CONNECTICUT

STATE RAIL PLAN

2010-2014

CTDOT

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EXECUTIVE SUMMARY

The Connecticut State Rail Plan 2010-2030 (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; presents a vision of 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, promotes the state and regional competitive advantage in the global economy, decrease highway and aviation congestion, and 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 critical 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% less energy per passenger-mile and generates corresponding lower levels of greenhouse gas 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 reviews intermodal rail connections and facilities and 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. 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 access, information, and eases of use impact the rail system's contribution to 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. Our existing infrastructure needs critical investments 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. There are ten freight railroad companies operating in Connecticut. These companies operate over tracks they own or control or over tracks controlled by the state, Amtrak, or other private entities. Several of the railroad companies also have trackage rights by agreement to operate over a competitor's tracks. 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 to bring the freight system to a state of good repair and begin to address current standards to allow modern freight cars to utilize the network in key corridors to expand the reach of the national rail freight network.

Another tier of investments is aimed at maximizing the potential of current rail services. Key strategic investments in the New Haven Line are aimed at increased speed and capacity as well as expanding access to the passenger rail network. Significant opportunities exist to increase rail market and encourage smart and needed economic growth the Shore Line East, New Canaan Branch, Danbury Branch, and Waterbury Branch. 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 New Haven-Hartford-Springfield high-speed 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 improving 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 *Vermonter* service supported by Vermont, which connects St. Albans and Burlington with New York, Philadelphia, and Washington, DC, and is itself the beneficiary of a $120 mil grant award 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, MA.

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

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. 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.

This draft Final SRP reflects input received from stakeholders in the rail system during numerous collaborative meetings with these stakeholders. The Department has planned an extensive additional round of meetings with stakeholders to obtain comments on this draft Final SRP. By statute, the plan will also be reviewed by the Connecticut General Assembly. 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, OBJECTIVES, AND STRATEGIES

The State Rail Plan (SRP) is a long-range planning document developed in accordance with the mission of the Department with a regional context. 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.

Department of Transportation's Mission & Purpose

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.

Bureau of Public Transportation's Mission

The mission of the Bureau of Public Transportation is to develop, maintain, and operate a safe and efficient system of motor carrier and rail facilities, such as bus transit, rail operations, and ridesharing programs, for the movement of people and goods.

The Department supports a variety of alternatives to driving alone, including express and local buses, two rail lines, a statewide vanpool system and other services to reduce traffic congestion and improve mobility in Connecticut and throughout the region.

1.1 VISION OF RAIL TRANSPORTATION IN CONNECTICUT AND IN THE NORTHEAST

Connecticut is located in the middle of a mega-region stretching beyond New England and strategically located within the Northeast Corridor. The economic health of the state will depend upon the ability of the Northeast region to grow as part of an interconnected mega-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 maintain an active collaboration and dialogue with rail stakeholders a rail system vision for Connecticut that promotes aggressive growth of existing rail corridors to expand service, and to develop new rail corridors to improve quality of life through the movement of people and goods that is consistent with the state-designated growth plan.

Regional collaborating, 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. To achieve this ambitious goal, states in the region are actively engaged as partners in a regional working group that is undertaking a system-wide capacity analysis.

1.2 GOALS, OBJECTIVES, AND STRATEGIES FOR RAIL SERVICE IN CONNECTICUT

The Department's goals are consistent with its mission and the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) legislation. The Department aims to exceed customer expectations and provide a high quality and safe system. Maintenance of the existing system is the Department's highest priority, while expansion of the system is intended to be ahead of system and ridership demand. The goal is to provide programs and services that increase mobility of people or goods, enhance trade and economic development, while reducing public expenditures due to improved transportation efficiency and infrastructure preservation.

System *objectives* that support this strategy are:

- Maintain the rail system in a state-of-good-repair and improve safety on, and productivity of, the rail system;
- Improve rail system effectiveness and increase competitive travel and shipment options;
- Apply analytical tools to concentrate resources in highly effective growth programs;
- Improve the utility of the rail transportation system through communications and access to increase ease-of-use in connection with other modes;
- Integrate transport system networks to maximize achievement of energy, environmental, and climate change mandates.

The Department will pursue the following strategies as means to achieve its stated goals and objectives for the rail system in Connecticut. The Long-Range Investment Plan contained in Chapter 11 translates these strategies into concrete goals.

Passenger Rail

- Achieve and sustain state-of-good repair on the NHL.
- Double intercity and commuter ridership region-wide by 2030 by increasing capacity, introducing new rail services where feasible, and improving reliability on all corridors.
- Provide frequent and convenient passenger rail service connecting cities across the state as an energy and timesaving alternative to driving or flying.
- Achieve on-time performance of at least 95% for all passenger rail services.
- Reduce travel time for rail service between New Haven-New York and New Haven-Hartford-Springfield.
- Partner with Amtrak and FRA to invest in the New Haven-Hartford-Springfield corridor to support high-speed, intercity, commuter rail, and freight service.
- Study and establish extended and new passenger services where viable, such as service extension to New London, upgrade and extension of commuter rail service on New Canaan, Danbury, and Waterbury branches, and the New Haven Line (NHL), and to Penn Station in New York.
- Study the feasibility and cost of implementing commuter rail service between Hartford and Waterbury, New London-Worcester, New Milford service, Old Saybrook – Hartford, and other corridors.
- Collaborate with adjacent states and produce a development plan to introduce regional high-speed rail service.

Freight Rail

- Increase freight rail usage by 25% to reduce truck traffic and energy consumption.
- Facilitate modern freight car access to the state rail system starting with the Danbury, New Haven, and New London north-south routes in the state.
- Revitalize intermodal facilities/inland ports across 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.

Intermodal Connections

- Provide efficient and effective connections to Bradley International Airport from New Haven-Hartford-Springfield.
- Construct intermodal connections and facilities integrating the New Britain-Hartford Busway with New Haven-Hartford-Springfield.
- Improve service and facilities connecting the local, express, and intercity bus network with passenger rail stations and terminals.
- Provide seamless passenger trip planning and service information among all modes.

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), which 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, was enacted October 16, 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.[1]

The Department developed the SRP in coordination with the State's long-range transportation plan[2] (LRP) and the Department's Master Transportation Plan[3] (MTP) and complements their content. As such, the SRP shall not conflict with either plan, but represents an addition to those plans in both the policy ambition for growth, and the strategies recommended to achieve 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 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.

The content of this SRP is consistent with the direction and strategies employed by the Transportation Strategy Board (TSB). Information that is new to this Plan is a natural extension of the continuum of TSB strategies.

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 their development cycle.

[1] September Special Session, Public Act No. 09-2, Section 65
[2] http://www.ct.gov/dot/cwp/view.asp?A=1383&Q=431792
[3] 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 No. 110-432

The SRP is presented to assist the 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 their 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, including an inventory of the existing rail transportation system, rail services, and facilities within the state. They 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. US DOT is to establish minimum standards for the preparation and periodic revision of state rail plans.[4]

Statewide Long-Range Transportation Plan

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 long-range transportation plan (LRP) which 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 plan 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.

[4] 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

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 the Department proposes to achieve and implement goals and strategies. Projects to implement unfunded strategies are the key elements of focus with respect to increasing 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 potential projects listing. The PRIIA specifies the necessity of identifying in the State Transportation Improvement Program (STIP) those projects, which will then be considered eligible types of federal funding that is authorized and envisioned to become available by the PRIIA.

At this time, the Department has advanced some funding, with the STIP requirement removed, in order to advance the distribution of federal Stimulus funding and the benefits from early project initiation for those meeting an early eligibility test.

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

Section 13b-15 of the Connecticut General Statutes, requires the Commissioner of the Department to publish a Master Transportation Plan (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.

Transportation Strategy Board

In June 2001, the Connecticut General Assembly passed Public Act 01-5 which created the Connecticut Transportation Strategy Board (TSB) and made it responsible for: 1) proposing a long-term transportation strategy for the state, 2) identifying actions to achieve the strategy, 3) estimating the amount of money required to implement the actions, and 4) suggesting sources of revenue.

In 2003, the TSB, pursuant to Section 13b-57g of the Connecticut General Statutes, submitted recommended strategies that the Connecticut General Assembly later adopted as the state's transportation strategies. Subsequently, the TSB was required to review and, if necessary, revise the transportation strategies. When revising the strategies, the TSB considered the aforementioned federally mandated factors, identified eight guiding principles, and developed three broad strategies that are the basis of the board's January 2007 report, *Moving Forward – Connecticut's Transportation Strategy*. The strategies pertain to economic development, movement of people and movement of goods. Figure 1 contains the Guiding Principals; Figure 2 presents the Connecticut's Transportation Strategies.

The overall goal of the principles and strategies is "the creation of a balanced, intermodal transportation system which provides for the efficient, cost-effective movement of people and goods."

GUIDING PRINCIPALS	
1.	A balanced transportation system is essential to Connecticut's economic and social health and welfare. The system must provide mobility for people and goods in a way that meets the needs of users, businesses, and commerce.
2.	Connecticut's transportation system must be multi-modal and provide options to the single passenger automobile.
3.	Connecticut's transportation system represents an investment in the state's future that must be maintained and preserved. It requires both strategic investments and on-going operating and capital support. It also requires efficient, cost-effective management and operations which make the best use of available resources.
4.	Transportation policy does not exist in a vacuum: it must also reflect the economic, social and environmental needs and policies of the state. Transportation investments, or lack of them, can be an important factor in influencing economic development and job growth. Likewise, proper planning of transportation infrastructure and improvements can positively influence housing, land use and commutation patterns. It must support both economic development and a sustainable environment.
5.	Transportation system must be flexible and responsive enough to meet the transportation needs of a wide variety of customers, including those with special needs. It must leverage innovation and advances in technology in order to improve service and control costs.
6.	The provision of accurate, timely information about transportation systems and services is essential to the success of the state's transportation system.
7.	Connecticut's transportation and development investments must support responsible growth, transit-oriented development and the State Plan of Conservation and Development.
8.	Transportation planning, at all levels, must be comprehensive, inclusive and visionary and must maximize the options available to decision makers. Cooperation between local, state and federal organizations must be encouraged. Whenever possible, transportation investments should be coordinated with similar planning and investments in neighboring states.

Figure 1. Guiding Principles

CONNECTICUT'S TRANSPORTATION STRATEGIES	
Economic Development	Ensure that the State's Transportation Investment Areas remain vibrant and competitive economic engines for Connecticut and attractive gateways to the State by leveraging existing transportation and other infrastructure assets, especially in Connecticut's urban centers, and by focusing appropriate resources on the mitigation and management of road congestion throughout the State with a focus in the near term on the Coastal Corridor.
Movement of People	Facilitate the movement of people within and through the State by expanding the quality and quantity of options (e.g. air, bike, bus, ferry, flex-time, rail, ridesharing, telecommunicating) to single occupancy automobile trips; encouraging employer participation in demand management programs; enhancing the customer's transit experience; improving transit travel times through better integration of all options; increasing capacity of roads through continued focus on information, safety, and incident management tools; and expanding targeted portions of certain roads.
Movement of Goods	Facilitate the movement of goods to and through the State by expanding and coordinating the State's air, rail, road and water infrastructure; improving the flow and safety of commercial truck traffic; and providing a broad range of competitive options to commercial trucks.

Figure 2. Connecticut's Transportation Strategies

State Conservation and Development Policies 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). 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 they prepare agency plans. In addition, agency-prepared plans, when required by state or federal law, must be submitted to the Office of Policy and Management (OPM) for a review of conformity with the State's C & D Plan.

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

GROWTH MANAGEMENT PRINCIPALS IN CONSERVATION & DEVELOPMENT POLICIES PLAN[5]	
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 3. Growth Management Principles in Conservation & Development Policies Plan

DEVELOPMENT AREA POLICIES[6]	
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% 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 that 80% 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 4. Development Area Policies (In order of priority)

CONSERVATION AREA POLICIES[7]

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 5. Conservation Area Policies (In order of priority)

[5] 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.
[6] Id.
[7] 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.

CHAPTER 3 – DESCRIPTION OF RAIL SYSTEM IN CONNECTICUT

The Connecticut State Rail Plan (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 transport system and economy, and provides for efficiency in freight and personal mobility while also providing modal alternatives in transport.

The State of 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 and high-speed rail passengers over the Northeast Corridor lines owned and operated by Amtrak, and 20 million commuter rail passengers over the Metro-North New Haven Line (NHL) and Shore Line East services (SLE).

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, flight transportation 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 contemporary 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. 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, 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 passenger service.

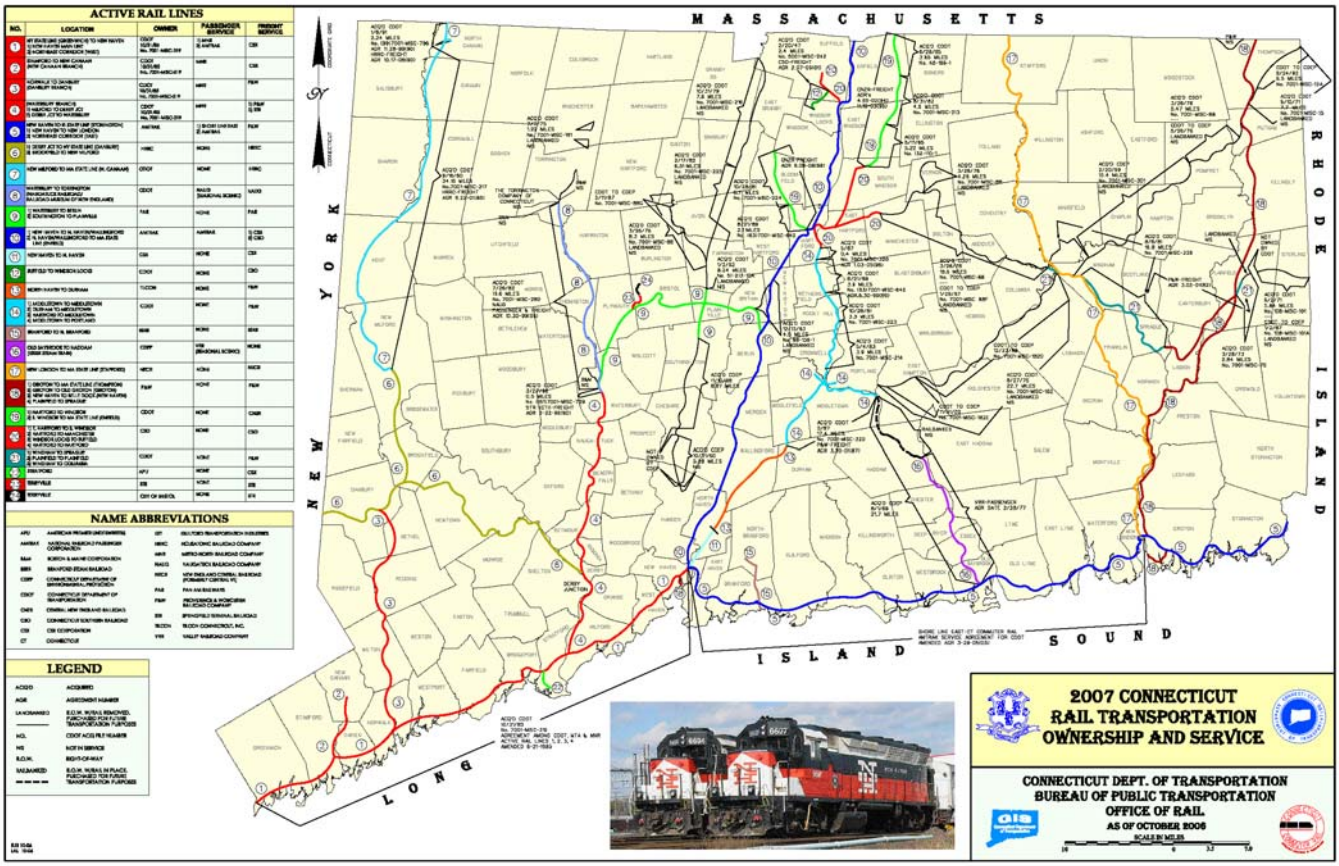


Figure 6. 2007 Connecticut Rail Ownership and Service Map

3.2 HISTORY OF CONNECTICUT RAILROADS - SUMMARY

Penn Central Goes Bust - 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 Metropolitan Transportation Authority (MTA) of New York immediately stepped in, electing to take over commuter rail operations themselves. The MTA created the Metro-North Commuter Railroad Company 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. Metro-North assumed operations on January 1, 1983.

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, known as Amtrak, to run the service. Intercity service on Amtrak's Northeast Corridor 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, the Consolidated Rail Corporation (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 their economies. The LRSA Program, which was administered by the Federal Railroad Administration (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 their 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 their 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 Connecticut Department of Environmental Protection (CDEP) to be used for recreational purposes. The transfer of these lines included the right of the Department to retake ownership of the lines if they were needed for transportation purposes. In addition to the 60 miles of rights of way acquired by the CDEP from the Department, CDEP has acquired another 50 mile of abandoned rail rights of way. About 22 miles of that is leased by CDEP 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 Northeast Corridor 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.

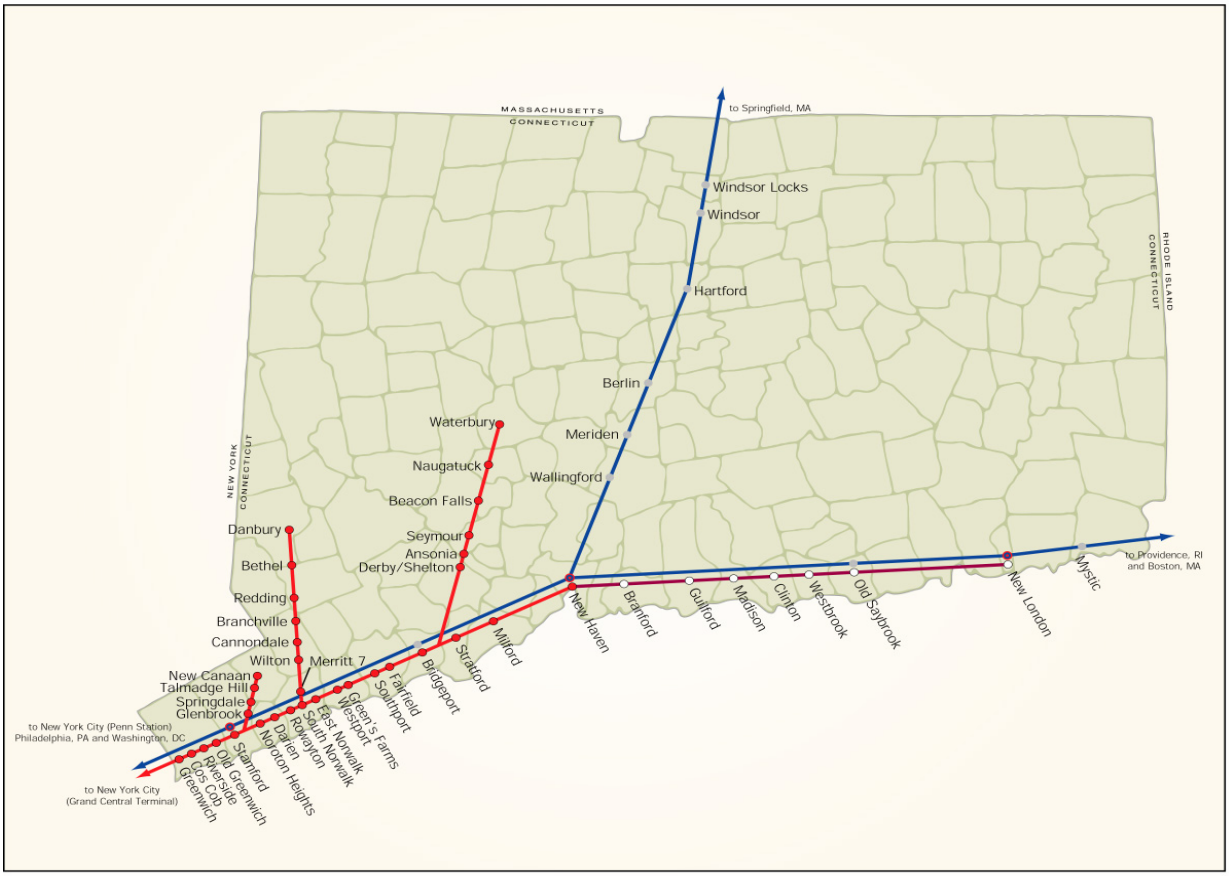
The Department continues to be actively involved in the provision of rail service as it undertakes an Environmental Assessment for the institution of new and expanded high speed, intercity, commuter, and freight rail service in the New Haven, Hartford, and Springfield, Massachusetts corridor.[8]

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

CHAPTER 4 – COMMUTER PASSENGER RAIL NETWORK

Connecticut provides commuter rail services on the New Haven Line (NHL) operated by Metro-North Railroad from New Haven into Grand Central Terminal, New York and on Shore Line East (SLE) operated by Amtrak from New Haven to New London.

Connecticut Passenger Rail Service



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

Figure 7. Passenger Rail Services and Providers in the State

4.1 INVENTORY OF COMMUTER RAIL NETWORK

NEW HAVEN LINE

The NHL is a commuter rail service, owned by Connecticut that operates between New Haven, Connecticut, and Grand Central Terminal in New York City. In 1985, the Department entered into a three-party service agreement with New York Metropolitan Transportation Authority (MTA) and Metro-North Railroad (MNR) that provides for operation of NHL service by MNR. 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 19 Main Line stations in Connecticut include New Haven – State Street, New Haven - Union Station, Milford, Stratford, Bridgeport, Fairfield, Southport, Green's Farms, Westport, East Norwalk, South Norwalk, Rowayton, Darien, Noroton Heights, Stamford, Old Greenwich, Riverside, Cos Cob, and Greenwich. The entire Main Line has an overhead catenary system that provides the primary source of power for over 90 percent of the trains operated in daily service.

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 Federal Railroad Administration (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 New Haven-Hartford-Springfield Line and Shore Line East Line in New Haven. CSX Transportation (CSX) and Providence and Worcester Railroad Company (P&W) provide through freight service; CSX provides local freight service. Amtrak provides intercity passenger service, and Metro-North Railroad provides commuter service. On the NHL, Amtrak has an agreement with the Department for access where Amtrak trains operate over Connecticut-owned portions of the Northeast Corridor.

Figure 8. Stamford Intermodal Center - Stamford, Connecticut

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, Talmadge Hill, Springdale, and Glenbrook. Connecting service is available at the Stamford station. 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 Norwalk and connects with the Derby Line in Danbury. The Danbury Branch Line operates between Danbury and Norwalk. The seven stations on the line are located in Danbury, Bethel, Redding, Branchville, Cannondale, Wilton, and at Merritt 7 in Norwalk. Connecting service is available at the South Norwalk and Stamford stations. The state owns the branch line and it is maintained at FRA Class 3 track standards. 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 Line. The six stations on the line include Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia, and Derby/Shelton. Connecting service is available at Bridgeport Station. The branch line is maintained at FRA Class 3 track standards. 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 (STR) 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 state and FTA funds to upgrade the right-of-way, build and rehabilitate the maintenance facilities, and purchase the equipment.

SHORE LINE EAST

Shore Line East (SLE) commuter operations began in May of 1990 to serve the southeastern shoreline of the state. The Department extended service to New London in 1996. The Department opened the New Haven State Street station in 2003 to provide pedestrians with access to rail service in downtown New Haven.

The State of Connecticut has a contract with Amtrak to provide daily rail operations of the SLE service along the 68.2-mile segment of the Amtrak owned Northeast Corridor between New Haven and New London. The Department makes payments to Amtrak for use of the Amtrak-owned Northeast Corridor facilities. The Department also provides other funding on the Northeast Corridor, including capital funds for infrastructure and/or stations.

SLE trains run primarily inbound from Old Saybrook and New London in the morning and primarily outbound from New Haven in the evening. SLE service connects at New Haven, Bridgeport, and Stamford stations for Metro-North service on the NHL to Connecticut stations and New York City. Reduced-price combined SLE/Metro-North monthly commuter tickets are available.

The Department extended the agreement with Amtrak to operate this service to June 30, 2013, including the introduction of weekend service in July 2008. A three-phase expansion plan that

the Department began implementing in 2008 also includes service extensions to/from New London and full bi-directional service with upgraded stations.

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.

The SLE connects with the Branford Line 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. Amtrak provides intercity passenger service.

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 constructed new stations at Branford, Guilford, Madison, and Clinton and plans to construct a new station at Westbrook. The new stations include passenger amenities such as high-level platforms to allow for level boarding on trains, a commuter shelter area, a convenient commuter drop off area, increased parking, enhanced lighting, and passenger information systems.

4.2 COMMUTER RAIL SERVICE OVERVIEW

New Haven Line

The NHL service in 2008 (Main Line and branch lines) consisted of 287 weekday trains, 178 Saturday trains, and 148 Sunday and holiday trains with the majority of the ridership heading to Stamford or further west into New York City. There were 37,895,826 annual passenger trips and 24,915,000 Connecticut interstate and intrastate passenger trips on the NHL in 2008. In 2008, the total passenger miles were 1,195,046,871 and Connecticut interstate and intrastate passenger miles were 968,891,120.

Connections to Amtrak are available at Union Station New Haven, Bridgeport, and Stamford stations. Bicycles are permitted on certain trains during certain times and are generally not permitted during peak times, as seating is limited. Café Car Snack and Beverage Service are available on certain cars. 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, ADA access, and other services.

Shore Line East

The SLE service in 2008 consisted of 23 daily weekday trains (21 between Old Saybrook and New Haven and 2 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 2008, SLE service totaled 568,114 annual passenger trips and 11,640,071 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 New Haven Line trains.

Operating Statistics

On the NHL, the state and MTA/Metro-North Railroad divide the 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.

NEW HAVEN LINE (includes three branch lines)	Fiscal Year 2009
Annual Passenger Trips	37,133,094
Expenses	$360,344,450
Revenue (fare box & other)	$253,117,688
Net Deficit (expenses minus revenue)	$107,226,762
The Department Share	$68,410,180
NY Share	$38,816,582
Cost Per Passenger (total expense / total passenger trips)	$9.70
Deficit per Passenger (total deficit / total passenger trips)	$2.89
Operating Ratio (total revenue / total expenses)	70.24%
SHORE LINE EAST	**Fiscal Year 2009**
Annual Passenger Trips	593,723
Expenses	$19,947,057
Revenue (fare box & other)	$2,222,979
Net Deficit (expenses minus revenue)	$17,724,078
The Department Share	$17,724,078
Cost Per Passenger (total expense / total passenger trips)	$33.60
Deficit per Passenger (total deficit / total passenger trips)	$29.85
Operating Ratio (total revenue / total expenses)	11.14%

Figure 9. Operating Statistics[9]

4.3 COMMUTER RAIL FACILITIES, SYSTEMS, AND EQUIPMENT

Rail Stations

Fifty stations serve various passenger rail lines in Connecticut. Each station allows for a certain degree of motor vehicle access, although not every location offers parking. Most stations do offer taxi service. At several stations – Stamford, Westport, Bridgeport, Danbury, and New Haven – there are reasonably convenient connections to local bus service. At others, such as Hartford, Waterbury, Norwalk, New London, Greenwich, and Fairfield, only one or two bus routes provide access to and from the rail stations.

[9] Source: Connecticut Department of Transportation, Office of Rail, 2010.

Figure 10. Branford Station on SLE

Three of seven fixed route bus systems, 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.

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 they are 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.

Most major rail stations (Greenwich, Stamford, South Norwalk, Westport, Bridgeport, and New Haven) are well supplied with 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. Schedules of Metro-North 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.

Rail Station Parking

More than 16,700 parking spaces are available among the 50-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, Greenwich, Stamford, Westport, and Fairfield 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 both the NHL and SLE, the parking utilization rate is extremely high, exceeding 80 percent. On the Waterbury Branch, utilization ranges from a high of 72 percent to a low of 10 percent. On the Danbury Branch, utilization ranges from a high of 90 percent to a low of 58 percent. On the New Canaan Branch, utilization ranges from 88 percent to 82 percent. On SLE, utilization ranges from a high of 113 percent to a low of 22 percent.

Station Name	Station Building		Rail Station Parking Costs						Rail Station Permits*		Parking Capacity					Comments
	Owner	Oper.	Semi-Annual	Annual	Monthly	Daily	Hourly	Date of Last Rate Change	# on Waiting List	Est. Time on Wait List	Permit Capacity	Daily Capacity	Other Capacity (incl. H/C)	# State Owned	Total	
NH State Street	CDOT	DeMarco Mgmt Co.		n/a	n/a	n/a			n/a		n/a	n/a	n/a		n/a	No on-site parking, bus queue only. DeMarco: CDOT's contracted operator
NH Union Station	CDOT	New Haven Parking Authority		n/a	$75.00	$9/16hrs $11/24hrs	$1.00	9/08	880	5 years	340	813	39	1,153	1,153	Garage and surface lot. Shuttle bus to Coliseum & Temple St. garage avail.
NH Union Station Proposed Garage(s)															1,200	preliminary design phase
West Haven															1,100	garage/surface parking in design
Milford	CDOT	Town	$175.00	$275.00	$60.00	$5.00	n/a	4/09	600	4 years	593	75	8	444	676	MTD: Milford Transit District
Stratford	CDOT	Town	$175.00			$5.00			1,200	6 years	205	80	11	296	296	
Stratford Proposed Garage & Surface Lot															1000+	garage (700 gross spaces)/surface (300+ spaces) parking in design
Bridgeport-Garage	City	Fusco Mgmt. Co.			$45.00	$6.00	$2/up to 3 hrs	3/07	726		768		18	915	915	Fusco: CDOT's contracted operator. Permit renewals halted to accommodate city's garage expansion project.
Bridgeport-Lot	CDOT				$35.00	n/a		2/07	24		191	0	7	191	191	CDOT lot under I-95
Bridgeport Garage Addition															400	under construction
Fairfield Metro															1,500	under construction
Fairfield	CDOT	Town	$170.00			$6.00			3,408	4.5 years	861	327	28	376	1,216	
Southport			$115.00			$6.00			3,355	4.5 years	146	28	5	99	179	Nearby church lot included
Green's Farms	CDOT	Town		$225.00		$4.00		4/04	Res: 1,000 Non Res: 900	Res: 4 Yrs Non Res: 6 Yrs	384	85	5	204	474	
Westport				$225.00		$4.00		4/04			1,030	204	73	834	1,307	
East Norwalk	CDOT	Town		N/A	$43.00			1/09	140	12-18 months	250	0	2	147	252	Nearby church lot included
South Norwalk	Town owned and operated			N/A	$78.00	$8.00		1/09	200	12-18 months	650	140	14	0	804	Municipally owned garage
Rowayton	CDOT	6th Taxing District		$315.00		$5.00		4/06	33	1-2 years	291	25	3	319	319	
Darien	CDOT	Town		$315.00		$3.00		1/09	1000+	6 years	543	312	5	195	860	
Noroton Heights				$315.00		$3.00		1/09	1000+	5 years	431	328	13	772	772	
Stamford South State Street Lot	CDOT	Fusco Mgmt. Co.			$70.00			8/06	0	none	115	0	2	115	115	Fusco: CDOT's contracted operator
Stamford Garage					$70.00	$9/16 hrs $10/24 hrs	$1.00	8/06	1,040		1,350	500 +/-	55	1,912	1,912	Fusco: CDOT's contracted operator
Stamford Proposed TOD															300+	proposed increase of 300 (net) parking spaces
Old Greenwich	CDOT	Town		$266.00		$5.00		10/08	57	2-3 months	520	70	4	397	594	
Riverside				$266.00		$5.00		10/08	41	2-3 months	282	33	4	307	319	
Cos Cob				$266.00		$5.00		10/08	84	2-3 months	521	56	3	361	580	
Greenwich Plaza	Private	Private		$465.00		$5.00		10/08	355	5-8 years	370		8	0	378	Privately owned garage
Greenwich (outside station)	Town	Town		$242.00		$5.00		10/06	576	3 years	605	209	6	0	820	Municipal lots

*Number of permits issued range from 100-130% of permit capacity.

New Haven Main Line Parking Capacity		
State-owned Total=	49%	9,037
Municipal/Non-State Total=	51%	9,295
Total Parking Spaces=	100%	18,332

Figure 11. New Haven Main Line Parking Information[10]

[10] Source: ConnDOT, Office of Rail, 2010.

Station Name	Station Building		Rail Station Parking Costs						Rail Station Permits*		Parking Capacity					Comments
	Owner	Oper.	Semi-Annual	Annual	Monthly	Daily	Hourly	Date of Last Rate Change	# on Waiting List	Est. Time on Wait List	Permit Capacity	Daily Capacity	Other Capacity (incl. H/C)	# State Owned	Total	
Waterbury	CDOT	CDOT		n/a	n/a	n/a					0	150	6	156	156	
Naugatuck	CDOT	CDOT		n/a	n/a	n/a					0	125	0	10	125	State-owned spaces per deeded right
Beacon Falls	CDOT	CDOT		n/a	n/a	n/a					0	25	3	28	28	Town presently maintaining lot
Seymour	CDOT	CDOT		n/a	n/a	n/a					0	21	1	22	22	Addt'l state highway property nearby for parking
Ansonia	CDOT	CDOT		n/a	n/a	n/a					0	48	2	40	50	
Derby Shelton	CDOT	Town		n/a	n/a	n/a					0	70	5	75	75	
Danbury	CDOT	Town		$250.00		$6.00	$0.25/15 min	1/09	56	1 year	129	12	5	146	146	Hourly parking is metered
Bethel	CDOT	Town		$250.00			$0.25/hr	1/07	59	1 year	165	26	6	197	197	Hourly parking is metered
Redding	CDOT	Town		$250.00		$5.00		1/07	TBD	TBD	65	13	4	82	82	
Branchville	CDOT	Town		n/a	n/a	n/a					0	166	2	168	168	
Cannondale	CDOT	Town			n/a				N/A	N/A	138	0	2	140	140	
Wilton					n/a				N/A	N/A	204	0	8	105	404	
Wilton Proposed Tiered Structure																Environmental Phase; structure (300 spaces); 176 net spaces
Merritt 7	CDOT	CDOT			n/a				N/A	N/A	0	86	2	88	88	
New Canaan	CDOT	Town		$480.00		$3.00 ^^		2007	1006	3-6 years	350	150	6	156	506	
Talmadge Hill				$360.00		$3.00 ^^		2007	217	1 year	270	96	2	18	368	Municipal lots
Springdale	CDOT	City			$42.00 Res $84.00 Non Res	$3.00 ^^		7/02	91	9 months	148	56	6	68	210	
Glenbrook					$42.00 Res $84.00 Non Res	$3.00 ^^		7/02	11	3 months	56	90	3	23	149	

*Number of permits issued range from 100-130% of permit capacity.
^^ for up to 12 hours.

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

Total Parking Capacity		
State-owned Total=	50%	10,559
Municipal/Non-State Total=	50%	10,687
Total Parking Spaces=	100%	21,246

Figure 12. New Haven Branch Line Parking Information[11]

Rail Yards – Maintenance Facilities

The Department owns four rail yards that support NHL service. MTA Metro-North Railroad, 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 supports NHL Electric Multiple Unit (EMU) as well as diesel equipment, and will support the M8 equipment. Most Main Line trains are comprised of EMU equipment. Amtrak operates and maintains a Department-owned maintenance shop in New Haven to support the SLE service. Amtrak also has a small facility that allows for equipment storage and permits basic running repairs to intercity trains.

Stamford 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 they 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.

[11] Source: ConnDOT, Office of Rail, 2010.

Bridgeport Yard has a two-story facility housing Metro-North 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. Additional tracks are being added to the yard for M8 storage

Danbury Yard supports diesel equipment operated on the Danbury Branch Line.

Rail Tracks

Rail tracks are maintained at Federal Railroad Administration (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 Northeast Corridor 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 mainline 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 maximum allowable operating speed is 80 mph on that line.

Power Systems

Trains on the New Haven Main Line and New Canaan Branch Line are electrically powered. Overhead catenary provides the traction power to propel the trains. 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 they are distributed by thirteen railroad wayside substations.

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 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 is replacing these with state-of-the-art circuit breaker technology. It is anticipated that all of the wayside substations will be replaced by the end of 2011.

Signal Systems

The Signal Control System on the New Haven Main Line is Centralized Traffic Control (CTC) with signal control passage of trains at Interlockings. Cab signals and Go-No-Go automatic train control indicate train speeds. The New Canaan Branch is a continuation of CTC with automatic train control, cab signals, and Go-No-Go signals. The Danbury and the Waterbury branches 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 13 contains a summary of the bridges maintained by the Department.

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	26
Waterbury to Torrington	ConnDOT	Naugatuck	24
Windham to Sprague - Plainfield to Plainfield	ConnDOT	Providence & Worcester	38
South Windsor to Enfield	ConnDOT	Central New England	12
Waterbury	ConnDOT	Springfield Terminal	4
East Hampton, Plainfield, Vernon	ConnDOT	Abandoned	18
New Britain, Avon, Winchester	ConnDOT	Inactive	6
		TOTAL	**329**

Figure 13. Connecticut Railroad Bridge Inventory

Commuter Rail Passenger Rolling Stock

The Department owns 289 vehicles (rolling stock units); 265 of the vehicles are passenger vehicles, 24 are diesel locomotives. Of the passenger vehicles, 118 are M-2 coaches, 34 are M-4 coaches and 30 are M-6 coaches, for 182 electrical multiple unit (EMU) coaches and 83 are diesel hauled push/pull coaches.

The alternating current/direct-current (AC/DC) EMU cars operate under either 12.5 kilovolts/60 Hertz catenary wire or the 700 volts direct current third rail power system leading into Grand Central Terminal. The states of Connecticut and New York jointly purchased the core NHL fleet M-2 series electric rail cars in 1973-1976. 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. 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.

Of these vehicles, 232 passenger units and 10 locomotives are dedicated to providing service on the NHL, 33 passenger units and 14 locomotives are assigned to SLE service, with provisions for some run-through service onto the NHL. SLE equipment is also used for limited service on Metro-North's Waterbury Branch.

Equipment Type	*Book Count*	*Average Age*	*Unit Size*	*Unit Seating*
M-2 EMU (NHL)	108	35	PAIR	A&B UNIT – 230/232
M-2 EMU (NHL)	10	35	CAFÉ PAIR	A&C UNIT – 144/146
SUB TOTAL M-2 COACHES	**118**			
M-4 EMU (NHL)	34	22	TRIPLET	A,B,D UNIT – 350
M-6 EMU (NHL)	30	15	TRIPLET	A,B,D UNIT – 341/344
SUB TOTAL ELECTRIC COACHES	**64**			
Bombardier Push/Pull Coach (NHL)	20	23	COACH	Cab 113, Tr. 131
Bombardier Push/Pull Coach (NHL)	20	18	COACH	Cab 113, Tr. 131
Bombardier Push/Pull Center Door Coach (NHL)	10	7	COACH	Cab 99, Trailer 115 Trailer w/ toilet 103
Mafersa Push/Pull Coach (SLE)	33	17	COACH	Cab 100, Tr. 109
SUB TOTAL PUSH-PULL COACHES	**83**			
TOTAL PASSENGER VEHICLES	**265**			

Equipment Type	*Book Count*	*Average Age*	*Year Rebuilt*
GP-40-2H Locomotive (SLE)	6	38	1996
P32AC-DM Locomotive (NHL)	4	8	N/A
P40 Locomotive (NHL)	4	17	N/A
P40 Locomotive (SLE)	4	17	N/A
BL20-GH Locomotive (NHL/Branch)	6	1	N/A
TOTAL PASSENGER DIESELS	**24**		

NHL – New Haven Line Service, SLE – Shore Line East Service

Figure 14. Rail Rolling Stock Unit Summary

The Department and Metro-North Railroad are currently purchasing new M8 EMU equipment from Kawasaki. This fleet of 300 cars is ADA compliant and provides seats to accommodate future growth and allow for the retirement of the M2 EMU equipment that is the oldest of the EMU fleets.

Figure 15. M8 Rail Car

Shore Line East, and Danbury and Waterbury Branch Lines Equipment

The Department purchased rail rolling stock from Virginia Railway Express (VRE). The VRE 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. Twenty Bombardier coaches were formerly in service on SLE and the Danbury and Waterbury Branch shuttles were transferred to the New Haven mainline service.

The Department operates eleven new reduced-emission locomotives manufactured by Brookville Locomotive Company. The Department has contracted 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 EPA requirement for locomotive engine emissions. 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 constrains 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. While many of these projects are not funded, the funded projects are contained in the Master Transportation Plan the Department produces biennially.

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 Stations

Funding is programmed 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 requires. 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 Americans with Disabilities Act (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 Parking

Parking constraints at rail stations is a significant issue for the Department, and 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. Other commuter parking supporting many of the NHL stations is owned and operated by municipalities and private businesses.

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. In addition, 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.

A Rail Station Parking and Access Task Force is currently identifying critical access needs and strategies for expanding rail station access.

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. There are several planned projects at the New Haven, Stamford, and Bridgeport rail yards that are detailed in Appendix A.

One significant project is the construction of new maintenance facilities in the New Haven Yard to support the new M8 fleet. The present New Haven maintenance facility is 30-years old, was designed to maintain the initial order of 144 EMU cars, and is severely over-burdened operating 24/7 (around-the-clock). The new facilities are to include a main maintenance facility, a service/inspection facility, ancillary support facilities, a heavy repair facility, a paint facility, a car wash building, a stores facility building, a layover yard, a car repair shop, and storage yards.

A second important project in the East Bridgeport Rail Yard will provide additional yard storage tracks for servicing and storing rail cars. This project is needed for the new M8 cars and to provide needed space during construction of the New Haven maintenance facilities.

At the Stamford Yard, an upgrade is needed to existing maintenance systems and equipment as well as code compliance 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 A.

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 they need 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 M8 train sets will be equipped with appropriate signal code to reach their full operating potential.

Assuming the 30-year expected life, replacement should commence by the 2010-2015 period. Many components will continue to require maintenance and/or replacement at shorter periods as previously noted.

Signal System - 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, the Secretary has since delegated those responsibilities to the FRA Administrator.[12] In the legislation, Congress established very aggressive dates for PTC system build-out completion. Each subject railroad is 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.

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

Signals and Communications - Radio System Upgrade

A significant capital project the Federal Communication Commission (FCC) has mandated is the mitigation 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 have identified that over 210 rail cars will need to be outfitted and this amount does not include M2 cars that are scheduled to be retired.

Railroad Bridges

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

RAILROAD BRIDGE INSPECTIONS

All railroad structures are inspected utilizing consultant services. The frequency of inspection for railroad bridges operated by the Metro-North Railroad and the Off-System railroads is every two years. The primary goal of the inspection program is to identify deficiencies and recommend repairs, rehabilitation, or replacement in a timely manner.

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

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 16 provides a summary of bridge condition ratings.

CODE	DESCRIPTION
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 16. Bride 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 their 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 they program 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.

Railroad / Location	Very Good 8	Good 7	Satisfactory 6	Fair 5	Poor 4	Serious 3	Critical 2	N/A N	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 17. Railroad Bridge Condition Rating by Location[13]

Commuter Passenger Rail Rolling Stock - Aging Equipment

The majority of train cars on the New Haven Main Line are Electric Multiple Unit (EMU) rail cars. The average age of the rail cars is 24.5 years (see Figure 18). Considering that the useful life of a rail car is typically 25 years, the purchase of the M8 railcars is critical to the overall viability of Connecticut's commuter rail service, since the "backbone" of the fleet are the M2 EMUs that were built in the mid-1970s. Most of the M2 fleet will be retired on a gradual basis with the purchase of M8 EMUs. The M-4 and M-6 fleet will require an overhaul and eventual replacement.

[13] Source: ConnDOT, 2009 Bridge Inspection Report

New Haven Line and Shore Line East **2009**
Average Age of Connecticut Owned Rail Fleet[14]

Equipment Type	Service	Number of Units	Built	Average Age
Locomotives				
P-32 (Genesis Dual Mode)	NHL	4	2001	8.0
P-40 (former Amtrak)	SLE	8	1992	17.0
GP-40	SLE	6	1996	13.0
BL-20 (Brookville)	NHL	6	2008	1.0
TOTAL		**24**		**10.5**
Coaches				
Bombardier – 19	NHL	20	1985 - 87	23.0
Bombardier – 34	NHL	20	1990 - 91	18.5
Bombardier – 38A	NHL	10	2002	7.0
Mafersa	SLE	33	1991 - 92	17.5
TOTAL		**83**		**17.8**
EMU				
M2	NHL	118	1973 - 76	34.5
M4	NHL	34	1985 - 87	23.0
M6	NHL	30	1991 - 94	16.5
M8	NHL		2010 - 13	
TOTAL		**182**		**29.4**
TOTAL FLEET		**289**		**24.5**

Figure 18. Average Age of Connecticut Owned Rail Fleet

The fleet replacement and overhaul projects are discussed in more detail in Appendix A.

[14] Note: These figures are State owned only, not the total NHL fleet of which MTA owns equipment along with CDOT.

4.5 PLANNING AND INITIATIVES

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. Additionally included in Appendix A are several feasibility studies for potential future corridors that the Department has not initiated nor funded.

Expanding Rail Service on Shore Line East[15]

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 Connecticut Department of Environmental Protection (CTDEP) regulate the Connecticut waterways and marine traffic activities.

The Department extended one round trip to New London in February 2010 and anticipates extending 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 proposed third phase of expansion would introduce bi-directional service on weekdays between New Haven and New London.
The Department would have to complete several projects at the SLE stations prior to implementing the third phase. The lack of north-side platforms at most SLE stations is a significant obstacle to bi-directional service. A pedestrian bridge or tunnel linking the north to the south side of the tracks with elevators would have to be constructed at all stations.

[15] Expanding Rail Service on Shore Line East , http://www.ct.gov/dot/lib/dot/SLE_Service_Expansion_Report.pdf

The Department has initiated the design of these station improvements (i.e. north side platforms and overpasses) at the SLE stations. However, the majority of the construction costs are currently under-funded. Once funding is in place 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. To operate the SLE service under the electric power system, at least 24 M8 cars would have to be purchased for current service levels. Once SLE becomes electric, the Department could utilize the current diesel equipment on the proposed New Haven-Hartford-Springfield (NHHS) Line 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.

New Haven-Hartford-Springfield Intercity Rail Corridor Development

The State of Connecticut's Department of Transportation (the Department) has teamed with Amtrak in development of the New Haven-Hartford-Springfield (NHHS) rail corridor into a viable high-speed/intercity rail corridor. The corridor is owned by Amtrak and 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 towns of Springfield, MA, Longmeadow, MA, Enfield, East Windsor, Suffield, Windsor Locks, Windsor, Hartford, Newington, New Britain, Berlin, Meriden, Wallingford, North Haven, and New Haven. The current intercity Amtrak service serves seven stations, Springfield, MA, Windsor Locks, Windsor, Hartford, Berlin, Meriden, Wallingford, and New Haven. 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, and North Haven. 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 their stations to encourage Transit Orientated Development. The plan also includes a long range plan to include a Bradley Airport Rail Connection, and a short term plan to provide timed transfer bus service from the Airport to meet trains at Windsor Locks Station.

The 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. There are 54 at-grade crossings. 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. Because the line was once double tracked, sufficient right of way exists for the restoration of a second track. Additional land will be required to provide additional parking at each of the stations.

Currently the corridor supports 10 daily freight train and 12 daily intercity train movements. During Fiscal Year 2008, ridership on the Amtrak service was 349,928. Amtrak owns this

corridor and presents as part of their 2030 Service Plan a level of service that includes 36 trains per day by 2030, including both intercity and high-speed rail 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 two services with an estimated increase in freight service, along the corridor, is the basis for the required infrastructure investment along the line.

Development of this rail corridor to the levels desired by the State of Connecticut and Amtrak will require full restoration of the two-track system over the 62-mile length of the corridor and possibly three tracks in some areas. The Department has undertaken an Environmental Assessment of the Start-up service, as well as, a Full Build Alternative in compliance with NEPA/CEPA environmental documentation requirements. The study does take into consideration the impacts of High Speed and Intercity Rail Service (except electrification) and needs to be modified to support the development of High Speed and Intercity Rail Service along the Corridor.

During the study process, the Federal Rail Administration announced guidelines for an ARRA competitive discretionary grant program, High Speed Intercity Passenger Rail (HSIPR) Program. . This program makes available to State Department of Transportations, $8 Billion dollars for the implementation and development of Intercity and High Speed Rail projects and corridors. It is anticipated that Federal Transportation Authorization will lead to additional funding through the HSIPR program.

Because the corridor between Springfield and New Haven is owned by Amtrak and the HSIPR funding is available only to state department of transportations, the Department, Amtrak, along with the Commonwealth of Massachusetts and the State of Vermont, partnered to apply for HSIPR funding to invest in short and long term infrastructure improvements on the NHHS corridor. This program will upgrade track structure to provide 110 mph maximum authorized speed, improve or install universal Interlockings where required, repair undergrade bridges especially the Hartford Viaduct, and upgrade signals and grade crossing protection. The project will permit operation of single-seat through service between Springfield, Hartford and other intermediate stations and the NEC from New Haven to New York and Washington. Substantial ridership is expected by offering High Speed capability along this heavily populated route due to improved travel times. This service will also provide significant reduction of congestion and carbon emissions, along with economic benefits. This route also will increase the capacity of train service between New York and Boston creating the inland route.

The Department was awarded $41 million in January 2010 under the Track 1A application. The Track 1A grant award provides funding for NEPA documentation (a Categorical Exclusion), preliminary engineering, and construction activities to restore a second track along 10 miles of Amtrak Right of Way between Meriden and Berlin.

The Department will be preparing a Track 2 application for funding that will involve the completion of a “corridor-wide service NEPA study (i.e., a Programmatic Environmental Impact Statement (PEIS) addressing the impacts associated with establishing a high speed rail corridor between Boston, Springfield, and New York, a High-Speed Rail/Intercity Passenger Rail Service Development Program (SDP), and project-level NEPA documentation and the associated preliminary engineering. Should the Department receive a Track 2 grant award, the first initiative within the rail corridor that would require project-level NEPA documentation and preliminary engineering is the restoration of double track over the entire 62-mile corridor between New Haven and Springfield. In addition, under the Track 2 grant, the Federal Rail Administration (FRA) will obligate additional funding for project-level NEPA documentation,

preliminary engineering, final design, and construction of other initiatives within the High-Speed Rail corridor as milestones are reached.

Connecticut Service to New York Pennsylvania Station

The implementation of commuter rail service into Pennsylvania Station (Penn Station) 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 and traffic congestion along the I-95 corridor will realize some relief.

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, Metro-North Railroad, Amtrak, and New Jersey Transit on a plan for access to Penn Station. Key for Connecticut is access for high-speed and intercity trains in the New Haven-Hartford-Springfield corridor.

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

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

The purpose of Danbury Branch Electrification Feasibility Study is to evaluate a range of infrastructure and service improvements to determine their 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 study will result in 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 will 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 I recommended the following alternatives for further study:

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 – Transportation Strategy Board 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 2011. The infrastructure improvement requirements along the study corridor have also begun.

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

This study will produce an assessment of the deficiencies and needs associated with the Waterbury and Canaan Branch Line corridors and evaluate a range of transit service options and infrastructure requirements to determine their potential to significantly enhance the corridor's transit attraction as a competitive alternatives to driving in the Route 106 and Route 8 and other adjacent north/south corridors. The result of this analysis is 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.

<u>Waterbury Branch Line Improvement Alternatives</u>

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.

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 mainline service is to build a new station that provides Waterbury Branch customers with frequent access to NHL trains, without taking up mainline 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.

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 + 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.

These alternatives will be brought forward to the NEPA/CEPA Environmental Documentation phase when funding becomes available.

CHAPTER 5 – INTERCITY PASSENGER RAIL NETWORK

Amtrak provides intercity passenger rail service on the North East Corridor (NEC) between Washington, DC and Boston, Massachusetts.

5.1 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. In Connecticut, the NEC rail line is between New Haven and the Rhode Island state line. The State of Connecticut-owned portion of NEC used jointly between Amtrak and Metro-North Commuter railroad is between New York State line and New Haven on the New Haven Line (NHL).

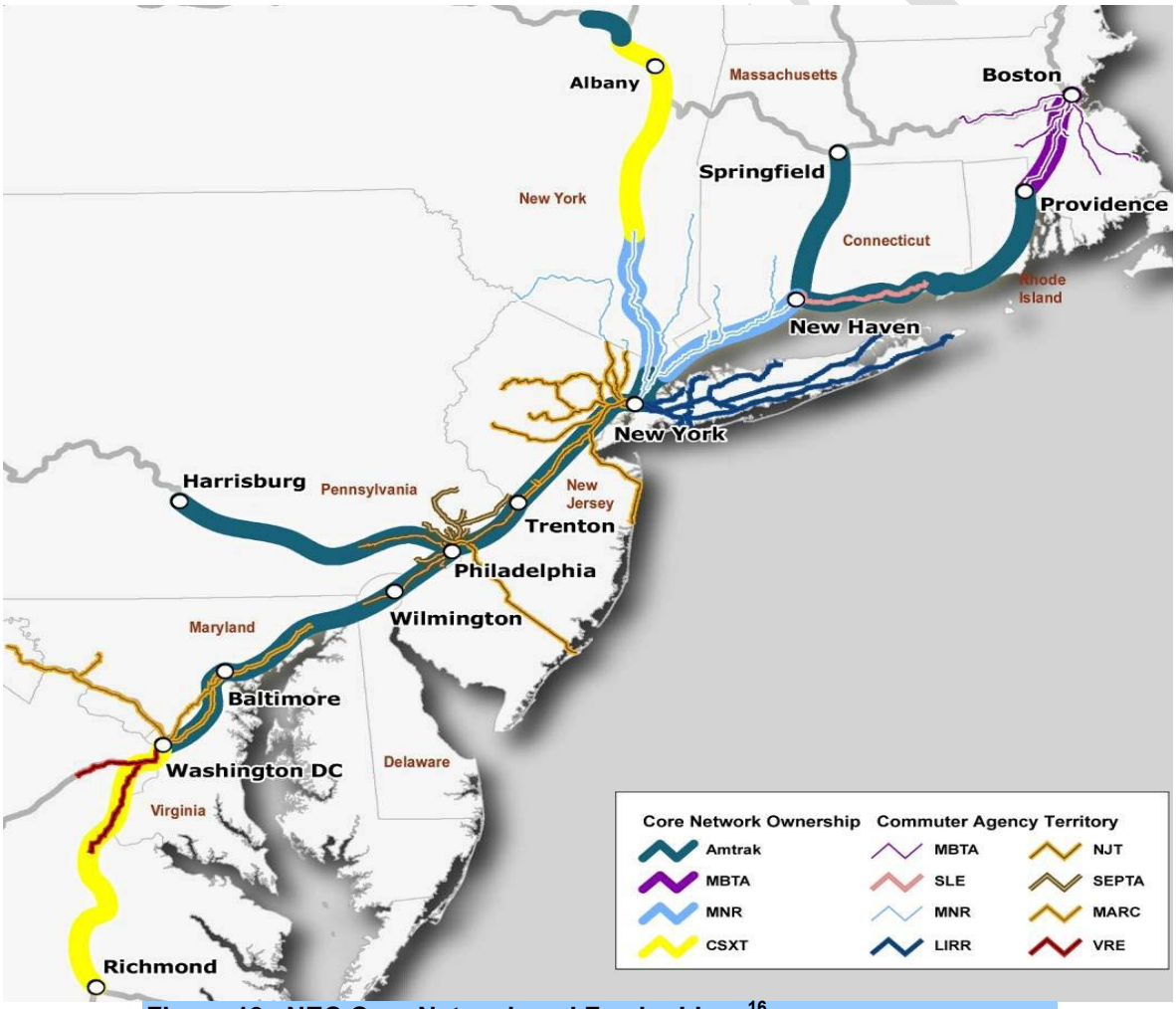


Figure 19. NEC Core Network and Feeder Lines[16]

[16] Source: The Northeast Corridor Infrastructure Master Plan, Draft 1.0, October 2009.

Springfield Line

The Springfield Line traverses 54.3 miles in Connecticut between New Haven and Enfield and extends to Springfield Massachusetts. The U.S. Department of Transportation has designated this Line as a High-Speed Rail Corridor in Connecticut. Amtrak Regional, Springfield Shuttles, and the Vermonter serve this line. The Springfield Line connects with the NEC in New Haven.

The following freight lines connect with the Springfield Line: Terryville Secondary, Griffin Line, Manchester/ Wethersfield Secondary, and the Suffield Branch. Connecticut Southern Railroad (CSO), Pan Am Southern (PAS), and CSX Transportation (CSX) provide Springfield Line freight service.

Figure 20. Train Traversing the Connecticut River Bridge

Westerly, RI – New Haven

Amtrak owns the 70-mile segment along the Connecticut shoreline and operates 38 trains (19 daily round trips) en route to Boston and New York and points south, providing approximate hourly service in the peak and bi-hourly service in off peak periods with a mix of *Acela Express* and *Regional* services.

The segment is primarily 2-tracks with passing sidings near Guilford, Old Saybrook, and Groton. Amtrak's Springfield Line joins this segment at Mill River Junction, north of New Haven - Union Station. Amtrak *Regional*, *Vermonter*, and *Acela Express* intercity services, as well as MNR and SLE commuter rail services, shares this station.

Amtrak, SLE, CSX, and Providence and Worcester Railroad Company (P&W) operate in or through the segment. P&W operates at least daily through freight trains serving regional industries including several large quarries.

5.2 INTERCITY PASSENGER RAIL SERVICE OVERVIEW

Amtrak Service and Ridership

Amtrak operates approximately 46 daily trains in Connecticut consisting of *Acela Express*, *Regional*, and *Springfield Shuttles*.

During FY09 Amtrak served the following Connecticut locations:

City Boardings + Alightings	
Berlin	20,555
Bridgeport	70,765
Hartford	157,791
Meriden	31,571
Mystic	19,776
New Haven	661,656 - *New Haven is the 12th busiest station in the national Amtrak System.*
New London	159,317
Old Saybrook	61,997
Stamford	337,674
Wallingford	14,867
Windsor	9,793
Windsor Locks	14,527

Total Connecticut Station Usage: 1,560,289

Figure 21. Amtrak Ridership in Connecticut **by Station**[17]

Service Coordination

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

Amtrak trains operating on the NEC between New Rochelle and New Haven come under the Amtrak/Metro-North NHL Operating Agreement. Under this agreement, Metro-North 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.

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

[17] *Source:* Amtrak Fact Sheet, Fiscal Year 2009, State of Connecticut

5.3 INTERCITY PASSENGER RAIL FACILITIES

Stations

Connecticut NEC stations include Stamford, Bridgeport, New Haven, Old Saybrook, New London, and Mystic.

Connecticut Springfield Line stations include New Haven, 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 Metro-North 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 thirty-three 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 NED 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 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 preliminary discussions between the Department, Amtrak, and MADOT for commuter service on the Springfield line. To allow additional capacity, several infrastructure requirements must be met. The Department is advancing a National Environmental Policy Act (NEPA) process to identify infrastructure needs, including, but not limited to the Hartford Viaduct, the Connecticut River Bridge, restoration of the second main track, new Interlockings, station and facility improvements, and the signal system.

On January 28, 2009, the Federal Railroad Administration notified the Department that it would receive discretionary grant funding for the restoration of eleven miles of double track between Berlin and Newington.

Northeast Corridor

In 2009, on a given day there are 2500 passenger trains and 50 freight trains that operate over NEC. The prediction is that in the year 2030 this number would increase to 3600 passenger trains, an increase of 59%, with a 38% 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.

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 double side or up-and-over commuter platforms, and agreement by the DEP regarding the number of trains operating over the movable bridges.

Nine movable bridges on the NEC are over 100 years old and are badly in need of replacement. In southeastern Connecticut, two bridges Niantic, and Connecticut (Conn) River, need serious repair or replacement that would improve reliability and decrease the chance of a failure. Amtrak is currently rebuilding the Niantic Bridge. The Connecticut River Bridge has some serious structural deficiencies that need to be addressed. A feasibility study is currently underway on the Connecticut River Bridge to determine whether the bridge should be repaired or replaced.

Amtrak has a project to replace the 102-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 3 Overlook Walkway and replenishment of a portion of the beach. The project, to cost about $105 million, is scheduled to be complete in May 2013.[18]

Amtrak's 2030 Master Plan identified 300 capital projects that will be necessary to reduce choke points and capacity constraints. Connecticut infrastructure projects in addition to Niantic and Connecticut River Bridges, include a universal interlocking in Clinton, third track upgrade Palmers Cove, Guilford upgrade to track(s) 3 & 4, Old Saybrook catenary and track improvements, New London layover facility, Branford and Shore Line Jct. interlocking upgrades, and a passing siding in Waterford.

For the Northeast Corridor, reinstituting Track 3 between West Haven and Devon, and upgrading the signals between NYC and New Haven will result in more efficient use of the NHL.

The eleven-mile stretch between West Haven and Devon is the only portion of the NHL that has only three main tracks. The fourth track is necessary to reduce traffic bottlenecks and allow track outages to accommodate construction work.

The signal system between NYC and New Haven is outdated, based on 1975 speeds and braking distances. The new system will be based on 2030 speeds, and integrated with an updated communications system that will increase reliability.

[18] Source: Amtrak Fact Sheet, Fiscal Year 2009, State of Connecticut, p. 2-3.

5.5 HIGH-SPEED RAIL AND NORTHEAST CORRIDOR PLANNING AND INITIATIVES

Northeast Corridor Master Plan

Amtrak developed the NEC Master Plan to be an all-encompassing service plan for the Northeast Corridor (NEC) and based it on 2030 schedules, capital projects, and train movements. The planning of the NEC Master Plan was a collaborative effort of NEC states and commuter partners.

High-Speed Rail Designations

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

Figure 22. Designated High-Speed Rail Corridors Map (FRA.DOT.GOV)

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 high-speed rail funds, but rather eligible for intercity rail funding.

High-Speed Service Planning on the Northeast Corridor

As the owner of a 46-mile section of the Northeast Corridor, Connecticut has participated in high-speed rail corridor planning on a continuous basis since the inception of high-speed service by Amtrak on the Northeast Corridor 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.

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.

Figure 23. Amtrak Acela Service

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, Shoreline, and the New Haven-Hartford-Springfield line for both their intercity and high-speed rail growth potential.

Regional Planning and Coordination

The states of Connecticut, Massachusetts, and Vermont share a vision of a high-speed corridor from New Haven to Springfield, Worcester, and Boston/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. Likewise, the development of linkages recently institutionalized into Penn Station New York and beyond is vital to the maturation of Connecticut's regional connections.

Figure 24. Major Cities: Portland, Boston, and Montreal (Source: FRA)

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 six 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 in order 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, VT 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.

- Providing the connection between Providence and Boston to TF Green Airport in Rhode Island via the Northeast Corridor as well as enhancing passenger service south of Providence will build on the long-term transportation partnership between Rhode Island and Massachusetts. In addition, Rhode Island is working with Amtrak on capacity improvements along the Northeast Corridor in southern Rhode Island that will permit bi-directional overtakes for intercity passenger rail, benefiting all users of the corridor while providing for future commuter rail infrastructure at Kingston Station.

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, NH, 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.

CHAPTER 6 – FREIGHT RAIL NETWORK

The State Rail Plan (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. The SRP also reviews the rail asset condition, the constraints and needs of the system, and concerns expressed by the operators.[19] The long-term investment program submitted by the operators is contained in a spreadsheet in Appendix B and the accompanying narrative in Appendix A. The Department submitted grants for several of these projects under the American Recovery and Reinvestment Act of 2009 after consultation with the railroads.

Connecticut legislation encourages strategies to achieve connectivity in access to the regional, national, and global economies. It promotes the expansion of modal choices for passenger and freight, assuring workable freight access to the ports of New York and New Jersey and to the Corridor related to the North American Free Trade Agreement.[20] While challenging, one goal of the state is to support ways in which freight can move seamlessly from truck to rail and rail to truck in order to use the most cost efficient, fuel efficient and environmentally efficient way of moving freight to and from Connecticut industries.

Freight plays an important role in the national and state network. 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; without rail as an option, freight shippers would have to add 50 million additional trucks on the roadways if rail was not a viable alternative.[21] 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.

6.1 FREIGHT RAIL SERVICE OVERVIEW AND FACILITIES

There are ten freight railroad companies operating in Connecticut. These companies operate over tracks they own or control or over tracks controlled by the state, Amtrak, or other private entities. Several of the railroad companies also have trackage rights by agreement to operate over a competitor's tracks.

[19] Note: CSX Transportation and Tilcon/Branford Steam did not respond to requests to provide input into the SRP.
[20] Connecticut General Statutes, Sec. 13b-57g (3).
[21] State of Nation's Intercity Rail, Surface Transportation Policy Project, Decoding Transportation Policy & Practice series #12 (February 2004).

FREIGHT RAILROAD RIGHT OF WAY MILES	
	ROW Miles
Public	
Freight Railroad Operating Rights	
Federal – Amtrak owned	122.5
Shore Line and Hartford Line	
State of Connecticut owned	128.2
New Haven Line, Branch Lines and misc.	
Freight Railroad Lease Agreements	
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 25. Freight Railroad Rights of Way Miles in Connecticut

Providence and Worcester Railroad Company

The Providence and Worcester Railroad Company (P&W) is a regional Class II railroad operating in Massachusetts, Rhode Island, Connecticut, and as far south as the New York City area. In Connecticut, P&W operates over 238.5 miles of track, consisting of 67.9 miles of their own lines, 85.5 miles of line over which they have operating rights and provide service, and 85.1 miles of track over which they operate through trains only. They operate on track they own 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). They have rights to move trains over the NHL (46.8 miles), over the first 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 has classification yards in Plainfield and New Haven, and operates an intermodal facility in Worcester, Massachusetts, where they interchange with CSX Transportation (CSX). They interchange with Pan Am Railways (PAR) in Gardner, Massachusetts, and the New England Central Railroad at New London. The connection at New London provides good access to the Canadian Pacific Railway and Canadian National Railway in Canada. P&W interchanges with the Housatonic Railroad in Danbury, with the Connecticut Southern Railroad in North Haven, and the New York and Atlantic Railway in Fresh Pond, Long Island, New York.

P&W serves a chemical and bulk plastic transfer facility in Plainfield, a construction and demolition debris facility in Portland, and metal transfer facilities in New Haven and Middletown. They have 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.

In 2009, the company transported nearly 30,000 carloads of freight that included a mix of chemicals, plastics, and minerals, and nearly 24,000 intermodal shipments. They estimate they divert 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 42 separate railroads in 28 different States and 3 Canadian Provinces. They have two subsidiaries that operate in Connecticut: the New England Central Railroad (NECR), and the Connecticut Southern Railroad (CSOR).

New England Central Railroad / RailAmerica Incorporated
New England Central Railroad (NECR) is a subsidiary of RailAmerica Incorporated, and operates on their own line between New London and Stafford (55.8 miles) and on to East Alburg, Vermont where they connect with the Canadian National Railway. They also interchange with CSX at Palmer, Massachusetts and they interchange with the Providence & Worcester Railroad at Willimantic. Annually, 19,000 car loads are transported consisting of paper, plastics, lumber, copper, wood products, corrugated paper, coal, and fly ash. Trains operate out of New London and Palmer six days a week, and interchange freight cars in Willimantic with the P&W.

Connecticut Southern Railroad / RailAmerica Incorporated
Connecticut Southern Railroad (CSOR) 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). CSOR owns and operates the Manchester Secondary Line (9.6 miles), the Armory Branch Line (6.8 miles), and the Suffield Branch Line (4.4 miles). They also operate on the spur track to Bradley Airport that the Department owns (2.4 miles). They operate trains between Springfield and Hartford and between North Haven and Hartford on Monday through Saturday, and they operate out of Hartford daily.

The major commodities carried are construction and demolition debris (C&D), lumber, steel, grain, paper, pulp and consumer goods. They estimate that they divert more than 80,000 truck trips per year. CSOR also moves traffic for CSX between West Springfield, Massachusetts, and North Haven. They have switching yards in Hartford (30 acres) and East Hartford (10 acres).

CSOR has two major projects that are under active development. A paving stone manufacturer is constructing a sidetrack in North Haven, and a major C&D transfer station is under construction in Berlin.

Branford Steam Railroad

The Branford Steam Railroad is an industrial railroad serving the Tilcon Connecticut, Inc., stone quarry and provides service between their trap rock quarry in North Branford and their barge loading facility on Long Island Sound in Branford. They have an interchange with the P&W on the shoreline in Branford, and load ballast trains for Amtrak. Most of the loads are destined for barges, although some are shipped by rail.

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 Boardmans Bridge in New Milford and the Massachusetts State line. HRRC owns the southern 13.6 miles of the Berkshire Line between Boardmans Bridge and Danbury, as well as the Maybrook Line. They interchange with CSX in Pittsfield, Massachusetts, and have the potential to interchange with the CSX and the Canadian Pacific Railway in Beacon, New York. The HRRC also interchanges with the P&W in Danbury and could potentially interchange with PanAm Southern/Norfolk Southern in Derby.

HRRC operates trains between Pittsfield and Canaan on Monday through Friday, and between Canaan and New Milford on Sunday through Thursday. They operate a local switching train on Monday through Friday, as needed. There is a switching yard in Danbury, a yard in New Milford and an engine maintenance facility in Canaan.

They 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.

Central New England Railroad

Central New England Railroad (CNZR) is a shortline railroad that operates in Connecticut over the Department's Griffin Line 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). They interchange with the Connecticut Southern Railroad in Hartford. On the Griffin Line, they run trains twice a day, five to six days per week totaling over 2,000 cars a year and on the Armory branch, they move 125 cars a year for a total combined truck equivalent of 6,500.

The company's major customers include Home Depot, USA, 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 upgrade the rail on their line and step up crosstie replacement. Additional rail freight traffic could be generated if the Armory Secondary Track, which they operate north of South Windsor, was restored through to Springfield. The track currently ends at the Massachusetts State line.

Naugatuck Railroad Company

Naugatuck Railroad Company (NAUG) is a shortline railroad that operates over the Department's Torrington Branch Line between Waterbury and Torrington (19.5 miles). They are primarily a tourist passenger service out of Thomaston, providing sightseeing tours along the Naugatuck River. The regular tours start in May and end in October, and operate on Tuesday and Sunday. Additionally, independent charter tours are available during the running season. The railroad operates excursion trains for special events outside of the regular season throughout the year.

The NAUG moved regular shipments of lubricating oils to Waterville, and has lately handled a series of special overweight and over-dimension transformer shipments for CL&P. In addition, the railroad has been the location for filming portions of several motion pictures in the past few years. They have a maintenance shop in Thomaston and perform contract maintenance for other local railroads.

Currently, projects include a construction and demolition transload facility currently undergoing the permitting process (expected to be active in 2011).

The 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 Department of Environmental Protection. The company began operations on July 29, 1971 and has been in business for 38 years. Currently they do not move any third-party freight, but they are authorized to provide rail freight service on an as-needed basis for companies located along their line. They have authority to operate up to the southern end of the Laurel Branch in Middletown.

From May through the Christmas season, the VRR runs four 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. Many patrons additionally make a riverboat connection with company facilities in Deep River. There are additional services provided on a smaller scale during the winter and early spring months. The company's positive economic impact on the lower river valley community is significant.

With the exception of one, all public crossings are at least 107 pound or better, and most are in very good condition. Twelve of the fourteen public crossings are equipped with active warning devices, most of these systems designed, constructed and funded by the Company

CSX Transportation

CSX Transportation (CSX) operates over a 21,000 route miles 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, and New Orleans; and the Midwestern cities of St. Louis, Memphis, 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.[22]

[22] http://csx.com/?fuseaction=about.network

In Connecticut, CSX operates over and maintains approximately 220 miles of track, and handles approximately 40,000 carloads of freight annually. They invested approximately $20,000 to maintain and upgrade track in 2007. Products shipped include municipal and construction waste, lumber, woodpulp, wooden panel products, and steel. There is a TRANSFLOSM terminal located in North Haven[23]

The Pan Am Southern Partnership

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

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

Pan Am Southern
Pan Am Southern (PAS) (Spring 2009) is a freight railroad jointly owned by PAR and Norfolk Southern. Under this arrangement, PAS now owns the trackage in Connecticut formerly owned by the Boston and Maine Corp. Under the PAS plan, 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), Waterbury Industrial Track and Watertown Branch, and the Canal Branch (3.4 miles), the Springfield Line (59.2) To service its Connecticut operations, PAS operates trains between East Deerfield, Massachusetts, and Plainville over the Springfield Line.

PAS transports carloads of propane, lumber and construction materials, steel, plastics, chemicals, stone, paper, and scrap. PAS has general-purpose rail yards in Waterbury, Plainville, and New Britain. PAS presently centralizes Connecticut operations out of its Plainville Facility, where the Springfield Terminal Railway also performs light mechanical repairs. Additionally, Plainville serves as the logistical support center for track and signal maintenance forces. The New Britain yard also serves as a transload facility.

6.2 INVENTORY OF FREIGHT RAIL NETWORK

Chapter 3 of the State Rail Plan contains a map that illustrates the rail lines and service of the rail network (see Figure 6).

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 Brookfield, and the Waterbury Branch Line in Derby. 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 moves stone from central and eastern Connecticut to a delivery point in Danbury. There is no passenger service on this line.

[23] CSX and Connecticut, Revised July 10, 2008, http://www.csx.com/share/general/fastfacts/docs/Conn_Fact_Sheets_0506-REF21836.pdf

Berkshire Line

The Berkshire Line traverses 50.0 miles between Brookfield and North Canaan. It runs from the Maybrook Line in Brookfield to the Massachusetts State line in North Canaan. HRRC owns this line from Brookfield to New Milford, and the Department owns it from New Milford to North Canaan. It is maintained at FRA Class 1 and Class 2 track standards. The Housatonic Railroad provides through service for freight gathered in central and western Connecticut and provides local freight service to customers between Danbury and North Canaan. Housatonic Railroad 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.

Torrington Branch Line

The Torrington Branch Line 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 Department 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.

Waterbury Branch

The Waterbury Branch integrates the Berlin Branch (2.6 tm.), the New Britain Secondary (4.5 tm.), and the Terryville Secondary Line (17.2 tm.) and collectively traverses 24.3 miles between Berlin and Waterbury. It connects with the Springfield Line in Berlin, the Canal Branch in Plainville, (where it crosses the line at grade), and the Waterbury Branch and the Torrington Branch in Waterbury. Pan Am Southern (PAS) owns this line and it 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.

Canal Branch

The Canal Branch Line traverses 3.9 miles between Southington and Plainville. It crosses at grade and connects with the Waterbury Branch at Plainville Yard. PAS owns this line and it is maintained 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.

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). The Department 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.

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 (CSOR) owns this line from a connection with the New Haven-Hartford-Springfield Line in Windsor Locks to Suffield. The Line is FRA Excepted Track. The Department 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 CSOR.

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 Department owns these lines and they are maintained at FRA Class 1 or 2 track standards. There is no passenger or through freight service on these lines and local freight service is provided by the P&W.

Branford Line

The Branford Line traverses 7.2 miles between Branford and North Branford. It is owned by Tilcon Connecticut, Inc. and used to move trap rock from their quarry in North Branford to their barge loading dock on Long Island Sound in Branford, or to a connection with the 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.

Valley Line

The Valley Line traverses 22.5 miles between Old Saybrook and the Laurel Track in southern Middletown. The Valley Railroad Company has operated as a tourist passenger service attraction for the past 38 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 12.75 in Haddam and Middletown, although this portion is maintained clear for Maintenance of Way equipment, vegetation control, and property surveillance. The Connecticut Department of Environmental Protection owns this line. It 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 provides limited local freight service.

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 the 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.

P&W owns this line and provides through and local freight service. 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 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 Department from Sprague to Willimantic. It is maintained at FRA Class 2 and Class 1 track standards. Through and local freight service is provided by the P&W. There is no passenger service on this line.

Griffin Line

The Griffin Line traverses 8.7 miles through urban and suburban areas, serving customers between Hartford and Windsor. It is owned by the Department and 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 Central New England Railroad (CZNR).

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. This line is owned by CSOR from East Hartford to South Windsor (6.8 miles), and by the Department from South Windsor to Enfield (13.3 miles). The Line 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 CSOR from East Hartford to South Windsor, and by CNZR from South Windsor to Enfield.

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. Connecticut Southern Railroad owns the northern 3 miles of this line and the Department owns the remainder. It is maintained at FRA Class 1 track standards. The line had been out of service south of Hartford, but P&W restored the track (2002) and is able to provide through service when it is needed. There is weekly through freight service on this line between Middletown and Hartford and local freight service is provided by the Connecticut Southern Railroad and P&W. There is no passenger service on this line.

Manchester Secondary Line

The Manchester Secondary Line traverses 9.6 miles through urban and suburban areas serving retail customers between Hartford and Manchester. CSOR owns this line and it is maintained at FRA Class 1 track standards. There is no passenger or through freight service on this line and local freight service is provided by the CSOR.

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 Branch	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
Middletown Cluster			
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 26. Rail Line Mileages in Connecticut[24]

[24] Source: Connecticut Department of Transportation, Bureau of Public Transportation - Rail Operations, February 2010.

STATE OF CONNECTICUT FREIGHT RAILROAD RIGHT OF WAY MILES	
Public	**ROW Miles**
Freight Railroad Operating Rights	
Federal – Amtrak owned	122.5
Shore Line and Hartford Line	
State of Connecticut owned	128.2
New Haven Line, Branch Lines and misc.	
Freight Railroad Lease Agreements	
State of Connecticut owned	129.6
Municipal - City of Bristol owned	2.0
Total Public	**382.3**
Private	
Freight Railroad Companies (privately owned)	
Total Private	**246.2**
TOTAL	**628.5**

Figure 27. Freight Railroad Rights of Way Miles in Connecticut[25]

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 they are loaded into or unloaded from rail cars and transferred to trucks for delivery to their ultimate destination. Use of bulk transfer facilities enables Connecticut industries that are not served by 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 market.

Significant tonnage is moved each year by several freight railroads that serve Connecticut. All of these freight railroads are connected to the North American rail network.

The major types 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 types 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. The major types of commodities shipped out of the state by rail include waste materials such as construction and demolition debris (C&D), 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.

[25] Source: CTDOT, Bureau of Public Transportation - Rail Operations, February 2010.

WHAT COMES TO CONNECTICUT BY RAIL
Gravel, crushed stone, sand 7,880 (34%)
Iron or steel 3,600 (15%)
Lumber or wood products 2,200 (9%)
Pulp or paper products 2,120 (9%)
Chemicals 1,528 (6%)
Food products 1,396 (6%)
Petroleum or coal products 1,040 (4%)
All other 3,756 (16%) **TOTAL CARLOADS: 23,520**

WHAT CONNECTICUT SHIPS BY RAIL
Scrap paper or metal 10,112 (44%)
Gravel, crushed stone, sand 8,744 (38%)
Chemicals 1,120 (5%)
All other 3,160 (14%) **TOTAL CARLOADS: 23,136**

Figure 28. Commodities Shipped by Rail[26]

Freight Carrier	2004	2005	2006	2007	2008
Providence & Worcester RR (Reports 1.7-2 million tons annually)	1,850,000	1,850,000	1,850,000	1,850,000	1,850,000
CSX Transportation	1,016,600	1,105,000	1,081,200	994,500	956,250
Central New England RR	159,800	181,730	181,220	181,730	172,321
Connecticut Southern Railroad Co.	1,955,000	2,210,000	2,252,500	2,210,000	2,125,000
Housatonic RR (Reports 700,000-800,000 tons annually)	750,000	750,000	750,000	750,000	750,000
New England Central RR	1,050,000	1,066,700	1,160,600	1,024,427	1,085,782
Tilcon/BSRR	2,500,000	2,500,000	2,200,000	1,800,000	1,600,000
Total	**9,281,400**	**9,663,430**	**9,475,520**	**8,810,657**	**8,539,353**

Figure 29. Rail Freight Tonnage Borne by the State's Major Rail Carriers[27]

The economic analysis and additional information on freight commodities movement can be found in Chapter 8, Economic Impact and Development.

[26] Source: 2007 STB Waybill Sample (American Association of Railroads, http://www.aar.org
[27] Source: Connecticut Department of Transportation, Office of Rail, Dec. 2009.

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 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, which typically carries approximately 110 tons (222,000 pounds) of cargo on four axles for improved long-distance efficiency. In some markets, that standard is being expanded to a gross weight of 312,000 pounds. Rail lines that do not meet the 286,000 pounds 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 inherent efficiencies of rail versus truckload. Shippers will tend to move more traffic via truck or favor areas where they can take full advantage of 286,000 pounds loading. It would be beneficial for Connecticut's rail network to be brought up to, or maintained at this standard to maintain a competitive advantage.

Owner	Connecticut Rail Lines	Weight Limit	Freight Operator
		(pounds)	
CTDOT	New Haven Line (1)	263,000	CSX, PWRR
CTDOT	New Canaan Branch	263,000	CSX
CTDOT	Danbury Branch (1)	263,000	PWRR
CTDOT	Waterbury Branch - Lower (1)	263,000	PWRR
CTDOT	Waterbury Branch – Upper	263,000	STRR
Amtrak	Springfield Line (Hartford - Enfield) (2)	263,000	CSOR, STRR
Amtrak	Springfield Line (New Haven - Hartford)	263,000	CSOR, STRR, CSX
Amtrak	Shore Line (Groton - Stonington)	286,000	PWRR
Amtrak	Shore Line (New Haven - Groton)	286,000	PWRR
CTDOT	Berkshire Line - North Section	286,000	HRRC
Freight	Berkshire Line - South Section	286,000	HRRC
Freight	Maybrook Line	286,000	HRRC
CTDOT	Torrington Branch (3)	263,000	NRR
CTDOT	Terryville Secondary - South Section (4)	263,000	STRR, NRR
Freight	Terryville Secondary – North Section (4)	263,000	STRR
Freight	Lower Middletown Secondary	263,000	CSX
Freight	Stratford Industrial Track	263,000	CSX
Freight	Armory (East Windsor Sec.) - South Section	286,000 *	CSOR
Freight	Manchester Secondary (5)	286,000 *	CSOR
Freight	Suffield Branch	286,000 *	CSOR

CTDOT	Bradley Spur	286,000 *	CSOR
Private	Middletown Secondary - Middle (6)	263,000	PWRR
CTDOT	Middletown Secondary - Upper (6)	263,000	PWRR
Freight	Plainfield Secondary (Norwich) (7)	286000 Modified	PWRR
CTDOT	Willimantic Secondary (8) - West Section	263,000	PWRR
Freight	Willimantic Secondary (8) - East Section	263,000	PWRR
Freight	Branford Line (9)	263,000	BSRR
CTDEP	Valley Line (10)	263,000	VRR
Freight	Palmer Line	263,000	NECR
CTDOT	Armory (East Windsor Sec.) - North Section	286,000 *	CNZR
CTDOT	Griffins Industrial Track	286,000 *	CNZR
*	Requires bridge upgrades on adjacent rail line(s)		
(1)	PWRR request for higher weight limit of 286,000		
(2)	CSOR request for higher weight limit of 286,000, impacts other freight lines		
(3)	Bridge and culvert repairs will allow weight limit increase to 286,000		
(4)	Review of infrastructure needed to upgrade of weight limit to 286,000.		
(5)	Bridge repair (Hartford-East Hartford) needed to maintain 286,000 weight limit.		
(6)	Reconnection of rail line plus bridge work needed for higher weight limit of 286,000		
(7)	Higher weight limit of 286,000 pounds allowed with alternating cars.		
(8)	Bridge analysis and repairs needed to allow weight limit increase to 286,000		
(9)	Route 1 bridge repair needed to upgrade weight limit to 286,000.		
(10)	Bridge repairs will allow weight limit increase to 286,000		

Figure 30. Connecticut - Railroad Freight Car Weight Limits[28]

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 has 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, in order for the track to meet Federal Railroad Administration (FRA) Track Standards, which limit the speed and, in some cases, the carrying of hazardous materials over the track in question.

[28] Source: Office of Rail, Jan. 2010.

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 they have 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 their current strength, based on a standard format, rate the current load-bearing capacities of bridges. Some bridges might need light-to-moderate component replacement in order 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.

Housatonic Railroad's Berkshire Line, Amtrak's Shore Line, and Providence and Worcester's Plainfield Secondary Line are the main 286,000 pounds rail lines in Connecticut. The remaining railroads are either 263,000 pounds or 286,000 capable.

Connecticut Southern's Manchester Secondary Line and Central New England Railroad's Griffin Line are 286,000 pounds capable but weight restrictions on Amtrak's Connecticut River Bridge on the New Haven – Hartford – Springfield Line allow only a maximum weight of 263,000 pounds per carload. This is hindering Central New England Railroad from moving 286,000-pound freight to the Griffins Line and Connecticut Southern from moving 286,000-pound freight to the Suffield Line and the Manchester Secondary Line that are 286,000 pound capable. The NHL and Waterbury Branch Line is hindering P&W from moving 286,000-pound freight to Danbury (via Maybrook) and to New York.

Dimensional Restrictions

Clearances

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 22' 8" above the rail. In some markets the use of high-cube cars, particularly for shipping lighter material, help 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, VT to the P&W connection at Willimantic.

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 New England Central Railroad, from Montreal south to Willimantic, where the cars can be handed off to the Providence and Worcester Railroad. They can travel east to Plainfield, then north to Davisville, R.I. for unloading. The rail cars are then reloaded with European automobiles bound for Canada and the Midwest.

Track and Operating Speeds

While freight railroads that operate over passenger lines generally operate over newer, heavier-weight rail designed for higher speeds, railroads that exclusively focus on freight are generally operating on rail that was manufactured 60 to 100 years ago. In the coming years that 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 need to be provided to upgrade bridges to support heavier loads.

Freight railroads are categorizes as Class I, Class II, or Class III. Generally, Class II and III railroads serve local and regional markets, serve as feeder systems to larger trunk line carriers, and operate at slower speeds than Class 1. 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 was generally ignored by predecessor owners.

The Federal Railroad Administration (FRA) has established regulations that govern the operation of trains over track conditions.[29] These regulations establish the 10 different speeds based on the track conditions.

[29] Track Safety Standards, 49 CFR, Part 213)

Track Class	Maximum Allowable Operating Speeds (mph)	
	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 31. FRA CLASS OF TRACK AND OPERATING SPEEDS[30]

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 are owned either by Amtrak or the State of Connecticut benefit from the higher speeds associated with passenger services. They generally do not pay directly for track maintenance, but contribute a share of the cost of maintaining the tracks to higher standards (and speeds) through the payment of track usage fees.

State Legislation requires the Transportation Commissioner to offer rail or track material to freight railroad companies for upgrading state-owned rights-of-way. It requires him to do so before directly or indirectly selling, transferring, or otherwise disposing this property. He must also offer any remaining rail or track material to these companies for upgrading other rails located in Connecticut.

If a company accepts the Commissioner's offer, the Commissioner must transfer the rail or track material to company's designated material site and charge the company for doing so. The amount depends on whether the property will be used to upgrade a state-owned right-of-way. If it is, the charge cannot exceed the value, as scrap, of the materials replaced by those the Commissioner transfers. If the transferred materials are used to upgrade non state-owned rights-of-way, the charge cannot exceed the value, as scrap, of the materials transferred by the Commissioner.[31]

Positive Train Control (PTC)

This 2008 legislation 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 they operate on freight-only rail lines when they are part of a Class I 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 are

[30] Source: 49 CFR Part 213.9

[31] September Special Session, Public Act No. 09-2, Section 66.

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.[32]

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 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 has overhead wire (with its height limitations); however, freight trains do not operate on this branch.

The Danbury Branch has overhead wire on its southernmost portion. It connects with the NHL (and its overhead wire) at S. 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) at Waterbury. Again, the overhead catenary lines on the main line restrict the height of rail cars that would theoretically enter or leave the Waterbury Branch at Devon.

Issues Relating to Amtrak

The entire Amtrak Shoreline route, from New Haven 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 structure 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.

Hartford-Springfield Line

Amtrak's Hartford-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

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

Hartford-Springfield Line connects CSX to its significant inland operation at New Haven, along with its local freight service between New Haven and Bridgeport.

The Hartford-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. The current industry standard for freight cars is 286,000 pounds per car. 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 their full capacity for several high volume rail shippers.

Factors Affecting Demand for Rail Freight Service in Connecticut

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. An intermodal yard with connections to the west is located just over the state line in West Springfield, 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 lead 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, means that sites are getting smaller, requiring more frequent deliveries of materials, and are doing the same with outbound shipments.

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 small size of the state

and the strong competitive position of the trucking industry due to the short distances involved in movements into and through the state from the major intermodal centers in surrounding States.

The railroads are changing in response to the new dynamics affecting supply logistics. In Connecticut, the arrival of PAS and the resulting partnership with Norfolk Southern Railway brings connections to western rail carriers. Norfolk Southern operates the most extensive intermodal network in the East.

6.4 FREIGHT RAIL OPERATORS CONCERNS

Providence & Worcester Railroad

- Sellers of rail lines may place restrictions on future users of the line; only one rail carrier would be able to use the line.
- Plate F cars, measuring 17 feet tall cannot be run under the overhead electrical system along the Northeast Corridor.
- Norwich Truss Bridge over the Shetucket River in Norwich needs repair.
- Weight restriction of 263,000 pounds restricts freight movement along New Haven Line and Branch Lines.

Central New England Railroad

- Clearance issues in Hartford prohibit certain types of freight.
- An Interchange Agreement with PAS would help in the movement of goods.
- Griffins Line and Armory Branch needs updated cross ties and rail.

Connecticut Southern Railroad

- High Amtrak car-mile charges present a problem with generating new business. Amtrak's New Haven-Hartford-Springfield Line must allow freight cars to be loaded to 286,000 pounds on four axles, the national standard, in order for tenant freight carriers to remain competitive and to divert heavy truck traffic off Connecticut's roadway system.
- Positive Train Control (PTC) is an issue for CSOR running on Amtrak.
- The CSOR's Connecticut River Bridge between Hartford and East Hartford is in need of over $1 million in repairs.
- So-called "paper barriers" 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 ties and rails to the freight railroads was very beneficial.
- CSOR pays $1.8 million to Amtrak in car-mile fees, which is a financial burden on the company. Other concerns include the weight limit of 263,000 pounds per car, due to the Amtrak-owned Connecticut River Bridge in Windsor Locks. CSOR would like to haul 286,000 pounds per freight car, but structural repairs to the Connecticut River Bridge are not programmed into Amtrak's capital improvement program.

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 New Haven-Hartford-Springfield 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.

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.
- Houses are being built adjacent to the rail line and people complain about the noise. The new residents also trespass onto the rail right-of-way.
- Funding is needed for washouts.

Housatonic Railroad Company

- Replacing or enlarging culverts is a big financial burden.
- The bridge in Derby over the Housatonic River needs repair soon.
- Rail on the state-owned portion of the Berkshire line is 70-100 years old and must be replaced.
- 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.
- In order to maintain stone unit train service over the Maybrook line, work must be performed to upgrade tie and rail conditions.
- 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 Housatonic is rated as a 286,000 pounds railroad, work will be necessary to upgrade and strengthen bridges and strengthen track structure in order to maintain the 286,000 pounds classification.
- Rail on the Housatonic Railroad (HRRC) is generally 60-100 years old. In one small location, rail dates back to 1876. Over the past years, HRRC has begun replacing the older, lighter weight rail will 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.

Valley Railroad Company

- Maintenance of roadway sight lines near grade crossings on the approach to grade crossings need 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 moving 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 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, they are 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 CDEP on property encroachment issues, particularly on the out-of-service portion of the line in Haddam and Maromas (south Middletown).
- Valley Railroad 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.

Naugatuck Railroad Company

- Interchange yard/interchange tracks in Waterbury must be addressed, sufficient to accommodate current and future inbound and outbound traffic needs.
- Existing car storage side tracks are not sufficient to accommodate freight customers.
- Capital Project culvert and bridge repair/replacement due to 100+ year old structures.
- Rail replacement due to age of rail and need for higher capacity cars.
- R-O-W Trespass/ATV Damage problems: need better law enforcement, and existing damage repair.
- Capital tie and surfacing projects, especially on northern section of railroad.
- Upgrading of crossing signals and road surfaces at heavily traveled crossings.
- As the C&D transload operation becomes an active freight customer in 2011, there will be an increased need for car storage tracks. 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 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. It 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. It 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).
- There are a number of smaller culvert structures located on the railroad that will need attention/replacement with modern culvert piping materials.
- NAUG has indicated that their bridges and grade crossings are in need of improvements (one short bridge should be replaced due to age and condition) and their SR 262 highway grade crossing in Watertown needs full protection including gates and modern lights.

- 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.
- There is a desire for a regular interchange area/yard in Waterbury with PAS that does not involve leaving interchange cars on the Naugatuck mainline. This is critical to NAUG operations, as interchange cars left on the mainline prevent NAUG from completing regular, federally mandated track and switch inspections.
- Most of the Naugatuck Railroad Company (NAUG) line is NH 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.

6.5 RAIL LINE ABANDONMENTS AND REOPENINGS

There are various out of service tracks that may offer opportunities for future freight service development.

Significant Line Segments Not in Service

Rail Line	Ownership	Miles	Status
Southbridge Sec.	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	9	NIS-Land 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

* - An inactive rail line is a former rail corridor that has not been parsed. NIS – Not in service.

Figure 32. Connecticut Inactive* Rail Lines

P&W Willimantic Reopening

In May 2007, the PWRR re-established service on the Willimantic-Versailles line, a portion of which is leased to the railroad by the State of Connecticut. This re-established an interchange with the NECR at Willimantic, opening up a high-clearance route between the port of Providence, Rhode Island and Canada.

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 Route

The primary route, by a considerable margin, is over the CSX Boston and Albany (B&A) route, which crosses southern New England via a main line 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 New England Central Railroad's (NECR) 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.

The Palmer Line is an over-dimension route that connects with the Providence & Worcester's Willimantic Branch at Willimantic. This is a rapidly growing route for double-stack containers (both inbound and outbound), tri-level automobile carriers (both inbound and outbound), and other freight, from chemicals, to raw plastics, animal feed, and lumber. The Palmer Line also connects with the Providence & Worcester at New London. Freight car interchange at this location has been reduced in favor of the recently re-opened interchange at Willimantic.

The NECR's Palmer Line offers regional connections to four Class I railroads: Canadian National Railway, Canadian Pacific Railway, CSX, and Norfolk Southern Railway (via its connection with PAS). The NECR also links these Class I railroad connections to other New England shortline 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 shortline railroads.

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. The upcoming purchase of CSX's B&A main line from Boston to Worcester by the

State of Massachusetts will likely result in a downsizing of the rail freight operations along this route. As a result, additional rail freight will likely terminate in western New England. That freight would then be transloaded for final delivery by local truck service or move via rail intermodal service and local drayage.

Patriot Corridor

The lowest-volume, yet competitively important route, is the newly-improved Pan Am Southern's (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 Pan Am Railways (PAR) and Norfolk Southern (NS), a major carrier in the eastern half of the United States. Effective April 2009, governmental approvals were granted for their proposed PAS joint 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 route 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.

New York Cross-Harbor Tunnel Study

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 Federal Railroad Administration (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% by weight of the area's freight is said to move 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% 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. Providence & Worcester is projected to handle the decrease in 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.

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 Plan[33]:

- Promote competitive passenger movement options between high-density population centers by promoting, advocating for resources for 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 that is consistent with commodity movement needs at and surrounding the rail system, seaports, and airports in the state.
- 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 all transportation providers and accessed by the public to identify connecting services.

[33] 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.

- 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 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.
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. Transit Oriented Development: Contributing to a transit-oriented and mixed use land use conducive to walking access to stations, consistent with Governor Rell's Executive Order #15.[34]

Major Rail Intermodal Connection Points

The key rail intermodal connection points are:

Stamford - Full ADA compliant station served by commuter rail (NHL and Shore Line East), Amtrak Intercity passenger rail, 16 CTTransit bus routes, three CTTransit Commuter Connection bus routes, intercity bus routes, taxis, privately operated corporate shuttle bus services, and approximately 12 bike racks located on both sides of the station.

Bridgeport - 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) offers year round ferry service for pedestrians and vehicles to Port Jefferson, Long Island, New York.

New Haven - 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 Connecticut Transit-operated downtown shuttle, intercity bus routes, taxis, rental car service, and private shuttle bus systems (including

[34] "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

the extensive Yale University bus system). 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 Metro-North Getaways combination travel package.

New London - 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, NY, and Block Island, RI (seasonal). The Mohegan Sun and Foxwoods casino bus services also serve the Cross Sound terminal.

Hartford - ADA equipped station served by 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 Britain - Hartford Busway

The New Britain - Hartford Busway will be a dedicated Bus Rapid Transit (BRT) facility along a 9.4-mile corridor between downtown New Britain and downtown Hartford. 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.

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. There will be stops at Union Station, 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.

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.

Maritime

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 the State of Connecticut with a focus on the three deep-water ports.

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 by-passed 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 hubandmarshalling centers.[35]

Connecticut Public Act 06-136, "An Act Concerning the Roadmap for Connecticut's Economic Future" (Act) supports a program of transportation initiatives, passed during the 2006 legislative session. The Act 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.

7.2 RAIL IN AND AROUND NEW HAVEN HARBOR

Figure 33. New Haven Harbor

Rail Operations and Facilities in New Haven

The Port of New Haven, as seen in Figure 33, is the largest deepwater 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 was moved through the Port of New Haven. According to the data published by the American Association of Port Authorities, this number

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

had grown from 10.8 million tons in 2004 and was 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 USA, Inc. (Logistec) is currently the main terminal operator at the port. For handling dry cargo, they have an inlet into their 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 has seven warehouses totaling approximately 225,000 square feet. There are 40 pieces of forklift equipment.

Active, near dock rail exists at Gateway Terminals Chapel Street Facility. Additionally, rail is active to Logistec's Waterfront Street Terminal, within the Port. The Providence and Worcester Railroad (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 together with their primary objective to promote and encourage development of the port-related economy, maintain and expand maritime industrial employment, and enhance key port properties for active maritime uses.

Planning and Initiatives

The Department's I-95 New Haven Harbor Crossing (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 Shore Line East 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 Q-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 are 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 (3) major phases of work. Phase 1 and phase 2 construction of the rail link serves 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).

7.3 RAIL IN AND AROUND NEW LONDON HARBOR

Figure 34. New London Harbor

Rail Operations and Facilities in New London

Admiral Harold E. Shear State Pier (State Pier), as seen in Figure 34, 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, 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 air draft restrictions for vessels arriving at the State Pier. New London Harbor channel is 40 feet deep and 500 feet wide. Cargoes received at facilities in 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 30-83 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. 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 under lease agreement with Logistec, a Canadian stevedoring company. Reconstruction of the east side of the State Pier was completed in 1997; rebuild 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 side of State Pier, with 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.

The City of New London has a Port Authority that has been essentially inactive. 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 supervision of the Connecticut Department of Environmental Protection. Pier 7 is roughly 654 feet long and 30 feet wide, with depths ranging from 26 to 35 feet alongside. 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 Hess Oil Terminal. The U.S. Navy Submarine Base in Groton is about two nautical miles north of the State Pier.

New England Central Railroad (NECR) provides 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 northeast corridor for its access. Rail America, Inc. (Jacksonville, Florida) is the largest operator of short line and regional railroads in the world. In the month of August 2009, NECR reportedly moved approximately 80 railcars to the State Pier, delivering about 6,400 m.t. of lumber from Canada and Pacific Northwest.

P&W, a regional freight railroad operating in Massachusetts, Rhode Island, Connecticut, and New York, interchange freight traffic with the NECR at Willimantic, Connecticut. P&W operates four classification yards in Worcester, Massachusetts; Cumberland, RI; Plainfield and New Haven, Connecticut.

In 2008, Pan Am Railways (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 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.

Planning and Initiatives

In 2009, the Department hired a consultant to provide services for the State Pier Needs and Deficiencies Planning Study. Among the tasks included in the study were to analyze the State Pier property and infrastructure to determine the best business use of the existing facility. The study will also consider recommendations for infrastructure improvements. 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 the year 2013.

Regional Intermodal Transportation Center New London Master Plan and Efficiency Study

The Southeastern Connecticut Council of Governments and the Department have identified the need to create a plan that sustains and enhances the regional New London Intermodal Transportation Center. The purpose of this study will be to fully evaluate the environmental, economic, transportation, and engineering issues associated with this site and improving the link between and the operations of the various transportation providers/facilities in the region including Union Station, Cross Sound Ferry, Fishers Island Ferry, Amtrak, Shore Line East, 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 Transit Oriented Development. Funding is being provided to the Council of Governments to hire a consultant to conduct this study.

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 is also being prepared for what options are being 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. This study will be completed the winter of 2010.

7.4 RAIL IN AND AROUND BRIDGEPORT HARBOR

Figure 35. Port of Bridgeport

Rail Operations and Facilities in Bridgeport

The City of Bridgeport is served by two harbors – Bridgeport Harbor and Black Rock Harbor. Bridgeport Harbor, the principal harbor, as seen in Figure 35, 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.

The Bridgeport Train Station serving Metro North and Amtrak is located adjacent to the Water Street Dock and Terminal, located in Bridgeport Harbor. The Terminal houses a year round ferry service between Connecticut and Long Island, New York. 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.

Black Rock Harbor is primarily a recreational harbor however; there are several industrial uses such as oil tank farms and construction companies that receive water-borne materials located here. 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; their current operational status is unknown.

The Bridgeport Port Authority is a quasi-public agency that was organized by the City of Bridgeport in 1992 and that gets its powers from State Statutes. A five-member Board of Commissioners, selected by the Mayor, governs the Bridgeport Port Authority and who appoints the Executive Director. The Bridgeport Port Authority is a self-funding organization, relying on its own revenues for its operations and grant funds for larger projects.

The Bridgeport Port 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, NY.

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 Bridgeport Regional Maritime Complex 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.

The primary commodities historically being 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, a longshoremen organization. Bridgeport has unique warehousing assets for foodstuffs in addition to its bulk liquid-handling assets. Coastline Terminals has recently entertained several new interests in their 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.

Bridgeport Harbor is also 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.

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 type 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 that can come into the harbor. 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 terminal reaches. Therefore, the procurement of various pieces of equipment such as top loaders, stackers, cranes, and yard tractors would be required.

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 physically and functionally integrate 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 Board has endorsed the concept of the Bridgeport ITC as one of the three mainline multi-modal hub stations on the Metro North Line in Connecticut. The BITC incorporates the functions of the local bus service, the Greater Bridgeport Transit (GBT); Metro North and Amtrak commuter rail services; intercity bus services, such as Peter Pan & Greyhound; Bridgeport/Port Jefferson Ferry Service to Long Island, NY; 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.

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, as development patterns emerged and were sustained by the introduction of the railroad. Subject to geography and terrain, 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, where 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 introduction and wide availability of electric power in the 1930s opened development opportunities for new factories and factory locations with regional connections that in turn presented a production advantage over the older industry in Connecticut. 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

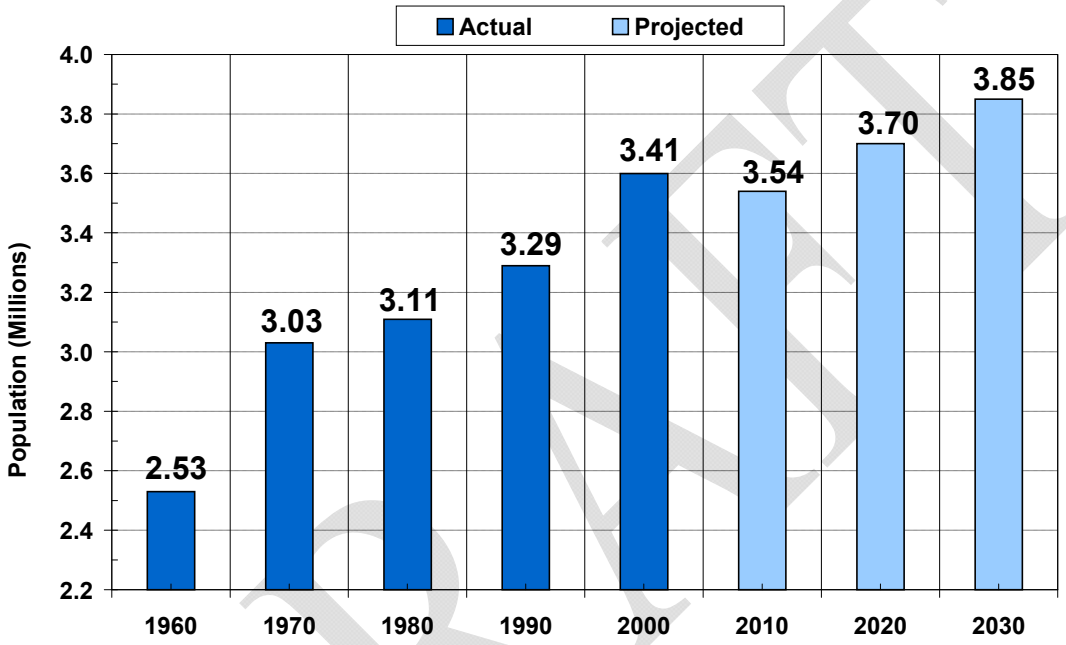
The demographic data presented in this chapter projects increases in population, employment, motor vehicle ownership and usage, with daily vehicle miles growing steadily through 2030. The majority of people continue to drive alone to get to their places of employment. The Department has adopted the following rail-related strategies contained in the 2009 Long Range Plan (LRP) to address these issues:

- Partner with the State Department of Economic and Community Development 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 36 presents census data for Connecticut in ten-year intervals from 1960 through 2000 and projected population growth for ten-year intervals from 2010 through 2030. Modified state population projections from the Connecticut Office of Policy and Management call for an 8.5 percent increase in total state population from 3,405,545 in 2000 to 3,696,560 by 2020. As presented in Figure 36 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 3.8 million by 2030.



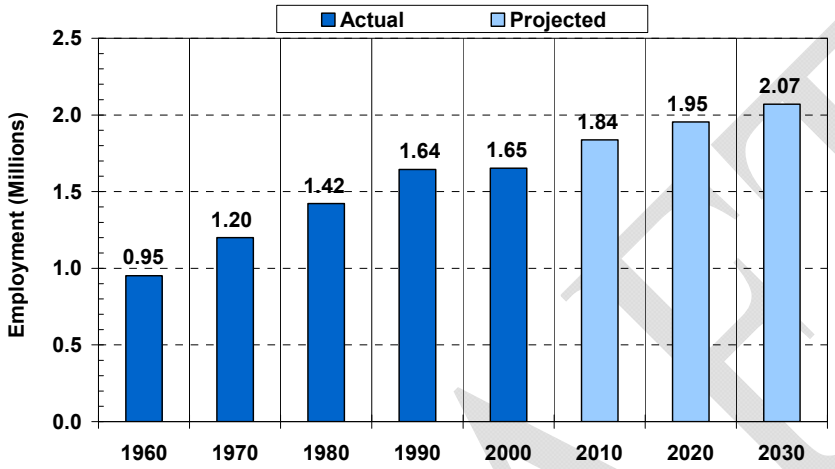
Source: 1960 Census, 1970 Census, 1980 Census, 1990 Census, 2000 Census, and ConnDOT Series 27B Land Use Projections. Data for years following 2000 is projected. Graphic revised in September 2009.

Figure 36. 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 (DOL) 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 37 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 2030. From 2000 to 2030, 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 0.85 percent from the 2000 employment level to 1.95 million in 2020 and 2.07 million in 2030. This represents a 25.3 percent increase in employment from 2000 to 2030.



Source: 1960 Census, 1970 Census, 1980 Census, 1990 Census, 2000 Census, and ConnDOT Series 27B Landuse Projections, as well as data from the Connecticut Department of Labor. Data for years following 2000 is projected. Graphic revised in August 2004.

Figure 37. Employment in Connecticut, 1960-2030

Regional Employment

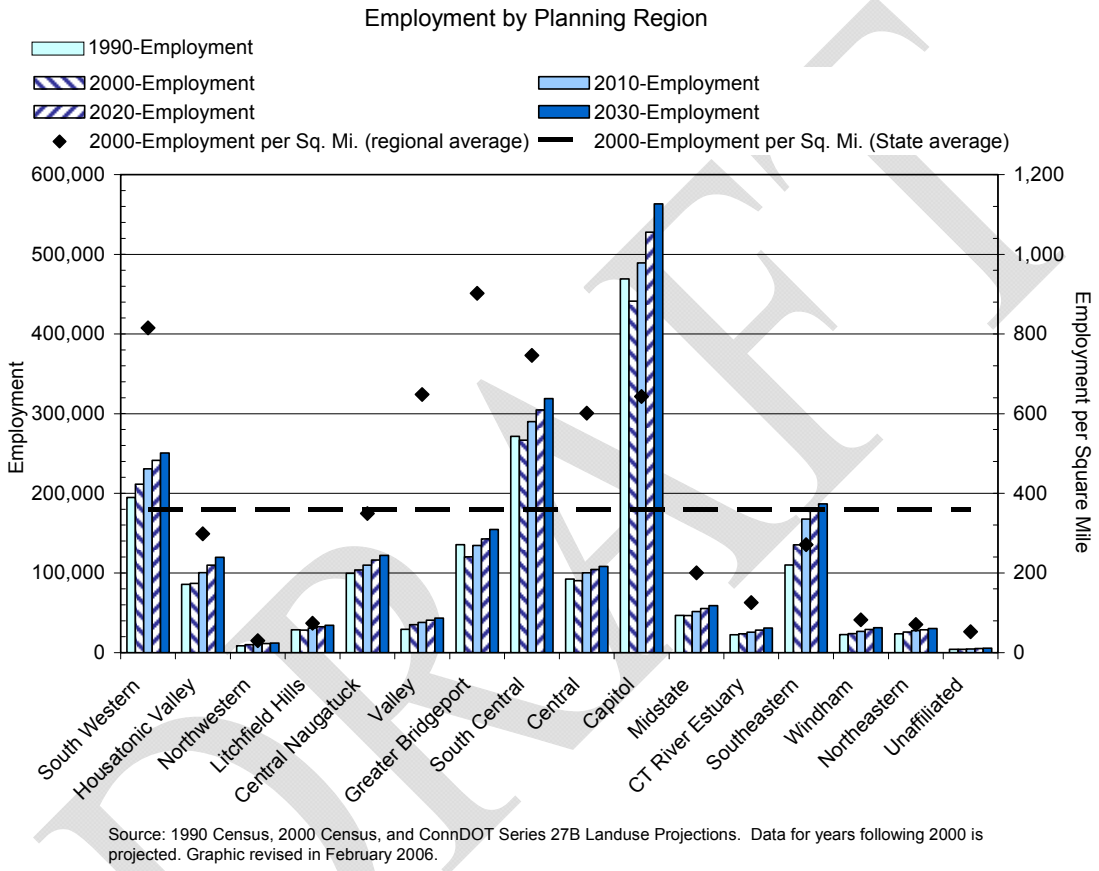
Figure 38 presents actual and projected Connecticut employment data from 1990 through 2030 by planning region. In 2000, the Capitol, South Central, and South Western regions had the greatest numbers of jobs: 441,290, 266,580, and 211,480, respectively. The total employment in these regions represented 55.6 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 323 jobs per square mile.

The Department has projected employment increases in all planning regions through 2030. The Capitol Region is projected to experience the highest growth in employment followed by South Central, Southwestern, Southeastern Connecticut, and Greater Bridgeport. The lowest employment growth is projected in the following regions: Litchfield Hills, Northeastern Connecticut, Windham, Connecticut River Estuary, and Northwestern Connecticut.

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 Capital and South Central regions as an alternative to driving vehicles to places of employment.



Source: 1990 Census, 2000 Census, and ConnDOT Series 27B Landuse Projections. Data for years following 2000 is projected. Graphic revised in February 2006.

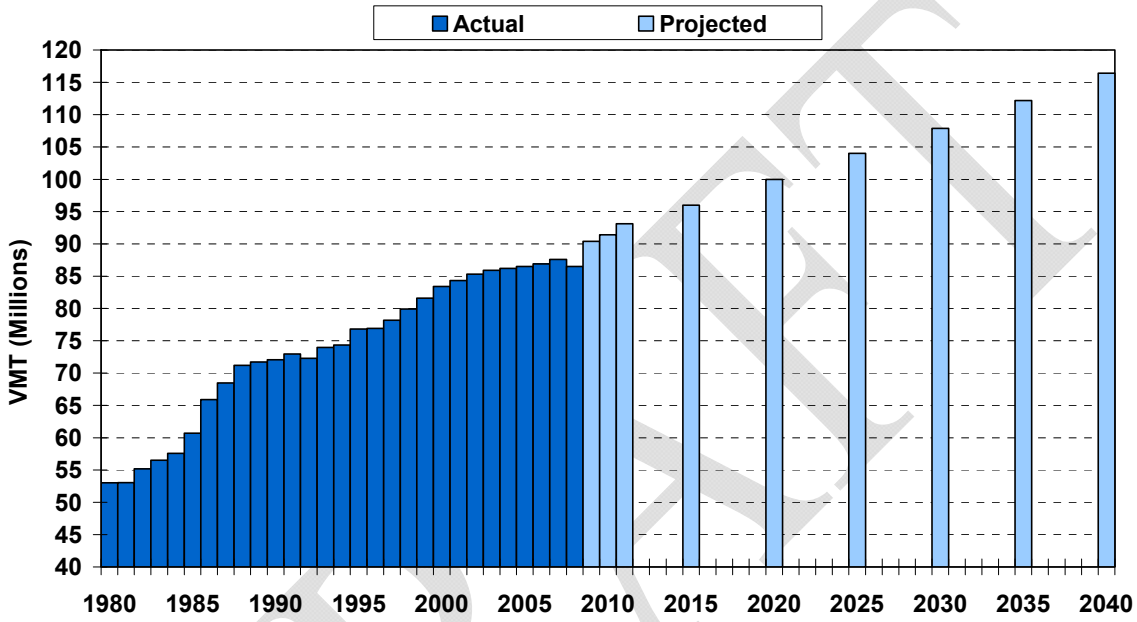
Figure 38. Employment Data by Planning Region, 1990-2030

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

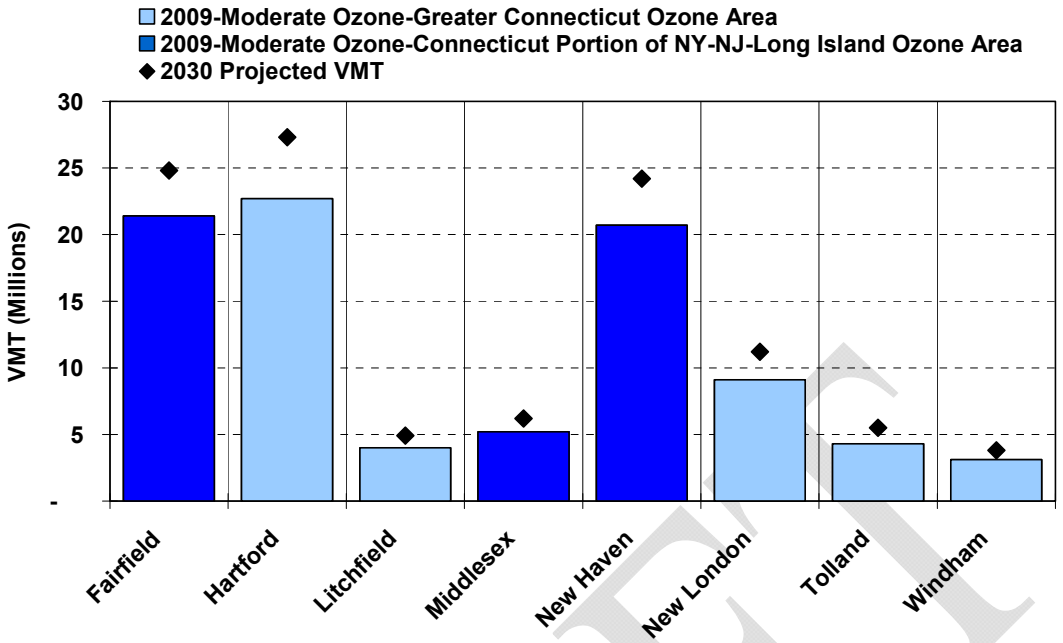
One index of vehicle use is Daily Vehicle Miles of Travel, or VMT. As Figure 39 illustrates, daily VMT in Connecticut has been growing steadily since 1980. In 2000, the total VMT in Connecticut was 83.4 million miles. Future projections call for continued slow growth in VMT as both the state and the economy continue to grow. In 2030, the statewide VMT is anticipated to be 108.1 million miles. This represents an increase of 24.7 million miles or a 29.6 percent increase from the VMT in 2000.



Source: Years 1980 to 2009 from Highway Performance & Monitoring System Data; years greater than 2009 are projected with ConnDOT Travel Model (Series 28I). Graphic revised in September 2009.

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

Figure 39. Vehicle Miles Traveled (VMT) in Connecticut



Source: CTDOT Travel Model (Series28I). Graphic revised in September 2009.

Special Notes: Data represents the Average Daily vehicle miles of travel. Graph shows 2009 ozone non-attainment designations.

Figure 40. Vehicle Miles Traveled (VMT) by County

On a county level, in 2009, as illustrated in Figure 40, Hartford County had the most vehicle miles traveled in the state: 21.7 million miles or 24.9 percent of the average daily miles traveled. Comparatively, Windham County had the fewest with slightly less than 3.2 million miles or 3.7 percent of the statewide average daily VMT.

In 2009, all of the counties in Connecticut were designated as Moderate Ozone Non-attainment areas. As shown in Figure 41, the three counties with the highest VMT in 2009: Hartford County, Fairfield County, and New Haven County, are projected to have the largest increases in VMT in 2030.

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 has placed added strain on the transportation system beyond the urban center.

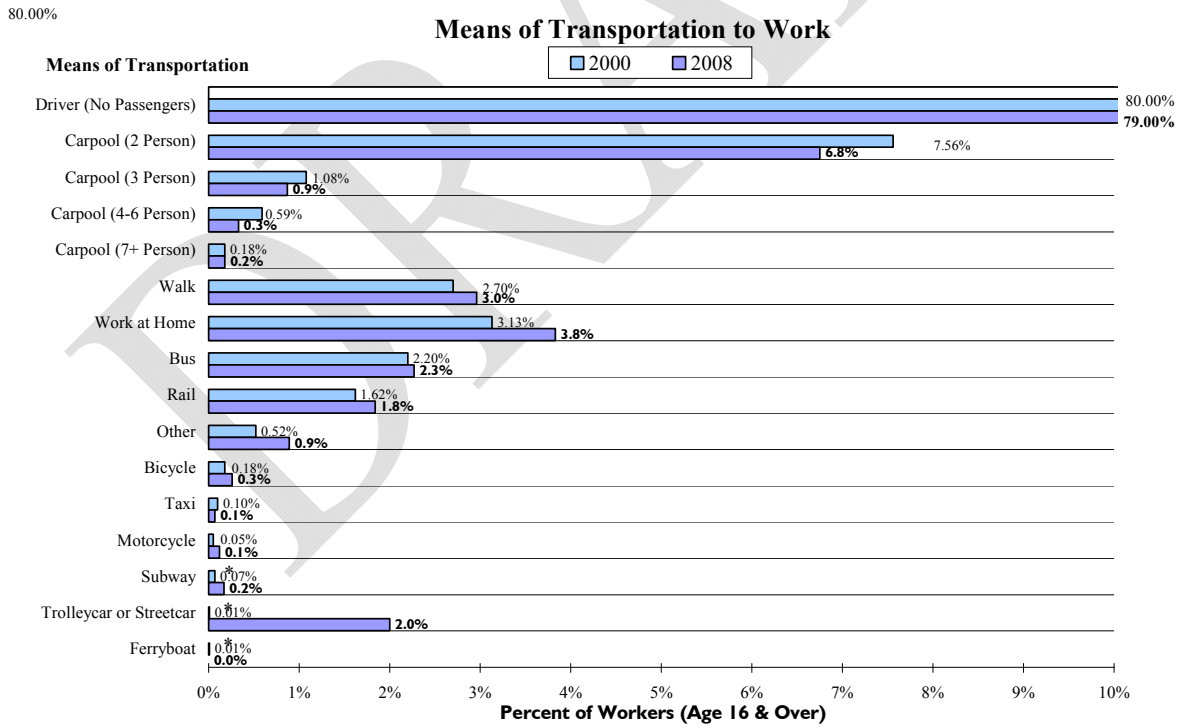
During the period 1980 through 2000, the shift of employment from central cities to suburban towns has been accompanied by an increase in the percentage of Connecticut's work force commuting to employment sites outside their towns of residence. The percentage of workers who commuted to a job located outside their towns of residence increased 7% 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 41. 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: American Community Survey Table S0801 Commuting Characteristics, 1990 Census, and 2000 Census Supplemental Survey. * The following categories: Trolley, Subway and Ferryboat were not available in the1990 census. The Census allows a person to select only one category as a means of transportation to work. It does not account for dual-mode trips to work. Data updated as of February 2010.

Figure 41. 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 carpooling 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.[36]

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 affect 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 cost-effectively address 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;
- volatile fuel prices,
- Federal and state actions to reduce greenhouse gas 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, 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 Governor's office recently (Sept 09) released a Statewide Economic Strategic Plan (ESP). The Department of Economic and Community Development (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. The ESP is available on the DECD web page.[37]

[36] 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.

[37] http://www.ct.gov/ecd/lib/ecd/connecticut_esp-final.pdf

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, they tend to lose their 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 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 they need when they need them.

A further development is the efforts to “compact” the logistics chain, that is, to minimize the time goods are 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 their efficiencies and decrease transit times in order 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 42 presents data from the Association of American Railroads on freight rail traffic by commodity type, originating and terminating in Connecticut (2007).

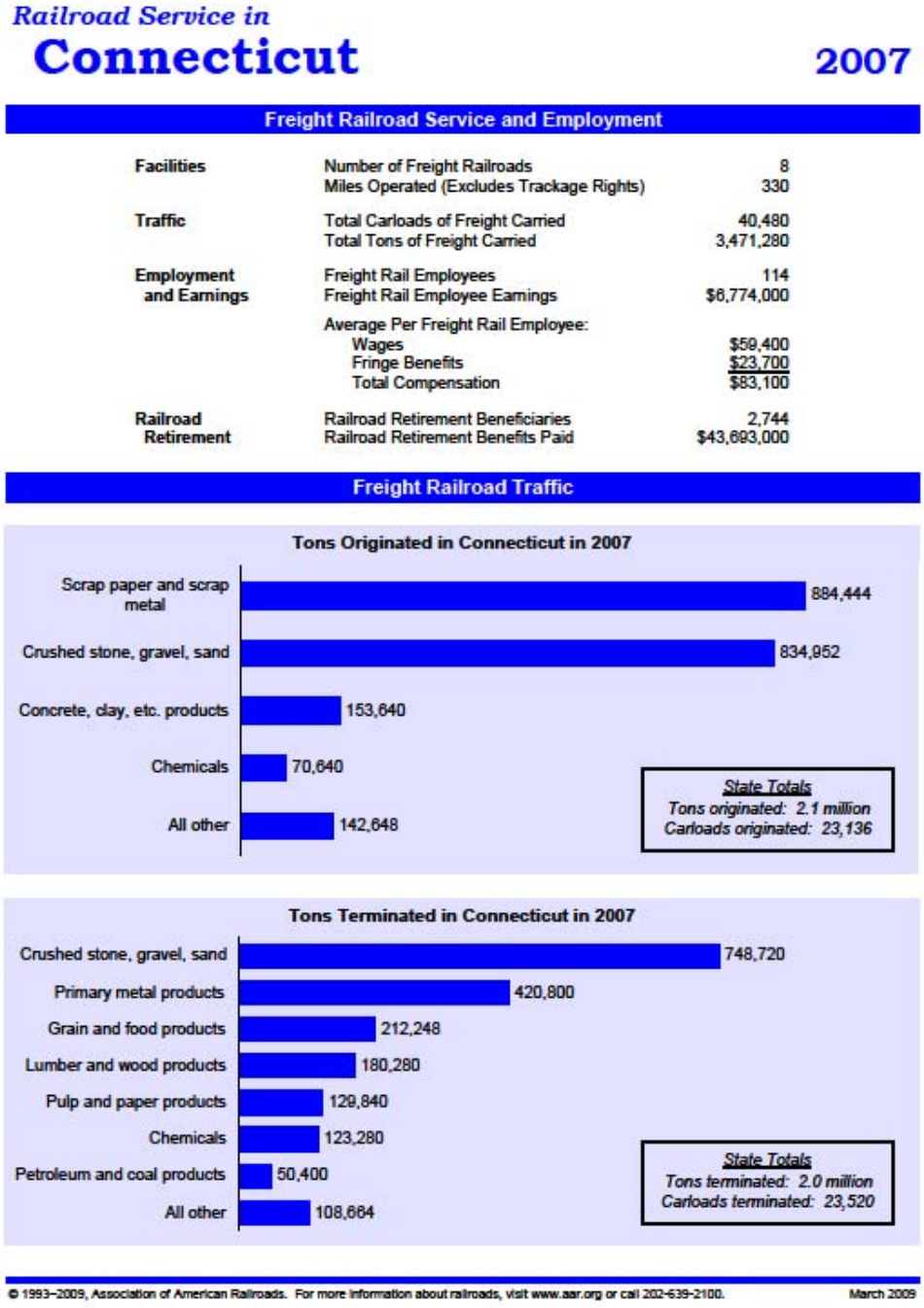


Figure 42. Freight Rail Traffic by Commodity Type

Figure 43 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.

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 43. Freight Shipments To, From, and Within Connecticut Shipments by Weight: 2002 and 2035 (Millions of Tons)[38]

According to Figure 43, approximately 2.3% of freight shipments in terms of tonnage to, from, and within Connecticut are attributable to rail. Also, according to U.S. Department of Commerce data "every dollar spent on investments in our freight railroads — tracks, equipment, locomotives, bridges — yield $3 in economic output. In addition, each $1 billion of rail investment creates 20,000 jobs."[39]

Additional information about freight railroads and commodities movement can be found in Chapter 6.

[38] 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.
[39] American Association of Railroads, http://www.aar.org/Economy/Economy.aspx

Passenger Rail Service

On the NHL service (Main Line and branch lines) in 2008, there were 37,895,826 annual passenger trips and 24,915,000 Connecticut interstate and intrastate passenger trips on the NHL in 2008. In 2008, the total passenger miles were 1,195,046,871 and Connecticut interstate and intrastate passenger miles were 968,891,120. On the SLE service in 2008, there were 568,114 annual passenger trips.

Connecticut residents travel about 31 billion vehicle miles per year.[40] This implies that passenger rail service represents about 3.8% of automobile vehicle miles traveled (VMT) in Connecticut. In Connecticut Vehicle Miles Traveled (VMT) increased 32% from 1986 to 2006. Transit ridership on Connecticut's rail and bus systems has been increasing. In 2006, rail passenger ridership on the NHL was 6.5% higher than it was in 2003. Ridership on trains and buses and trains continues to grow as fuel prices increase.

Passenger Rail Employment

Amtrak Intercity
In FY2008, Amtrak employed 554 Connecticut residents, with total wages of Amtrak employees living in Connecticut amounting to $39,778,320.[41]

Shore Line East
For the SLE service, Amtrak has approximately seventy employees that include transportation, mechanical, and three managers.

New Haven Line
There were 1,367 Metro-North workers employed in Connecticut for the NHL service in the year 2009.

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

[40] http://www.ehhi.org/reports/exhaust/summary.shtml
[41] *Source:* Amtrak Fact Sheet, Fiscal Year 2008, State of Connecticut.

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 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).[42]

8.3 MODELING CONNECTICUT WITHOUT RAIL TRANSPORT

For purposes of this analysis, we use the REMI model. 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, we remove the direct jobs associated with the rail industry in the state and reduce access to commodities and labor for all industries in the state. 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) 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, we include support activities for rail transportation (NAICS 488210) 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.

We omit operations such as the Essex Steam Train and the Trolley Museum included in the rail industry scenic and sightseeing land transportation sector (NAICS 487110). In addition, we omit railroad car rental (NAICS 532411), factory conversion, overhaul, or rebuilding rolling stock (NAICS 336510) and rail car janitorial services (NAICS 561720).[43]

Modeling Strategy Summary

With the information given above, we note 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. We have no information on the number of jobs in the rail support activities sector in Connecticut (NAICS 488210). We note that according to Table 2, between 7% and 8% of freight shipments in terms of tonnage to, from, and within Connecticut are attributable to rail. We therefore estimate that commodity access would

[42] Connecticut Department of Economic and Community Development, Nov. 2009.
[43] Connecticut Department of Economic and Community Development, Nov. 2009.

deteriorate by 0.5% 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% of the vehicle miles plus passenger rail miles traveled in the state is attributable to passenger rail. Therefore, we estimate that labor access in the state would deteriorate by 3% in all industries in the absence of passenger rail. Finally, we estimate that Connecticut's quality of life would deteriorate by 1% 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 44.

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$)	$19,706,895,592	4.12%
Personal Income (2008$)	$24,584,236,612	1.89%
Real Disp. Personal Income (2008$)	$7,704,993,217	3.02%
Output (Fixed 2008$)	$32,430,804,879	4.20%
Labor Productivity (2008$)	$6,452	1.98%
Relative Delivered Price	-0.01199581	98.8%
Relative Cost of Production	-0.02037831	97.96%
Exports to Rest of Nation (2008$)	$11,037,001,293	3.84%
Exports to Rest of World (2008$)	$2,020,203,838	3.17%
Ave Ann Comp Rate (2008$)	-$1,016	-0.32%
Net State Revenue (2008$)	$7,769,316	N/A

Figure 44. 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% 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% of it would be absent rail services on average each year. Because of the 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 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.[44]

[44] 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 Long Range Plan (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 greenhouse gas (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 greenhouse gas emissions attributable to transportation.

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

- 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 in order 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 and to move passengers and freight through Connecticut and to and from points in Connecticut by working with the Connecticut Maritime Commission, appropriate transportation agencies and other stakeholders.[45]

9.1 ENERGY USE

Energy Intensity (2005)

The energy efficiency of personal travel could be increased by encouraging the use of rail passenger transport. National data for the year 2005 indicates 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.[46]

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 45. Energy Consumption per Passenger Mile by Mode

[45] Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035,* Connecticut Department of Transportation, Newington, Conn., June 2009.
[46] Oak Ridge National Laboratory, Transportation Energy Data Book, Edition 26, 2007.

9.2 AIR QUALITY

The transportation sector accounts for roughly 40 percent of Connecticut's greenhouse gas (GHG) emissions. The amounts of GHG attributable to various means of transportation are shown in Figure 46.

Figure 46. Greenhouse Gas Emissions (GHG) of Transportation Options

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 airplanes[47] or cars.

Railroads are the environmentally friendly way to move freight, due to their lower fuel consumption and reduced greenhouse gas 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.[48]

- A freight train moves a ton of freight an average of 457 miles on a single gallon of fuel. According to the Federal Railroad Administration, 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 greenhouse gas 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 carbon dioxide 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 greenhouse gas emissions would fall by some 12 million tons.

[47] 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.
[48] American Association of Railroads, http://www.aar.org/Environment/Environment.aspx

- From 1980 through 2008, U.S. freight railroads emitted 579 million fewer tons of carbon dioxide thanks to their 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.[49]

According to the Tri-State Transportation Commission, use of rail transit in even partially occupied rail cars can significantly reduce emissions in this region.

In order to meet Connecticut's GHG targets, a comprehensive package of transit improvements and land use policies and incentives are needed to achieve VMT reductions. 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, Environmental Protection, Administrative Services, Public Utility Control, 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 greenhouse gas emissions to meet state and regional goals. The Connecticut Global Warming Solutions Act of 2008 changes voluntary greenhouse gas goals into mandatory limits of 10% below 1990 levels by 2020 and 80% 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 coordinate 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, transit-oriented development, and housing diversity.
    d. Expand bicycle and pedestrian infrastructure.
4. Redirect at least 25 percent of new development (based on forecast population & 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.[50]

[49] American Association of Railroads, http://www.aar.org/Environment/Environment.aspx
[50] 2005 Connecticut Climate Change Action Plan, http://www.ctclimatechange.com/StateActionPlan.html

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

Figure 47 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 carbon dioxide 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 greenhouse gas emissions avoided because of the availability and use of passenger rail services in Connecticut are substantial.[51]

An estimation of avoided GHG Emissions as a function of rail commuter miles

Reporting Year	CT New Haven Line Passenger Miles[1] (000)	CT Shore Line East 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
Reporting Year	CT New Haven Line Passenger Miles[1] (000)	CT Shore Line East 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 CTDOT 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 CO_2 per gallon, 2000 pounds per short ton
[6] Estimated as 5% of CO_2 Emissions (http://www.epa.gov/otaq/climate/420f05004.htm)

Figure 47. Avoidable Emissions on EPA Mobile 6.2 Model Basis

9.3 EFFORTS TO REDUCE LOCOMOTIVE EMMISSIONS

M8 Rail Fleet

The new M8 rail fleet, which will begin being phased into service on the NHL in 2010, will be able 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 M8 car design 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 replaces the

[51] Source: Connecticut Department of Environmental Protection, Nov. 2009.

older incandescent lighting providing lighting that is more efficient and less maintenance of the lighting components. 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.

9.4 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 transit-oriented development (TOD) potential, and coordinate with local interests to foster such development. Support municipal efforts to develop transit-oriented developments.
- Employ the use of context-sensitive solutions, including early solicitation of public input, 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.[52]

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. Often, 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, a "transit-oriented development" (TOD), is a mixed use/compact area that is designed to facilitate the use of and maximize access to public transportation. In the Connecticut General Statutes, a "transit-oriented development" 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, in order 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

[52] *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035,* Connecticut Department of Transportation, June 2009

producing local and regional benefits. TOD proponents believe it 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. TOD implementation ideally starts with a vision, cultivated from broad-based public input, and proceeds to strategic station-area plan 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 to make TOD a reality. Some of these TOD projects are discussed in Appendix A.

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 significantly enhance 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.[53]

Federal and State Roles

The Federal Railroad Administration (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 having active warning devices and two-hundred ten (210) of the crossings currently having passive warning devices.

[53]Connecticut Department of Transportation, *Connecticut on the Move, Strategic Long-Range Transportation Plan 2009 – 2035,* Connecticut Department of Transportation, Newington, Conn., June 2009, pp. 3-9 – 3-11.

Since the program's inception in 1976, two hundred seventeen (217) locations have received improvements, of which seventy-five (75) locations were improved under programs other than the grade crossing program.

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, they are 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 their 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.

Current Fiscal Year Projects

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. The following is a list of these projects and their 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 48. Current 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.[54]

[54] September Special Session, Public Act No. 09-2, Section 67.

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 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.

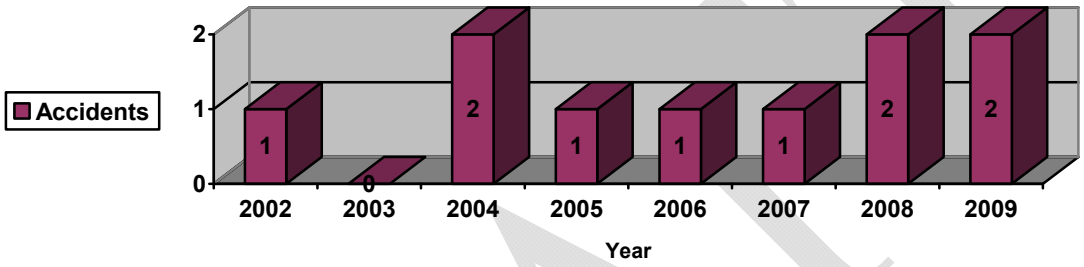
Rail Regulatory and Compliance Unit

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

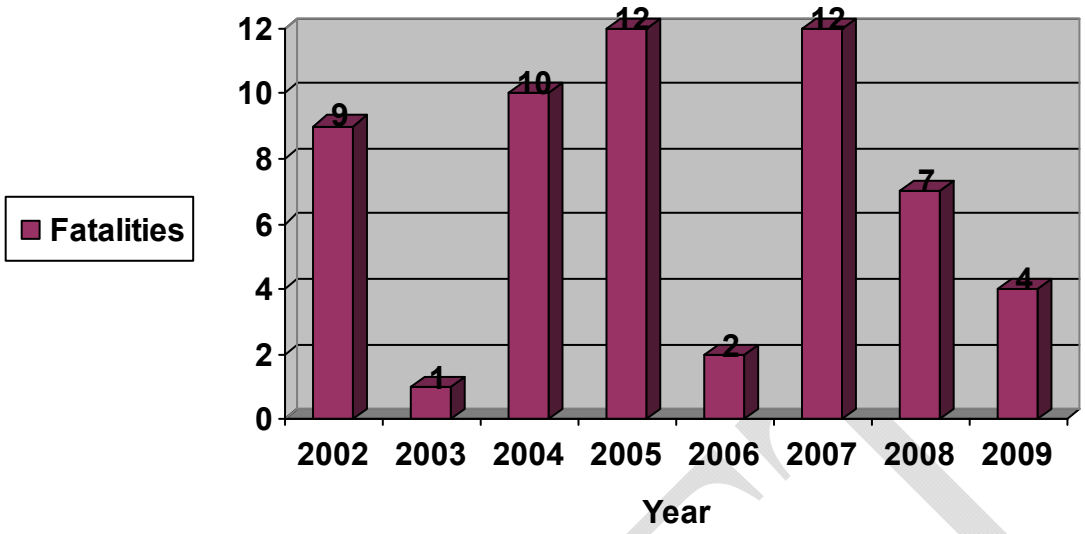
railroad related accidents within the state and provides coordination between other Department units as well as various railroad companies during planning and design as related to railroad at-grade crossings.

As mentioned above, the Rail Regulatory and Compliance Unit is responsible for the monitoring of railroad related accidents within the State of Connecticut. Figure 49 shows the number of accidents at railroad/highway at-grade crossings in Connecticut from the year 2002 to the year 2009. Figure 50 depicts the number of railroad related fatalities in Connecticut from the year 2002 to the year 2009. Figure 51 shows the type of railroad related fatality from the year 2002 to the year 2009. 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.



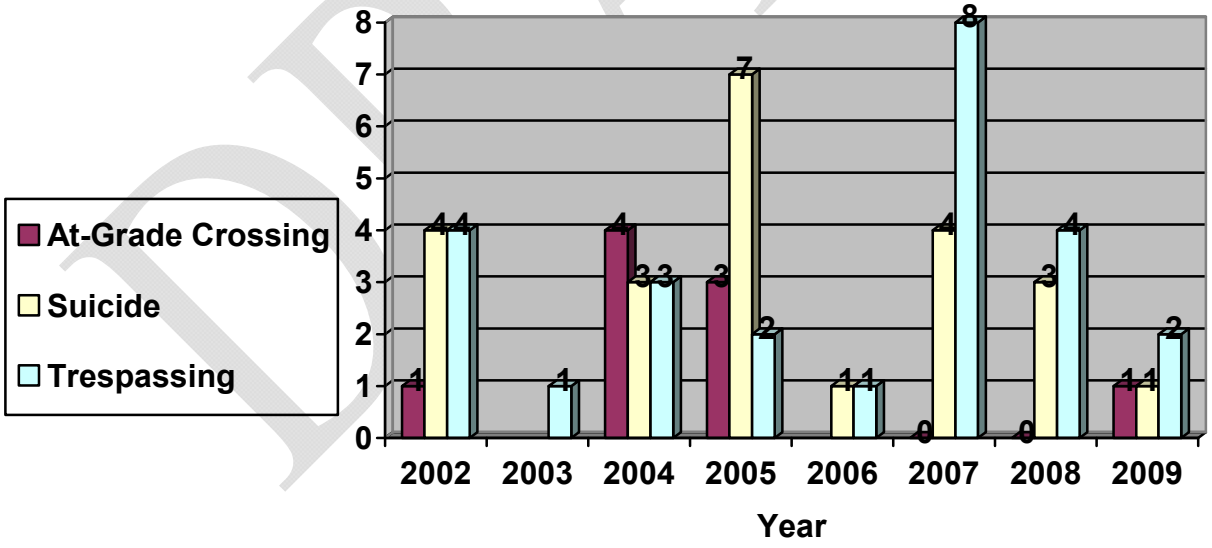
Note: As of October 2009

Figure 49. Railroad/Highway At-Grade Crossing Accidents in Connecticut



Note: As of October 2009

Figure 50. Railroad Fatalities in Connecticut



Note: As of October 2009

Figure 51. 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.

Measurements and Rating

As a part of the NHL operating agreement, Metro-North annually conducts a detailed survey of riders. The Figure below shows the results of the personal safety questions received from riders on the NHL (Connecticut residents only).

Customer Perception of Rail Safety

New Haven Line (Connecticut only)	2004	2005	2006	2007
Safety on trains (% Satisfied)	94%	95%	94%	95%
Safety at stations (% Satisfied)	92%	92%	91%	94%
Safety at parking (% Satisfied)	90%	93%	90%	93%

A positive perception of personal safety is correlated with higher ridership and stronger commitment to public transit as a mode of travel.

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.

The Department also created a Homeland Security Task Force to identify, review, and

addresses any needs for increased coordination between Department bureaus to enable them to respond effectively and efficiently to any natural and/or homeland security events.

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 will be 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 Management and Homeland Security and other outside agencies.
    - Review, monitor, and advise Department managers on the availability, related deadlines, and eligibility requirements of grant programs and other funding.
- Partner with the Department of Emergency Management and Homeland Security, 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.[55]

[55] 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.

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 Federal Transit Administration (FTA) and Federal Railroad Administration (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.

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).

Transit Security Grant Program

The Transit Security Grant Program (TSGP) is one of six grant programs that constitute the DHS Fiscal Year 2009 transportation infrastructure security activities. The TSGP provides grant funding to the nation's key high-threat urban areas to enhance security measures for their critical transit infrastructure including bus, ferry, and rail systems. FY 2009 TSGP priorities include security training of frontline employees, operational deterrence initiatives, drills and exercises, developing security plans, and public awareness programs. The TSGP also funds anti-terrorism measures that help protect underwater/underground infrastructure, high density elevated operations, multi-user high-density stations and terminals, interoperable communications, evacuation plans, and Supervisory Control and Data Acquisition (SCADA) systems.

The Department is a member of the Regional Transit Security Working Group (RTSWG) that is comprised of 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 in order 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.

Commuter Rail Security Projects

The Department has implemented a security program in cooperation with 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. Funding for these projects has been primarily through the TSGP with state funds supplementing most of the projects.

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 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 Connecticut Department of Emergency Management and Homeland Security (CT DEMHS) 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 and coordinated through the CT DEMHS, will link MTA communication centers to all public safety answering points along the NHL rail corridor.

The Department has also received funding through the CT 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 in order 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

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 MTAPD and Amtrak PD. Typical Connecticut rail VIPRs include TSA, MTAPD, Amtrak PD, State Police including those troopers deployed to the Connecticut Department of Emergency Management and Homeland Security, 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 detailed to DEMHS with advanced radiological and nuclear detection capabilities.

New Haven Line

The Metropolitan Transportation Authority Police Department (MTA PD) is the primary law enforcement agency for the Metro-North Railroad, 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 Metro-North Railroad services and patrol the railroad right of way in Connecticut from Greenwich to New Haven and the three branch lines that service New Canaan, Danbury, and Waterbury. 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 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 fifty-five explosive detection canines some that are cross-trained for patrol that includes tracking, criminal apprehension, and evidence recovery.[56]

Shore Line East and Intercity Passenger Rail

Amtrak Police is the primary law enforcement agency for the SLE commuter service and Amtrak Intercity passenger service in Connecticut. Amtrak has in place a program that includes a variety of security measures aimed at improving passenger rail security. Some of these

[56] Source: Metropolitan Transportation Authority Police Department, Nov. 2009.

measures are noted on Amtrak's website[57] 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. The 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 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.

Beginning in 2010, the Connecticut State Police's newly created Mass Transit Security Unit consisting of K-9 Explosive Detection Teams is being deployed to conduct proactive explosive detection sweeps at passenger rail and bus stations/terminals and critical locations related to the mass transit system in Connecticut. The Unit 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. This project was partially funded through the Federal Transit Security Grant Program.

[57] www.Amtrak.com

CHAPTER 11 – LONG-RANGE SERVICE AND INVESTMENT PROGRAM

The State Rail Plan (SRP) 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 and maintain the existing transportation system. The existing system comprises major transportation infrastructure such as airports, bridges, highways, rail lines, and navigable waterways. The system also consists of many other components that must be maintained.

The Department is committed to making investments to preserve, maintain, address safety issues on, and maximize the use of the existing transportation system before making investments to expand the system.

The following rail-related strategies are identified in the State's 2009 Long Range Plan:

- 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.
    - 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.[58]

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.

[58] 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.

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 of 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

Based on the Five Point Strategic Action Plan, the Department has developed the following strategies:

- Partnering with the freight railroads in maintaining and growing interconnectivity of the state rail freight system with the national network;
- Leading the programs in maintaining and growing the existing rail service on the NHL and SLE;
- Partnering with the Amtrak, the federal government, and adjacent states in maintaining and growing the intercity and high-speed regional rail system;
- Driving new service investment and growth east to New London and beyond;
- Leading new service growth north through the capitol of the state to Springfield;
- New service growth west to Penn Station, New York and beyond;
- Studying and planning the potential for 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.

11.2 NEAR –TERM ACTIONS

Translating the above strategies to next steps, the following near-term actions are proposed.

The Connecticut Rail Freight System

The statewide rail freight and preservation program should focus on track, bridge, and crossing upgrades or replacement, improvements in drainage and culverts, and other improvements to strengthen first-mile/last-mile interchange, off-loading, and other shipment connection points.

New Haven Line and Branches

For the NHL, of key importance is to prepare all aspects of the railroad for the M-8 car delivery including yard facilities construction, shop preparations, the renewal of the signal and communications systems, and maintenance of rail bridges and tracks. Station and parking development now underway at Fairfield, West Haven, Bridgeport, and other locations is a key element in doubling rail parking for this system. Regional engagement is required to generate the additional spaces to enable regional economic growth, and with the help of business groups and the Regional Planning Agencies, parking development must be expedited.

Intercity and High-Speed Rail Development

Partnering With Amtrak

The required Amtrak review of needs for a state-of-good-repair on the North East Corridor (NEC) has resulted in a project listing that more completely identifies the infrastructure needs for the current and year 2030 level of intercity and Acela service through Connecticut and the region.[59] The state will continue to collaborate with Amtrak in federal funding requests to obtain the necessary funding to enable the NEC to achieve its full potential as a critical component of

[59] Northeast Corridor Infrastructure Master Plan, Draft 10/23/09.

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 NEC east of New Haven and on Amtrak's Springfield Line.

With respect to the New Haven-Hartford-Springfield service that has received Connecticut legislative authorization; the Department has received ARRA Stimulus funds for double-tracking 10 miles of this line to support commuter, high speed, and freight rail service on this line.

High-Speed Rail

Connecticut, Massachusetts, and Vermont have recently requested ARRA Stimulus funds to improve the Connecticut River Line for new passenger rail traffic. The Massachusetts study undertaken by the Pioneer Valley Planning Commission needs to be advanced and the possibility of obtaining high-speed rail planning funds for this study needs to be advanced. This is a key initiative for the connection of the Northern New England High-Speed rail corridor designation. The Department will continue to work with the other Northeastern states to promote high-speed rail in the region.

Shore Line East Expansion

The expansion plan for the SLE service is progressing in accordance with the timeline envisioned by the Plan, recognizing the obstacles to service additions eastward. Phase 1 for expansion of weekday, weekend/holiday service has been completed ahead of schedule. Phase 2 expansion to New London is underway. The Department continues to work with the stakeholders in the region to accommodate both rail and maritime traffic.

Penn Station Rail Service

The Department coordinated with MTA MNR to initiate New Haven-Penn Station-Secaucus weekend Sports complex 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 in the future, from Connecticut to Penn Station, New York. Based on the experience gained in this initiative, the Department will begin discussions to expand such service to other times that may be available, and to investigate the obstacles to introducing peak commuter service in the future.

Modal Connectivity

Although the rail system is the central focus of the SRP, the Plan recognizes the significant importance of intermodal connections to system function and productivity. Chapter 7 reviews those intermodal connections that form an integral element in both the freight and passenger systems. All intermodal connections will require upgrading and improvement to achieve greater system delivery.

The air, freight, intercity, and commuter linkages at intermodal sites will receive particular attention as an outgrowth of this Plan. The commuter rail system linkages to Tweed Airport and Bradley International Airport on the New Haven-Hartford-Springfield Line (NHHS) shall respectively be improved and introduced. The Bradley connection is envisioned to be a direct linkage shuttle bus direct to the Airport.

The long-range service and investment program funding tables and project descriptions are included in Appendix A and B. The Appendix also includes 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.

Department of Transportation – Overall Funding Program

Connecticut's total transportation capital program in recent years has been between $658 million and $2.1 billion per year, with $12 million coming from Special Transportation Fund (STF) appropriations; between $212 million and $1.6 billion coming from state bonds; and the remainder coming from federal program funds. The cost of the Capital Program for State Fiscal Year (SFY) 2009 is estimated at $840.6 million. The state's share of this cost is estimated at $389 million with $12.8 million coming from appropriations.

For rail, the state invests about $118 million annually in Metro-North Railroad and SLE services in operating funds and about $160 million annually in capital investments. Operating funds come from the Department's budget. Capital projects are funded from either the federal program (80% federal and 20% state match) or 100% state bond funds. Connecticut provides state-funded capital programs benefiting freight and passenger rail.

12.1 FEDERAL FUNDING PROGRAM

Federal Funding Process

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.

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 American Recovery and Reinvestment Act of 2009 (ARRA). Funds received under ARRA supplemented the funding pool available for capital projects, allowed for 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 in order 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.

Federal Transit Program Funding - Rail Projects

FTA Section 5309 Capital Funding Program
The Federal Transit Administration (FTA) administers several transit funding programs. The Section 5309 Program provides capital funding for the establishment of new transit service projects ("New Start" - 40%), the improvement and maintenance of existing rail and other fixed guideway systems ("Rail Modernization"- 40%), and the rehabilitation of bus systems ("Bus and Other"- 20%).

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.

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 were satisfied, the Section 5307 funds were programmed for priority bus projects in other UZAs. When the priority bus needs had been satisfied, the uncommitted funds were 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.

Transit Security Grant Program Funding – Rail Security Projects

The Transit Security Grant Program (TSGP) provides grant funding to the nation's key high-threat urban areas to enhance security measures for their critical transit infrastructure including bus, ferry, and rail systems.

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. The Department of Homeland Security (DHS) meets with a Regional Transit Security Working Group (RTSWG) in each region to establish a Cooperative Agreement that identifies projects that will have the greatest security impact based on national priorities.

Priorities include security training of frontline employees, operational deterrence initiatives, drills and exercises, and public awareness programs. The TSGP also funds anti-terrorism measures that help protect underwater/underground infrastructure, high density elevated operations, multi-user high-density stations and terminals, and Supervisory Control and Data Acquisition (SCADA) systems.

Proposed projects are scored based on these criteria:

- The agency's risk score
- The project's effectiveness score
- The project's potential for risk mitigation
- The project's regional collaboration component (as applicable)
- The agency's offering of cost share (as applicable)

12.2 STATE FUNDING PROGRAM

State Budget Process

The General Assembly of the State of Connecticut operates through a bicameral legislature in which members of both the Senate (36 members) and the House of Representatives (151 members) serve two-year terms. The executive power of the state is vested in the Governor who is elected to serve a four-year term. The ultimate "power of the purse", the authority to spend public funds and tax the public, is vested in the legislative branch of government. In certain selective instances, however, some of this power is delegated by the legislature to the Governor.

The main responsibility of the Governor is to recommend the budget to the legislature and execute the budget passed by the legislature by carrying out the program mandates through the agencies of the executive branch. The following paragraphs more fully discuss the budget cycle, politics of the process and budget reforms in Connecticut.

Timing of the Budget Cycle

The Budget cycle consists of two phases: budget formulation and budget execution.

Budget Formulation

The Budget and Financial Management Division of the Office of Policy and Management (OPM) develops forms and instructions to be used by state agencies in submitting their budget requests that are sent to the agencies by August 1. This is eleven months prior to the effective date of the beginning of the biennial budget being requested. The state's fiscal year runs from July 1 through June 30. (Sec. 4-71 CGS, as amended by PA 91-3, JSS)

The agencies prepare their biennial budget requests. In recent years, agencies have been required to present a current services budget plan and a separate list of programmatic options if the agency requests changes in expenditures or revenues. The changes represent anything above or below the present level (current services), as well as the reallocation of resources. The current services level includes inflation, caseload increases, annualization of partial year

costs, and other increases based on current law. (Sec. 4-77 CGS, as amended by PA 91-3, JSS)

Agencies must submit their current services biennial budget requests to the Budget and Financial Management Division on or before September 1 of each even-numbered year and program options are due by October 1. In each odd-numbered year, the agency submits adjustments and revisions to the second year of the previously approved Biennial Budget if necessary.

In September and October, budget analysts in the Budget and Financial Management Division review requests and prepare recommendations for agencies within their jurisdiction. They base recommendations on an analysis of the efficiency and effectiveness of existing programs, and the perceived public need for new and expanded programs. (Sec. 4-77 CGS, as amended by PA 91-3, JSS)

The Secretary of OPM reviews all recommendations. Adjustments are made in accordance with the administration's determined priority of public needs and state revenue estimates. (Sec. 4-77 CGS, as amended by PA 91-3, JSS)

When there is a newly elected Governor, the Secretary of the Office of Policy and Management sends the tentative recommendations to the Governor by November 15 for review. (Sec. 4-79 CGS, as amended by PA 91-3, JSS)

In December and January, the Governor-elect may hold budget hearings with such agencies as desired, or at the request of any agency. Final policy decisions are then incorporated in the recommended budget. (Sec. 4-80 CGS, as amended by PA 91-3, JSS)

The Governor transmits the budget document for the next biennium to the legislature by the first session day following February 3 in each odd numbered year. The package presented to the General Assembly must contain a separate budget for each of the two fiscal years and a report outlining estimated revenues and expenditures for the three years following the biennium. If, however, the Governor has been elected or succeeded to the Office of Governor since the submission of the last budget document, s/he shall transmit the biennial budget recommendations and reports to the General Assembly by the first session day following February 14. (The General Assembly convenes on the first Wednesday after the first Monday in January in odd-numbered years.) In even numbered years, the Governor will transmit a report on the status of the budget enacted, along with any recommendations for revisions and adjustments if needed, including estimated revenues and expenditures for the next three years. Such transmittal occurs on the Wednesday after the first Monday in February, which is the day that the General Assembly convenes.

The Governor's recommended budget document is required by statute to contain four parts: 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. (Sec's. 4-71 through 4-74a CGS, as amended by PA 91-3, JSS)

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. In work sessions, Appropriations subcommittees review the agency operating

budgets with agency heads, Budget and Financial Management Division staff (executive) and Office of Fiscal Analysis (OFA) staff (legislative). 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, with the assistance of OFA staff, 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. OFA prepares a committee budget report containing legislative intent for all changes made by the Appropriations Committee to agency budgets.

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 state facilities through a main bond bill. Two other significant bond bills are passed: one for various continuing statutory programs such as school construction, housing, and pollution control grants, and one for transportation purposes. In addition to the Appropriations Act, there may be other individual bills authorizing the expenditure of funds (although these are not usually significant), as well as several bills relating to revenue measures (tax changes as well as various fees and fines). (Sec. 2-35 CGS, as amended by PA 91-3, JSS)

The OFA publishes an annual report on the budget as passed by the legislature. It provides detailed information on agency budgets including newly authorized expenditures and expenditure reductions, changes in state taxes and other revenue measures, and bonding.

Budget Execution

The Budget and Financial Management Division staff administers agency appropriations through the allotment process to ensure sound fiscal management of state funds. Generally, funds are allotted quarterly based on an annual financial program submitted by the agency for review and the Governor's approval prior to each July 1. The Governor, after filing a report with the Appropriations and Finance Committees, 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. If the monthly financial statement issued by the Comptroller includes a projected deficit greater than 1% of the total General Fund appropriations, the Governor is required to restrict allotments within specified limits (up to 5% of an individual appropriation account within an agency but not more than 3% of total appropriations in a fund). Any action that would reduce overall appropriations more than 3% of the total appropriation from any fund or more than 5% of any appropriation, requires the approval of the Finance Advisory Committee (FAC), a joint legislative-executive body. The FAC is composed of the Governor, Lieutenant Governor, Treasurer, Comptroller, and two Senate members (not more than one from same political party) and three House members (not more than two from same political party) of the Appropriations Committee. (Sec. 4-93 CGS, as amended by PA 91-3, JSS). Any change, however, that would result in a reduction of more than 5% of the total appropriation from any fund, requires the approval of the General Assembly. (Sec. 4-85 CGS, as amended by PA 91-3, JSS)

Adjustments in the quarterly allotment program or transfers of funds from one appropriation account to another are requested through the Budget and Financial Management Division. If a transfer exceeds 10% of the original appropriation or $50,000, whichever is less, the FAC must approve it.

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. (Sec. 3-20 CGS)

Special Transportation Fund

The sections that follow are excerpts from two documents. The first is an excerpt from the Department's 2009 Master Transportation Plan, explaining in detail the structure of the Special Transportation Fund (STF), the various programs funded from the STF, and some historical and prospective program statistics. The second is an excerpt from the Connecticut Revenue and Budget Data report dated July 2009 titled "History of Adjustments to the Fund" prepared by the Connecticut General Assembly's Office of Fiscal Analysis, Page 158. This excerpt details the process of ongoing adjustments that have been made to the STF over the years to provide financial stability.

From the 2009 the Department's Master Transportation Plan

The STF funds state transportation programs that receives 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).[60] In addition, the STF finances most of the operations and services of the Connecticut Department of Motor Vehicles.

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 SFY 2009 is currently estimated at $840.6 million. The state's share of this cost is estimated at $389 million with $12.8 million coming from appropriations.

The pie chart (Figure 52), Department's Operating Budget for SFY2009, shows how the Department allocates the $507.2 million operating budget. It shows that 50 percent is allocated to public transportation subsidies for both bus and passenger rail (including 4 percent for Americans with Disabilities Act paratransit programs), 39 percent is allocated to personnel services and other expenses, 4 percent is allocated to town-aid road grants, 2 percent is allocated to highway and bridge renewal, 2 percent is allocated to highway and bridge renewal equipment, and 1 percent is allocated to highway planning and research. In SFY2007, 47 percent was allocated to public transportation. The increase in funding for public transportation is in response to the growing public demand. It is anticipated that demand for investments in public transportation will continue to grow if fuel prices continue to increase.

[60] 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.

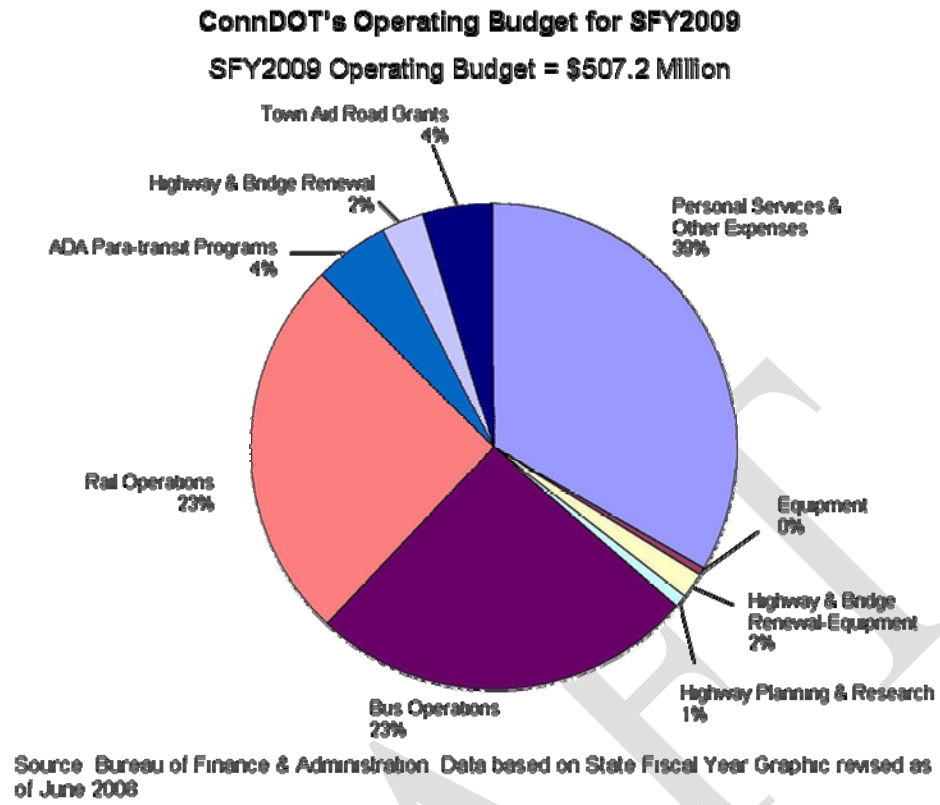


Figure 52. ConnDOT's Operating Budget for SFY 2009

The pie chart (Figure 53), Expenditures from Special Transportation Fund, presents a breakout of STF estimated expenditures. For SFY2009, 39 percent of the STF is allocated to pay debt on highway, rail and bus transportation projects paid for with bonds; 22 percent is allocated to operate and subsidize mass transit; 18 percent is allocated to Department operations; 11 percent is allocated to pension and fringe benefits; 5 percent is allocated to the Department of Motor Vehicles; 2 percent is allocated to renewal of state-owned and maintained highways and bridges; 2 percent is allocated to town aid and 1 percent is allocated to other budgeted expenses.

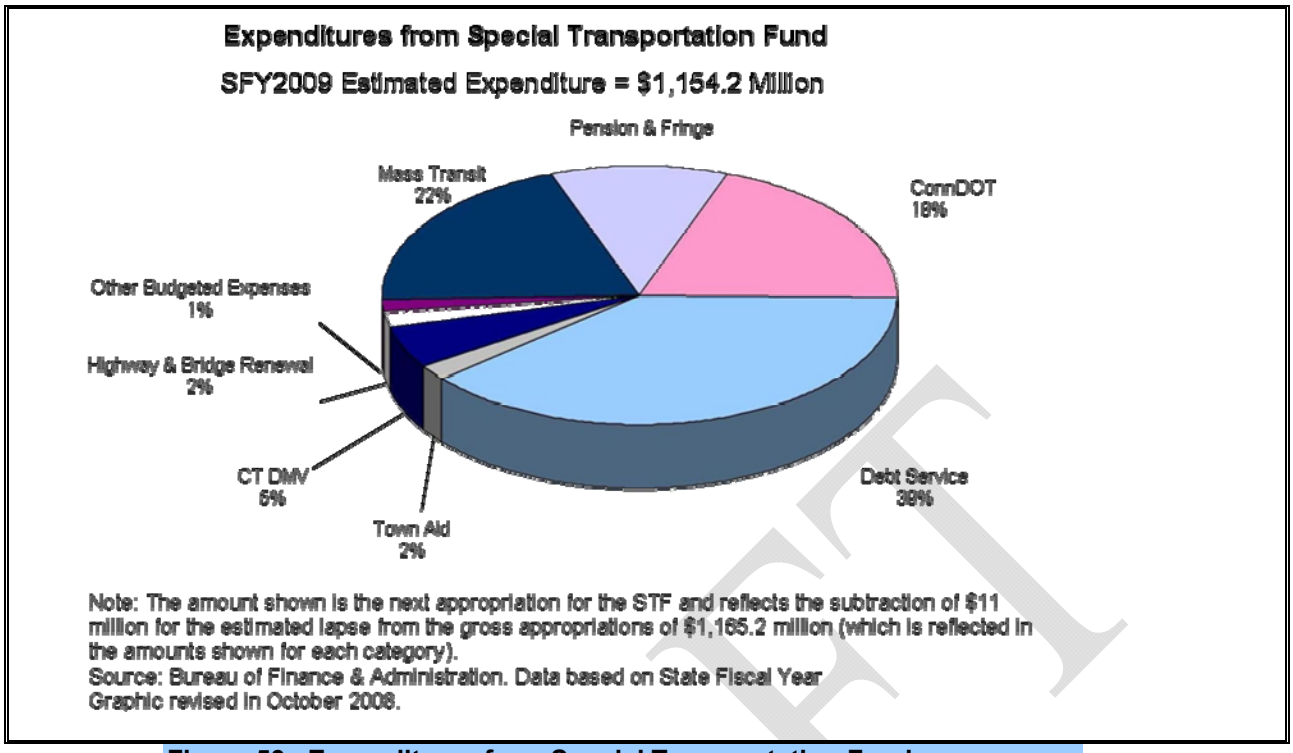


Figure 53. Expenditures from Special Transportation Fund

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 which federal funds are programmed against. 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, Governor Rell's 2005 Transportation Initiative discussed in section 2.4 of this Plan did pledge certain rail fare surcharges to the payment of specific new bonding authority used for the purchase of new railcars.

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 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. Bond program requests must fit within that limit, but when additional

funding has been required, the legislature has a history of providing new or additional revenue sources into the STF or has removed non-capital expenses out of the STF.

The Prospectus for State of Connecticut Second Lien Special Tax Obligation Refunding Bonds Transportation Infrastructure Purposes 2009 Series 1 dated January 22, 2009 shows a Summary of Enacted Tax and Fee Adjustments in Table 2 on page 16 from 2003 to 2012.

The excerpt from the Connecticut Revenue and Budget Data report included in section 2.2.2, details the adjustments that have been made to the STF over the years to provide financial stability. This process of ongoing adjustments will be discussed in more detail in sections 3.5, 4.5 and 5.0 of this Plan.

There are also two recent examples of special executive and legislative actions to provide funding for infrastructure improvements.

Governor Rell's 2005 Transportation Initiative legislation was proposed by the Governor and enacted by the Connecticut General Assembly in 2005, providing $1.3 billion of state funding for the purchase of rail cars for the NHL, a new rail maintenance facility, improvements to I-95, purchase of new buses and other transportation improvements. No single initiative could meet all of Connecticut's transportation needs, and no single funding source could pay the extraordinary cost associated with this initiative, but it was recognition that additional resources were necessary. This transportation investment is funded through new user fees, additional tax revenue, and a reallocation of existing resources.

The Roadmap for Connecticut's Economic Future is the compromise bill that grew out of a number of transportation initiatives introduced during the 2006 legislative session by the Governor, the Speaker of the House and the President Pro Tempore of the Senate. This action was evidence of the importance that transportation and the financing of transportation have taken within the state. The resulting $2.3 billion program requires the Department to plan, design, and implement a number of projects and studies.

Governor Rell's 2005 Transportation Initiative (Public Act 05-4)

In the first Legislative session after Governor M. Jodi Rell took office, she proposed and the General Assembly approved a $1.3 billion Transportation Initiative -- 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 will be 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. Yet the Governor moved Connecticut's transportation program forward – independent of federal action – with this state funding package.

The Governor's package demonstrated a transportation vision for Connecticut that was both forward-looking and realistic. It recognized the limits on highway expansion and the promise of public transportation.

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 Governor's Initiative 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 New Haven-Hartford-Springfield 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 (PA 06-136)

Public Act (PA) 06-136 combines elements of the various transportation initiatives introduced during the 2006 legislative session by the Governor, the Speaker of the House and the President Pro Tempore of the Senate. This $2.3 billion program 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) is authorized over 10 years for the projects and studies outlined in the act supported by an increase in the amount of 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 are as follows:

PA 06-136 requires the Commissioner of the Department of Transportation to implement the projects and initiatives listed below. Under the act, only two projects have dollar amounts listed with them. One of those is the busway for which $52 million is committed. 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 New Haven-Hartford-Springfield line with shuttle bus service to Bradley International Airport - ($146 million);
2. New Britain-Hartford busway state match for federal funding - ($52 million);
3. Rehabilitation of rail passenger coaches for use on SLE, New Haven-Hartford-Springfield, and NHL branch lines - ($25 million);
4. Developing a new commuter rail station between New Haven and Milford (i.e. West Haven or Orange) - (at least $11 million);
5. Meeting costs of capital improvements on branch rail lines “not to exceed forty-five million dollars”;
6. Meeting capital costs of parking and station improvements on NHL, SLE (at least four stations) and branch lines, “not to exceed sixty-million dollars”.
7. Funding the local share of the Southeast Area Transit federal pilot project - (Approximately $10 million, but amount to be ultimately determined after review of project specifics);
8. Completing the Norwich Intermodal Transit Hub Roadway improvements - ($7 million);

9. Conducting environmental planning and assessment for the I-95 expansion between Branford and Rhode Island border - (Approximately $6 million for second and third phase Environmental Impact Statement);
10. Completing preliminary design and engineering for I-84 widening between Waterbury and Danbury - ($70 million);
11. Funding the Commercial Vehicle Information System Network (CVSN) at an additional location - ($1-2 million);
12. Funding the capital costs of the greater Hartford highway infrastructure improvements in support of economic development (i.e. Rentschler Field road improvements) - ($25 million); and
13. 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 projects listed below. Several of these projects have had significant work already performed.

1. Improving Routes 2/2A in Preston, North Stonington & Montville;
2. Upgrading the Pequot Bridge in Montville;
3. Evaluating rail links to other ports (i.e. Bridgeport and New London);
4. Supporting and encouraging dredging of the state's commercial ports;
5. Developing a second rail passenger station between New Haven and Milford (i.e. West Haven or Orange); and
6. Expanding Route 9.

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.

In order 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 offers 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 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 permit the use of previously authorized Urban Action Program bonds for transit-oriented projects.

GARVEE bonds
Sections 10 and 11 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 be used 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 Special Transportation Fund

The $1 billion STO bond authorization in sections 4 through 9 of the act is supported by an increase in the amount of 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% 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 Department of Economic and Community Development 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 transit-oriented development 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.

Transit-oriented development 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, in order 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.

Transit Oriented Development Pilot Program

Public Act 07-7
This act creates a transit-oriented development pilot program that was codified as Connecticut General Statutes Section 13b-79*ll*. It states:
"Bond issue for transit-oriented development pilot program. Projects. Grants.
(a) For the purposes described in subsection (b) of this section, the State Bond Commission shall have the power, from time to time, to authorize the issuance of bonds of the state in one or more series and in principal amounts not exceeding in the aggregate five million dollars.
(b) The proceeds of the sale of said bonds, to the extent of the amount stated in subsection (a) of this section, shall be used by the Department of Transportation for the purpose of establishing a transit-oriented development pilot program.
(c) The following projects have been designated as transit-oriented 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.
(d) (1) Projects meeting the following criteria may also be designated as transit-oriented development pilot projects:
(A) A strategic transportation project, as identified in section 13b-79p;
(B) Projects which are substantially funded by state, local or federal governments; and
(C) Projects where substantial planning is either underway or completed.

12.3 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 Metro-North Commuter Railroad 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 from, 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 could, at its option, 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 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 2007 Act that authorized up to $10 million in GO bonds to the DOT 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% of the funding needed for improving, repairing, or modernizing state-owned rights of way and grants for 70% of amounts needed to modernize, repair, or improve privately owned rail lines. The bill authorizes the DOT commissioner to waive the 30% 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 DOT'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.[61]

[61] September Special Session, Public Act No. 09-2, Section 68

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%?); and
- Continue office reviews of staffing capabilities to implement evolving transportation-related technologies.[62]

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). They 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 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).

[62] 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.

The Department's website contains the latest updated performance measures for rail ridership, on-time performance, and MDBF.[63]

Objective – Preservation
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 Metro-North train service on the NHL. It 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 is for train service.[64]

Reported Value (April – June 2009):
Locomotive-35,223 miles; Coach-336,543 miles;
M2 EMU-106,361 miles; M4 EMU-37,637 miles;
M6 EMU-48,105 miles

2009 Performance Target Value:
Locomotive-30,000 miles; Coach-300,000 miles;
M2 EMU-73,000 miles; M4 EMU-60,000 miles;
M6 EMU-70,000 miles

Discussion of trend

70,000 miles is the equivalent of running a round trip from New York to New Haven 460 times. A typical train makes three round trips per day. Thus, 70,000 is the equivalent of running without failure for 150 days.

The high average age of the EMU passenger rail car fleet poses a significant challenge in providing reliable and on-time train service. Connecticut is meeting/exceeding the MDBF goal in more than half of the rail rolling stock equipment.

Strategies to Achieve Improvements

Recognizing the importance of maintaining an aging fleet, the Department has moved forward on two specific initiatives to support the maintenance of the existing fleet while preparing for the arrival of the new M8 EMU rail cars.

Starting in 2001, the Department began an M2 Electric Multiple Unit (EMU) Critical System Replacement (CSR) program. The program consists of replacing and upgrading major components to expand the operational life of the equipment by 10 to 12 years. This method appears to be the most cost effective and prudent approach for maintaining fleet availability at this time and has dramatically improved the MDBF for the M2 fleet. In 2004, the MDBF for M2 cars was just less than 50,000 miles. For the first two quarters of 2009, the MDBF for M2 rail cars is averaging over 75,000 miles, which is above the target of 73,000. Figure 54 shows a

[63] See www.ct.gov/dot and Click on performance measures.
[64] Note: Data for this measure becomes available monthly. The data set used for this posting covers the calendar year quarter 4/1/2009 through 6/30/2009. Revised 9/16/09.

graphic of MDBF for five types of rail vehicles. The same information is presented in tabular form in Figure 55.

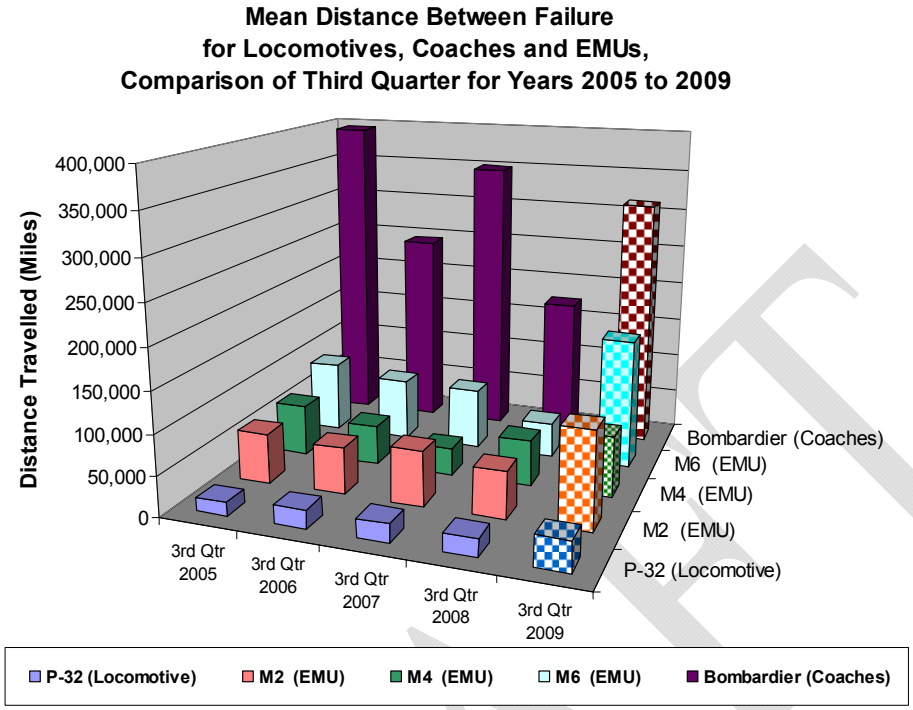


Figure 54. Mean Distance between Failures for Locomotives, Coaches, and EMU's

In 2006, the Department commissioned a new rail car maintenance shop facility in New Haven, which provided an additional 12 rail car "spots" for maintenance and inspection. The new shop facility almost doubled the current shop capacity (18 existing rail car maintenance spots for the EMU fleet) on the NHL.

These two initiatives have dramatically improved MDBF, which has translated 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).

Comparison of Calendar Year Second Quarters, 2005 through 2009					
Equipment Type	**2nd Qtr 2006**	**2nd Qtr 2007**	**2nd Qtr 2008**	**2nd Qtr 2009**	***2009 Goals***
Locomotives					
P-32 (Genesis Dual Mode)	44,364	26,322	32,914	35,223	*30,000*
Coaches					
Bombardier	521,062	465,242	171,293	336,543	*300,000*
EMU					
M2	95,381	69,127	90,003	106,361	*73,000*
M4	53,355	35,236	156,441	37,637	*60,000*
M6	168,363	81,429	64,482	48,105	*70,000*

Figure 55. Table of Mean Distance between Failures (Miles) for Locomotives, Coaches, and EMU's

Objective: Efficiency & Effectiveness
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 the SLE. By monitoring efficiency metrics in the form of rail ridership, load factors, market share, as well as on-time service rates, the Department of Transportation can maximize the performance and capacity of the existing systems.

Reported Value (April – June 2009):
9,202,707 Passengers — NHL
145,349 Passengers — SLE

Performance Target Value:
9,946,868 Passengers — NHL
141,163 Passengers — SLE

Achieving a more sustainable balance of usage across all of the modes of transportation within Connecticut remains a top priority. Overall, ridership on our public transportation network has been growing steadily by 3 percent to 5 percent in recent years. Significant ridership growth on both of the Connecticut commuter rail networks has been experienced over the last four years and is illustrated in Figure 56 and Figure 57.

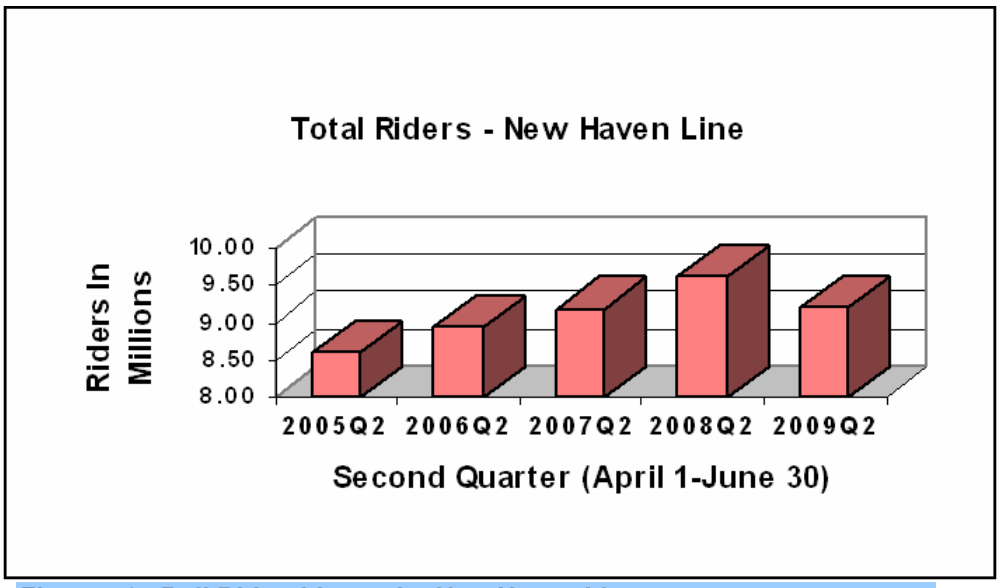


Figure 56. Rail Ridership on the New Haven Line

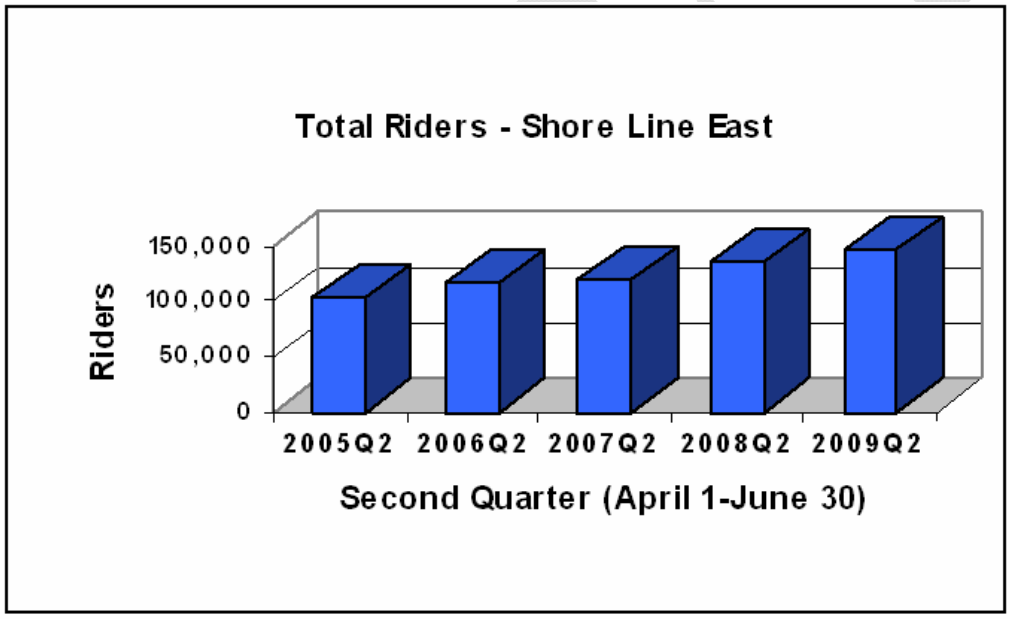


Figure 57. Rail Ridership on Shore Line East

Discussion of trend

Figures 1 and 2 show calendar year second quarter comparisons for ridership from 2005 to 2009. Significant ridership growth has occurred on both of the Connecticut commuter rail networks over the past several years. For example, NHL ridership increased by 12% from 2nd quarter 2005 to 2nd quarter 2008. The reduction of riders on the NHL for the second quarter in 2009 is due primarily to the economic downturn in the greater New York Metro area. SLE ridership has continued to increase.

Strategies to Achieve Improvements

Adding additional capacity on the New Haven 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.

Objective: Efficiency & Effectiveness
Measure: Percent of Rail On-Time Performance
Purpose/Description of Measure

A key measure for commuter rail and its customers is on-time performance (OTP), which is a measure of service reliability. This measure tracks the On-Time Performance (OTP) of Connecticut's commuter rail service on the NHL and the 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.[65]

Current Reported Value:
97.7% On time - NHL
97.0% On time - SLE

Performance Target Value:
97.0% On time — NHL
95.0% On time — SLE[66]

[65] Id.
[66] 2009, 2nd quarter.

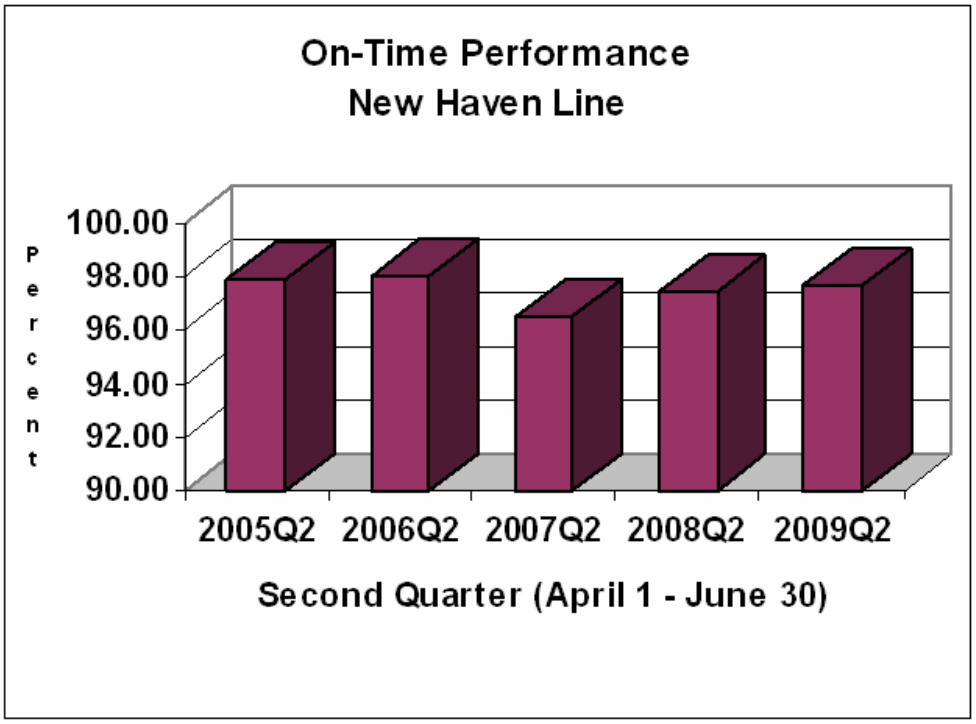


Figure 58. On-Time Performance – New Haven Line

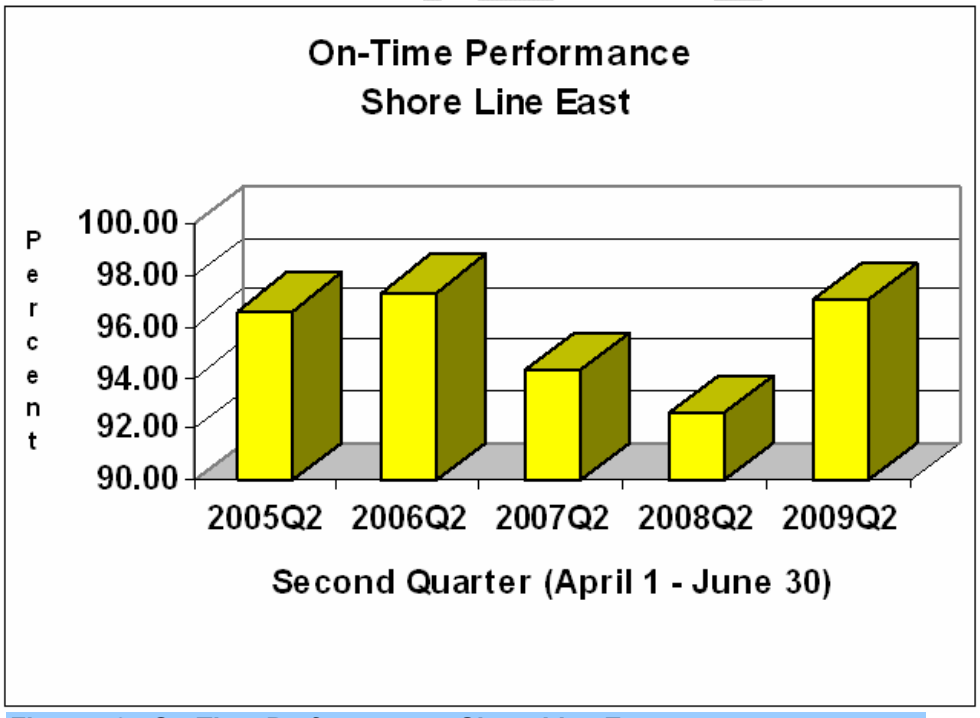


Figure 59. On-Time Performance – Shore Line East

Discussion of trend

As illustrated in Figure 58 and Figure 59, the OTP for both commuter services over the past four years remains high. The NHL has consistently exceeded 95% OTP and SLE is typically in the mid-90's. The lower OTP for SLE in the second quarters of 2007 and 2008 was a result of periodic equipment and signal failures that led to reduced speed restrictions on SLE trains. At times, the speed restrictions placed by Amtrak, which operates the northeast corridor, delay SLE arrivals to rail stations.

Strategies to Achieve Improvements

The Department has been investing heavily in capital improvements and maintenance programs on the New Haven Main and Branch Lines and in the rail fleet that have a direct benefit for on time performance. Investments include capital tie replacement programs, upgrade of continuous welded rail (Continuous Welded Rail), bridge cyclical maintenance programs, installation of new universal interlocking at CP 248, and the M-2 fleet Component System Replacement project. These projects reduce failure rates of the rail infrastructure and fleet and increase capacity for improved on time performance.

Measure: Customer Satisfaction

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 Metro-North Railroad conducts the survey on 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, as well as overall satisfaction.

SLE has an excellent, and improving, reputation among its riders. 31.4 percent of survey respondents gave SLE the highest possible rating "1-Completely satisfied."

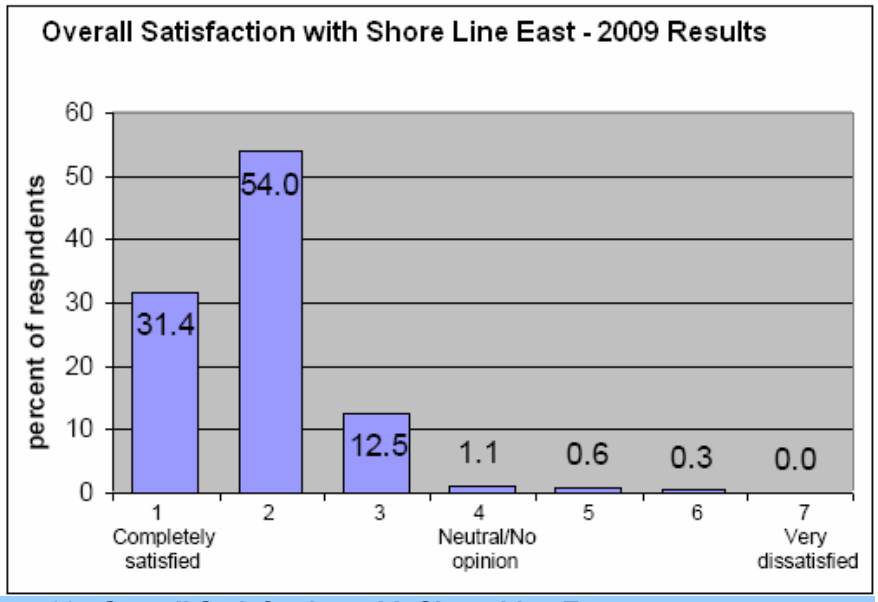


Figure 60. Overall Satisfaction with Shore Line East

The average rating on the 1 to 7 scale for overall satisfaction was a 1.87. This is an improved rating from the previous SLE passenger survey in 2008, for which the comparable score for overall satisfaction was 2.06. This finding is also consistent with the 53 percent of SLE travelers who consider the service to have improved over the past year. Only 1.4 percent of survey respondents state the service has gotten worse.

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 81.9 percent of respondents. In comparison, 71.5 percent of the respondents chose the fare option in 2008. The full list of preferences from the 2009 survey appears in the chart below.

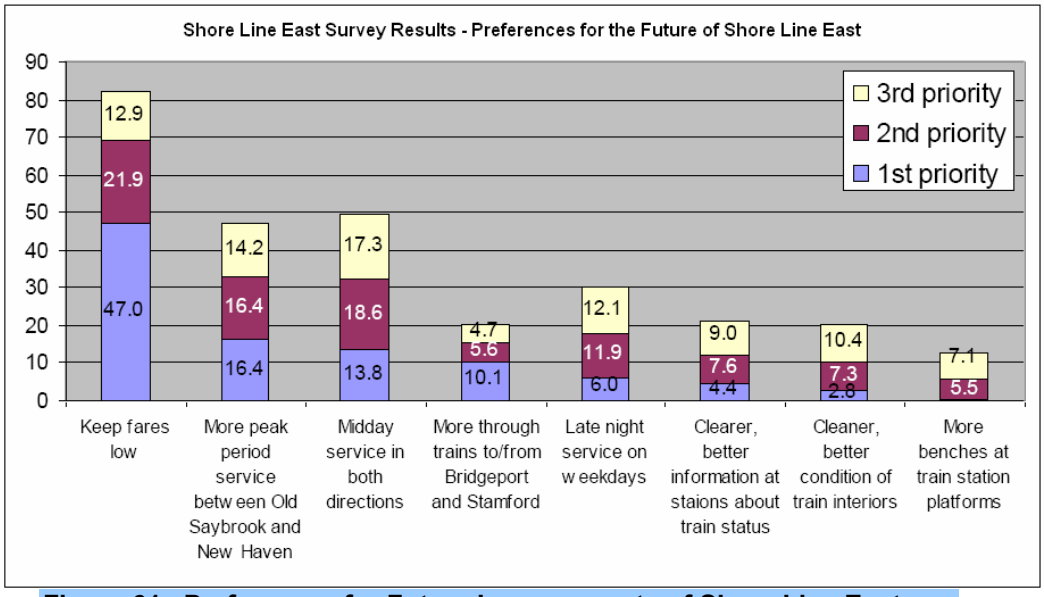


Figure 61. Preferences for Future Improvements of Shore Line East

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 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.

On the NHL, customer satisfaction has been growing steadily, up a cumulative eight points over the past three years, reaching 90% for the first time. Among customers on the Outer New Haven segment of the line, which has been an area of focus for the railroad, total satisfaction jumped 12 points since 2005. Over the same period, satisfaction among Inner New Haven customers has risen 4 points. Both of these line segments are now at their highest satisfaction levels ever.[67]

[67] Note: The Inner New Haven is defined as customers on trains that make stops between Stamford and GCT. The Outer New Haven is defined as customers on trains that make stops between New Haven and Stamford, plus customers on the three branch lines.

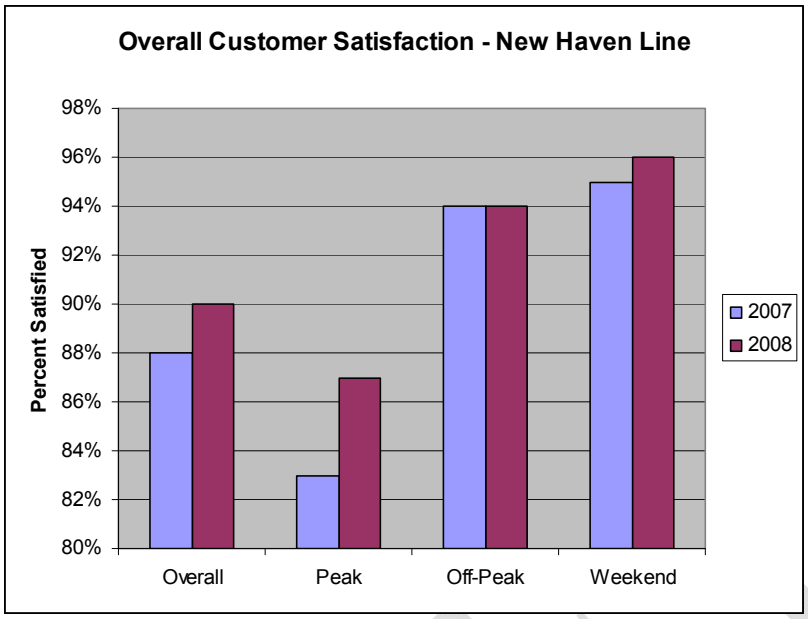


Figure 62. Overall Customer Satisfaction – New Haven Line

The increase seen in customer satisfaction on the NHL can be attributed to several improvements including, the rehabilitation of over one hundred car interiors, the renovation of eight bar cars, improved car availability with the opening of the new Service and Inspection facility in New Haven among other improvements.

CHAPTER 14 – PLAN OUTREACH AND DEVELOPMENT PROCESS

Public Participation and Input

The Department developed the State Rail Plan (SRP) with significant input from and in coordination with a variety of stakeholders. The outreach and collaboration process provided adequate and reasonable notice for comment and other input from the public, rail carriers, commuter, and transit authorities operating in, or affected by rail operations within the state, units of local government, and other interested parties in the preparation and review of the SRP.

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.

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-term strategies 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.

Railroads, Shippers, and Industry Trade Associations

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.

Intergovernmental, Regional Planning Agencies/Metropolitan Planning Organizations

The State Rail Plan 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 interconnectiveness. 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 New Haven-Hartford-Springfield 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.

State Rail Plan Compliance Statement

In accordance with the statement made by the Connecticut Department of Transportation as part of the Long-Range Transportation Plan, 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, funding.

In accordance with the statement made by the Connecticut Department of Transportation as part of the Long-Range Transportation Plan, 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

APPENDIX A

LONG RANGE SERVICE AND INVESTMENT PROGRAM FOR COMMUTER PASSENGER RAIL

CONNECTICUT DEPARTMENT OF TRANSPORTATION

The Department has identified the Long Range Investment Program contained in the spreadsheet in Appendix B and accompanying project description contained in this Appendix. Many of the projects are included in the Department's Five Year Capital Program while others are unfunded initiatives. The Department's Capital Program is continually evolving and is reprioritized and reprogrammed based on needs and the availability of funding.

RAIL ROLLING STOCK

Manufacture and Delivery of M8 Electric Multiple Unit (EMU) Rail Cars (Project No. 0300-0116)

In September 2006, Metro-North Railroad acting on behalf of the Department awarded a contract to Kawasaki Rail Car for the manufacture and delivery of up to 380 electric multiple unit rail cars.

The acquisition of new rail cars is a critical need for this commuter rail service, since the first generation of 241 M-2 Electric Multiple Unit (EMU) cars on the NHL is over thirty years old. Replacement of these rail cars will address fleet reliability, ridership and service demand, and American with Disabilities Act requirements. The purchase of these cars would also enable operation of the EMU equipment on SLE.

The General Assembly approved funding for the procurement in 2005 and the Bond Commission authorized it in August 2006. Deliveries of the first rail cars for the 300 cars ordered began arriving in December 2009 and the remainder of cars will be delivered through December 2012. The Department can exercise the option to purchase up to 80 additional rail cars as funding becomes available.

Locomotive Overhaul (Project No. TBD)

P- 40 and GP- 40

The Department's Maintenance of Equipment Unit has prepared a specification for the overhaul of the eight (8) P-40 locomotives that are currently being used on the SLE commuter rail service between New London and New Haven. These 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. Anticipated timeframe for P-40 overhaul is 1st quarter of 2011, with approximately 3-4 months construction per locomotive.

In addition to the overhaul of the P-40 locomotive, the Department plans to have a Top Deck Overhaul (TDO) performed on the six (6) GP-40 locomotives also used in the SLE service. These locomotives were manufactured in 1971 and remanufactured in 1996. This work consists of replacement of 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. Estimated timeframe

on this overhaul work is contingent upon securing funding, once the Department secures funding the normal course for a contract bid, and award could take between 6-8 months, actual construction work on the locomotives would be approximately 2 months per locomotive.

P- 32 Genesis

General Electric manufactured the GE P-32 Genesis locomotives in 2001. The Department purchased four (4) P-32 locomotives as part of their fleet requirement for NHL operations. In addition to the four (4) Department owned locomotives, the MTA/MNR purchased twenty-seven (27) locomotives. The four (4) Department owned locomotives are scheduled for overhaul work in 2010-2011. This overhaul work is part of the manufactures recommended maintenance practices in addition to proper scheduled maintenance will maximize the full useful life expectancy for locomotives of twenty five (25) years. General Electric, at their Erie, PA., facility is performing this work.

M4 Car Critical System Replacement (Project No. TBD)

The M4 EMU fleet was manufactured in 1987 and the M6 EMU fleet was manufactured in 1994. Both fleets are relatively small fleets in numbers 54 – M4's and 48- M6's.

The Department and MNR agree that some type of Critical System Replacement (CSR) program is needed for the fifty four (54) M4's. This fleet is approaching 23 years old and is showing its age with equipment reliability and availability trending downward. CDOT has provided funding to MNR for the replacement of the invertors on the M4's with a promise to fund the replacement of the PHW Automatic Train Control (ATC), the Heat Ground relay (HGR) and truck cabling as a "min" CSR Program. This will address the critical systems that affect safety and operations. A larger more comprehensive CSR program will be required if this equipment is going to be in operation beyond 2015.

M6 Car Critical System Replacement (Project No. TBD)

The M6 fleet was manufactured between 1993 -1995. This fleet of forty-eight (48) cars is due a mid-life overhaul to maximize its useful life.

Shore Line East Fleet Replacement - Specification Development (Project No. TBD)

The Mafersa equipment was manufactured in 1991 and was purchased in 2004 from Virginia Railway Express (VRE). 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 served the SLE service very well. The Department will need to replace the 14 locomotives and 33 Mafersa coaches and cab cars in the 2015-2017 timeframe.

According to Department plans, this equipment replacement is scheduled for 2017-2018.

Shore Line East Fleet Replacement (Project No. TBD)

The SLE fleet replacement project represents the Department going to bid for the manufacture and delivery of rail rolling stock equipment the Department will utilize in providing both intrastate and interstate commuter rail service operations.

Until the Department makes a determination on the type of equipment that will be required and the advancement of technologies within the rail equipment manufacturing industry, the costs

vary. All equipment will be mandated to meet federal standards in effect at time of specification and request for proposals.

M8 Mid-life Overhaul (Project No. TBD)

The M8 is currently being manufactured and will be scheduled for its mid-life overhaul sometime in the 2024-2025 timeframe.

RAIL MAINTENANCE FACILITIES

New Haven Rail Yard Facilities Improvement Projects

New Haven Yard Preliminary Engineering Phase (Project No. 301-0088)
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 EMU cars ("M-8's") as well as continued upkeep for the existing fleet (M-2's, M-4's, M-6's, Diesels, and Coaches). 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). The current EMU rail fleet totals over 350 EMU cars and is expected to exceed 400 cars by 2015.

After extensive study by the Department and Metro-North Railroad, the preferred approach and location was determined to be further expansion of the existing maintenance facilities complex in the New Haven Rail Yard. These facilities will help relieve today's over-extended New Haven and Stamford facilities and support the complete maintenance needs of the entire NHL fleet in a fully integrated manner. The maintenance facilities can then return to a two-shift, weekday operation to support the combined fleet of EMU cars (380 new M8 EMUs, 144 M-2's, 54 M-4, and 48 M-6). The new facilities would need to be operational in time to support the new M-8 cars in the fleet replacement order, which started arriving in December 2009.

This program requires a Federal Environmental Assessment/State Environmental Impact Evaluation (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. Construction on the first phase started in 2008 with construction on the subsequent phases continuing through 2019. The anticipated completion date of this program is 2020. A combination of federal and state funds will fund this program.

Individual projects within this program include:

Component Change Out Facility, Training, and Storage (Project No. 301-0106):
This major (293,000 Sq Ft) facility will consist of a maintenance shop with 13 car spots on 3 tracks with overhead cranes and floor lifts to allow easy removal of major car components (trucks, HVAC units, pantographs), support shops to repair and maintain the major car components, parts storage facilities, offices and welfare facilities for employees, a training facility, a security suite with command center and MTA police offices, the Department's offices, and a communications hub. This project 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. Site work will include utility and track connections, driveways, security fencing, catenary, and illumination. This project is currently out to bid. Construction of the facility began in January 2010 and will be complete by late 2012.

Diesel Storage Yard (Project No. 301-0110):
Three new tracks will be installed adjacent to the existing Shoreline East storage tracks, with connections to the inner loop track. These tracks will have no utilities or catenary (Stand-By/Hotel Power will be provided under Project 300-0138). There is a need to construct them quickly with minimal disruption and the requirement not to disrupt the existing Waste Stockpile Area and Shoreline East tracks. This project will provide for storage of Shoreline East and Waterbury Branch Diesel/Coach train sets. Gravel access drives, illumination, and minor utility work are also included. The Department issued a Notice to Proceed in May 2010 for construction. Completion is scheduled for late 2010.

Employee Parking (Project No. 301-0120):
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 in late 2010, so an interim plan to accommodate employee parking within the site or offsite needs to be in place by that time.

Independent Wheel Truing Facility (Project No. 300-0139):
This facility will be used 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 approximately 60% complete. The Department advertised this project in June 2010.

Central Distribution Warehouse (Project No. 301-0107):
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. An offsite warehouse will be purchased and fit out to serve this purpose, prior to demolition of the Stores Building scheduled for mid-2013.

Pedestrian Bridge (Project No. 301-0123):
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.

Renovate EMU Stores Area for Maintenance of Way (Project No. 301-0124):
Once the Component Change Out Shop is completed, the major shop operations will be moved there and the EMU Shop will be vacated. The former Stores area and second floor office/welfare area will be turned over to the Structures Department, which is part of Maintenance of Way. Currently, Structures is housed in Building 10, which will be demolished. Metro-North forces will do this minor work.

Stores Building Demolition (Project No. 301-0111):
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 project is scheduled for late 2013.

Fuel Cells in Component Change Out Facility (Project No. 301-0122):
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 building footprint and the building has been designed to accommodate future installation. The method of procurement, installation, and maintenance must be determined.

Running Repair Shop Upgrades (Project No. 301-0125):
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.

West End Yard (Project No. 300-0138):
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 six 10 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.

EMU/Program Shop Upgrades (Project No. 301-0126):
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. This will occur after 2015.

East End Yard (Project No. 301-0127):
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. 301-0128):
The main line signal system will be modified to add a portion of the main line/yard interface to the main line interlocking. Metro-North forces will perform this at the same time as the East End Yard project.

Yard Signal System (Project No. 301-0129):
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. Metro-North 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.

Paint & Heavy Repair Shop (Project No. TBD):
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.

Car Wash Facility (Project No. TBD):
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 after 2015.

Final Track Completion (Project No. TBD):
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.

Bridgeport Rail Yard Expansion (Project No. 300-0130)

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 M8s. Five existing tracks will be upgraded and electrified for revenue service. Maintenance of Way tracks and storage will be relocated and expanded. Convert tracks 24, 26, 28, 30, & 32 to revenue service tracks with catenary, construct tracks 50, 52 and 54 for MOW tracks no catenary. Construction is estimated to be completed in December 2012.

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.

Rail 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.

RAIL COMMUNICATIONS AND SIGNALS

Danbury Branch Centralized Traffic Control (CTC) System (Project No. 0302-0007)

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 Metro-North'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 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 May 2012.

Mainline Signalization (Stage 1) (Project No. 0300-125)

The Department is implementing the signalization modernization program to include replacing and updating the technology of the signal system. Stage 1, Signal is from the state line to CP 229 (Riverside station). This section is under construction.

Emergency Control Center – New York (Project No. 300-0157)

This is the Department's portion of the rehabilitation of the building, building the control center and security center, and installation of the equipment.

Positive Train Control (PTC) – New Haven Line and Branch Lines (Project No. 301-149)

The Department is required to complete this project by December 31, 2015. For Metro-North Railroad (MNRR) PTC can be deployed as an overlay to the existing Cab Signal System Technology. MNRR 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 Federal Communications Commission (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.

This project will include retrofitting the trains and developing, designing, and installing new radio systems and equipment.

Waterbury Branch Signalization (Project No. TBD)

The Waterbury Branch 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 Centralized Traffic Control System (CTC) with four passing sidings that would include eight Interlockings, and a Go-No-Go signal system.

Communications and Signal System Replacement (Project No. TBD)

The signalization modernization program 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 signalization modernization program is being implemented along the entire NHL.

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.

Rail Communications and Signals/Maintaining a State-of-Good-Repair (Project No. TBD)

In order 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 Metro-North Power Department that will be required include replacement of the Signal Power Motor Operated Disconnect Switches and replacement of the Signal Power Motor Generator sets.

RAIL POWER

New Haven Line

New Haven Main Line Catenary Replacement (Project Nos. 0301-0054(B), 301-0070(C1B), 0301-040 (C1A), 0301-T120 (C2)

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 catenary replacement that will be undertaken along 46 miles of the NHL has been divided into four major sections:

Catenary A – Connecticut/NY State Line to Stamford (Complete)
Included replacement of three railroad bridges and station improvements in Greenwich. The Project was completed in 2004 at a cost of $66.5 million.

Catenary B – Stamford to Norwalk (2011 completion)
Includes rehabilitation of three railroad bridges.

Catenary C – Norwalk to Stratford (2019 completion)
Includes rehabilitation of seven railroad bridges. The rehabilitation of two moveable bridges (over the Norwalk River in Norwalk and the Saugatuck River in Westport) within this section will be funded under a separate project and will be included in the construction phase.

Catenary D – Stratford to New Haven (Complete)
Includes replacement of three railroad bridges and station improvements in Milford. The Project was completed in 2006 at a cost of $89.5 million.

Section B Bridges

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 feet 9 inches. The bridge is supported on stone masonry abutments and steel bents. The main span of the bridge is 47 feet 3 inches 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. Estimated date for completing construction is mid 2011.

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. Estimated date for completing construction is mid 2011.

Monroe Street Bridge – Norwalk (Project No. 0301-0033)
Bridge No.41.12, in Norwalk, carriers the four New Haven Mainline 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. Estimated date for completing construction is mid 2011.

Section C1B Bridges

Westway Road Bridge – Fairfield (Project No. 0301-0070)
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 Metro-North 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 June 2012.

Fairfield Avenue Bridge – Bridgeport (Project No. 0301-0070)
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 June 2012.

Main Street Bridge – Bridgeport (Project No. 0301-0070)
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 June 2012.

North Benson Road Bridge – Fairfield (Project No. 0301-0070)
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 (Project No. 0301-0070)
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 June 2012.

Section C1A Bridges

Walk and Saga Bridges Rehabilitation (Project No. 301-040)
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.

East Avenue Bridge in Norwalk-rehabilitation (Project No. 0300-T124)
This bridge (No. 42.14, East Avenue in Norwalk), carries four New Haven Mainline 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.

Section C2 Bridges (Project No. TBD)

It is the Department's intention to replace the existing catenary system on the NHL between Bridgeport and Milford (M.P. 55.31 and M.P. 60.51), approximately five miles between CP256 and CP261. In order to maximize railroad track outage, the rehabilitation of the railroad bridges is intended to be performed in the same block as the catenary replacement project for catenary section C2.

The following railroad bridges are located and included in the Catenary Section C2 block:
Site 1 – Bridge No. 08075R over Bishop Avenue, Bridgeport
Bridge No. 08075R (M.P. 57.46) carries the Metro-North Railroad NHL, the Northeast Corridor Line for Amtrak and freight service over Bishop Avenue in the town of Bridgeport, Connecticut.

The three-span structure was constructed in 1896 and reconstructed in 1969. The through girder bridge is 60 feet long and has an out-to-out deck width of 72 feet. The superstructure consists of deck girders in spans 1, 3, and stone masonry abutments and two piers consisting of steel columns on stone pedestals support a girder-floor beam-stringer system (common girders) in span 2. The minimum vertical clearance under the bridge was measured to be 11 feet – 1 inch. The controlling Cooper E load rating is E64 for normal traffic.

The bridge was found to be in fair condition (Overall Rating = 5). The deficiencies reported for this structure in the latest inspection report dated September 21, 2007 are as follows: There is section loss at connections of stringers to floor beams or floor beams to girders. There is collision damage to the girder bottom flanges. There are scattered cracks throughout the superstructure and substructure.

Site 2 – Bridge No. 08077R over Bruce Avenue, Stratford
Bridge No. 08077R (M.P. 57.62) carries the Metro-North Railroad NHL, the Northeast Corridor Line for Amtrak and freight service over Bruce Avenue in the town of Stratford, Connecticut.

The single-span structure was constructed in 1906 and reconstructed in 1944. The through girder bridge is 38 feet long and has an out-to-out deck width of 73.5 feet. The superstructure consists of a girder-floor beam-stringer system (common girders) and is supported by stone masonry abutments. The minimum vertical clearance under the bridge was measured to be 10 feet – 1 inch. The controlling Cooper E load rating is E65 for normal traffic.

The bridge was found to be in fair condition (Overall Rating = 5). The deficiencies reported for this structure in the latest inspection report dated October 5, 2007 are as follows: There is section loss to stringers, floor beams, and girders. There is collision damage to the girder bottom flanges. There are scattered cracks throughout the superstructure and substructure.

Site 3 – Bridge No. 01318R over Main Street (Route 113), Stratford
Bridge No. 01318R (M.P. 59.01) carries the Metro-North Railroad NHL, the Northeast Corridor Line for Amtrak and freight service over Main Street (Route 113) in the town of Stratford, Connecticut.

The three-span structure was constructed in 1893 and reconstructed in 1935 and 1998. The through girder bridge is 40 feet long main span, two 14 foot long approach spans, and has an out-to-out deck width of 53 feet. The superstructure consists of deck girders in spans 1, 3, and a girder-floor beam-stringer system (common girders) in span 2, is supported by stone masonry abutments and two piers consisting of steel columns on stone pedestals. The minimum vertical

clearance under the bridge was measured to be 13 feet – 7 inches. The controlling Cooper E load rating is E50 for normal traffic.

The bridge was found to be in poor condition (Overall Rating = 4). The deficiencies reported for this structure in the latest inspection report dated May 29, 2007 are as follows: There is section loss to stringers, floor beams, and girders. There is collision damage to the girder bottom flanges. There are numerous scattered cracks throughout the superstructure and substructure.

Site 4 – Bridge No. 01312R over East Main Street (Route 110), Stratford

Bridge No. 01312R (M.P. 59.96) carries the Metro-North Railroad NHL, the Northeast Corridor Line for Amtrak and freight service over East Main Street (Route 110) in the town of Stratford, Connecticut.

The single-span structure was constructed in 1905 and rehabilitated in 1966. The through girder bridge is 48.5 feet long and has an out-to-out deck width of 67.7 feet. The superstructure consists of a girder-floor beam-stringer system (common girders) and is supported by stone masonry abutments. The minimum vertical clearance under the bridge was measured to be 11 feet – 4 inches. The controlling Cooper E load rating is E62 for normal traffic.

The bridge was found to be in fair condition (Overall Rating = 5). The deficiencies reported for this structure in the latest inspection report dated October 5, 2007 are as follows: There is section loss to stringers, floor beams, and girders. There is collision damage to the girder bottom flanges. There are scattered cracks throughout the superstructure and substructure.

The rehabilitation of these four bridges will include the complete replacement of the existing superstructures with ballasted decks and the rehabilitation by reinforcement of the existing substructures.

Main Line Catenary Replacement /Maintaining a State-of-Good-Repair

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.

Cos Cob West Supply Substation Upgrade (Project No. 301-134)

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 presently borderline in capacity and will be compromised when M-8 operations commence. Phase 1 will include 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 will include the 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. Metro North manages this project.

Replace Five New Haven Line Substations (State Project No. 301-0072)

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.

Sub Station Component Change Out (Project No. TBD)

The substations require cyclical maintenance, including breakers, transformers, motorized disconnect switches, and other components.

Rail Power / Maintaining a State-of-Good-Repair (Project No. TBD)

To maintain a state-of-good-repair to the rail power system 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.

Shore Line East

Shore Line East Electrification Siding – Guilford, Old Saybrook (Project No. 301-051)

The Department is planning to operate electric trains in SLE service. This will require the installation of additional catenary wire and other infrastructure improvements. Initial capital improvement are needed at Guilford track 4 siding (catenary) Brook to Old Saybrook track 3 (catenary). Additional areas need to be evaluated to determine is upgrades are needed.

Shore Line East Power Distribution Upgrade (Project No. TBD)

The Systra Power Study for SLE (Project No. 301-113) was a task to the MNR/Systra study to have the consultant analyze the operation of M8s on the Shore Line. The study will ascertain if the M8 rail cars can operate on the Amtrak system and determine what type of upgrades are needed to the power supply. The extent of upgrades needed and the costs associated with the upgrades are unknown until SYSTRA completes the study.

RAIL BRIDGES

The Office of Rail has contracted with consulting engineering firms to perform inspections of the 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.

Devon and Cos Cob Moveable Bridges Feasibility Study (Project No. 301-099)

Metro-North Bridge over the Housatonic River, also known as the Devon Bridge
The Bridge carries four tracks of Metro-North Railroad, including service to Amtrak's Northeast Corridor, over the Housatonic River in Stratford/Milford, Connecticut. The seven-span, open deck, steel truss structure was constructed in the late 1800's, 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 Metro-North Railroad (MNRR).

The intent of this project is to develop engineering, feasibility, and economic analysis study report that investigates 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.

Metro-North Bridge over the Mianus River also known as the Cos Cob Bridge
The Bridge carries four tracks of Metro-North Railroad, including service to Amtrak's Northeast Corridor, 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 Metro-North Railroad (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.

S-Program / Timber Program (Project No. TBD)

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 Metro-North railroad bridges. The two active S-Programs are S-18, State Project No. 300-0142 and S-19, State Project No. 300-0155. S-18 Bridge Repair Project is continuing with the program 75% complete. Additional work that was anticipated to be done in S-19 was transferred into S-18 to utilize Metro-North's work forces more effectively. There was a pre-construction meeting set for December to start S-19 Bridge Repair Project consisting of 13 bridges on the New Haven Main line for various repairs.

The Timber Program consists of the renewal of bridge timbers on Metro-North railroad bridges. The program is developed jointly by inspections of CDOT Rail Construction and Metro-North personnel to determine the condition and remaining "life" of the timber bridges. Dapping Plan designs are performed by CDOT to turn over to Metro-North for procurement and installation. The Timber Program is continuing. Thirty-two (32) timber decks have been ordered and scheduled to be installed through 2010.

Bridge Design (Project No, 300-T069)

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.

Bridge Culvert Replacement Program (Project No. TBD)

This project includes construction costs for various bridges. This is an ongoing capital program.

Stamford/New Canaan/Bulk Track NC-3 Improvements (Project No. 302-0010)

Metro-North Railroad's New Canaan Branch terminates at the rail yard adjacent to the New Canaan Railroad Station in the Town of New Canaan. Currently the yard consists of three tracks. The easternmost track is referred to as the "bulk" track; its official designation is NC-3 and is used to store a train for the morning rush hour commuters. The bulk track rests approximately two feet lower than adjacent tracks. The purpose of this project is to accommodate the arrival of the new M-8 rail cars and increase the track's ability to store a longer consist, which will increase the number of commuters that may ride the train stored there for the morning rush.

The NC-3 track will be removed and the existing retaining wall supporting the track will be raised. This will allow the roadbed to be raised to the approximate elevation of the adjacent track while promoting proper drainage. The track will be extended approximately 170 feet from its existing terminus to allow two additional cars to be added to the stored consist. There are twenty parking spaces along the rail line that will require relocation to the east. The rail bed will be raised and extended with modifications to the overhead catenary system also being carried to the new terminus. In order to stage the project, a portion of the east side parking lot will be closed to allow for construction of the new track and reconstruction of the parking lot to its new configuration. Every effort to minimize the impact to station parking is being made. The state is working with the Town of New Canaan towards providing supplemental parking with the vicinity of the New Canaan Rail Station.

Sound Beach Ave., Greenwich - Bridge No. 03948R, M.P. 32.29 (Project No. 301-092)

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. It is anticipated that the design will be completed by April 2011 and that construction will begin in October 2011 and will be completed by October 2015.

Tomac Ave. in Greenwich, Bridge No. 03955R, M.P. 31.62 (Project No. 301-092)

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 in order 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.

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 4 (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 5 (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 5 (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 4 (poor condition) due to extensive deterioration to the substructure and bearing assemblies. The recommendation is to replace the existing bridge with a culvert.

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.

Stamford Railroad Bridges on New Haven Line (City of Stamford Projects)

Railroad Bridge No. 03680R over Greenwich Ave., Stamford (Project No. 0135-0301)
This open deck bridge was constructed in 1896 and rehabilitated in 1944. The 63-foot long bridge is a three-span structure with a through girder main span and deck girder approach spans. Stone masonry abutments and two piers consisting of steel columns with pier caps resting on stone masonry pedestals support the superstructure. The bridge is currently posted for a minimum vertical clearance of 13'-5" with a measured minimum vertical clearance of 13'-8" (2001 Survey). The project consists of two phases: First, the feasibility study of all five Stamford bridges to get a better understanding of the planning and programming of the project; and second, the re-construction of the underpass. This project will widen and increase the vertical clearance of the constrained railroad underpass and make associated roadway improvements allowing full utilization of the Stamford Intermodal Transportation Center (SITC) and reducing congestion on I-95.

Railroad Bridge No. 08012R over Atlantic Street in Stamford (Project No. 0135-0301)
The bridge was constructed in 1896. This open deck bridge consists of a riveted built-up through girder main span varying in length from 41 feet to 77 feet and two riveted built-up deck girder approach spans varying in length from 10 feet to 18 feet. Stone masonry abutments and two piers consisting of steel pier caps with steel columns resting on stone masonry pedestals support the superstructure. The bridge is currently posted for a minimum vertical clearance of 12'-4" with a measured minimum vertical clearance of 12'-11" (2001 Survey). The project consists of two phases: First, the feasibility study of all five Stamford bridges to get a better understanding of the planning and programming of the project; and second, the re-construction of the underpass. This project will widen and increase the vertical clearance of the constrained

railroad underpass and make associated roadway improvements allowing full utilization of the Stamford Intermodal Transportation Center (SITC) and reducing congestion on I-95.

Railroad Bridge No. 03678R over Canal Street in Stamford (Project No. 0135-0301)
The single span, open deck bridge was constructed in 1896. The 60-foot long bridge consists of riveted built-up deck girders supported by stone masonry abutments. The bridge is currently posted for a minimum vertical clearance of 13'-11" with a measured minimum vertical clearance of 14'-2". The project consists of two phases: First, the feasibility study of all five Stamford bridges to get a better understanding of the planning and programming of the project; and second, the re-construction of the underpass. This project will widen and increase the vertical clearance of the constrained railroad underpass and make associated roadway improvements allowing full utilization of the Stamford Intermodal Transportation Center (SITC) and reducing congestion on I-95.

Railroad Bridge No. 03686R over Elm Street in Stamford (Project No. 0135-0301)
The open deck bridge was constructed in 1896. The total length of the bridges is 64 feet and the out-to-out deck width is 96 feet. The superstructure consists of a 37 foot long riveted built-up deck girder main span and two 13.5 foot long riveted built-up deck girder approach spans. Stone masonry abutments and two piers support the superstructure with steel columns resting on stone masonry piers. The bridge is currently posted for a minimum vertical clearance of 12'-6" with a measured minimum vertical clearance of 12'-9". The project consists of two phases: First, the feasibility study of all five Stamford bridges to get a better understanding of the planning and programming of the project; and second, the re-construction of the underpass. This project will widen and increase the vertical clearance of the constrained railroad underpass and make associated roadway improvements allowing full utilization of the Stamford Intermodal Transportation Center (SITC) and reducing congestion on I-95.

Railroad Bridge No. 02237R over East Main St. (U.S. Route 1), Stamford (Project No. 0135-0301)
The open deck bridge was constructed in 1896 and rehabilitated in 1931. The three span bridge consists of a 71 foot long riveted built-up girder-floor beam-stringer main span and two 17 foot long riveted built-up deck girder approach spans. Stone masonry abutments and two piers consisting of steel pier caps and columns resting on stone masonry pedestals support the superstructure. The bridge is currently posted for a minimum vertical clearance of 13'-1" with a measured minimum vertical clearance of 13'-3". The project consists of two phases: First, the feasibility study of all five Stamford bridges to get a better understanding of the planning and programming of the project; and second, the re-construction of the underpass. This project will widen and increase the vertical clearance of the constrained railroad underpass and make associated roadway improvements allowing full utilization of the Stamford Intermodal Transportation Center (SITC) and reducing congestion on I-95. Estimated completion of the feasibility study is September of 2010.

RAIL TRACK PROGRAM

Concrete Tie Repair (ROKLA) (Project No. is 301-0133)

ROKLA is the manufacturer of the concrete ties that are being replaced and the supplier of the replacement ties based upon a settlement agreement with Metro-North 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 CDOT or Metro-North per the terms of the settlement agreement on tracks 3 and 4 from state line to Stamford in 2010 and 2011. Track 3 was completed in June 2010. Track 4 will be scheduled for spring – summer 2011.

Concrete Tie Track Programs (C29-C42) (Project No. TBD)

The Capital 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 in order to maintain operating speeds and comfort.

C-28, State Project No. 301-0093, is continuing through 2010 with wood tie installation and renewal of CP 266. C-29 Track Program, State Project No. TBD has been developed consisting of wood tie installation, track surfacing, Continuous Welded Rail patch rail installation, and turnout renewals at CP 257.

Interlocking and Drainage Program (Project No. is 301-0083)

This program is designed to address the renewal of Interlockings and turnouts on the Metro-North NHL. The current project consists of welding of previously installed Interlockings remains and the purchase of turnouts for CP 257. This is an annual program and is included in the Transit Capital Program Unfunded Initiatives. As funding is identified, separate projects will be developed to renew specific Interlockings and turnouts.

RAIL STATIONS AND PARKING

New Haven Line – Stations

New Haven Line Station Improvement Program (Project No. 0300-0153)

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*.[68]

The Department has completed an inspection 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. Improvement categories developed from the study include maintenance repairs, state-of-good-repair, platform improvements, amenity upgrades, and major capital projects. The latter category includes large-scale improvements that will require considerable design effort and project administration. These improvements include ADA compliant pedestrian bridges, installation of platform canopies, extension of platforms, parking improvements and expansion including structures.

Phase 1 of New Haven Line Station Improvement Program (Project No. 300-148)

$10 Million in ARRA Stimulus funds have been allocated to perform various station improvements along the New Haven Main Line, Waterbury Branch Line, Danbury Branch Line, and New Canaan Branch Line. The purpose of the program is to accomplish a portion of the long-term maintenance issues and minor improvements that were highlighted in the *Train Station Visual Inspection Report*. A series of site visits to verify the findings in the Report and to coordinate with local elected officials has been completed.

[68] Conducted by Office of Rail, January 2007, http://www.ct.gov/dot/cwp/view.asp?a=1386&q=332450

In keeping with the intent of the ARRA legislation, this program will be advertised in two stages in order to expedite the start of construction. The first phase will consist of installation of station amenities such as benches, trash receptacles, bicycle racks, and waiting shelters; and the repair and painting of steel structures, guardrails, and handrails.

The second phase of the program will involve concrete repairs including precast and prestressed concrete structures, masonry repairs, platform upgrades, and repairs to the station building at Wilton. The scope of the project will be adjusted to use the entire $10 million allocated along with any other funds that might become available. The project is scheduled to award in July 2010 with a completion date late 2010.

PA/VMS and Union Station Tunnel Improvements (Project No. 301-0078)

This project will install a new public address (PA) system to provide audio voice announcements and visual messages using variable message signs at Union Station and State Street Station in New Haven, in compliance with ADA regulations. Also included is the installation of a communications network system to control the dissemination of train information to Union Station (concourse and platforms), State Street Station, and SLE Stations. The main train information system in Union Station, aka Solari Board, will be replaced under this project.

This project also involves code improvements to Union Station including the replacement of the existing two elevators. Additionally, the project will remove the existing tunnel liner at Union Station and install new utility conduits before attaching a new tunnel liner. Placement of train arrival and departure variable message signs in the tunnel and audio improvements in the existing elevators will also be included. The current schedule has a completion date of April 2011.

Installation of Canopies at Stratford and Springdale Stations (Project No. 300-146)

The Stratford Metro-North Railroad station serves the residents of Stratford, Connecticut via the NHL. This station has two high-level side platforms each four cars long. The northern platform is generally used to board westbound trains and the southern platform is generally used to board eastbound trains.

The Springdale station, in the City of Stamford, is located entirely on the west side of the single track of the New Canaan Branch and is between the Glenbrook and Talmadge Hill Metro-North railroad stations. The Springdale station currently has a shelter that will remain and a single high-level platform allowing access to four railroad cars at once.

At the Stratford station, a new canopy will be designed and constructed for the westbound platform only. The bus shelters, impacted by the new canopy, will be removed and salvaged for possible installation at other stations along the rail line, as needed.

For the Springdale Station, a canopy will be installed along the full length of its only platform.

Lighting, audio, and messaging systems will be relocated under and attached to the new canopies. Minor Improvements to the railings and stairways will be made in the areas impacted by the new canopy. Physical obstructions such as advertising signs and benches will be relocated. It will be necessary to remove temporarily the availability of some station parking to gain access to the platforms during construction and to provide a staging and waste stockpile area for the contractor. Following construction, these will be returned for public use. Construction was begun in May 2010 and will be completed by June 2011.

High Level Platform Rehabilitation (Project No. TBD)

This is an annual program included in the Rail Station / Maintenance Program that includes rehabilitation of the platforms.

New Haven Line Customer Service Initiative – Grand Central Terminal (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 CCTV to a central locations, etc.

New Haven Line – New Stations

West Haven Railroad Station Project (Project No. 106-116)

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 guard rails, 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 Americans with Disabilities Act (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 railroad station is currently in the procurement phase.

Fairfield Railroad Station (Project No. 0301-0060 and 301-096)

This project was initially a tri-party agreement between the Department, the town of Fairfield, and a private developer to create a commercial development that will include a new ADA accessible rail station with up to 1,200 new parking spaces for rail users. The Department agreed to fund the construction of a vehicular bridge and a separate pedestrian bridge over the railroad to access the development and the platforms for the new station. The Department has taken the lead on having this project move forward. The project is in construction.

Orange Passenger Station (Project No. 106-120)

Although the City of West Haven was chosen for the location of the railroad station, this determination did not preclude the future consideration of a commuter railroad station at the Orange site.

The Federal Transit Administration has provided Earmark grant for approximately $1.2 million to prepare a NEPA document for the Orange railroad station. At this time, the Department is completing the planning and environmental evaluation of the proposed station.

PARKING

New Haven Line Parking Expansion Program (Project No. TBD)

Adding parking capacity to accommodate existing and expanded ridership on the NHL and SLE services is a priority of the Department. The Department formed a Rail Parking Task Force to explore customer and parking expansion options. The Task Force includes the Connecticut Commuter Rail Council and Regional Planning Agencies. 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. The purpose of the task force is to identify major issues and develop recommendations for short and longer-range solutions to the parking capacity issues along the NHL and SLE commuter rail lines.

Earlier this year, the Department conducted empty space counts at NHL and SLE stations as a precursor to roundtable discussions. The Task Force has met several times and plans to establish a set of recommendations for potential implementation.

Shore Line East Railroad Station Expansion Program (Project No. TBD)

Railroad stations located in Branford, Madison, and Clinton have been upgraded to include south side high-level boarding platforms and parking lot improvements. The Madison station was relocated to the corner of Rt. 79 and Bradley Road. The Guilford Station was upgraded to include a south side high-level platform and a shortened north side platform connected by a Pedestrian Bridge.

RAIL TRANSIT ORIENTED DEVELOPMENT (TOD)

Georgetown Passenger Station Proposal

The Georgetown Land Development Company (GLDC), LLC, and the Georgetown Station Taxing District (GSTD) are planning a mixed-use transit oriented development on the site of the former Gilbert and Bennett Wire Mill in Georgetown, Connecticut. The development will include a new train station on the Danbury branch with an approximately 600-space parking garage, 416 housing units, and approximately 350,000 square feet of mixed use space, a regional performing arts center, and hotel. The Department supports the GLDC efforts to provide a fully functioning rail station on the Danbury branch. When the rail station is completed and based upon ridership projections, the Department would intend to provide full commuter rail service at the Georgetown Station in addition to current stations served. Subsequent service adjustments may be made based upon demonstrated ridership volumes at the Georgetown Station.

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 transit oriented development 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.

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.

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.

RAIL SECURITY

Security Cameras on Moveable Bridge (Project No. 0301-0109)

The project will allow the Department to install security cameras at a moveable bridge in order to strengthen surveillance capabilities and the detection of suspicious activity.

Upgrade Network Infrastructure (Project No. 0300-0150)

This project will provide for continuation of overall fiber optic system upgrade project consisting of upgrading the current fiber optic hardware, adding Ethernet connections at the 17 fiber optic nodes on the NHL in Connecticut.

Canine Team (Project No. 0300-0152)

The purpose of this project is to provide the Connecticut State Police with Canine Explosive Detection Teams dedicated to transit operations to meet the security needs for visible and unpredictable deterrence efforts and increase prevention, detection, and response capabilities relative to explosive devices.

Public Awareness Campaign (Project No. 0300-0151)

The project will allow the Department to implement a public awareness and preparedness campaign that will include television, radio, and/or print advertising for the NHL and SLE services.

Potential Future Rail Corridors

The Department has identified several corridors as candidates for potential future commuter rail service. The concepts are outlined below. At this time, none of the corridors has active studies underway.

Eastern Connecticut Mobility/Groton – Worcester Commuter Rail

The Department has identified the need to study the transportation and mobility needs of residents and businesses in eastern Connecticut. The study will include but will not be limited to transportation between residential and employment centers, improved rail freight service,

opportunities for improved public transportation services and facilities, and the feasibility of creating a commuter rail service from Groton to Worcester, Massachusetts.

The Department will develop an assessment and plan for the implementation of commuter rail service between Groton and Worcester, Massachusetts. The study will 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 the Commonwealth of Massachusetts and any authorities, entities or local governments of the Commonwealth of Massachusetts.

Old Saybrook – Hartford Rail Corridor

The Department has identified the need to study the transportation and mobility needs of residents and businesses in Central Connecticut. The study will include but will not be limited to transportation between residential and employment centers, improved rail freight, opportunities for improved public transportation services and facilities, and the feasibility of creating a commuter rail service from Old Saybrook and Hartford.

The study will include operating schedules and costs, ridership, fare structure, subsidies connotations to other public transportation, required facilities and equipment, trackage rights issues and costs, and preliminary evaluation of environmental sensitivity.

New London – Palmer, Massachusetts, Commuter Rail

The Department has identified the need to study the transportation and mobility needs of residents and businesses in eastern Connecticut. The study will include but will not be limited to transportation between residential and employment centers, education institutions such as the University of Connecticut, and Easter Connecticut State University, improved rail freight service, opportunities for improved public transportation services and facilities, and the feasibility of creating a commuter rail service from New London to Palmer, Massachusetts.

The Department will develop an assessment and plan for the implementation of commuter rail service between New London and Palmer, Massachusetts. The study will include operating schedules and costs, ridership, fare structure, subsidies connotations to other public transportation, required facilities and equipment, trackage rights issues and costs, a preliminary evaluation of environmental sensitivity, and coordination with the Commonwealth of Massachusetts and any authorities, entities or local governments of the Commonwealth of Massachusetts.

Willimantic and Manchester

The Department has identified a need to study restoration of the rail route between Willimantic and Manchester. This route's right of way belongs to Connecticut, and NECR and CSO serve the remaining in service trackage. This could re-establish the freight connection between Hartford and NECR's route to P&W Railroad, Massachusetts, and Canadian Railroads. It would also provide a passenger service route that could link Hartford with major stations at Mansfield (University of Connecticut) and Uncasville (Mohegan Sun Casino).

South County Commuter Rail Service (Rhode Island)

The Department has met with the Rhode Island Department of Transportation (RIDOT) to discuss Rhode Island's plan to extend commuter rail service south of Providence to Kingston and/or Westerly. Connecticut is keeping an open dialog with RITDOT since this expansion might affect Connecticut's SLE commuter rail service.

The Department is interested in studying the expansion of the SLE service East of New London.

Bradley Airport Rail Spur

The Department will study transportation to Bradley Airport and the feasibility of creating a commuter rail service or bus connection from the Windsor Locks station on the New Haven-Hartford-Springfield service to Bradley Airport. The study will include an assessment and plan for the implementation of the service on either the Griffin or Suffield Line and will evaluate bus connections.

The study will include operating schedules costs, ridership, fare structure, subsidies, connections to other public transportation, required facilities and equipment, trackage rights issues and costs, and preliminary evaluation of environmental sensitivity.

LONG RANGE SERVICE AND INVESTMENT PROGRAM FOR INTERCITY PASSENGER RAIL

AMTRAK

Amtrak has identified numerous capital projects in their Northeast Corridor Master Plan that affect the State of Connecticut. These infrastructure improvements will benefit Amtrak Intercity, Freight, NHL, and SLE commuter rail.

The projects are located on the state-owned NHL and on Amtrak's Shoreline and Springfield 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. Most of 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. Should the New Haven–Hartford–Springfield commuter service be initiated capital investments will be required.

EASTERN CONNECTICUT SERVICE EXPANSION IMPROVEMENTS

Palmers to Groton - 3rd Track Upgrade

Upgrades track 4 including catenary and interlocking upgrades at Groton; provides Amtrak passing capacity east of New London. The project is located on Amtrak's right-of-way from Mile Post 128 to Mile Post 124.

New London Layover Yard (Electrified)

This is a potential Department project to add layover capacity at New London to facilitate growth in SLE service. A new yard would minimize deadhead moves by SLE and provide storage for new/retired equipment.

Waterford Passing Siding

Potential improvement provides passing capability from Mile Post 119 to 121 south of New London for Amtrak and SLE services. The project is located on Amtrak's right-of-way

Old Saybrook Track and Catenary Improvements

Add new station track and upgrade track 3 and 4 including catenary wire installation; potentially add additional high-level platform and parking. The project is located on Amtrak's right-of-way at Mile Post 107.

Clinton Universal Interlocking Upgrade

Potential new universal interlocking south of Clinton station would permit greater use of Clinton siding to provide routing flexibility and / or temporary storage of trains including freights. The project is located on Amtrak's right-of-way at Mile Post 97.

Guilford Track 3 Upgrade

Upgrade and expand Whitfield siding to provide fourth track capability at Guilford. Consistent with high-speed rail configuration, long-term plan. Project in 30% design. The project is located on Amtrak's right-of-way at Mile Post 88.5.

Branford Interlocking Reconfiguration

New cross over immediately east of Branford station. Identified in high-speed rail configuration. The project is located on Amtrak's right-of-way at Mile Post 81.

Shoreline Junction - Interlocking Reconfiguration

Potential interlocking reconfiguration to reduce conflicts north of New Haven with expansion of SLE services. The project is located on Amtrak's right-of-way at Mile Post 75.

Connecticut (Conn) River Moveable Bridge Replacement

Rehabilitation of the moveable bridge on Connecticut River at Mile Post 106.8. This Amtrak project is in design and includes long-term replacement to improve reliability. The new bridge will be a high-level span.

Guilford Station - Track 4 Catenary Upgrade

Track upgrade with catenary wire installation provides additional capacity and passing capability for SLE and Amtrak trains. The project is located on Amtrak's right-of-way

STATION IMPROVEMENTS - EASTERN CONNECTICUT

Mystic - ADA / SGR Improvements
New London - ADA / SGR Improvements
Old Saybrook - ADA / SGR Improvements

Station improvements are programmed to assure compliance with the Americans with Disabilities Act (ADA) and to bring stations to a state-of-good-repair (SGR), as well as to meet Amtrak and partner agency guidelines and standards. Depending on site-specific station assessments of the condition of the station buildings, platforms, pathways, and parking facilities, these improvements may include modifications to parking facilities and circulation paths, platforms, signage and passenger information display systems, and other internal and external station improvements to waiting areas, ticketing areas, restrooms, and related facilities. These stations are located on Amtrak's right-of-way.

South Lyme - New Station

SLE commuter rail would benefit from the use of this station. Currently low-level platforms exist at the station. Need high-level platforms on both sides at the station. Surface parking exists at the station and is being used by area retail stores.

SPRINGFIELD LINE NEW TRACK AND INTERLOCKING UPGRADES

Connecticut and Amtrak are jointly developing corridor improvements between New Haven and Springfield that will accommodate the introduction of commuter service and expanded corridor service. These projects are located on Amtrak's right of way.

Springfield Line - Double Track and Sidings

Restores double track to the Springfield Line in anticipate of future commuter service. Adds third track sidings to accommodate freight during daylight hours. The project is located on Amtrak's right-of-way from Mile Post 0 to Mile Post 62.

Springfield Line - Interlocking Upgrades

Renews and upgrades 13 Interlockings to #20 crossovers.

Springfield Line - Viaducts and Bridges - Structural Rehab

Hartford Viaduct, Conn River Bridge, and undergrade fixed bridges will be rehabilitated or replaced, and when complete will permit operation of 286,000 pound freight service.

Positive Stop Train Control - Springfield Line

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 <150) as mandated by The Rail Safety Improvement Act of 2008.

Springfield Line - Grade Crossing Upgrades / Elimination

Grade crossings are eliminated or upgraded to quad-gate style with cross bucks. The project is located at 45 grade crossings on Amtrak's right-of-way.

Springfield Line - Electrification

Electrify Springfield Line for increased intercity and commuter operations. The project is located on Amtrak's right-of-way from Mile Post 0 To Mile Post 62.

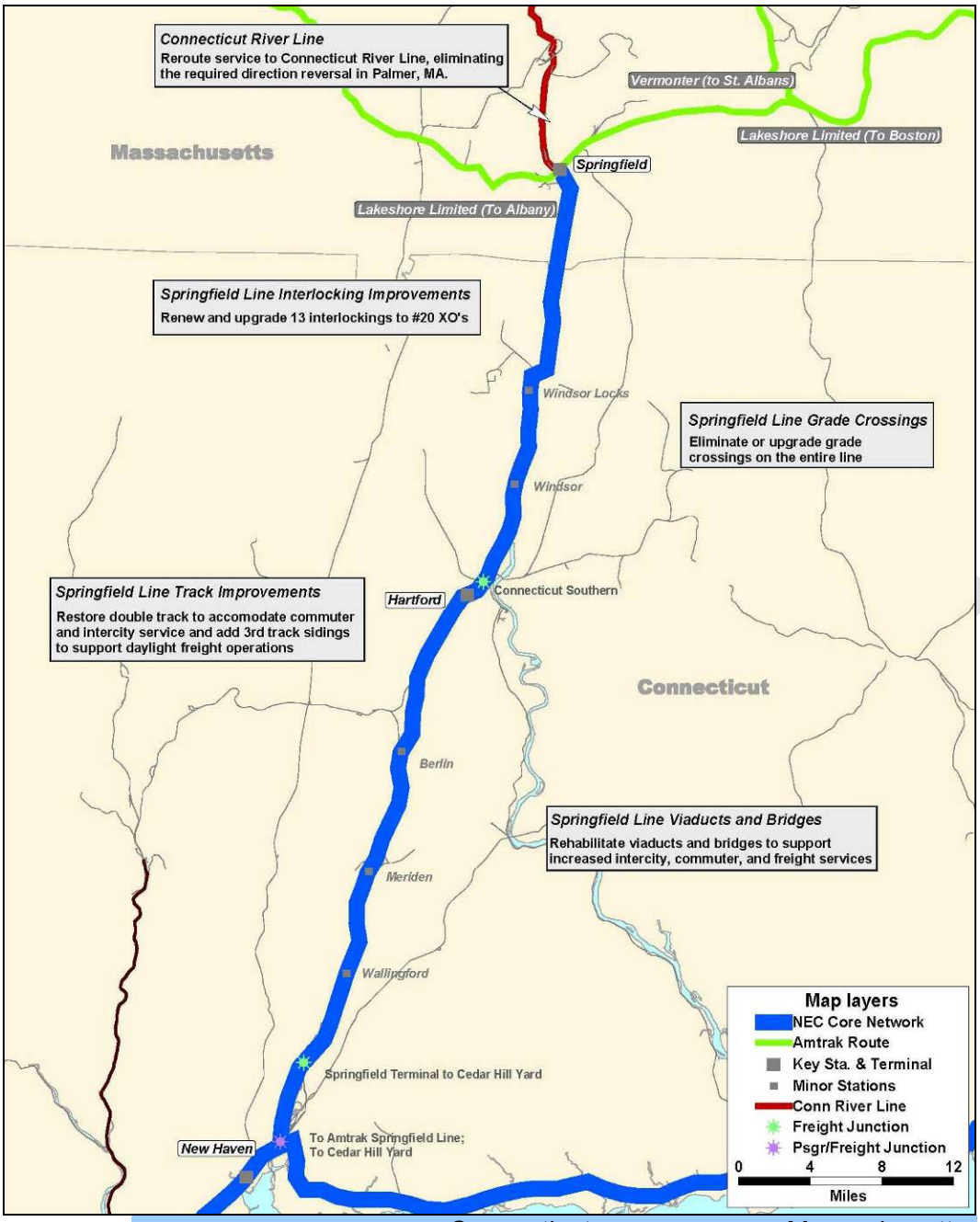


Figure 63. New Haven, Connecticut **to Springfield** Massachusetts**, Issues Map**

STATION IMPROVEMENTS - SPRINGFIELD LINE

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.

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. In

addition, three new commuter stations are proposed along with expansion of State Street Station in New Haven.

Springfield Line - High Level Platforms

Construct high-level platforms where necessary on the Springfield Line. High-level platforms needed for proposed intercity and commuter services.

Wallingford, Meriden, Berlin, Hartford, Windsor, Windsor Locks - ADA / SGR Improvements

Station improvements are programmed to assure compliance with the Americans with Disabilities Act (ADA) and to bring stations to a state-of-good-repair (SGR), as well as to meet Amtrak and partner agency guidelines and standards. Depending on site-specific station assessments of the condition of the station buildings, platforms, pathways, and parking facilities, these improvements may include modifications to parking facilities and circulation paths, platforms, signage and passenger information display systems, and other internal and external station improvements to waiting areas, ticketing areas, restrooms, and related facilities.

LONG RANGE SERVICE AND INVESTMENT PROGRAM

FREIGHT RAILROADS

The freight railroad companies in the state submitted the projects contained in this Appendix to the Department for inclusion in the State Rail Plan. The Department is working with the freight railroad companies to create a strategy for the state and the region. At this point, the current list of needs identified by the freight railroads in the Appendix has not received regional or multi-state review and the projects are subject to change.

NEW ENGLAND CENTRAL RAILROAD (NECR) / RAIL AMERICA

Rail Track Program

This project addresses improvements and repairs for portions of the statewide freight rail network operated by NECR and CSO. The NECR projects consist of bridgework, replacing 30,000 ties; 23,000 tons of new ballast, 55.7 miles of surfacing, and rebuilding ten switches. All work will be conducted on existing railroad owned infrastructure and supporting structures. This project will result in returning 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.

Track Maintenance
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 the P&W Railroad at Willimantic, Connecticut 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.

Upgrade Rail
This project would upgrade 21 miles of 100# rail to 115# Continuous Welded Rail to allow for safe movement of heavier 286-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.

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 stay competitive with the CN/P&W route. Project location: Connecticut Main Line between Massachusetts and New London, Connecticut.

Rail Yard

Willimantic Yard
The project would include rebuilding the yard and installing new crossover interchange connection with P&W Railroad. Traffic is increasing between NECR & P&W Railroad, including automobiles and containers. This long dormant interchange is seeing renewed rail traffic.

Bridges

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 railroad at Willimantic, Connecticut 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.

Upgrading Bridge Structures
This project will increase track capacity on the 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. Project location: Connecticut Main Line between Massachusetts and New London, 55 miles.

Culverts/ Drainage

Norwich Tunnel
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.

Drainage
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.

Facilities/ Yards

Willimantic Yard
This project would include rebuilding the yard and installing new crossover interchange connection with P&W Railroad. Traffic is increasing between NECR & P&W Railroad, including automobiles and containers. This long dormant interchange is seeing renewed rail traffic.

Studies for Upgrades/Expansion

New London and Palmer, Massachusetts.
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.

Willimantic and Manchester
A feasibility study is needed to look at restoration of the rail route between Willimantic and Manchester. This route's right-of-way belongs to Connecticut and NECR and CSO serve the remaining in-service trackage. This could re-establish the freight connection between Hartford and NECR's route to P&W Railroad, Massachusetts, and Canadian Railroads. It would also provide a passenger service route that could link Hartford with major stations at Mansfield (University of Connecticut) and Uncasville (Mohegan Sun Casino).

Full Double Stack Container Route
An engineering study is needed to look at bridge clearance plans for full double stack container route. The route currently handles "modified" double stack container equipment, one domestic, and one overseas container stacked on a railcar. As a competing route, such as CSX and PAS are cleared for full double stack service, this is needed to stay competitive with the CN/P&W route.

Other

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.

CONNECTICUT SOUTHERN RAILROAD COMPANY (CSO) / RAIL AMERICA

Rail Track Program

This project addresses 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 10# relay rail (replacing 80# 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 to FRA Class 1.

Track Maintenance
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.

Upgrade Rail
Replace small 90# and less rail in main track with 115#. 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

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.

Hartford Yard
Install new switch timbers and repair/replace switch points at north and south ends of the yard to keep Hartford Yard in service for all CSO customers.

Ditching
These routes have seen a lot of deterioration due to heavy ATV trespasser issues. They also see many high water conditions and are susceptible to flooding and washouts, thus causing safety and service issues. Project location: Windsor and Manchester Subdivisions.

Switch Tie Program
Switch Tie Program to restore switches to maintenance level after years of deferred maintenance.

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.

Bridges

Connecticut River Bridge
Perform structural repairs to steel work as outlined in the 2009 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. Project location: between Hartford & East Hartford, M.P. 1.1-1.2.

Manchester and Suffield Subdivision Bridges
Catch up with deferred maintenance and to keep the lines in service.

Crossings

Road Crossings
Rebuild seven at grade road crossings. Project location: Bradley, Manchester, and Wethersfield Subdivisions

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.

Studies

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 New Haven-Hartford-Springfield Line. RA/CSO would like to explore the possibility of operating the service as well as providing the route.

HOUSATONIC RAILROAD COMPANY (HRRC)

Rail Track Program

This project addresses upgrading and strengthening a portion of main line track in western Connecticut operated by the HRRC. HRRC is a regional short line that operates in the western part of Connecticut and in Massachusetts and New York along the Berkshire Line (50.0 miles) and the Maybrook Line (33.5 miles). 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.

Replace 70 year old or older rail: Provide for annual phased rail renewal to replace worn rail. Project Location: Main lines from Canaan to Danbury and Danbury to Derby.

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.

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.

Facilities/ Yards

Provide for improved infrastructure to promote truck to rail, rail to truck expansion. Project Location: Newtown and others.

VALLEY RAILROAD COMPANY (del) VALE

Rail Track Program

This project addresses improvements and repairs for portions of the statewide freight rail network operated by Valley Railroad Company. The proposed improvements and repairs 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. The project will also establish an interchange at Old Saybrook with Providence and Worcester Railroad (P&W) and an interchange at Maromas for anticipated freight trains to/from Middletown, Hartford, and on, also with P&W. The project will also improve the entire Valley Railroad operating line by completing track, ballast, brush control, and bridge improvements, which will result in the designation of FRA Class 2 and Class 3, as well as being in a state-of-good-repair.

Install 2400 ties, ballast and shoulder improvements, redeck 1 bridge, new culvert at Mile Post .5, switch timber renewals, upgrade to FRA class 2. These improvements will increase train speeds and enable enhanced train operations. Project location: Mile Post 0-Mile Post 3.45, south operable track.

Reconstruct two yard tracks, build switch, ballast and raise track, 600 new ties, two public crossings, renew track switch and two private crossings, cable one crossing system, extensive ballast/tamping, and improve yard drainage. These improvements will enhance crossing safety for motorists and stabilize track in poor draining areas. Project location: Mile Post 3.45- Mile Post 4.25, Essex Yard trackage.

Upgrade tracks to FRA Class 3 including installation of 1700 ties, switch timberwork, upgrading Deep River sidings, one public crossing replacement, one private crossing replacement, and ballast and tamping of all mainline and siding tracks. These improvements will increase train speeds, enable enhanced train operations, and improve passenger loading at Deep River. Project location: Mile Post 4.25- Mile Post 8, Essex to Deep River.

Upgrade tracks to FRA class 3 including installation of 500 ties, switch tie renewal, re-railing of curve south of Deep River Creek bridge, ballast and tamping of all mainline track. These improvements will increase train speed and improve track quality. Project location: Mile Post 8 - Mile Post 9.75, Deep River to Chester.

Engineering and inspection for out-of-service trackage including inspection and engineering of four bridges for repair, replacement of private access via reconfigured driveway and fill in of washout. This will allow work to be done to reopen trackage and restore service between Middletown and Old Saybrook. Project location: Mile Post 12.75 to Mile Post 22.

Reconstruct entire 9.25 mile corridor from Haddam to Middletown including removal of existing out of service track, grading, replacing track, new grade crossings, repair 4 bridges, install 1 box culvert, repair washout, create new access driveway for private property to enable removal of filled-in overpass. The proposed projects for VRR and the P & W Middletown Secondary are along the same freight rail corridor and when completed (del) can provide an alternate route for freight rail movements between Old Saybrook and Hartford via Middletown that does not currently exist. This new route (del) could relieve freight rail traffic from the Northeast Corridor between Old Saybrook and New Haven as well as along the Hartford Line between New Haven and Hartford.

Crosstie Replacement
Replace crossties to mainline and switches as needed to sustain/improve track class. This will provide for continuation of rail service that will benefit VRR and the local economy. Project location: Old Saybrook-Haddam running track Mile Post 0-Mile Post 12.75.

Ballast/ Tamping
Application of new stone ballast and tamping covering 4 miles every 3 years, in order to maintain track and sustain train speeds. Project location: Old Saybrook-Haddam running track Mile Post 0-Mile Post 12.75.

Upgrade Rail
Upgrade rail on 8 miles of operable track to 112# or better. This will provide the foundation for expanded freight service, higher train weights, and faster service to increase competitiveness and reduce transit times. Project location: all operable tracks, Old Saybrook to Haddam.

Interchange Track
Create interchange track at Mile Post 1 to provide for exchange of inbound/outbound freight. This will provide for busy interchange out of the Old Saybrook passenger terminal area. Project location: Mile Post 1 in Old Saybrook, 1 mile north of junction with Shore Line route.

Crossing

Renewal of one public crossing, renewal of one private crossing, tie renewal to Class 2 standards, 1000 new ties, passing track and house track upgrades at Haddam, rail seal and pavement improvements at Rt. 82 crossing, and ballast/tamping. These improvements will enhance public safety at public crossings (11,000 cars/day), and improve track quality. Project location: Mile Post 9.75- Mile Post 12.75, Chester to Haddam.

Replacements/Upgrades
Annual replacement of one crossing a year provides for complete renewal every 34 years. This will enhance public safety at critical crossings. Project location: 34 public and/or private crossings at various locations on running track.

Upgrade Crossing
Upgrade system to include gates at busy industrial road junction. This will enhance public safety at a public crossing. Project location: Essex Transfer Station Road, Essex.

Install Crossing Signals
Install automatic lights and gates at public crossings to enhance public safety. Project location: Kirtland Street, Deep River, and Parker's Point Road, Chester.

Bridges

Bridge inspections and annual bridge maintenance including superstructure and underwater inspections, cleaning of structures, and routine maintenance of paint and masonry. Project location: seven bridges between Essex and Haddam.

Communications and Signals

Replace signal system batteries, one set every two years. This will avoid any one large expenditure in a single year. Project location: various locations at twelve automated crossings.

Facilities / Yards

Upgrade to shop/locomotive servicing facility to include enclosed outdoor servicing location, runoff water control, and solid fuel/waste containment (coal, cinders). Project location: Essex Yard.

Other

General work including heavy brush cutting and crossing sightline improvements, manual tree cutting beyond machine limits, ditching of 15 percent of entire line, pointing of existing culvert masonry headwalls, and weld repairs to rail/points/frogs.

Contingencies and engineering for 15-year state-of-good-repair program.

Vegetation Control
Annual weed spray program and maintenance of line side clearances/crossing sightlines. This will provide for enhanced safety at crossings and comply with FRA requirements for vegetation control. Project location: Old Saybrook-Haddam running track Mile Post 0-Mile Post 12.75, spray Mile Post 12.75-22.0.

PROVIDENCE & WORCESTER RAILROAD (P&W)

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. The project includes:

Rail Track Program

Crosstie Replacement
Installation of 1500 ties per mile. Project location: Willimantic Branch, Mile Post 3.00 to Mile Post 24.30.

Installation of 1200 ties per mile. Project location: Middletown Branch, Mile Post 28.75 to Mile Post 35.88.

Installation of 136# continuous welded rail (Continuous Welded Rail) Project location: Willimantic Branch, Mile Post 9.4 to Mile Post 23.22.

Crosstie Replacement

Installation of 1500 ties per mile. Project location: Norwich Branch, Mile Post 0 to Mile Post 53.
Installation of 1000 ties per mile. Project location: Old Groton Main, Mile Post 0.0 to Mile Post 3.00.

Running Rail Upgrade
Installation of 136# Continuous Welded Rail. Project location: Norwich Branch, Mile Post 1 to Mile Post 14.
Installation of 115# relay rail. Project location: Middletown Branch, Mile Post 28.75 to Mile Post 35.88.
Installation of 115# relay rail. Project location: Middletown Branch, Mile Post 15.00 to Mile Post 21.

Bridges

Replace Bridges
Project Location: Norwich, Connecticut, Mile Post 12.14 over the Shetucket River.
Project Location: Groton, Connecticut Bridge 2.40 over Groton Shipyard (Sub base) Driveway.
Project Location: Groton, Connecticut Bridge 2.58 over Groton Shipyard (Sub base) Driveway.

Facilities/ Yards

Yard Expansion
Install 3000' yard track west of Main Track to support freight operations. Project Location: Plainfield, Connecticut.

Equipment Repair Facility
Expand existing facility to enable Maintenance of Way (MOW) equipment repair. Project Location: Putnam, Connecticut.

Other

Clearance Improvement
Increase overhead structure clearance to meet Phase 2 requirements of 20'-6". Project location: Putnam to Willimantic.

PAN AM SOUTHERN RAILWAY (PAS)

Rail Track Program

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.

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.

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.

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:

Project location: Terryville Tunnel beginning at the switch to the Terryville Loop and running to a point immediately east of the Hancock River # 2 bridge (Plymouth – Waterbury).

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.

Project location: through the City of New Britain from a location, Whiting Street installing continuous through to the Curtis Street.

Bridges

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 support safe and efficient freight rail operations.

Crossings

Maintenance
Maintaining the integrity of crossing warning signals and signs is essential for public safety at all at-grade rail / highway crossings. Project location: Waterbury to Berlin.

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.

Facilities/ Yards

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 future potential for this location.

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.

Other

Clearances
The bridges and other potential clearances 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.

NAUGATUCK RAILROAD COMPANY (NAUG)

Rail Track Program

This project addresses 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, Chases Bridge in Waterville, and Jericho Bridge in Thomaston. Six culverts are also in need of replacement. The project includes the rehabilitation of the Torrington passing siding including heavier rails, 17,500 ties, and 800-900 tons of ballast. These improvements will bring the entire Torrington Line 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:

Ties, Surfacing and Ballasting
Installation of 17,500 ties, which will bring the line to a solid state of repair, ensuring continued safe operation of freight and passenger trains. 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 line.

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 moves needed for efficient freight and passenger operations into Torrington.

Replace Rail
Replace deteriorated rail on north end of rail line with heavy rail. Project location: Torrington line.

Bridges

Re-deck, Masonry, and Steel Repairs
Project locations: Hancock Brook Bridge, Chase Bridge (over Naugatuck River in Waterville), and Jericho Bridge (over Naugatuck River south of Thomaston).

Crossings

Crossing Improvements
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.

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. Some improvements in the road surface and track structure will be required as well. Project location: Route 262, Common Court Road, Waterbury.

Culverts/ Drainage

Culverts along the Torrington Line 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 their advanced age and deterioration. Additional maintenance and cleaning will be performed on other culverts. Project location: Torrington Line.

CENTRAL NEW ENGLAND RAILROAD (CNZR)

CNZR is a short-line railroad that operates in Connecticut over the Department's Griffin Line 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). CNZR priority projects include rail improvements to the Armory Line and the Griffin Line to increase operating speeds. The project addresses improvements and repairs for portions of the 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.

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, and Mile Post 5.5 to 5.7

Griffin Line/ Rebuild Roger Sherman Switch
Project location: Mile Post 4.3

Griffin Line/ Farmers Exchange Track Extension and Switch
Project location: Mile Post 5.1 to 5.15

Griffin Line/ Install Siding and Switches
Project locations: Sigourney St.: Mile Post .63 to .83, Wintonbury: Mile Post 5.3 to 5.7, Home Depot: Mile Post 7.4 to 7.87

Griffin Line/ Wood Ties
Project locations: Mile Post 4.1 to 4.6, Mile Post 4.9 to 7.4, Mile Post 7.4 to 8.2,

Griffin Line/ Replace 4200 Ties
Project location: Griffin Line

Armory Line/ Broad Brook Run-Around Rebuild and Turnouts
Project location: Mile Post 11.67 to 11.9

Armory Line/ Replace Switch At Hazardville
Project location: Mile Post 16.8 to 16.9

Armory Line/ Install Dbl Ended Siding at State Line
Project location: Mile Post 19.8 to 20.1

Armory Line/ Install Ties
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

Rail Track Program

Restore Armory Secondary Connection to CSX
Project location: Armory line

Design and Construct Freight Rail Connection
Project location: Former Rockville Branch from Broadbrook to East Windsor

Install Sidings for New Freight Rail Customers
Project location: system-wide

Bridges

Armory Line/ Replace Bridge Deck
Project location: Scantic and Broad Brook

Repair 3 Bridges per Current Bridge Insp. Reports
Project location: System-wide

Crossings

Armory Line/ Install gates and flashers at 12 local crossings.
Project location: Armory line.

Armory Line/ Install gates and flashers
Project location: Rte. 140 and Rte.191

Armory Line/ Refurbish flashers
Project location: Rte. 190 and Rte. 220

Griffin Line/ New gates and crossing at Tobe Road
Project location: Mile Post 3.4

Griffin Line/ Renew Wintonbury Road crossing
Project location: Mile Post 5.4

Griffin Line/ New gates and flashers at Mills Lane
Project location: Mile Post 5.82

Engineering Support during Construction, Project Management and contingency

Communications and Signals

Griffin Line/Add Communications Repeater

Drainage/ Culverts

Griffin Line/ Sigourney Street to Woodland Street drainage
Project location: Hartford

Facilities/ Yards

Design and construct Locomotive Repair Facility with offices
Project location: East Windsor

Rolling Stock

Procure twelve new refrigerator freight cars

Purchase two "Green" low-emission Locomotives

Purchase six new Ballast Cars

Purchase new High-rail Maintenance Vehicles

Studies

Feasibility Study - Partner with the Connecticut Department of Economic and Community Development to attract new rail freight shippers.

Security

Safety and Security - Fencing, Railroad Police, Improved Communications

Other

Acquire right-of-way to Bradley Field
Project location: Windsor and Windsor Locks

(TILCON) BRANFORD STEAM RAILROAD (BSRR)

Rolling Stock

Branford Steam Railroad (BSRR) is a subsidiary of Tilcon Connecticut, Incorporated, and provides service between their trap rock quarry in North Branford and their barge loading facility on Long Island Sound in Branford (7.2miles). 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 their 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.

APPENDIX B
LONG RANGE SERVICE AND INVESTMENT PROGRAM FUNDING TABLES

Commuter Passenger Rail - Connecticut Department of Transportation

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost (millions)	2010-14	2015-29
Rolling Stock	ConnDOT	N/A	M8 RAIL CAR PURCHASE (300 CARS)	539.22	539.22	-
	ConnDOT	N/A	M8 RAIL CAR PURCHASE (42 CARS) (10 @ 100% CDOT/32 CARS AT 65%)	80.08	80.08	-
	ConnDOT	N/A	M8 RAIL CAR PURCHASE (38 CARS) (24 @ 100% CDOT/14 CARS AT 65%)	86.32	86.32	-
	ConnDOT	N/A	LOCOMOTIVE OVERHAUL	18.50	18.50	-
	ConnDOT	N/A	M4 CSR	45.00	45.00	-
	ConnDOT	N/A	M6 CSR	30.00	30.00	-
	ConnDOT	N/A	SLE FLEET REPLACEMENT - SPEC DEVELOPMENT	0.50	-	0.50
	ConnDOT	N/A	SLE FLEET REPLACEMENT	200.00	-	200.00
	ConnDOT	N/A	M8 MIDLIFE OVERHAUL	100.00	-	100.00
Maintenance Facilities/ Yards	ConnDOT	New Haven	NHY - DESIGN	20.00	20.00	-
	ConnDOT	New Haven	NHY - COMPONENT CHANGE OUT FACILITY, TRAINING, STORAGE	194.00	194.00	-
	ConnDOT	New Haven	NHY - DIESEL STORAGE YARD	9.00	9.00	-
	ConnDOT	New Haven	NHY - EMPLOYEE PARKING	18.00	18.00	-
	ConnDOT	New Haven	NHY - INDEPENDENT WHEEL TRUE	47.30	47.30	-
	ConnDOT	New Haven	NHY - CENTRAL DISTRIBUTION WAREHOUSE	22.00	22.00	-
	ConnDOT	New Haven	NHY - PEDESTRIAN BRIDGE	17.80	17.80	-
	ConnDOT	New Haven	NHY - RENOVATE EMU AREA FOR MOW	1.70	1.70	-
	ConnDOT	New Haven	NHY - STORES BUILDING DEMO	5.70	5.70	-
	ConnDOT	New Haven	NHY - FUEL CELLS IN COMPONENT CHANGE OUT FACILITY	8.30	8.30	-
	ConnDOT	New Haven	NHY - RUNNING REPAIR SHOP UPGRADES	28.70	28.70	-
	ConnDOT	New Haven	NHY - WEST END YARD	80.70	-	80.70
	ConnDOT	New Haven	NHY - EMU/PROGRAM SHOP UPGRADES	30.20	-	30.20
	ConnDOT	New Haven	NHY - EAST END YARD	91.20	-	91.20
	ConnDOT	New Haven	NHY - MAINLINE SIGNALS SYSTEM MODS	16.00	-	16.00
	ConnDOT	New Haven	NHY - YARD SIGNAL SYSTEM	12.70	-	12.70
	ConnDOT	New Haven	NHY - PAINT AND HEAVY REPAIR SHOP	22.40	-	22.40
	ConnDOT	New Haven	NHY - CAR WASH FACILITY	51.20	-	51.20
	ConnDOT	New Haven	NHY - FINAL TRACK COMPLETION	50.50	-	50.50
	ConnDOT	Bridgeport	BRIDGEPORT RAIL YARD EXPANSION	55.50	55.50	-
	ConnDOT	Stamford	STAMFORD MOE & MOW - MSGR - PE PHASE	5.00	-	5.00
	ConnDOT	Stamford	STAMFORD MOE & MOW - MSGR - CON PHASE	50.00	-	50.00
	ConnDOT	New Haven, Stamford, Bridgeport	RAIL MAINTENANCE FACILITIES - MSGR	125.00	-	125.00
Communications & Signals	ConnDOT	Danbury Branch	DANBURY CTC	64.00	64.00	-
	ConnDOT	Main Line	MAINLINE SIGNAL (STAGE 1)	10.00	10.00	-
	ConnDOT/MNR	New York	EMERGENCY CONTROL CENTER - 525 NORTH BROADWAY	6.30	6.30	-
	ConnDOT	Main Line	POSITIVE TRAIN CONTROL MAINLINE - PE PHASE	6.00	6.00	-
	ConnDOT	Main Line	POSITIVE TRAIN CONTROL MAINLINE - CON PHASE	80.00	80.00	-
	ConnDOT	Branch Lines	POSITIVE TRAIN CONTROL BRANCH LINES - PE PHASE	27.00	27.00	-
	ConnDOT	Branch Lines	POSITIVE TRAIN CONTROL BRANCH LINES - CON PHASE	-	-	-
	ConnDOT	Waterbury Branch	WATERBURY BRANCH SIGNALIZATION - PE PHASE	2.50	2.50	-
	ConnDOT	Waterbury Branch	WATERBURY BRANCH SIGNALIZATION - CON PHASE	50.00	50.00	-
	ConnDOT	New Haven Line	COMMUNICATIONS & SIGNAL SYSTEM REPLACEMENT-PE PHASE	5.90	3.90	2.00
	ConnDOT	New Haven Line	PHASE	295.00	145.00	150.00
	ConnDOT	New Haven Line	RADIO SYSTEM UPGRADE	20.00	20.00	-
	ConnDOT	Main Line	RAIL COMMUNICATIONS & SIGNALS - MSGR - MAINLINE	145.00	-	145.00
	ConnDOT	Branch Lines	RAIL COMMUNICATIONS & SIGNALS - MSGR - BRANCH LINES	100.00	-	100.00
Power	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT-DESIGN	16.00	11.00	5.00
	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT-SECTION B & BRIDGES	90.91	90.91	-
	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT-SECTION C1B & BRIDGES	162.24	162.24	-
	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT-SECT C1A WITH WALK & SAGA	496.90	496.90	-
	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT-SECT C2 & STRATFORD BRIDGES - PE	4.00	4.00	-
	ConnDOT	Main Line	MAIN LINE CAT REPLACEMENT-SECT C2 & STRATFORD BRIDGES - CON	575.00	100.00	475.00
	ConnDOT	Main Line	MAIN LINE CATENARY REPLACEMENT- MSGR	80.00	-	80.00
	ConnDOT	Greenwich	COS COB WEST SUPPLY SUBSTATION UPGRADE	5.35	5.35	-
	ConnDOT	New Haven Line	SUBSTATION REPLACEMENT	47.00	47.00	-
	ConnDOT	New Haven Line	SUBSTATION COMPONENT CHANGE OUT	30.00	30.00	-
	ConnDOT	New Haven Line	RAIL POWER - MSGR	145.00	-	145.00
	Amtrak	Guilford and Old Saybrook	SLE ELECTRIFICATION SIDINGS - GUILFORD & OLD SAYBROOK	3.50	3.50	-
	Amtrak	Shore Line East	SLE POWER DISTRIBUTION UPGRADE - PE PHASE	2.00	2.00	-
	Amtrak	Shore Line East	SLE POWER DISTRIBUTION UPGRADE - CON PHASE	20.00	20.00	-
Bridges	ConnDOT	Milford and Greenwich	DEVON & COS COB - PE PHASE	15.30	15.30	-
	ConnDOT	Milford and Greenwich	DEVON & COS COB - CON PHASE	251.90	1.90	250.00
	ConnDOT	New Haven Line	S PROGRAM / TIMBER PROGRAM	133.56	25.06	108.50
	ConnDOT	New Haven Line	BRIDGE DESIGN	103.72	14.72	89.00
	ConnDOT	New Haven Line	BRIDGE CULVERT REPLACEMENT PROGRAM	425.00	70.00	355.00
	ConnDOT	Stamford/ New Canaan	RETAINING WALLS STAMFORD/NEW CANAAN/BULK TRACK	4.30	4.30	-
	ConnDOT	Greenwich	SOUND BEACH & TOMAC	20.00	20.00	-
	ConnDOT	Waterbury Branch	WATERBURY BRANCH BRIDGES	8.00	8.00	-
	ConnDOT	Bridgeport	PECK - MSGR	30.00	-	30.00
Rail Track Program	ConnDOT	New Haven Line	CONCRETE TIE REPAIR (ROKLA)	15.00	15.00	-
	ConnDOT	New Haven Line	CONCRETE TIE TRACK PROGRAMS (C-29 THROUGH C-42)	558.00	90.00	468.00
	ConnDOT	New Haven Line	INTERLOCKING & DRAINAGE PROGRAM	221.00	66.00	155.00
Stations & Parking	ConnDOT	New Haven Line	NEW HAVEN LINE STATION IMPROVEMENT PROGRAM	120.00	120.00	-
	ConnDOT	New Haven Line	PROGRAM	6.40	6.40	
	ConnDOT	New Haven	PA/VMS AND UNION STATION TUNNEL IMPROVEMENTS	8.00	8.00	
	ConnDOT	Stratford and Stamford	INSTALLATION OF CANOPIES AT STRATFORD AND SPRINGDALE STATIONS	3.50	3.50	
	ConnDOT	New Haven Line	HIGH LEVEL PLATFORM REHAB	15.00	15.00	-
	ConnDOT	New Haven Line	NEW HAVEN LINE CUSTOMER SERVICE INITIATIVES-GCT	1.80	1.80	-
	ConnDOT	New Haven Line	NH LINE CUSTOMER SERVICE INITIATIVES-OUTLYING STATIONS	18.80	18.80	-
	ConnDOT	West Haven	WEST HAVEN STATION - PE/ROW/CON	132.50	132.50	-
	ConnDOT	Fairfield	PE/ROW FAIRFIELD RR STATION	20.00	20.00	-
	ConnDOT	Fairfield	CON FAIRFIELD RR STATION	25.00	25.00	-
	ConnDOT	Orange	ORANGE STATION - PE/ROW/CON	60.00	60.00	-

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	ConnDOT	New Haven Line	NEW HAVEN LINE PARKING EXPANSION PROGRAM - PE	94.00	39.00	55.00
	ConnDOT	New Haven Line	NEW HAVEN LINE PARKING EXPANSION PROGRAM - CON	271.00	91.00	180.00
		Shore Line East	SLE STATION EXPANSION PROGRAM	110.40	110.40	-
	ConnDOT	New Haven Line	RAIL STATIONS MSGR	326.00	31.00	295.00
Transit Oriented Development	ConnDOT	Georgetown	GEORGETOWN STATION	TBD		
	ConnDOT	Seymour	SEYMOUR	TBD		
	ConnDOT	Naugatuck	NAUGATUCK	TBD		
	ConnDOT	New Haven	NEW HAVEN UNION STATION	TBD		
Security	ConnDOT	Systemwide	SECURITY CAMERAS ON MOVABLE BRIDGES	2.00	2.00	-
	ConnDOT	New Haven Line	UPGRADE NETWORK INFRASTRUCTURE	8.50	6.30	-
	ConnDOT	Systemwide	CANINE TEAM	1.88	1.88	-
	ConnDOT	Systemwide	PUBLIC AWARENESS CAMPAIGN	2.70	2.70	-
	ConnDOT	Systemwide	RAIL SECURITY ENHANCEMENTS	63.50	4.00	59.50
New Rail Service	Amtrak	NHHS Corridor	NEW HAVEN-HARTFORD SPRINGFIELD - PE/CON	900.00	-	900.00
	P&W	Groton - Worcester	EASTERN CT MOBILITY/GROTON - WORCESTER RAIL STUDY	TBD		
	CT DEP/ConnDOT	Old Saybrook - Hartford	OLD SAYBROOK -HARTFORD RAIL CORRIDOR STUDY	TBD		
	Canadian National Railway/Operated by Rail America		NEW LONDON – PALMER, MASSACHUSETTS, COMMUTER RAIL STUDY	TBD		
	ConnDOT		WILLIMANTIC AND MANCHESTER	TBD		
	Amtrak		SOUTH COUNTY COMMUTER RAIL SERVICE (RHODE ISLAND)	TBD		
	ConnDOT		BRADLEY AIRPORT RAIL SPUR			
Freight Rail Program	Varies		STATEWIDE RAIL FREIGHT PRESERVATION & IMPROVEMENT	TBD		
COMMUTER RAIL TOTAL				**8,528.87**	**3,644.27**	**4,882.40**

Intercity Passenger Rail - Amtrak

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost (millions)	2010-14	2015-29
Eastern Connecticut						
Rail Track Program	Amtrak	MP 100.6 to 104.5	PALMERS TO GROTON - 3RD TRACK UPGRADE	7.00	Short-term	
	Amtrak	MP 105.8 to 105.8	NEW LONDON LAYOVER YARD (ELECTRIFIED)	55.00	Short-term	
	Amtrak	MP 107.8 to 109.8	WATERFORD PASSING SIDING	15.00	Short-term	
	Amtrak	MP 124	OLD SAYBROOK TRACK AND CATENARY IMPROVEMENTS	15.00	Short-term	
	Amtrak	MP 131.8	CLINTON UNIVERSAL INTERLOCKING UPGRADE	5.00	Short-term	
	Amtrak	MP 138.3	GUILFORD TRACK 3 UPGRADE	25.00	Short-term	
	Amtrak	MP 147.2	BRANFORD INTERLOCKING RECONFIGURATION	5.00		Medium-term
	Amtrak	MP 153.5	SHORELINE JUNCTION - INTERLOCKING RECONFIGURATION	10.00		Medium-term
Bridges	Amtrak	MP to 121.9	CONNECTICUT (CONN) RIVER MOVEABLE BRIDGE REPLACEMENT	250.00	Short-term	
Power	Amtrak	MP 138.3	GUILFORD STATION - TRACK 4 CATENARY UPGRADE	2.00	Short-term	
Stations	Amtrak	MP 96.8	MYSTIC - ADA / SGR IMPROVEMENTS	2.00	Short-term	
	Amtrak	MP 106.3	NEW LONDON - ADA / SGR IMPROVEMENTS	2.00	Short-term	
	Amtrak	MP 116.8	SOUTH LYME - NEW STATION	50.00		Medium-term
	Amtrak	MP 124	OLD SAYBROOK - ADA / SGR IMPROVEMENTS	1.00	Short-term	
Rail Track Program	Amtrak	MP 1.5 to 62	SPRINGFIELD LINE - DOUBLE TRACK AND SIDINGS	193.00	Short-term	
	Amtrak	MP 1.5 to 62	SPRINGFIELD LINE - INTERLOCKING UPGRADES	140.00	Short-term	
Bridges	Amtrak	MP 1.5 to 62	SPRINGFIELD LINE - VIADUCTS AND BRIDGES - STRUCTURAL REHAB	75.00	Short-term	
Communications & Signals	Amtrak	MP 1.5 to 62	POSITIVE STOP TRAIN CONTROL - SPRINGFIELD LINE	8.00	Short-term	
Crossings	Amtrak	MP 1.5 to 62	SPRINGFIELD LINE - GRADE CROSSING UPGRADES / ELIMINATION	61.00	Short-term	
Power	Amtrak	MP 1.5 to 62	SPRINGFIELD LINE - ELECTRIFICATION	335.00	Short-term	
Stations	Amtrak	MP 0 to 62	SPRINGFIELD LINE - HIGH LEVEL PLATFORMS	95.00	Short-term	
	Amtrak	MP 12	WALLINGFORD - ADA / SGR IMPROVEMENTS	1.00	Short-term	
	Amtrak	MP 18	MERIDEN - ADA / SGR IMPROVEMENTS	2.00	Short-term	
	Amtrak	MP 25	BERLIN - ADA / SGR IMPROVEMENTS	1.00	Short-term	
	Amtrak	MP 36	HARTFORD - ADA / SGR IMPROVEMENTS	3.00	Short-term	
	Amtrak	MP 42	WINDSOR - ADA / SGR IMPROVEMENTS	1.00	Short-term	
	Amtrak	MP 47	WINDSOR LOCKS - ADA / SGR IMPROVEMENTS	2.00	Short-term	
INTERCITY RAIL TOTAL				**$ 1,361.0**		

Freight Railroads

Major Transportation Initiative	Owning Railroad	Project Location	Project Description	Total cost (millions)	2009-13	2014-28
Rail Track Program	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Bridge work, replace 30,000 ties; 23,000 tons of new ballast, 55.7 miles of surfacing, and rebuild ten switches. Bridges will be upgraded to handle 286,000 pounds gross rail weight freight cars.	5.15		
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Tie replacement, ballast, surfacing, switch ties, and bridge work needed to sustain existing track conditions. It will include the connection with the P&W Railroad at Willimantic, CT that provides double stack clearance container service between the Canadian National Ry. and New England.	3.20	0.60	2.60
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Upgrade 21 miles of 100# rail to 115# c.w.r. to allow for safe movement of heavier 286K rail cars and restored passenger service. It will have the benefit of reducing service failure and rail test defects.	10.00		
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	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.	6.90		
Yard	NECR	Willimantic Yard	Rebuild the yard and install new crossover interchange connection with P&W Railroad.	0.65		
Rail Bridges	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.	3.99	0.79	3.20

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	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Upgrading bridge structures to handle 286K lb freight cars.	2.81		
Culverts/ Drainage	NECR	Norwich Tunnel	Establish drainage system inside the tunnel. Currently the tunnel fills with water and rises above the top of rail.	1.00		
	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	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.	0.70		
Studies	NECR	MA State Line, MP 55, near Palmer, MA to New London, CT	Feasibility Study to look at restoring intercity passenger service between New London & Palmer, MA	0.85		
	NECR	Willimantic to Manchester, CT	Feasibility Study to look at restoration of the rail route between Willimantic and Manchester.	0.90	0.90	
	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. The route currently handles "modified" double stack container equipment, one domestic, and one overseas container stacked on a railcar.	0.55		
Other	NECR	M.P. 55 and M.P. 43	Purchase and install new hotbox/weigh in motion detectors, 2 @ $75,000 each.	0.15		
Rail Track Program	CSO	All CSO subdivisions- Suffield, Wethersfield, Manchester, Windsor, & Bradley	Project consists of replacing an estimated 13,500 ties, 13,640 tons of new ballast, 27.5 miles of surfacing, installing 10# relay rail (replacing 80# and smaller rail), a bolt tightening program, and rebuilding six switches	2.63	2.63	
	CSO	All CSO subdivisions- Suffield, Wethersfield, Manchester, Windsor, & Bradley	Yearly Maintenance Capital for ties, ballast, switches, and surfacing.	7.09	1.63	5.47
	CSO	Windsor Subdivision	Replace small 90# and less rail in main track with 115#.	0.36	0.36	
	CSO	Bradley Spur	Replace worn out curve rail.	0.10	0.10	
	CSO	Bradley Spur	Purchase, dump, and tamp new ballast along 5.5 mile route from Amtrak main to Bradley Field.	0.22	0.22	
	CSO	Hartford Yard, rebuild switches	New switch timbers and repair/replace switch points at North and South ends of the yard.	0.45	0.45	
	CSO	Windsor and Manchester Subdivisions.	Ditching along main tracks.	0.40	0.40	
	CSO	All CSO subdivisions- Suffield, Wethersfield, Manchester, Windsor, & Bradley	Switch Tie Program to restore switches to maintenance level.	0.50	0.50	
	CSO	CRRA in Hartford	Reinstall rail for facility.	1.50	1.50	
	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 in order to retain current business as well as secure future loads.	65.00	65.00	
Rail Bridges	CSO	Connecticut River Bridge, between Hartford & East Hartford, M.P. 1.1-1.2	Structural repairs to steel work as outlined in the 2009 bridge inspection report.	1.71	1.71	
	CSO	Manchester and Suffield Subdivision bridges	Maintenance	0.25	0.25	
Crossings	CSO	Windsor and Manchester Subdivisions.	Rebuild seven at grade road crossings.	0.45	0.45	
	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.	0.20	0.20	
Studies	CSO	Windsor to Bradley Field	Feasibility Study for upgrading the Bradley Spur for future commuter rail service.	0.85	0.85	
Rail Track Program	ConnDOT/Proposed by HRRC	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 road crossing surfaces, improve drainage and culverts, restoration of two small overhead bridges and substantial rehabilitation of a major rail bridge over the Housatonic River between Shelton and Derby.	21.00	21.00	
	ConnDOT/Proposed by HRRC	Main lines from Canaan to Danbury and Danbury to Derby	Sustain RR and public Road Crossings: Bring public road crossings up to standard that will permit normal on going maintenance and safety	44.00	11.00	33.00
	ConnDOT/Proposed by HRRC	Main lines from Canaan to Danbury and Danbury to Derby	Replace 70 year old or older rail: Provide for annual phased rail renewal to replace worn rail	80.00	20.00	60.00
Culverts/ Drainage	ConnDOT/Proposed by HRRC	Main lines from Canaan to Danbury and Danbury to Derby	Improve drainage/culverts to accommodate excess water due to upstream development	12.00	3.00	9.00
Facilities/ Yards	HRRC	Newtown, Others	Strengthen Transload facilities: Provide for improved infrastructure to promote truck to rail, rail to truck expansion	8.00		0.00
Rail Track Program	VRR	Old Saybrook-Haddam running track MP 0-MP 12.75	Crosstie replacement average 100/mile/year: Renew mainline and switch timber as needed to sustain/improve track class	1.60	0.40	1.20
	VRR	Old Saybrook-Haddam running track MP 0-MP 12.75	Ballasting/tamping on three-year cycle	0.61	0.20	0.41
	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	0.40	0.40	
	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, recable 1 crossing system, extensive ballast/tamping, improve yard drainage	0.88	0.88	
	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	0.66	0.66	
	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	0.30	0.30	
	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, railseal and pavement improvements Rt 82 crossing, ballast/tamping	0.30	0.30	

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	VRR	All out of service tracks north of MP 12.75, consisting predominantly of mainline track	Engineering and inspection for out-of-service trackage from MP 12.75 to MP 22: Inspection and engineering of 4 bridges for repair, replacement of private access via reconfigured driveway, fill in of washout.	0.40	0.30	0.10
	VRR	All out of service tracks north of MP 12.75, consisting predominantly of mainline track	Reconstruct entire 9.25 mile corridor from Haddam to Middletown and re-open for freight and passenger service: Remove existing out of service track, grade subgrade, build replacement track using combination new and relay materials from a variety of sources, new grade crossings, repair 4 bridges, install 1 box culvert, repair washout, create new access driveway for private property to enable removal of filled-in overpass	11.10	11.00	0.10
	VRR	Various locations of worn and/or small rail sections	Rail upgrades on 8 miles of operable track: Upgrade such sections to 112# or better, perhaps in conjunction with CTW removals on other parts of CDOT rail network	0.60	0.10	0.50
	VRR	MP 1 in Old Saybrook, 1 mile north of junction with Shore Line route	Create interchange track at MP 1: Provide for exchange of inbound/outbound freight. Minimal tracks exist for such interchange at Old Saybrook since the inception of the Northeast Corridor Improvement Act removed many side tracks	0.40	0.00	0.40
	VRR	State of Good Repair (15 year) program	Contingencies and engineering for 15 year state of good repair program	0.57	0.57	
	VRR	Old Saybrook-Haddam running track MP 0-MP 12.75, spray MP 12.75-22.0	Vegetation control incl. spray and clearance/sightlines: Annual weedspray program and maintenance of lineside clearances/crossing sightlines	0.06	0.02	0.05
	VRR	All operable track, Old Saybrook to Haddam	General Work on entire line: Heavy brushcutting 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	0.36	0.36	
Bridges	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	0.60	0.15	0.45
Communications and Signals	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	0.04	0.01	0.03
Crossings	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	0.80	0.20	0.60
	VRR	Essex Transfer Station Road, Essex	Upgrade crossing to gated: Upgrade system to include gates at busy industrial road junction	0.15	0.00	0.15
	VRR	Kirtland Street, Deep River and Parker's Point Road, Chester	Install crossing signals: Install automatic lights, gates	0.35	0.20	0.15
Facilities/ Yards	VRR	Essex yard facility	Upgrade to shop facility/loco. servicing facility: Enclose outdoor servicing location, runoff water control, solid fuel/waste containment (coal, cinders)	0.71	0.70	0.01
Track program	P&W	Willimantic Branch MP 3.00 to MP 10.34	Cross-tie replacement: Install 1500 ties per mile	0.86		
	ConnDOT/Proposed by P&W	Willimantic Branch MP 10.34 to MP 24.30	Cross-tie replacement: Install 1500 ties per mile	1.73		
	P&W	Middletown Branch MP 28.75 to MP 35.88	Cross-tie replacement: Install 1200 ties per mile	1.00		
	P&W	Norwich Branch MP 0 to MP 53	Cross-tie replacement: Install 1500 ties per mile	6.00		
	P&W	Old Groton Main MP 0.0 to MP 3.00	Cross-tie replacement: Install 1000 ties per mile	0.23		
	ConnDOT/Proposed by P&W	Willimantic Branch MP 9.4 to MP 23.22	Running Rail Upgrade: Install 136# CWR	8.55		
	P&W	Norwich Branch MP 1 to MP 14	Running Rail Upgrade: Install 136# CWR	9.00		
	P&W	Middletown Branch MP 28.75 to MP 35.88	Running Rail Upgrade: Install 115# relay rail	2.90		
	P&W	Middletown Branch MP 15.00 to MP 21	Running Rail Upgrade: Install 115# relay rail	2.50		
Bridges	P&W	the Shetucket River	Replace Bridge	6.50		
	P&W	Groton, CT Bridge 2.40 over Groton Shipyard (Subase) Driveway	Replace Bridge	1.50		
	P&W	Groton, CT Bridge 2.58 over Groton Shipyard (Subase) Driveway	Replace Bridge	2.50		
	P&W	Plainfield, CT	3000' yard track West of Main Track	2.70		
Facilities/ Yards	P&W	Putnam , CT	Expand existing facility to enable MOW equipment repair	1.00		
Other	P&W	Putnam to Willimantic	Increase Overhead Structure Clearance to meet Phase 2 requirements of 20'-6"	2.00		
Rail Track Program	Pan Am Southern	Waterbury to Berlin	Rail replacement: Replace existing jointed rail with either new or fit	13.95	5.20	6.45
	Pan Am Southern	Waterbury to Berlin	Cross tie replacement: Replace crossties and maintain to sustain a safe and efficient operational status	13.80	8.20	5.60
	Pan Am Southern	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.	2.10	0.70	1.40
	Pan Am Southern	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 beginning at the switch to the Terryville Loop and running to a point immediately east of the Hancock River # 2 bridge (Plymouth – Waterbury)	0.70	0.70	
	Pan Am Southern	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 from a location west of the Mellon Street Bridge and installed continuous to the North Pond Street Bridge	1.40	1.40	
	Pan Am Southern	New Britain	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 New Britain from a location Whiting Street installing continuous through to the Curtis Street.	1.25	1.25	
Bridges	Pan Am Southern	Waterbury to Berlin	Bridges: Maintaining bridges and other track carrying structures to support safe and efficient freight rail operations	7.60		

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Crossings	Pan Am Southern	Waterbury to Berlin	Rail-Highway - at-grade crossings: Maintaining the integrity of crossing warning signals and signs is essential for public safety at all at-grade rail / highway crossings	5.30	1.50	3.80
Maintenance Facilities/ Yards	Pan Am Southern	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 to I-84 - 72 and 9 is just such a location, strategically located for Connecticut's taking advantage of all modes of transportation rail and highway and air. This proposal preserve the integrity of the freight facilities in Plainville Yard for the present and the foreseeable potential for this location.	2.40	0.60	1.80
	Pan Am Southern	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 throwing the switch at Plainville Yard Install switch and rehabilitate crossings	0.40	0.40	
	Pan Am Southern	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. Waterbury is just such a location, strategically located for Connecticut's taking advantage for rail and highway infrastructure location. This proposal preserve the integrity of the freight facilities in Waterbury Yard for the present and the foreseeable potential for this location.	4.36	0.76	3.60
Other	Pan Am Southern	Waterbury to Berlin	Clearances: The bridges and other potential clearances obstructions must be capable of accepting traffic that will meet the State's clearance regulations to provide every benefit to Connecticut shippers.	2.50	2.50	
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. This will also greatly facilitate on-going maintenance of the line. Also, approximately 800-900 tons of stone ballast will be placed per mile.	2.40		
	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 track switch installed, giving trains the capability to perform switching moves needed for efficient freight and passenger operations into Torrington.	0.21		
	ConnDOT/ Proposed by NAUG	Torrington line	Replace deteriorated rail on north end of rail line with heavy rail.	0.39		
Bridges	ConnDOT/ Proposed by NAUG	Waterbury	Hancock Brook Bridge: Re-deck, masonry repairs, steel repairs.	0.43		
	ConnDOT/ Proposed by NAUG	Waterville	Chase Bridge (over Naugatuck River in Waterville): Re-deck, masonry and minor steel repairs.	0.23		
	ConnDOT/ Proposed by NAUG	Thomaston area	Jericho Bridge (over Naugatuck River south of Thomaston): Re-deck, masonry and minor steel repairs.	0.39		
Crossings	ConnDOT/ Proposed by NAUG	Watertown	Highway-Rail Crossings: State Route 262, Frost Bridge Road crossing-signals, gates, road surface.	0.36		
	ConnDOT/ Proposed by NAUG	Waterbury	Highway-Rail Crossings: Common Court Road crossing- signals and equipment, road and track surfaces.	0.12		
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. Additional maintenance and cleaning will be performed on other culverts.	0.30		
Rail Track Program	ConnDOT/ Proposed by CNZR	MP 2.9 to 3.1	Griffin Stabilize Soft Roadbed	0.17		
	ConnDOT/ Proposed by CNZR	MP 3.6 to 3.9	Griffin Stabilize Soft Roadbed	0.25		
	ConnDOT/ Proposed by CNZR	MP 4.3 to 4.6	Griffin Stabilize Soft Roadbed	0.25		
	ConnDOT/ Proposed by CNZR	MP 4.9 to 5	Griffin Stabilize Soft Roadbed	0.08		
	ConnDOT/ Proposed by CNZR	MP 5.5 to 5.7	Griffin Stabilize Soft Roadbed	0.17		
	ConnDOT/ Proposed by CNZR	MP 7.4 to 7.87	Griffin Home Depot Siding	0.71		
	ConnDOT/ Proposed by CNZR	MP 7.4 to 7.87	Griffin Switches For Home Depot Siding	0.15		
	ConnDOT/ Proposed by CNZR	MP .63 to .83	Griffin MP 0.63 Install Double Ended Siding	0.30		
	ConnDOT/ Proposed by CNZR	MP .63 to .83	Griffin Switches For Sigourney St Siding	0.15		
	ConnDOT/ Proposed by CNZR	MP 5.3 to 5.7	Griffin Wintonbury Double Ended Siding	0.60		
	ConnDOT/ Proposed by CNZR	MP 5.3 to 5.7	Griffin Switches For Wintonbury Siding	0.15		
	ConnDOT/ Proposed by CNZR	MP 5.1 to 5.15	Griffin Farmers Exchange Track Extension	0.08		
	ConnDOT/ Proposed by CNZR	MP 5.1	Griffin Farmers Exchange New Switch	0.08		
	ConnDOT/ Proposed by CNZR	MP 11.9 to 13.07	Armory Depot To Broad Brook Br New Conc Tie	1.76		
	ConnDOT/ Proposed by CNZR	MP 13.08 to 13.91	Armory Broad Brk Br To Kreyssig Road	1.13		
	ConnDOT/ Proposed by CNZR	MP 13.91 to 15.7	Armory Kreyssig Rd To 191 Conc Tie On Hand	1.54		
	ConnDOT/ Proposed by CNZR	MP 15.7 to 16.62	Armory Rt 191 To Scantic Br Ties On Hand	1.19		
	ConnDOT/ Proposed by CNZR	MP 1 to 2	Griffin Mp 1.0 To 2.0 Wood Tie	1.36		
	ConnDOT/ Proposed by CNZR	MP 2.5 to 4	Griffin Mp 2.0 To 4.0 Wood Tie	2.04		
	ConnDOT/ Proposed by CNZR	MP 4.1 to 4.6	Griffin Mp 4.1 To 4.6 Wood Tie	0.68		
	ConnDOT/ Proposed by CNZR	MP 4.9 to 7.4	Griffin Mp 4.9 To Mp 7.4 Wood Tie	3.40		
	ConnDOT/ Proposed by CNZR	MP 7.4 to 8.2	Griffin Mp 7.4 To 8.2 Wood Tie	1.09		

APPENDIX B
LONG RANGE SERVICE AND INVESTMENT PROGRAM FUNDING TABLES

	ConnDOT/ Proposed by CNZR	Griffin Line	Griffin Line Replace 4200 Ties	0.54		
	ConnDOT/ Proposed by CNZR	MP 4.3	Griffin Rebuild Roger Sherman Switch	0.08		
	ConnDOT/ Proposed by CNZR	MP 11.67 to 11.9	Armory Two Turnouts For Broad Brook Run-Around	0.15		
	ConnDOT/ Proposed by CNZR	MP 11.67 to 11.9	Armory Broad Brook Run-Around Rebuild	0.31		
	ConnDOT/ Proposed by CNZR	MP 16.8 to 16.9	Armory Replace North Switch At Hazardville	0.08		
	ConnDOT/ Proposed by CNZR	MP 16.8 to 16.9	Armory Replace South Switch At Hazardville	0.08		
	ConnDOT/ Proposed by CNZR	MP 19.8 to 20.1	Armory Switches For State Line Siding	0.15		
	ConnDOT/ Proposed by CNZR	MP 19.8 to 20.1	Armory Install Dbl Ended Siding At State Line	0.41		
	by CNZR	MP 6.77 to 11.9	Armory Troy Rd To Depot Street Wood Tie	6.98		
	ConnDOT/ Proposed by CNZR	MP 16.78 to 20.3	Armory Rte. 190 To End Of Line Wood Tie	4.79		
	ConnDOT/ Proposed by CNZR	systemwide	Engineering Support During Construction, PM and contingency	5.22		
	ConnDOT/ Proposed by CNZR	Armory line	Restore Armory Secondary Connection To CSX - ConnDOT Partner With MA DOT (Facilitate Freight Rail Corridor To New Haven)	0.40		
	ConnDOT/ Proposed by CNZR	East Windsor	Design And Construct Freight Rail Connection - Former Rockville Branch From Broadbrook To East Windsor	5.80		
	ConnDOT/ Proposed by CNZR	systemwide	Install Sidings For New Freight Rail Customers	0.75		
	ConnDOT/ Proposed by CNZR	Hartford Union Station To Griffin Line	Construct Track From Hartford Union Station To Griffin Line	8.75		
Bridges	ConnDOT/ Proposed by CNZR	MP 16.8	Armory Replace Bridge Deck At Scantic And Broad Brook	0.10		
	ConnDOT/ Proposed by CNZR	systemwide	Repair 3 Bridges Per Current Bridge Insp. Reports	1.50		
Crossings	ConnDOT/ Proposed by CNZR	systemwide	Armory Install Gates at Flashers at 12 Local Crossings	2.43		
	ConnDOT/ Proposed by CNZR	Rte. 140 and Rte. 191	Armory Gates And Flashers at Rte. 140 and Rte.191	0.50		
	ConnDOT/ Proposed by CNZR	Rte. 190 and Rte. 220	Armory Refurbish Flashers At Rte. 190 and Rte. 220	0.08		
	ConnDOT/ Proposed by CNZR	MP 5.4	Griffin Renew Wintonbury Rd Crossing	0.10		
	ConnDOT/ Proposed by CNZR	MP 3.4	Griffin Renew Tobe Rd Crossing	0.10		
	ConnDOT/ Proposed by CNZR	MP 3.4	Griffin New Gates and Crossing at Tobe Rd	0.20		
	ConnDOT/ Proposed by CNZR	MP 5.82	Griffin New Gates And Flashers At Mills Lane	0.20		
	ConnDOT/ Proposed by CNZR	MP 6.77	Armory Renew Grade Crossing At Troy Road	0.10		
Communications and Signals	ConnDOT/ Proposed by CNZR	Griffin Line	Griffin Add Communications Repeater	0.12		
Drainage/ Culverts	ConnDOT/ Proposed by CNZR	Hartford	Griffin Sigourney St To Woodland St Drainage	0.30		
Facilities/ Yards	ConnDOT/ Proposed by CNZR	East Windsor	Design And Construct Locomotive Repair Facility With Offices	6.80		
Rolling Stock	ConnDOT/ Proposed by CNZR	n/a	Procure 12 New Refrigerator Freight Cars	2.40		
	ConnDOT/ Proposed by CNZR	n/a	Purchase Two "Green" Low-Emission Locomotives	2.10		
	ConnDOT/ Proposed by CNZR	n/a	Purchase 6 New Ballast Cars	0.75		
	ConnDOT/ Proposed by CNZR	n/a	Purchase New Hyrail Maintenance Vehicles	0.80		
Studies	ConnDOT/ Proposed by CNZR	systemwide	Feasibility Study - Partner With CT DED to Attract New Rail Freight Shippers	0.40		
Security	ConnDOT/ Proposed by CNZR	systemwide	Safety And Security - Fencing, RR Police, Improved Communications	1.80		
Other	ConnDOT/ Proposed by CNZR	Windsor and Windsor Locks	Acquire Right Of Way To Bradley Field	3.00		
	ConnDOT/ Proposed by CNZR	systemwide	CDOT / CNZR Federal Grant Application Support (FRA, FTA, Etc)	0.50		
Rolling Stock	BSRR	Branford	Replacement and Repowering of Locomotive Engines for BSRR & TLTX Railcar Replacements	6.45		
FREIGHT RAIL TOTAL				**496.54**	**173.49**	**140.07**