throughout the development process to solicit information and input specifically from the group since freight components are included in several chapters of the SRP. The Department made a presentation to the Regional Planning Organizations and encouraged the group to provide input and comments.

The draft SRP was posted on the Department's website for review and press releases were issued. The first elected officials, state legislators, and other stakeholders were notified of its availability. There was a forty-five day comment period and then an additional outreach session was held on November 8, 2010.

The information received at the outreach meetings was taken into account during the development process. While the Department developed each chapter, significant input was received from the subject matter experts both inside and outside of the agency. Intergovernmental coordination included review of the freight and passenger rail service activities and initiatives by regional planning agencies, regional transportation authorities, and

municipalities within the state, and the SRP includes recommendations made by such entities as deemed appropriate by the state.

People and Entities Consulted

As mentioned above, the Department met with the Regional Planning Organizations and provided an electronic copy of the draft to the first elected officials in the municipalities, State Representatives and Senators, and other stakeholders for input.

The Department coordinated with other state agencies including the DECD, CDEEP, Department of Emergency Services and Public Protection, and the Office of Policy and Management, including the Transportation Strategy Board. The Department consulted with the cities of Bridgeport, New Haven, and New London. Amtrak, Amtrak Police, MNR, and MTA Police provided information and input to the Department. The Department had several meetings with the freight railroad companies in the state. All of the companies participated in the development of the SRP, except CSX and Branford Steam Railroad. The Department consulted the I-95 Corridor Coalition and reviewed several documents produced by Amtrak, Coalition of Northeastern Governors and others that are contained in the footnotes throughout the document.

Comments Received From Stakeholders, Agencies, and the Public

There was uniform opinion expressed by parties during the course of this planning process that the Department should take a more active role in advancing the development and implementation of strategies that offer rail as a transportation alternative. Stakeholders expressed considerable concern over the practicality of growing the rail system that centered on land use, development control, and availability to accommodate the passenger and freight capacity needs.

Legislators, public officials, and citizens expressed frustration in their perception of the lack of speed in development of important rail transportation projects. In spite of investing over \$2 billion in the Southwestern commuter rail system over the past three decades, the pace of development has been perceived as slow because it has typically taken place in response to demand instead of in anticipation of demand. The Long-Range Investment Program contained in the SRP can place the Department in a position to advance infrastructure improvement projects before the demand surfaces and provide a stimulus for goods movement by rail in Connecticut.

Of key importance in advancing policy, goals, and the strategies to attain them is funding. Although the state of Connecticut does not have the population density to compete with other developing systems nationwide, the development of a regionally interconnected system connecting the Boston and New York City metropolitan centers has strong potential to qualify for funding. The ability of Connecticut to provide funding beyond federal match can be a crucial element to developing regional partnerships and future federal funding eligibility.

The Department met on numerous occasions with state freight and passenger railroads, and their comments herein represent the belief that continued access to regional and national markets will require capital assistance to ensure the viability and growth of existing state rail corridors. The ability to provide industry options along rail corridors may also be dependent upon zoning. Land use issues and economic development may require further evaluation to hold open corridors for future mobility.

Each freight railroad company that participated expressed its own concerns that are contained in Chapter 6 and some had competing business interests. Collectively the group expressed insufficient financial support from the state. They stressed the importance of obtaining 286,000 pound capacity or better because and without 286,000 pound access, modern freight cars cannot operate competitively in Connecticut. This could be accomplished by improving the physical condition of the existing rail line with new track and ties, eliminating restrictions and clearance issues to bridges/tunnels to allow for a 22'8" clearance and double stack clearance, where appropriate. Other priorities include maintaining railway-highway grade crossings through signal upgrades, and preventing intrusion of All Terrain Vehicles (ATVs) from operating on the roadbed.

The SRP is intended to reflect coordinated elements in the Regional Planning Agencies' plans, where appropriate to the central strategy concerning rail system growth enumerated in Chapter 1, and further discussed in the Infrastructure Issues sections of this document in Chapters 4-6 and the Appendix. Rather, of paramount importance to the state is to develop linkages to Massachusetts and Rhode Island that can establish national access in goods movement and regional interconnectedness. Acknowledgement and support of regional balance to access new markets can have a significant effect in transforming the Southwest corridor in Connecticut from the isolated stand-alone western rail segment, into a true interconnected corridor.

All regions in Connecticut stand to grow by implementing such a strategy, which begins with interconnections with the southeastern New London-Westerly corridor and the central north-south Springfield Line corridor. Development of portal feeders in the form of greater transit-rail connections, cohesive accessible stations, and a strong user-information portal will be important elements in producing the growth and interconnections that can increase economic activity in an environmentally friendly manner.

Summary of Comments Received

The written comments received in 2010 were consistent with the issues expressed at the public listening sessions. A majority of both the written and oral comments expressed the need for improving and expanding rail services and facilities and the need to address better the needs of pedestrians and bicyclists as a means of promoting a more comprehensive and environmentally sustainable transportation network.

More specifically, the Department received the following comments:

- Insufficient parking and the need to construct multi-level parking garages
- Adding more intrastate trains on the NHL (New Haven to Stamford and Greenwich)
- Support for constructing a new passenger station in Orange, Milford (Devon), Groton, Old Lyme, East Lyme, Waterford, and other locations
- Significant opposition to Valley's Railroad proposed improvements and repairs that include reopening/rehabilitating a dormant section (9 miles) of the 22-mile section of leased and operating track from Old Saybrook to Maromas (in Southern Middletown) to accommodate modern freight rail and expanded tourist/passenger service. Based on the opposition by the community during the public comment period, VRR requested the Department to remove this project from the SPR. Although the Department removed this project from the SRP, the Department strongly supports maintaining this section of the Valley Line as a rail corridor and not converting the line into a trail.
- Support for TOD efforts
- Support for the electrification off all commuter rail lines

- On SLE, adding service especially during the day to bring headways down and make the service more attractive to commuters.
- Support for studying the use of various existing rail lines to initiate commuter services, such a Waterbury-Bristol-Hartford service studied by the Department and proposed as an alternative/complement to the Busway, NECR's Palmer Line, and using the Armory Branch instead of NHHS
- Support for a rail connection from Windsor Locks station to Bradley International Airport for a more seamless means of travel
- Need for comprehensive state plan for intermodal freight (rail, major truck carriers, maritime freight, planned routing and location of new freight customers, and highway capacity)
- There is significant potential at the State Pier to enhance cargo capabilities. The railroads need the ability to move full double stack container to and from the Port that will open marketing of new shipping potential in the future.
- Revise peak hour's restriction on bringing bikes aboard trains.
- Support for implementing the projects contained in the *Danbury Branch Electrification Feasibility Study* and the *Waterbury, New Canaan Branch Needs and Feasibility Study*, and the *Regional Intermodal Transportation Center Master Plan and Efficiency Study*.
- Support for Light Rail.
- The Department should take into consideration how future bridge projects will impact freight service with an aim at reducing clearance restrictions.

State Rail Plan Compliance Statement

In accordance with the statement made by the Connecticut Department of Transportation as part of the LRP, the state complies with the eligibility requirements of Sec. 22102 to receive federal assistance. Specifically, the elements of this section include adequacy of planning process, administration, authority and control, accounting and performance evaluation.

The Plan and the Connecticut Department of Transportation maintain compliance with Title 23, Chapter 1, Section 130 concerning railway-highway grade crossings, and project designation, reporting, and funding.

In accordance with the statement made by the Connecticut Department of Transportation as part of the LRP, the state is in compliance with Title 23, Chapter 1, Sec. 135 of the U.S. Code concerning Statewide Transportation Planning, the planning process, collaboration process, and development of the Statewide Transportation Improvement Program (STIP).

APPENDIX

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APPENDIX A - LONG-RANGE SERVICE AND INVESTMENT PROGRAM FUNDING TABLES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
Transit Capital Plan
Federal Fiscal Year 2011

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST
0300-0133	NHL	VARIOUS	Concrete Tie (ROCLA)-Phase 2	13,550,000
0302-0007	NHL	VARIOUS	Danbury Centralized Traffic Control (CTC) System	67,000,000
0300-0159	NHL	VARIOUS	Locomotive fleet Overhauls	20,000,000
0300-0116	NHL	VARIOUS	M8 Rail Car Purchase Option (38 Cars)	81,641,056
0300-0116	NHL	VARIOUS	M8 Rail Car Purchase Option (42 Cars/soft costs/ COs)	140,000,000
0301-0054	NHL	VARIOUS	Main Line Catenary - Section B	107,000,000
0301-0070	NHL	VARIOUS	Main Line Catenary - Section C1b & Bridges	140,000,000
0301-0049	NHL	VARIOUS	Positive Train Control - Design	12,000,000
0310-0048	SLE	VARIOUS	SLE Station Improvements	60,019,000
0301-0092	NHL	GREENWICH	Sound Beach & Tomac Bridges	34,000,000
0301-0149	NHL	STAMFORD	Stamford Pedestrian Bridge	4,000,000
0301-0072	NHL	VARIOUS	Substation Replacement	54,000,000
0304-0008	NHL	VARIOUS	Waterbury Branch Line Bridges	25,908,245
0301-0038	NHL	NEW HAVEN	New Haven Yard - Supply Station 1086	41,000,000
0301-0039	NHL	NEW HAVEN	New Haven Yard - Independent Wheel Truing	48,000,000
0301-0124	NHL	NEW HAVEN	New Haven Yard - Rehabilitate 152 Water Street for MOW	5,000,000
0301-0140	NHL	NEW HAVEN	New Haven Yard - Rewire Snow Melters	2,000,000
TOTAL				855,118,301

Note: Funding may be adjusted as needed.

*Total Project Cost reflects partial funding only. Remaining unfunded portion listed on the Unfunded Initiatives table and/or the Major Long Term Unfunded Initiatives table. Note:

CONNECTICUT DEPARTMENT OF TRANSPORTATION
Federal Fiscal Year (FFY) 2012-2016
Transit Capital Plan Overview

TRANSIT	FFY 2012	FFY 2013	FFY 2014	FFY 2015	FFY 2016
Federal Funding	\$ 465,070,019	\$ 252,925,922	\$ 196,695,923	\$ 211,104,904	\$ 133,620,000
State Funding	\$ 276,290,000	\$ 75,900,000	\$ 56,540,000	\$ 60,140,000	\$ 40,800,000
Carryover Funding					
Newly Authorized Additional State Funding	\$ 116,722,000	\$ 127,000,000			
Total Funding	\$ 858,082,019	\$ 455,825,922	\$ 253,235,923	\$ 271,244,904	\$ 174,420,000
Programmed for Committed Projects	\$ 546,358,981	\$ 87,868,981	\$ 31,668,981	\$ 74,618,981	\$ 39,668,981
Programmed for Current Year Projects	\$ 110,000,000	\$ 227,655,922	\$ 203,555,923	\$ 196,625,923	\$ 134,751,019
Programmed for Newly Authorized Additional State Funding	\$ 116,722,000	\$ 127,000,000			
Year-end Carryover	\$ 85,001,038	\$ 13,301,019	\$ 18,011,019	\$ -	\$ -
<hr/>					
Note: For the Transit Federal funding amounts, it is assumed funding will be level with the FY 2011 amounts. For State funding it is assumed future year funding will be level with the actual SFY 2012 amounts.					
<hr/>					
Note: Any funding not fully utilized in a year is carried forward into the next fiscal year for programming. This carry forward of funds is why funding appears greater in some years than others, although level federal and state funding is assumed.					
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Note: If federal funds were to receive a 35% reduction in FFY 2012 the Federal Funding for Transit would decrease by an estimated by an estimated \$50 million per year.					
<hr/>					
Note: A designation of "committed" is meant to identify those projects for which the Department proposes that funding is non-discretionary in nature. Examples of such projects are projects specifically identified in federal legislation (earmarks), State legislated projects for which funds have been allocated by the State Bond Commission, projects for which previous phases of work have already begun, projects awarded under Federal Transit Administration grants, or State or federally mandated programs.					

**CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan
Fiscal Year 2012 - Constrained**

PROJECT	ROUTE TOWN	DESCRIPTION	TOTAL PROJECT COST		FFY12 TOTAL FED & STATE		TOTAL FEDERAL		TOTAL STATE	FUNDING SOURCE
0171-2296	NHHS Various	NHHS	900,000,000	*	121,000,000		121,000,000		0	HSIPR
0300-0033	NHL Various	Bridge Design	1,180,000		1,180,000		0		1,180,000	STATE
0300-0077	NHL Various	PE Devon & Cos Cob	18,000,000		18,000,000		14,400,000		3,600,000	5309
0300-0138	NHL New Haven	NHY West End Yard	62,000,000		62,000,000		0		62,000,000	STATE
0301-0088	NHL New Haven	NHY Design	71,000,000		10,000,000		0		10,000,000	STATE
0301-0111	NHL New Haven	NHY Stores Building Demo	4,900,000		4,900,000		0		4,900,000	STATE
0301-0125	NHL New Haven	NHY Running Repair Upgrades	31,100,000		31,100,000		0		31,100,000	STATE
0301-0144	NHL New Haven	NHY Substation (Hallock)	1,000,000		10,000,000		0		10,000,000	STATE
0301-0145	NHL Various	ML Catenary - Section C1a and Section C2	129,270,000		129,270,000		114,560,000		14,710,000	5307/ 5309
TBD	NHL Various	NHL - PTC (Including Waterbury Branch)	120,000,000		60,000,000		48,000,000		12,000,000	5307/ 5309
0300-0155	NHL Various	NHL Bridge Timber/ S-program	6,000,000		6,000,000		4,800,000		1,200,000	5307
VARIES BY YEAR	NHL Various	Bridge Culvert Replacement Program	3,010,000		3,010,000		0		3,010,000	STATE
VARIES BY YEAR	NHL Various	NHL Track Program	27,500,000		27,500,000		22,000,000		5,500,000	5307/ 5309
TBD	NHL Various	NHL Branch line Improvements	32,300,000		32,300,000		0		32,300,000	STATE
TBD	NHL Stamford	Stamford Parking Garage	35,000,000	*	35,000,000		0		35,000,000	STATE
		TOTAL:			551,260,000		324,760,000		226,500,000	

* Total Project Cost reflects partial funding only. Remaining unfunded portion listed on the Unfunded Initiatives table and/or the Major Long Term Unfunded Initiatives table

Note: Funding for all projects is committed except for the Stamford Parking Garage Project

**CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan - Constrained
Fiscal Year 2013**

PROJECT	ROUTE TOWN	DESCRIPTION	TOTAL PROJECT COST		FFY12 TOTAL FED & STATE		TOTAL FEDERAL		TOTAL STATE	FUNDING SOURCE
TBD	NA Various	Transit Capital Planning	400,000	*	400,000		320,000		80,000	5307
TBD	NHL Varies	NHL - PTC (Including Waterbury Branch)	120,000,000	*	60,000,000		48,000,000		12,000,000	5307/ 5309
0301-0040 0301-0033	NHL Norwalk Westport	NHL Bridges - Walk, Saga, East Ave, Osborne Ave	400,000,000		88,000,000		64,920,000		23,080,000	5307/ 5309
TBD	NHL Various	NHL Bridge Timber/ S-program	6,000,000		6,000,000		4,800,000		1,200,000	5309
TBD	NHL Various	Bridge Design	2,000,000		2,000,000		0		2,000,000	STATE
		TOTAL			156,400,000		118,040,000		38,360,000	

* Committed Projects

**FFY 2012-2016 Transit Capital Plan - Constrained
Fiscal Year 2014**

PROJECT	ROUTE TOWN	DESCRIPTION	TOTAL PROJECT COST		FFY12 TOTAL FED & STATE		TOTAL FEDERAL		TOTAL STATE	FUNDING SOURCE
0301-0040 0301-0033	NA Various	NHL Bridges - Walk, Saga, East Ave, Osborne Ave	400,000,000		61,400,000		43,640,000		17,760,000	5307/ 5309
TBD	NHL Various	NHL Bridge Timber/ S-program	6,000,000		6,000,000		4,800,000		1,200,000	5307
TBD	NHL Various	Bridge Design	2,000,000		2,000,000		0		2,000,000	STATE
TBD	NHL Various	New Haven Line Track Program	12,500,000		12,500,000		10,000,000		2,500,000	5309
		TOTAL			81,900,000		58,440,000		23,460,000	5307/ 5309

**CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan - Constrained
Fiscal Year 2015**

PROJECT	ROUTE TOWN	DESCRIPTION	TOTAL PROJECT COST	FFY12 TOTAL FED & STATE	TOTAL FEDERAL	TOTAL STATE	FUNDING SOURCE
TBD	NA Various	Transit Capital Planning	400,000	* 400,000	320,000	80,000	5307
0301-0040 0301-0033	NHL Various	NHL Bridges - Walk, Saga, East Ave, Osborne Ave	400,000	90,370,000	72,300,000	18,070,000	5307/ 5309
TBD	NHL Various	NHL Bridge Timber/ S-program	8,500,000	8,500,000	6,800,000	1,700,000	5307
TBD	NHL Various	Bridge Design	2,000,000	2,000,000	0	2,000,000	STATE
TBD	NHL Various	Bridge Culvert Replacement Program	6,850,000	6,850,000	0	6,850,000	STATE
TBD	NHL Various	New Haven Line Track Program	6,250,000	6,250,000	5,000,000	1,250,000	5309
		TOTAL		114,370,000	84,420,000	29,950,000	

* Committed Project

**FFY 2012-2016 Transit Capital Plan - Constrained
Fiscal Year 2016**

PROJECT	ROUTE TOWN	DESCRIPTION	TOTAL PROJECT COST	FFY12 TOTAL FED & STATE	TOTAL FEDERAL	TOTAL STATE	FUNDING SOURCE
TBD	NA Various	Transit Capital Planning	450,000	450,000	360,000	90,000	5307
TBD	NHL Varies	Rail Rolling Stock - Rehab Program	20,000,000	20,000,000	16,000,000	4,000,000	5307
TBD	NHL Varies	NHL Bridges - Walk, Saga, East Ave, Osborne Ave	400,000,000	66,413,774	53,131,019	13,282,755	5307/ 5309
TBD	NHL Stratford	Main Street Bridge - Stratford	20,000,000	20,000,000	16,000,000	4,000,000	5307/ 5309
TBD	NHL Various	NHL Bridge Timber/ S-program	8,500,000	8,500,000	6,800,000	1,700,000	5307
TBD	NHL Various	Bridge Design	3,500,000	3,500,000	0	3,500,000	STATE
TBD	NHL Various	Bridge Culvert Replacement Program	7,237,245	7,237,245	0	7,237,245	STATE
		TOTAL		126,101,019	92,291,019	33,810,000	

**CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan
Newly Authorized Additional State Funding
Fiscal Year 2012**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST
DOT03010150CN	NHL	NRWLK/ WSTPRT	Walk & Saga Interim Repairs	1,722,000
DOT03010078PE	NHL	NEW HAVEN	NH Union Station Code Compliance (PE)	1,777,907
DOT03100021CN	SLE	CLINTON	SLE - Clinton Railroad Station	9,000,000
TBD	SLE	CLINTON	SLE - Clinton Interlocking (CT Share)	7,500,000
TBD	NHL	VARIOUS	NHL Station Improvement Program	1,222,093
DOT03010136CN	NHL	FAIRFIELD	Fairfield Metro Station (Additional)	3,000,000
DOT03010096CN	NHL	FAIRFIELD	Fairfield Metro Station (Additional)	1,000,000
DOT03000116RS	NHL	VARIOUS	M8 Rail Cars - 25 Singles	60,500,000
DOT03000116RS	NHL	VARIOUS	M8 Rail Cars - Communication Upgrade/Contingency	1,500,000
			TOTAL	87,222,000

**FFY 2012-2016 Transit Capital Plan
Newly Authorized Additional State Funding
Fiscal Year 2013**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST
TBD	NHL	VARIOUS	Bridge Culvert Replacement Program	3,661,000
DOT03010150CN	NHL	NRWLK/ WSTPRT	Walk & Saga Interim Repairs	3,428,000
TBD	NHL	VARIOUS	Interlocking and Drainage (ANNUAL)	5,000,000
TBD	SLE	MADISON	Madison Railroad Station	16,911,000
TBD	NHL	STAMFORD	Stamford Parking Garage	30,000,000
TBD	NHL	NEW HAVEN	New Haven Parking Garage	40,000,000
TBD	NHL	VARIOUS	NHL Station Improvement Program	10,000,000
TBD	NHL	VARIOUS	Branch line Improvements -PE Waterbury Signals and Sidings	18,000,000
			TOTAL	127,000,000

CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan
Unfunded Initiatives

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST	YEAR
TBD	NHL	VARIOUS	Interlocking and Drainage (ANNUAL)	20,000,000	2012
TBD	NHL	VARIOUS	PE - Code Review of Rail Buildings (BI - ANNUAL)	5,000,000	2012
TBD	NHL	VARIOUS	C & S Replacement - Phase 1	60,000,000	2012
TBD	NHL	VARIOUS	Substation Component Change Out	30,000,000	2012
TBD	NHL	VARIOUS	Bridge Culvert Replacement Program	10,000,000	2012
TBD	NHL	VARIOUS	High Level Platform Rehab (ANNUAL)	10,000,000	2012
TBD	NHL	VARIOUS	Rail Radio System Upgrade	25,000,000	2012
TBD	NHL	VARIOUS	Security Improvements	10,000,000	2012
TBD	NHL	VARIOUS	NHL Parking Program	10,000,000	2012
TBD	VARIOUS	VARIOUS	Transit Planning	5,000,000	2012
TBD	SLE	GUILFORD	Guilford RR Station Parking Expansion	3,000,000	2012
TBD	NHL	WILTON	Wilton Tiered Parking	10,000,000	2012
TBD	NHL	VARIOUS	High Level Platform Rehab (ANNUAL)	10,000,000	2012
TBD	NHL	VARIOUS	C & S Replacement - Phase 2	85,000,000	2013
TBD	NHL	VARIOUS	NHL Customer Service Initiatives	20,600,000	2012
TBD	NHL	VARIOUS	High Level Platform Rehab (ANNUAL)	10,000,000	2013
TBD	NHL	VARIOUS	CON - Code Review of Rail Buildings (BI - ANNUAL)	10,000,000	2013
TBD	NHL	VARIOUS	NHL Parking Program	10,000,000	2013
TBD	VARIOUS	VARIOUS	Transit Planning	5,000,000	2013
TBD	SLE	VARIOUS	SLE Fleet Replacement Spec Development	500,000	2014
TBD	NHL	VARIOUS	Interlocking and Drainage (ANNUAL)	20,000,000	2014
TBD	NHL	VARIOUS	High Level Platform Rehab (ANNUAL)	10,000,000	2014
TBD	NHL	VARIOUS	C & S Replacement - Phase 3	65,000,000	2014
TBD	NHL	VARIOUS	Bridge Culvert Replacement Program	10,000,000	2014
TBD	NHL	VARIOUS	PE - Code Review of Rail Buildings (BI - ANNUAL)	5,000,000	2014
TBD	NHL	VARIOUS	NHL Parking Program	10,000,000	2014
TBD	VARIOUS	VARIOUS	Transit Planning	5,000,000	2014
TBD	NHL	VARIOUS	NHL Station Improvement Program	10,000,000	2014
TBD	NHL	VARIOUS	Smart Card Implementation Program	25,000,000	2014
TBD	NHL	VARIOUS	Smart Card Implementation Program	25,000,000	2015
TBD	NHL	VARIOUS	NHL Station Improvement Program	10,000,000	2015
			TOTAL	544,100,000	

**CONNECTICUT DEPARTMENT OF TRANSPORTATION
FFY 2012-2016 Transit Capital Plan
Major Long-Term Unfunded Initiatives**

PROJECT	ROUTE	TOWN	DESCRIPTION	TOTAL PROJECT COST
TBD	NHL	VARIOUS	C & S Replacement - Phase 4	85,000,000
TBD	NHL	NEW HAVEN	New Haven Yard Master Complex - Tier 1	160,000,000
TBD	NHL	NEW HAVEN	New Haven Yard Master Complex - Tier 2 & 3	170,000,000
TBD	NHL	VARIOUS	Devon and Cos Cob Movable Bridges	873,000,000
TBD	NHL	VARIOUS	Concrete Tie Program	250,000,000
TBD	NHHS	VARIOUS	New Haven - Hartford - Springfield Rail Service (Including Rolling Stock) *	735,000,000
TBD	NHL	VARIOUS	Danbury Branch Line Investments	TBD
TBD	NHL	VARIOUS	New Canaan Branch Line Investments	TBD
TBD	NHL	VARIOUS	Waterbury Branch Line Investments	TBD
TBD	NHL	ORANGE	Orange Railroad Station	TBD
TBD	NHL	VARIOUS	New Haven Line Customer Communications Program	TBD
TBD	VARIOUS	VARIOUS	Rail Freight Program	TBD
TBD	SLE	VARIOUS	Amtrak Joint Benefit Program (SLE)	TBD
TBD	NHHS	VARIOUS	Amtrak Joint Benefit Program (NHHS)	TBD
TBD	NHL	VARIOUS	Catenary Replacement - NHL Main Line - Maintaining a State-of-Good-Repair	TBD
TBD	NHL	VARIOUS	Communications and Signals - Maintaining a State-of-Good-Repair	TBD
TBD	NA		M-8 Mid-life Overhaul	TBD
TBD	NHL	VARIOUS	Maintenance Facilities - Maintaining a State-of-Good-Repair	TBD
TBD	NHL	Bridgeport	Peck Bridge - Maintaining a State-of-Good-Repair	TBD
TBD	NHL	VARIOUS	Power - Maintaining a State-of-Good-Repair	TBD
TBD	NHL	Stamford	Stamford Maintenance of Equipment and Maintenance of Way Facility - State of Good Repair	TBD
			TOTAL	2,273,000,000

* Represents unfunded portion of project - project partially funded in FFY 2011 and FFY 2012

APPENDIX A

LONG-RANGE SERVICE AND INVESTMENT PROGRAM FUNDING TABLES

AMTRAK

Amtrak's *Northeast Corridor Infrastructure Master Plan* (Master Plan) identifies "an initial baseline of infrastructure improvements needed to maintain the current NEC system in a state of good repair; integrate intercity, commuter and freight service plans; and move the NEC forward to meet the expanded service, reliability, frequency, and trip time improvements that are envisioned by the northeast states and the District."¹⁰⁶

The projects contained on the next four pages of this Appendix were taken directly from the Master Plan for the Amtrak-owned Springfield Line and the Amtrak-owned Connecticut portion of the Westerly, Rhode Island to New Haven segments of the NEC. The projects for the Connecticut portion of the NEC from New Haven to New Rochelle, New York are contained in Appendix A and B under the commuter rail section since Connecticut owns this line.

Some of the Amtrak identified projects are included in the Department's Long Range Investment Plan and are priorities of the Department, while other projects have a more direct benefit to Amtrak service and are supported by the Department. The projects will have mutual benefit to commuter, freight, and intercity passenger rail.

In the past, the Department has shared costs associated with capital improvements on Amtrak property that benefit SLE commuter service. The New Haven–Hartford–Springfield commuter service will require significant capital investments prior to the service being initiated.

¹⁰⁶ *Northeast Corridor Infrastructure Master Plan*, May 2010, Page 1.

Northeast Corridor Infrastructure Master Plan
Part III: Capital Program Summary by Segment

ID	Project Title	Milepost		Project Benefits	Category
		From	To		

Segment:
Westerly, RI - New Haven, CT

Program:	OoM Cost (\$ millions)
EASTERN CONNECTICUT SERVICE EXPANSION IMPROVEMENTS	736

Amtrak and SLE 2030 service plans represent significant increases in service over current levels. SLE plans will significantly expand service to New Haven, Old Saybrook and New London. New London will require a new storage and layover facilities to accommodate additional trains and reduce deadhead movements. Track, interlocking and electrification upgrades previously identified in the North End High Speed Rail Configuration Plan are needed to meet 2030 commuter and intercity service goals. Two movable bridges, the Niantic River and Connecticut River, are beyond SGR and decreasing in reliability, causing delays. Partial construction funding for the Niantic Bridge replacement is contained in Amtrak's capital program and not included here. Replacement of the Connecticut River bridge span is in design; feasibility analysis is underway to look at a potential high-level configuration to improve reliability and speeds and minimize bridge openings. Dual side high-platforms with pedestrian overpasses at SLE stations, portions of which are in construction or complete, will minimize crossover moves and improve capacity utilization.

Projects Included in this Program:

487 SHORE LINE EAST STATIONS - HIGH-LEVEL PLATFORMS / PEDESTRIAN OVERPASSES	97	154	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
190 PALMERS TO GROTON INTERLOCKINGS - THIRD TRACK UPGRADE	101	105	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
492 NEW LONDON LAYOVER YARD (ELECTRIFIED)	106	106	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
195 WATERFORD - NEW PASSING SIDING	108	110	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
471 CONNECTICUT (CONN) RIVER MOVABLE BRIDGE REPLACEMENT	122	122	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
199 OLD SAYBROOK - TRACK AND CATENARY IMPROVEMENTS	124	124	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
200 CLINTON - UNIVERSAL INTERLOCKING UPGRADE	132	132	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
203 GUILFORD STATION - TRACK 4 CATENARY UPGRADE	138	138	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
570 GUILFORD - TRACK 3 UPGRADE	138	138	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
204 BRANFORD INTERLOCKING RECONFIGURATION	147	147	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
206 SHORELINE JUNCTION - INTERLOCKING RECONFIGURATION	154	154	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Note: Costs shown are preliminary, order of magnitude for planning purposes; NEC mileposts are cumulative from Boston to Richmond; except branch lines, mileposts are from station intersecting the NEC Main Line to outlying station.

Northeast Corridor Infrastructure Master Plan
Part III: Capital Program Summary by Segment

ID	Project Title	Milepost		Project Benefits Category			<i>OoM Cost (\$ millions)</i>	
		From	To	ADA / Safety / Reliability	Congestion / Capacity	Trip Time		
<i>Program:</i>								
STATION IMPROVEMENTS								
There are four projects within this program, three of which provide state of good repair and accessibility improvements to Amtrak served stations. In the longer term, a potential plan calls for the construction of a new on the eastern portion of this segment in the vicinity of South Lyme.								
Projects Included in this Program:								
608	MYSTIC STATION - ADA / SGR IMPROVEMENTS	97	97	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
609	NEW LONDON STATION - ADA / SGR IMPROVEMENTS	106	106	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
198	SOUTH LYME - NEW STATION	117	117	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
610	OLD SAYBROOK STATION - ADA / SGR IMPROVEMENTS	124	124	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Totals for: Westerly, RI - New Haven, CT								
# of Projects:		15	Order of Magnitude Segment Costs (\$m)			791		

Note: Costs shown are preliminary, order of magnitude for planning purposes; NEC mileposts are cumulative from Boston to Richmond; except branch lines, mileposts are from station intersecting the NEC Main Line to outlying station.

Northeast Corridor Infrastructure Master Plan
Part III: Capital Program Summary by Segment

ID	Project Title	Milepost		Project Benefits Category		
		From	To	ADA / Safety / Reliability	Congestion / Capacity	Trip Time

Segment:**New Haven, CT - Springfield, MA**

<i>Program:</i>	O&M Cost (\$ millions)
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SPRINGFIELD NEW TRACK AND INTERLOCKING UPGRADES 834

Electrification, double tracking and the addition of third track sidings are included to support new commuter and increased intercity rail services in the segment. Fixed bridges and the Hartford viaduct will be rehabilitated or replaced, and when complete will permit operation of 286,000-pound freight car service. Existing and new interlockings will be designed to support electrification and the double track program and increase speeds. Additionally, increased train servicing and layover requirements will be defined at Greenfield, Springfield and New Haven terminals.

Projects Included in this Program:

541 SPRINGFIELD LINE - DOUBLE TRACK AND SIDINGS	2	62	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
542 SPRINGFIELD LINE - INTERLOCKING UPGRADES	2	62	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
543 SPRINGFIELD LINE - GRADE CROSSING UPGRADES / ELIMINATION	2	62	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
544 SPRINGFIELD LINE - VIADUCTS AND BRIDGES - STRUCTURAL REHAB	2	62	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
785 SPRINGFIELD LINE - ELECTRIFICATION	2	62	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
722 KNOWLEDGE CORRIDOR - SPRINGFIELD LINE CONNECTION	62	62	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<i>Program:</i>	O&M Cost (\$ millions)
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POSITIVE TRAIN CONTROL 8

The Springfield Line includes installation of ACSes wayside transponders incorporating positive stop and civil speed control in areas of the corridor where ACSes is not currently installed (operating speeds greater than 150 mph) as mandated by The Rail Safety Improvement Act of 2008. PTC design for the Knowledge Corridor and Inland Route will be determined by Pan Am Southern and CSXT for their respective routes.

Projects Included in this Program:

501 POSITIVE STOP TRAIN CONTROL - SPRINGFIELD LINE	2	62	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Note: Costs shown are preliminary, order of magnitude for planning purposes; NEC mileposts are cumulative from Boston to Richmond; except branch lines, mileposts are from station intersecting the NEC Main Line to outlying station.

Northeast Corridor Infrastructure Master Plan
Part III: Capital Program Summary by Segment

ID	Project Title	Milepost		Project Benefits Category					
		From	To	ADA / Safety / Reliability	Congestion / Capacity	Trip Time			
<i>Program:</i>					O&M Cost (\$ millions)				
STATION IMPROVEMENTS					105				
<p>Station improvements are designed to meet ADA and SGR requirements, facilitate ease of travel, encourage intermodalism, and integrate stations into the economic fabric of the communities they serve. There are seven projects in this program, six of which are related to ADA and SGR improvements. The City of Springfield and the metropolitan planning organization are currently evaluating alternatives for the potential restoration of historic Springfield Union Station. If a decision is made to rehab the historic station platform and track modifications will be included to effectively serve trains operating via the Knowledge Corridor, Springfield Line and Inland Route to Boston. All existing intercity stations including Hartford will require expansion and modification to accommodate double tracking of the line. Modifications will include additional platforms, ADA compliance and facilities to accommodate excess dimension freight traffic shipments.</p>									
<p>Projects Included in this Program:</p>									
782	SPRINGFIELD LINE - HIGH LEVEL PLATFORMS	2	62	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
658	WALLINGFORD STATION - ADA / SGR IMPROVEMENTS	12	12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
643	MERIDEN STATION - ADA / SGR IMPROVEMENTS	18	18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
642	BERLIN STATION - ADA / SGR IMPROVEMENTS	25	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
641	HARTFORD STATION - ADA / SGR IMPROVEMENTS	36	36	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
640	WINDSOR STATION - ADA / SGR IMPROVEMENTS	42	42	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
639	WINDSOR LOCKS STATION - ADA / SGR IMPROVEMENTS	47	47	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<hr/>									
<p>Totals for: New Haven, CT - Springfield, MA</p>									
# of Projects:		14	Order of Magnitude Segment Costs (\$m)		947				
<hr/>									

Note: Costs shown are preliminary, order of magnitude for planning purposes; NEC mileposts are cumulative from Boston to Richmond; except branch lines, mileposts are from station intersecting the NEC Main Line to outlying station.

APPENDIX A**LONG-RANGE SERVICE AND INVESTMENT PROGRAM FUNDING
TABLES
FREIGHT RAILROAD COMPANIES**

The freight railroad companies in the state submitted the projects and priorities contained in Appendix A and B to the Department for inclusion in the State Rail Plan. Many of the initiatives are needed to maintain current assets and service. At this point, the current list of needs identified and priority rankings submitted by the freight railroad companies in each Appendix have not received regional or multi-state review and the projects are subject to change.

Branford Steam

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rolling Stock	BSRR	Branford	Replacement and Repowering of Locomotive Engines for BSRR & TLTX Railcar Replacements	6,445,000		
TOTAL COST				\$6,445,000		

Central New England Railroad (CNZR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Track Program	ConnDOT/ Proposed by CNZR	MP 2.9 to 3.1	Griffin Stabilize Soft Roadbed	168,000	168,000	
	ConnDOT/ Proposed by CNZR	MP 3.6 to 3.9	Griffin Stabilize Soft Roadbed	252,000	252,000	
	ConnDOT/ Proposed by CNZR	MP 4.3 to 4.6	Griffin Stabilize Soft Roadbed	252,000	252,000	
	ConnDOT/ Proposed by CNZR	MP 4.9 to 5	Griffin Stabilize Soft Roadbed	84,000	84,000	
	ConnDOT/ Proposed by CNZR	MP 5.5 to 5.7	Griffin Stabilize Soft Roadbed	168,000	168,000	
	ConnDOT/ Proposed by CNZR	MP 7.4 to 7.87	Griffin Home Depot Siding	705,767	705,767	
	ConnDOT/ Proposed by CNZR	MP 7.4 to 7.87	Griffin Switches For Home Depot Siding	152,000	152,000	
	ConnDOT/ Proposed by CNZR	MP .63 to .83	Griffin MP 0.63 Install Double Ended Siding	300,326	300,326	
	ConnDOT/ Proposed by CNZR	MP .63 to .83	Griffin Switches For Sigourney St Siding	152,000	152,000	
	ConnDOT/ Proposed by CNZR	MP 5.3 to 5.7	Griffin Wintonbury Double Ended Siding	600,652	600,652	
	ConnDOT/ Proposed by CNZR	MP 5.3 to 5.7	Griffin Switches For Wintonbury Siding	152,000	152,000	
	ConnDOT/ Proposed by CNZR	MP 5.1 to 5.15	Griffin Farmers Exchange Track Extension	75,081	75,081	
	ConnDOT/ Proposed by CNZR	MP 5.1	Griffin Farmers Exchange New Switch	76,000	76,000	
	ConnDOT/ Proposed by CNZR	MP 11.9 to 13.07	Armory Depot St To Broad Brook Bridge, New Ties & Rail, ties on hand	1,756,909	1,756,909	
	ConnDOT/ Proposed by CNZR	MP 13.08 to 13.91	Armory Broad Brook Bridge to Kreyssig Road, Rail, Ties & OTM	1,128,906	1,128,906	
	ConnDOT/ Proposed by CNZR	MP 13.91 to 15.7	Armory Kreyssig Rd To 191, Rail, Ties & OTM, Concrete Ties On Hand	1,535,630	1,535,630	

Central New England Railroad (CNZR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
	ConnDOT/ Proposed by CNZR	MP 15.7 to 16.62	Armory Rt. 191 To Scantic Br, Rail, Ties, and OTM, Concrete Ties On Hand	1,185,643	1,185,643	
	ConnDOT/ Proposed by CNZR	MP 1 to 2	Griffin MP 1.0 To 2.0 Rail & OTM	1,360,128	1,360,128	
	ConnDOT/ Proposed by CNZR	MP 2.5 to 4	Griffin MP 2.0 To 4.0 Rail & OTM	2,040,192	2,040,192	
	ConnDOT/ Proposed by CNZR	MP 4.1 to 4.6	Griffin MP 4.1 To 4.6 Rail & OTM	680,064	680,064	
	ConnDOT/ Proposed by CNZR	MP 4.9 to 7.4	Griffin MP 4.9 To MP 7.4 Rail & OTM	3,400,320	3,400,320	
	ConnDOT/ Proposed by CNZR	MP 7.4 to 8.2	Griffin MP 7.4 To 8.2 Rail & OTM	1,088,102	1,088,102	
	ConnDOT/ Proposed by CNZR	Griffin Line	Griffin Line Replace 6200 Ties	744,000	744,000	
	ConnDOT/ Proposed by CNZR	MP 4.3	Griffin Rebuild Roger Sherman Switch	76,000		76,000
	ConnDOT/ Proposed by CNZR	MP 11.67 to 11.9	Armory Two Turnouts For Broad Brook Run-Around	152,000	152,000	
	ConnDOT/ Proposed by CNZR	MP 11.67 to 11.9	Armory Broad Brook Run-Around Rebuild (track)	312,829	312,829	
	ConnDOT/ Proposed by CNZR	MP 18.1	Armory Replace Switch in Enfield	76,000		76,000
	ConnDOT/ Proposed by CNZR	MP 16.8 to 16.9	Armory Replace South Switch in Hazardville	76,000		76,000
	ConnDOT/ Proposed by CNZR	MP 19.8 to 20.1	Armory Switches For State Line Siding	152,000		152,000
	ConnDOT/ Proposed by CNZR	MP 19.8 to 20.1	Armory Install Dbl Ended Siding in State Line	408,038		408,038
	ConnDOT/ Proposed by CNZR	MP 6.77 to 11.9	Armory Troy Rd To Depot Street Rail, Ties & OTM	6,977,456	3,500,000	3,477,456
	ConnDOT/ Proposed by CNZR	MP 16.78 to 20.3	Armory Rte. 190 To End Of Line Rail, Ties & OTM	4,787,650	2,587,650	2,200,000

Central New England Railroad (CNZR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
	ConnDOT/ Proposed by CNZR	system wide	Engineering Support During Construction, PM and contingency	5,218,695	3,218,695	2,000,000
	ConnDOT/ Proposed by CNZR	Armory line	Restore Armory Secondary Connection To CSX – ConnDOT Partner With MA DOT (Facilitate Freight Rail Corridor To New Haven)	400,000	400,000	
	ConnDOT/ Proposed by CNZR	East Windsor	Design And Construct Freight Rail Connection – Former Rockville Branch From Broadbrook To East Windsor	5,800,000		5,800,000
	ConnDOT/ Proposed by CNZR	system wide	Install Sidings For New Freight Rail Customers	750,000		750,000
	ConnDOT/ Proposed by CNZR	Hartford Union Station To Griffin Line	Construct Track From Hartford Union Station To Griffin Line	8,750,000		8,750,000
Bridges	ConnDOT/ Proposed by CNZR	MP 16.8	Armory Replace Bridge Deck At Scantic And Broad Brook	103,040	103,040	
	ConnDOT/ Proposed by CNZR	system wide	Repair 3 Bridges Per Current Bridge Insp. Reports	1,500,400	1,500,400	
Crossings	ConnDOT/ Proposed by CNZR	system wide	Armory Install Crossing Signals at 12 Local Crossings	2,432,640		2,432,640
	ConnDOT/ Proposed by CNZR	Rte. 140 and Rte. 191	Armory Crossing Signals at Rte. 140 and Rte.191	496,000		496,000
	ConnDOT/ Proposed by CNZR	Rte. 190 and Rte. 220	Armory Refurbish Flashers At Rte. 190 and Rte. 220	80,000		80,000
	ConnDOT/ Proposed by CNZR	MP 5.4	Griffin Renew Wintonbury Rd Crossing	104,000	104,000	
	ConnDOT/ Proposed by CNZR	MP 3.4	Griffin Renew Tobe Rd Crossing (track and roadway)	104,000	104,000	
	ConnDOT/ Proposed by CNZR	MP 3.4	Griffin New Crossing Signals at Tobe Rd	202,720	202,720	

Central New England Railroad (CNZR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
	ConnDOT/ Proposed by CNZR	MP 5.82	Griffin New Crossing Signals at Mills Lane	202,720	202,720	
	ConnDOT/ Proposed by CNZR	MP 6.77	Armory Renew Grade Crossing At Troy Road	104,000	104,000	
Communications and Signals	ConnDOT/ Proposed by CNZR	Griffin Line	Griffin Add Communications Repeater	118,400		118,400
Drainage/ Culverts	ConnDOT/ Proposed by CNZR	Hartford	Griffin Sigourney St To Woodland St Drainage	296,000		296,000
Facilities/ Yards	ConnDOT/ Proposed by CNZR	East Windsor	Design And Construct Locomotive Repair Facility With Offices	6,800,000	3,000,000	3,800,000
Rolling Stock	ConnDOT/ Proposed by CNZR	n/a	Procure 12 New Refrigerator Freight Cars	2,400,000	2,400,000	
	ConnDOT/ Proposed by CNZR	n/a	Purchase Two "Green" Low-Emission Locomotives	2,100,000	1,050,000	1,050,000
	ConnDOT/ Proposed by CNZR	n/a	Purchase 6 New Ballast Cars	750,000	350,000	400 ,000
	ConnDOT/ Proposed by CNZR	n/a	Purchase New Hyrail Maintenance Vehicles	800,000	400,000	400,000
Studies	ConnDOT/ Proposed by CNZR	system wide	Feasibility Study – Partner With CT DECD to Attract New Rail Freight Shippers	400,000	400,000	
Security	ConnDOT/ Proposed by CNZR	system wide	Safety And Security – Fencing, Security Cameras, Improved Communications	1,800,000	900,000	900,000
Other	ConnDOT/ Proposed by CNZR	Windsor and Windsor Locks	Acquire Right Of Way To Bradley Field	3,000,000		3,000,000
	ConnDOT/ Proposed by CNZR	system wide	CDOT / CNZR Federal Grant Application Support (FRA, FTA, Etc.)	500,000		
TOTAL COST				76,288,308		

Connecticut Southern Railroad (CSO)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Bridge Priority 1	CSO	Connecticut River Bridge, between Hartford & East Hartford, M.P. 1.1-1.2	Critical structural repairs to steel work as outlined in the 2010 bridge inspection report to keep bridge in service.	3,800,000	3,800,000	
Upgrade Rail Priority 2	CSO	Windsor Subdivision	Replace small 90 pound and less rail in main track with 115 pound.	360,000	360,000	
Locomotives	CSO	NA	Acquire and install PTC Equipment on 6 locomotives	\$600,000	\$600,000	
Rail Track Program Priority 3	CSO	All CSO subdivisions-Suffield, Wethersfield, Manchester, Windsor, & Bradley	Replace an estimated 13,500 ties, 13,640 tons of new ballast, 27.5 miles of surfacing, installing 10 pound relay rail (replacing 80 pound and smaller rail), a bolt tightening program, and rebuilding six switches	2,625,000	2,625,000	
	CSO	All CSO subdivisions-Suffield, Wethersfield, Manchester, Windsor, & Bradley	Yearly Maintenance Capital for ties, ballast, switches, and surfacing.	7,094,190	1,625,000	5,469,190
Switch Tie Program Priority 4	CSO	All CSO subdivisions-Suffield, Wethersfield, Manchester, Windsor, & Bradley	Switch Tie Program to restore switches to maintenance level.	500,000	500,000	
Bradley Spur Priority 5	CSO	Bradley Spur	Replace worn out curve rail.	100,000	100,000	
	CSO	Bradley Spur	Purchase, dump, and tamp new ballast along 5.5 mile route from Amtrak main to Bradley Field.	220,000	220,000	
Yard Priority 6	CSO	Hartford Yard, rebuild switches	New switch timbers and repair/replace switch points at North and South ends of the yard.	450,000	450,000	
Ditching Priority 7	CSO	Windsor and Manchester Subdivisions.	Ditching along main tracks.	400,000	400,000	

Connecticut Southern Railroad (CSO)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
	AMTRAK/ Proposed by CSO	Amtrak Main Line between MA state line and New Haven- Conn R Bridge & Hartford Viaduct	Upgrade Amtrak's route to handle 286K lb. freight cars. Amtrak's route is the only connection for rail freight customers served by CSO, CSXT, CNZR, and a secondary connection to P&W. It is important that this route be upgraded to handle the heavier rail cars	65,000,000	65,000,000	
Bridges Priority 8	CSO	Manchester and Suffield Subdivision bridges	Maintenance	253,000	253,000	
Crossings Priority 9	CSO	Bradley, Manchester, and Wethersfield Subdivisions.	Rebuild seven at grade road crossings.	450,000	450,000	
Priority 10	CSO	Hartford Diamond Crossing	Replace worn out diamond with a new one. This diamond sees heavy traffic and is located on the switching lead to Hartford yard, the main serving yard for all CSO customers.	195,000	195,000	
Other	CSO	CRRA in Hartford	Reinstall rail for facility.	1,500,000	1,500,000	
Studies Other	CSO	Windsor to Bradley Field	Feasibility Study for upgrading the Bradley Spur for future commuter rail service.	850,000	850,000	
TOTAL COST				84,397,190		

Housatonic Railroad Company (HRRC)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Track Program Priority 1	HRRC/ConnDOT	Canaan to New Milford and Danbury to Derby	Replace 7.5 miles of rail at several locations between Derby and Danbury, installation of 9 miles of rail between Canaan and New Milford, expand a storage track in Canaan, renew three railroad crossings in Canaan, installation of 92,000 new ties, restore	21,000,000	21,000,000	
Priority 1	HRRC/ConnDOT	Main lines from Canaan to Danbury and Danbury to Derby	Replace 70 year old or older rail, old track materials, and ties: Provide for annual phased rail renewal to replace worn rail	80,000,000	20,000,000	60,000,000
Crossings Priority 2	HRRC/ConnDOT	Main lines from Canaan to Danbury and Danbury to Derby	Sustain railroad and public road crossings: Bring public road crossings up to standard that will permit normal ongoing maintenance and safety	44,000,000	11,000,000	33,000,000
Culverts/ Drainage Priority 3	HRRC/ConnDOT	Main lines from Canaan to Danbury and Danbury to Derby	Improve drainage/culverts to accommodate excess water due to upstream development	12,000,000	3,000,000	9,000,000
Facilities/ Yards Priority 4	HRRC	Newtown, Others	Strengthen Transload facilities: Provide for improved infrastructure to promote truck to rail, rail to truck expansion	8,000,000		
TOTAL COST				165,000,000		

Naugatuck Railroad Company (NAUG)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Track program	ConnDOT/ Proposed by NAUG	Torrington line	Capital Tie, Surfacing and Ballasting work: An additional 17,500 ties should be installed which will bring the line to a solid state of repair, ensuring continued safe operation of freight and passenger trains. Long-term plan also includes continual replacement cycle.	3,500,000	2,500,000 Priority 1	1,000,000 Priority 11
Culverts/ Drainage	ConnDOT/ Proposed by NAUG	Torrington line	Culvert Replacement and Repair Work: Culverts along the Torrington line range in age from 125+ year-old stone box culverts to 50-year old concrete pipe culverts. 6 of these are in need of replacement, due to their advanced age and deterioration.	950,000	450,000 Priority 2	400,000 Priority 9
Bridge	ConnDOT/ Proposed by NAUG	Thomaston area	Jericho Bridge (over Naugatuck River south of Thomaston): Re-deck, masonry and minor steel repairs.	765,000	765,000 Priority 3	
Crossings	ConnDOT/ Proposed by NAUG	Watertown	Highway-Rail Crossings: State Route 262, Frost Bridge Road crossing- signals, gates, road surface.	435,000	435,000 Priority 4	
Bridge	ConnDOT/ Proposed by NAUG	Waterbury	Hancock Brook Bridge: Re-deck, masonry repairs, steel repairs.	726,000	726,000 Priority 5	
Bridge	ConnDOT/ Proposed by NAUG	Waterville	Chase Bridge (over Naugatuck River in Waterville): Re-deck, masonry and minor steel repairs.	700,000	700,000 Priority 6	

Naugatuck Railroad Company (NAUG)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Crossing	ConnDOT/ Proposed by NAUG	Waterbury	Highway-Rail Crossings: Common Court Road crossing-signals and equipment, road and track surfaces.	120,000	120,000 Priority 7	
Siding	ConnDOT/ Proposed by NAUG	Torrington	Rehabilitate and Upgrade Plains Passing Siding: The existing 900-foot long, single-ended "Plains" side track in Torrington will be rehabilitated with newer, heavier rails (the existing rails are lightweight rails dating to 1889), and will have an additional switch installed.	270,000	270,000 Priority 8	
Rail Track	ConnDOT/ Proposed by NAUG	Torrington Line	Replace deteriorated rail on north end of rail line with heavy rail.	450,000	450,000 Priority 8	
Facilities/ Yards	ConnDOT/ Proposed by NAUG	Waterville	Construct transload/public delivery facility at MP2.	250,000	250,000 Priority 10 (may change if active customer wants service at that location)	
TOTAL COST				8,166,000		

New England Central Railroad (NECR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Bridges Priority 1	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Upgrading bridge structures to handle 286K lb. freight cars.	2,813,000		
Upgrade Rail Priority 2	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Upgrade 21 miles of 100 pound rail to 115 pound c.w.r.	10,000,000		
Rail Track Program Priority 3	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Project consists of replacing an estimated 30,000 ties, 23,000 tons of new ballast, 55.7 miles of surfacing, bridge work, and rebuilding ten switches.	5,150,000		
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Annual capital needs to sustain track conditions including tie replacement, ballast, surfacing, switch ties, and bridge work	3,200,000	600,000	2,600,000
Priority 4	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Clear route for full double stack container service.	6,900,000		
Culverts/Drainage Priority 5	NECR	Norwich Tunnel	Establish drainage system inside the tunnel. Currently the tunnel fills with water and rises above the top of rail.	1,000,000		
Rail Bridges Priority 6	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Annual capital needs to sustain existing bridge conditions. This includes piles, abutments, stringers, decks, etc.	3,993,500	793,500	3,200,000
Yard Priority 7	NECR	Willimantic Yard	Rebuild yard and install new crossover interchange connection with P&W RR	650,000		

New England Central Railroad (NECR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Culverts/ Drainage Priority 8	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Drainage project, clean out ditches and repair culverts.	700,000		
Other Priority 9	NECR	M.P. 55 and M.P. 43	Purchase and install new hotbox/weigh in motion detectors, 2 @ \$75,000 each.	150,000		
Studies Other	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Feasibility Study to look at restoring passenger service between New London & Palmer, MA	850,000		
Study		System wide	CT Freight Rail Study to assess rail freight system, projects benefit/cost, economic development strategy, funding efficiency, and rail freight program administration.	750,000	750,000	
	NECR	Willimantic to Manchester, CT	Feasibility Study to look at restoration of the rail route between Willimantic, CT and Manchester, CT. This route's R.O.W. belongs to CT and NECR and CSO serve the remaining in service trackage.	900,000	900,000	
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Engineering Study to look at bridge clearance plans for full double stack container route.	550,000		
TOTAL COST				37,606,500		

Pan Am Southern Railroad (PAS)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Waterbury Branch Crosstie Replacement Program Priority 1	PAS	Waterbury to Berlin	Cross tie replacement: Replace crossties and maintain to sustain a safe and efficient operational status	13,800,000.00	8,200,000.00	5,600,000.00
Waterbury Branch Track Surfacing In support of tie installation Priority 1 (a)	PAS	Waterbury to Berlin	Track Surfacing: Maintaining proper track geometry is particularly essential to sustaining and maintaining a safe and efficient operational status, by supporting surfacing operations on a 7-year cycle.	2,100,000.00	700,000.00	1,400,000.00
Select CWR installation – Priority 1 <i>Line Segment is complicated with the advent of the proposed Busway</i>	PAS	New Britain	Continuous Welded Rail Installation: The Installation of CWR improves the safety and efficiency of train operations and public safety accommodating continuous movement over this segment of track in thru the business district of New Britain	1,250,000.00	1,250,000.00	
Crossings – essential system safety priority projects - 1	PAS	Waterbury to Berlin	Maintaining the safety and integrity of crossing warning signals and signs is essential for public safety at all at-grade rail / highway crossings.	5,300,000.00	1,500,000.00	3,800,000.00
Waterbury Branch Rail Program Priority 2	PAS	Waterbury to Berlin	Rail replacement: Replace existing jointed rail with either new or fit Continuous Welded Rail	13,950,000.00	7,500,000.00	6,450,000.00

Pan Am Southern Railroad (PAS)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Select CWR installation – Priority 2	PAS	Bristol	Continuous Welded Rail Installation: The Installation of CWR improves the safety and efficiency of train operations and supports improved train handling by maintaining steady speeds It would be our proposal to install CWR rail through the City of Bristol	1,400,000.00	1,400,000.00	
Select CWR installation – Priority 3	PAS	Plymouth	Continuous Welded Rail Installation: The Installation of CWR improves the safety and efficiency of train operations and supports improved train handling by maintaining steady speeds It would be our proposal to install CWR rail through the Terryville Tunnel.	700,000.00	700,000.00	
Advance Freight Rail Support Facilities/ Yards	PAS	Plainville	Plainville Yard: The demands of freight rail goods movement require safe and efficient switching and interchange operations, prompt, safe and effective goods movement influences locations within the State where these functions are vital. Plainville access	2,400,000.00	600,000.00	1,800,000.00

Pan Am Southern Railroad (PAS)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Alleviate rail initiated interference in Plainville at Route 372 (E. Main) and Route 10 (East St.)	PAS	Plainville	Install a DTMF controlled switch into Plainville Yard: The Installation of a DTMF controlled switch improves the safety and efficiency of train operations and supports improved train handling by maintaining steady speeds and eliminating the delay in hand.	400,000.00	400,000.00	
Advance Freight Rail Support Facilities/ Yards	PAS	Waterbury	Waterbury Yard: The demands of freight rail goods movement require safe and efficient switching and interchange operations, prompt, safe and effective goods movement influences locations within the State where these functions are vital.	4,360,000.00	760,000.00	3,600,000.00
Clearance Restrictions	PAS	Waterbury to Berlin	Sustain the state clearance statute which will benefit present and future Connecticut shippers	2,500,000.00	2,500,000.00	
TOTAL COST				48,160,000		

Providence and Worcester Railroad (P&W)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Bridge Priority - 1	P&W	Norwich, CT Bridge 12.14 over the Shetucket River	Replace Bridge	6,500,000	6,500,000	
Track Program Priority – 2	P&W	Plainfield, CT	3000' yard track West of Main Track	2,700,000	2,700,000	
Track Program Priority – 3	P&W	Norwich Branch MP 1 to MP 14	Running Rail Upgrade: Install 136 pound CWR	9,000,000	9,000,000	
Other Priority – 4	P&W	Putnam to Willimantic	Increase Overhead Structure Clearance to meet Phase 2 requirements of 20'-6"	2,000,000	2,000,000	
Track Program Priority – 5	P&W	Norwich Branch MP 0 to MP 53	Cross-tie replacement: Install 1500 ties per mile	6,000,000	6,000,000	
Track program Priority - 6	P&W	Willimantic Branch MP 3.00 to MP 10.34	Cross-tie replacement: Install 1500 ties per mile	857,080	857,080	
Track Program Priority – 7	ConnDOT	Willimantic Branch MP 10.34 to MP 24.30	Cross-tie replacement: Install 1500 ties per mile	1,729,345	1,729,345	
Track Program Priority – 8	P&W	Middletown Branch MP 28.75 to MP 35.88	Cross-tie replacement: Install 1200 ties per mile	1,000,000	1,000,000	
Track Program Priority 9	P&W	Middletown Branch MP 15.00 to MP 21	Running Rail Upgrade: Install 115 pound relay rail	2,500,000	2,500,000	
Bridge Priority 10	P&W	Groton, CT Bridge 2.58 over Groton Shipyard (Subbase) Driveway	Replace Bridge	2,500,000	2,500,000	
Bridge Priority 11	P&W	Groton, CT Bridge 2.40 over Groton Shipyard (Subbase) Driveway	Replace Bridge	1,500,000	1,500,000	
Facilities/ Yards Priority 12	P&W	Putnam , CT	Expand existing facility to enable MOW equipment repair	1,000,000	1,000,000	

Providence and Worcester Railroad (P&W)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Track Program Priority 13	P&W	Middletown Branch MP 28.75 to MP 35.88	Running Rail Upgrade: Install 115 pound relay rail	2,900,000	2,900,000	
Track Program Priority 14	P&W	Old Groton Main MP 0.0 to MP 3.00	Cross-tie replacement: Install 1000 ties per mile	225,000	225,000	
Track Program Priority- 14	P&W/ ConnDOT	Willimantic Branch MP 9.4 to MP 23.22	Running Rail Upgrade: Install 136 pound CWR	8,550,250	8,550,250	
TOTAL COST				48,961,675		

Valley Railroad (VRR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Track Program Priority – 1	VRR	Old Saybrook-Haddam running track MP 0-MP 13.25	Crosstie replacement average 100/mile/year: Renew mainline and switch timber as needed to sustain/improve track class	1,600,000	400,000	1,200,000
Rail Track Program Priority – 1	VRR	Old Saybrook-Haddam running track MP 0-MP 13.25	Ballasting/tamping on three-year cycle	610,000	200,000	410,000
Rail Track Program Priority – 1	VRR	All trackage from Essex north yard limit to Deep River yard, north limit	Track upgrades MP 4.25- MP 8 Essex to Deep River: Upgrade to FRA Class 3, 1700 ties, switch timber work, upgrade Deep River sidings, 1 public crossing replacement, 1 private crossing replacement, ballast and tamping of all mainline and siding tracks.	660,000	660,000	
Rail Track Program Priority – 1	VRR	All trackage from Deep River north yard limit to north Chester	Track upgrades MP 8- MP 9.75 Deep River to Chester: Upgrade to FRA class 3, 500 ties, switch tie renewal, rerailing of curve south of Deep River Creek bridge, ballast and tamping of all mainline track	300,000	300,000	

Valley Railroad (VRR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Track Program Priority – 1	VRR	All trackage from north Chester to end of currently operable track in Haddam	Track upgrades MP 9.75- MP 12.75 Chester to Haddam: Renewal of 1 public crossing, renewal of 1 private crossing, tie renewal to Class 2 standards, 1000 new ties, passing track and house track upgrades at Haddam, rail seal and pavement improvements Route 82.	300,000	300,000	
Rail Track Program Priority – 2	VRR	Southern active trackage	Track upgrades MP 0-MP 3.45 South operable track: 2400 ties, ballast and shoulder improvements, redeck 1 bridge, new culvert at MP .5, switch timber renewals, upgrade to FRA class 2	400,000	400,000	
Rail Track Program Priority – 2	VRR	Essex yard trackage	Track upgrades MP 3.45- MP 4.25 Essex Yard trackage: Reconstruct 2 yard tracks, build switch, ballast and raise track, 600 new ties, public crossings (2), renew track switch and 2 private crossings, replace 1 crossing system, extensive ballast/tamping.	880,000	880,000	

Valley Railroad (VRR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Rail Track Program Priority – 2	VRR	Various locations of worn and/or small rail sections	Rail upgrades on 8 miles of operable track: Upgrade such sections to 112 pound or better, perhaps in conjunction with CTW removals on other parts of CDOT rail network	600,000	100,000	500,000
Rail Track Program Priority – 2	VRR	Various locations of worn and/or small rail sections	Rail upgrades on 8 miles of operable track: Upgrade such sections to 112 pound or better, perhaps in conjunction with CTW removals on other parts of CDOT rail network	600,000	100,000	500,000
State of Good Repair Priority – 1	VRR	State of Good Repair (15 year) program	Contingencies and engineering for 15 year state of good repair program	570,000	570,000	
Vegetation Control Priority – 1	VRR	Old Saybrook-Haddam running track MP 0- MP13.25, spray MP 13.25-22.0	Vegetation control incl. spray and clearance/sightlines: Annual weed spray program and maintenance of line side clearances/crossing sightlines	64,000	16,000	48,000
Other Priority – 1	VRR	All operable track, Old Saybrook to Haddam	General Work on entire line: Heavy brush cutting and crossing sightline improvements, manual tree cutting beyond machine limits, ditching of 15% of entire line, pointing of existing culvert masonry headwalls, weld repairs to rail/points/frogs	360,000	360,000	

Valley Railroad (VRR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Bridges Priority – 1	VRR	7 bridges between Essex and Haddam	2-year bridge inspections, annual bridge maintenance: Superstructure and underwater inspections, cleaning of structures, routine maintenance of paint and masonry	600,000	150,000	450,000
Crossings Priority – 1	VRR	Various locations on running track, public and/or private crossings	Crossing replacements/track upgrade: Given 34 crossings, annual replacement of 1 crossing provides for complete renewal every 34 years.	800,000	200,000	600,000
Priority – 2	VRR	Essex Transfer Station Road, Essex	Upgrade crossing to gated: Upgrade system to include gates at busy industrial road junction.	150,000		150,000
Priority – 3	VRR	Kirtland Street, Deep River and Parker's Point Road, Chester	Install crossing signals: Install automatic lights, gates.	350,000	200,000	150,000
Facilities/ Yards Priority - 2	VRR	Essex yard facility	Upgrade to shop facility / locomotive servicing facility: Enclose outdoor servicing location, runoff water control, solid fuel/waste containment (coal, cinders).	710,000	700,000	10,000

Valley Railroad (VRR)

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost	2012-15	2016-2031
Communications and Signals Priority – 3	VRR	Various locations at the 12 automated crossings, 1 set every two years	Signal system battery renewals: Rotating replacement of batteries avoids any one large expenditure in one year	40,000	10,000	30,000
TOTAL COST				9,594,000		

APPENDIX B - LONG RANGE SERVICE AND INVESTMENT PROGRAM PROJECT DESCRIPTIONS

CONNECTICUT DEPARTMENT OF TRANSPORTATION

The Department has identified a Capital Program contained in the spreadsheet in Appendix A and an accompanying project description contained in this Appendix. The projects in this Appendix are included in the Department's Federal Fiscal Year (FFY) 2012-2016 Constrained Transit Capital Plan¹⁰⁷, FFY Unfunded Initiatives, or Major Long-Term Unfunded Initiatives.

The Department's Capital Program is continually evolving and is reprioritized and reprogrammed based on needs and the availability of state and federal funding. The federal highway and transit programs legislation – the Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy for Users (SAFETEA-LU) – expired on September 30, 2009 and has been operating on a series of short-term extensions since. States have funding certainty through the end of the calendar year. The passage of new federal legislation will affect Connecticut significantly and priorities will shift based on the federal funding level.

The funding methodology used to determine the cost estimates is based on best practices of the Department and the FTA, applying inflation rates to the mid-point of construction on large projects. The completion dates noted are subject to funding and may be revised accordingly.

FFY 2011 – Constrained

The following projects were funded in Federal Fiscal Year 2011 and are underway.

Concrete Tie Repair (ROCLA) – Phase 2 (Project No. 0301-0133)

Rocla is the manufacturer of the concrete ties that are being replaced and the supplier of the replacement ties based upon a settlement agreement with MNR due to the premature failure of the existing ties in track. The project calls for the replacement of the existing concrete ties with new concrete ties supplied at no cost to the Department or MNR per the terms of the settlement agreement on tracks 3 and 4 from the State Line to Stamford. A portion of track 3 east to CP 233 in Stamford is complete. Installation of Rocla Concrete ties on track 4 from State Line to Stamford has been completed with the exception of approximately 80 ties between Greenwich Avenue and Rowayton River bridges at the west end of Stamford Passenger Station.

Danbury Branch Centralized Traffic Control (CTC) System (Project No. 0302-0007)¹⁰⁸

The CTC Project has been designed to include electrified electronic track circuits. Cable will be buried in a manner so as not to preclude future construction of a pole line capable of supporting electrification. The signal system includes a remote control of train movements and switches from MNR's Control Center in Grand Central Terminal. The sidings at Norwalk, Wilton, Branchville, and Danbury will function as fully automatic control points. Signals at these sidings will be GO-NO-GO signals similar to those now in use on the New Haven Main Line. These signals indicate to a train to stop or proceed based on the onboard cab signal indications. The

¹⁰⁷ Note: Constrained means that all funding that is expected to be available is programmed.

¹⁰⁸ Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

signals and switches are interlocked for positive control of train moves. Lastly, the branch will be electrically segmented into approximately one-mile long blocks that provide the cab signal indication based on conditions of the track ahead. The project is expected to be completed by late 2012.

Locomotive Fleet Overhauls (Project No. 0300-0159)

The Department has a project to perform overhauls to the entire fourteen (14) locomotive fleet. The eight (8) P40 and six (6) GP40 locomotives are used in SLE operation, as well as in supplemental NHL branch rail service.

P-40

The eight P-40 locomotives were built in 1992 and were purchased from Amtrak in 2007. As part of the overhaul, major components such as the prime mover engine, generator set, traction motors, Automatic Train control, and braking components will be replaced. These locomotives are expected to be the backbone of the fleet for the NHHS until such time as a higher speed fleet becomes necessary and can be designed and built.

GP-40

The 6 GP40's locomotives were manufactured in 1971 and remanufactured in 1996 and are currently experiencing unacceptably high failure rates and extended out-of-service times, which are anticipated to further erode unless sufficient work is performed to extend the useful life of these vehicles. The project provides for a "top-deck" overhaul for the six locomotives that will replace or overhaul the major engine parts with inspection and replacement of other components as needed. This type of program will allow another 3-6 years of service life.

These overhauls will provide the Department and its service operator, Amtrak, reliable and more efficient locomotive power for operation on the SLE and New Haven Hartford Springfield (NHHS) services, until such a time when the next generation of rolling stock equipment is available.

The project is estimated to begin in the first quarter of 2012 with approximately 3-4 months of construction per locomotive.

M-8 Electric Multiple Unit (EMU) Rail Car Purchase (Project No. 0300-0116)

This project will provide funding for the 38 and 42 new M-8 EMU rail cars as discussed in Chapter 4.3.

Main Line Catenary Replacement

New catenary wire auto-tension (constant-tension) technology has been implemented to preclude the continually declining reliability of the catenary system and the lack of replacement components. In addition, the space between wires supporting the contact wire (system depth) will allow a lower contact wire elevation thus, reducing the number of and severity of hard-spots. The new system is designed for the maximum speed allowed by track geometry.

The catenary replacement is being undertaken along 46 miles of the NHL and has been divided into four major sections (Catenary A-D). Catenary A – Connecticut/New York state line to Stamford (Completed in 2004). The project included replacement of three railroad bridges and station improvements in Greenwich and the project cost was \$66.5 million. Catenary D –

Stratford to New Haven (Completed in 2006). The project included replacement of three railroad bridges and station improvements in Milford and the project cost was \$89.5 million.

Main Line Catenary Replacement – Section B (Project No. 0301-0054)

The project included the catenary replacement from C.P. 234 – C.P. 241 Stamford to Norwalk and three bridges: Boston Post Road Bridge - Darien (Project No. 0300-0099), Rowayton Avenue Bridge – Norwalk (Project No. 03300-0098), and Monroe Street Bridge – Norwalk (Project No. 0301-0033). The project is nearing completion.

Boston Post Road Bridge - Darien (Project No. 0300-0099)

This project requires the replacement with ballast deck to restore the proper functioning of the structure, as well as increase ride comfort. This bridge carries four New Haven Main Line tracks. The bridge is three span riveted through girder superstructure with a minimum vertical clearance of 11' 9". The bridge is supported on stone masonry abutments and steel bents. The main span of the bridge is 47' 3" in length and the approach spans are 15' 6" in length for a total structure length of 78' 3". The Darien train station is located immediately to the west of the bridge. Based on annual bridge inspections, this bridge is in poor condition. This project does not include improvements related to the widening of the road.

Rowayton Avenue Bridge – Norwalk (Project No. 03300-0098)

Replacement with a ballast deck is required to restore the proper functioning of the structure. It will also increase ride comfort. Bridge M.P. 39.11 over Rowayton Avenue in the city of Norwalk and has a 34' single span open deck structure. Based on annual bridge inspection, this bridge is in poor condition with a serious problem with the structure.

Monroe Street Bridge – Norwalk (Project No. 0301-0033)

Bridge No.41.12, in Norwalk, carries the four New Haven Main Line tracks and two side tracks over main Monroe Street. This bridge consists of an 85 foot, open deck, three span structures with a thru girder center span and deck girder side spans, with a vertical clearance of 12'0". Stone masonry abutments and two steel piers support the superstructure. Based on annual bridge inspection, this bridge is in poor condition with a serious problem with the structure.

Main Line Catenary Replacement - Section C1-B and Bridges (Project No. 0301-0070)

The project includes the catenary replacement in the area between CP 248 (Mile Point 48.4) to CP 255 (Mile Point 55.3) Westport to Bridgeport. The project also includes three bridges.

Westway Road Bridge – Fairfield

This ballasted bridge was constructed in 1890 and rehabilitated in 1940. The superstructure consists of riveted built-up girders and rolled beam floor beams with a steel deck. The substructure consists of two stone masonry abutments with concrete bridge seats. The bridge is currently posted for a minimum vertical clearance of 10' with a field measured minimum clearance of 10'3". The structure is 58 feet in length carrying four main line MNR tracks. The rehabilitation of this bridge will encompass the complete removal of the superstructure under each track followed by the erection of a new simple ban multi-beam structure with new safety walkways. The bridge seats will be rebuilt to

accept new bearings and support new spans. The abutments will also be reinforced with anchors as necessary. No roadway work is planned under this project; however, lane or complete road closures and detours will be required to perform some of the work. Estimated date for completing construction is August 2012.

Fairfield Avenue Bridge – Bridgeport

Bridge No. 53.42 in Bridgeport carries the four NHL tracks. The bridge consists of a 106-foot open deck, three span structures. The through girder bridge was constructed in 1895. Stone abutments and two piers support the superstructure with steel columns resting on stone pedestals. Based on annual bridge inspections this bridge is in poor condition with a serious problem with the structure. Improvements of the road to increase the vertical clearance under the bridge should be improved if possible. Estimated date for completing construction is August 2012.

Main Street Bridge – Bridgeport

Based on the age of this bridge, cost estimate, and future repairs, eliminating this bridge is the recommended course of action. Elimination of the railroad bridge would include the following: The existing bridge superstructures will be removed entirely and the substructure will be removed three feet below the proposed railroad grade. This project does not include road improvements related to widening the road. Estimated date for completing construction is August 2012.

North Benson Road Bridge – Fairfield

The age of the structure and the complicated nature of performing repairs have increased the deterioration of the structure. The bridge has a low clearance and is posted for a minimum vertical clearance of 10'5". The rehabilitation of this bridge would include the complete replacement of the existing superstructure with pre-cast concrete beams and reinforcement of the existing abutments. Estimated date for completing construction is 2012.

South Avenue Bridge – Bridgeport

The rehabilitation of this bridge will include the replacement of the existing superstructure with steel beams and reinforcement of existing abutments. Estimated date for completing construction is August 2012.

Positive Train Control (PTC) - Design Portion – New Haven Main Line (including Waterbury Branch Line) (Project No. 0301-0049)

This project is a new federal requirement. For MNR, PTC can be deployed as an overlay to the existing cab signal system technology. MNR proposes to use the system Amtrak currently employs, an Advanced Civil Speed Enforcement System (ACSES) or an advanced modification of that system called ACSES II. The systems work by sending a special frequency originating from the train engine to transponders located along the right-of-the way, where switches, signals, stations, code change points, curves, work zones, and temporary speed restrictions, (TSR) areas are to name a few. This transponder signals the train to change speed and enforce the speed change or stop the train.

The system is designed to monitor train activity, prevent collisions, control headway spacing, convey and enforce speed restrictions, advice of hazards and inoperable grade crossings. This is a radio-based system in a particular radio frequency spectrum; the range is from 200 MHz to 222 MHz. The operating entity must purchase the ability to use the radio frequency from the

FCC for each county it passes through and some adjacent counties also, to secure the frequency. The system is in the development stages for the design concept and equipment.

The Waterbury Branch Line does not have a signal system, but is operated under manual block rules. Installation of a signal system would improve safety on the line. Signalization is needed to implement Positive Train Control. The project would include a CTC with four passing sidings that would include eight interlockings and a Go-No-Go signal system.

This portion of the project is for the design. The entire project is estimated to be completed in March 2016.

SLE Railroad Station / Track Infrastructure Improvements (Project No. 0310-0048)

Expansion of commuter rail service on SLE requires high-level platforms to be constructed on the north side of the existing Amtrak tracks as well as track infrastructure modifications and improvements to allow the new M8 rail cars to operate on the line. This project included the design portion for the projects. Below is a description for each of the active construction projects (these projects are in the processing phase):

Westbrook Railroad Station – State Project No. 0310-0062

The project consists of the construction of a new railroad station in the town of Westbrook. The station will consist of two high-level ADA accessible platforms linked by a pedestrian overpass that includes stair towers and elevators. Surface parking lots will be located on either side of the tracks. The platforms will be constructed of both precast and cast-in-place concrete with steel canopies that will extend the entire length of the platform. Platforms include seating, windscreens, steel guard rails, and other amenities such as visual messaging systems and waste receptacles. Elevators are provided to meet ADA requirements. Electrical power, lighting, fire alarm, and CCTV security are included in the project. This facility will be constructed in stages to allow rail commuters to board trains during construction.

Branford Railroad Station – State Project No. 0310-0056

The project consists of the construction of a new north side high-level platform and pedestrian bridge that will connect to the existing south side platform. Stair towers and elevators will be added on both sides of the tracks. Additionally, a commuter drop off area, pedestrian access improvement and resurfacing of the presently unused parking lot will be part to this project. The platform will be constructed of both precast and cast-in-place concrete with a steel canopy that will extend the entire length of the platform. Platforms include seating, windscreens, steel guard rails, and other amenities such as visual messaging systems and waste receptacles. Elevators are provided to meet ADA requirements. Electrical power, lighting, fire alarm, and CCTV security are included in the project. This facility will remain open to allow rail commuters to board trains during construction, although access may be precluded from certain areas for brief periods. This project will be bid together with the Guilford Shore Line East Railroad Station Improvement project.

Guilford Railroad Station – State Project No. 0310-0057

The project consists of the extension of the existing north side high-level platform from approximately forty feet to two hundred feet. Minor sidewalk improvements will be undertaken in this project as well as replacement of lighting fixtures with more energy efficient LED lights. Platform and canopy construction will mimic what is already built. The Platform includes seating, windscreens, steel guard rails, and other amenities such

as visual messaging systems and waste receptacles. Electrical power, lighting, fire alarm, and CCTV security are included in the project. This facility will remain open to allow rail commuters to board trains during construction though access may be precluded from certain areas for brief periods. This project will be bid together with the Branford Shore Line East Railroad Station Improvement project.

Sound Beach Avenue, Greenwich - Bridge No. 03948R, M.P. 32.29 (Project No. 0301-0092)

This bridge consists of two span ballasted decks constructed in 1894 and rehabilitated in 1929. The 56-foot-long bridge consists of concrete girders, supported by stone abutments and a pier as steel column with a pier cap and vertical clearance of 12 feet 9 inches. Based on annual bridge inspection, this bridge is in poor condition with a serious problem with the structure. The project will require the replacement of the superstructure and rehabilitation of the existing substructure. This project does not include improvements related to the widening of the road or any increase in vertical clearance. Existing and additional high-level platforms has to be extended to accumulate 10 car train (1000 ft.). This project is estimated to be completed by April 2016.

Tomac Avenue, Greenwich - Bridge No. 03955R, M.P. 31.62 (Project No. 0301-0092)

This open deck bridge was constructed in 1895 and rehabilitated in 1943. The 32-foot superstructure consists of a single span with riveted built-up through girders. Stone abutments with cast-in-place concrete bridge seats support the superstructure. The vertical clearance under the bridge is 10 feet 8 inches. This project will replace the superstructure with ballasted deck to restore proper functioning of the structure. Rehabilitation of the existing abutments is required. This project does not include improvements related to widening the road or increasing vertical clearance. Existing and additional high-level platforms has to be extended to accumulate 10 car train (1000 ft.). This project is estimated to be completed by April 2016.

Stamford Pedestrian Bridge over Washington Boulevard (Project No. 0301-0149)

This project is pursuant to Public Act 06-136, Section 2(c). The project is to build a pedestrian crossing over Washington Boulevard in Stamford to mitigate traffic concerns anticipated by future development. The bridge will extend the public way from the Stamford Railroad Station and platforms on the east side of Washington Boulevard to the west side. The bridge will be independent of the existing bridge that supports the tracks over the road and will include vertical stair access, to grade, on either side. The estimated start date is August 2012.

Substation Replacement (State Project No. 0301-0072)

Circuit breakers at substations are oil-filled, 75 to 80 years in age, and are overdue for replacement. Several problems exist: replacement parts are difficult to obtain; at some locations, loads on circuit breakers have reached the upper limit of the established current rating for the breakers; and short circuit fault clearing times need to be significantly improved. Additionally, the existing physical plant impedes any decision to expand service.

This project will replace all oil-filled circuit breakers at five of the remaining six Connecticut anchor bridge substations with a state-of-the-art ground mounted system with the optional sixth site. The replacement breakers will be specified as indoor draw out-type breakers and will be enclosed in a prepackaged modular enclosure. The replacement breakers will be of the same voltage and current rating as the vacuum circuit breakers in service at seven other locations on the NHL. The substations to be replaced are located at mileage point (Mile Post) 42.0 in East

Norwalk, Mile Post 53.3 in Bridgeport, Mile Post 57.5 in Bridgeport, Mile Post 60.8 in Milford and Mile Post 66.2 in Milford. Estimated construction completion is May 2013.

Waterbury Branch Line Bridges (Project No. 0304-0008)**Site No. 1 - Bridge No. 08272R over Naugatuck River (M.P. 14.64), Seymour**

Based on the latest bridge inspection performed on September 30, 2003, the bridge has an overall condition rating of four (poor condition) due to extensive steel deterioration to Span 1. The recommendation is to replace Span 1 with a new riveted built-up deck girder.

Site No. 2 - Bridge No. 08276R over Spruce Brook (M.P. 19.21), Beacon Falls

Based on the latest bridge inspection performed on March 30, 2004, the bridge has an overall condition rating of five (fair condition) due to extensive deterioration to the substructure and bearing assemblies. The recommendation is to replace the existing bridge with a culvert.

Site No. 3 - Bridge No. 08277R over Sugar Bush Brook (M.P. 20.11), Naugatuck

Based on the latest bridge inspection performed on April 20, 2004, the bridge has an overall condition rating of five (fair condition) due to extensive deterioration to the substructure and bearing assemblies. The recommendation is to replace the existing bridge with a culvert.

Site No. 4 - Bridge No. 08283R over Hop Brook (M.P. 22.42), Naugatuck

Based on the latest bridge inspection performed on April 16, 2004, the bridge has an overall condition rating of four (poor condition) due to extensive deterioration to the substructure and bearing assemblies. The recommendation is to replace the existing bridge with a culvert.

This project is estimated to begin in January 2012 and to be completed November 2012.

New Haven Yard - Supply Substation 1086 (Project No. 0301-0038)

This project will construct a new substation to provide a new power source for the NHL traction power (overhead catenary) system from the power utility, United Illuminating (UI), adjacent to New Haven Union Station. Currently, the east end of the NHL traction system is only fed from the Devon substation, adjacent to the Housatonic River. This has resulted in low voltage levels on the east end of the NHL. Projected traction power loads will increase due to increases in fleet size and scheduled service, plus the need for a stable power source for the new, high-technology M-8 cars. Therefore, this additional electrical supply point is required to increase voltage level that would allow more conservative protective relay settings, efficient train acceleration, and more reliable operation of the new M-8 cars. Funding is in place and bids were opened for the construction contract in December 2010. Agreements have been consummated with the power supplier, UI, to provide for their portion of the work and to purchase the specialized switchgear needed for the substation. Construction is anticipated to be completed by late 2012.

New Haven Yard - Independent Wheel Truing (IWT) Facility (Project No. 0300-0039)

This facility will be used to reprofile the steel wheels on the new and existing NHL and Shoreline East rolling stock. This reprofiling consists of milling the wheels to restore wheel diameter parity and profile because of the stresses of track wear, drift, spalling and wheel flat spots. The wheel machine is mounted under-floor for ease of operation. Vehicles are pulled over the machine to speed turnaround time. The machine will be a tandem type machine that can true both axles on a truck at the same time. The building will enclose the machine pit on a single track plus

extensions to house a pair of cars indoors at both ends of the facility. Design is complete, and construction is anticipated to be complete by mid-2013.

New Haven Yard – Rehabilitate 152 Water Street for Maintenance of Way Facility (Project No. 0301-0124)

This project will provide a facility to house the MNR departments that maintain the yard and main line infrastructure. This will address both short and long-term needs. The short-term requirement is to accommodate Structures Department staff currently housed in the Stores Building, which is slated for demolition in 2013. The current plan is to move this operation to the existing building on the 152 Water Street property currently being purchased. The existing building requires minor life safety upgrades before it can be occupied. This requires the 152 Water Street property to be acquired by early 2012. Long term needs will be addressed in the Yard Master Plan Update. The current schedule for this work calls for completion of the renovations by early 2013.

New Haven Yard - Rewire Snow Melters (Project No. 0301-0140)

This project will re-feed the yard and Main Line switch snowmelters from the traction power system to the Yard power system. This will alleviate an anticipated deficit in Traction power for the 2012/2013 winter season. This is required during the interim period when the new M-8's are onsite and the new 1086 traction power substation is not online yet. Design is complete and the project is estimated to be completed by the fall of 2012.

FFY 2012-2016 – CAPITAL PLAN - CONSTRAINED

FFY 2012 - Constrained

New Haven - Hartford - Springfield 2030 Vision for High-Speed and Intercity Passenger Rail Service in New England Environmental Assessment (Project No. 0170-2296)

The scope of this project is discussed in Section 4.6 of the SPR. The discussion includes the sources of the funding the project has received to date. Partial funding for this project is included in the Department's Capital Plan and the remainder of the project is one of the Department's Major Long-Term Unfunded Initiatives.

Bridge Design (Current Project No. 0300-0033)

The Office of Rail has contracted with consulting engineering firms to perform inspections of the railroad bridges. All inspections are concluded with a written report for each individual bridge outlining the general condition of the structure, noting any deficiencies and recommending repairs as required. Consulting engineering firms provide services to the Department for development of the "Bridge Repair Program" for railroad bridges. The purpose of the bridge programs is to develop a comprehensive schedule of maintaining the structural integrity and safety of the railroad bridges. This project includes the design fee for repair or replacement of various bridges. This is an ongoing program and is based on the bridge inspection reports.

Devon and Cos Cob Bridges - Preliminary Engineering (Project No. 0300-0077)

This project is for the preliminary engineering phase for the Devon and Cos Cob moveable bridges.

Bridge over the Housatonic River, also known as the Devon Bridge

The Bridge carries four tracks of MNR, including service to Amtrak's NEC, over the Housatonic River in Stratford/Milford, Connecticut. The seven-span, open deck, steel truss structure was constructed in the late 1800s, rehabilitated in 1991, and has a total length of 1067 feet. The fourth span from the west consists of a bascule lift movable span. The abutments and stone masonry piers are constructed of cut stone masonry. The Bridge is owned by the Department, operated, and maintained by MNR.

A feasibility study was completed in December 2010 that included engineering, feasibility, and economic analysis report that investigated appropriate short and long-term repair alternatives, as well as rehabilitation and replacement alternatives. In support of the feasibility study, an in-depth inspection will be conducted of the Bridge, as well as underwater inspection and ultrasonic testing of all truss pins.

Bridge over the Mianus River, also known as the Cos Cob Bridge

The Bridge carries four tracks of MNR, including service to Amtrak's NEC, over the Mianus River in Greenwich, Connecticut. The twelve-span, open deck, steel truss structure was constructed in late 1904, rehabilitated in 1989, and has a total length of 1089 feet. The seventh span from the west consists of a bascule lift movable span. The abutments and piers are constructed of cut stone masonry. The Bridge is owned by the Department, operated, and maintained by MNR. The intent of this phase of the project is to conduct an engineering feasibility and economic analysis study that investigates appropriate short and long-term repair alternatives, as well as rehabilitation and replacement alternatives. Final design and construction support services are not included in this phase of the work

The purpose of the study is to provide the Department with a comprehensive report that will allow the Department to make management decisions regarding the future allocation of funds relative to the repairs and long-term options associated with the Bridge. The report will identify existing deficiencies, and any necessary short-term repairs as well as present rehabilitation and replacement alternatives. The study will be completed in early 2012.

New Haven Yard - West End Yard (Project No. 0300-0138)

A new six-track storage yard for EMU cars will be constructed within the footprint of the former Stores Building and connected into the existing track network. The new yard will provide storage for two 10 car trains and four eight car trains with full service utilities (toilet dumps, paved aisles, water, high mast lighting). This will provide the storage required for the anticipated EMU fleet expansion. This will be constructed after the Stores building is demolished, in late 2013.

New Haven Yard - Design (Project No. 0301-0088)

Under this program of projects, new rail car storage and maintenance facilities will be designed and constructed as part of the program to purchase new rail cars for the NHL. These are critical to providing reliable service, and are necessary to handle the maintenance, servicing, and storage needs for both the new M-8 EMU cars as well as continued upkeep for the existing fleet

(M-2's, M-4's, M-6's, Diesels, and Coaches). The maintenance facilities can then return to a two-shift, weekday operation to support the combined fleet.

This program requires an EA/EIE, which was approved in May 2009, and will require Flood Plain Management and Coastal Area Consistency permits for each individual project. Rights-of-way acquisitions will be limited to utility and access easements, plus possible offsite locations for employee parking and a central warehouse.

These facilities will be constructed in phases over many years under a series of construction contracts. Individual construction projects are being designed and constructed based on prioritized needs and staging within existing yard operations. Construction on the first phase started in 2008 with construction on the subsequent phases continuing through 2020. A combination of federal and state funds will fund this program. Only a portion of the projects has an identified funding source. Each project is discussed in detail in this Appendix.

New Haven Yard - Stores Building Demolition (Project No. 0301-0111)

Once all of the current occupants of the current Stores Building ("Building 10") have moved into their new quarters in the Component Change out Shop and elsewhere, the Stores Building will be demolished to make way for the West End Storage Yard. This is scheduled for late 2013.

New Haven Yard - Running Repair Shop Upgrades (Project No. 0301-0125)

The existing Running Repair Shop will be upgraded so that it can be used more effectively as a Service and Inspection Facility. Rooftop access platforms, a stand-by generator, additional Stores and employee welfare facilities, and upgraded cranes will be provided. This will occur after the Component Change out Shop project is complete in 2012 and the current Running Repair operation is relocated to the EMU Shop in 2013. The project is currently in the Schematic Design Phase.

New Haven Yard - Power Upgrade (Project No. 0301-0144)

This project will provide a new feed from the power utility (United Illuminating) for the yard power distribution system. This is required because, as the new yard facilities are brought online, power consumption is anticipated to exceed the capacity of the existing feeders by 2013. In addition, the existing feeders are shared with other customers, are aerial, and are on the same pole line. This project will provide two dedicated feeders with sufficient capacity for long-term future expansion, installed underground and fed directly from UI's Water St. substation. A new Point of Entry enclosure will be constructed on the former USPS property adjacent to the Route 34 overpass. This will serve as the interface between UI and MN. A new duct bank will be installed to feed the existing Hallock Street substation from the new POE. This project is under design now, with construction estimated to be completed by late 2012.

Main Line Catenary Replacement – Section C1A and C2 (Project No. 0301-0145)

This project includes catenary replacement C1A between East Norwalk and Westport (CP241 (Mile Point 41.3) - CP 248 (Mile Point 48.4) and catenary replacement C2 between Bridgeport and Milford (CP255 (Mile Point 55.3) - CP261 (Mile Point 60.5)). The estimated completion date is January 2015.

Positive Train Control (PTC) - Construction – New Haven Main Line (including Waterbury Branch Line) (Project No. 0301-0049)

As discussed above, this project will fund the installation portion of the new radio systems and equipment and retrofitting the trains. The project is estimated to be completed in March 2016.

NHL Bridge Timber / S- Program (Annual)

The S-Program is an annual program of bridge repairs driven by the continual bridge inspection program to address condition 4 and 5 ratings on NHL railroad bridges. The Timber Program consists of the renewal of bridge timbers on NHL railroad bridges. The program is developed jointly by inspections of the Department's Rail Construction Unit and MNR personnel to determine the condition and remaining "life" of the timber bridges. Dapping Plan designs are performed by the Department to turn over to MNR for procurement and installation.

The two active S-Programs are S-19, State Project No. 0300-0155 and S-20, State Project No. TBD. S-19 Bridge Repair Project is continuing with the program 75 percent complete. Additional work that was anticipated to be done in S-19 will be transferred into S-20 to utilize MNR's work forces more effectively. The S-20 Bridge Repair Project consisting of 19 bridges on the New Haven Main line for various is underway.

Bridge Culvert Replacement Program (Annual) (Project No. TBD)

This project includes construction costs for various bridges. This is an ongoing capital program.

NHL Track Program (Annual)

The Concrete Tie Track Program is a cyclical program for the continued maintenance of the track structure on the NHL. The project involves the purchase and installation of wood ties, turnouts, renewal of interlockings continuous welded rail, timbers at various bridges as well as surfacing track miles. Each project receives its own state project number and is typically funded by various FTA grants. All work is based on the annual cycle to maintain operating speeds and comfort.

NHL Branch Line Improvements (Project No. TBD)

The Department has identified improvements needed on the NHL branch lines through the *Danbury Branch Electrification Feasibility Study* and the *Waterbury and New Canaan Branch Needs and Feasibility Study*. These studies are discussed in more detail in Chapter 4. The scope of this project has not been developed, but some of the improvements recommended in the studies include:

Danbury Branch Line

These improvements support the efforts identified in the *Danbury Branch Electrification Feasibility Study* (Study). The Study (Phase 1) recommended improvement options that required an EIS to implement (Phase 2).

At the Bethel Station, improvements recommended include expanding the existing surface parking lot by approximately 130 spaces for a new total of about 320 spaces. The additional parking is within the current station property therefore no property acquisition is required.

At the Merritt 7 station, improvements recommended include the construction of a 200 space surface parking lot for commuters on the west side of Glover Avenue opposite the north end of the existing station parking. Property acquisition will be required. Other improvements include the replacement of the existing low-level platform with a 500 foot long (six car) high-level platform with canopy, waiting shelter, access stairs and ramps. A pedestrian overpass is needed over the tracks to provide access to the commercial development on the east side of the tracks with stairs and an elevator at the platform or west side. The overpass would land at the elevated main entrance of the adjacent development.

At the Redding Station, recommended improvements include expansion of the existing surface parking by about 100 spaces for a new total of approximately 180 spaces. The additional parking is within the current station property therefore no property acquisition is required.

At Cannondale Station, recommendations include extending the existing high-level platform by 300' to provide a total length of 500' sufficient for a six-car train and expanding the existing surface parking lot by 50 spaces to provide 190 spaces.

At Branchville Station, recommendations include revising the access to the station by relocating Portland Avenue to the south and reconstructing Depot Road. Such improvements are also being proposed in SWRPA's Route 7 Study and implementation must be coordinated between the studies. Depot Road would be terminated at the station parking lot and the existing at grade crossing eliminated. The Depot Road Bridge over the Norwalk River would be replaced. Portland Road and its at grade crossing would be relocated approximately 150' to the south to enter Route 7 opposite Old Town Road. A new Portland Avenue bridge over the Norwalk River would be required. This would allow for expanded parking in the area between the existing and relocated Portland Road and would require the acquisition of property for expanded parking in the area between Route 7 and the Norwalk River opposite the station.

From South Norwalk to Danbury, other recommendations electrification, passing sidings, curve realignments, and station improvements. From Danbury to New Milford, extension and improvements include extending diesel service to New Milford, track reconstruction, curve realignments, passing sidings, new stations, and electrification. The Transportation Strategy Board included an option for partial electrification from South Norwalk to the vicinity of the Route 15 (Merritt Parkway) near the Wilton Station.

Waterbury Branch Line

These improvements support the efforts identified within the *Waterbury and New Canaan Branch Needs and Feasibility Study* (Study).

The Study identified several improvements to the Waterbury Branch Line that would require the preparation of an Environmental Impact Statement. These improvements include the following: a new station at the "Devon Y" which would allow the Waterbury Branch Shuttle to meet inbound and outbound trains without having to travel on the mainline to Bridgeport; a new parking facility in Derby (over 200 spaces) along with significant improvements to the Derby Railroad Station; the acquisition of property from Pan Am Railway in Waterbury for a new rail storage yard and light maintenance facility; and parking improvements at the Waterbury Station (over 200 spaces).

New Canaan Branch Line

These improvements support the efforts identified within the Study for the New Canaan Branch Line.

The improvements would include extending the signal system to New Canaan Station and providing remote switch operations, adding a passing siding, extending the existing platform, and adding second platform at Springdale, adding New Canaan Station signalization, extending platforms at New Canaan, adding a second platform at Talmadge Hill and expanding parking at Talmadge Hill.

Stamford Parking Garage (Project No. TBD)¹⁰⁹

The Department is making plans to demolish the existing 700-vehicle garage, which was built in the late 1980s, and replace it with 1,000 parking spaces at or in close proximity to the existing facility. The existing garage, while structurally sound, was poorly built and will require extensive maintenance and reconstruction efforts in the years ahead in order to remain fully functional and safe to operate.

Before the facility is demolished, and as required by Public Act 09-186, the Department must make plans to accommodate those commuters presently parking at the facility. This analysis will become part of the Connecticut Environmental Policy Act document that must be completed for this project. All options for maintaining the supply of commuter parking are being investigated, including exploring public/private partnerships with the local development community. The Department will make a decision on how best to accommodate these commuters.

FFY 2013 - Constrained**Transit Capital Planning (Annual) (Project No. TBD)**

The Department programs funding for consultants to conduct transit capital planning studies on a variety of topics.

Positive Train Control (PTC) - Construction – New Haven Main Line (including Waterbury Branch Line) (Project No. 0301-0049)

- Discussed in FFY 2012

NHL Bridges - Rehabilitation of Walk and Saga Moveable Bridges, East Avenue Bridge Replacement, and Osborne Avenue Rehabilitation (NHL) (Project No. 0301-0040)**East Avenue Bridge in Norwalk-rehabilitation (Project No. 0300-T124)**

This bridge (No. 42.14, East Avenue in Norwalk), carries four New Haven Main Line tracks, an open superstructure founded on cut stone masonry gravity type abutments. This superstructure consists of one simple span comprising built-up riveted through girders, floor beams and stringers. The span length is 39 feet. Existing vertical clearance is 12 feet 7 inches. Based on annual bridge inspection this bridge is in poor condition. Replacement with ballast deck is required to restore proper functioning of the structure, as well as to increase ride comfort. In addition, existing substructures shall be modified to carry new loads.

¹⁰⁹ Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

Osborne Avenue Bridge in Norwalk Project No. 0300-0033 (PE)

This project is for preliminary engineering design phase for the future rehabilitation of the railroad bridge M.P. 41.96 over Osborne Avenue in Norwalk. The existing bridge consists of a single span constructed in 1894. The bridge is 43 feet long and the out-to-out deck width is 49 feet. The vertical clearance under the bridge is posted for 10 feet – 10 inches. The bridge has superstructure as, riveted built-up through girders, supported by stone abutments. Based on annual bridge inspection, this bridge is in fair condition, given a rating of five and load rating is E52 for normal railway traffic.

The project will require replacement of the existing superstructures, with ballast deck and rehabilitation of existing substructure. This project does not include improvements, relative to the widening of the road or any increase to vertical clearance.

The estimated completion for this project is February 2021.

NHL Bridge Timber / S- Program (Annual)

- Discussed in FFY 2012

Bridge Design (Current Project No. 0300-0033)

- Discussed in FFY 2012

Newly Authorized Additional State Funding - FFY 2012**Walk and Saga Bridge – Interim Repairs (Project No. 0301-0150)****Walk and Saga Bridges Rehabilitation**

In November of 2000, the Department completed a study of the Walk Bridge in Norwalk and the Saga Bridge in Westport. The study provided information on the present versus alternative alignment and a type of movable structure recommendation. The study alternatives included short-term repairs, rehabilitation, and replacement. The rehabilitation of these structures is supported in the TSB's 2003 strategy. The Department is proceeding with the rehabilitation recommendation. The design phase for the rehabilitation of these bridges is currently underway.

The Walk Bridge, constructed in 1896, is a four-track swing bridge that spans 562 feet over the Norwalk River. It has experienced increasing deterioration and mechanical problems over the years. Being a swing bridge, if the bridge fails in the open position, there is no rail service.

The Saga Bridge, constructed in 1904, is a bascule lift bridge that spans 458 feet over the Saugatuck River. The Saga Bridge is double-spanned, meaning it has two parallel, identical spans, both separately moveable structures, each containing two tracks (for a total of four). In case of malfunction, rail can still operate on two of the four tracks. It also has experienced increasing deterioration and mechanical problems over the years.

Interim Repairs are scheduled.

Clinton Railroad Station (SLE) (Project No. 0310-0059)

The project consists of a new north side platform and canopy (similar to the existing south side platform), new elevator/stair tower assemblies, a new pedestrian overpass and associated site work. The existing south side passenger shelter frame will be removed to make room for the south side elevator and stair assembly.

Clinton Interlocking (SLE) (Connecticut Share) (Project No. TBD)

This project would include a new interlocking and siding in Clinton. Currently there is a long section of track between Guilford and Old Saybrook. The interlocking and siding will allow trains to switch from one track to the other, which would be beneficial for the efficient movement of trains. The Department would share in the cost of the project with Amtrak.

NHL Station Improvement Program (Phase A - Project No. 0300-0153) (Phase B – Project No. 0300-0154) – Funding included in FY 2012-2013

The purpose of the program is to accomplish long-term maintenance issues and minor improvements that were highlighted in the *Train Station Visual Inspection Report*.¹¹⁰ The Department produced the report after an inspection was conducted of all NHL rail stations. This inspection included a review of all aspects and components of each station. From this review, a comprehensive program has been developed to provide for needed maintenance, repair, and expansion of the Connecticut stations.

\$10 Million in ARRA Stimulus funds have been allocated to perform various station improvements along the NHL including the three branch lines. In keeping with the intent of the ARRA legislation, this program was advertised in two stages to expedite the start of construction.

Phase A

This project is making various improvements and repairs to the railroad stations on the New Haven Line, Waterbury Branch Line, Danbury Branch Line, and New Canaan Branch Lines. The improvements and repairs will include replacement of the metal roof decks on the platform canopies; field painting of the station canopies, railings, and platform markings; installation of benches; installation of trash receptacles; installation of platform shelters; replacement of canopy gutters and downspouts; installation of bicycles racks; platform repairs; and repairs to guardrails. Some or all of these items shall be accomplished at each of the 36 stations in the MNR operated system. MNR forces will also be incorporating a grounding system at all stations that currently do not have them.

Phase B

This project is making various improvements and repairs to the railroad stations on the New Haven Line, Waterbury Branch Line, and Danbury Branch Line. The improvements and repairs will include platform pier and surface modifications and improvements, full and partial depth concrete patch repairs at various locations, repairs to platform stairs and lighting. Improvements also included renovating the Wilton Station in order to bring the facility back in service. Some or all of these items shall be accomplished at 13 stations in the MNR operated system.

The scope of the project will be adjusted to use the entire \$10 million allocated along with any other funds that might become available. Phases A and B completion date is early 2012.

¹¹⁰ Conducted by Office of Rail, January 2007, <http://www.ct.gov/dot/cwp/view.asp?a=1386&q=332450>

Phase C

Phase C will include a comprehensive Engineering Review and Assessment of all NHL locations identifying remaining, outstanding station building, platform, and parking area needs. Reports generated would help to package any future projects should funding become available. Final reports are anticipated by the end of 2011.

Fairfield Metro Station Additional

Additional funding has been allocated to costs associated with constructing the new Fairfield Metro station.

NHL Station Improvement Program (Phase A - Project No. 0300-0153) (Phase B – Project No. 0300-0154)

- Discussed above - Funding included in FY 2012-2013

M-8 Electric Multiple Unit (EMU) Rail Car Purchase (Project No. 0300-0116)

This project will provide funding for the remaining 25 additional single M-8 rail cars and for communications upgrade as discussed in Chapter 4.3.

Newly Authorized Additional State Funding - FFY 2013**Bridge Culvert Replacement Program (Annual)**

- Discussed in FFY 2012

Walk and Saga Bridge – Interim Repairs (Project No. 0301-0150)

- Discussed in Newly Authorized Additional State Funding - FFY 2012

Interlocking and Drainage Program (Annual)

This annual program is designed to address the renewal of interlockings and turnouts on the NHL. The current project (No. 0301-0083) consists of welding of previously installed interlockings remains and the purchase of turnouts for CP 257. As funding is identified, separate projects will be developed to renew specific interlockings and turnouts.

Madison Railroad Station (Project No. 0310-0058)

The scope of this project has not been developed but it will be similar to the other SLE station projects including a new north side platform and canopy (similar to the existing south side platform), new elevator/stair tower assemblies, a new pedestrian overpass and associated site work. There is a need for additional parking at this location and there is potential for structured parking. The parking improvements may be included in this project or it could become a separate project.

Stamford Parking Garage (Project No. TBD)¹¹¹

- This project is discussed in FY 2012 – Constrained

¹¹¹ Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

New Haven Union Station Parking Garage (Project No. 0301-0114)¹¹²

This project will create at least a 670-space to 1,000- space garage on the parcel of State-owned land between the historic Union Station and the Church Street Extension overpass over the New Haven Rail Yard. The facility will feature a pedestrian bridge connecting the new garage to the station building at its second level. This will allow separation of pedestrian and vehicular flow. The lowest level of the facility is envisioned to be an area for the circulation of bus, taxi and rental cars. With Union Station being on the National Register of Historic Places, this project will require coordination with the State Historic Preservation Office. This project is considered Phase 1 of a multi-phase project where additional parking to meet future forecasted demand would be built adjacent to the existing parking garage on the opposite side of the station. A major challenge is developing a thorough set of documents to ensure preservationists that a new parking supply can be added in such close proximity and, in fact, connect to a historic building. The other major challenge is addressing the temporary relocation of buses, deliveries and normal commuting patterns of patrons during construction.

The preliminary engineering phase will produce 1) a schematic design; and 2) an EA /EIE that will determine environmental and socio-economic impacts, as well as establish an initial estimate for the construction cost of this facility. The Department has selected Medina Consultants to perform the assignment. A scope of work has been developed shared with the City of New Haven. The design is currently underway with all project stakeholders participating.

The Department will gain an understanding of the level of regional and community support or criticism of this project when it holds its public hearing for the NEPA/CEPA document anticipated in early 2012. Following the approval of the NEPA/CEPA document, a supplemental agreement would be negotiated to complete the design effort. Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

NHL Station Improvement Program (Phase A - Project No. 0300-0153) (Phase B – Project No. 0300-0154) – Funding included in FY 2012-2013

- Discussed in Newly Authorized Additional State Funding - FFY 2012

Waterbury Signals and Sidings - Branch Line Improvements – Preliminary Engineering

This project would include the preliminary engineering phase for improving sidings and platforms and signalizing sections on the Waterbury Branch Line.

FFY 2014 - Constrained**NHL Bridges - Rehabilitation of Walk and Saga Moveable Bridges, East Avenue Bridge Replacement, and Osborne Avenue Rehabilitation (NHL) (Project No. 0301-0040)**

- Discussed in FFY 2012

NHL Bridge Timber / S- Program (Annual)

- Discussed in FFY 2012

Bridge Design (Current Project No. 0300-0033)

- Discussed in FFY 2012

¹¹² Information on the status of this project is posted on the Department's website at www.ct.gov/dot under "Major Project Updates."

NHL Track Program (Annual)

- Discussed in FFY 2012

FFY 2015 - Constrained**Transit Capital Planning (Annual) (Project No. TBD)**

- Discussed in FFY 2013

NHL Bridges - Rehabilitation of Walk and Saga Moveable Bridges, East Avenue Bridge Replacement, and Osborne Avenue Rehabilitation (NHL) (Project No. 0301-0040)

- Discussed in FFY 2012

NHL Bridge Timber / S- Program (Annual)

- Discussed in FFY 2012

Bridge Design (Current Project No. 0300-0033)

- Discussed in FFY 2012

Bridge Culvert Replacement Program (Annual)

- Discussed in FFY 2012

NHL Track Program (Annual)

- Discussed in FFY 2012

FFY 2016 - Constrained**Transit Capital Planning (Annual) (Project No. TBD)**

- Discussed in FFY 2013

Rail Rolling Stock - Rehabilitation Program (Project No. TBD)

This project would provide funding for the specification development, and the preliminary, initial and final design phases for the SLE equipment.

NHL Bridges - Rehabilitation of Walk and Saga Moveable Bridges, East Avenue Bridge Replacement, and Osborne Avenue Rehabilitation (NHL) (Project No. 0301-0040)

- Discussed in FFY 2012

Main Street Bridge Stratford

This project will include the rehabilitation of the Main Street Bridge in Stratford. The design for this project is estimated to begin in 2015.

NHL Bridge Timber / S- Program (Annual)

- Discussed in FFY 2012

Bridge Design (Current Project No. 0300-0033)

- Discussed in FFY 2012

Bridge Culvert Replacement Program (Annual)

- Discussed in FFY 2012

FFY 2012-2016 – CAPITAL PLAN – UNFUNDED INITIATIVES**Interlocking and Drainage Program (Annual)**

- Discussed in Newly Authorized Additional State Funding FFY 2013

Code Review of Rail Buildings – Preliminary Engineering (Bi-Annual) (Project No. TBD)

The bi-annual program includes a Code Review Inspection of state owned rail facilities occupied and operated by MNR. The findings of these inspections will lead to a design and construction phase to bring each of the facilities up to current fire, safety and building codes. Facilities that have been completed under this program include the New Haven Union Station, the EMU/CSR Shop in New Haven Rail Yard, the Bridgeport Rail Station, and the Bridgeport Harbor Yard Parking Garage.

Communications and Signal System Replacement Phases 1-4 (Project No. TBD)

The signalization modernization program to include replacing and updating the technology of the signal system is being implemented along the entire NHL including updating the New Canaan and Waterbury branch lines, and overlaying an advanced signal system on the Danbury branch. This also includes updating all rail switches and ancillary apparatus along the way including rail switches, wayside signals, interlockings, and impedance bonds.

The Main Line Signalization (Stage 1) (Project No. 0300-0125) is from the state line to CP 229 (Riverside station). This section is under construction and is estimated to be completed in January 2013.

Substation Component Change Out (Project No. TBD)

The substations require cyclical maintenance, including breakers, transformers, motorized disconnect switches, and other components.

Bridge Culvert Replacement Program (Annual)

- Discussed in FFY 2012

High-Level Platform Rehabilitation (Annual) (Project No. TBD)

This is an annual program included in the Rail Station / Maintenance Program that includes rehabilitation of the platforms.

Radio System Upgrade (Project No. TBD)

This project will include replacement of the existing radio equipment system wide as mandated by the Federal Communication Commission.

Security Improvements (Annual) (Project No. TBD)

This is an ongoing program to invest in security enhancements. The project to upgrade the network infrastructure (Project No. 0300-0150) is a partially funded project to upgrade the current fiber optic hardware and install cameras along the Main Line of the NHL. There are additional security projects planned.

NHL Parking Program (Annual) (Project No. TBD)

Adding parking capacity to accommodate existing and expanded ridership on the NHL and SLE services is a priority of the Department. Despite efforts in past years to increase parking for rail commuters, parking capacity continues to be an issue in many areas and will require cooperation and agreement from all stakeholders to resolve.

Transit Capital Planning (Annual) (Project No. TBD)

- Discussed in FFY 2013

Guilford Railroad Station Parking Expansion (Project No. 0310-0039)

This project will create an additional 100 parking spaces at the Guilford SLE Railroad Station on the north side of the tracks on a portion of the town-owned Woodruff property.

Wilton Tiered Parking at Railroad Station (Project No. 0161-0136)

The project includes the construction of a parking structure at the Wilton Railroad Station located at US 7 and CT 33 in the Town of Wilton.

Customer Service Initiatives - NHL (Project No. TBD)

This project will bring real time customer information to stations in New York and Connecticut. This strategy also provides the capability to upgrade the speed with which ticket selling transactions and downloads can occur (particularly on heavy demand days); tie in Closed Circuit Television Video cameras to a central location, etc.

Code Review of Rail Buildings – Preliminary Engineering – Construction (Bi-Annual) (Project No. TBD)

The bi-annual program includes a Code Review Inspection of state owned rail facilities occupied and operated by MNR. The findings of these inspections will lead to a design and construction phase to bring each of the facilities up to current fire, safety and building codes. Facilities that have been completed under this program include the New Haven Union Station, the EMU/CSR Shop in New Haven Rail Yard, the Bridgeport Rail Station, and the Bridgeport Harbor Yard Parking Garage.

Fleet Replacement Specification Development - SLE (Project No. TBD)

The Mafera rail cars currently employed in Shore Line East service were manufactured in 1991. The Department purchased these thirty-three (33) cars from Virginia Railway Express in 2004. This equipment has undergone a rehabilitation/ modification project to make the equipment compatible with the existing fleet. This equipment has been in revenue service since 2005, and has and continues to serve the commuters on the SLE very well. In addition to the Mafera equipment, the Department will also replace the aging locomotive fleet with locomotives that will provide the latest in FRA requirements for PTC and high speed rail operations. The Department has identified this fleet for replacement in the 2016-2018 timeframe, since at that point the equipment will have reached its useful life expectancy.

This project would be for the specification development, preliminary, initial and final design review phases. The Department would prepare a Request for Proposal (RFP) for the manufacture and delivery of the next generation of diesel hauled passenger rail equipment to

provide intrastate and interstate commuter rail service operations on the NHL and the New Haven-Hartford-Springfield (NHHS) service.

NHL Bridges - Rehabilitation of Walk and Saga Moveable Bridges, East Avenue Bridge Replacement, and Osborne Avenue Rehabilitation (NHL) (Project No. 0301-0040)

- Discussed in FFY 2012

NHL Bridge Timber / S- Program (Annual)

- Discussed in FFY 2012

Bridge Design (Current Project No. 0300-0033)

- Discussed in FFY 2012

NHL Track Program (Annual)

- Discussed in FFY 2012

NHL Station Improvement Program (Annual) (Project No. TBD)

This program is designed to provide the required maintenance, repairs, and investment in capital improvements at stations along the Main Line of the NHL.

Smart Card Implementation Program

MNR will undertake a Smart Card Pilot and Studies project as part of the MTA-wide initiative to implement new fare payment technology at all its operating agencies. The goal of the project is to implement a system based on an open standard payment system/bank card standard. For the railroads, this new contact less fare payment system will allow customers to “tap” their smart card (or device) to pay their fare. Whether or not this payment method will be the only option or the main fare collection vehicle along with limited presenting of tickets or passes will be determined as part of the detailed business case analysis element of the project.

MTA and the railroads (MNR/LIRR) are considering different models for fare collection validation including validation off board and/or on board. The plan is to pilot the most viable scenarios to assess the technical and operational implications to select the likely adaptable scenarios for full implementation; as well as conduct related studies to effectively evaluate the financial viability, technical feasibility, operating, labor, and infrastructural impacts necessary to implement contact less smart card acceptance system wide.

**FFY 2012-2016 – CAPITAL PLAN
MAJOR LONG-TERM UNFUNDED INITIATIVES**

New Haven Yard Master Complex – Tier 1, 2 and 3

Central Distribution Warehouse (Project No. 0301-0121):

A new central warehouse is required for the overall NHL to serve as the main distribution point for stores material for the storerooms contained within the individual shops, as well as for major components of the M-8 cars. The Department has evaluated several options for this, including purchasing and fitting out an offsite warehouse to serve this purpose, or constructing a high-density automatic storage and retrieval system (ASRS) directly adjacent to the Component Change out Shop. Either option must occur prior to demolition of the Stores Building, which is scheduled for mid-2013. After analyzing several available offsite locations, the Department has

determined that the most cost effective option is to construct the ASRS adjacent to the Component Change out (CCO) shop.

Employee Parking (Project No. 0301-0120):

It will be necessary to purchase or lease offsite parking areas for Railroad employees, since the areas currently used for parking will be displaced by the footprint of new facilities. The first major displacement of parking will occur when the Independent Wheel Truing Facility starts construction so an interim plan to accommodate employee parking within the site or offsite needs to be in place by that time. Currently, temporary parking is being added in selected locations throughout the New Haven Rail Yard to the Independent Wheel Truing Facility project by Addendum, and the adjacent CSX and New Haven Reserve properties are being purchased to provide some of the required space for parking in the short term. A long-term plan will be identified during the Yard Master Plan Update.

Existing Wheel Mill Upgrade (Project No. 0301-TBD):

The existing wheel mill is to be retained for the long-term future. It will supplement the new Independent Wheel Truing Facility's capacity. The existing milling machine is very out of date and needs to be upgraded. The existing building is in poor condition and requires life safety and serviceability upgrades. A study has been completed to determine the scope and cost of these upgrades. It is anticipated that this project will go to construction after the new IWT is completed in early 2013.

EMU/Program Shop Upgrades (Project No. 0301-0126):

The existing EMU shop will be renovated to convert it to a Program Shop and extend the service life of the building. The shop area will be provided with a new roof and wall systems to meet energy codes. A new DC power system will be installed. This will occur after 2015.

East End Yard (Project No. 0301-0127):

The track will be reconfigured between the main line and the east end of the yard to provide redundant connections between the main line and the yard, to provide connections to the east end of the shops, and to provide for the footprint of the car wash facility. Utilities, catenary, and site work will also be upgraded. This will occur after 2015.

Main Line Signal System Modification (Project No. 0301-0128)

The main line signal system will be modified to add a portion of the main line/yard interface to the main line interlocking. MNR forces will perform this at the same time as the East End Yard project.

Car Wash Facility (Project No. 0301-0131):

A new car wash facility will be constructed at the east end of the yard, located so that trains can access any yard storage track after washing. This will be a fully enclosed all weather facility. This will extend the service life of the rolling stock and enhance appearance. This will occur simultaneously with the East End Yard, after 2015.

Convert CSR Shop to Paint and Heavy Repair Shop (Project No. 0301-0130)

The existing CSR shop is to be renovated and converted to a Paint and Heavy Repair Shop. The exterior skin of the building will be replaced to meet energy codes and extend the service life of the building. A paint booth will be installed on one track. A continuous jacking pad will be installed on the heavy repair tracks. The office space will be upgraded or replaced. This will occur after 2015.

Pedestrian Bridge (Project No. 0301-0123):

A pedestrian overpass that connects the various major shop facilities (Component Change Out, EMU, and Wheel Truer) to the south station platform (Platform D) will provide a sheltered unhindered access way between these facilities. This will greatly enhance safety by eliminating grade level track crossing by employees, and encourage commuting by train to work. The schedule and funding for this work is TBD.

Fuel Cells in Component Change Out Facility (Project No. 0301-0122):

A study was completed per Legislative direction that concluded that fuel cells could satisfy the base load of the Component Change out Shop. A space has been set aside for them outside the CCO building footprint, but inside the possible onsite Central Warehouse footprint, and the CCO building has been designed to accommodate future installation. The method of procurement, installation, and maintenance must be determined.

Yard Signal System (Project No. 0301-0129):

There are many switches in the yard between the west end storage yard and the main line. These are to be controlled by a yard signal system, similar to the system in place for the '60's yard. This will improve operating efficiency, increase safety, and decrease crew costs. MNR forces will perform this at the same time as the East End Yard. The scope of this project will be further refined prior to 2015.

Final Track Completion (Project No. 0301-0132):

The existing "bone yard" tracks will be upgraded with new steel catenary, and any older steel catenary remaining on existing yard connector tracks (Track 38 adjacent to the EMU Shop, the Coal Bridge Track, and the west end of the EMU Shop) will be replaced so that all catenary is up to date. The existing tracks will be rehabilitated to current standards. Remaining utility and site work will be completed to unify the yard facilities. This will be the last project in the New Haven Yard program.

Devon and Cos Cob Bridges – Construction Phase (Project No. TBD)

This project is for the construction phase for the Devon (Milford) and Cos Cob (Greenwich) moveable bridges.

Concrete Tie Program (Cyclical) (Project No. TBD)

The Concrete Tie Track Program is a cyclical program for the continued maintenance of the track structure on the NHL. All work is based on the annual cycle to maintain operating speeds and comfort.

New Haven – Hartford – Springfield Rail Service (Including Rolling Stock)

The funding contained in the Department's Major Long-Term Unfunded Initiatives represents the unfunded portion of the project.

Danbury Branch Line Investments (Annual) (Project No. TBD)

This program is designed to provide the required maintenance, repairs, and investment in capital improvements at stations along the Danbury Branch Line.

New Canaan Branch Line Investments (Annual) (Project No. TBD)

This program is designed to provide the required maintenance, repairs, and investment in capital improvements at stations along the New Canaan Branch Line.

Waterbury Branch Line Investments (Annual) (Project No. TBD)

This program is designed to provide the required maintenance, repairs, and investment in capital improvements at stations along the Waterbury Branch Line.

Orange Railroad Station

Although the City of West Haven was chosen for the location of the railroad station in the July 2007 EIE, which compared the West Haven and Orange sites, this determination did not preclude the future consideration of a commuter railroad station at the Orange site. The FTA has provided an earmark grant for approximately \$1.2 million to prepare a NEPA document and preliminary planning for the Orange railroad station. At this time, the Department is completing the planning and environmental evaluation of the proposed station. A draft EA/EIE is scheduled to be published at the end of 2011.

Rail Freight Program (Annual) (Project No. TBD)

It is the intention of the Department to assist local rail freight operators with infrastructure improvements. The Department supports regional rail freight and intermodal coalitions in the northeast area, such as those advocating the construction of an additional rail crossing of the lower Hudson River to enhance competitive rail freight access to southern New England.

Amtrak Joint Benefit Program (SLE and NHHS) (Project No. TBD)

The Department participates in funding portions of some capital projects on the Amtrak-owned Shoreline Route from New Haven to New London and on the Springfield Line from New Haven to the Massachusetts state line in Enfield.

Catenary Replacement /Maintaining a State-of-Good-Repair – NHL Main Line (Project No. TBD)

To insure the recommendations of the 2005 Traction Power Study are planned, designed, scheduled, and constructed and the investment into the system is protected the following items are required: High voltage transformers rehabilitation, replace synthetic termination strand insulators on Main Line and storage yards, replace high-speed section insulators, replace motor-operated disconnect switches, interlocking lighting at six locations, purchase high-level catenary maintenance vehicles and trailers, retrofit MNR Geometry Car with non-contact power measuring subsystem, and stationary optical system to measure pantograph/contact wire interaction.

Communications and Signals/Maintaining a State-of-Good-Repair (Project No. TBD)

To maintain a state-of-good-repair for the next 20 years, the following are items of the signal system on the NHL, under the jurisdiction of the MNR Power Department that will require replacement: the Signal Power Motor Operated Disconnect Switches and the Signal Power Motor Generator sets.

M-8 Mid-life Overhaul (Project No. TBD)

The new M-8 rail cars will be scheduled for its mid-life overhaul sometime in the 2023-2025 timeframe.

Maintenance Facilities/Maintaining a State-of-Good-Repair (Project No. TBD)

The existing rail maintenance facilities will require maintenance and repair in the years 2018-2025.

Peck Bridge / Maintaining a State-of-Good-Repair (Project No. TBD)

The Peck Bridge will require a rehabilitation to maintain a state-of-good-repair in 2020.

Power Distribution Upgrade – SLE - (Project No. TBD)

The Systra Power Study for SLE (Project No. 0301-0113) will ascertain what is needed for the M-8 rail cars to operate on the Amtrak system and determine what types of upgrades will be needed to the power supply. The extent of upgrades needed and the costs associated with the upgrades are unknown until SYSTRA completes the study. Some of the known upgrades include the electrification of the sidings of Track 6 in New London, part of Track 3 in Old Saybrook, Track 4 in Guilford, and a power distribution upgrade.

Power - Maintaining a State-of-Good-Repair (Project No. TBD)

To maintain a state-of-good-repair to the rail power system at the Cos Cob Supply Station will need upgrading, additional protective relay equipment (Transfer Trip) at all NHL substations, including replacement of Programmable Logic Control systems at three movable bridges, and replacement substation batteries and chargers.

Stamford Maintenance of Equipment and Maintenance of Way Facility/Maintaining a State-of-Good-Repair (Project No. TBD)

Based on an in depth engineering inspection of this existing facility, the Department has determined that a project to renew this facility is warranted. Work will include upgrades to existing maintenance systems and equipment as well as code compliance elements.

APPENDIX B - LONG RANGE SERVICE AND INVESTMENT PROGRAM PROJECT DESCRIPTIONS

FREIGHT RAILROAD COMPANIES

The freight railroad companies in the state submitted the projects and priorities contained in Appendix A and B to the Department for inclusion in the State Rail Plan. Many of the initiatives are needed to maintain current assets and service. At this point, the current list of needs identified and priority rankings submitted by the freight railroad companies in each Appendix have not received regional or multi-state review and the projects are subject to change.

BRANFORD STEAM RAILROAD (BSRR) (TILCON)

Priority projects for BSRR include replacement and upgrade of locomotives and replacement of hopper railcars. The proposed project is for the BSRR to replace one locomotive and re-power a second locomotive for use along its 7.2-mile rail line in the Branford area. The existing main line locomotive, a 1976 Electro-Motive Design (EMD) SW1001 will be replaced with a new BL14CG Cogeneration locomotive that will exceed Tier II standards. The current switcher locomotive, a 1984 GE diesel electric class B-B 85 ton locomotive, will be replaced with a re-powered version of the current EMD SW 1001 engine locomotive. The SW1001 will be re-powered with a two-engine Cogeneration conversion package. The project will also include replacement of 40 100-ton hopper railcars for interchange use to replace existing cars that were constructed in 1964.

CENTRAL NEW ENGLAND RAILROAD

Central New England Railroad (CNZR) priority projects include rail improvements to the Armory Line and the Griffin Line to increase operating speeds. The projects address necessary infrastructure improvements and repairs for portions of the Department-owned statewide freight rail network operated by CNZR. CNZR has two rail corridor maintenance projects that are urgently needed to ensure the continued use of the Armory Line and the Griffin Line. The Armory Line requires improvements such as rail, tie, and ballast replacement; surfacing; bridge deck repairs; drainage upgrades, and new rail cars. The Griffin Line requires similar improvements including rail, tie, and ballast replacement; surfacing; grade crossing upgrades; drainage upgrades; and a new passing storage track with turnouts.

Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)

Priority 1:

- Griffin Line / New grade crossing warning gates and crossing surface at Tobe Road
- Armory Line / Replace Bridge Decks – Scantic River and Broad Brook
- Armory Line / Repair three Bridges per the current CTDOT Bridge Inspection Reports
- Purchase twelve new refrigerator freight cars for new freight customer
- Purchase six new Ballast Cars for track rehabilitation system wide
- Purchase new High-rail Maintenance Vehicles
- Armory Line / Install Ties, Rail, and Other Track Materials - Project locations: Depot to Broad Brook Bridge: Mile Post 11.9 to 13.07, Broad Brook Bridge to Kreyssig Rd: Mile Post 13.08 to 13.91, Kreyssig Rd to Rte. 191: Mile Post 13.91 to 15.7, Rte. 191

- to Scantic Bridge: Mile Post 15.7 to 16.62, Troy Rd To Depot Street: Mile Post 6.77 to 11.9, Rte. 190 to End of Line: Mile Post 16.78 to 20.3.
- Armory Line / Broad Brook Run-Around rebuild and turnouts - Project location: Mile Post 11.67 to 11.9.

Priority 2:

- Griffin Line/ Stabilize soft roadbed - Project locations: Mile Post 2.9 to 3.1, Mile Post 3.6 to 3.9, Mile Post 4.3 to 4.6, Mile Post 4.9 to 5
- Griffin Line / Replace rail: Mile Post 1.0 to 2.0, Mile Post 2.5 to 8.2.
- Griffin Line/ Replace 6200 Ties to support rail project
- Griffin Line / Complete installation of new crossing signals and road crossing improvements, Wintonbury Road, Bloomfield
- Griffin Line / Farmers Exchange track extension and switch, Mile Post 5.1 to 5.15.
- Restore Armory Secondary Connection to CSX (Partner with MassDOT)
- Griffin Line / New gates and flashers at Mills Lane, Mile Post 5.82.
- Armory Line / Install gates and flashers - Project locations: Rte. 140 and Rte.191.
- Armory Line / Refurbish flashers - Project locations: Rte. 190 and Rte. 220.

Priority 3:

- Armory Line / Design and construct Locomotive Repair Facility, East Windsor
- Griffin Line / Drainage improvements, Sigourney Street to Woodland Street, Hartford
- Griffin Line / Drainage improvements, Replace Culvert Mile Post 4.7
- Griffin Line / Install Siding and Switches - Project locations: Sigourney St, Mile Post 0.63 to 0.83; Wintonbury Rd, Mile Post 5.3 to 5.7; Home Depot, Mile Post 7.4 to 7.87.

Priority 4:

- Armory Line / Install double ended siding at state line - Project location: Mile Post 19.8 to 20.1.
- Armory Line / Install gates and flashers at 12 local crossings, South Windsor, East Windsor, Enfield
- Armory Line / Replace switch in Enfield, Mile Post 16.8
- Griffin Line / Rebuild Roger Sherman switch in Bloomfield, Mile Post 4.3.
- Feasibility Study - Collaborate with the CTDECD to attract new freight rail shippers.
- Safety and Security - Fencing, security cameras, improved communications.
- Purchase two "Green" low-emission locomotives
- Acquire right-of-way to Bradley Field, Windsor and Windsor Locks
- Design and construct freight rail connection, in Broadbrook; Former Rockville Branch from Broadbrook to East Windsor.

CONNECTICUT SOUTHERN RAILROAD COMPANY (CSO) / RAIL AMERICA

These projects address improvements and repairs for portions of the statewide freight rail network operated by NECR and CSO. The CSO projects consist of replacing 13,500 ties; 13,640 tons of new ballast; 27.5 miles of surfacing; installing 115 pound per yard rail (replacing 80 pound and smaller rail); a bolt-tightening program; and rebuilding six switches. All of this work will also be conducted on existing railroad owned infrastructure and supporting structures. This project will upgrade track from FRA Excepted to FRA Class 1.

Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)**Priority 1:**Connecticut River Bridge

Perform critical structural repairs to steel work as outlined in the 2010 Bridge Inspection Report. This bridge is the lifeline for the CSO to connect with all customers in East Hartford and those on the Windsor and Manchester Subdivisions. The bridge handles about 1,200 loaded railcars annually, serving 10 customers with 500 employees. Project location: between Hartford and East Hartford, M.P. 1.1-1.2.

Priority 2:Upgrade Rail

Replace small 90 pound and smaller rail in main track with 115 pound rail. The small rail is breaking under heavy freight carloads and poses a long-term safety and maintenance risk. Replacement rail is difficult and expensive to find. Project location: Windsor Subdivision.

Positive Train Control Equipment

Amtrak is required to install PTC on the New Haven - Springfield line for January 1, 2013 activation. This means that the CSO will need to acquire and install PTC equipment on its six locomotives for a cost of approximately \$100,000 per locomotive.

Priority 3:Track Upgrade

This project includes replacement of ties, ballast, switches, and surfacing. This will allow for continued service to existing CSO customers, including large construction debris shippers, thus keeping trucks off the roads and retaining employees. Project location: All CSO subdivisions - Suffield, Wethersfield, Manchester, Windsor, and Bradley.

Priority 4:Switch Tie Program

Switch Tie Program to restore switches to maintenance level after years of deferred maintenance.

Priority 5:Bradley Spur

Replace worn curve rail to maintain service to CSO's route to Bradley International Airport and five customers.

Purchase, dump, and tamp new ballast along 5.5-mile route from AMTRAK main to Bradley Field. This section of the line has seen heavy deterioration of the ballast section and needs restoring to remain in service.

Priority 6:Hartford Yard

Install new switch timbers and repair/replace switch points at north and south ends of the yard to keep the Hartford Yard in service for all CSO customers.

Priority 7:Ditching

These routes have seen a lot of deterioration due to heavy ATV trespasser issues. It also sees many high water conditions and is susceptible to flooding and washouts, thus causing safety and service issues. Project location: Windsor and Manchester subdivisions.

Priority 8:**Manchester and Suffield Subdivision Bridges**

Catch up with deferred maintenance and to keep the lines in service.

Priority 9:**Road Crossings**

Rebuild seven at grade road crossings. Project location: Bradley, Manchester, and Wethersfield Subdivisions.

Priority 10:**Hartford Diamond Crossing**

Replace worn out diamond with a new one. This is necessary to maintain service on the CSO and its busy Hartford Freight Yard. This diamond sees heavy traffic and is located on the switching lead to Hartford yard, the main serving yard for all CSO customers.

Other Projects:**Connecticut Resource Recovery Authority**

Reinstall rail for facility. This facility has the capacity to ship 200 to 250 truckloads or 50 railcars per week. This will take trucks off the road and create jobs. Requires commitment from CRA to use freight rail service.

Feasibility Study/ Bradley Spur

CSO has an existing route to the airport, with very few grade crossings along the approximately five mile long route from the connection with Amtrak's Springfield Line. RA/CSO would like to explore the possibility of operating the service as well as providing the route.

HOUSATONIC RAILROAD COMPANY

These projects address upgrading and strengthening a portion of main line track in western Connecticut operated by the HRRC. Priority improvements for HRRC include replacing 7.5 miles of rail at locations between Derby and Danbury; installing 9 miles of rail between Canaan and New Milford; expanding a storage track in Canaan; renewing three railroad crossings in Canaan; renewing access to Specialty Minerals and Becton Dickenson rail users and employees; installing 92,000 new ties, restore road crossing surfaces; restoring two overhead bridges; repairing culverts and drainage systems; restoring two small overhead bridges; and rehabilitating a major rail bridge over the Housatonic river between Shelton and Derby.

Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)**Priority 1:****Rail Track Program**

Replace 70 year old or older rail, older track material, and ties: Provide for annual phased rail renewal and tie replacement to replace worn rail and old ties. Project location: Main lines from Canaan to Danbury and Danbury to Derby.

Priority 2:**Crossings**

Bring public road crossings up to standard that will permit normal ongoing maintenance and safety. Project Location: Main lines from Canaan to Danbury and Danbury to Derby.

Priority 3:Culverts/ Drainage

Improve culverts/ drainage to accommodate excess water due to upstream development.
Project Location: Main lines from Canaan to Danbury and Danbury to Derby.

Priority 4:Facilities/ Yards

Provide for improved infrastructure to promote truck to rail, rail to truck expansion. Project Location: Newtown and others.

NAUGATUCK RAILROAD COMPANY (NAUG)

These projects address improvements and repairs for portions of the statewide freight rail network operated by NAUG. The proposed improvements and repairs include bridge and culvert updates, track structure, and at-grade crossings. Bridge improvements include Hancock Brook Bridge in Waterbury, Chase Bridge in Waterville, and Jericho Bridge in Thomaston. Six culverts are also in need of replacement. The project covers 19,500 main track ties, 800-900 tons of ballast per mile and the rehabilitation of the Torrington passing siding including heavier rails. These improvements will bring the entire Torrington Branch into a state-of-good-repair. The project also includes two railroad crossing improvement projects, State Route 262, Frost Bridge Road in Watertown and Common Court Road in Waterbury. The project includes:

Prioritized List of Railroad Infrastructure Projects (1 Highest - 9 Lowest)**Priority 1:**Ties, Surfacing and Ballasting

Installation of 19,500 ties, which will bring the line to a solid state of repair, ensuring continued safe operation of freight and passenger trains and accommodation of anticipated new freight traffic. This will also greatly facilitate on-going maintenance of the line. In addition, approximately 800-900 tons of stone ballast will be placed per mile. Project location: Torrington Branch.

Priority 2:Culverts/ Drainage

Culverts along the Torrington Branch range in age from 125 plus year-old stone box culverts to 50-year old concrete pipe culverts. Six of these are in need of replacement, due to its advanced age and deterioration. Additional maintenance and cleaning will be performed on other culverts. Project location: Torrington Branch.

Priority 3:Re-deck, Masonry, and Steel Repairs to Bridge

Project locations: Jericho Bridge (over Naugatuck River south of Thomaston).

Priority 4:Crossing Improvement

Rte. 262 Watertown: The proposed improvement to this crossing would replace the existing signals with current standard, high-visibility flashing lights, and improve the safety of the crossing by installing gates. The track-road surface would be rebuilt to current standards and would better enable the increase in truck and bus traffic projected for the crossing. Project location: Rte. 262, Frost Bridge Road, Watertown.

Priority 5:Re-deck, Masonry, and Steel Repairs to Bridge

Project location: Hancock Brook Bridge

Priority 6:Re-deck, Masonry, and Steel Repairs to Bridges

Project locations: Chase Bridge (over Naugatuck River in Waterville)

Priority 7:Crossing Improvement

Commons Court Road, Waterbury: The crossing is protected by flashing lights installed in 1955. The signal light equipment is old and will be upgraded to current standard LED light heads. Additionally, the relay equipment is obsolete and should be replaced with modern equipment, and modern wiring. Major improvements in the road surface, drainage and track structure will be required as well. This crossing may be impacted by the new City of Waterbury DPW facility adjacent to the rail line. Project location: Commons Court Road, Waterbury.

Priority 8:Replace Rail

- Replace deteriorated 90-year old rail on north end of rail line with 115-119 lb. relay rail.
Project location: Torrington Branch, MP 9 to MP 10.3; MP 15 to MP 16.
- Replace curve-worn rail with 131-132 lb. relay rail in area of increased new heavy freight traffic. Project Location: Torrington Branch, MP 3 to MP 4.2

Priority 8:Plains Passing Siding

The existing 900-foot long, single-ended "Plains" side track in Torrington will be rehabilitated with newer, heavier rails (the existing rails are lightweight rails dating to 1889), and will have an additional track switch installed, giving trains the capability to perform switching and passing moves needed for efficient freight and passenger operations into Torrington.

Priority 9 (If an active customer wants service at that location):Transload Facility

Construct transload/public delivery facility in Waterville.

NEW ENGLAND CENTRAL RAILROAD (NECR) / RAIL AMERICA

These projects address improvements and repairs for portions of the statewide freight rail network operated by NECR. The NECR projects consist of bridgework, replacing 30,000 ties; 23,000 tons of new ballast, 55.7 miles of surfacing, and rebuilding eleven switches. All work will be conducted on existing railroad owned infrastructure and supporting structures. This project will result in upgrading the Connecticut Main Line to a FRA Class 2 and 3 freight speeds and restore the track to a state-of-good-repair. Bridges will be upgraded to handle 286,000 pounds gross rail weight freight cars, which is the national standard. Full double-stack container clearances will be achieved.

Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)**Priority 1:**Upgrading Bridge Structures

This project will increase track capacity on the 68 Connecticut bridges to handle industry standard 286,000 pound freight cars. The Railroad is losing traffic and is unable to secure new

traffic due to the route being unable to handle these cars. Establishing a through corridor along the NECR through New England and connecting with Canada will allow freight rail traffic growth and attract new businesses to rail use in Connecticut. Project location: Connecticut Main Line between Massachusetts and New London, 55 miles (extends into Massachusetts and northern Vermont).

Priority 2:Upgrade Rail

This project would upgrade 21 miles of existing 100 pound rail to 115 pound Continuous Welded Rail to allow for safe movement of heavier 286,000 pound rail cars and restored passenger service. It will have the benefit of reducing service failure and rail test defects. Project location: Connecticut Main Line between Massachusetts and New London, 55 miles.

Priority 3:Track Upgrade

This project includes tie replacement, ballast, surfacing, switch ties, and bridgework needed to sustain existing track conditions. This will allow for continued operation of freight service to existing customer base between New London and the Massachusetts State line. It will include the connection with P&W at Willimantic that provides double stack clearance container service between the Canadian National Ry. and New England. P&W connects with the line at Willimantic and Amtrak at New London. Project location: Massachusetts State Line, Mile Post 55, near Palmer, Massachusetts to New London, Connecticut.

Priority 4:Clear Route for Full Double Stack Container Service

The route currently handles "modified" double stack container equipment, one domestic, and one overseas container stacked on a railcar. As competing routes, such as CSX and PAS, are cleared for full double stack service, this project is needed to keep the CN/P&W route competitive and allow Connecticut and New England customers access to the Port of Prince Rupert, BC and Montreal, PQ. Project location: Connecticut Main Line between Massachusetts and New London, Connecticut (extends into Massachusetts, New Hampshire and Vermont).

Priority 5:Norwich Tunnel Drainage System

This project will establish drainage system inside the tunnel. Currently the tunnel fills with water and rises above the top of the rail. This safety and operating issue affects the majority of Connecticut NECR cars.

Priority 6:Bridge Maintenance

The project is for annual capital needs to sustain existing bridge conditions. This includes piles, abutments, stringers, decks, etc. The project is needed for the continued operation of freight service to existing customer base between New London and the Massachusetts State line. This includes the connection with the P&W at Willimantic that provides double stack clearance container service between the Canadian National Ry. and New England. Project location: Massachusetts State Line, Mile Post 55, near Palmer, Massachusetts to New London, Connecticut.

Priority 7:Willimantic Yard

This project would include rebuilding the yard and installing new crossover interchange connection with P&W. Traffic is increasing between NECR and P&W, including automobiles and containers. This long dormant interchange is seeing renewed rail traffic.

Priority 8:Drainage/Culverts

This project would clean out ditches and repair culverts. This route is very susceptible to flooding and high water flows that can wash out the main track and cause major damage, including interruptions in service. This project would increase the Railroad's ability to handle water flow and thus the safety of train operations. Project location: Connecticut Main Line between Massachusetts and New London, 55 miles.

Priority 9:Hotbox/Weigh in Motion Detectors

The project would include the purchase and installation of two new hotbox/motion detectors. These devices will improve safety along this freight corridor that currently carries hazardous materials. Project location: M.P. 55 and M.P. 43.

Other Project:New London and Palmer, Massachusetts Study

A feasibility study is needed to look at restoring passenger service between New London and Palmer, Massachusetts. The Town of Mansfield and the University of Connecticut have expressed an interest in establishing rail service. The NECR formerly hosted the Montrealer on this route. The Mohegan Sun casino at Uncasville could be a rail station as well.

PAN AM SOUTHERN RAILWAY (PAS)**Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)****Waterbury Branch Track Strengthening Program****Priority 1:**Waterbury Branch Crosstie Replacement

Replace and maintain crossties to sustain a safe and efficient operational status. This will improve the safety, efficiency, reliability, and dependability of the operations by enhancing the railroads infrastructure. Project location: Waterbury to Berlin.

Priority 1 (a): – supporting above tie installation projectWaterbury Branch Track Surfacing

Maintain proper track geometry to sustain a safe and efficient operational status, by supporting surfacing operations on a seven-year cycle. This will improve the safety, efficiency, reliability, and dependability of the operations by enhancing the railroads infrastructure. Project location: Waterbury to Berlin.

Priority 2:Waterbury Branch Rail Replacement

Replace existing jointed rail with either new or fit Continuous Welded Rail. This will improve safety, efficiency, and reliability of the railroads infrastructure and promote a continued growth of goods movement by rail within the state of Connecticut. Project location: Waterbury to Berlin.

Continuous Welded Rail Installation

The Installation of Continuous Welded Rail improves the safety and efficiency of train operations and supports improved train handling by maintaining steady speeds. PAS proposes to install Continuous Welded Rail at the following:

Priority 1:

Project location: through the city of New Britain from a location, Whiting Street installing continuous through to the Wooster Street. – will allow railroad to maintain continuous movement through the City of New Britain with the multiple rail-highway crossings – assist in reducing traffic disruption with the advent of the proposed bus-way project

Priority 2:

Project location: through the city of Bristol from a location west of the Mellon Street Bridge and installed continuous to the North Pond Street Bridge.

Priority 3:

Project location: Terryville Tunnel beginning at the switch to the Terryville Loop and running to a point immediately east of the Hancock River number 2 bridge (Plymouth – Waterbury).

System Priority 1:Bridge Maintenance

Maintaining the entire right-of-way infrastructure is essential to sustaining a safe and efficient operational status. The bridges and other track carrying structures must be capable to maintain and support contemporary, dependable and efficient freight rail operations and allow Connecticut business and industry to connect into – regional, national and international markets.

Priority 1:Promote and Support Contemporary Bridge Clearances

The bridges and other potential clearance obstructions must be capable of accepting traffic that will meet the state's clearance regulations to provide every benefit to Connecticut shippers. Having clearances to accept conventional equipment in this competitive area is essential. Project location: Waterbury to Berlin. Simultaneously supporting acceptable clearances over Amtrak's Springfield Line

General Safety Priority 1:Crossing Maintenance

Maintaining the integrity of crossing warning signals and signs is essential for railroad operations and public safety at all at-grade rail / highway crossings. Project location: Waterbury to Berlin.

Priority Crossing Project 1:Rail – Highway Grade Crossing Safety – Plainville, Connecticut - Route 10 and Route 372 – Dual-Tone Multi-Frequency (DTMF) Switch

There is immense public benefit to support the installation of a DTMF controlled switch accessing Plainville Yard. The controlled switch will minimize the delay and improve the dependability of the crossing protection by not having a crew member manually operate the switch.

Facility Priority Project 1:Plainville Yard

The demands of freight rail goods movement requires safe and efficient switching and interchange operations. Prompt, safe, and effective goods movement influences locations within the state where these functions are vital. Plainville's access to I-84, Rte. 72 and Rte. 9 is

good location. This proposal preserves the integrity of the freight facilities in the Plainville Yard for the present and foreseeable potential for this location.

Facility Priority Project 2:**Waterbury Yard**

The demands of freight rail goods movement require safe and efficient switching and interchange operations. Prompt, safe, and effective goods movement influences locations within the State where these functions are vital. This proposal preserves the integrity of the freight facilities in the Waterbury Yard for the present and foreseeable potential for this location.

PROVIDENCE & WORCESTER RAILROAD

Priority improvements for P&W include rail replacement and tie installation to upgrade the status of the Willimantic Branch from a Class 1 with 10 mile per hour (mph) operations to a Class 3 with 40 mph operations and tie installation to rehabilitate and/or reconstruct the Connecticut River Line (Middletown Branch) from Middletown to Hartford. The reconstruction of the Middletown Branch in conjunction with the Valley Railroad's rehabilitation project will result in a new, shorter freight route between Hartford and Old Saybrook. These projects include:

Prioritized List of Railroad Infrastructure Projects (1 Highest - 5 Lowest)**Priority 1:**

Replace Bridge in Norwich, Connecticut, Mile Post 12.14 over the Shetucket River.

Priority 2:

Install 3000' yard track west of Main Track to support freight operations in Plainfield.

Priority 3:

Running Rail Upgrade - Installation of 136 pound Continuous Welded Rail on the Norwich Branch, Mile Post 1 to Mile Post 14.

Priority 4:

Increase overhead structure clearance to meet Phase 2 requirements of 20'-6" from Putnam to Willimantic.

Priority 5:

Cross Tie Replacement - Installation of 1500 ties per mile on the Norwich Branch, Mile Post 0 to Mile Post 53.

Priority 6:

Crosstie Replacement - Installation of 1500 ties per mile on the Willimantic Branch, Mile Post 3.00 to Mile Post 10.34.

Priority 7:

Crosstie Replacement - Installation of 1500 ties per mile on the Willimantic Branch, Mile Post 10.34 to Mile Post 24.30.

Priority 8:

Crosstie Replacement - Installation of 1200 ties per mile on the Middletown Branch, Mile Post 28.75 to Mile Post 35.88.

Priority 9:

Running Rail Upgrade - Installation of 115 pound relay rail on the Middletown Branch, Mile Post 15.00 to Mile Post 21.

Priority 10:

Replace Bridge 2.58 over Groton Shipyard (Sub base) Driveway.

Priority 11:

Replace Bridge 2.40 over Groton Shipyard (Sub base) Driveway.

Priority 12:

Expand existing equipment repair facility to enable Maintenance of Way equipment repair in Putnam.

Priority 13:

Running Rail Upgrade - Installation of 115 pound relay rail on the Middletown Branch, Mile Post 28.75 to Mile Post 35.88.

Priority 14:

Crosstie Replacement - Installation of 1000 ties per mile in Old Groton Main, Mile Post 0.0 to Mile Post 3.00.

Priority 15:

Crosstie Replacement - Installation of 136 pound continuous welded rail (Continuous Welded Rail) on the Willimantic Branch, Mile Post 9.4 to Mile Post 23.22.

THE VALLEY RAILROAD COMPANY

Valley Railroad Company priority projects include tie and rail improvements on the Connecticut Valley Line between Old Saybrook and Haddam in order to sustain operations of the popular "Essex Steam Train and Riverboat" attraction, which regularly draws in excess of 140,000 visitors a year to the Connecticut River Valley region. The Company employs in excess of 100 people during its operating season (mainly April through December), and a full time staff of 18; with over 40 percent of patronage coming from out-of-state, the Company creates a significant positive economic impact on this part of Connecticut. The projects include on-going upkeep and improvement of bridges, signal systems, vegetation, and service facilities. All improvements are planned and designed in such fashion to accommodate future freight service should routing freight over this line prove feasible or desirable in the future.

Railroad Infrastructure Projects Prioritized (1 Highest Priority – 3 Lowest)**Priority 1:**

- Track Class upgrade to Class 3 MP 4.25 to 9.75, including 2,300 ties, switch timber work, upgrade to sidings at Deep River, re-rail of curve south of Deep River Creek Bridge, one public and one private crossing replacement, ballasting and tamping.
- Track Class upgrade to Class 2 MP 0-4.25, and MP 9.75 to 13.25. Tie and ballast upgrades, tamping as required.
- Every 3 years application of ballast and tamping to 4 miles of track, MP 0-13.25.
- Replacement of (on average) one at-grade crossing per year, spreads the cost of replacement of 34 crossings.
- Bridge inspections and upkeep of paint and masonry on seven active bridges.

- Annual vegetation maintenance by regulated application of weed spray by licensed contractor, cutting of heavy trees along line and at crossing sight-line locations.

Priority 2:

- Upgrade 8 miles of operable track to 112# rail or better, replacing all sub-80# rail on active track.
- Renewal of Parkers Point Road public crossing, Railseal and pavement upgrades at Route 82, passing and house track upgrades at Haddam rail yard.
- Upgrade from lights to lights/gates at Essex Transfer Station Road crossing.
- Re-deck Mud River Bridge (new open-deck ties and bar tie spacer), new culvert at MP .5
- Reconstruct two yard tracks in Essex south yard, build new switch to cut Track 6 back into the main, creating a passing track. Drainage improvements in this yard area.
Renew two public (Route 153) crossings and two private (Dickensons) crossings. Re-cable Route 153 automated warning devices.
- Enclose out-door servicing of locomotives in a new building/inspection pit.

Priority 3:

- Replace one set of signal batteries every two years. With 12 systems, such spread will prevent a large single expenditure of doing several crossings at once.
- Install automatic lights and gates at Parkers Point Road, Chester and Kirtland Street, Deep River.

APPENDIX C - LIST OF ACRONYMS

ADA	Federal Americans with Disabilities Act
Amtrak	National Railroad Passenger Corporation
ARRA	American Recovery and Reinvestment Act of 2009
CCTV	Closed Circuit Television Video
CDEEP	Connecticut Department of Energy and Environmental Protection
C&D Plan	Conservation and Development Policies Plan
C&D	construction and demolition debris
CEPA	Connecticut Environmental Policy Act
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CN	Canadian National Railway
CNZR	Central New England Railroad
COFC	Container On Flat Car
Conrail	Consolidated Rail Corporation
CO2	Carbon Dioxide
CSO	Connecticut Southern Railroad / RailAmerica, Incorporated
CSX	CSX Transportation
CTC	Centralized Traffic Control
DECD Department	Connecticut Department of Economic and Community Development Connecticut Department of Transportation
EA	Federal Environmental Assessment
EIE	State Environmental Impact Evaluation
EIS	Environmental Impact Statement
EMU	Electric Multiple Unit
EPA	U.S. Environmental Protection Agency
FCC	Federal Communications Commission
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	Green House Gases
HOC	High Occupancy Vehicle
HRRC	Housatonic Railroad Company
HSIPR	High Speed Intercity Passenger Rail
LRP	State's Long-Range Transportation Plan
LRSA	Local Rail Service Assistance
MADOT	Massachusetts Department of Transportation
MBTA	Massachusetts Bay Transportation Authority
MNR	Metro-North Railroad Company
MTA	Metropolitan Transportation Authority
MTA PD	Metropolitan Transportation Authority Police Department
MTP	Master Transportation Plan

NAUG	Naugatuck Railroad Company
NEC	Northeast Corridor
NECR	New England Central Railroad
NEPA	National Environmental Policy Act
NHHS	New Haven-Hartford-Springfield
NHL	New Haven Line
NYCEDC	New York City Economic Development Corporation
OPM	Office of Policy and Management
PAR	Pan Am Railways
PAS	Pan Am Southern
RPIIA	Passenger Rail Investment and Improvement Act of 2008
PSNY	Pennsylvania Station New York
PTC	Positive Train Control (PTC)
P&W	Providence and Worcester Railroad Company
RIDOT	Rhode Island Department of Transportation
SLE	Shore Line East
SRP	Connecticut State Rail Plan 2012-2032
STF	Special Transportation Fund
STIP	State Transportation Improvement Program
TOD	Transit-oriented development
TSB	Transportation Strategy Board
ULSD	Ultra-low-sulfur diesel
USDOT	U.S. Department of Transportation
USRA	United States Railway Association
VMT	Vehicle Miles of Travel
VRE	Virginia Railway Express
VRR	Valley Railroad Company
4R Act	Railroad Revitalization and Regulatory Reform Act