STATE PIER NEEDS AND DEFICIENCIES PLANNING STUDY

NEW LONDON, CONNECTICUT

March 2011

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Prepared for:

State of Connecticut Department of Transportation
Bureau of Aviation and Ports

Prepared by:

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773

In Association With:

Marpro Associates International
11 Katahdin Road
Cape Elizabeth, ME 04107

FMX Associates
53 Country Road
Mattapoisett, MA 02739

The Cecil Group
241A St., Suite 500
Boston, MA 02210

NOTE

This study was prepared by professional consultants under contract to the Connecticut Department of Transportation. The statements, findings, conclusions, recommendations and other data in this report are solely those of the contractors and do not necessarily reflect the views of the Connecticut Department of Transportation.

Table of Contents

EXECUTIVE SUMMARY

- Appendices A through D contain the preliminary tasks associated with this study, which are included as background information.
    - A review of past planning efforts for the State Pier Facility indicates that expanding the current site, making site improvements, attracting additional cargo markets, and a strong terminal operator would benefit the Facility.
    - The market analysis identified feeder barge container shipments that take advantage of rail opportunities as a potential market opportunity for the State Pier Facility.
    - A review of traffic in and around the Facility informed the Master Plan, especially with respect to relocation of the main entrance road and other roadway concerns.
    - Several potential Inland Port areas connected to the State Pier Facility by existing rail lines were identified and evaluated for expansion of port operations.

- Existing State Pier Facility conditions and operations are inventoried and evaluated in Section III of the report. The existing conditions analysis identified several physical constraints to alternative uses. Overall, the cargo facilities at the New London State Pier Facility are excellent for niche based marine services that would support the economy of not only the State of Connecticut but also a good portion of Southern and Central New England. However, water depths in some areas limit the types of vessels that can use existing pier structures. In addition, there are several areas on the existing piers and aprons with limited structural integrity, uneven and irregular surfaces, structurally unsound steel and wood pier faces and fendering, and limited vessel protection that limit alternative uses.

- Section IV contains an assessment of State Pier Facility uses, and alternative uses and strategies. The assessment identifies several commodities with good potential to begin handling, or to increase the volumes handled, through the State Pier Facility, including manufactured goods, minerals, project cargoes, pulp/paper, lumber, metals, bulk water and containerized trash. These targeted commodities provided the basis for a development program. The development program resulted in the iterative master plan contained in Section II.

- The State Pier Facility Master Plan (Section II) recommends physical and operational management improvements that would influence the Facility's capabilities and means of functioning more effectively. Improvements range from structural repairs, dredging, site paving and other physical improvements to port management and marketing and other operational activities. The Plan suggests a phasing sequence for improvements, ranging from immediate and short-term improvements to maximum build-out; however, costs and precise timing have not been determined within this report.

I. INTRODUCTION

The New London State Pier Facility is approaching its 100th anniversary. Funded by the Connecticut General Assembly, the Pier was built to facilitate business and commerce in the State of Connecticut. Today the mission of the Facility remains essentially the same as it was at its inception. Periodically studies have been commissioned to evaluate conditions and opportunities to adapt the State Pier facility's capabilities to emerging economic conditions.

This State Pier Needs and Deficiencies Planning Study was commissioned by the Connecticut Department of Transportation (ConnDOT), Bureau of Aviation and Ports in May 2010 for the purpose of determining the best business uses of the existing facility and the infrastructure improvements that would facilitate those business uses. The Consultant Team selected to undertake this study consists of Milone & MacBroom, Inc., Planning and Engineering Consultants, as Prime Contractor in association with Marpro Associates International, Port Logistics and Operations Consultants; FMX Associates, Maritime Economic Consultants; and The Cecil Group, Planning and Design Consultants.

As the desired final product for this study, we have presented the New London State Pier Master Plan and Implementation Strategy first in this report. To arrive at this Master Plan, the Study Team completed several discrete tasks involving data collection, review and analysis over the course of eight months. The first tasks involved collecting and reviewing information on past plans and existing conditions at the State Pier Facility. The next steps were to analyze market, traffic and shipping conditions affecting Pier Facility operations. At the completion of each of these tasks, the Team prepared and submitted a report to ConnDOT, all of which are contained in Appendices A-D. This information provided the foundation for the assessments and alternative strategy development that are the bulk of this report.

Existing State Pier Facility conditions and operations were evaluated vis-à-vis market, traffic and shipping trends. This evaluation identified physical and operational site constraints that might influence alternative strategies for development, and is contained in Section III of this report. The Study Team then assessed alternative State Pier Facility uses to create the development strategies described in Section IV of this report. This section makes recommendations for port improvements to support each strategy.

The Master Plan and Implementation Strategy synthesizes the recommended development strategies and their associated port improvements into reasonable phases of development.

II. MASTER PLAN AND IMPLEMENTATION STRATEGY

The following section outlines the recommended phasing of the development program more thoroughly described in Section IV of this report. The recommended facility improvements range from enhancing the terminal's current functionality to the complete development program. Some of the elements of the development program become viable only after longer-term shipping demands become better known. Several iterations of the alternatives are possible as the implementation of development program elements does not have to follow a rigid sequence. It is important to consider current trends from an economic, functional, operational and constructability stand point when implementing development program elements.

Immediate and Short-Term Improvements

Immediate and Short-Term Improvements include minimal, least-costly development program elements to enhance the State Pier Facility's current functionality, thereby improving its overall efficiency. Many of these elements are financially and logistically possible to implement in the short-term without affecting daily operations. Combined with corresponding operational and marketing program improvements, the State Pier Facility has the potential to operate more successfully with these changes alone. The following development program elements are shown on the Immediate and Short-Term Improvements Map.

1. Add pavement painting to clearly identify loading/off loading areas, travel lanes, queuing lanes, parking and storage areas including limited storage under the Gold Star Bridges.

2. Add signage to further direct activity within the State Pier Facility.

3. Initiate a port management and marketing plan.

4. Purchase or execute a lease/contract agreement with NECR for the NECR cargo-handling areas adjacent to State property. This would enable the development of a single terminal parcel.

5. Repair the two areas near or on the State Pier identified in the assessment as structurally deficient.

6. Re-grade the yard storage areas adjacent to State Pier and Long Dock to create a level working area and properly channel runoff from rain and melting snow.

7. Resurface yard areas to control dust and eliminate uneven surfaces, as well as provide a more stable and safer working area. The use of reclaim from road resurfacing projects is recommended because it is readily available and inexpensive to source.

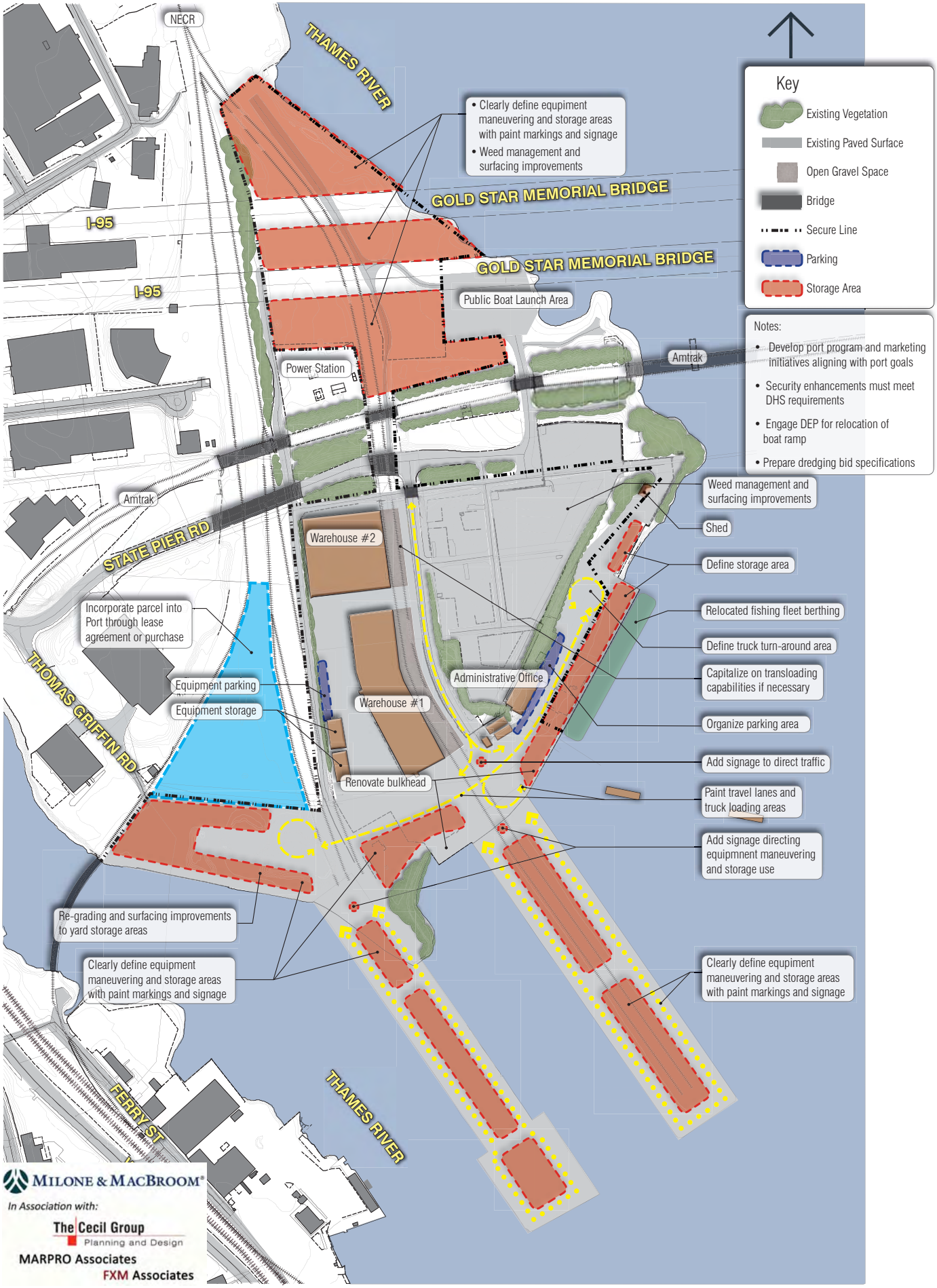
8. Prepare bid specifications for dredging the approaches to and both sides of State Pier, including additional sheet piling to allow dredging to 40'mean low water and to contain dredged spoils.

9. Plan to relocate the fishing fleet to the northeasterly sector of the terminal near the Amtrak railroad bridge. This improvement would free up Long Dock for cargo storage and capital repairs. The fishing fleet area should be fenced, excluded from the terminal security plan and designed for free access from the roadway system.

10. Initiate discussions with the Connecticut Department of Environmental Protection on the relocation of the public boat launch, including securing a site for the facility.

IMMEDIATE AND SHORT-TERM IMPROVEMENTS

New London State Pier



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Intermediate Improvements

The Intermediate Improvements build upon the Immediate and Short-Term Improvements with more significant physical changes to the State Pier Facility. The various program elements incorporated into this alternative would improve site storage capacity, as well as vehicular access and maneuvering ability. These improvements can be considered a five to ten-year goal for the State Pier Facility. Again, the following recommendations would need to be reassessed relative to emerging trends in cargo potential and usage prior to implementation. Intermediate Improvements are illustrated on the Intermediate Improvements Map.

1. Dredge both sides of State Pier and approaches to 40' mean low water.

2. Improve the main access road including improved turning radius and widening for creating additional queuing lanes

3. Remove the bridge at the entry road and fill in the existing access road that is currently fenced off under the bridge.

4. Establish additional gravel or paved areas to provide a level surface for the northeast storage area.

5. Relocate secure fencing at the new access drive.

6. Improve the bulkheads between Long Dock and the State Pier.

7. Potentially construct a retaining wall to contain the hillock area. The wall would free up space for additional parking and storage along the northeast quay or bulkhead.

8. Extend the bulkhead at the eastern quay to accommodate the fishing fleet.

9. Improve security features at the east and north railroad access points.

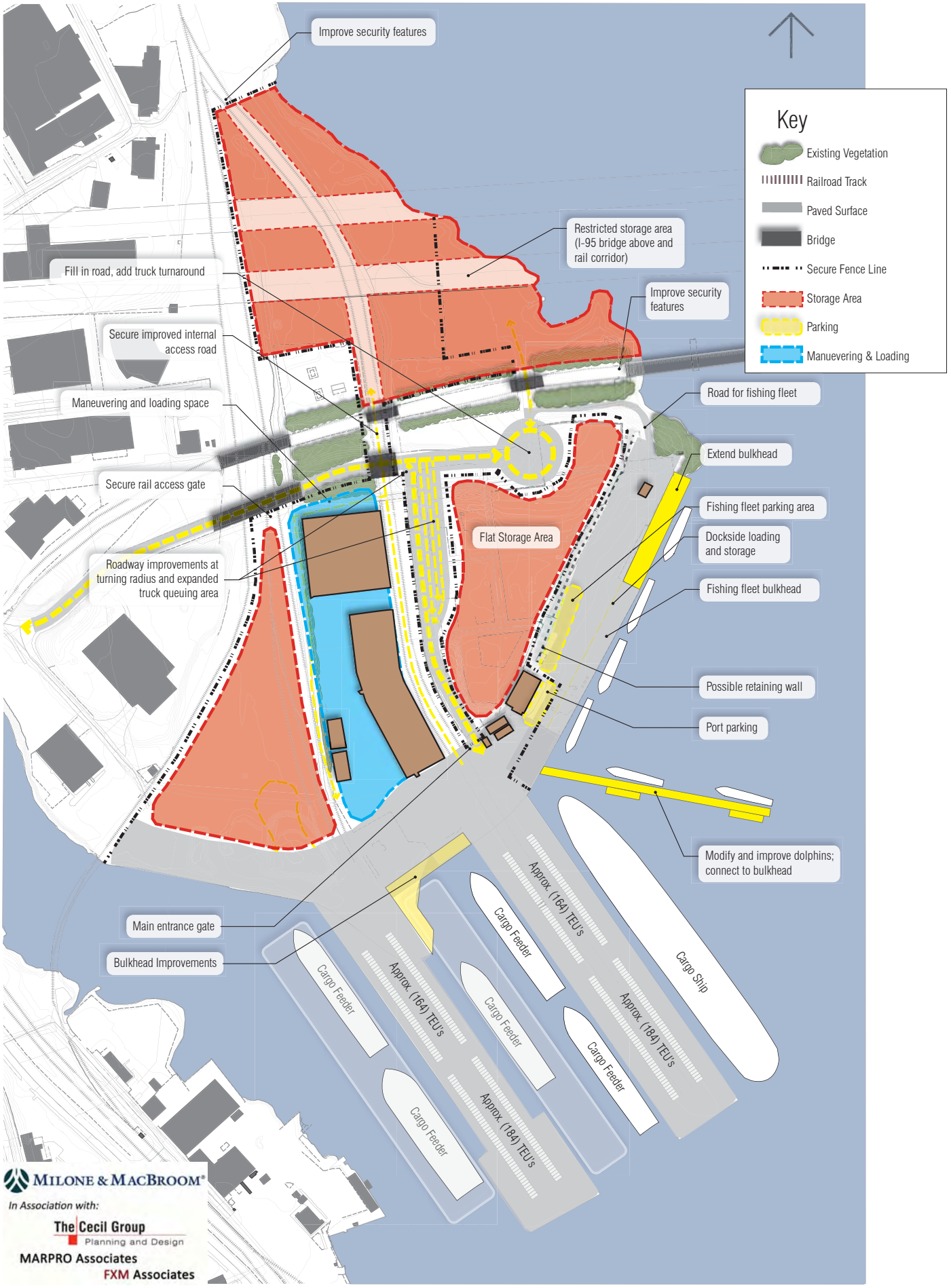
10. Improve the dolphin docks by adding a deck and connecting them to the bulkhead.

11. Prepare an environmental impact evaluation and permitting application for dredging both sides of Long Dock and re-decking the pier.

12. If regular container feeder service is recruited, procure a mobile harbor crane to facilitate the operation.

INTERMEDIATE IMPROVEMENTS

New London State Pier



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Maximum Build Out Improvements

The maximum build out scenario includes the recommendations from all previously described alternatives, and significant additional items. These recommendations total tens of millions of dollars of improvements that would need to be planned and phased in accordance with market demand, and the financial/logistical capacity required to complete them. All or a majority of the development program elements are incorporated into this alternative. The State Pier Facility would accommodate the most storage, and would function the most effectively and safely under this alternative. These improvements can be considered a ten to fifteen-year goal for the State Pier Facility. The recommendations are as follows, and are shown on the Maximum Build Out Improvements Map on the following page.

1. Level and re-grade the entire northeast side of the State Pier Facility.

2. Remove and relocate the existing access road, including removal of the large retaining wall.

3. Relocate the fishing fleet from Long Dock.

4. Repair and renovate all necessary pier bulkheads including the entire deck renovation of Long Dock, reestablishing the railroad tracks if intermodal traffic warrants.

5. Dredge both sides of Long Dock.

6. Locate and construct a 100,000 square foot transit-oriented warehouse.

7. Repave all open storage areas with appropriate drainage to contain storm water.

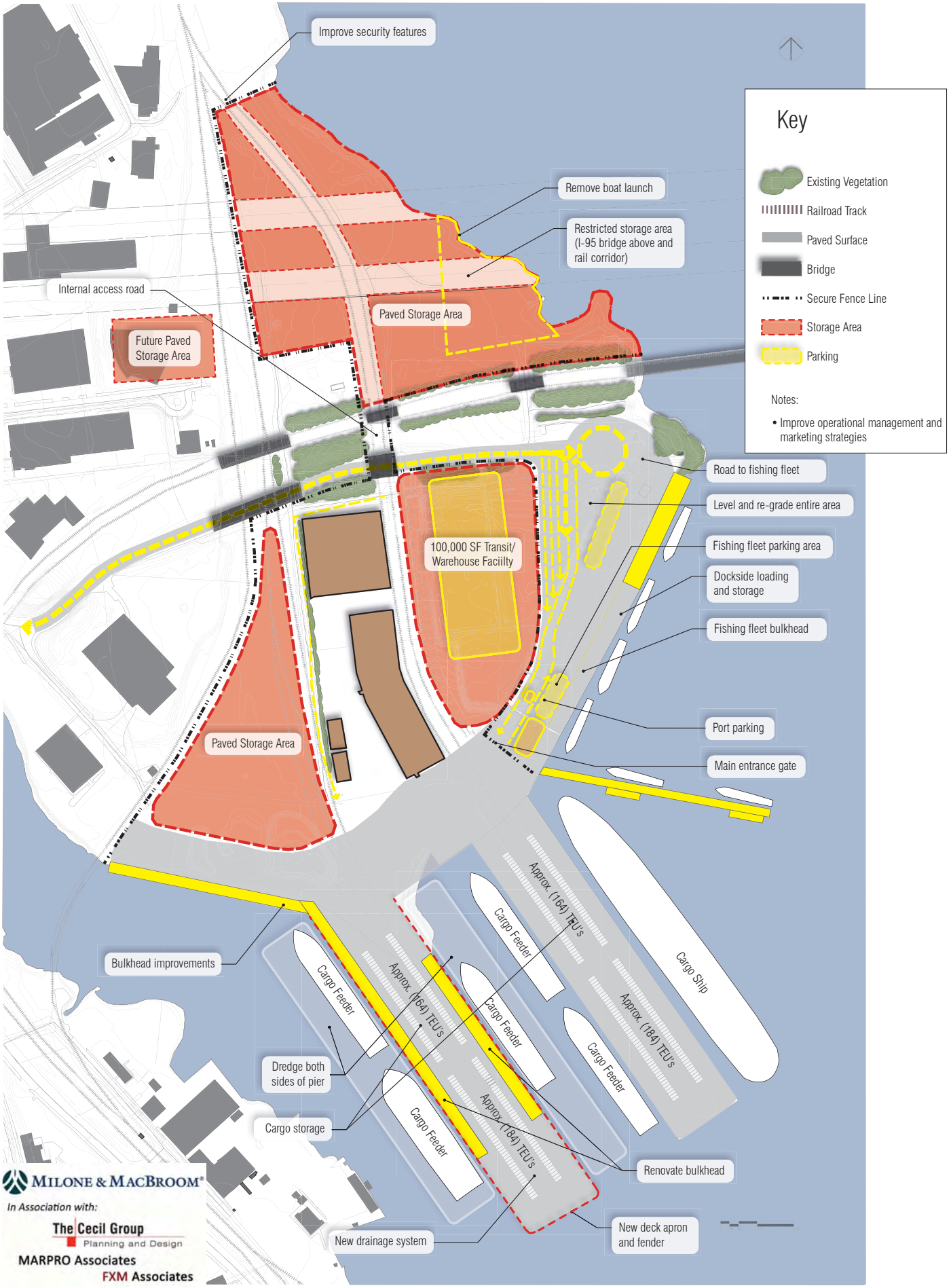
8. Improve the bulkhead along the western quay west of Long Dock.

9. Repair any remaining bulkheads and fully pave the pierhead areas.

10. Remove or relocate the public boat launch.

MAXIMUM BUILD OUT IMPROVEMENTS

New London State Pier



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Master Plan

The Master Plan integrates all of the previously described physical improvements, showing how phased improvements will result in an expanded, more efficient State Pier Facility. The Master Plan, shown on the following page, represents the development goals for the Facility over the next ten to fifteen years.

Operational Functions and Management

In addition to the physical recommendations embodied in the improvements described above, there are several operational and management changes that could improve port operations at the State Pier Facility. Recommendations regarding port management, staffing, opportunities for partnerships and marketing are included in this report, as they are necessary for realizing the benefits of the suggested physical changes.

Management and Staffing

The New London State Pier Facility is publicly owned and privately operated. Public entities often elect to become landlord ports and have a third party operator take over cargo and marine operations because of their general lack of expertise in port operations. They will generally engage terminal operating companies that also serve as the terminal stevedore and handle all aspects of the marine activities, including administration. To accomplish this successfully, it is necessary for the port to shift portions or all of the cost centers to the new operating or service provider entities. Many ports have structured agreements with operators in the following manner:

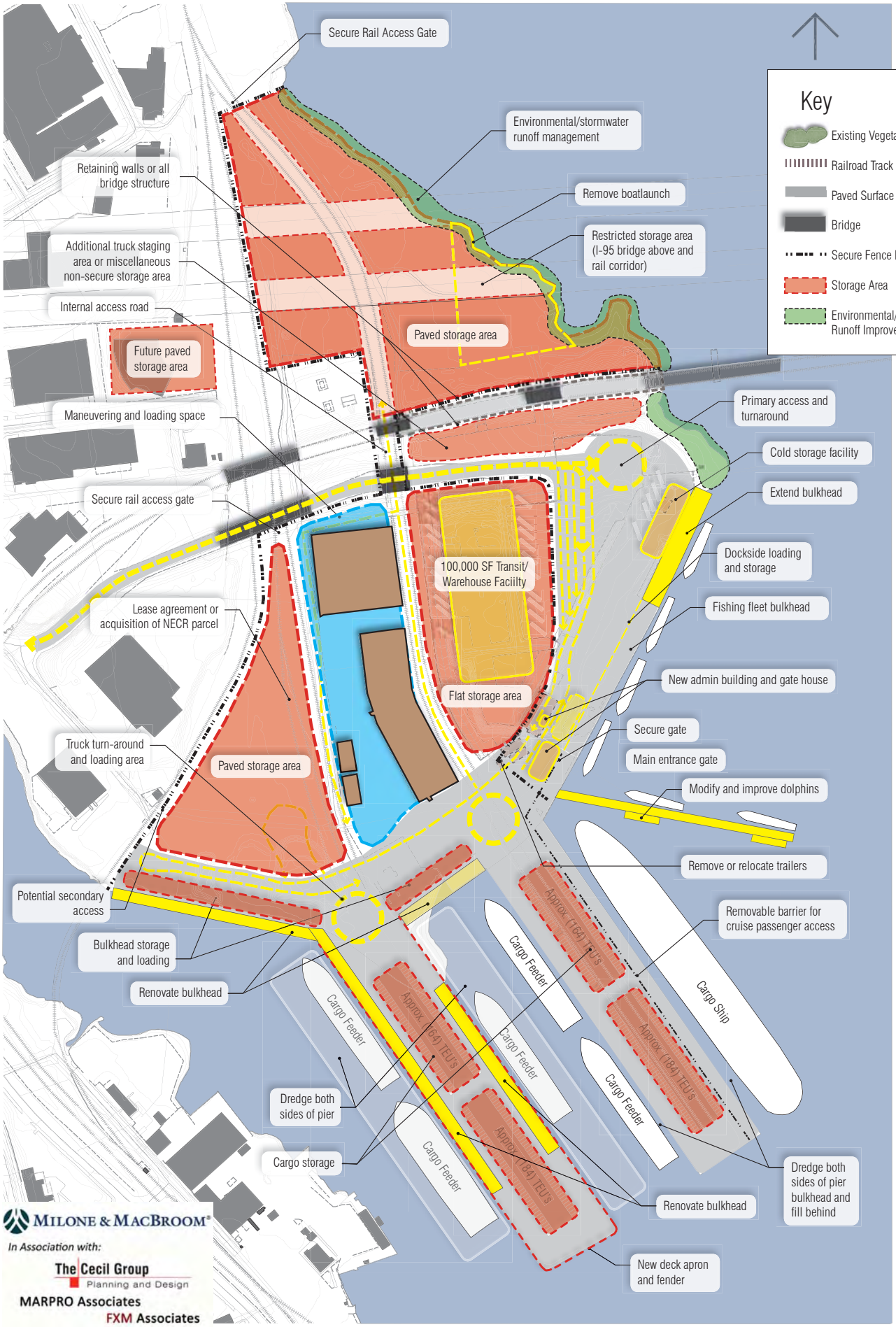
1. Contract Operator or Service Provider - The facility owner manages the facility and contracts a terminal operator to manage and control part or all of the facilities on a cost plus basis. The service provider may also provide a level of specific services such as cargo handling or maintenance requirements. All revenue is retained by the owner except for those services contracted by the vessel or shipper such as stevedoring or longshoring services.

2. Cost Share Operator - The facility owner contracts a terminal operator to manage and operate the facilities based on a cost-share formula. The owner assumes a portion of the infrastructure cost while the operator assumes the operating cost. The revenue is shared on a prorated basis.

3. Private Operator - A private operator assumes full responsibility for the facilities and pays a fixed lease cost to the facility owner.

MASTER PLAN

New London State Pier



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The third option is usually only successful when there is adequate business revenue to justify the offsetting costs, which in most cases, is not generated solely by marine activity. In many ports, new developments managed by the private sector are done in combination with compatible but non-maritime related activities such as transportation services and distribution. This is also successful with non-cargo based marine activities such as cruise ship operations. In some cases, however, land rich cargo facilities have been reallocated to accommodate non-marine activities. During the recession, most of the commodities handled at the State Pier Facility have not come in by vessel, rather they arrived by rail.

The current terminal operator in New London has invested limited resources into marketing the State Pier Facility. In addition, the State has diversified its attention in regard to transportation needs which has limited its focus on port effectiveness. Therefore, the current operational scenario at the State Pier Facility needs improvement, and possibly a whole new approach to management of the Facility. This may include a new public agency focused on port activities, a new commercial terminal operator including a non-marine operator such as a railroad, or the State hiring professional staff to operate the facility under their jurisdiction.

Management and staffing for ports the size of New London are similar throughout the United States and Canada, depending on whether the facilities are operated by the terminal owner or another party. Functions focus on administration, regulatory compliance, marine and cargo related shoreside operations, and security. Staffing requirements focus on key management roles related to the terminal's activities and functions, and are developed within a cost structure that reflects the terminal's potential annual revenue potential. Key to effective and efficient operations are clear lines of responsibility within the terminal's operational divisions. Since operational changes can occur in moments, each manager should possess the responsibility, authority and accountability for their position.

Management and Staffing Recommendations

1. The Connecticut Department of Transportation, under its Bureau of Aviation and Ports, should hire professional port staff including a qualified Port Director and a Terminal Manager to facilitate the development of new business, to ensure compliance with federal and state regulations, and to work with the commercial terminal operator to optimize marine commerce as intended.

2. CONNDOT should review the various types of common management models utilized by other ports of similar size and complete a review of the various impacts in relation to each type of management structure. After review, the State Pier Facility should adopt and implement an appropriate organizational structure.

3. The State Pier Facility should utilize the RFP process as established under this contract to solicit appropriate services for the State Pier Facility including open licensing of terminal services. The RFP should be distributed to a wide range of transportation entities and not be restricted to marine terminal operators. Other entities include the adjacent railroad, trucking companies, warehouse and distribution entities, third party logistics providers and marine carriers.

Partnerships

The State Pier Facility has some of the best intermodal connectivity in New England. Direct rail and highway access provide the State Pier Facility with an opportunity to serve the state, regional and national locations. The State Pier Facility needs to further develop these connections to provide a base for development, new business and related port employment. A formalized relationship with the NECR and possible Mass Central Rail would enhance capabilities for both the State Pier Facility and rail lines. A port-rail association would provide the State Pier Facility with direct inland port capability that is more efficient and better connected than most New England ports with the possible exception of New Bedford or Quonset Point-Davisville, Rhode Island. The ability to connect to outlying facilities provides both the railroads and the State Pier Facility a wide variety of price competitive services with alternative marine highway connections to Norfolk, New York and Halifax.

Partnership Recommendations

1. The State Pier Facility should explore opportunities through partnerships with the New England Central, Mass Central, Providence and Worcester and other connecting railroads to identify inland port and shipper opportunities that include handling of bulk, neo-bulk, project and containerized cargo.

2. The State Pier Facility should market is capabilities as a competitive alternative to other forms of regional land based transportation.

3. The State Pier Facility should develop partnerships with other U.S. and Canadian ports to develop all water feeders and Marine Highway based transportation services including participation in container feeder services connecting to other regional ports and major hubs such as Halifax, New York, Philadelphia, Baltimore and Norfolk.

Marketing

Marketing is an important component of improving port operations, especially as new physical and operational changes occur. As port-rail associations are formalized, new competitive pricing opportunities will be created. Such opportunities must be aggressively marketed in order to fully realize their potential.

Marketing Recommendations

1. The State Pier Facility needs to develop and adopt a marketing plan that promotes the assets and connectivity of the State Pier Facility to regional origins and destinations to the advantage of New England and International shippers.

2. The Connecticut Department of Transportation should hire port marketing professionals as part of their effort to develop the ports of Connecticut.

3. CONNDOT should insure that the State's marketing effort be managed by the State and that adequate financial resources' be dedicated to implementing the effort.

4. The State Pier Facility should focus on the targeted commodities and industries described in this report.

Vessel Services
Depending on their geographic location, some terminals have expanded their business opportunities through the providing of support to vessels. Most terminals will have some form of vessel support service in place.

Support services include but are not limited to:

- Harbor services including transient berthing
- Tugs and escort vessel berthing
- Water, sewage and utilities
- Supplies and chandlery services
- Repair and maintenance berthing
- Lay berthing
- Fueling

Each of these areas provides a revenue source for the terminal. Many terminals generate additional income by providing at least some of these services to the vessel. One of the key advantages to having these services available is that a vessel may indicate a preference for a port based upon the support services available in various locations. The more services that can be provided in a port, the more attractive the port is to the vessel operator.

Many of these services can be provided by third party contractors and are readily available in New London Harbor. The contractor generally pays a license fee or percent of gross sales to the terminal operator for the opportunity to provide these services in the port.

Stevedoring
A stevedore is defined as an individual or firm employing longshoreman for the purpose of loading and unloading a vessel. Longshoremen are the personnel that handle the cargo aboard the vessel and ashore including yard and often ship equipment, as well as sort, check, stage and manhandle when necessary all commodities in transit. The stevedore is the employing management firm while the longshoremen are employed on a regular or casual basis. While stevedoring is generally limited to cargo handling, line-handling and other dockside services are generally handled by the same labor force.

The stevedoring firm can either have regular employees or use contract labor. Personnel are often members of a longshoremen's union in the United States but there are also a number of non-union operations. The stevedore is responsible for all salaries, benefits and care if a longshoreman is injured.

When cargo is received, the stevedore can act as the responsible receiving party or the cargo can be received by the terminal and handled on their behalf by the stevedore. A fully functional form of the stevedoring operation is the terminal management company which is a stevedore that handles both the vessel and terminal cargo handling activities.

Stevedoring arrangements can vary according the practice and work arrangements in a port. The stevedore can have an exclusive or non-exclusive for all cargo handling, may only handle one type of cargo on a terminal or may hold a lease on a portion of the terminal for a specific type of cargo handling, commodity or operation.

Based on the arrangement, a license fee, percent of gross, fixed leased area fee or per unit/tonne fee is collected by the port from the stevedoring company. Ports may also have the stevedore handle all billings and collections depending on the operation.

In most cases, the stevedore will provide all ground equipment which includes forklifts, reach stackers or top loaders, yard hustlers, small cranes and other basic pier handling equipment. Large cranes and similar equipment are generally provided by the port. Use time and a fuel surcharge are generally charged to the vessel along with other fees.

Marine and Shore-side Operations

Depending on the type of terminal, shore-side operations can be integral to marine operations or kept separated. This is generally defined by the type of cargo and the means of handling. The management structure of the port can be defined by the type of cargo being handled and the number of personnel required. Some cargo types require very few on the ground personnel such as liquid bulk cargoes. Other cargoes such as containers require personnel levels. In most cases, these services are contracted to stevedores that employ union labor in conformance with master contact agreements between carriers and longshore labor unions. There are however a number of non-union container activities.

Various cargoes that are handled on terminals are outlined and specified in the following table:

Cargo Handling Operations

Type of Cargo	On Terminal	Off Terminal
Containers	Adjacent Yard to Pier	Inland Consolidation Yard
Liquid Bulk	Tank Farm	Tank Farm with Pipeline
Dry Bulk	Enclosed/covered storage	Covered/open storage
Break Bulk	Transit shed	Warehouse
Neo-Bulk	Adjacent yard to pier	Distribution Centre
Ro-Ro	Adjacent yard to pier	Consolidation yard
Project	Remote yard	Storage yard

How each cargo is handled is dependent upon the configuration of the terminal, available infrastructure, cargo volume and traffic patterns. Multi-use terminals such as the State Pier Facility function best when cargo is transferred pier-side but stored for delivery or staged, near dock or off site.

Shore-side operations may be integrated into a single management structure with both marine and various shore based activities under the authority of the terminal manager or in separate operating units. The latter is becoming more common in larger operations because it can be designed around performance based procedures and limitations of liability.

Marine operations are also a critical management function of a port. There are two components to marine operations at a terminal; operational planning, and operational management. The operation planning includes laying out the procedures and staging of cargo including personnel requirements and safety/security procedures. Once developed, they are integrated into in a set of operations manuals which define and specify the procedures and practices for carrying on activities. It is important that these procedures are comprehensive and well defined since the efficiency of terminal operation depends on the clarity and adequacy of personnel tasks. These procedures also provide the terminal with preventative measures for personnel safety and establish protective parameters with regard to liability.

Operational management comprises identification, allocation and control of resources required to perform each operation in the most efficient and economical manner. The success of the second component is dependent on the clarity of the first. Terminal operations for the State Pier Facility involve an orchestrated marine component and shore-side components involving rail and on-site truck moves. In addition, there are regulatory, administrative and support; emergency functions are associated with each evolution.

As previously mentioned, terminal activities are designed to enable a vessel to load and unload its cargo in a safe, efficient and economic manner. The marine terminal provides an interface between the vessel and the shore. The effectiveness of the terminal is based on its ability to remain flexible. Infrastructure, if inappropriate, can actually be an impediment to marine operations. Many older facilities were developed with limited forms of cargo handling capabilities. Modern terminals are designed to afford as much open space on the pier as possible and allow for maximum flexibility to adapt to changing demand needs. Management structures should be developed and utilized to optimize this concept.

Summary

The improvements and operational management recommendations presented in this section represent numerous opportunities to influence the State Pier Facility's capabilities and means of functioning more effectively. Costs and time frames related to each of the improvements and recommendations have not been depicted in this report, but must be carefully assessed. It is understood that permitting, funding and the economy will affect how and when the various improvements and recommendations may be implemented.

III. EXISTING FACILITY ASSESSMENT AND OPERATIONAL EVALUATION

Introduction to Site

New London State Pier Facility is situated in Southeastern, Connecticut approximately 100 miles south of Boston, Massachusetts; 75 miles southwest of New Bedford, Massachusetts; 50 miles south of Quonset Point, Rhode Island; 50 miles east of New Haven, Connecticut; 70 miles east of Bridgeport, Connecticut; and 130 miles northeast of New York City, where the closest competing ports are situated. The State Pier Facility is located approximately 3 miles upstream from the mouth of the Thames River, which deposits into the Atlantic Ocean between Long Island Sound and Fisher's Island Sound and is just minutes from downtown New London. The Context Map on the following page shows the State Pier Facility and its location within the region.

Various modes of transportation such as railroad, trucking, and shipping conveniently link the port to the state, region, Canada and beyond.

The State Pier Facility has two main piers: the State Pier located to the east, and a pier known as Long Dock (formerly known as the Central Vermont Railroad Pier) located to the west. The State Pier Facility received major overhauls including functional, structural and aesthetic improvements in 1997 and 2003. Both piers are utilized during the day and night and at different capacities, which are further explained in this report.

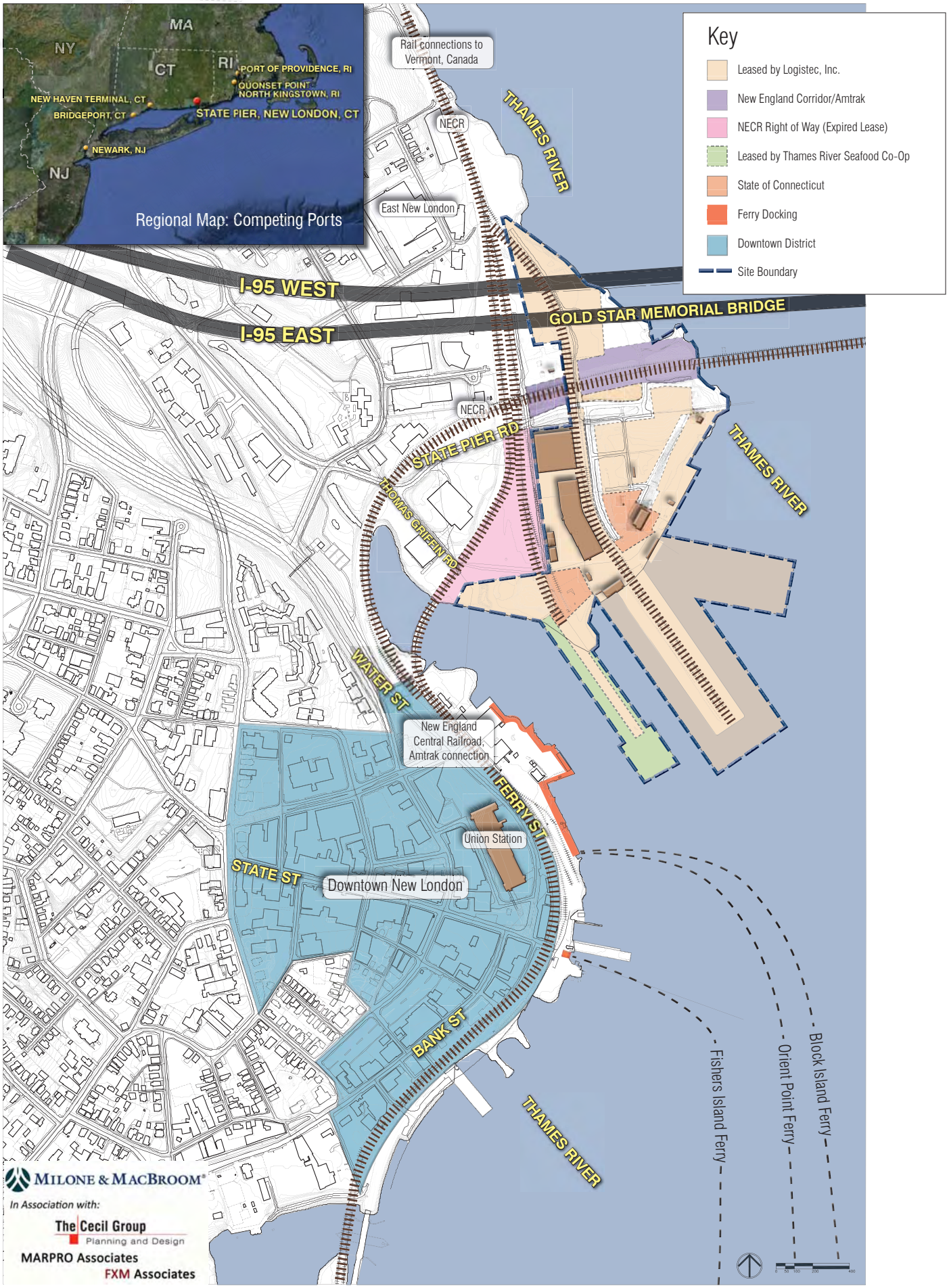
The State Pier Facility site has an unusual property configuration, which is intersected by the New England Central Railroad (NECR), Amtrak's Northeast Corridor tracks, State Pier Road and the elevated Interstate 95 Gold Star bridges. The State Pier Facility is primarily leased by Logistec, Inc. while several other parcels of land protrude into or are located within the site, as shown in the Site Context Map on the following page. The State of Connecticut owns the site which is administered through the Connecticut Department of Transportation's Bureau of Aviation and Ports (ConnDOT). A parcel owned by the NECR is situated on the west side of the State Pier Facility, but also extends into the site.

The State Pier Facility can be broken down into three general areas including the piers, shoreline and the upland storage areas (see the Functional Use Areas and Patterns Map). The piers have direct access to marine shipping activities while the shoreline bulkheads consist of paved and unpaved surfaces which are directly accessible to marine activities. They also contain the various structures and existing railroad tracks. The upland area is somewhat fragmented from the main pier areas due to the intersecting modes of transportation including the NECR, Amtrak line and State Pier Road.

There are currently five structures in use. Warehouses One and Two are the largest storage structures with direct access to NECR tracks. The third structure is a smaller

CONTEXT MAP

New London State Pier



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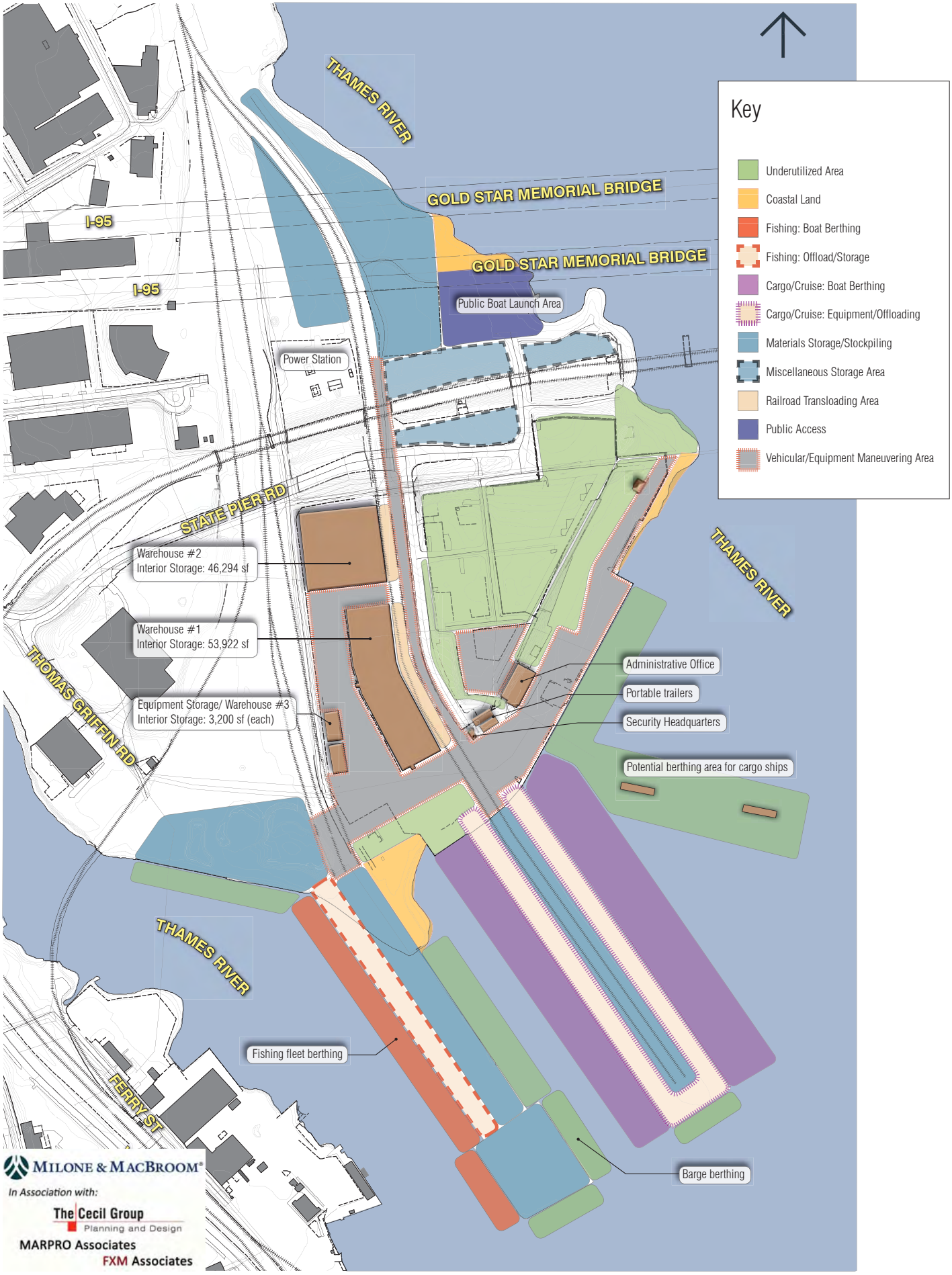
FUNCTIONAL USE AREAS AND PATTERNS

New London State Pier



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SITE CONDITIONS

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warehouse and equipment storage facility. The fourth structure is the Administration Building, which houses ConnDOT personnel and port operations personnel. The fifth structure consists of portable trailers that act as the check in and security buildings. The Site Conditions Map shows these structures, as well as functional use areas at the State Pier Facility.

The State Pier Facility contains various small pockets of vegetation. They are primarily located in areas not currently used for port activities, and generally consist of steep slopes along the rail road and roadways, under the Gold Star Bridges, and some small pockets of over growth along the coastal shoreline. Long Dock also has some overgrowth due to its poor condition. Most of the vegetation consists of younger saplings, shrubbery and weeds. Specimen trees appear to be very limited, if any at all.

The State Pier Facility is primarily flat, with the exception of a hillock land formation on the northeast open area of the site, east of the entrance road, south of State Pier Road and north of the Administration Building. The hillock formation is approximately 15' feet higher than the shoreline bulkhead and is defined by steeply vegetated slopes. This land formation disrupts the overall site and occupies otherwise useable space.

There are five bridges that impact the State Pier Facility and its configuration. Three steel girder bridges accommodate the Amtrak railroad and two roadway bridges service State Pier Road. Two of the bridges are located within Logistec's leased land borders. An active public boat launch is located near the northeast property border under the I-95 Gold Star Bridges. The boat launch is accessed by State Pier Road which also services the main State Pier Facility access road.

Existing Conditions Assessment

Overall, the cargo facilities at the New London State Pier Facility are excellent for niche based marine services that would support the economy of not only the State of Connecticut but also a good portion of Southern and Central New England. In comparison with many of the ports throughout the region, New London Harbor has a number of critical assets that provide the State Pier Facility with a strong capability to attract and retain marine activities.

Figure 1: New London Port

Physical Conditions

In reviewing the physical attributes of New London Harbor as well as the geography, connectivity and flexibility, it is apparent that the State Pier Facility has

a great deal of potential to handle a wide variety of marine activities. The assets include:

- Deepwater access
- Protected harbor
- Short transit from open ocean
- Extensive available berthing space
- Wide and accessible pier aprons
- On dock rail
- Adequate upland lay-down area
- Upland protected warehouse space
- Direct highway connections to major interstates
- Direct rail connections to the national rail network
- Access to a local and extended large consumer base

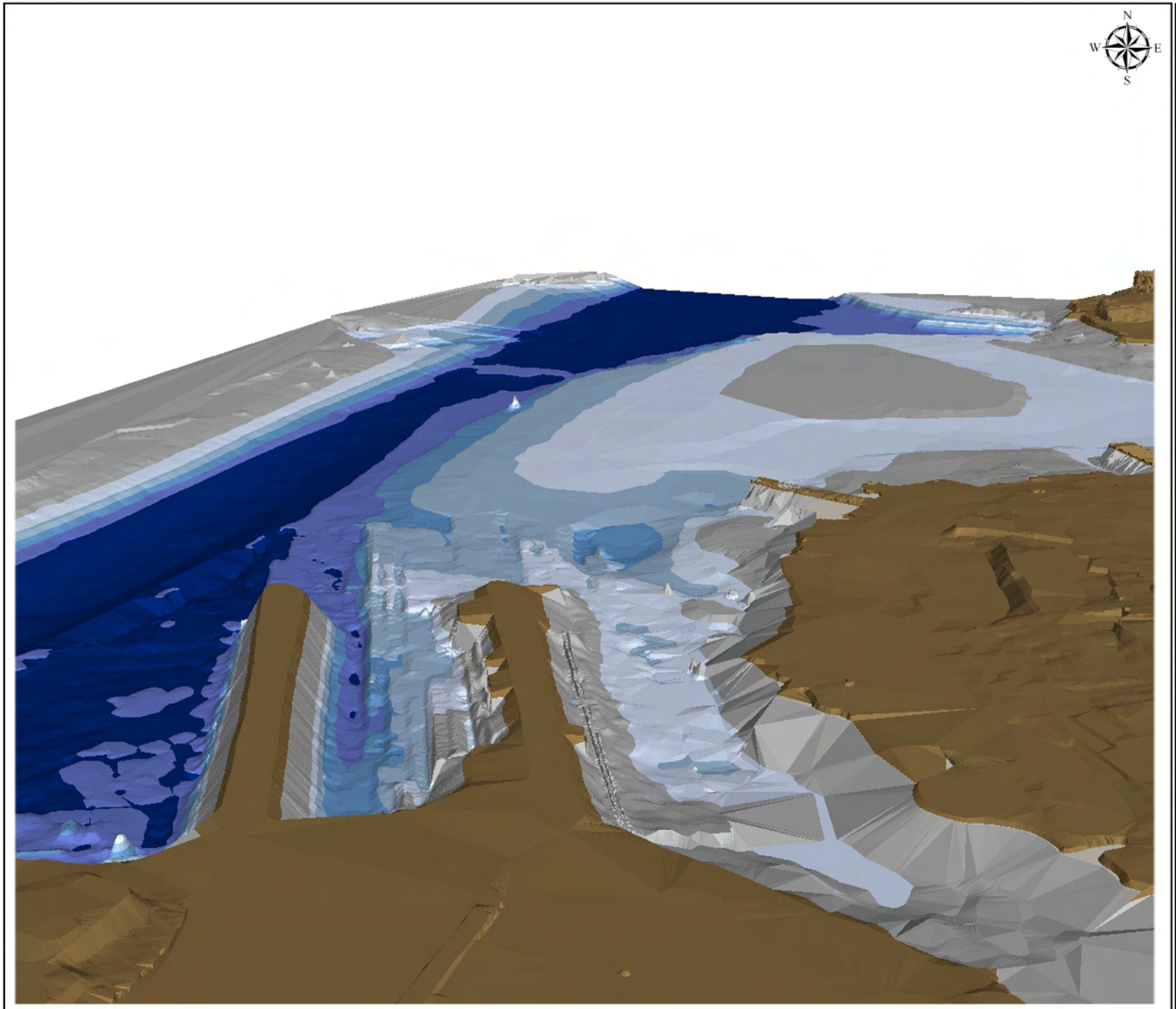
Harbor and Berthing

The approaches to the facility from the harbor allow for a wide range of vessels to undertake a straightforward approach as well as an effective docking and undocking. The State Pier, which is a finger pier structure, has two main berths with 35 feet alongside the eastern berth at Mean Low Water (MLW) and 30 feet alongside the western berth. Approach to either side of the berth based on NOAA surveys has consistent and berth equivalent depth from the boundary of the federal channel to the east side berth itself. The federal channel depth at 40 feet exceeds the approach and berth depth to beyond the boundary of the facility.

Figure 2: State Pier Approach Area

The federal channel and approaches are wide enough for vessels to utilize the water-sheet east of the facility for a turning basin. There are a set of fixed mooring dolphins in the northeast water-sheet that will be addressed later in the report.

Long Dock, the second main pier, is also a finger pier. NOAA depth data shows that this pier has shallower water compared to the State Pier. Depths off the pier range from 16 to 23 feet at minimum and approach depths up to 26 feet from the federal channel. There is a fair amount of shoaling near the pier proper reducing depths further in the berthing areas to less than adequate for any type of deep sea vessel other than fishing or similar craft. See the Bottom Contour Map on the following page for a depiction of these depths.



State Pier Needs & Deficiencies Planning Study

New London, CT

Bottom Contour Map

Scene layers

TIN Elevation Model (feet)

Elevation

- 0 - 130
- -0.1 - 0
- -20 - -0.1
- -25 - -20
- -30 - -25
- -35 - -30
- -40 - -35
- -60 - -40
- -66 - -60

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Sources:
Connecticut Department of Transportation (2010).
City of New London Engineering Department (2010)
CT DEP Geographic & Information Center, CT

Not Drawn to Scale

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
MZ	MZ	MZ	1433-62

DATE: December 2010

The water-sheet north of the State Pier has a diagonal pier area adjacent to the administration building referenced as the quay. Water depths outside of the berthing area are consistent with water depth at the State Pier. There is shoaling in the area adjacent to the pier proper which precludes utilization for larger vessels without dredging. Water depths are estimated to be little as 14 feet at MLW.

Also located in the northeast water-sheet are the former mooring dolphins for the U.S. Navy submarine support vessel. Water depth on either side of the dolphins is consistent with depths at the State Pier.

Pier Aprons

All of the pier areas have large workable aprons providing a wide range of flexibility related to handling of vessels and cargo. Some isolated deck segments adjacent to the piers have structural defects precluding them from being used for marine activities or vessel handling and need to be repaired. The quay, or pier area on the northeast side of the State Pier Facility, shown in Figures 3 and 4, consists of 5.96 acres on varying geographic levels with berthing space of approximately 650 linear feet, with an approximate apron width of 200 feet. The pier structure itself has been isolated because of structural defects in the support structure of the pier edge next to the berthing area.

Figure 3: Northeast Quay Apron

Figure 4: Northeast Quay Pier Edge

The upland pier area and apron shown in Figure 5 is usable for cargo storage and handling; however, an isolated portion of the pier face is not used for berthing because of its compromised structure. If the pier structure was repaired, the restored berth would provide a multi-use capability for attracting small cargo or passenger vessels.

Figure 5: Northeast Quay Upland Apron

Four former U.S. Navy mooring dolphins are located within the water-sheet inside of the federal channel and angled at approximately 45 degrees to the northeast quay. (See Figure 6 below.) Built for the mooring of submarine tenders in 1969, the dolphins do not have direct access to the shoreside facility. The structures are designed with batter piles situated to provide maximum longitudinal support for the dolphins when vessels are moored on the north side of the structures. The batter piles protrude outward from the concrete caps of the dolphins preventing mooring against the dolphins on the south side without the use of a mooring system that would hold a vessel off the structure. Utilization of this pile structure presents a unique opportunity for the facility which will be discussed in the recommendations. Previous studies have concluded that with modifications, the dolphin structure could accommodate vessels up to 635 feet.

Figure 6: Former U.S. Navy Mooring Dolphins

Figure 7: State Pier Apron and Berths

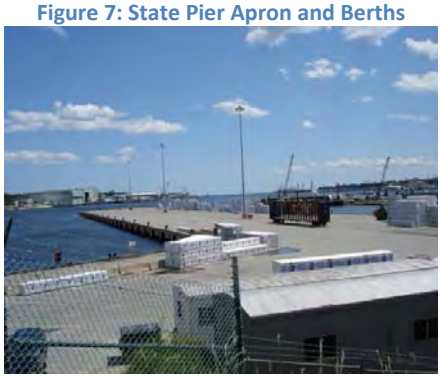

Figure 8: State Pier Fendering System

The Admiral Shear State Pier is approximately 1,000 feet long and has an inclusive apron width of 200 feet. Posted pier loading is restricted to storage of 1,000 pounds per square foot, truck loads up to HS 25 ratings and fork lift loads of 100 pounds per axle maximum load. Crane loads are limited to 1,000 pounds per square foot.

The pier structure consists of steel-pipe piles supported concrete decking and a central pier structure of solid fills with granite retaining walls. Pier improvements were undertaken in 1996-7 which included structural improvements, decking improvements and a new fendering system. The fendering system which is in place on both the east and west side of the pier is designed to handle large commercial vessels and is installed in such a manner as to allow berthing in close proximity to the pier preventing large crane reaches which reduces crane capacity at extended angles. The fenders, shown in Figure 8, utilize synthetic face pads with cushioning back frames standard in use on many commercial piers. The pier is equipped with a modern drainage system with direct grate run off within the pier cap log. The deck of the apron is cambered to prevent pooling of water.

Figure 9: State Pier Apron Surface

There is adequate apron space alongside the easterly deep water berth to accommodate a wide range of cargoes and commodities. Primarily used for lumber and similar neo-bulk products, the pier has a well suited apron surface for handling of any types of commodities including bulk cargo (see Figures 10 and 12). There is a high level pier lighting system which illuminates the main working space on the apron and the apron is equipped with direct on dock rail, as shown in Figure 11, for standard gauge rail equipment which connects to upland warehouses and the interchange with the NECR.

The second main pier area, Long Dock (formerly known as the Central Vermont Railroad Pier) has a number of limitations in regard to pier structure, berthing and utilization. A large amount of the pier structure is original with inconsistent berth interfaces. Portions of the pier structure are reported to have structural deficiencies.

Although there are large available basins next to the pier on the east and west sides, there is limited water depth for large commercial vessels. Pier areas near the head of the basins are underdeveloped and have retaining structures that currently preclude utilization of the area for small vessel berthing.

Figure 10: State Pier North Berth

Figure 11: State Pier On Dock Rail Link

Figure 12: Cargo

Figure 13: State Pier Warehousing at Head of Pier

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Figure 10: State Pier North Berth

Figure 11: State Pier On Dock Rail Link

Figure 12: Cargo

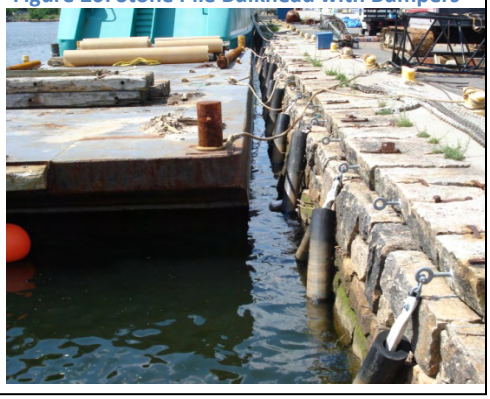
Figure 13: State Pier Warehousing at Head of Pier

Figure 17: Long Dock Pier Edge

Figure 18: Log Dock Apron Collapse

Figure 19: Long Dock Apron Edge

Figure 20: Stone Pile Bulkhead with Bumpers



Use of this pier and apron area for a small number of shallow draft vessels is a significant underutilization of this particular facility asset. The pier is available for cargo storage and can be used for additional berthing for limited draft commercial vessels. Some pier face improvements would be required and the installation of fendering such as fixed pier fenders, fender piles or floating camels would greatly improve the pier face capacity for vessel mooring.

The basic fendering system now in place at various locations provides some vessel protection but is limited in its ability to meet the requirements of heavier tonnage vessels such as tugs or barges. Based on the visual survey of the pier face, which in some places is constructed of quarried stone, the lateral strength of the pier would appear to be sufficient for utilization for cargoes transloaded from barges or small cargo vessels.

Portions of the apron and pier edge show settling which can be an apparent indicator of structural compromise. This is an ongoing problem in several sections of the pier apron which may be the erosion of pier footings which were often constructed of large wood timbers. The pier edge requires a further engineering assessment.

The apron appears structurally bordered by quarried stone in various potions of the structure. The stone pier bulkheads act as containment structures which maintain the integrity of the apron foundation.

The stone pier face is protected in some areas by a series of bumpers which offer limited protection to either the pier face or vessel mooring at the berths. The bumpers are of an inadequate size to compensate for the irregular pier face which restricts the use of the berths to lighter displacement tonnage vessels.

Figure 21: Irregular Pier Edge

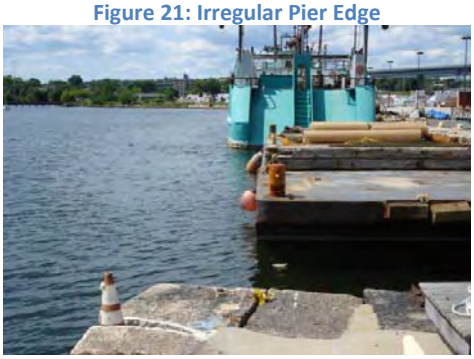


Figure 22: Deteriorated Apron

Figure 23: Unused Pier Apron at Foot of Dock

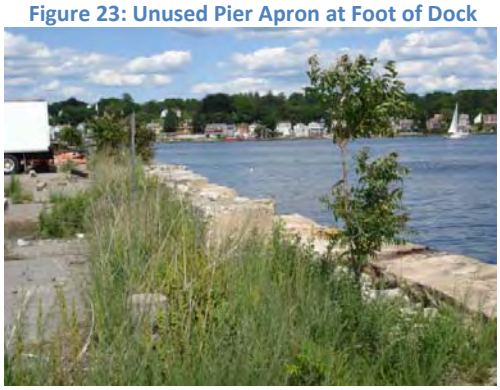
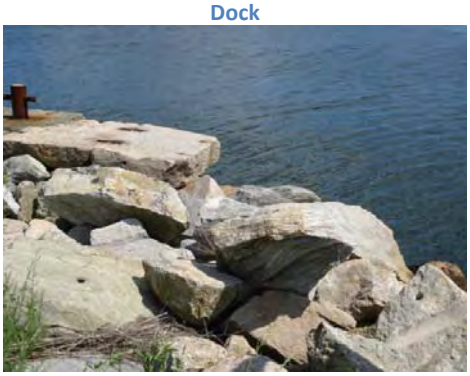


Figure 24: Stone Retention Wall at Foot of Long Dock



Due to the pier's phased construction and improvement periods, the pier has developed mooring areas with irregular berth lengths. This limits the utilization of the pier to those vessels that fit within the irregular sized berths based on the pier's structure. These irregularities are not insignificant and can range from a few feet to approximately 25 feet.

Overall, the pier area is available for material storage because it is paved and appears to have reasonably adequate drainage. The pier is also suited for the handling of smaller commercial vessels to provide mooring or cargo handling. There are a number of areas where the apron has deteriorated and is showing visible sign of compromise. These areas need to have structural surveys completed to determine if cargo can be stored on or adjacent to the areas without further compromising the apron or sub-structure integrity. In addition, temporary repairs to prevent the further intrusion of water and plant growth further compromise the apron integrity.

Several areas of the apron are unused and in some cases blocked off. There appears to be retained storage of equipment in these areas. There appears to have been no recent effort to repair or restore any of these areas.

The leading edges of the structure on the harbor side of the pier have stone rip-rap which has been placed to provide for a retaining wall on portions of the pier.

These areas are unusable for berthing. In addition, there are several areas where wood fender piles and sheet piles have been installed. The areas are irregular and the condition of the sheet pile is in most cases reached a point where it provides limited structural support. The fender pile structures also appear to have limited integrity and limited utilization.

Additional unusable areas of the State Pier Facility are highlighted in Figures 25 to 31. These images show limited structural integrity, uneven and irregular surfaces, structurally unsound steel and wood pier faces and fendering, and limited vessel protection.

Figure 25: Retaining Wall on Dock

Figure 26: Remaining Steel Beam and Pile Structure

Figure 27: Former Pier Edge Structure

Figure 28: Deteriorated Pier Edge Structure

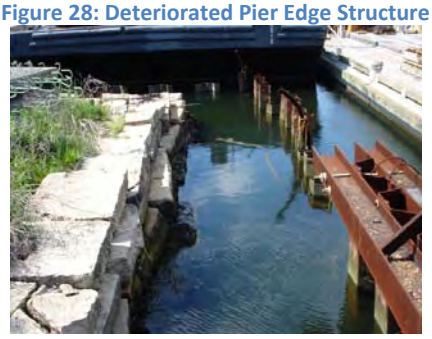


Figure 29: Berthing Area East Side of Long Dock

Figure 30: Unused Apron at Foot of Long Dock

Figure 31: Free Standing Fender Piles

Generally, the pier and apron area in this part of the facility are underutilized (see figure 32) and have had limited maintenance. As noted previously, the water depth limits the size of vessels that can use the pier for cargo operations or general mooring.

Upland Storage Areas

Figure 32: Undeveloped Portions of Long Dock

The upland storage areas of the State Pier Facility and adjacent property have been used primarily for the storage and distribution of lumber products. The past two years has seen lumber arrive by rail and redistributed by truck. The storage areas have varied surfaces comprised of packed dirt and gravel as well as some areas that are paved, as shown in Figure 33. The topography of the area is reasonably level to accommodate cargo moves on site. The uneven topography has created some drainage issues.

Figure 33: Partially Paved Upland Storage

A significant concern is the surface area comprised of pack dirt and gravel shown in Figures 34 and 35. These areas generate dust because of equipment moves and wind conditions. The dust compromises the operating efficiency of terminal equipment and increases operating costs because of the ongoing maintenance requirements. Vegetation control is not uniform and grading is inconsistent.

Figure 34: Unpaved Upland Storage Areas

Facilities with similar storage areas have utilized materials comprised of recycled materials such as roadway reclaim and composites made of reprocessed tires to control dust. There is no evidence that this type of material has been applied to the upland storage areas.

Figure 35: Unpaved Upland Storage Areas

There are numerous areas where low spots in the surface area have developed where the collection of water occurs, some examples of which are visible in Figure 35. The depressions and resulting puddles limit uniform storage on the site. Since storage volumes are low in comparison to the available storage area, this has not resulted in a situation where cost effective operations are compromised.

In addition to the storage areas, there are several paved site access roads which allow terminal vehicles to access parts of the terminal outside of cargo handling operations. The main pier area lighting was completed in 2010, but remains limited in most of the upland storage areas.

Figure 36: Upland Storage Areas and Access Road

Warehouse and Transit Structures

The facility incorporates six primary structures consisting of warehouses, a garage, an administration building and other supporting structures. There is warehouse space on site of approximately 106,200 square feet located between three primary structures.

Figure 37: Warehouse Interior

Warehouse Number 1 is 53,000 square feet; Warehouse Number 4 is 3,200 square feet and is used primarily for equipment storage; and the new warehouse structure is 50,000 square feet.

The main warehouse structures are rail served, with both railcar and truck loading docks. Warehouse Number 1 has an average warehouse ceiling height with reinforced concrete and steel floors designed for heavy loads. Both warehouses are usable for a wide range of cargoes and are suitable for utilization as distribution, fabrication and processing facilities.

Figure 38: Warehouse Rail Docks

The rail access allows for the heavy weight transportation of commodities which can be transloaded to and from the warehouses. Track conditions appear to be acceptable for standard rail car loads and low speed freight car and locomotive utilization.

The newest warehouse facility, which has a capacity of approximately 50,000 square feet, was designed for handling lumber products, pulp and paper commodities. The interior has above average ceiling heights and is designed for high load stacking and heavy per square foot load weights. The facility is in excellent condition and suitable for a number of warehousing, transit or processing activities.

Figure 39: New Warehouse Interior

Intermodal Rail Facilities

The rail intermodal component of the facility consists of the property north of the State Pier, served by the NECR. This includes the two warehouses and adjoining open sites with rail tracks and sidings. Portions of the site are currently utilized for the handling and storage of lumber products. There is a secure and fenced-in area partially located under the Gold Star Bridge. The connecting rail allows for direct access onto the State Pier as well as immediate access to the warehouse facilities. Rail access on Long Dock needs to be restored at the time that pier is restored. This is in addition to roadway access to the

sites, which in some cases is narrow and in need of paving repairs and improvements. The rail in the intermodal area is in similar condition to the rail on the State Pier Facility site.

Figure 40: Rail Corridors to New England Central Right of Way

Figure 41: West Intermodal Storage Areas Near the Gold Star Bridge

Figure 42: West Unpaved Intermodal Storage Areas

The intermodal area is similar in condition to the upland component of the State Pier Facility. It is unpaved, has irregular topography and depressions where water collects. The area has the same disadvantages as the upland storage areas near the State Pier. Although the overall area has both State and railroad owners, the site is utilized for the most part as a single integral storage yard. That portion of the site spanned by the Gold

Star Bridge has some restrictions on the storage of cargo under the bridge spans due to potential structural damage that may occur if the cargo burned or had a similar casualty. A number of facilities nationwide are spanned by road and bridge structures and methods of yard layout can be employed to address concerns of threats to this type of infrastructure.

Figure 43: Uneven Storage Area Surface

Overall, the operational utilization of the site works for the terminal operator and the connecting railroad. There are operational limitations similar to those noted earlier for the upland component. The site is functional and would need to be better organized if high volumes of cargo are to be managed. The site needs to be re-graded and a new surface substance applied such as gravel or reclaim to address dust impacts and irregular surfaces. In addition, site drainage needs to be addressed.

Figure 44: West Unpaved Intermodal Storage Areas

Security

The facility and adjacent areas are in compliance with US Coast Guard Security Regulations as established by the Maritime Security Act of 2002 based on personnel interviews. However, there are site conditions and issues that affect overall site security, and should be reviewed in detail.

Figure 45: Perimeter Fencing

The irregular shape of the property is difficult to monitor and contain. The various layers of transportation modes intersecting at the site create a web of fencing and gates, which also needs to be monitored and secured. The various

existing security features are shown in the Site Security and Access Map on the following page.

A secondary gated entrance exists on the west side of the property at Thomas Griffin Road. It is unclear as to how this entrance is currently utilized and secured. This entrance crosses over the rail road tracks and therefore could pose a safety concern as a secondary access point and could conflict with the active railroad use. However, a secondary access point to the State Pier Facility could be useful in the future to accommodate high-volume cargo flows and its associated vehicle traffic.

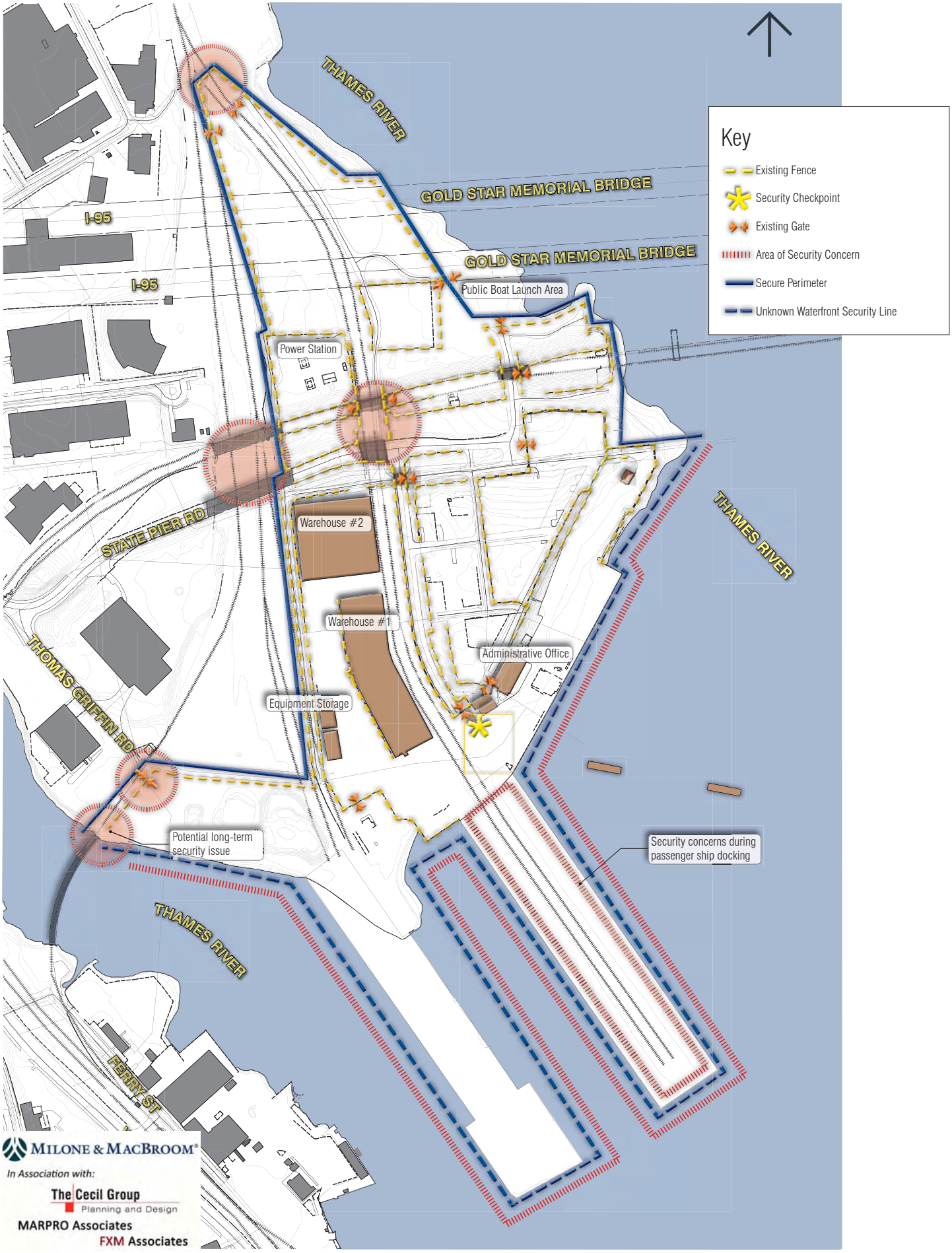
The marine terminal site is surrounded by perimeter fencing with locked gates and controlled access. Site modifications and some operations require security plan reviews by federal authorities, according to personnel interviews.

Passenger ships have regularly docked at the State Pier Facility, with as many as 16 docked between 2007 and 2008. Passengers exit ships directly onto the State Pier property to visit local attractions. Buses are used to control access and egress. Presumably, there would be a high level of concern for safety and security if both cargo and passenger ships are berthed simultaneously, especially given poorly defined site circulation patterns.

Access into the State Pier Facility from the ocean side bulkheads appears to be unsecured. Currently, no fences along this part of the State Pier Facility exist. Both the terminal operator and vessels must notify each other of any security concerns or specific threat levels coinciding with the United States Department of Homeland Security. Therefore, the State Pier Facility relies on the specific ships berthing at the port to have complied with these security measures.

SITE SECURITY AND ACCESS

New London State Pier



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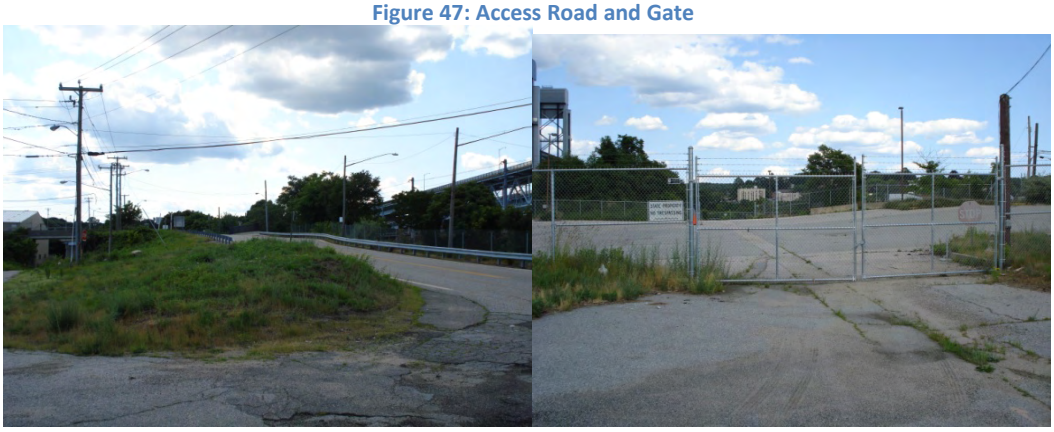
Transportation and Site Circulation

The State Pier Facility has good accessibility to marine and land shipping capabilities via the Atlantic Ocean and Interstates 95 and 395 connecting to all other major ports and cities throughout New England, the Mid-Atlantic and Canada. Although trucks can easily access nearby highways, there are several on-site and adjacent road design issues. Small turning radiuses pose challenges to truck drivers and the main entrance road to the State Pier Facility can become congested due to truck queuing. Indeed, the entrance road has been identified as a deterring element that prevents the State Pier Facility from functioning more effectively.

Figure 46: Narrow Access Corridor

Internal truck circulation near the piers is not clearly defined through physical markings or signage; however, a circulation pattern has been observed and is shown on the Site Circulation Map. The pattern appears to change when accommodating ships of varying size and cargo. Trucks enter the site from one main central access point and drive to the location where materials are ready for shipping. Trucks were observed being loaded at the head of both piers, although truck loading is possible on the piers as well. The limited size and fragmented layout of the State Pier Facility, and the variety of ships utilizing the port, causes patterns of truck circulation to vary, which can create confusion and disorganization. Ultimately, this type of ad-hoc operation affects the overall effectiveness, management and security of the State Pier Facility.

Figure 47: Access Road and Gate



The topography of the State Pier Facility is irregular and has a number of small parcels of land connected by internal access roads. Some of the roads have constraints which would limit the use of certain cargo handling equipment. However, most of the site is accessible by vehicles handling cargo loads. Some of the paved roadways are in need of

SITE CIRCULATION

New London State Pier

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repair and appear to be limited in their ability to handle heavy cargo loads at standard highway Gross Vehicle Weight (GVW) of 80,000 pounds or higher or 20,000 pounds per axle, or 34,000 pounds per tandem axle.

The primary concern for on-site road access is the turning radius of large trucks. Federal requirements prohibit exceeding an overall vehicle length of 65 feet, or 75 feet, depending on the connection between the trailer and the tractor. State standards set vehicle widths at approximately 102 inches, and do not include the additional widths of mirrors or safety handles. Most states have height limitations of between 13.6 to 14.6 feet. Although specific measurements were not made, it appears that a few restrictions may be present on site that prohibit some, but not all, paths of travel. This may limit the handling of some large components generally associated with project cargoes.

Integrated roadways to and from the terminal areas are generally unencumbered and allow for a wide range of truck traffic that does not exceed bridge or local road ratings.

Areas immediately around the larger warehouses are utilized for equipment loading and maneuvering, while parking is prevalent in front of the smaller storage facilities. Many of the access roads within the site are comprised of dirt or gravel. Paved areas are limited to the entrance road and immediately adjacent to the piers and on the State Pier. As mentioned previously, dust from the gravel storage and driving areas is recognized as an important issue affecting truck maintenance that needs to be addressed.

The presence of rail lines in and around the State Pier Facility is an invaluable asset. Coordination with rail operators on the maintenance and future improvements to these rail lines is critical to the overall success of the State Pier Facility.

Ship circulation consists of large cargo and passenger ships docking at the State Pier and fishing vessels at Long Dock. The port accommodated up to 16 cruise ships and approximately 20 cargo ships per year prior to 2008. In 2010, two cruise ships and thirteen cargo ships used the State Pier. The Thames River Fishing Coop leases the majority of Long Dock, the east side of which can only accommodate small fishing vessels and barges due to its limited water depth and dilapidated wharf's edge. Cargo ships could also utilize the dolphin docks east of the State Pier for layovers and another section of wharf located in front of the administration building, during rare times of congested docking.

The north half of the State Pier Facility (or land side) is severed from the ocean side by an elevated land form supporting the entrance road to the State Pier Facility, the public boat launch and railroad bridges. This arrangement creates a unique challenge both for circulation and security. Some of the existing roads and bridges are not functional or necessary. A simplified arrangement would be safer and more effective for the overall State Pier Facility.

Site Constraints

The New London State Pier Facility has some of the best infrastructure compared to ports of similar size, but remains one of the most underutilized in the northeast. The site has good flexibility and can be adapted to a number of marine activities including cargo and cruise ship operations. Nevertheless, several site constraints were identified in this existing conditions assessment. There are a number of improvements that can be made to optimize utilization of the entire site. These constraints are summarized below.

Hill on Site

One of most dominant constraints to the State Pier Facility is a hillock land formation located in the center of the site. Because of this land formation, the access driveway is elevated and retained by a large wall, and several bridges are necessary accommodating vehicular and railroad access. Ultimately, this divides the State Pier Facility and causes congestion, as well as wasting valuable and useable space. It also makes port security more difficult. A web of fencing is located throughout the State Pier Facility, not only along the perimeter, but also at the base of slopes, under the bridges and along both sides of the access road. Although the State Pier Facility is compliant with US Coast Guard Security Regulations, the current layout has a multitude of potential access points. In 2000, a Grading Study was undertaken by ConnDOT. It should be used in the replanning of this area.

Dredging

The water depths on both sides of Long Dock are inadequate for large ship berthing and should be dredged to 32 feet at the time Long Dock is renovated. State Pier requires some dredging to achieve depths of 40 feet, consistent with the approach channel. The inability to accommodate several cargo ships at once hinders the competitiveness of the New London State Pier Facility, therefore further dredging is required should the need to accommodate more vessels arise.

Unpaved Surfaces

Most of the open storage areas including the NECR parcel consist of loose and uneven gravel. This poses a significant issue with truck and equipment maintenance along with appropriate drainage. The environmental impact of these areas to the site will most likely be an issue in the future.

Security Concerns

Numerous access points to the site make security monitoring difficult. Undefined circulation patterns raise safety and security concerns, especially if passenger and cargo ships may dock simultaneously. Reliance on ships self-monitoring also poses some potential security issues. Finally, the public boat launch located adjacent to the State Pier Facility property attracts community boaters and potentially unwanted visitors during the evening hours. If this area is not monitored during the evening hours, there is the potential for a security breach.

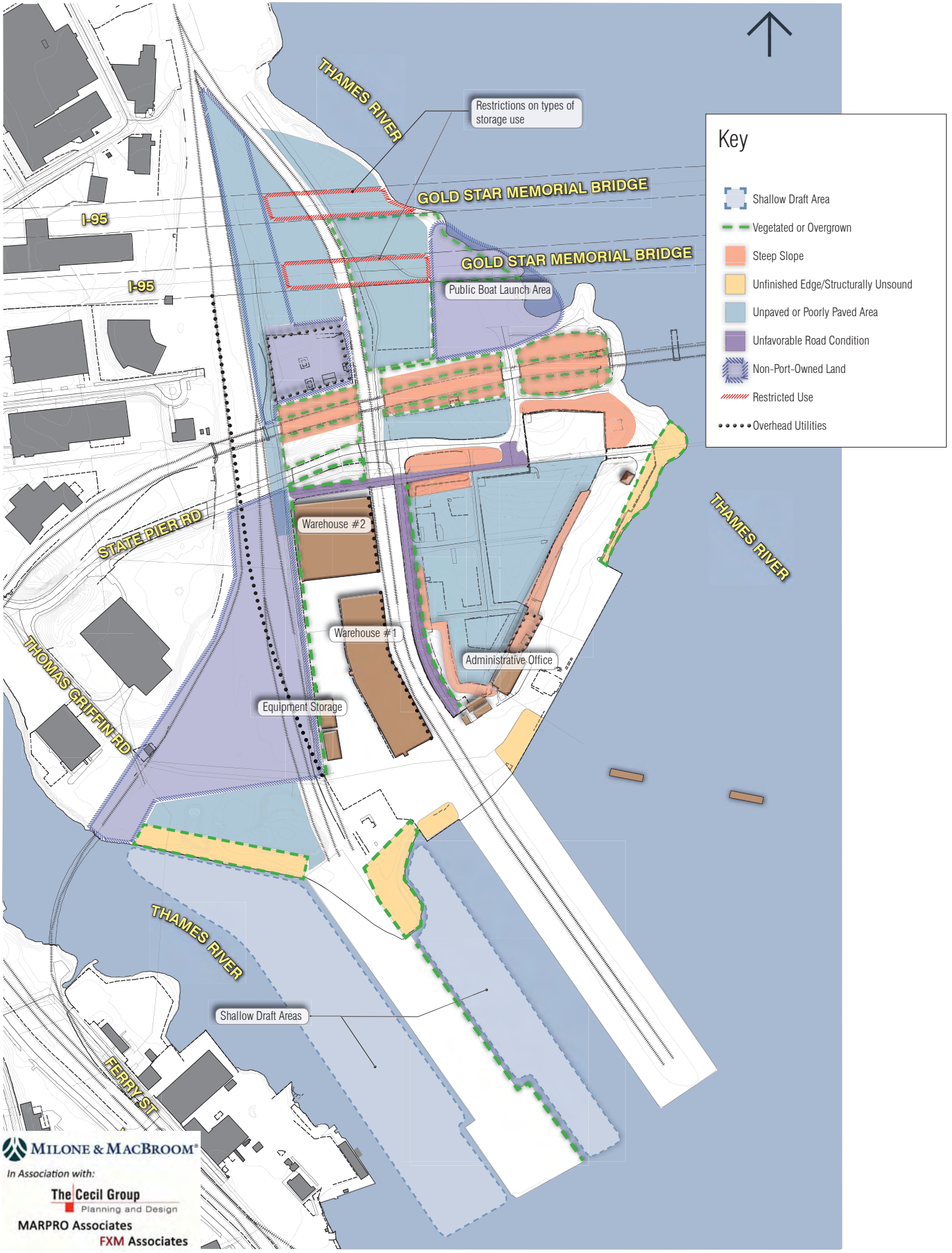
Transportation and Circulation
The lack of a formalized circulation pattern has the potential to generate confusion and disrupt the efficiency of operations. In addition, several internal road design issues, including tight turning radii and roads and unpaved surfaces that cannot support heavy loads, limit the potential for moving large amounts of cargo around and off-site.

Overhead Utilities
Major overhead utilities extend from north to south on the site, from the small storage building on the State Pier Facility's property, intersecting the NECR property and eventually intersecting the railroad and I-95 bridges. The utility poles may potentially pose an issue for storage within the NECR parcel.

None of these or other constraints noted in this report are insurmountable problems that would prohibit the State Pier Facility from attracting and handling a wide variety of marine cargos. In addition, the State Pier Facility has the distinct advantage of direct rail connections, including on-dock rail, warehousing and transit storage space; as well as excellent road and highway connections. The facility is located in an active harbor area where a wide range of marine services are available. The facility and the harbor are well protected from adverse environmental conditions. While the facility could better utilize its existing infrastructure and add new cargo handling equipment such as a mobile harbor crane, the facility overall is readily adaptable to most marine activities appropriate for a port terminal of its size.

SITE CONSTRAINTS

New London State Pier



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IV. USE ASSESSMENT, ALTERNATIVES AND STRATEGY DEVELOPMENT

Introduction

Alternative uses and future opportunities for the State Pier Facility were assessed relative to its current physical and operating characteristics and market trends. This opportunity analysis thoroughly examines the wide spectrum of commodities that the State Pier Facility can handle. A development program was developed around targeted commodities and industries that appear to have the greatest potential for expanding activities and ensuring the State Pier Facility's success. The program details various physical improvements that could be made to enhance the State Pier Facility's attractiveness to targeted industries, expand volumes of cargo handled and improve operational efficiencies. Four alternatives for the future of the State Pier Facility were derived from the development program. The alternatives range from less to more aggressive in terms of financial and development commitments, and include: No Build/Current, Current Intermediate, Current Moderate and Maximum Build Out. Finally, general recommendations regarding management and organization to support the development program and alternatives are made.

Commodities Suitable for Handling at New London State Pier Facility

The following section reviews the various commodities and activities that the State Pier Facility of New London can currently accommodate, and identifies opportunities where volumes and/or efficiencies can be increased. These opportunities form the basis for the programmatic plan.

Manufactured Goods

Manufactured goods are primarily moved in containers. New London is within close proximity to the Port of New York and New Jersey where the largest quantity of container cargo moving into and out of the east coast is currently handled. New York offers a wide range of direct-call container services and a good portion of the local and extended market around New London is serviced through there. The service area for New London is also served by Boston, where low-cost, direct-call container service provides an efficient and cost effective option for local shippers in the Boston and New England markets.

The Ports of New York and New Jersey, Boston and Portland, ME were connected by a feeder service operated by Columbia Coastal, which suspended operations into Boston and Portland in 2010. When Columbia Coastal had extended its Boston service to Portland, it generated an increasing export volume, due primarily to wood pulp exports; however, the service had cost challenges associated with the need to reposition empties for reloading. The port had worked with several importers in an attempt to balance the import/export load but was not able to attract sufficient volume before the service was suspended. In addition, both Boston and Portland were serviced by a feeder ship that connected to Halifax, Nova Scotia. The combination of these feeder services provided shippers with lower unit costs and a wider variety of options and markets. Since the suspension of these services, most New England origin and destination cargo

has shifted to either truck or rail, adding volume to the already congested New England highway and rail infrastructure.

The New London State Pier Facility has an opportunity to work with partner ports to develop connecting feeder services and attract cargo that originates in or is destined for New England. Potential partner ports include Davisville and Providence, RI; New Bedford, MA; Portsmouth, NH; and Portland, ME. Collectively these ports could develop sufficient cargo volume and commodity balance to develop a successful feeder service to either the Port of New York and New Jersey or the Port of Boston. These regional hub ports offer a larger range of competitive carrier services and a wider array of international market access affording shippers with transportation alternatives to trucking or rail.

Minerals

The State Pier Facility of New London has not handled sand and gravel for a number of years. These materials generally produce lower revenues, while occupying large expanses of valuable land that might be better suited for higher value commodities. Sand and gravel also produce a large amount of heavy-weight truck movement servicing local markets. Minerals are a niche opportunity for smaller ports, though, and the State Pier Facility could develop a balance of bulk import trade tied to its connecting rail service. An inland partnership providing access to bulk mineral commodities such as road salt in conjunction with rail movements to locations serviced by the New England Central Railroad (NECR), Mass Central and other connecting rail lines would take full advantage of this opportunity.

Figure 48: Salt Being Off-Loaded onto State Pier

Project Cargo

The movement of project cargo, particularly equipment and machinery, is managed on a case-by-case basis and often includes containerized freight. Very large equipment and machinery move on a per-ship or per-barge basis. The attraction of this type of cargo is dependent upon the availability of appropriate facilities and equipment. New London's State Pier Facilities can accommodate either barge- or ship-based loads. Project cargo opportunities could be enhanced with the addition of a facility-based crane. In addition, the State Pier Facility's direct connection to rail provides the opportunity for movement of project cargo to inland New England areas.

Project and specialty cargoes are handled on an occasional basis depending on the source or destination requirement. These commodities are unit-based and include power transmission and generation equipment, manufacturing components, and imported wind turbine components. Although occasional, the State Pier Facility's ability to handle these cargos benefits both the port and the region. In most cases, such cargo requires heavy-weight crane capacity.

Chemicals
There are a number of chemicals handled through transportation facilities throughout the Northeast, such as Sodium Hydroxide, used primarily in the paper and textile industries, and glycol-based products used in aviation deicing. These commodities are attracted on a niche basis and expansion is based upon the need of the dependent industries. Particular attention has to be paid to the provision of adequate hazardous cargo handling and storage infrastructure to meet demand. Handling of these commodities, normally delivered by barge or in small lots by container, can be accommodated at the State Pier Facility and transloaded to rail tank or box cars.

Automobiles
The import and processing of automobiles is a highly specialized industry dependent upon an importer or manufacturer interested in handling the commodity. Basic port requirements for this activity includes an adequate land mass for vehicle storage (125 cars per acre) and up to 50,000 square feet of processing space depending upon the anticipated volume. Car carriers average 3,500 to 5,000 vehicles per voyage and can also handle wheeled equipment. These vessels have shallower drafts than similarly sized container or bulk ships, but have very high superstructures which can be affected by environmental forces such as wind. Facilities do not require specialized equipment for loading or off-loading vehicles, and need only provide a pier area with wide apron suited for the anticipated size vessel.

The State Pier Facility would compete with Boston and Quonset Point, RI which have established automobile processing industries. Automobile exports from New England are generally limited to the handling of used automobiles in niche markets. The auto industry often uses free trade zones in ports to attract processors. This allows manufacturers to consolidate processing efforts and export vehicles with value added services without Customs duties to international markets. Utilization of a free trade zone enhances a port's attractiveness for vehicle handling.

Fuels
Except as transported in containers, the handling of bulk fuels is not appropriate for the State Pier Facility.

Pulp and Paper
The processing of pulp and paper products provides a good opportunity for the New London State Pier Facility because of its existing warehouse facilities, low warehouse and labor costs, and direct rail connections to New England-based processors. Currently, these products are moved by rail to New Jersey transload facilities and reloaded into containers for export. They had previously been handled on the Columbia Coastal feeder service. The State Pier Facility has the ability to perform the same services at a lower cost and could provide shippers with ocean carrier access through the Ports of New York and New Jersey or Halifax, depending on which service could be developed.

An estimated 4 million tons of pulp and paper, or 80,000 truckloads, move out of the State of Maine every year. Most New England paper exports are destined for Japan, Korea, and China (including waste paper). Most waste paper out of New England is destined for Northern Europe.

This containerized export product could balance import volumes at the State Pier Facility and support a feeder service connecting through Halifax or the Port of New York and New Jersey.

Lumber

The State Pier Facility already handles a quantity of lumber, although recently mostly via rail and truck, rather than over the dock. Before the economic recession began in 2007, significant quantities of European lumber were handled at State Pier. The experience of the connecting railroad and the source of existing lumber products could support lumber exporting through the State Pier Facility, as well as the potential for importing. Most New England lumber exports are destined for Europe and Asia. These consist of mainly manufactured wood products and construction material. Specialty manufactured lumber products are normally shipped in containers and could support a local container service.

Figure 49: Lumber at State Pier Facility

Agricultural Products

New London could handle containerized agricultural imports and exports based on the ability to develop a connecting feeder service. The State Pier Facility would have to invest in significant facilities to handle bulk agricultural commodities.

Seafood Products

New London and the local region does not harvest or process a large quantity of fresh and frozen fish and shellfish products. Any product might be moved by container.

Metals

Most New England metal handling is export-based and consists of processed scrap metal. The handling of this type of cargo requires specialized handling capability, large handling facilities and exceptional environmental controls. Scrap metal is processed and controlled by a small number of specialty companies and is not recommended for ports with limited land area and limited harbor depth. Processed and manufactured metal products including steel plates, rolled steel, steel coils and similar products have been imported through ports in both Connecticut and Rhode Island. Recent facility issues in other ports have created diversions to New London where these products have been unloaded for delivery. This experience has demonstrated that metal handling represents a potential and viable opportunity for the port.

Figure 50: Steel Coils at State Pier Facility

Bulk Water

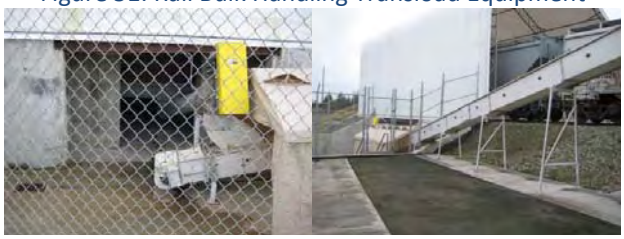
Iceland water importation and processing was identified as an opportunity for New London. Water is shipped in twenty foot containers, loaded into bladders, and transloaded into smaller retail units for distribution. The company responsible for this product identified the New London State Pier Facility as ideal for handling this commodity because of the adequacy of its port facility, its availability of warehouse and transload space and the strong potential retail market. In addition, product could be moved inland for processing and distribution. The company projected annual container volumes into the New England market as follows:

CONTAINERIZED PRODUCT	2011	2012	2013
Bottled	375	1,907	2,852
Medium Bulk Product	251	4,936	7,946
Total Containers	625	6,843	10,798

.

Organic Materials

Figure 51: Rail Bulk Handling Transload Equipment



Organic materials such as wood pellets, fertilizers and peat moss represent a potential import or export opportunity for the State Pier Facility. These commodities are often containerized based on volume or can be handled in bulk with the development of appropriate facilities. Handling of these commodities can be in conjunction with the connecting railroad. Bulk handling facilities can be compact and relatively inexpensive to develop. There is adequate indoor storage available for handling of hydroscopic cargoes and adequate open land for open storage of product.

Containerized Trash

Figure 52: Trash containers on Barge

Containerized trash is frequently transported from New England to processing and storage facilities along the U.S. East Coast. Trash handling is a steady commodity and because of new environmental regulations, is often processed in specialized facilities and only transported through a port. Therefore, containerized trash could provide the State Pier Facility with a steady revenue base while maintaining multi-purpose handling facilities.

Cruise Ships

Except for occasional cruise ship calls, the State Pier Facility is not considered a major player in the international cruise ship trade. The cruise ship industry is important to decisions on State Pier Facility development in New London because of the unique handling and logistics

requirements it presents. In 2010, only two cruise ships berthed at the State Pier Facility; however, there is the potential for home port operations in the pocket cruise ship trade. The State Pier Facility's direct connections to Amtrak and the local drive-in market could support an expanding market for this type of cruising. Large vessel turnarounds are not practical in New London Harbor because of the lack of a close airport with extensive air service. The State Pier Facility can continue to develop fall-oriented cruise ship port of calls through partnerships with other regional and Atlantic Canada ports to develop programs and itineraries that meet cruise company criteria.

Figure 53: Cruise Ship Docked at State Pier

Commodities Summary

COMMODITY	SOURCE	HANDLING	FLOW	NEW LONDON POTENTIAL
Manufactured Goods	International/Domestic	Container, Truck, Rail	Import/Export	High
Minerals	International/Domestic	Bulk Ship, Rail, Truck	Import/Export	High
Project	International/Domestic	Lot and Container	Import/Export	High
Chemicals	Domestic	Barge, Rail, Truck	Import/Export	Medium
Fuels	Domestic	Barge, Rail, Truck	Import	Low
Automobiles	International/Domestic	Neo-Bulk Ship, Truck, Rail	Import/Export	Medium
Pulp/Paper	Domestic	Container, Rail	Export	High
Agricultural Products	International/Domestic	Container, Rail, Truck	Import/Export	Medium
Seafood Products	International/Domestic	Container, Rail, Truck	Export	Low
Lumber	International	Bulk Ship, Container, Rail, Truck	Import/Export	High
Metals-Scrap	International/Domestic	Bulk Ship, Container, Rail, Truck	Export	Low
Metals	International	Bulk Ship	Import	High
Bulk Water	International	Container, Bulk Ship	Import	High
Organic Material	Domestic	Bulk, Container	Export	Medium
Containerized Trash	Domestic	Barge	Export	High
Cruise	Domestic/International	Ship	Port of Call	Medium

Development Program

Based on the preceding summary of commodities suitable for handling by the State Pier Facility and their market and operational potential, the following commodities and industries should be targeted for increased or future handling:

- Bulk salt and aggregates
- Lumber products
- Wood pulp and paper transloading and processing
- Used vehicle export (Potentially 400-500)
- Project cargos
- Steel and steel products
- Bulk boutique water
- Machinery
- Scrap steel
- Manufactured goods shipped by container
- Specialty food products and oils shipped by container
- Regional agricultural products shipped by container
- Seasonal cruise activities concentrated in the fall

Overall, the State Pier Facility is in usable condition to handle these targeted cargos and industries immediately without significant improvements. However, some intermediate improvements are recommended. The following development program details physical improvements that would facilitate increased volumes and efficiencies in these targeted industries. This development program drives the alternative development scenarios described in the next section and will assist in determining future investments in port facilities.

Storage

The State Pier Facility should create more interior and exterior storage space to accommodate larger and more frequent cargo shipping demands. A 100,000 square foot transit-oriented warehouse has been suggested, for when demand dictates. A cold storage facility is also necessary to establish a robust fishing fleet. Developing larger, exterior, level open space close to the piers would maximize efficiency and effectiveness of port operations. Additional inland storage areas could accommodate shipments of cargo that requires longer periods of storage, such as used vehicles. The State Pier Facility could store approximately 400-500 vehicles if existing open spaces were level.

Lease Use Agreement or Land Acquisition

The parcels of open land belonging to the State as well as the adjacent cargo-handling interests, such as the NECR parcel, should be developed into a single terminal parcel by purchase of available property, leasehold or contract agreement between adjacent cargo interests. A larger site would enable the State Pier Facility to accommodate more storage of lumber, automobiles or other bulk material.

The NECR owns two parcels adjacent to the State-owned parcel that offer significant potential lay-down space to improve port operations. These areas are shown in the Potential Enlarged State Pier Area Map. The first is an eight-acre parcel just north of Long Dock. This site was

recently leased by Logistec and contains rail tracks. Its proximity to the pier makes this a priority parcel for the State to consider gaining control over to integrate into port operations. The second area is smaller at just over an acre, and is a portion of another NECR parcel. This parcel is located at the north end of Fourth Street and could provide valuable lay-down space in very close proximity to the piers by expanding the lay-down area under the Gold Star Bridges. Therefore, it is another location that the State should consider gaining control over whether through lease or ownership.

Plans should be made to incorporate the current site of the State boat launch into the secure area of the State Pier Facility. The need to activate this plan would be dictated by expanded cargo flows through the State Pier Facility and the consequent need for additional lay-down space. See below for further discussion of moving the boat launch.

The Eastern Avenue Properties parcel shown on the Potential Enlarged State Pier Area Map contains a vacant 2.29 acre site with 18.5 acres of deeded river bottom. Since it abuts the northern edge of the State property and has been used for various marine related projects, it offers potential to enhance port operations.

Shipping

The State Pier Facility has the capacity to accommodate several large ships at once, which could include up to two to three cargo ships per month and ten to twelve cruise ships per year, with most cruise ship port-of-call operations concentrated in the fall. There is adequate space to accommodate these operations at the same time, while remaining compliant with federal security regulations.

The cargo ships would include a variety of bulk, neo-bulk and container feeder ships. The State Pier Facility is capable of handling large bulk ships with operation drafts of approximately 30 feet depending on tidal conditions. The Facility can also handle neo-bulk ships such as lumber carriers or roll on-roll off (RO-RO) vessels of the same approximate size.

Container feeder ships represent the best potential for continuous and steady cargo service. Connecting services to other New England ports as well as major hub ports in Halifax or New York present the port with a unique opportunity to service not only the immediate New England market but also destinations well inland because of the connecting rail service. The State Pier Facility also would provide a competitive marine alternative to all rail service which would have a positive impact on regional shipper costs.

Figure 54: Small Container Feeder Ship

Feeder ships are designed to provide distribution and gathering service from smaller regional ports that allow for connections to large and varied international services. Feeder ships are

constructed to utilize marginally developed ports that handle smaller amounts as opposed to hub ports designed to handle mega-container ships. A typical feeder ship is designed to carry around 500 Twenty-foot Equivalent Units (TEUs), is less than 400 feet in length and draws less than 25 feet. While equipped in most cases with ship's equipment for loading and unloading, the productivity when utilizing ship's gear is generally limited. Many smaller ports utilize mobile harbor cranes which are relatively inexpensive compared to gantry cranes and have a wide range of flexible uses and good lift capacity. A typical modern mobile harbor crane can cost approximately $3 million in the current market and is very suitable to operations in New London.

In addition, cargo moves by barge are well suited to the State Pier Facility, which could easily handle project cargoes, neo-bulk and bulk cargoes, containers and a host of other commodities. Barges are normally not equipped with cargo handling equipment and require shore based cranes and ramps. Due to lower volume levels, barges are well suited for regular service to smaller ports like the New London State Pier Facility. These barges generally draw less than 15 feet, are less than 300 feet in length and are moved by a companion tugboat from port to port. Container barges move on average approximately 300 TEUs per load.

Figure 55: Container Barge

Critical to operations at the State Pier Facility is regularly scheduled service. Normally, a weekly service meets the needs of most shippers. Barge services would best connect to the hub ports of New York and New Jersey while a feeder ship service would be more appropriate for Halifax. The New York and New England corridor has been designated a marine highway pilot area by the US Maritime Administration (MARAD) and several potential projects are currently under discussion.

Loading/Off Loading Areas

Loading/Off Loading clearance on the piers must be at least 50 feet wide from the bulkhead. This width is sufficient for equipment access and miscellaneous short-term storage items.

Fishing Fleet

The fishing fleet should be relocated from Long Dock to the northeast quay wall area of the terminal to free up the Long Dock area for cargo storage and capital repairs. The area should be excluded from the terminal security plan and designed for free access from the new roadway system.

Berthing and Bulkheads

A dredging plan should be developed and include an assessment of spoils and the stability of wharf areas, dredge disposal options, and development of near terminal containment areas. Maintaining a 40 foot depth on the approaches and both sides of State Pier and the dolphin docks should be pursued. A depth of 32 feet at Long Dock should be adequate. Compromised pier areas

on Long Dock should be repaired and stabilized. Drainage should be enhanced where needed and damaged paving repaired. Damaged fender and sheet piles should be removed. The pier service adjacent to the pier structure should be developed into a consistent berthing area and fender and sheet piles utilized to create a consistent wharf face for vessel berthing. Exploration of placing dredged spoils behind pier perimeter sheet pilings should be pursued.

The former submarine tender vessel moorings should be retained and floating or low structured piers installed to provide berthing areas for fishing and other small vessels. The dolphin docks should be equipped with dock-side berthing for smaller cargo or fishing vessels. The northeast land-side pier requires renovations and should also be extended to the northeast to fully accommodate the fishing fleet or potentially larger ships.

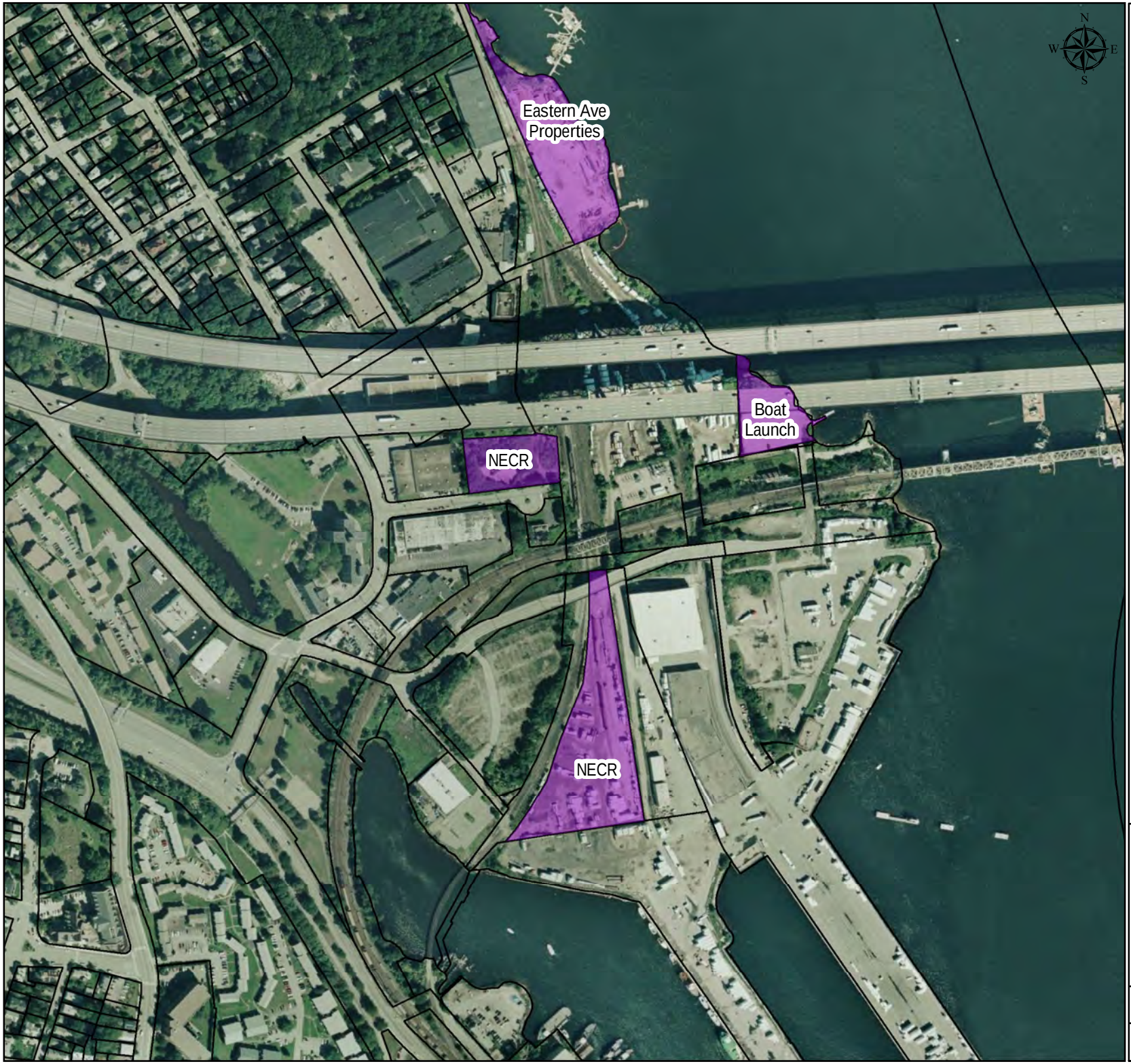
Environmental
Water runoff should be contained throughout the entire State Pier Facility to minimize erosion and contamination of the Thames River. Drainage should meet local, state and federal regulations. Certain innovative and sustainable drainage solutions may be appropriate, such as recycled asphalt, porous paving, bio-retention and bio swales. In addition, shoreline edges should be restored to a natural state with native habitat wherever possible.

New and existing lighting should be installed or modified to meet IESNA, Dark Sky and/or Department of Homeland Security guidelines and requirements in those areas of the State Pier Facility not currently illuminated.

Infrastructure/Utilities
Appropriate drainage structures and systems should be installed across the entire terminal site. The drainage should be coordinated with the resurfacing of yard areas to control dust and eliminate uneven surfaces, as well as provide a more stable and safer working area. The use of reclaim from road resurfacing projects is recommended because it is readily available and inexpensive to source. Lighting throughout the site should be reviewed and coordinated with the various alternatives keeping in mind the long-term facility goals.

Boat Launch
The public boat launch is operated by the Connecticut Department of Environmental Protection (DEP) on land under the jurisdiction of the ConnDOT. It should be relocated within or off-site. One possible location is at the easterly point of the State Pier Facility, and abutting the proposed new fishing fleet area. This location could be made more convenient with the relocation of the main access road. These two modifications would simplify the overall secure line and allow for more inland storage. Another potential location for the boat launch is to the north of the current boat launch site, on a portion of the adjoining Eastern Avenue Properties parcel, if acquisition of that parcel were to be pursued.

A boat launch would require an area with an approximate 100-foot diameter for maneuvering and an 18-foot, one-lane launch and 200-foot backup area.



State Pier Needs & Deficiencies Planning Study

New London, CT

Potential Expanded State Pier Area

Potential Areas for Expansion

MILONE & MACBROOM

99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax: (203) 271-9733
www.miloneandmacbroom.com

Sources:
CT DEP Geographic & Information Center, CT Parcels, 2010.
StreetMaps USA, 2010.

250 125 0 250 Feet

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
RA	RA	MZ	4334-01
SCALE:	DATE: July 27, 2010		FIGURE: Figure 1

Security
A secure line for the site should be simplified. Lease or acquisition of adjacent properties along with relocation of the main access road, fishing fleet and boat launch would help achieve this goal. A clear program or physical solution should be established for securing the site when passenger ships are berthing, specifically when passengers are exiting and entering the site. A temporary fencing structure may be appropriate and should be coordinate with ongoing shipping and storage requirements. A program should be developed to meet all state and federal requirements as the State Pier Facility is further developed.

An overall lighting layout should be enhanced for the entire State Pier Facility offering better security during evening hours, especially within the inland storage area at the northern railroad access point and under bridge locations.

Accessibility and Circulation
Relocating the main entrance road parallel to the Amtrak line is suggested. This relocation would create easier accessibility into the site and more space within the State Pier Facility. The new location would also create direct access to the potentially relocated boat launch and fishing fleet, bypassing secure entrances.

Truck queuing lanes should accommodate a minimum of 15-20 trucks without blocking or impeding traffic flow to or from the State Pier Facility. Lanes should be clearly marked and all trucks should pass through a security check point.

The entrance at Thomas Griffin Road could be used as a second access point into and out of the State Pier Facility, especially during peak loading/off-loading hours when truck traffic is congested. Security of this entrance would need to be monitored carefully and specific guidelines should be put in place prior to its use.

Parking for a new boat launch could be located along the access road minimizing the paved area to just the trailer-maneuvering and ramp areas. This would allow for better environmental coastal management practices.

Base Equipment
There are three essential pieces of equipment that would significantly improve cargo handling capabilities and help to diversify the mix of cargo handled. Most terminals comparable to the State Pier Facility have a base set of equipment to handle a variety of cargoes. This equipment is usually acquired by the terminal operator or stevedore, and is operated and maintained by the stevedore's personnel. The recommended equipment for the State Pier Facility includes:

<u>Mobile Harbor Crane</u>
Mobile harbor cranes are designed to afford a wide range of mobility on a terminal site. They are compact and can quickly move to any accessible point within the terminal. The crane is mounted on a rubber-tired chassis and is designed to handle all forms of cargo, including containers, bulk, and general and project cargoes. Average units have handling radii of up to 184 feet (56 meters) and lifting capacities of up to 200 tonnes.

All of the axles are designed for individual steering and the unit has large tires to operate on rougher terrain. These features make mobile harbor cranes highly maneuverable through tight terminal areas, enable them to pass over obstacles such as rails and uneven terrain, and have a tight turning circle for accurate positioning on the side of the pier. The current stated load capacity of the State Pier except where noted can accommodate the weight and lifting capacity of a mobile harbor crane. The equipment is also designed to handle variations in weather with sustainability in high winds. The units have diesel-electric drives and relatively low operating and maintenance costs. They can also be operated from an external electricity supply.

Figure 56: Mobile Harbor Crane

The terminal should develop cargo crane capacity, such as a mobile harbor crane to improve and enhance cargo throughput efficiency and opportunities. Current estimated cost of this equipment from either of the two main manufacturers is $3,000,000.

Reach Stacker/Top Loader

Reach stackers and top loaders are designed to load or remove containers or cargo from trucks or rail cars. They are also used to stack equipment and containers on top of each other to preserve yard space. Stackers differ in size and capacity, but operate in the same manner. Reach stackers use the unit body as the central lifting support whereas top loaders are similar to fork-lifts. Reach stackers generally have higher and larger lifting capacities.

Figure 57: Reach Stacker

Reach stackers and top loaders require a hard and even surface to operate effectively. The terminal should consider requiring the stevedore to supply this equipment once adequate improvements to the wharf surface have been made. Many ports have their own equipment for use by the terminal operator, while at others, the stevedore supplies and operate this type of equipment. Estimated purchase cost can vary from $500,000 to $1,000,000 per unit.

Yard Hustlers

Yard hustlers are small truck cabs used to dray (transport) truck chassis throughout the terminal. They are small with a short turning radius thus reducing the swing diameter of trailer units. These units are easy to maintain and are used on most marine terminals. They are particularly well suited to container and roll-on/roll-off cargo operations. Like the top loader/reach stacker, they are generally supplied, operated and maintained by the stevedore. As with reach stackers or top loaders, the terminal should consider having the terminal operator or stevedore supply this equipment once improvements to

Figure 58: Yard Hustler

the wharf surface are completed.

Alternatives

Four alternatives were derived from the development program and evaluated. The alternatives ranged from a No Build/Current to a Maximum Build Out. The Maximum Build Out directly responded to all or the majority of the development program elements, and led to the Master Plan presented in Section II of this report.

Appendix A:

Review of Past Planning Efforts

Introduction

The following is a technical memorandum detailing planning efforts over the past 10 years for the New London State Pier. It is essential for the MMI Project Team to review all previous reports and studies and be well versed in past efforts for the State Pier. A number of relevant studies and reports have been undertaken in the study area over the past 10 years by the City of New London, New London Development Corporation, Southeastern Connecticut Council of Governments, ConnDOT, and the Department of Economic and Community Development (DECD). The following review lays the foundation for the Needs and Deficiencies Study that will be prepared by Milone & MacBroom following this technical memorandum. A summary of the relevant prior and on-going reports and studies pertaining to the State Pier are presented below.

New London Port Development Study (1994); Martin O'Connell Associates
This study reviewed the State Pier facility in its entirety. It examined current uses, best uses and limitations, and offered findings and recommendations for the future of the facility (pre-purchase of the CVRR Pier).

Transportation and Land Use Compatibility Study State Pier New London, Connecticut (1998); Maguire Group, Inc.
This study was prepared for the Connecticut Department of Transportation's Intermodal Planning Group. The study looked at "Port and Non-Port" development scenarios for the site. The study initially identified five alternative scenarios:

- Option A – Expanded Cargo Port
- Option B – Cargo Port/Ferry-Tourist-Cruise Boat Facility
- Option C – Ferry-Tourist-Cruise Boat Facility
- Option D – Residential/Yacht Club
- Option E – Industrial Park

The study later narrowed down the scenarios and identified options A and B as the best options, with Option B identified as the preferred scenario. The study provided a detailed plan for each parcel within the preferred site location and discussed the associated impacts and associated cost of developing each site. The Plan also offered recommendations for implementation under the Option B scenario of Cargo Port/Ferry-Tourist-Cruise Boat Facility.

State Pier Municipal Development Plan: New London, Connecticut (1999); *Milone & MacBroom, Inc.*
The MDP was developed for the New London Development Corporation (NLDC) in conjunction with the State of Connecticut Department of Economic and Community Development (DECD), and encompassed the area adjacent to the Thames River generally referred to as the "State Pier" area. The City of New London and NLDC were interested in revitalizing the economy in this specific area by improving the operations at the port facility and optimizing multi-modal transportation linkages. This plan specifically addressed an area of approximately 125 acres, and identified an "action area" to the northeast of the State Pier port facility. The MDP identified the

limitations and constraints of the study area, possible alternative development uses and provided recommendations and implementation strategies.

The Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis (2001); *CCEA University of Connecticut by Carstensen, Lott, McMillen, Shrestha*
This study specifically analyzed the economic impacts of Connecticut's three deepwater ports by using both IMPLAN and REMI state analysis models for economic development. The study identified the economic benefits of employment, as well as impacts on Gross Regional Product (GRP) and personal income resulting from deepwater port activity. This study also identified the economic gains associated with support for Connecticut's deepwater ports.

Container Barge Feeder Service Study – Bridgeport, New Haven, New London, Norwich (March 2001); *Connecticut Department of Transportation, The Office of Intermodal Planning*
This study examined the possibility of establishing a Container Barge Feeder Service along Long Island Sound between the Port of New York/New Jersey and the ports in Connecticut in order to offset the amount of truck traffic traveling on Interstate 95. This study considered both the RO/RO and LO/LO methods of cargo loading and unloading. The study also analyzed the existing Connecticut ports and the feasibility and cost associated with establishing barge feeder service at each port. The study determined that it was feasible to have a Container Barge Feeder Service in Connecticut, but that the type of cargo loading and unloading system (RO/RO or LO/LO) would determine whether improvements would need to be made at the Port of New York/New Jersey.

The study concluded that a LO/LO service would not be economically feasible in Bridgeport due to its proximity to Hartford/Springfield and lower costs to transport items by truck rather than by sea vessels. In New Haven, a LO/LO service would be the most viable. It is the closest port to Hartford/Springfield and would eliminate the truck congestion caused by the transport of products via Interstate 95. The study also concluded that the Port of New London could not sustain a Container Barge Feeder Service at the time of the study (2001) because of major construction repairs being conducted at the site at the time, along with structural issues at the CNR (CVRR) Pier and a lack of space for container storage. The study determined that even if these issues could be remediated, New London still had the limitations of being situated a significant distance from the balance of the Connecticut market and was located in close proximity to the Davisville Port in Rhode Island, which is more attractive for a Container Barge Feeder Service. Also, the report found that there would be various impacts such as environmental, socio-economic, and physical and equipment needs to support a Container Barge Feeder Service.

Port of New London – Can New London Be a Transit Container Port? (2001); *prepared under a contract with the Greater Bridgeport Regional Planning Agency and for the Connecticut Department of Transportation by Management & Transportation Associates, Inc.*
This study addressed the possibility of turning the Port of New London into a Transit Container Port. The study discussed the current operations of the port and the existing limitations that would need to be addressed before the port could become a Transit Container Port. The key

issues are described as land availability, container volume, ownership of property, economics, capital investment, emissions-air quality, the railroad system and competition.

Connecticut Economic Strategic Plan (2009); *by the Department of Economic Development State of Connecticut (DECD), Joan McDonald, Commissioner*
This plan analyzed the State of Connecticut's current economic position and offered findings and implementation strategies to address all identified issues. Relative to this plan, the State addressed transportation issues that impact economic development and included a section on maritime operations. Two of the goals within the plan are to "invest in the ports by creating a Maritime Investment Fund for port infrastructure pursing federal funding under the Maritime Highway Program and creating a new CDA program to provide for low-cost financing for qualified seaport investments targeted to companies that expand maritime industrial jobs in Connecticut" and to "Pursue federal funding under the Maritime Highway Program, ferryboat discretionary funding and Port Homeland Security Funding."

CVRR PIER USAGE STUDY State Pier-New London; *State Project 94-209 by Frederic R. Harris, Inc.; an AECOM Company*
This study analyzed the positive and negative impacts of acquiring the CVRR Pier by the State or another third party. The State Project studied the best uses and requirements for obtaining the site.

In addition to the aforementioned reports, several additional plans and studies were reviewed including: *New London Plan of Conservation & Development* (2007), *SCCOG Regional Plan of Conservation & Development* (2007), *SCCOG Regional Transportation Plan 2007-2035*, *CTDOT's Transportation in Connecticut: The Existing System* and the *MTC's Long Island Sound Waterborne Transportation.*

New London State Pier Goals, Issues and Limitations

After a thorough review of planning efforts over the past decade, a number of re-occurring goals, issues and limitations were identified. The State of Connecticut Department of Transportation's goal for the State Pier is to "achieve full utilization" of the facility. This goal supports the State's on-going initiative to maintain and support the deepwater ports as critical infrastructure of statewide economic priority. In addressing the overall goal of the State "to achieve full utilization" of the New London State Pier, the following issues and limitations have been identified:

- Facility utilization
- Capacity limitations
- Potential for expansion through acquisition of adjacent lands
- Capital improvements and dredging
- Best use of site
- Economic/environmental benefits
- Terminal operations

A detailed review of each of these issues or limitations is provided below.

Facility Utilization

The State of Connecticut Department of Transportation's goal for the Connecticut State Pier is to "achieve full utilization of the facility as an intermodal commerce facility, for export and import of general cargo, involving rail, marine, and highway operations in order to maximize intermodal commerce."[1]

This goal is supported throughout the literature pertaining to the New London State Pier. According to the *Connecticut Strategic Economic Plan*, as of 1998 water was the second highest mode of freight shipment for Connecticut imports in terms of tonnage.[2] According to the Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis, Connecticut's port operation account for 2% of the State's total employment, 2.6% of the State's total output, and 2.5% of the States total taxes collected.[3]

In 2001, the State of Connecticut purchased the CVRR Pier. The CVRR Pier, also known as "Long Dock," was formerly owned by the Central Vermont Railroad Company, which serviced rail freight through Connecticut, New Hampshire, Vermont and New York. The rail spur linking the State Pier facility to the freight rail system, currently owned and managed by New England Central Railroad, provides rail access to the warehouses situated north of the CVRR Pier. With Interstate 95 just north of this area, the State Pier facility's location and infrastructure permits intermodal marine, rail and highway connections. At one time, Logistec USA Inc. managed the port operations for all three of the State's deepwater ports (New Haven, New London and Bridgeport).

Capacity Limitations

The limited cargo capacity at the current State Pier facility is a major limitation identified throughout the previous studies. Much of the literature reviewed noted that the lack of warehouse space, limited land for cargo space and lay down areas, and low tonnage rates continue to prevent the State Pier facility from becoming a regional cargo transportation site.

The *Connecticut Economic Strategic Plan* noted that "Connecticut's ports have limited land for cargo space and consequently continue to miss opportunities for sea transportation business. Seaports need capital investment to expand storage capacity, and to increase intermodal connections between water, highway, and rails."[4]

Due to a lack of land, the State Pier facility has limited ability to expand operations. In addition, due to the fragmented nature of the Connecticut market and low tonnage amounts, the facility

[1] CVRR Pier Usage Study; p. 1.
[2] Connecticut Economic Strategic Plan; p. 263, Table 13.
[3] The Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis; p. i.
[4] Connecticut Economic Strategic Plan; p. 7.

would need to be redeveloped in order to attract additional cargo. According to the *CVRR Pier Usage Study*, the State Pier handled a total of 10 vessels in 1998 and 9 vessels in 1999.[5] At less than one vessel per month and a berth utilization rate of 8%, increasing the cargo tonnage processed at the State Pier facility was determined to not be an issue. However, the ability to increase tonnage would require increased warehouse space and upland storage areas.

The *Port of New London – Can New London Be a Transit Container Port*? examined the possibility of converting the Port of New London into a Transit Container Port and found that there was inadequate warehouse space and upland area at that time to create a warehousing and/or distribution and consolidation center near the State Pier facility.

Potential for Expansion Through Acquisition of Adjacent Lands

In order to address capacity issues, many of the past reports and studies recommended purchasing adjacent property to expand port operations. In order for the State Pier facility to increase its tonnage loads, the State would need to purchase property adjacent to the existing facility to expand its operations and build new warehouse facilities to increase storage capabilities. The *New London Port Development Study* suggested that the State should acquire the CNNA railroad and possibly the Long Dock (now known as the CVRR Pier).

In 1998, The Maguire Group conducted a *Transportation and Land Use Compatibility Study, State Pier New London, CT* for the State Pier facility. To expand the use of the site as a cargo port/ferry-tourist-cruise development, the study suggested that the State conduct a feasibility study to determine whether or not the State should purchase the plateau area located in the central portion of the pier, along with the possible purchase of the Long Dock. Subsequently, both of these purchases have been completed.

In 1999, Milone & MacBroom prepared the *State Pier Municipal Development Plan (MDP)* that examined the land north of the State Pier facility, prior to the acquisition of the CVRR Pier. The MDP recommended that the State or the City of New London purchase the single family homes within this area and abandon several city roads to redesign the infrastructure and gain land to increase warehouse space and upland areas, and provide improved traffic circulation for port operations. This area has now been acquired and cleared.

The *CVRR Pier Usage Study* analyzed the feasibility and limitations of the State purchasing the CVRR pier. It was determined that the ability of the State Pier to increase its tonnage would depend on the availability of warehouse space and upland storage space. Likewise, the *Port of New London – Can New London Be a Transit Container Port?* study also found that if the State purchased the CVRR land, the State Pier facility could expand by 8.3 acres. This study concluded that the more land that was available, the more attractive the facility would be for container carriers.

[5] CVRR Pier Usage Study; p. 6.

Along with capacity limits and the agreement to purchase adjacent land, these studies also noted that significant improvements would be needed for both the State Pier and the CVRR Pier (if purchased).

Capital Improvements & Dredging

While the review of past planning efforts revealed that current land availability and capacity limitations were significant issues to address, significant improvements were also needed in order for the State Pier to support the types of vessels that an expansion would attract. The State Pier itself requires improvement and the *CVRR Pier Usage Study* found that if the CVRR Pier were to be purchased, as it has been, additional repairs would be needed to dock larger vessels.

Most importantly, the issue of dredging at both piers is a priority. The *Connecticut Economic Strategic Plan* found that "The state's maritime advantage is literally eroding as silt collects in deepwater ports. Without dredging, port channels grow shallower and larger ships cannot safely enter ports to offload goods. Cargo will need to be transported by alternative methods, most likely over highways, thus increasing congestion, maintenance, and pollution."[6]

The *Transportation and Land Use Compatibility Study, State Pier New London, CT* examined the transportation impacts within the State Pier area. The study suggested improvements to the roadway circulation pattern within the State Pier area, such as improving the entrance into the State Pier facility, and examined the feasibility of using an upgraded Congdon Street, 8th Street or Thomas Griffin Road as the primary means of access to Long Dock.

Best Use of Site

Many of the studies looked at alternative uses for the State Pier facility to determine whether or not the current port operation is the most effective use of the property. Collectively, however, the reports support the continuation of the State Pier's operations as a cargo port.

The *Transportation and Land Use Compatibility Study, State Pier New London, CT* explored the types of development that are feasible at the facility either as "port" or "non-port" developments. Of the five possible scenarios identified as part of this study, the option of maintaining the State Pier facility as a cargo port and also a ferry/tourist-cruise facility ranked the highest. Expanding the cargo port operations ranked second in this study.

The *CVRR Pier Usage Study* specifically analyzed the purchase of the CVRR Pier and came to the conclusion that maintaining the property rather than allowing a third party to operate the CVRR site would be most beneficial and would allow cargo port operations to expand and subsequently attract a larger market. This study also concluded that allowing a third party to manage the pier potentially could lead to development and land uses that might effectively eliminate port operations all together.

[6] Connecticut Economic Strategic Plan; p. 7.

The *Port of New London – Can New London Be a Transit Container Port?* study found that due to the limitations on capacity and available land, converting the State Pier facility into a regional container port was not reasonable. However, with the suggested improvements and cooperation with other ports in the State, the facility could maintain a successful cargo port operation.

The *Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis* does not address New London specifically; however the economic impacts associated with job creation, growth in GRP and increases in personal income support the facility's continued use as a cargo port operation that benefits the State of Connecticut. The study also recognized cargo port operations as the best use and strongly recommended that the State continue to invest in the property as a cargo port.

Economic/Environmental Benefits

The *Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis* recognized the economic benefits that the Port of New London has on the economy. This study identified gains in employment, output and personal income as illustrated in Table 1 below.

Table 1: Comparison Results

Variables	IMPLAN	REMI (2035)
Employment (jobs)	22,765	35,850
Output (Bill. $95)	$2.621	$3.17
Personal Income (Bill. $95)	$0.965	$4.82

Source: CCEA, pg. 13

The study also discussed the cost/benefit impacts vis-a-vis transportation and the associated environmental impacts. If the State of Connecticut loses its ports, more trucks will pass through the State putting a significant additional strain on the highway system. According to the study, 80% of the State's imports are transported by way of the interstate highway system. The utilization of the three deepwater ports decreases the number of trucks traveling across the State, and thereby decreases the amount of greenhouse gas emissions in the air. This alone makes deepwater ports not only economically beneficial, but environmentally beneficial as well.

The *CVRR Pier Usage Study* also recognized the cost/benefit impacts of terminal operations. As the study explains, "Greater cargo handling efficiencies typically have a positive impact on the cost of terminal operations. The more efficient the terminal operations become, the greater the quantity of cargo that can be processed. Increasing cargo tonnage moving through the terminal will likely generate the need for additional jobs and result in increased economic benefits."[7]

[7] CVRR Pier Usage Study, p. 2.

Terminal Operations

In order to achieve the overall goal of becoming a cargo transportation center, studies and reports completed prior to the selection of Logistec USA, Inc. as the operator for the Port of New London stressed the importance of the State's hiring of an operator who could effectively and efficiently market the facility. Before an operator was chosen, the *New London Port Development Study* recommended that the terminal operator's ability to aggressively market the facility should be a key selection factor, along with the additional suggestion that the State should create an internal group to market the State Pier facility. The *Transportation and Land Use Compatibility Study, State Pier New London, CT* also stressed the importance of marketing the State Pier facility to potential port users, as well as potential land-side users (for the additional ferry, tourist, and cruise line operations as suggested within their report). Lastly, the *CVRR Pier Usage Study* discussed Logistec USA Inc. and their three- to five-year Marketing Plan and noted the physical expansion of the State Pier facility will not be enough to attract new markets to the port; an aggressive marketing plan is essential to achieve the goal of a transit/expanded cargo port location.

Next Steps

Connecticut's deepwater ports are highly valued within the State. A review of past plans and studies indicates that expanding the current site, making site improvements, attracting additional cargo markets, and a strong terminal operator will greatly benefit the New London State Pier. The State of Connecticut has already expressed the value in their deepwater ports and supports the deepwater ports as critical infrastructure of statewide economic priority.

The next step in the State Pier Needs and Deficiencies Study will be to analyze and assess the State Pier facility, infrastructure, operations, current and future shipping trends and market conditions and assessment of additional sites. The final steps involve the assessment of future uses, analysis of alternatives and strategies, examination of undeveloped water front property, development of conceptual design plans and finally the creation of a Master Plan. The Master Plan will contain narrative explaining the study process, the preferred set of improvements, and how they evolved.

Appendix B:

Current and Future Market and Shipping Trends

Introduction

This Technical Memorandum is directed toward Task 3.2 of the scope of services. It also summarizes information from FXM Associates data collection under Task 2 which included a review of prior relevant studies and reports, planning documents and other pertinent materials provided by ConnDOT and available from public sources. This memorandum also provides an overview of recent and current market demand for marine cargo and other commercial vessel use at New London State Pier, and a preliminary assessment of potential growth opportunities based on market trends and State Pier Facility's competitive position. An analysis of import/export markets using the proprietary PIERS data base was provided to FXM by MARPRO and is incorporated into this memorandum.

Historically, New London State Pier was used us a military facility, and began commercial shipping activity with a private terminal operator management agreement in 1998.[8] Since then, Logistec USA, Inc. has managed State Pier facilities, including the Foreign Trade Zone (FTZ), warehouses and related trans-shipment operations. This analysis of State Pier also is intended to provide data to the consultant team and client for preparation of an RFP associated with the expiration in 2013 of the current ConnDOT operation and management agreement (as amended) with Logistec USA, Inc.

The City of New London recently reactivated its port authority (NLPA) and is studying plans for new moorings at several sites as well as ways to attract more ships to State Pier.[9] The NLPA is an independent, local port authority created under state statute granting broad powers to plan, finance, develop, and operate facilities in locally designated port districts – the New London district includes the state-owned and managed State Pier.[10]

Context

State Economy and the Maritime Cluster

The components of the Connecticut marine cluster are identified in the state's Economic Strategic Plan as marine transportation, marine manufacturing, marine recreation and commercial fishing.[11] The Plan analyzed the Connecticut economic infrastructure and assessed its economic competitiveness defined in terms of job opportunities, business development and prosperity. Statewide economic development was evaluated across an array of measures derived from several reports issued from 2005 to 2009 including, workforce quality, globalization, regulations/cost of doing business, R&D, and venture capital. The significance of the state's maritime cluster for New London and all of southeastern Connecticut also was described in the

[8] State of Connecticut and Logistec USA, Inc. Operation and Management Agreement No. 10.06-99 (97) dated February 26, 1998

[9] *Connecticut's Ports,* John Rappa, Chief Analyst, OLR Research Report (August 16, 2010)

[10] *Connecticut's Ports,* John Rappa, Chief Analyst, OLR Research Report (August 16, 2010)

[11] *Connecticut Economic Strategic Plan,* Connecticut Department of Economic and Community Development (September 2009)

Regional Plan of Conservation and Development, which emphasizes the importance of current and future commercial shipping, passenger ferries, and cruise ships to New London.[12]

A recent report sponsored by the Connecticut Maritime Coalition found that maritime-dependent industries, their suppliers and related economic activity accounted for over $5 billion in business output within the State of Connecticut; more than 30,000 jobs; approximately $1.7 billion in household income; and $2.7 billion in state GDP.[13] As a consequence of maritime industry direct, indirect, and induced economic effects within the statewide economy, maritime industries annually account for over $56 million in taxes paid to local communities; $54 million in State tax revenues, and over $224 million in Federal tax revenues. In total, the maritime dependent industries accounted for 3,738 jobs in 2007 – about 0.15 percent of total employment in Connecticut. The maritime industries accounted for $336.2 million in wages in the state – approximately 0.3 percent of the statewide total or twice their share of total employment. Wages within Connecticut's maritime-dependent industries averaged nearly $63,000 per year per job in 2007, which was 15% higher than the average $55,000 wage reported for all jobs.

The largest maritime industry in Connecticut is the water transportation sector comprised of firms providing both passenger and cargo transportation. The water transportation sector also generates significant additional employment that supports the industry – marine cargo handling, navigational services, and other support activities. In 2007, a total of 6,569 jobs were directly related to cargo-based port activity: 1,165 (17.7 percent) were conventional ship, dock, and terminal jobs, and 4,073 (62.0 percent) were in trucking and warehousing. The remaining 1,329 (12.3 percent) of the directly related jobs were allocated to business services and manufacturing. The direct, indirect and induced effects of Connecticut's port-based cargo industry totaled 8,867 jobs with payroll of $393.0 million, contributed nearly $689.6 million in GDP to the state economy, and generated about $52.1 million in state and local tax revenues, $24.7 million and $27.4 million, respectively. Port-based cargo activity also contributed about $77.8 million to federal tax revenue through corporate receipts, taxes and household income taxes.

Several years ago, when shipping trends indicated decreased cargo shipments at many northeastern ports, the state's economic development focus shifted from competing ports to an inclusive "Port of Connecticut" concept with one terminal operator, Logistec, for all three ports.[14] The state's major ports have been categorized as "niche" ports, specializing in bulk, liquid bulk, breakbulk and neobulk operations and, collectively, provide a diversity of facilities, services, and have attributes associated with successful 'niche ports.' Some of the characteristics identified for successful 'niche ports' and germane to this study of New London State Pier Facility include:[15]

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[12] *Regional Plan of Conservation and Development*, Southeastern Connecticut Council of Governments (2007)

[13] *Economic Effects of Maritime Industries in the State of Connecticut, by* Apex Engineering, Inc. and FXM Associates for the Connecticut Maritime Coalition (April 2010)

[14] *Transportation and Land Use Compatibility Study Executive Summary,* Connecticut Department of Transportation (1997)

[15] *Transportation and Land Use Compatibility Study Executive Summary,* Connecticut Department of Transportation (1997)

- Facility flexibility to handle diverse cargos with sufficient equipment and backland;
- Separation of passenger and freight operations
- Efficient traffic flow into, through and out of port;
- Related industrial districts/FTZs and warehousing facilities nearby or on-site;
- Direct access to rail and highways;
- Significant local markets within 50-mile radius and hinterland of 500+ miles;
- Adequate waterside access for safe navigation and vessel calls;
- Partnerships of port customers, service providers involving terminal operators, carriers, rail companies and trucking enterprise, ship pilots, vessel operators, other ports, labor, manufacturers, and government agencies;
- Excellent customer service and cost competitiveness.

These reports analyzing the state's transportation sectors and its maritime industry contained several recommendations pertinent to New London State Pier Facility:

- In the context of globalization, foreign exports are an engine of growth and their importance as a contributor to state gross domestic product (GDP) cannot be understated. Connecticut's overseas commodities exports totaled more than $15 billion in 2008, representing approximately 7% of the state's GDP. Connecticut ports handle a negligible amount of this business. A new study focusing on the components of these exports to determine what segment(s) may be appropriate to move by water should be conducted.

- Connecticut's deepwater ports need maintenance dredging to ensure safe navigation and berthing, and to meet demand from increasingly larger ships, otherwise cargo has to be transported by alternative modes and most likely over highways, thus increasing maintenance, congestion and pollution.

- Trucking will continue to provide the majority of freight service in Connecticut, regardless of state policies and programs, carrying .approximately 76% of all freight in Connecticut (2009) and projected to reach 77.5% by 2010.

- Connecticut's ports have limited land for cargo storage space, consequently, the state continues to miss opportunities for sea transportation business; its seaports need capital investment to expand storage capacity and to increase intermodal connections between water, highway and rail.

- New London State Pier Facility is underutilized and has the potential to become a key freight handling resource as well as possible future passenger depot.

I-95 Marine Highway Corridor

The I-95 Marine Highway Corridor is comprised of coastal and inland waterways along the Eastern Seaboard from Maine to Florida that complement and interchange passenger and freight traffic with Interstate 95 and other highway and rail corridors. The I-95 Corridor Coalition was established in 1993 and is an alliance of transportation agencies, authorities, and related organizations from Maine to Florida, with affiliate members in Canada. The State of

Connecticut is a member of the Coalition, and ConnDOT is represented by Charles Beck, Transportation Maritime Manager, Bureau of Aviation and Ports. The Coalition vision for the future I-95 Corridor calls for diversification of transportation investments to make the best use of maritime and landside infrastructure. Highlights of the 2009 Coalition application for designation of the I-95 Marine Highway Corridor include the following points.

- The Corridor includes more than 50 coastal and inland ports with public as well as privately-owned and operated seaport terminals, including 50 of the largest marine ports in the U.S. (ranked by total throughput).

- Larger ports have chronic capacity constraints (berths and on-dock storage); and smaller "niche ports" in the I-95 Corridor could absorb the demand for marine highway services, accommodate loading/off-loading and provide storage facilities service.

- The Corridor includes 42 of the nation's top 100 metropolitan areas based on population and economic activity, including 5 of the top 10 metropolitan economies in U.S. (New York, Washington, DC, Philadelphia, Boston, Atlanta).

- Significant and growing delays to users of urban area highways in the I-95 Corridor were estimated to cost $25 billion in lost time, according to the 2007 Urban Mobility Report by the Texas Transportation Institute, and FHWA forecasted highway congestion.

- Passenger and Freight Flows – fuel prices have declined from 2007-2008 peaks when diesel prices had measurable effects on logistics patterns, but surface transportation system congestion continues to increase cost of transporting freight from West Coast ports to East Coast consumer markets.

- Shipping freight over the Marine Highway could increase productivity of the trucking and rail industries, provide opportunities to renew domestic shipbuilding and other maritime industry, as well as spur economic growth in and around the port communities that link the Maritime Highway to the surface transportation system.

- Panama Canal expansion will be a reality enabling much larger ships to call East Coast ports; distribution of freight from mega-container ships requires substantial investments in rail, highway, Marine Highway networks and infrastructure in the I-95 Corridor. Multiple modes needed to accommodate enormous flows of bulk and containerized goods expected with global economic recovery and expanded Panama Canal. Completion of the Canal expansion is expected by 2015-16.

The I-95 Corridor application also described prospective partner roles and responsibilities for the Coalition and MARAD, Ports, Public Sector Agencies, Private Sector and Labor. Ports are defined to include landlords, port authorities and terminal operators who control the access points to the I-95 Marine Highway. Ports would participate in several ways including:

- public-entity ports could sponsor Marine Highway Corridor projects;

- provide land/water interface for passenger and freight flow on surface transportation systems;
- provide intermodal connections and terminal infrastructure;
- assist in regional commodity flow analysis;
- support development of business models to serve the Marine Highway;
- seek funding for Marine Highway infrastructure such as dredging, RO/RO ramps, pier improvements, truck staging and operations areas, 'fast-lane' highway and rail improvements.

The U.S. DOT and MARAD are establishing the Marine Highway Corridors for existing and future freight and passenger uses. ConnDOT and the I-95 Corridor Coalition have recommended the East River and Long Island Sound as a freight corridor to serve freight movement from New York to Boston on the American Marine Highway, and urged that Connecticut's three deep draft ports be included as part of the East River-Long Island Sound corridor.[16] The East River-Long Island Sound marine route parallels the congested Interstate-95 roadway, and its designation as a marine corridor is expected to add efficient freight and passenger carrying capacity that will advance federal transportation, energy and homeland security initiatives. Currently, Orient Point, NY-New London, CT are identified as a service facility in the AMH East Coast –North Corridor, providing *Cross Sound Ferry Service* (pedestrian/personal vehicle and trailer) schedule and contact information to avoid the alternative 105-mile transit through New Rochelle.[17]

New London Marine Highway Development Potential

A 2001 study examined the general feasibility of capital investments to develop container handling facilities at New London State Pier. The study concluded that the State Pier facility could be a "small transfer port" handling selected customers but, at that time, the projected container traffic from New York/New Jersey did not warrant developing a regional container transit port facility.[18] The study suggested that the State Pier Facility 'small transfer handling facility' could be marketed to container customers in New London, Groton, Norwich and as far north as Worcester who would benefit from direct shipping service to/from the State Pier Facility. Consistent with the state's 'Port of Connecticut' economic development strategy, the study also advised that ConnDOT consider establishing "combined container services" through its deep-water ports (New London, New Haven, Bridgeport) related to identified Connecticut markets. The following physical and market factors influencing the feasibility of a New London State Pier container handling facility were examined in the 2001 study.

- *Land Availability* – in addition to existing State Pier terminal operations and future acreage needed to attract reasonable cargo volume: RO/RO (wheeled) cargo handling system requires 12 to 15 acres initially and 25 to 30 acres future land area; LO/LO (grounded) cargo handling system requires 10 to 12 acres initially and 15 to 30 acres future land area

[16] Correspondence from Charles C. Beck, Transportation Maritime Manager, ConnDOT Bureau of Aviation and Ports to George E. Schroeder, I-95 Corridor Coalition (May 14, 2009)

[17] *Marine Highway Program: East Coast – North Corridor Map* available at www.marad.dot.gov/ships

[18] *Can New London be a Transit Container Port?* (study presentation), Management & Transportation Associates, Inc. (January 2001)

- *Container Volume* –Port Authority of New York and New Jersey (PANY&NJ) data projected significant container volume to/from Narragansett Bay area sufficient to justify a major transfer container terminal in Massachusetts or Rhode Island. At that time, annual container volume destined to/from New London was low, with additional containers moving to/from PANY&NJ and the Worcester/Framingham area by railroad.

- *Property Ownership* – Fragmented property ownership adjacent to State Pier facilities would require the State or other single entity to acquire several identified parcels.

- *Economics* – waterborne RO/RO transportation system via New London is the least expensive when compared to trucking and rail when timely delivery is not a variable.

- *Capital Investment* – RO/RO system requires lowest level of investment (yard 'hustlers' and possibly a vessel ramp); LO/LO system requires additional investment (crane(s) and stackers, possibly container chassis) at a total estimated capital cost of $2.5 million in 2011 dollars. Either operation requires additional investment in State Pier land properties.

- *Railroad System* – is not cost competitive with RO/RO barge or truck in this market area even though rail may be service competitive; and, AMTRAK rail line through State Pier property limits further land development and expansion for the State Pier Facility.

- *Competition* – Port of Davisville, RI is the potential major competitor and already capable of supporting container RO/RO services but needs crane capacity. It is currently port of entry for new autos; adequate pier, upland, channel/berth depth, and warehouse facilities; good access to I-95; planned double-stack rail service; projected tonnage to area significantly higher than New London area.

Port of New London and State Pier

Traditionally, the Port of New London's primary commercial cargo has been gasoline and, more recently, lumber and copper; and New London State Pier Facility has accommodated twenty cruise ships since 2004.[19] According to federal records for 2006, Connecticut ports collectively handled 19.3 million short tons of commodities, placing the state 34th nationally in terms of waterborne traffic. In addition, Connecticut is one of eight states shipping/receiving less than $0.5 billion in domestic cargo, and of the top 150 U.S. ports ranked by tonnage in 2006, New Haven ranked 51st and Bridgeport ranked 76th – notably, New London was not ranked.[20] In recent years, annual rail shipments originating or terminating within the state have generated

[19] *Connecticut Economic Strategic Plan,* Connecticut Department of Economic and Community Development (September 2009)

[20] U.S. Army Corps of Engineers Waterborne Commerce Statistical Center (2006) as cited in *Connecticut Economic Strategic Plan,* Connecticut Department of Economic and Community Development (September 2009)

50,000 carloads carrying 3-4 million tons of goods. Currently mixed steamship and domestic double-stack rail freight service between New London and NECR's Willimantic Yard is available using the P&W tracks on the east side of the Thames River. From Willimantic into Vermont the rail line currently has the necessary vertical clearance for double stack operations. Removal of four overhead obstructions between New London and Willimantic would provide mixed container double-stack capability from the State Pier Facility along New England Central railroad lines connecting to the national Class 1 railroad network.

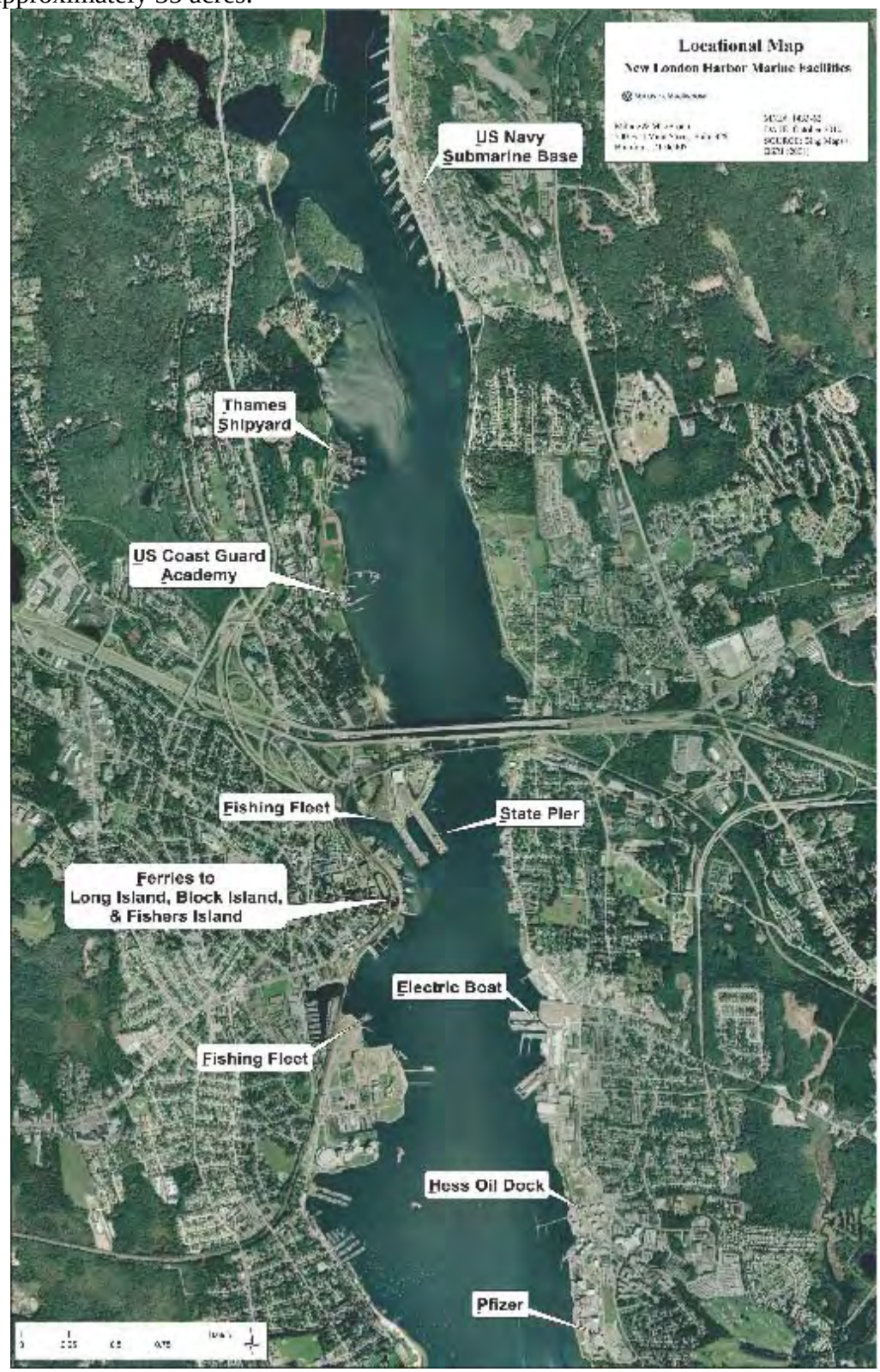
These highlights describing the Port of New London and the Admiral Shear State Pier are from the 2010 report, *Economic Effects of Maritime Industries in the State of Connecticut.* [21]

- The Port of New London includes two 1,000 ft. long, cargo piers: Admiral E. Shear State Pier (State Pier) and the Central Vermont Railroad (CVRR) Pier.
- The two piers are approximately 3.8 miles up the Thames River (40 ft. depth) from Long Island Sound via the main navigation channel (500 ft. federally authorized width).
- Intermodal connections at State Pier include cargo shipping, on-dock freight rail, and nearby truck access to Interstate 95.
- The ConnDOT Bureau of Aviation and Ports has contracted with a private company, Logistec USA, to operate a marine terminal at State Pier. The Bureau also has a lease agreement with the Thames River Seafood Cooperative for use of the western section of the CVRR Per as a support facility for scallopers and other fishing vessels.
- Cross Sound Ferry Service Inc. and Fisher's Island Ferry District own facilities for passenger ferry service located on the New London side of the port. Amerada Hess owns and operates a liquid bulk (petroleum) terminal facility in the section of the port located in Groton. *The following page contains a map of the Port of New London.*
- The U.S. Coast Guard Academy in New London, the Montville Electric Generating Station in Montville, the Dow Chemical plant in Gales Ferry, General Dynamic Electric Boat Shipyard, and the U.S. Navy submarine base in Groton have facilities along the Thames River, and utilize the same navigational channels as commercial vessels and ferries.
- This report and prior ConnDOT studies recommended dredging to the -40 ft. maximum depth along both sides of the Admiral Shear State Pier, especially the west side, to meet future shipping industry needs, providing refrigerated warehouse space, security improvements, and expanded use of the CVRR Pier.[22]

The State Pier facilities leased to Logistec, USA, Inc. have been improved using state funds appropriated by ConnDOT and to purchase the railroad pier known as "Long Dock" to provide additional berthing and 8 acres of land also leased by Logistec.[23] Logistec has also entered into

[21] *Economic Effects of Maritime Industries in the State of Connecticut,* Apex Engineering, Inc. and FXM Associates for the Connecticut Maritime Coalition (April 2010)
[22] *Economic Effects of Maritime Industries in the State of Connecticut,* Apex Engineering, Inc. and FXM Associates for the Connecticut Maritime Coalition (April 2010)
[23] *Connecticut's Ports: Transportation Centers for People and Goods,* Parsons Brinkerhoff (2002)

leases for two adjacent properties totaling 8.4 acres, bringing the entire State Pier complex land area to approximately 35 acres.



Market Overview

This section compares trends in vessel traffic and commodity volumes at the State Pier Facility to see if State Pier's commodity and cruise passenger volumes have tracked those of all New England ports. A key finding was that independent forecasts are not readily available for commodities handled specifically at the State Pier Facility (lumber and copper), or the New England cruise ship industry.

Data Sources

The main sources for the analysis were primarily large databases maintained by public and private entities for commodity vessels and cruise ships calling at New London and at other New England ports. FXM supplemented these databases with information available from websites for the ports that were examined. The principal sources are listed at the end of this report.

Commodities

The commodity analysis examined principal commodities handled at New London State Pier which is the subject of study. Coal and petroleum products were excluded from the comparative analyses since State Pier does not handle these commodities. There were three sources of commodity movements: State Pier Shipping Reports,[24] US Army Corps of Engineers' Waterborne Commerce of the United States,[25] and WISERTrade database.[26] The State Pier Shipping Reports were the primary source of New London data used in this report.

Table 1 presents a summary of the State Pier Shipping Reports for the 5-year period from 2004 through 2008. The original commodity volumes were in metric (long) tons and have been converted to short tons (US Tons) using a factor of 1 metric ton equals 1.102 short tons. As noted on the table, there were several shipments of undefined "Project Cargo" not included in the State Pier reported tonnages. Also noted is the partial year data for 2006.

[24] Annual State Pier Shipping Reports (2004through 2008), Logistec USA Inc. to the City of New London Office of Development & Planning, via Charles C. Beck, Transportation Maritime Manager, ConnDOT Bureau of Aviation and Ports email September 22, 2010.

[25] US Army Corp of Engineers, *Waterborne Commerce of the United States* (WCUS), Part 1 Tons Direction/Year Calendar Years 2008-2004, Sheet xx; New Orleans, LA, March 2010.

[26] WISERTrade Port Database Harmonized [Commodity] System (HS), 2004-2009.

Table 1. State Pier Commodities by Year, 2004 - 2008

Year	*Lumber*	*Copper*	*Other*	*Total*
2004*	150,913	91,391	0	242,304
2005**	139,590	86,564	89,261	315,416
2006***	85,928	15,667	61	101,656
2007	89,726	98,467	0	188,193
2008	109,336	7,359	0	116,695

Annual Short Tons

* Three "Project Cargo" shipments listed but no tonnage given.

** Two "Project Cargo" shipments listed but no tonnage given.

*** Partial year only (1/1/06 - 8/12/06)

Source: Annual Shipping Reports provided to the City of New London Office of Development & Planning by Logistec USA Inc; via email from Charles Beck, Transportation Maritime Manager, ConnDOT; 9/22/10.

Table 2 presents a comparison of State Pier Shipping Reports, ACOE Port of New London commodity data, and import statistics from the WISERTrade Port Database. There was a concern that using ACOE data for the Port of New London would overstate the volume of commodities using State Pier because there are other shipping facilities in the Port in addition to the State Pier. However, the State Pier volumes reasonably approximate the Port of New London data from the ACOE, given that the 2006 report is for a partial year, except for 2004 where the State Pier reports are nearly one-and-a-half times the ACOE's Port of New London data. Figure 1 shows a graphical comparison of the State Pier Facility, ACOE Port of New London, and WISERTrade data.

The State Pier data was used in all tables in this Technical Memorandum except for 2006 where the ACOE data were used to estimate the entire year.

Table 2. State Pier, Port of New London (ACOE) and WISERTrade Commodity Tons, 2004 - 2008

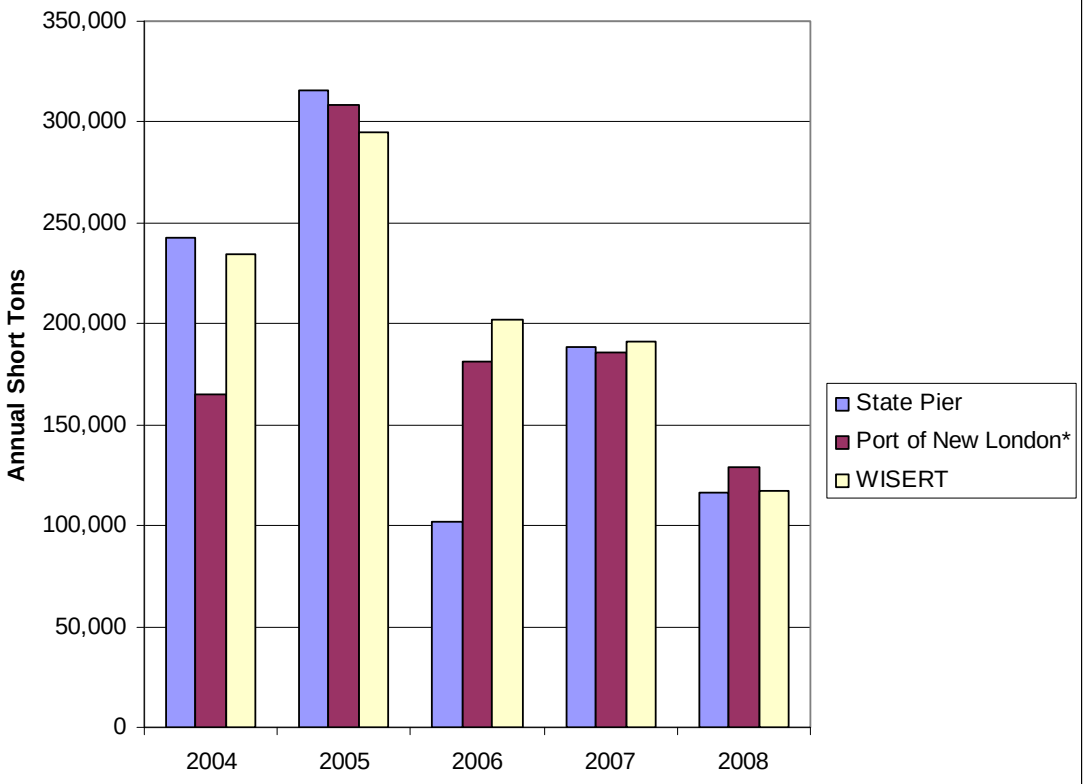
Year	*State Pier*	*Port of New London**	*WISERT*
2004	242,304	165,116	234,921
2005	315,416	308,925	295,024
2006	101,656	181,353	202,483 **
2007	188,193	185,655	191,503
2008	116,695	128,947	116,856

* Excludes coal and petroleum products

** Part year only for State Pier

Sources: Annual Shipping Reports by Logistec USA Inc; via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10; US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; WISERTrade, Port HS Database, US Census Bureau, Foreign Trade Division; and FXM Associates.

Figure 1. Comparison of State Pier Shipping Reports, Corps of Engineers Port of New London data, and WISERT Foreign Trade Statistics

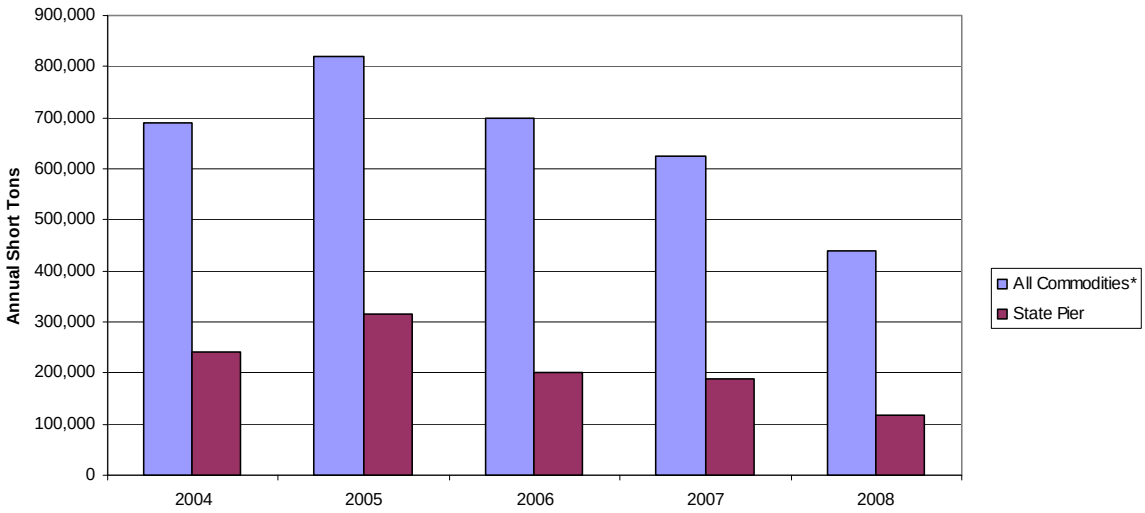


Sources: Annual Shipping Reports by Logistec USA Inc; via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10; US Army Corps of Engineers, Waterborne Commerce Statistics Center; March 2010; WISERTrade, Port HS Database (from US Census Bureau, Foreign Trade Division); and FXM

Figure 2 illustrates trends in all commodities for the Port of New London, and for those commodities landed at the State Pier. Unlike most graphs in this memorandum, the total commodities shown in Figure 2 include coal and petroleum products in order to show the relative proportion of State Pier Facility tonnage in relation to total tonnage for the entire Port of New London. In both cases commodity shipments peaked in 2005 and have been declining steadily since.

Table 3 on the next page shows New London foreign trade commodities by type from the WISERTrade database for 2004 to 2010. All of this activity appears to occur at the State Pier Facility.

Figure 2. New London Commodity Trends



*Includes coal and petroleum products

Source: US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; Annual State Pier Shipping Reports by Logistec USA Inc. via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10.

Table 3. WISERTrade Data not including oils

Year	*Lumber*	*Copper*	*Other*	*Total*
2004	144,785	81,789	8,347	234,921
2005	165,743	114,307	14,974	295,024
2006	156,676	15,667	30,140	202,483
2007	93,005	98,468	30	191,503
2008	101,485	7,359	8,012	116,856
2009	32,084	0	1,258	33,342
2010*	0	0	3,512	3,512

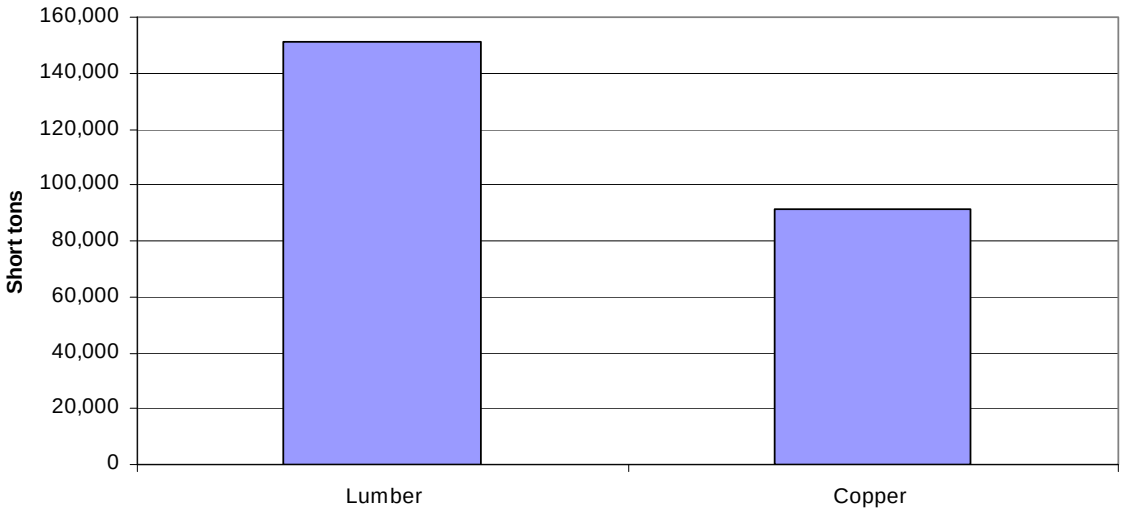
Annual Short Tons

* First half of year only

Source: WISERTrade, Port HS Database (from US Census Bureau, Foreign Trade Division); and FXM Associates

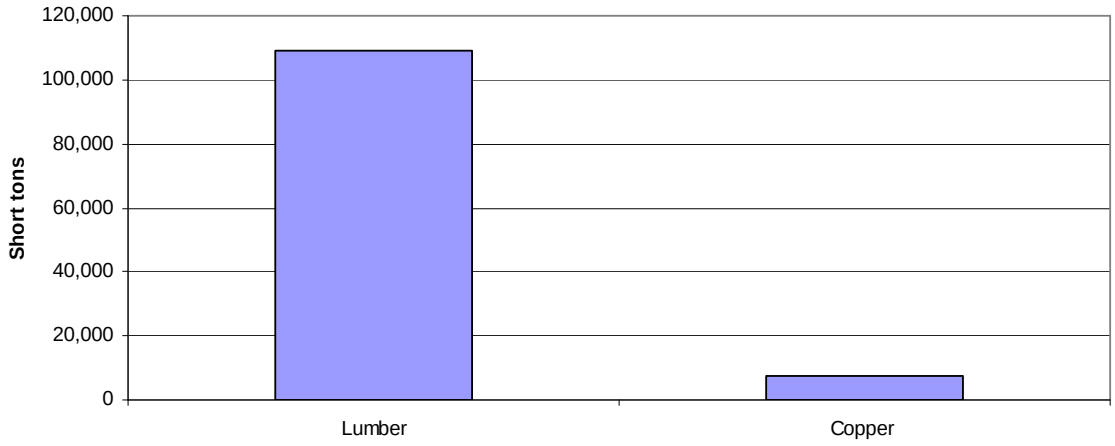
Figures 3 and 4 show the principal commodities (lumber and copper) landed at the State Pier Facility in 2004 and 2008, respectively, from Logistec annual shipping reports.

Figure 3. State Pier Principal Commodities for 2004



Source: US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; Annual State Pier Shipping Reports by Logistec USA Inc. via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10.

Figure 4. State Pier Principal Commodities for 2008



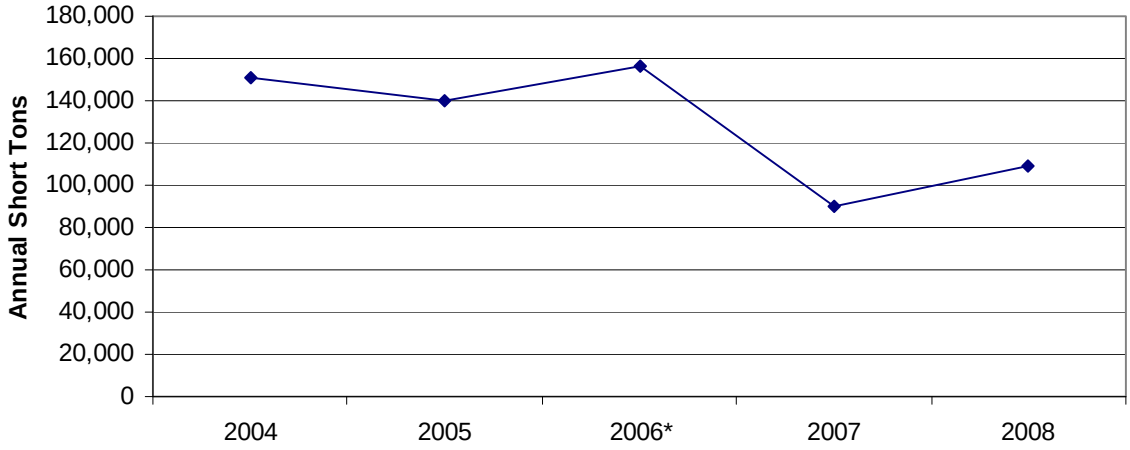
Source: US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; Annual State Pier Shipping Reports by Logistec USA Inc. via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10.

Data in Figures 5 and 6 show recent trends in shipments of lumber and copper to New London.

- The lumber volumes were relatively stable over the 5-year period with a high point of nearly 160,000 tons in 2006. The "lumber" landed at New London State Pier is mainly high quality lumber imported from Europe.

- Copper volume has had a 'peak-and-valley' history with low tonnage reported in 2006 and 2008. The principal copper user in New London operates its own copper mines in the US and decides on a year-to-year basis whether to mine and process its own copper, or to import copper from Chile, its principal supplier. Copper prices have risen considerably in value in recent years, and it has become a monetary surrogate for commodity traders. Thus, the cost-effectiveness of using domestic or imported copper depends on general economic conditions.

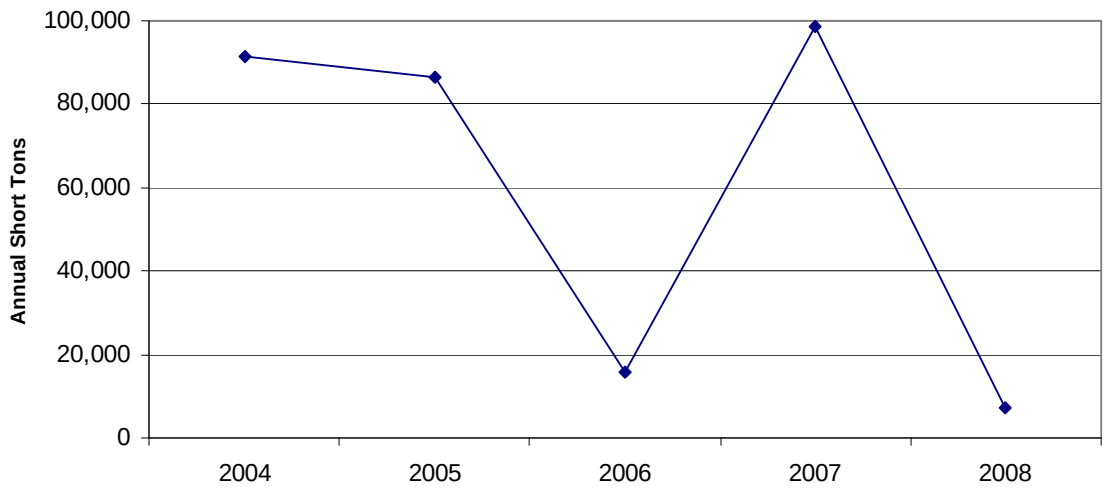
Figure 5. State Pier Lumber Trends



* WISERTrade data; State Pier Shipping Report only available part year.

Source: US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; Annual State Pier Shipping Reports by Logistec USA Inc. via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10.

Figure 6. State Pier Copper Trends



Source: US Army Corps of Engineers, Waterborne Commerce Statistics Center; Part 1 Tons Direction/Year Calendar Years 2008-2004; March 2010; Annual State Pier Shipping Reports by Logistec USA Inc. via email from Charles Beck, Transportation Maritime Manager, ConnDOT, 9/22/10.

Comparisons with New England Ports

Figure 7 shows Short Tons (2000 pounds) of commodities to and from New England ports by state from 2004 to 2008, indicating both the relative volume of commodity movements among the states and the trends for each state. Figure 7 is based on ACOE data for all ports including New London to capture the entire activity at the Port of New London.

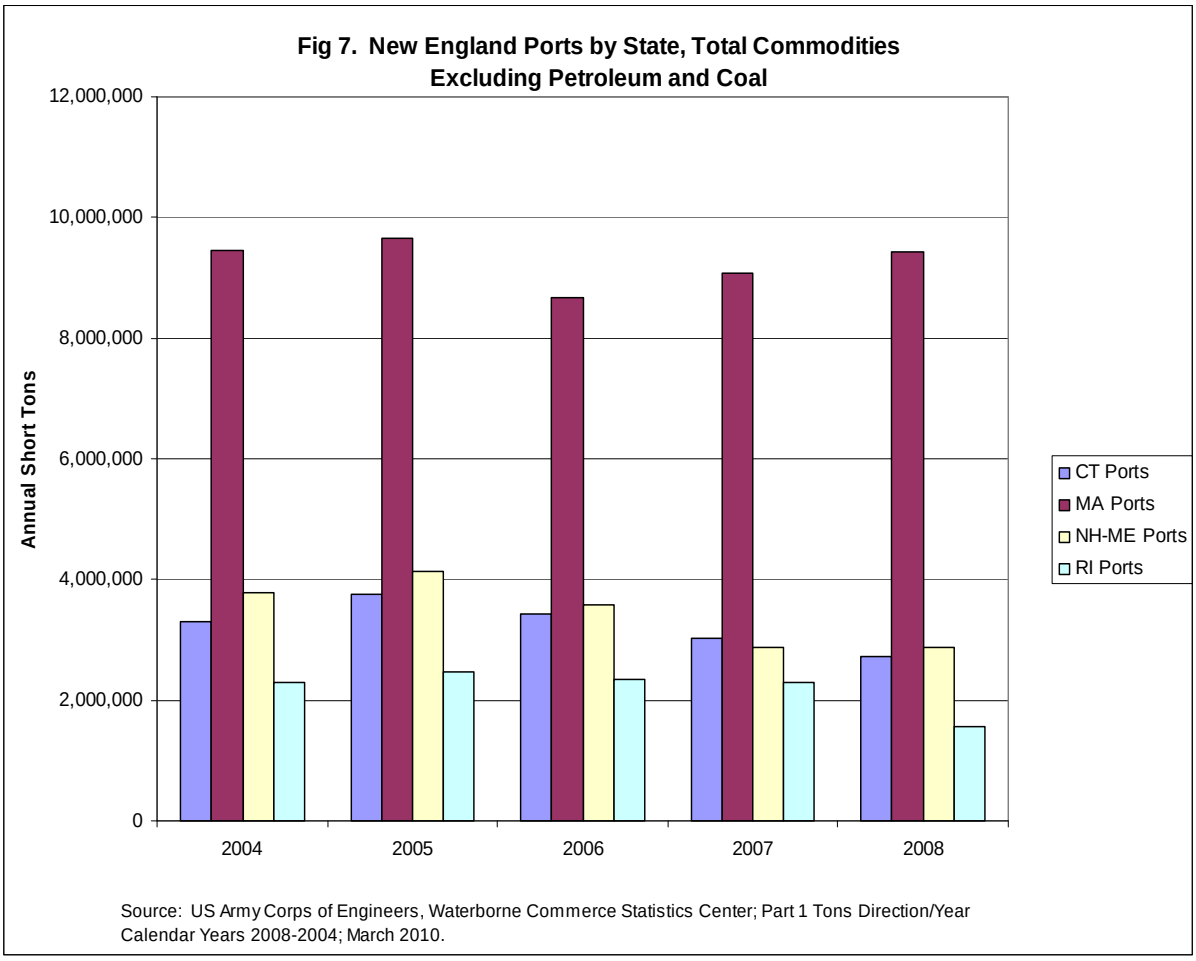


Figure 8 compares the State Pier commodity shipments from 2004 to 2008 with total commodities at all New England ports, excluding petroleum and coal shipments. The State Pier activity generally parallels the overall drop in commodity movements to and from all New England ports.

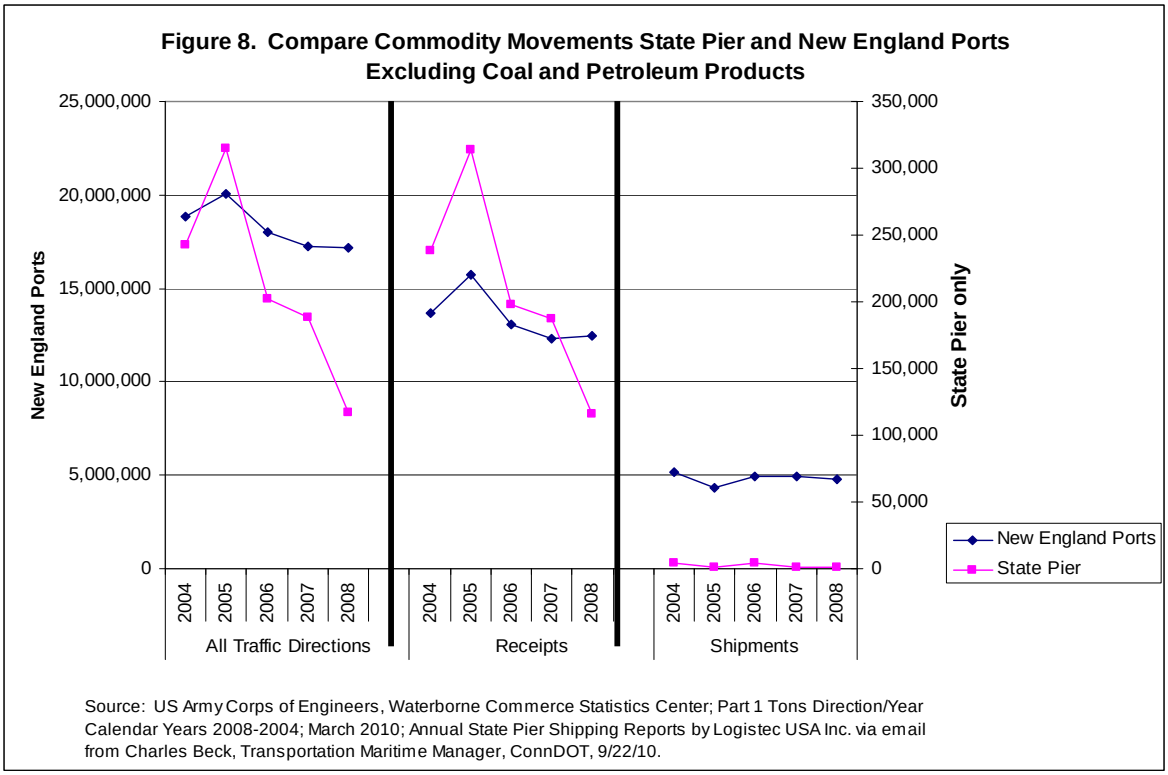
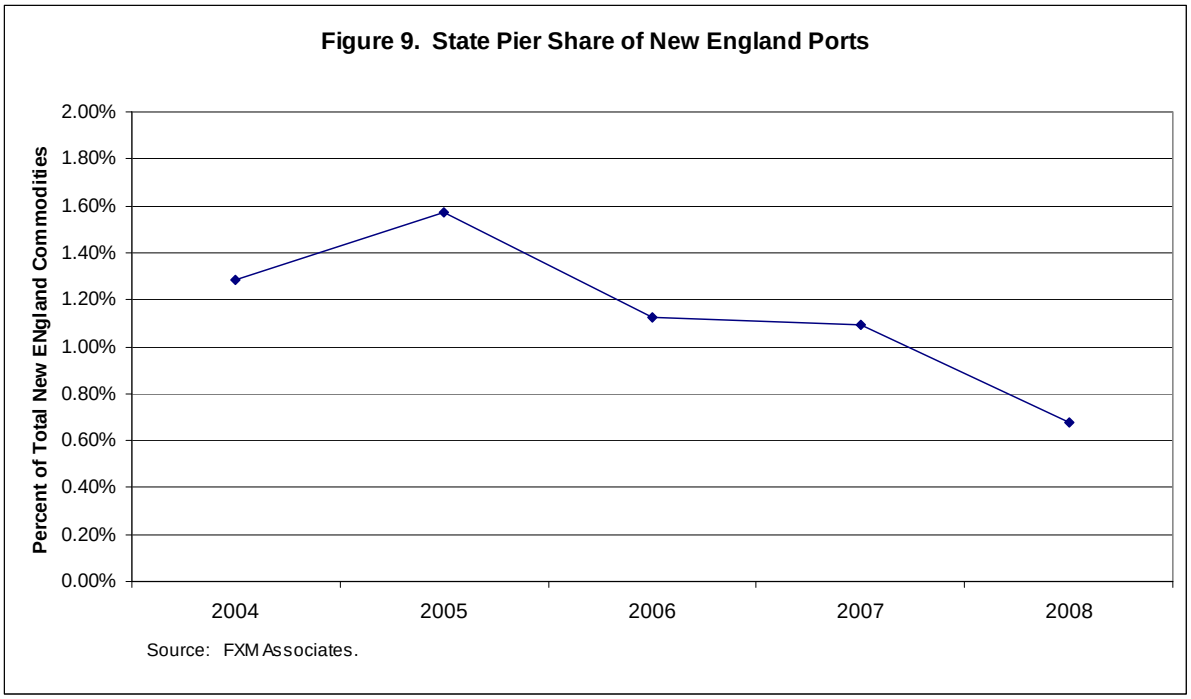


Figure 9 illustrates this drop in commodity shipments from another perspective. It shows that the State Pier has lost nearly one-half of its "market share" of total New England commodity shipments since 2005. This means that activity at the State Pier Facility has declined faster than other New England ports from 2005 to 2008.



The commodities handled at State Pier Facility are termed "Dry Bulk" commodities. Figure 10 shows a comparison of dry bulk volumes at State Pier and other New England Ports for the period from 2004 through 2008. The solid lines (Tier I) on this split axis graph refer to ports with over 1.0 million tons of dry bulk commodities in 2004, and the dashed lines (Tier II) refer to ports with under 1.0 million tons per year. Note that although New London State Pier has the same general trend as most of the other New England ports, it has the lowest annual volumes of the New England ports.

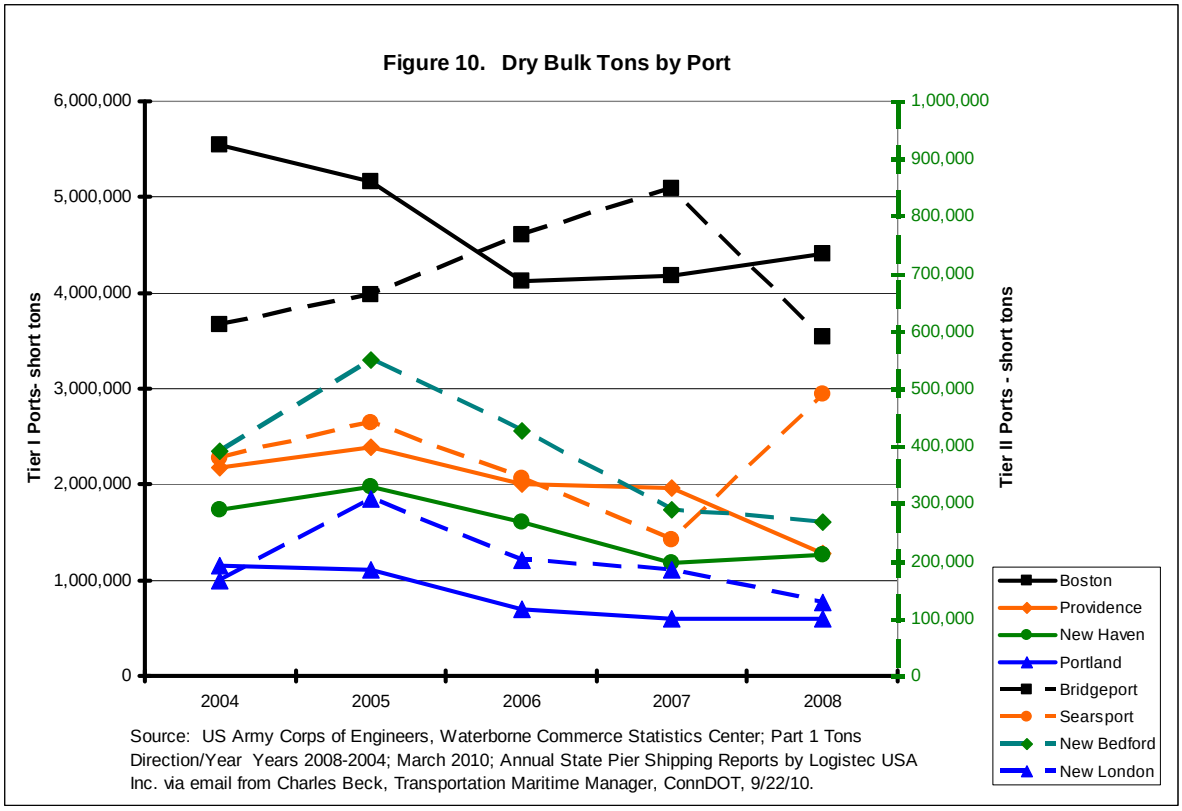


Table 3 lists the top commodities handled by New England ports. Commodities that are handled by the majority of these ports include: Chemicals (specific chemical product not given) and Non-Metal Minerals (glass, clay, salts).

Table 4. Principal Commodities by Port

Port	*Principal Commodities*			
Boston MA	Non Metal Minerals	Manuf. Goods	Equipment & Machinery	Chemicals
Bridgeport CT	Sand & Gravel	Chemicals	Bananas	
Chelsea River MA	Non Metal Minerals	Chemicals		
Eastport ME	Pulp & Paper Waste			
Fall River MA	Chemicals			
Mystic River MA	Iron & Steel Scrap	Fabricated Metal Products	Non Metal Minerals	Machinery
New Bedford MA	Sand & Gravel			
New Haven CT	Chemicals	Iron & Steel Scrap	Non Metal Minerals	Sand & Gravel
New London CT	Lumber	Copper		
Norwalk CT	Sand & Gravel			
Portland ME	Clay	Non Metal Minerals		
Portsmouth NH	Non Metal Minerals	Gypsum		
Providence RI	Iron & Steel Scrap	Non Metal Minerals	Concrete & Cement	Chemicals
Rockland ME	Concrete & Cement			
Searsport ME	Non Metal Minerals	Chemicals	Gypsum	
Town River MA	Vegetable Oil			
Weymouth MA	Chemicals			

Source: FXM Associates

New England Export Analysis-Port of New London[27]

To determine the probability of potential export cargo to balance potential imports, the team examined the overall volumes and values of the New England international export market. It reviewed the most prevalent export commodities, general destinations, how the commodities were being shipped, and how the ports compared to each other as a potential cargo source for New London. Export data for seven (7) selected New England Ports was collected based on their similarities to the Port of New London.[28] The ports were also selected because of volume of exports and availability of data and include estimated dollar values. These 7 ports represent the majority of all exports out of New England and provide a starting point for analysis of the New England export market as a whole.

[27] This section of the report was provided to FXM by Capt Jeff Monroe, MARPRO

[28] PIERS, a proprietary global import/export information service.

All record keeping of freight exports is based on bills of lading and public reporting requirements with the U.S. Census Bureau and the U.S. Customs and Border Protection Service (USCBPS) and is the only consistent means of volume analysis for U.S. Ports. The data does not capture the commodities or products being produced in the region that are being domestically transported to other ports outside of the region for export. The majority of this freight is recorded as having the U.S. Departure Port as its point of origin however some data can be tracked back to origin points if the data is listed in the Bill of Lading. The analysis indicates that New England based shippers are using New England ports for at least a portion of their freight. Based on that premise, direct contact with shippers becomes the most plausible way of determining what opportunities may exist in New England for export.

Ports are identified with the commodity that constitutes their highest volume. Important factors related to port activity include being able to handle a diverse cargo base and to achieve a balance of imports and exports. In New England, most of the ports handle more imports than exports. For example:

- Portland, ME imports over 23,000,000 metric tons of petroleum products annually
- Davisville, RI imports nearly 125,000 new automobiles annually
- New London handles small amounts of import cargo but for the past several years it has essentially operated as a lumber distribution facility for Canadian wood products arriving by rail and distributed by truck. As recently as 2005 State Pier handled approximately 300,000 tons of cargo of which approximately 45% was European lumber.

New England does account for a wide range of exports by water. These include:

- Scrap Metal,
- Used Automobiles,
- Waste Paper,
- Pulp & Paper Products,
- Cattle Hides
- Furs
- Seafood

However, the leading value exports out of New England are high value low volume items such as Medical Instruments, Computers, Pharmaceutical Products, Electric Machinery and Semiconductors which do not travel by water.

Export data from Boston provides a view of the New England Export since Boston represents the only direct call, all water, import/export international container service in New England. While a great deal of cargo moves to and from New England shippers by rail or truck through other ports in the United States or Canada, Boston provides a general overview of the type of commodities being moved by shippers because of the lower cost all water option which competes with rail and truck. As an example, Boston handled 9,300 TEUs of pulp and paper products which represent less than 1/3 of the estimated export capacity of the Maine pulp and paper Industry alone. This indicates that the Maine pulp & paper mills are finding other ports from which to export their

pulp 70% of the time. This represents a potential opportunity for New London exports given the right circumstances and the right vessels requiring a back haul assuming New London can generate adequate water based transportation services coupled with direct highway and regional rail service.

Total Exports
Approximately 29,000 shipments were exported from the seven (7) identified competitive New England ports over the course of the past year (2009). The total estimated value of these shipments exceeded $10 billion. Of the total shipments, over 15,600, valued at over $7 billion were not containerized and were shipped either as roll-on/roll-off cargo (vehicles) or in bulk. This comprises 54% of the total number of shipments and 72% of the total value of shipments. An analysis of the data suggests that this proportion is likely higher and is more in favor of non-containerized means of moving commodities. The total value of the exported cargo is estimated to be higher as 1855 (6%) of the shipments that were analyzed do not have a listed value in the export data. Some of these shipments may include empty containers that are being repositioned however indications are that the majority of these shipments have commodity value. This makes the total value of New England export shipments in this analysis as being conservative.

New England Ports
In looking at the 7 selected competitive New England Ports, the following containerized cargo data, type and destinations were identified:

Boston, MA
- **a.** Total amount of containerized freight: 59,000 TEUs
- **b.** Type: Used cars, waste paper (48%), pulp and paper (18%) and scrap metal
- **c.** Destination: Various

Eastport, ME
- **a.** Total amount of containerized freight: None
- **b.** Type: Wood pulp and seafood
- c. Destination: Various

New Haven, CT
- **a.** Total amount of containerized freight: None
- **b.** Type: Scrap metal and fuels
- **c.** Destination: Various

Portland, ME
- **a.** Total amount of containerized freight: 4,760 shipped in bulk (*see d.*)
- **b.** Type: Pulp and paper products
- **c.** Destination: Feeder service to Port of New York and New Jersey for export

Portsmouth, NH
- **a.** Total amount of containerized freight: None
- **b.** Type: Scrap Metal

c. Destination: Turkey

Providence, RI

a. Total amount of containerized freight: None

b. Type: Scrap Metal

c. Destination: Turkey

Salem, MA

a. Total amount of containerized freight: 140 TEU'S

b. Type: Household goods

c. Destination: Bermuda

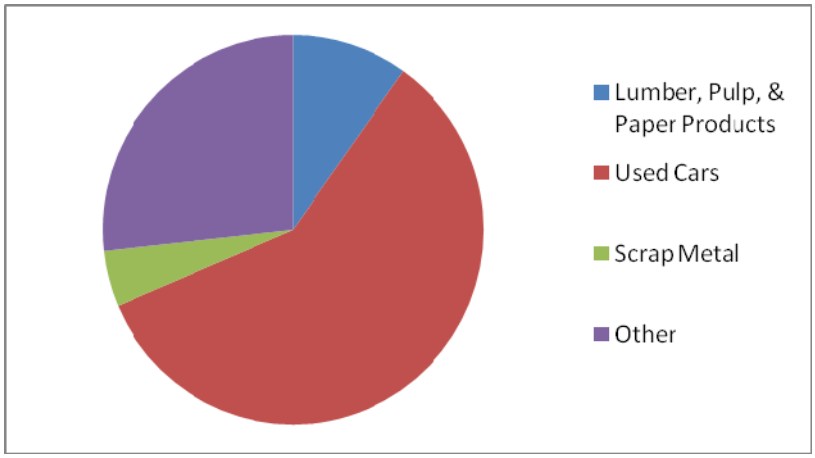
Table 5. Summary of New England Port Shipments (PIERS Data)

Port	Estimated Value of Shipments (in USD)	Volume of Containerized Freight (in TEUs)	TYPE
Boston, MA	$7,007,605,767	59,000	Used Cars, Waste Paper, Scrap Metal
Eastport, ME	$58,901,745	All Bulk	Seafood and Wood Pulp
New Haven, CT	$143,249,987	All Bulk	Scrap Metal and Fuel
Portland, ME	$3,791,093	All Bulk	Pulp & Paper Products
Portsmouth, NH	$110,832,428	All Bulk	Scrap Metal
Providence, RI	$2,767,058,822	All Bulk	Scrap Metal
Salem, MA	$5,812,996	139.83	HHGs

Goods and Manufactured Products

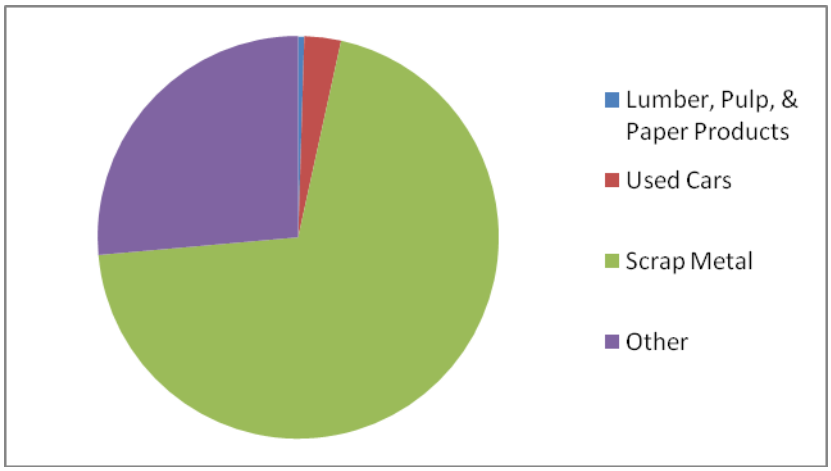
A wide variety of goods is being exported by New England Ports. The majority of these export shipments are used cars, exported by a variety of shippers, constituting well over 16,000 of the nearly 29,000 shipments done annually. The total value of these shipments exceeds $300 million while car shipments from Boston comprise the largest number of shipments, the value of the car shipments is less than 3% of all of the export shipments from New England.

Figure 11. Goods by number of shipments (PIERS Data)



Scrap metal comprises the majority of the value of shipments from New England Ports. The total value of scrap metal shipments from New England ports was over $7 million and accounted for over 1,300 shipments accounting for 71% of the total value of New England exports, at 5% of the total number of shipments. The bulk of scrap metal shipments originate in Boston and Providence.

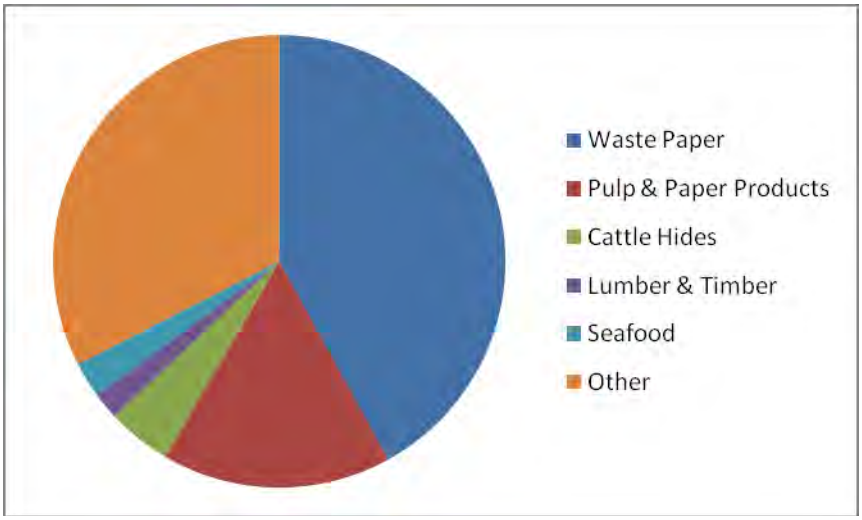
Figure 12- Goods by Estimated Value (PIERS Data)



The remainder of the export market is comprised of wood pulp, paper, waste paper and lumber; seafood; electronics; household goods; animal hides and furs; plastics; and food items, to name a few. None of these items constitutes a large enough value to be statistically relevant individually, but taken as a unit they constitute about a quarter of both the total value and the total number of shipments of exported goods from New England ports.

Since Boston is the only major container port in New England, it has the largest diversity of exported items thus giving the best example of what potential markets exist in New England for Export. Figure 13 illustrates the breakdown of Boston based Exports by commodity type:

Figure 13. Port of Boston Exports (Source PIERS Data)



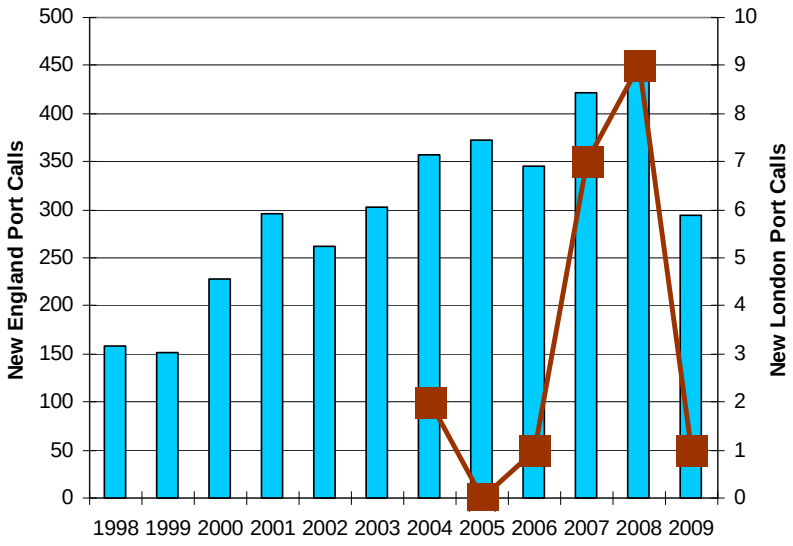
International Markets

The vast majority of export shipments from New England, approximately 28%, were destined for the West Coast of Africa and originated in Boston. The cargo was comprised mostly of used vehicles. Used vehicles also accounted for 13% of cargo exported from Boston and were destined for the Middle East, primarily Lebanon. West Europe was the third largest destination accounting for 9% of total exports. Exported goods to Western Europe included electronics, household goods, wood pulp and paper products, seafood, animal hides and furs, used vehicles and scrap metal.

Cruise Ship Traffic

Data on cruise ship landings at New England ports was obtained from the Cruise Lines International Association, supplemented by information from other published sources. Figure 14 shows a comparison of cruise ship calls at State Pier with calls at other New England ports for 1998 through 2009. As shown, there was a considerable drop off in cruise ship traffic in 2009 compared to the increasing traffic trend from 1998 to 2008. Two cruise ships called at State Pier during the Fall 2010 season.

Figure 14. Cruise Ship Calls at State Pier and Selected New England Ports



Note: Includes Ports of Bar Harbor, Boston, New Bedford, New London, Newport, Penobscot Bay and Portland. Source: Cruise Line International Association; 2009.; and Logistec Shipping Reports.

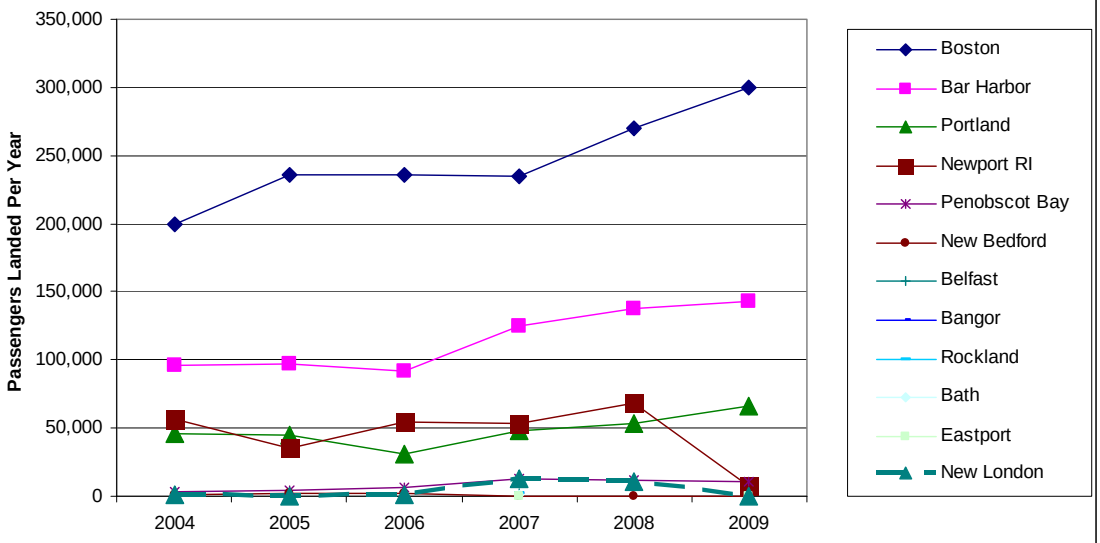
US Cruise Ship Trends

Although the US economy was still recovering from the recession in 2008, the Cruise Line International Association (CLIA) reported a 4.8 percent increase in passengers in 2009. This increase was achieved with substantial discounts from full fare, resulting in an 11.4 percent decline in 2009 gross revenues for the industry.[29] CLIA also reported an optimistic outlook for 2010 and beyond as the national economic recovery continues.[30] Figure 15 shows the 2004 through 2009 trends in cruise ship passengers at various New England ports including the New London State Pier Facility

In 2010, the Canada-New England cruise market experienced one of its largest cruise ship and passenger years. This market has shown about 3% annual growth recently, due to several factors including world events, convenience and discount berths. The industry is generally resilient to economic downturns and growth continues in the trade, although at a slower rate. Many ports are developing new facilities and the industry is adding new tonnage. Premium and luxury berths are expected to do well in 2011.

[29] CLIA press release "CLIA Releases Report on Industry's 2009 Contribution,' August 20, 2010.
[30] Ibid.

Figure 15. Passenger Trends by Cruise Port



Source: Cruise Line International Association; 2009.; and Logistec Shipping Reports.

The cruise industry faces a series of challenges. One such challenge is the necessity to fly to turn around ports. Due to multiple inconvenience factors including increasing costs, significant delays at airports and rising ticket costs, the industry has found itself expanding homeport selections to include port cities with good air service connections and large drive-in markets. Fuel costs are also becoming a major issue in the industry. Vessels are operating at a slower speed, visiting multiple destinations in smaller geographic areas and assessing fuel surcharges. This has repositioned vessels into non-traditional markets and opened up opportunities for ports that were otherwise not considered in the past. One advantage of this market is that the ports in the Canada-New England region are close to each other so few route miles are needed and ships can operate at slower speeds.

The industry is also continually pushing for a wider range of shore tours which are critical to profits. New London has the unique advantage of having on-dock rail which could easily accommodate excursion trains that would carry passengers into inland regional areas, particularly during fall foliage season. Many ports have been offering the same type of shore excursions for years. New ports have begun offering other excursions including soft adventure tours, golf programs and museum highlights. Traditional Canada-New England ports are considered to be costly because of high berthing and passenger fees. Shore tours have opened up some opportunities for lower cost ports in the region, which do not have the high cost of infrastructure or high labor costs.

While larger ships dominate the market, there are an increasing numbers of smaller vessels based in small niche ports entering the cruise market. Many smaller ports are now looking to accommodate these smaller cruise vessels, which tend to command high per diem rates and cater to a more upscale market than the current average. Companies are introducing small, high scale

luxury vessels classified as "pocket cruise ships," but which could just as easily be classified as super yachts. Companies such as American Cruise Line (ACL), American Canadian Caribbean Cruise Line (ACCL) and the new Pearl Seas Cruise Line are working on this new style of cruising for passengers who prefer smaller, more intimate vessels and destinations not normally featured among other cruise lines. The Canada- New England region is expected to attract more of these types of vessels, especially as European and Alaskan markets are filling up. Currently, the northeast region has a higher concentration of visits in the fall, but efforts are underway to distribute visits throughout the summer when there is greater potential for port connections.

Canada-New England should remain strong and steady in a cruise market that is expected to remain healthy. Boston is the predominant turnaround port in the region and New York is the largest turnaround port that serves New England and Canada. Boston in particular has strong turnaround growth potential with 13 million people living within two hours, and 58 million within five hours. Logan Airport, which is within the seaport area, has connections to 77 US cities and 32 international cities. Boston handled nearly 300,000 cruise passengers last year, an increase of 11% over the previous year, with 104 ship calls. Most called in the fall with a large number of lines calling just in September and October. Most Boston-based vessels, however, tend to travel north and any port calls for New London would most likely originate out of New York.

There are five companies operating cruises in the New England/Atlantic Canada market. These companies have six ships presently running cruises in the region, with each ship averaging around 200 passengers. Four more companies have the potential to operate small cruises in the same region and should be considered as cruising partners for the port. The industry generally has a two- to four-year window in adding new ports and itineraries. Lines choose ports based on physical infrastructure, facility quality, vessel services, ease of navigation, cost, other port calls, demographics, competition, shore excursion opportunities, and customer demand. The distinguishing factors for successful port selection revolve around the port's geographic location, scope of services offered, type and condition of terminals, available vessels and desirable destinations.

The New London State Pier Facility has the potential to do home port operations in the pocket cruise ship trade. Its direct connections to Amtrak and the local drive-in market could support an expanding market for this type of cruising. Large vessel turnarounds are not practical in new London because of the lack of a close airport with extensive air

Image 1: Pocket Cruise Ship (left) and Mega Cruise Ship

service. The State Pier Facility can continue to develop fall-oriented cruise ship port of calls and should partner with other regional and Atlantic Canada ports to develop programs and itineraries that meet cruise company criteria.

Successful marketing efforts on behalf of the State Pier Facility need to focus on cruise lines, travel agents and consumers. Effective tactics that successful ports and regions have used include branding and imaging, such as a recognizable logo; dynamic websites; useful brochures; provisioning directories; advertising campaigns; frequent press releases; events; familiarization trips for lines and travel writers; give-away items; and virtual trade shows. Successful ports note that marketing in most cases does not need to be expensive, just innovative.

New London State Pier Potential Market Opportunities

An initial State Pier marketing plan prepared by Logistec summarized the facility's strengths as inland rail connections, labor and port costs, and Foreign Trade Zone, and its weaknesses as capacity of one berth.[31] The Plan identified target markets as woodpulp/linerboard/newsprint, lumber, metals, waste paper, project cargoes, and container feeder; and secondary markets as bulk cargoes, FTZ and cruise business. A summary of the marketing plan provided to FXM did not include a description of the Logistec marketing strategy, market analysis, or cargo projections referenced in the Plan summary. Moreover, FXM was unable to obtain information pertaining to current State Pier marketing plans, and target market penetration since 1998.

"Niche" ports, like New London, are distinguished from "load center" ports (like NY/NJ) in that the cargoes handled are less a function of regional or global shipping trends and more dependent on the entrepreneurial efforts of the port operator. Niche ports depend upon specific deals transacted for specific cargoes where the port offers some competitive advantage in physical facilities, modal connections, handling and/or transshipment costs. Location is a factor but has not been as important as "opportunistic" deal-making since deregulation of the trucking and rail industries decades ago. The predominant marine cargoes handled at New London State Pier – lumber and copper – are highly dependent on fluctuations in demand for residential construction and the collapse of the national real estate market largely accounts for the recent decline in handling these cargoes. The copper imports are dependent on a single inland customer.

For New London State Pier to expand its handling of ocean borne or coastwise cargoes, one or more of the following opportunities -- and others not apparent in prior studies available for this examination or as foreseeable options -- will need to be pursued.

- As noted previously in this report, the potential for the State Pier Facility handling containers via feeder barge or full vessel transshipments from load center ports have been explored in prior studies. The opportunities for container feeder services are expected to increase dramatically following completion of the expanded Panama Canal (currently estimated for 2015-16). Many port officials in smaller East Coast ports are now considering the costs and other logistical factors that will need to be optimized to attract

[31] *Port of New London, Connecticut Marketing Plan,* Logistec Stevedoring, Inc. and Logistec Connecticut, Inc. (April 14, 1998)

these cargoes which are expected to dramatically expand as the smaller ports now handling direct container shipments are supplanted by the limited number of large ports (NY/NJ, Savannah, Norfolk, and possibly Philadelphia) capable of handling the much larger Post-Panamax vessels. The volume of container shipments by water to the East Coast is also expected to expand as more of the Asian trade moves by water to the East Coast rather than by rail and truck shipments from West Coast ports. The additional volume could tax the rail and truck servicing capacity of even the largest ports, not to mention congestion issues for trucks along the I-95 corridor.

- One *dis*advantage of New London for both feeder barge and short sea container shipping is its proximity to New York/New Jersey compared to more northerly New England ports for service to New England and Canadian markets. A potential *advantage* of New London is its rail connections to mainline rail routes, which ports such as New Bedford and Boston cannot match. Both New England Central and Providence and Worcester Railroads are potential candidates for pairing with the State Pier Facility to capture container feeder and short sea shipping cargoes. Competitive facilities at Davisville and Providence in Rhode Island both have direct rail connections to the port and double-stack freight rail capacity. A detailed analysis of port handling and shipper cost comparisons is beyond the scope of this report.

- The handling of additional bulk and break-bulk cargoes at New London is almost entirely dependent, as previously noted, on the inclination and ability of the State Pier terminal operator to pursue such cargoes on an individual movement basis. Few terminal operators are in a better position to be aware of these opportunities than Logistec, with its extensive network of terminal operations along the US East Coast and Canada. As previously noted Logistec has not provided documents to the consultant team or been forthcoming with information about potential new bulk and break bulk cargo opportunities, during the course of this market assessment.

Other potential maritime uses of the State Pier Facility include accommodating commercial recreational vessels such as excursion boats, day fishing vessels, tour boats and classic charter boats. Each of these operations could be physically accommodated at State Pier with some rearrangement of spaces but are typically small in scope and in revenue generating potential. Since they are directed to general public patronage they are likely to present conflicts with cargo operations and present challenges to port security measures. The City of New London has invested heavily in its nearby Waterfront Park which has several piers designed to accommodate these types of vessels. Small scale commercial recreational vessels would be better accommodated at City facilities leaving State Pier to focus on cargo handling operations.

Research & Reference Sources

Documents

FXM obtained and reviewed to information primarily from the following reports, studies, plans and website sources as identified in footnotes of this Technical Memorandum and listed below.

- *Economic Effects of Maritime Industries in the State of Connecticut, by* Apex Engineering, Inc. and FXM Associates for the Connecticut Maritime Coalition (April 2010)
- *Connecticut Economic Strategic Plan"* by Connecticut Department of Economic and Community Development (September 2009)
- *Application for Designation of the I-95 Marine Highway Corridor,"* submitted by the I-95 Corridor Coalition to the U.S. DOT America's Marine Highway Program (May 2009)
- *Connecticut's Ports: Transportation Centers for People and Goods,"* by Parson's Brinkerhoff for the Connecticut Maritime Coalition (2002)
- *The Economic Impact of Connecticut's Deepwater Ports: An IMPLAN and REMI Analysis,"* by the Connecticut Center for Economic Analysis (May 23, 2001) for Connecticut Coastline Port Authority
- *Can New London be a Transit Container Port?*(study presentation) by Management & Transportation Associates, inc., prepared for ConnDOT (January 2001)
- *Transportation and Land Use Compatibility Study Executive Summary* ,by Connecticut Department of Transportation (circa 1996)
- *CVRR Pier Usage Study: State Pier – New London,* by Frederick R. Harris, Inc. prepared for ConnDOT (circa 2001)
- *New London Port Development Stud,* by Martin O'Connell Associates, prepared for the City of New London, State of Connecticut, and Southeastern Connecticut Economic Development Commission (June 1994)
- *Comprehensive Economic Development Strategy for Southeastern Connecticut*, by Southeastern Connecticut Enterprise Region and Southeastern Connecticut Council of Governments (2004)
- *Regional Plan of Conservation and Development,* Southeastern Connecticut Council of Governments (2007)
- "Company Sees Rebound for State Pier," Lee Howard, published in *The Day*, May 13, 2010)
- "Lumber Imports Rebound in New London," Patricia Daddona, published October 19, 2008

Other Secondary Source Data

FXM used both public and private subscription service secondary source data to prepare the market overview assessment, including specific sources referenced in footnotes of this Technical Memorandum and listed below.

- *Waterborne Commerce of the United States* (WCUS), US Army Corp of Engineers, New Orleans, LA, 2010.
- *Vessel Calls Snapshot 2009,* US Department of Transportation, Maritime Administration (MARAD*);,* Washington, DC, August 2010.
- *US Port Calls by Vessel Type (2002 – 2008).* USDOT, MARAD, Washington, DC, July 2009.
- *North American Port Cruise Traffic (1980 – 2009),* Cruise Lines International Association
- State Pier Shipping Reports (2004-2008), provided by Logistec USA Inc. to the City of New London Office of Development & Planning
- "Cruise Ships Visiting Newport RI 1999 – 2008", City of Newport, RI at www.cityofnewport.com .
- *New Bedford/Fairhaven Municipal Harbor Plan 2010,* by Fort Point Associates, inc., Apex Companies, LLC, Urban Harbors Institute and FXM Associates, City of New Bedford Harbor Development Corporation (May 26, 2010)"
- American Cruise Lines Website at www.americancruiselines.com.

Interviews

- Steve Davis, *Logistec USA* New London State Pier, meeting with Frank Mahady, FXM Associates and Captain Jeff Monroe, MARPRO, September 8, 2010
- George Cassidy, October 21,2010.

Market Data

- US Army Corp of Engineers, *Waterborne Commerce of the United States* (WCUS), New Orleans, LA, 2010. Data on commodity shipments from 2002 to 2008.
- US Department of Transportation (USDOT), Maritime Administration (MARAD*); Vessel Calls Snapshot 2009*, Washington, DC, August 2010. Summary of all vessel movements in the US for 2002 to 2009.
- USDOT, MARAD, *US Port Calls by Vessel Type* (2002 – 2008). Washington, DC, July 2009. Detailed annual vessel calls by port and vessel type.

- Cruise Lines International Association, "North American Port Cruise Traffic 1980 – 2009," published 2010. Number of passengers and vessel calls by year for many cruise ports. This source did not include Newport, RI, or more recent data on New Bedford, MA or New London, CT.

- New London State Pier Shipping Reports (2004 to 2008) provided by Logistec USA Inc. to the City of New London's Office of Development & Planning; provided to FXM by Charles Beck, ConnDOT Transportation Maritime Manager by email on September 22, 2010.

- WISERTrade Port Database Harmonized [Commodity] System (HS), 2004-2009, at http://www.wisertrade.org, based on data from U.S. Census Bureau, Foreign Trade Division.

- Other sources of information FXM used to supplement these databases include:

- City of Newport, RI, "Cruise Ships Visiting Newport RI 1999 – 2008."

- New Bedford Harbor Development Commission, "On the Waterfront" newsletter June 2007 and May 2008.

- City of New Bedford, "New Bedford/Fairhaven Municipal Harbor Plan 2010."

- American Cruise Lines website at www.americancruiselines.com.

Appendix C:

Existing Traffic Operations

Introduction

Access to the proposed State Pier site along State Pier Road was reviewed as it relates to traffic operations and safety. Traffic volume data was collected and analyzed; accident records were reviewed; and the roadway geometry along Route 437 was reviewed for conformity to the AASHTO and ConnDOT design manual criteria.

Traffic Volumes

Daily traffic volumes along the roadways service access to/from the state pier were assembled from Connecticut Department of Transportation (ConnDOT) data. The following table summarizes the average daily traffic volumes along area roadways.

ConnDOT Average Daily Traffic Volumes

Roadway	Location	Station #	ADT[1]
State Pier Road	East of Crystal Avenue	2009	1,000
Crystal Avenue	South of State Pier Road	2066	2,700
Williams Street	North of Huntington Street	64	12,200
Huntington Street	East of William Street	65	8,000
State Pier Road	At approach to State Pier	281	300
I-95 SB Off-Ramp	Exit 84	7355	17,800

[1] Average Daily Traffic

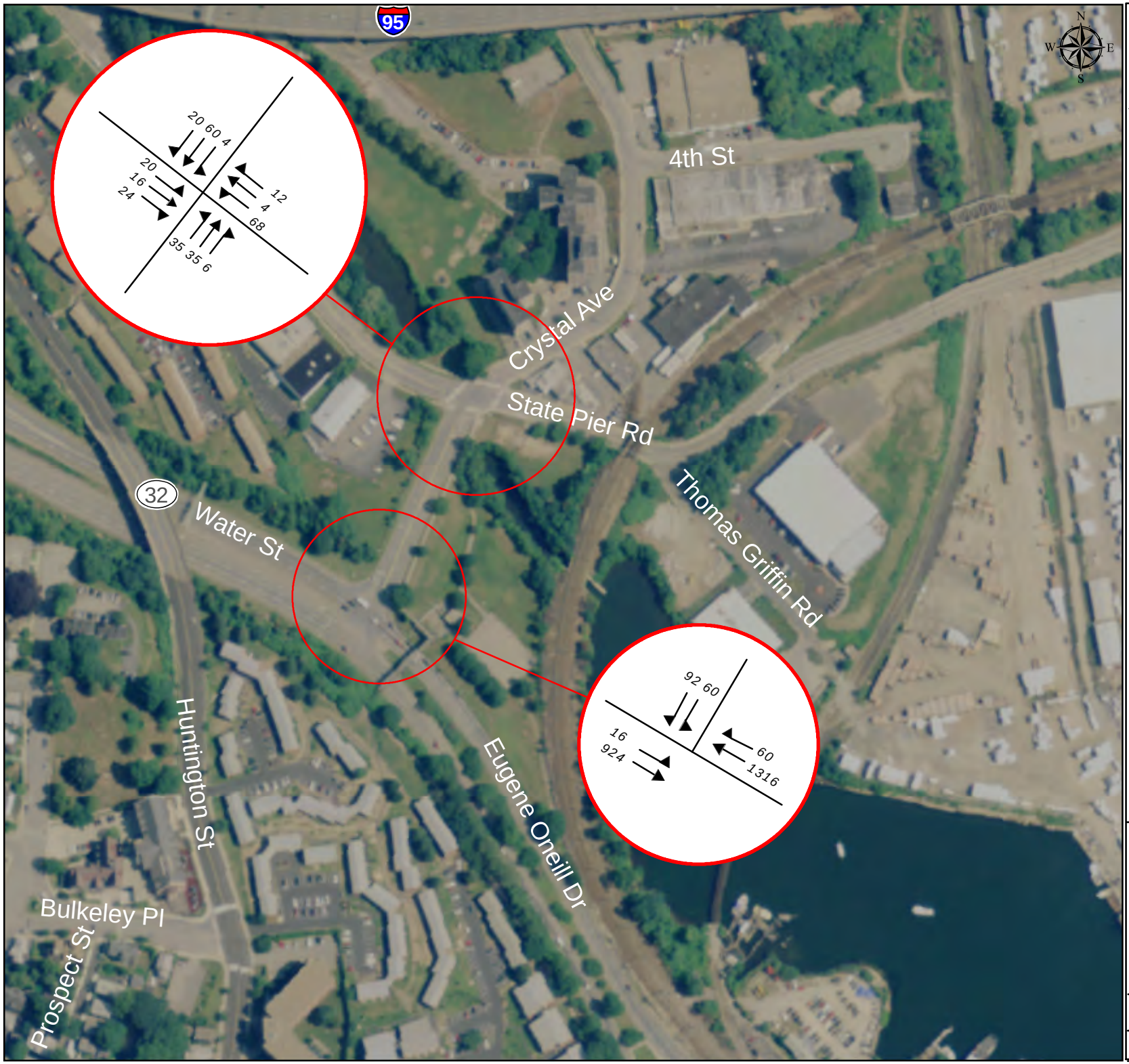
Manual traffic volume data was collected during the afternoon peak hour on Thursday, August 26, 2010 at the following intersections:

- Route 32/Water Street/Crystal Avenue
- Crystal Avenue/State Pier Road

The existing weekday afternoon peak hour traffic volumes are shown in Figure 2-2.1. During these counts, operations (delays and queues) were also observed. This information was used to calibrate the traffic analysis model.

Traffic Operational Analysis

The study area intersections were evaluated by means of capacity analysis techniques using Synchro software to determine a Level of Service (LOS) for the peak hour. The quality of operations is measured and expressed as a level of service (LOS). LOS is defined as a measure of inconvenience that motorists experience. The levels are expressed with letter designations between A through F. LOS A represents little or no vehicle delay. LOS F reflects an intersection or movement which is over capacity and one where long delays can be expected. The following table summarizes the findings from the operational analyses.



State Pier Needs & Deficiencies Planning Study

New London, CT

Balanced PM Peak Hour Traffic Volumes
Figure 2.2-1

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax: (203) 271-9733
www.miloneandmacbroom.com

Sources:
City of New London Engineering Department (2010)
CT DEP Geographic & Information Center, CT
UConn Clear, 2008 NAIP Aerial
Traffic Data: Milone & MacBroom, August 26, 2010.

0 100 200 400 Feet

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
EW	EW	MZ	1433-62

DATE: October 2010

LEVEL OF SERVICE SUMMARY

LOCATION / APPROACH	Level of Service	Delay (in seconds) [1]	95th Percentile Queues (in feet)
Water Street/Route 32/Crystal Avenue (signalized)			
Eastbound (Route 32)	A	6.1	29' – left turn lane 126' – through lanes
Westbound (Water Street)	A	6.6	206'
Southbound (Crystal Ave)	C	20.8	72' – left turn lane 44' – right turn lane
Overall	A	7.3	
Crystal Avenue/State Pier Road (signalized)			
Eastbound (State Pier Rd)	A	7.8	20'
Westbound (State Pier Rd)	A	9.3	29'
Northbound (Crystal Ave)	A	4.2	10' – left turn lane 11' – through lane
Southbound (Crystal Ave)	A	3.7	17'
Overall	A	6.2	

[1] Average delay per vehicle

Based on the analysis results, the intersection of Route 32/Water Street/Crystal Avenue operates at an overall LOS A. The eastbound and westbound through movements (which experience the highest volumes) operate at LOS A, while the eastbound left turn is LOS C and the southbound Crystal Avenue approach operates at LOS C. The queuing is moderate with 95th percentile queues for the Route 32 eastbound approach approximately 12 feet, the Water Street westbound approach approximately 200 feet and the Crystal Avenue southbound approach approximately 70 feet. These all reflect the observed conditions.

The intersection of State Pier Road/Crystal Avenue operated at an overall LOS A with all approaches at LOS A. The queues for all approaches generally do not exceed two vehicle lengths (50 feet). This also reflects the observed conditions.

Accident Analysis

Accident Data was obtained from the City of New London and the Connecticut Department of Transportation. Accidents were recorded along Route 437 and Route 32 at Crystal Avenue. Figure 2.2-2 identifies the locations of intersections that were included within this study.

The following table summarizes 28 accidents that occurred between January 2006 and September 2010. Of these, Rear-End accidents accounted for 46% of all accidents as the most common form with no major injuries reported. The intersection of Crystal Avenue and Water Street had the most common occurrence of accidents.

	Intersection
1	At Crystal Avenue and Water Street
2	At State Pier Road and Crystal Avenue
3	At Crystal Avenue and Lewis Street
4	On Crystal Avenue near Lewis Street
5	At Williams Street and State Pier Road

State Pier Needs & Deficiencies Planning Study

New London, CT

Accident Data Locations
Figure 2.2-2

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99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax: (203) 271-9733
www.miloneandmacbroom.com

Sources:
City of New London Engineering Department (2010)
CT DEP Geographic & Information Center, CT
Microsoft Virtual Earth
Street Map USA (2009)

0 100 200 400 600 800 Feet

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
EW	EW	MZ	1433-62

DATE: October 2010

NEW LONDON STATE PIER
ACCIDENT SUMMARY
January 2006 – September 2010

LOCATION	ACCIDENT SEVERITY			TYPE OF COLLISION											
				TURN											
	INJURY	PROPERTY DAMAGE	**TOTAL**	INTERSECTING	SAME TURN	OPPOSITE	REAR-END	ANGLE	SIDE- SWIPE (Same Side)	HEAD - ON	FIXED OBJECT	BACK - UP	MOVING OBJECT	OVERTURN	**TOTAL**
New London State Pier															
At Crystal Avenue and Water Street		17	17		1	1	12		2		1				17
At State Pier Road and Crystal Avenue						1	1								2
At Crystal Avenue and Lewis Street		1	1					1							1
On Crystal Avenue near Lewis Street		1	1								2	3			5
At Williams Street and State Pier Road				1					1		1				3
TOTAL		19	19	1	1	2	13	1	3		4	3			28

Source: New London Police Department 01/01/2007 to 09/17/2010
ConnDOT from 1/1/2006 to 12/31/2008

Roadway Geometry

The roadway geometry along State Pier Road, Crystal Avenue and Route 32 was reviewed for conformity to the AASHTO and ConnDOT design guide requirements. The aforementioned roadways currently carry semi trailer traffic. All roadways to be used for truck traffic exceed 24 feet in width for two-lane cross sections. The rail bridge underpass along State Pier Road east of Crystal Avenue has a clearing of approximately 14’2”, which is adequate for typical tractor trailer use.

TRAFFIC COUNTS

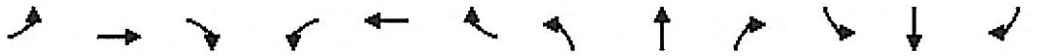
Traffic Counts 2008: New London State Pier						
Location	Direction	Station	ADT	Peak Hour	Peak Count	24 Hour
Route 635 North of State Route 641	North	64	6400	4pm	629	6909
Route 635 North of State Route 641	South	64	5800	8am	616	6248
State Route 641 East of State Route 635	Both	65	8000	8am	968	8658
Route 437 (Old Bridge Approach) to State Pier	Both	281	300	6am	42	330
Route437 (Old Bridge Approach) East of Crystal Ave	Both	2009	1000	10am	102	1064
NB Off Ramp to State Route 641	North	7351	2800	8am	451	3164
NB On Ramp From Route 32 SB & State Route 636	North	7352	14200	7am	1313	15723
SB Off Ramp to Route 32NB & SB Route 635 (Exit 84)	South	7355	17800	4pm	1848	19740
Route 32 SB On Ramp From I-95 SB	South	7006	7200	8am	873	7962
NB On Ramp From Route 32NB & State Route 641	North	7356	11900	5pm	1267	13252
NB On Ramp From Route 32 NB	North	7358	7400	5pm	762	8148
Source: State of Connecticut Traffic Count Locator Program TMSADT						

Traffic Counts 2005: New London State Pier						
Location	Direction	Station	ADT	Peak Hour	Peak Count	24 Hour
Route 635 North of State Route 641	Both	64	12300	4pm	1095	13530
State Route 641 East of State Route 635	Both	65	7600	8am	865	8643
Route 437 (Old Bridge Approach) to State Pier	Both	281	400	12pm	59	456
Route437 (Old Bridge Approach) East of Crystal Ave	Both	2009	600	11am	78	667
NB Off Ramp to State Route 641	North	7351	2700	8am	452	3025
NB On Ramp From Route 32 SB & State Route 636	North	7352	14700	7am	1317	16515
SB Off Ramp to Route 32NB & SB Route 635 (Exit 84)	South	7355	18800	4pm	1930	21146
Route 32 SB On Ramp From I-95 SB	South	7006	7300	8am	887	8255
NB On Ramp From Route 32NB & State Route 641	North	7356	1150	5pm	1225	12871
NB On Ramp From Route 32 NB	North	7358	7200	5pm	776	8105
Source: State of Connecticut Traffic Count Locator Program TMSADT						

Traffic Counts 2002: New London State Pier						
Location	Direction	Station	ADT	Peak Hour	Peak Count	24 Hour
Route 635 North of State Route 641	Both	64	13100	3pm	1161	14052
State Route 641 East of State Route 635	Both	65	7900	8am	820	8651
Route 437 (Old Bridge Approach) to State Pier	Both	281	550	12pm	67	596
Route437 (Old Bridge Approach) East of Crystal Ave	Both	2009	850	3pm	101	918
NB Off Ramp to State Route 641	North	7351	2900	8am	281	3208
NB On Ramp From Route 32 SB & State Route 636	North	7352	1380	7am	1380	17920
SB Off Ramp to Route 32NB & SB Route 635 (Exit 84)	South	7355	18100	4pm	1800	20282
Route 32 SB On Ramp From I-95 SB	South	7006	7600	8am	911	8520
NB On Ramp From Route 32NB & State Route 641	North	7356	11600	4pm	1252	13085
NB On Ramp From Route 32 NB	North	7358	7400	5pm	797	8288
Source: State of Connecticut Traffic Count Locator Program TMSADT						

SYNCHRO 7 REPORT

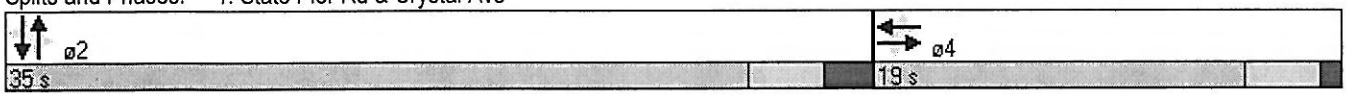
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	16	24	68	4	12	35	35	6	4	60	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946			0.981			0.977			0.967	
Flt Protected		0.983			0.961		0.950				0.998	
Satd. Flow (prot)	0	1732	0	0	1756	0	1770	1820	0	0	1798	0
Flt Permitted		0.851					0.698				0.986	
Satd. Flow (perm)	0	1500	0	0	1827	0	1300	1820	0	0	1776	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			13			7			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			663			516			442	
Travel Time (s)		11.9			15.1			11.7			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	17	26	74	4	13	38	38	7	4	65	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	65	0	0	91	0	38	45	0	0	91	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	3		1	1		1	1	
Detector Template	Left			Left						Left		
Leading Detector (ft)	20	31		20	27		256	256		20	256	
Trailing Detector (ft)	0	25		0	-6		250	250		0	250	
Detector 1 Position(ft)	0	25		0	-6		250	250		0	250	
Detector 1 Size(ft)	20	6		20	6		6	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					8							
Detector 2 Size(ft)					6							
Detector 2 Type					Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)					0.0							
Detector 3 Position(ft)					21							
Detector 3 Size(ft)					6							
Detector 3 Type					Cl+Ex							
Detector 3 Channel												
Detector 3 Extend (s)					0.0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	



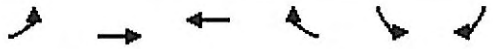
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Total Split (s)	19.0	19.0	0.0	19.0	19.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	35.2%	35.2%	0.0%	35.2%	35.2%	0.0%	64.8%	64.8%	0.0%	64.8%	64.8%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	1.5		1.5	1.5		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)		6.9			6.9		16.2	16.2			16.2	
Actuated g/C Ratio		0.27			0.27		0.64	0.64			0.64	
v/c Ratio		0.15			0.18		0.05	0.04			0.08	
Control Delay		7.8			9.3		4.5	4.0			3.7	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		7.8			9.3		4.5	4.0			3.7	
LOS		A			A		A	A			A	
Approach Delay		7.8			9.3			4.2			3.7	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		5			10		2	2			5	
Queue Length 95th (ft)		20			29		10	11			17	
Internal Link Dist (ft)		443			583			436			362	
Turn Bay Length (ft)												
Base Capacity (vph)		962			1165		1279	1790			1747	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.07			0.08		0.03	0.03			0.05	

Intersection Summary			
Area Type:	Other		
Cycle Length: 54			
Actuated Cycle Length: 25.5			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.18			
Intersection Signal Delay: 6.2		Intersection LOS: A	
Intersection Capacity Utilization 30.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: State Pier Rd & Crystal Ave



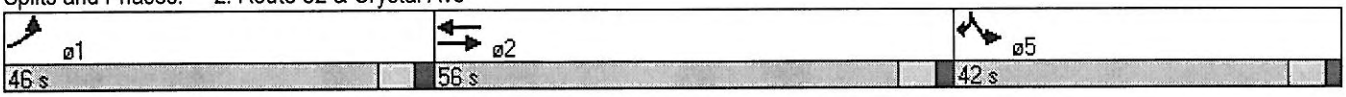
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	16	924	1316	60	60	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	5085	5050	0	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	5085	5050	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			5			100
Link Speed (mph)		30	30		30	
Link Distance (ft)		693	929		516	
Travel Time (s)		15.8	21.1		11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	1004	1430	65	65	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	1004	1495	0	65	100
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	1	1		1	1
Detector Template						
Leading Detector (ft)	10	431	266		26	26
Trailing Detector (ft)	-10	425	260		20	20
Detector 1 Position(ft)	-10	425	260		20	20
Detector 1 Size(ft)	20	6	6		6	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot					Prot
Protected Phases	1	2	2		5	5
Permitted Phases						
Detector Phase	1	2	2		5	5
Switch Phase						
Minimum Initial (s)	3.0	30.0	30.0		9.0	9.0
Minimum Split (s)	9.0	36.0	36.0		20.0	20.0
Total Split (s)	46.0	56.0	56.0	0.0	42.0	42.0
Total Split (%)	31.9%	38.9%	38.9%	0.0%	29.2%	29.2%



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Maximum Green (s)	40.0	50.0	50.0		36.0	36.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	6.0	6.0		3.0	3.0
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	7.7	53.0	53.0		9.4	9.4
Actuated g/C Ratio	0.10	0.69	0.69		0.12	0.12
v/c Ratio	0.10	0.29	0.43		0.30	0.36
Control Delay	33.5	5.7	6.6		35.1	11.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	33.5	5.7	6.6		35.1	11.4
LOS	C	A	A		D	B
Approach Delay		6.1	6.6		20.8	
Approach LOS		A	A		C	
Queue Length 50th (ft)	7	47	80		26	0
Queue Length 95th (ft)	29	126	206		72	44
Internal Link Dist (ft)		613	849		436	
Turn Bay Length (ft)	350					
Base Capacity (vph)	927	3496	3474		834	799
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.02	0.29	0.43		0.08	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 144			
Actuated Cycle Length: 77.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 7.3		Intersection LOS: A	
Intersection Capacity Utilization 44.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Route 32 & Crystal Ave



Appendix D:

Off-Site Identification and Evaluation

Introduction

A major limiting factor to operations at the State Pier Facility is the lack of available land for expansion of lay-down and storage space and additional services. According to the Transportation Research Center at the University of Texas, Inland Ports are growing in popularity because of business needs. Inland Ports are locations providing sea port services, such as storage and distribution, connected to seaports by a direct means of transportation, usually rail.

Multi-modal combinations at Inland Ports provide new opportunities to control efficiency, while additional "value–added services" located at Inland Ports can provide additional opportunities. Access to interstate highway systems and intermodal rail facilities, in conjunction with warehousing, manufacturing and distribution services at Inland Port locations, allows businesses to seek competitive advantages and choose appropriate distribution paths to suit their logistical needs.

The New London State Pier Facility is well-situated to explore Inland Port opportunities because of the presence of the New England Central Rail (NECR) line at the port. The NECR operates 55 miles of track between New London and Stafford in Connecticut and connects to the national trunk railroad system. Establishing Inland Port facilities would effectively expand the operations of the port, and increase distribution opportunities for users.

New London State Pier Facility and New England Rail Connectivity

As mentioned above, the New England Central Railroad (NECR) line accesses the New London State Pier property. The NECR operates 394 miles of railroad between the Quebec/Vermont border and the State Pier Facility. The line roughly parallels Interstate 91 through Connecticut, Massachusetts and southern Vermont, until it reaches White River Junction. From there it heads west, parallel to Interstate 89 and then along Lake Champlain until it reaches East Alburgh, Vermont, where connections to the Canadian railroad system are possible.

It operates seven days per week and has interchanges with four Class I railroads: Canadian National at East Alsburgh, VT; Canadian Pacific at Bellows Falls, VT; Norfolk Southern at Brattleboro, VT; and CSXT at Palmer, MA. The NECR has 19'6" clearance capacity from Willimantic, CT north to the Canadian border. This clearance is sufficient to support mixed double-stacking of steamship and domestic containers on flat car. In order to carry double-stacked domestic containers, a clearance of 20'6" is needed. The NECR intends to achieve this clearance on its line north of Willimantic as demand warrants it.

Willimantic is roughly 30 miles north of the State Pier Facility along the NECR. Four significant impediments preclude double-stack capacity of mixed steamship and domestic containers in this short stretch between New London and Willimantic. These impediments are shown in the following table.

Impediments to Mixed Container Double-Stack Capacity from New London to Willimantic

Milepost (from Union Station)	Current Clearance	Type	Description	Location
1.28	19’5”	Overhead	U.S. Coast Guard access road	New London
14.15	19’4”	Tunnel	Lafayette St.	Norwich
14.77	19’2”	Overhead	State Rts. 2 & 32	Norwich
16.47	19’4”	Overhead	State Rt. 642/W. Town Rd.	Yantic/Norwich

In addition, there are three other bridges in the stretch of rail line between New London and Willimantic that do not meet the clearance standards for double-stack domestic containers (20’6”). These impediments are described in the following table.

Impediments to Double-Stack Domestic Container Capacity from New London to Willimantic

Milepost (from Union Station)	Current Clearance	Type	Description	Location
.65	19’10”	Overhead	State Pier Road & Amtrak	New London
16.80	20’3”	Bracing	NECR truss bridge	Yantic
17.04	19’10”	Overhead	State Rt. 32	Yantic

Ultimately, addressing all seven of these clearance impediments would greatly expand opportunities for the State Pier Facility to distribute goods arriving at the Facility throughout New England. Nevertheless, under current circumstances, double-stack mixed container capacity and connections to Class I railroads are within reasonable distance of the State Pier Facility.

Major commodities moved on the NECR include: lumber, panels, plywood, poles, newsprint, printing paper, compressed gas, chemicals, fuel oils, road salt, ferrous and non-ferrous metals, fabricated metals, resins, finished vehicles, feed mill ingredients, machinery and equipment, recyclables, ash, construction debris, foodstuffs, and non-metallic minerals.

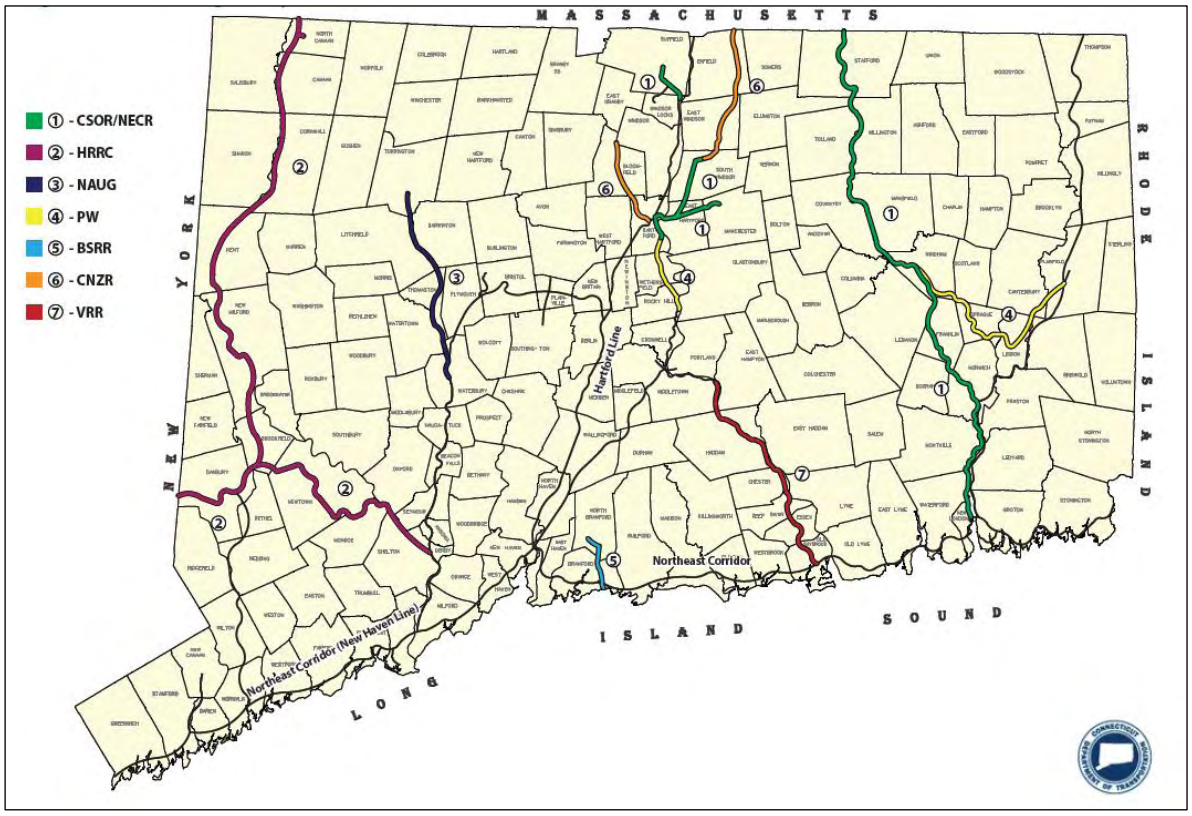
The NECR also offers two interchanges with the Providence and Worcester Railroad (P&W), one of the oldest rail lines in the country. P&W operates a regional freight system serving Connecticut, Massachusetts, New York and Rhode Island on over 500 miles of track. In fact, P&W is the only interstate freight carrier serving the State of Rhode Island.

P&W has specialized in carrying municipal and other solid waste throughout New England with containerized linkages to South Carolina landfills made possible through an agreement with CSX Corp.

While the NECR runs north from the State Pier Facility along the western side of the Thames River, the P&W crosses the Thames in New London, with one branch continuing East into Rhode Island and another running north along the east bank of the River. A second interchange

between the NECR and P&W is located in Willimantic, approximately 30 miles north of the pier. This interchange is facilitated by the Willimantic Branch Line of the P&W, a 21-mile track that connects Plainfield to Willimantic. The Willimantic Branch has recently had vertical clearance improvements to attract freight usage.

Figure 3.4-1



The State of Connecticut's Department of Transportation (ConnDOT) is committed to increasing rail freight shipments to reduce truck traffic and support economic growth. Figure 3.4-1 shows Connecticut's freight rail system with ConnDOT's priority improvement areas highlighted. The State has already invested over $282.5 million in the freight rail network over the past decade. The State has plans to upgrade bridges and other infrastructure to support 286,000 lb. gross rail weight cars on the NECR, instead of the 263,000 lb. capacity currently available. Given the State Pier Facility's strategic location between the major northeastern urban centers of New York City and Boston, the State's commitment to improving freight rail infrastructure and equipment, and the existing connections between the State Pier Facility and the northeast's railroad network, there is significant potential for Inland Port development to support expanded and diverse operations at the New London State Pier Facility.

Availability of Land for Inland Port Use

In order to identify the potential for inland port usage connected to the State Pier Facility, the zoning and land use of the following towns were analyzed:

- Bozrah
- Franklin
- Griswold
- Groton
- Lebanon
- Ledyard
- Lisbon
- Montville
- New London
- Norwich
- Plainfield
- Preston
- Sprague
- Waterford
- Windham

These towns are all located along the NECR and/or P&W rail lines, within 30 miles of the State Pier. Figure 3.4-2 shows a map of this study area.

The zoning map and regulations for each community were analyzed to determine the appropriateness of land for inland port use. Commercial and industrial zones that allow warehousing, storage and distribution and that are accessible by rail were mapped using the most recent information available. Currently available properties within these zones were then identified using the Connecticut Economic Research Center (CERC) Site Finder, the Commercial Investment Multiple Listing Service (CIMLS) and other commercial real estate brokers. The following discussion of each community summarizes this analysis.

Bozrah

The NECR line runs through the northeast corner of Bozrah, near the junction of State Routes 2 and 32. There are two industrial zones just west of the rail line, as shown on Figure 3.4-3. One consists of just over 500 acres of Industrial-80 (I-80), and the other is about 22 acres of Industrial-30 (I-30). The I-30 zone appears to have been carved out of the larger I-80 zone. At its closest point, the I-80 Zone is only about 175 feet west of the rail road, and extends about a mile west. It appears that a rail spur may have served the I-80 zone at one time.

The parcels in these zones are about a mile to a mile and a half away from an interchange with Route 2 via Stockhouse Road and State Routes 87 and 32. Interstate 395 is approximately 1.25 miles further along Route 2.

As of October 2010, we are not aware of any available land for sale or lease within the I-30 or I-80 zones. However, in the future parcels may become available.

Franklin

The NECR line traverses northwest through Franklin from its southeast corner to its western border with Lebanon, where the railroad turns north to follow the Franklin-Lebanon border for approximately 1.5 miles. Franklin has two areas commercially zoned (C-2) that would allow for Inland Port operations; see Figure 3.4-4. These areas are approximately 13-16 miles from the State Pier.

The C-2 Zone in the southeast corner of town is comprised of about 240 acres. This Zone contains about a mile of railroad. It is served by State Route 32, and is approximately 1.5 miles from the Route 32 and Route 2 interchange, with access to Interstate 395 in another 1.25 miles. We are not aware of any property within this zone currently available for sale or lease for Inland Port-type uses.

The second C-2 Zone is located in North Franklin along the rail line as it parallels the Franklin-Lebanon town boundary. This Zone consists of approximately 230 acres. It is about 6 miles from Route 2 via Route 32. It's also about 8.5 miles from Route 6 to the North, via Route 32.

According to a recent CT DOT federal TIGER grant application, there are several 20+ acre sites with freight rail access in the area where Franklin, Lebanon and Windham meet. These three municipalities are coordinating to work with property owners in the region and promote these sites.

As of October 2010, the CERC Site Finder had the following property within a C-2 Zone in Franklin as available. The site is also highlighted in Figure 3.4-4:

> 786 Route 32
> This property has two to twenty-six acres of available land zoned as C2 which would be suitable for an Inland Facility operation. The parcel is roughly 20 miles from the New London State Pier. It is located on Route 32, approximately six miles north of the Routes 32 and 2 interchange. Interstate 395 is just over 7 miles away via Routes 32 and 2. In addition, State Route 6 in Willimantic is roughly eight miles from this location. The site is accessed by the NECR, with direct rail access available on the west side of the property. It is listed for sale at $395,000, though there appears to be the possibility for subdivision.

Griswold

The P&W Rail Line runs north-south through the westernmost portion of Griswold and the Borough of Jewett City. As shown in Figure 3.4-5, there are two Industrial Zones and a Commercial Zone either adjacent or in near proximity to the rail line that may have potential for Inland Port usage. These zones are roughly 15 miles from the State Pier Facility along the P&W line, and total 133 acres.

In Jewett City, the rail line runs through two separate Industrial Zones. The first is approximately 47 acres located primarily between the Quinebaug River to the west and the Providence & Worcester rail to the east, with a few small parcels to the east of the rail line. This zone includes the Wyre-Wynd site, an industrial site with direct railroad access and hydropower available. The Wyre-Wynd facility has undergone environmental remediation that is nearly complete according to local officials. The Wyre-Wynd site is within three-quarters of a mile from a full interchange with Interstate-395, which is easily accessible via State Route 138.

The second industrial Zone is also located in Jewett City. This zone comprises about 12 acres, located along the rail line at the confluence of the Quinebaug and Pachaug Rivers. The former Slater Mill is located within this zone. This site has a direct rail access and excellent access to an Interstate 395 interchange using State Route 138.

Finally, the Town of Griswold has approximately 74 acres in its northwest corner zoned C-2 that is separated from the rail line only by Route 12 and Clayville Pond. The site is within approximately 1,000 feet of the rail via Route 12.

Groton (City and Town)

The City and Town of Groton are served by the P&W Rail Line, which runs east-west along the coast. As shown in Figure 3.4-6, there are several industrially zoned areas adjacent to the rail line in both the City and Town. Several parcels south of Route 1 and centered around the rail road and a spur line are zoned IA-40. This zone totals about 1,000 acres, but included in this area is the Groton-New London Airport, Electric Boat and Pfizer. Sites within IA-40 Zone are generally within a half mile of Route 1 and within a mile and a half of Interstate 95.

There is also about 72 acres in General Industrial and Restricted Industrial Zones near the Gold Star Memorial Bridge. This area is within a quarter mile of Interstate 95, State Route 1 and State Route 12.

Finally, there is approximately 200 acres zoned General Industrial in the area of the Electric Boat facility. These acres are directly served with rail, and are about a mile from Interstate 95, Route 1 and Route 12, via Route 349.

We are not aware of any currently available properties for sale or lease within these zones; however, parcels may become available in the future.

Lebanon

As discussed previously, the NECR runs along the border of Lebanon and Franklin for approximately 1.5 miles. Figure 3.4-7 shows the roughly 280 acres zoned for Light Industry that are adjacent to or in close proximity to the rail road in Lebanon. The southern zone has access to Route 207, while the northern zone is accessible by Route 32. Both areas are approximately 6 miles from Route 2 via Route 32and about 8.5 miles from Route 6 to the North, via Route 32. These zones are roughly 18-20 miles from the State Pier Facility along the NECR line.

As described previously, according to CT DOT, the Town of Lebanon is cooperating with the Towns of Franklin and Windham on promoting rail-dependent industrial uses in this region.

As of October 2010, the CERC Site Finder had one property listed within this area, which is described below. The site is also highlighted in Figure 3.4-7.

> 1 Williams Crossing
> This property offers over forty-five acres and is zoned suitably for an inland port operation. It is located south of Route 6 and north of Route 2. This site is accessible by the New England Central Rail Road via the Vermont Rail Line. Rail access can be found in the southeasterly portion of the property. The parcel is listed for sale for $795,000 and is roughly 20 miles from the New London State Pier Facility. This site is the furthest currently available property from the State.

Ledyard

The P&W line runs along the western border of Ledyard. There is approximately 169 acres along the rail road zoned for industrial uses, as shown in Figure 3.4-8. This is the site of the Dow Chemical plant. The area is accessible by State Route 12, and is approximately six miles from the New London State Pier Facility along the P&W line. The zone is also about six miles from Interstate 395 to the northwest, via Routes 12 and 2.

No listings for properties currently available in the Industrial zone were found as of October 2010.

Lisbon

The P&W line runs along the southern and eastern border of Lisbon, while the P&W branch that connects Plainfield to the NECR line in Willimantic bisects the town from north to south. There are two Industrial Park Zones along the main line of the P&W on the eastern border of Lisbon, as shown in Figure 3.4-9. These two zones total about 230 acres, and an interchange between Route 12 and Interstate 395 lies between them. This area is approximately 20 miles from the New London State Pier Facility via the P&W line. The southern zone has been developed for retail use.

We are not aware of any parcels available for lease or sale in these zones at this time.

Montville

The NECR line runs north-south along the Thames River in eastern Montville. Figure 3.4-10 shows the town's industrial zone along the rail line, at its southern border. The zone encompasses roughly 83 acres that are predominantly already developed. The area is about half a mile from Route 32 via local roads, and just over a mile from Interstate 395 via Routes 32 and 163. Finally, Montville's industrial district is approximately 5.3 miles north of the State Pier Facility along the NECR Rail.

No listings for parcels available for lease or sale in this district were found as of October 2010.

New London

The City is served by the NECR running north-south along the Thames River, and the P&W Rail Road running east-west along the coast. Along the two rail lines, there are approximately 32 acres zoned for Light Industrial and about 200 acres zoned Waterfront Commercial Industrial, as shown in Figure 3.4-11. The Waterfront Commercial Industrial Districts are within two miles along the P&W line to the southwest of the State Pier Facility. The area around the Facility itself is zoned Light Industrial and Waterfront Industrial. There's an additional Waterfront Industrial zone about a mile north of the Facility along the NECR line.

These properties all offer the advantages of being in very close proximity to the State Pier Facility and Interstate 95.

The following property is highlighted in Figure 3.4-11 as it is currently being marketed for purposes that could include port use.

> Eastern Avenue Properties
> This property is owned and managed by Eastern Avenue Properties. It abuts the New London State Pier Facility and has many amenities for lease. This site is accessible by rail, barge, and highway. It provides 2.29 acres of undeveloped waterfront property with direct access to the State Pier Facility and 18.5 acres of deeded river bottom. The site also provides for three different locations of roughly 148,815 sq. ft of warehouse space. This property is the closest to the New London State Pier Facility with direct access to the facility. However, the amount of storage and lay down space is limited.

Finally, the NECR owns two parcels adjacent to the State Pier Facility that offer significant potential for lay-down space to improve port operations. These areas are shown in Figure 3.4-12. The first is an eight-acre parcel just north and west of the existing State Pier. This site was formerly leased by Logistec and contains rail tracks. Its proximity to the pier makes this a priority parcel for the State to consider acquiring control over to improve port operations. The second area is smaller at just over an acre, and is a portion of another NECR parcel. The majority of the parcel contains right-of-way; however, this piece located at the north end of Fourth Street could provide valuable lay-down space as part of the long-term storage areas under the Gold Star Bridges. Therefore, it is another location that the State should consider gaining control over whether through lease or ownership.

Norwich

The City of Norwich is served by both the NECR and P&W lines along the east and west sides of the Thames River and along the Yantic and Shetucket Rivers. The City has two Industrial Zones along the rail lines and a Waterfront Development District along the Thames and NECR. All three zones are shown in Figure 3.4-12, and together total approximately 340 acres.

One of the zones is located near the confluence of the Shetucket and Yantic Rivers. This area is approximately 13 miles from the State Pier along the NECR Rail Line. Parcels within the zone

are generally within 500 feet of Route 82, and about 1.5 miles from an interchange with Interstate 395.

The second Industrial Zone is also located along the NECR in the northwest corner of Norwich along the Bozrah border. These parcels are adjacent to industrial zones in Bozrah discussed above. They are in close proximity to Route 2 and within a mile and a quarter of Interstate 395. The zone is approximately 16 miles from the State Pier Facility.

The Waterfront Development zone is approximately 256 acres located at the confluence of the Yantic and Shetucket Rivers, continuing south along both banks of the Thames River. There is currently an Inland Port business (see below) operating on the west bank of the River in this zone. The area is approximately two miles from Interstate 395 via Route 82.

No listings for properties available for sale or lease within any of these zones were found as of October 2010; however, the following business is operating within the Waterfront Development district:

> Norwich Intermodal Terminal
> The Norwich Intermodal Terminal located on the Thames River currently provides opportunities for storage and shipyard services. The property is owned and managed by Buchanan Marine who also manages a shipyard in New Haven, CT. The site provides seven acres of secure outdoor storage space and ship yard services for lease. The site is accessible via rail, barge and highway, and is located roughly 12 miles from the New London State Pier Facility. While the site does not provide the same acreage as some undeveloped properties along the rail line in other communities, it is currently developed and operated specifically for storage and shipyard services, and provides for multi-modal options thus allowing for easier access and availability.

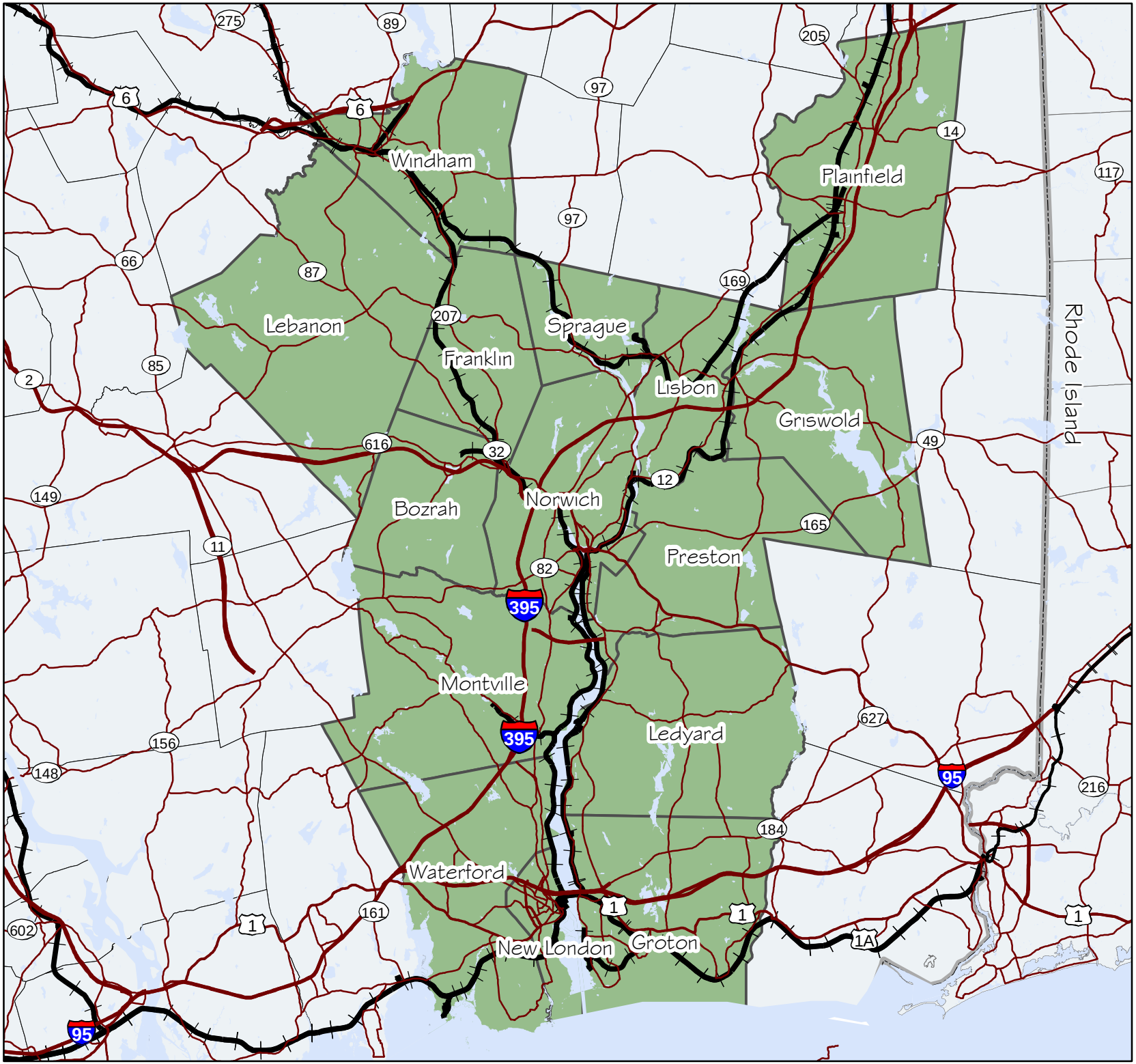
Plainfield

Plainfield is served by the P& W Rail Road, which runs north-south through the center of town. There are approximately 1,165 acres along the rail line zoned for industrial uses. These zones are shown in Figure 3.4-13, and are approximately 25 to 35 miles from the New London State Pier Facility along the P&W line.

The northern I-1 zone is approximately 3 miles from an Interstate 395 interchange via Green Hollow Road, and approximately 4 miles from the same interchange using Route 12/14. The rail line runs through the center of the zone.

About 140 acres of industrial land is located a little south, near the intersection of Routes 12 and 205. Much of this zone is already developed for retail use. It is located within two miles of Interstate 395.

A third small area of less than 20 acres is located further south along the rail line at the intersection of Routes 12 and 14. This area is with half a mile of Interstate 395, with rail access along its western boundary.



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-2
Locational Map

Legend

Towns with New England Central Railroad & Providence Worcester Rail Access

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax: (203) 271-9733
www.miloneandmacbroom.com

Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
Industrial Zones: Town Zoning Maps

0 0.5 1 2 3 4 5 Miles

N

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
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DATE:
October 2010

A fourth industrial district is located further south on the P& W line, where the branch that connects Plainfield to the NECR line in Willimantic begins. This area is located near Routes 12 and 14A, and within one to two miles of Interstate 395.

Finally, a small 30-acre industrial district is located in the southwest corner of town along the Griswold border, near the intersection of Butts Bridge Road and Route 12. The area is about three miles from Interstate 395 via Route 12, local roads and Route 201. It is approximately 5 miles from the interstate using just Routes 12 and 201 through Griswold.

We are not aware of any land currently for sale or lease in any of the industrial zones with rail access in Plainfield.

Preston

The P&W line runs along the western boundary of Preston. According to the latest data available, the Town has no industrial zones located along the rail line.

Sprague

The P&W Willimantic Branch line connecting Plainfield and Willimantic runs east-west through southern Sprague, with a private spur extending north to service Cascades Boxboard Group, as shown in Figure 3.4-14. There are over 460 acres zoned industrial along a portion of the rail line extending north. The Town recently expanded this industrial area with an eye towards promoting rail-dependent industrial uses, as improvements to the Willimantic Branch continue to be made.

The district is roughly 40 miles from the State Pier via the P&W north to Plainfield and then the Willimantic Branch west to Sprague. It is located along State Route 138, and is approximately two miles from Interstate 395.

As of October 2010, we are not aware of any currently available parcels in the district.

Waterford

The P&W rail line runs east-west along the coast of Waterford, while the NECR line runs north south along the Thames in the northeastern corner of town. General Industrial and Industrial Park zones located along both lines are shown in Figure 3.4-15. The four districts total almost 800 acres.

The district located along the NECR line consists of almost 230 acres, located on Route 32. The area provides good highway access, as it is about 3 miles north of Interstate 95 along Route 32, and only about 1.5 miles south of Interstate 395.

Another district of about 67 acres is located on the P&W line in the southeastern section of town. This area is within half a mile of Route 1 via Milner Lane and about 3 miles from Interstate 95.

Finally, two larger industrial districts are further west on the P&W line, near the East Lyme boundary. The district to the south of the rail road is occupied by the Millstone Power Plant.

The district to the north of the line may have some available land suitable for inland port use; however, it is somewhat removed from the highway system. Interstate 95 is approximately five miles away along Routes 156 and 1.

We are not aware of any land currently available for sale or lease within any of these districts in Waterford.

Windham (Willimantic)

Windham is served by both the NECR and P&W, as the P&W connecting branch to Plainfield merges with the NECR in Willimantic. Both Windham and Willimantic have substantial areas of industrially and commercially zoned land appropriate for Inland Port uses along the rail lines. All together, these districts total over 3,200 acres – see Figure 3.4-16.

In South Windham, there are several large Manufacturing zones between and along the NECR and P&W, where the two lines parallel each other. The Town is very interested in supporting rail-dependent redevelopment of industrial sites in this area. As outlined in a 2010 federal TIGER grant application by the CT DOT, the Town has plans for an NECR-served industrial park, and is supportive of several private redevelopment efforts for parcels along Route 32. These parcels are generally from seven to ten miles north of Route 2 along Route 32, and about five to eight miles south of Route 6.

Several other commercial and industrial areas that would allow Inland Port uses are located along the NECR line in Willimantic. These sites are predominantly already developed. Several offer excellent highway access, as they are located within half to one mile of Route 6.

Finally, a large manufacturing zone is located in the northwest corner of Windham, and includes the airport and Route 6. Rail stubs within this zone are limited to south of Route 6, where there already exists some industrial development.

As of October 2010, we are not aware of any listings for properties within these zones in Willimantic and Windham.

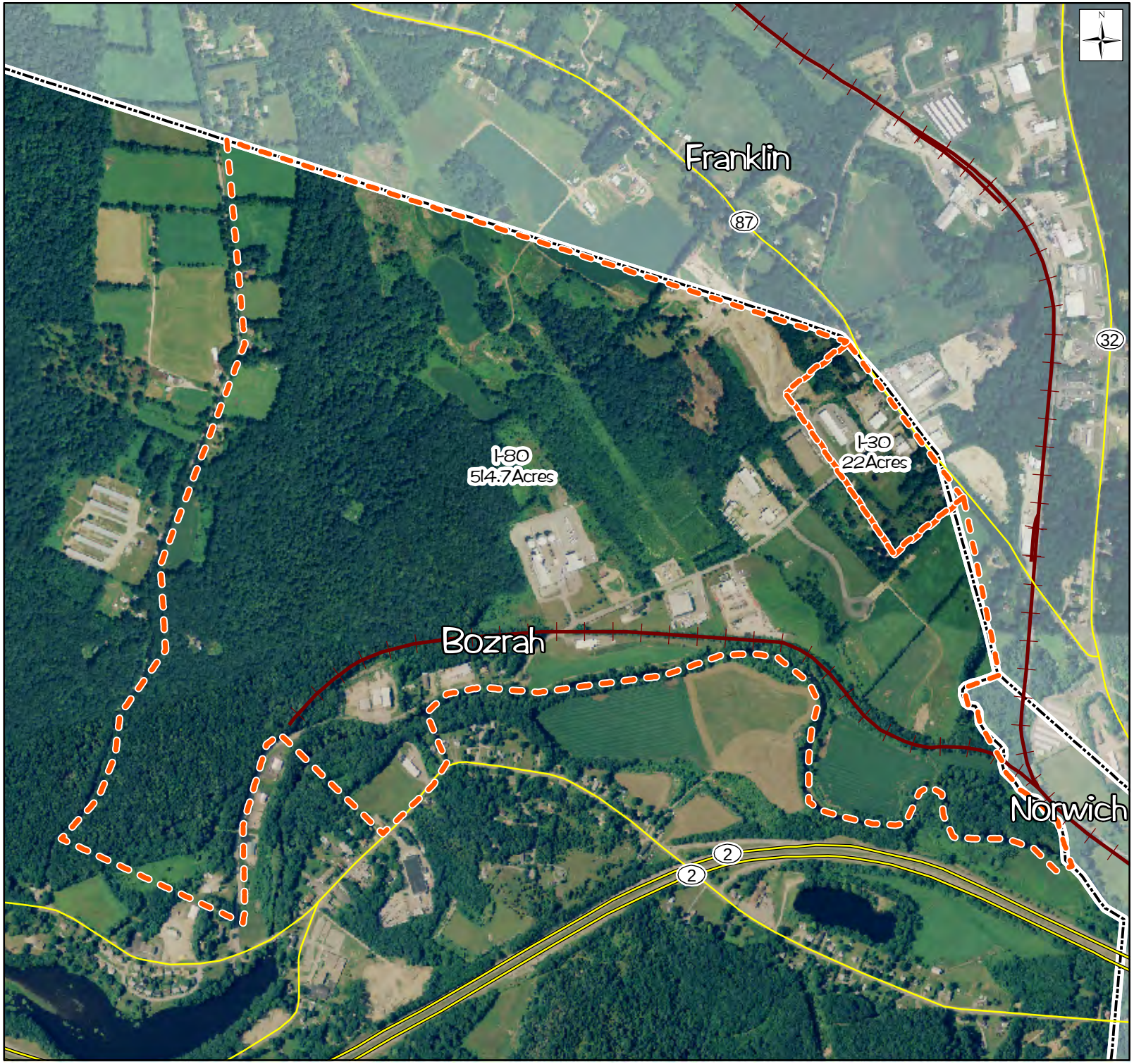
In addition to the sites and zones discussed above, ConnDOT's recent TIGER application for improvements along the NECR line identified sites further north in Stafford that may be appropriate for Inland Port activities. These include 70 acres on the NECR line near Interstate 84 and Route 32 for which the landowner has garnered municipal support to develop a distribution/freight type use; and the Stafford Industrial Park.

Summary of Findings

Within approximately 30 miles of the State Pier Facility, there are many potential sites for inland port activities that are already connected to the State Pier Facility by rail and are currently zoned for these types of uses. Expansion of port and rail connections for distribution of goods coincides with State initiatives to upgrade rail lines and provide lower cost transportation options to Connecticut businesses.

The currently available properties on Eastern Avenue in New London offer the most obvious benefits and potential for expanded port use in the short term. They are adjacent to the existing State Pier Facility property and offer indoor and outdoor storage opportunities.

Other sites located further from the State Pier Facility offer long-term opportunities for Inland Port operations, especially as rail upgrades occur on the NECR and P&W lines over the next several years. Improvements to the railroads and satellite port activities may stimulate interest in the Foreign Trade Zone surrounding the State Pier Facility and help to generate export business in the State.



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-3
Appropriately Zoned Areas for Inland Port Operations
Bozrah, CT

Legend

- *Industrial or Heavy Commercial Zoned Areas*
- *Railroad*

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.125 0.25 Miles

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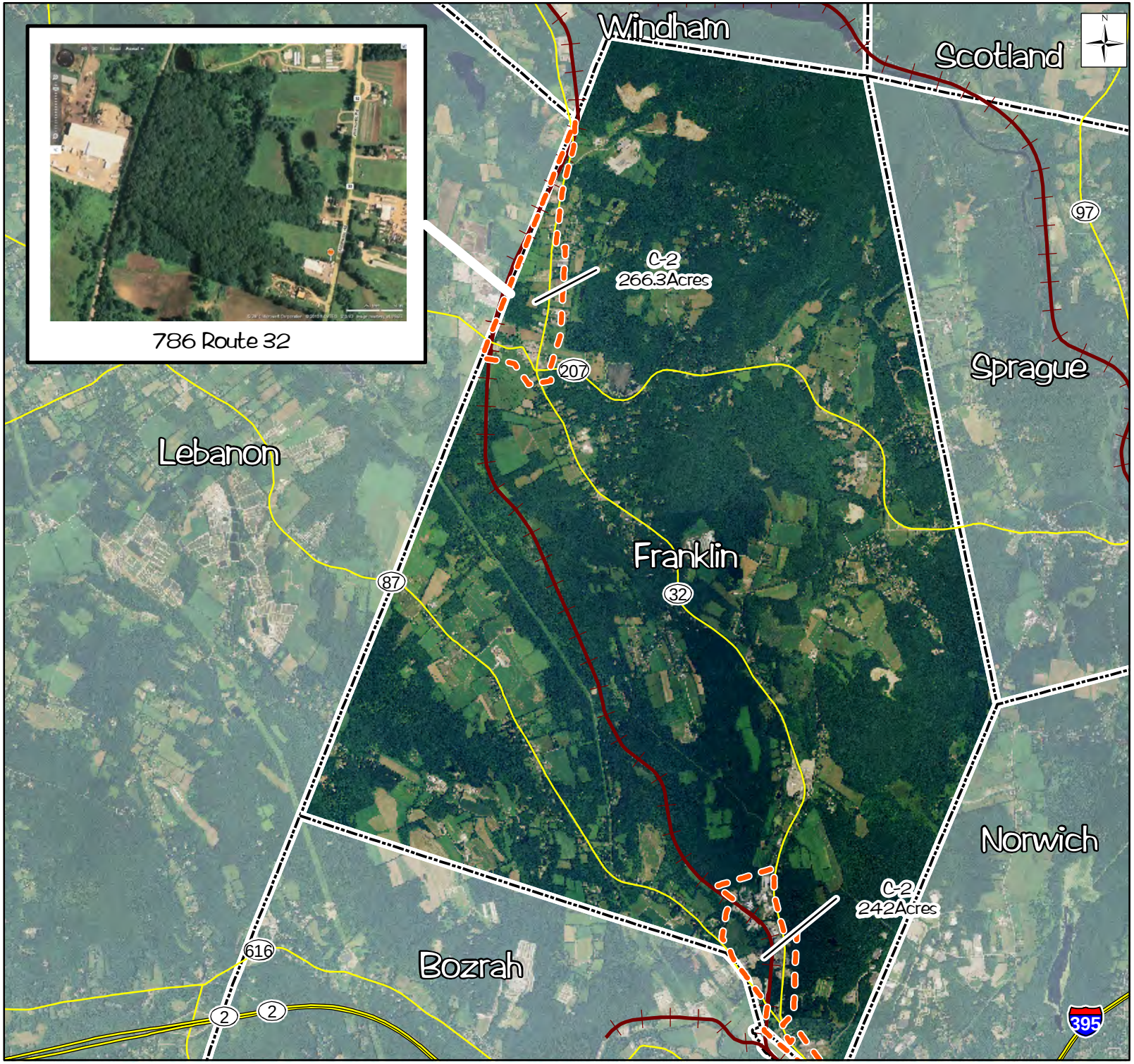
EW	EW	MZ	1433-62

DATE: *October 2010*



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-4
Appropriately Zoned Areas for Inland Port Operations
Franklin, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 1 Miles

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EW	EW	MZ	1433-62

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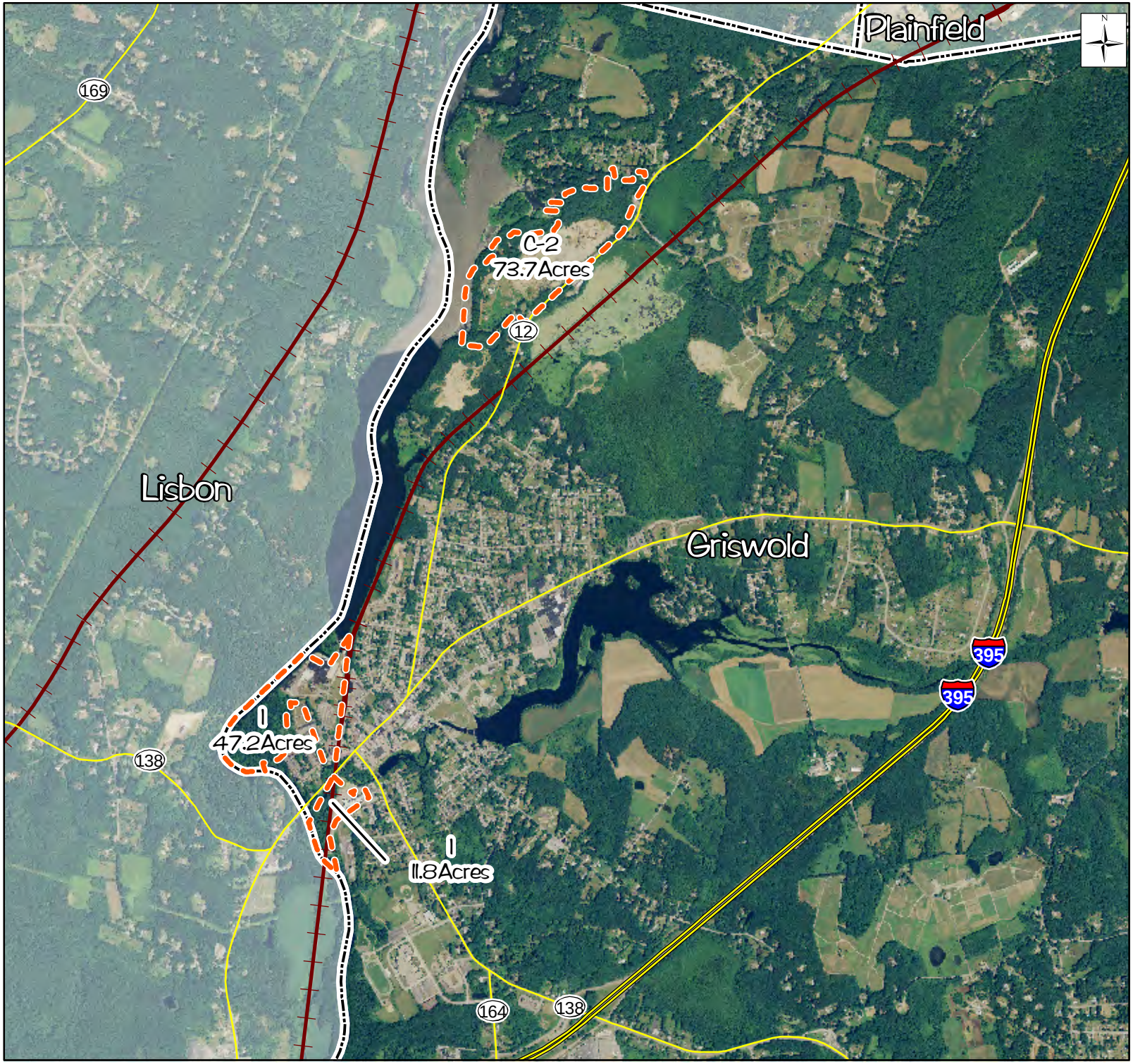

State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-5
Appropriately Zoned Areas for Inland Port Operations
Griswold, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 Miles

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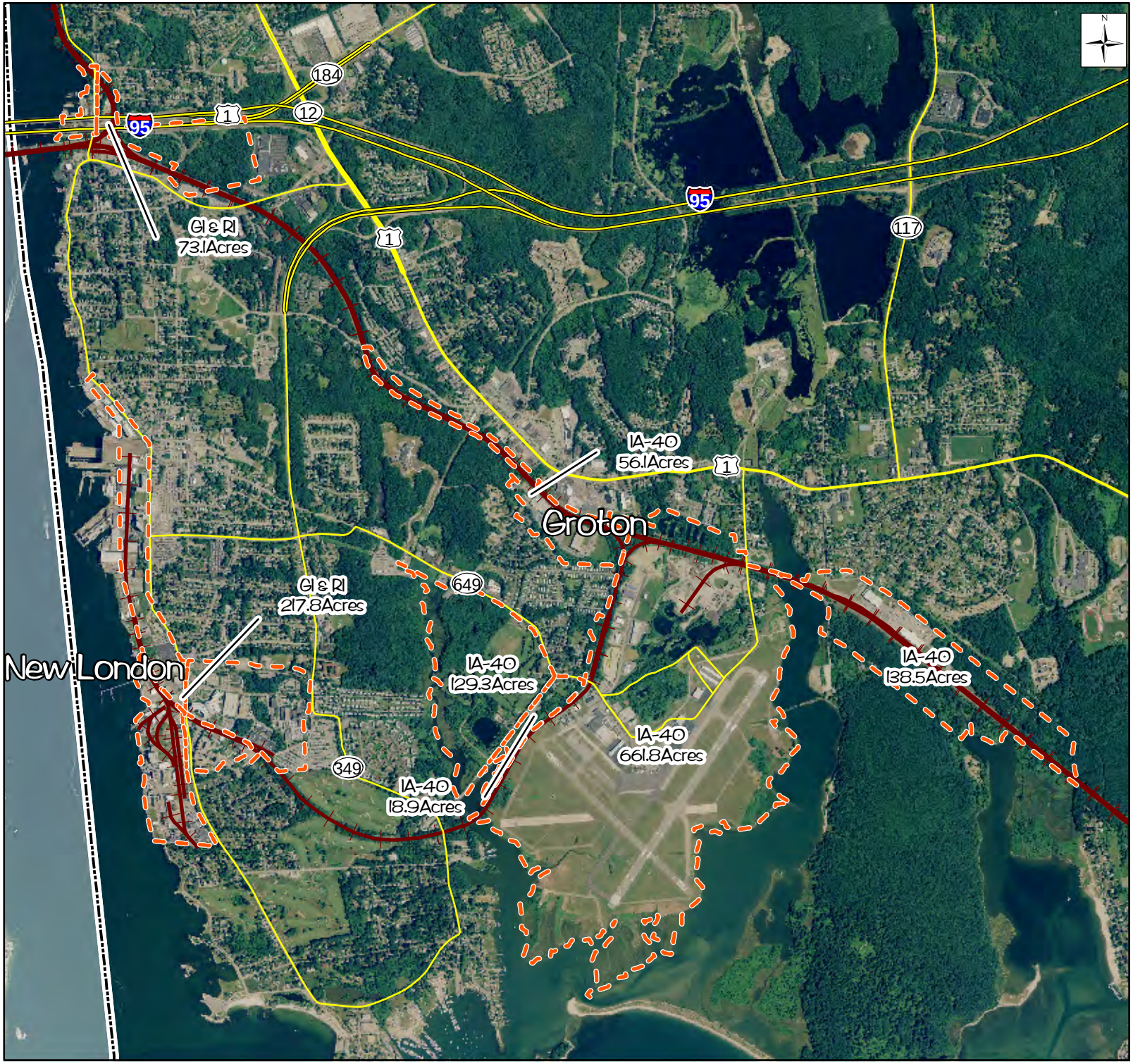
EW	EW	MZ	1433-62

DATE: October 2010



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-6
Appropriately Zoned Areas for Inland Port Operations
Groton, CT

Legend

- *Industrial or Heavy Commercial Zoned Areas*
- *Railroad*

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.125 0.25 0.5 Miles

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State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-7
Appropriately Zoned Areas for Inland Port Operations
Lebanon, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 Miles

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State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-8
Appropriately Zoned Areas for Inland Port Operations
Ledyard, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.1 0.2 Miles

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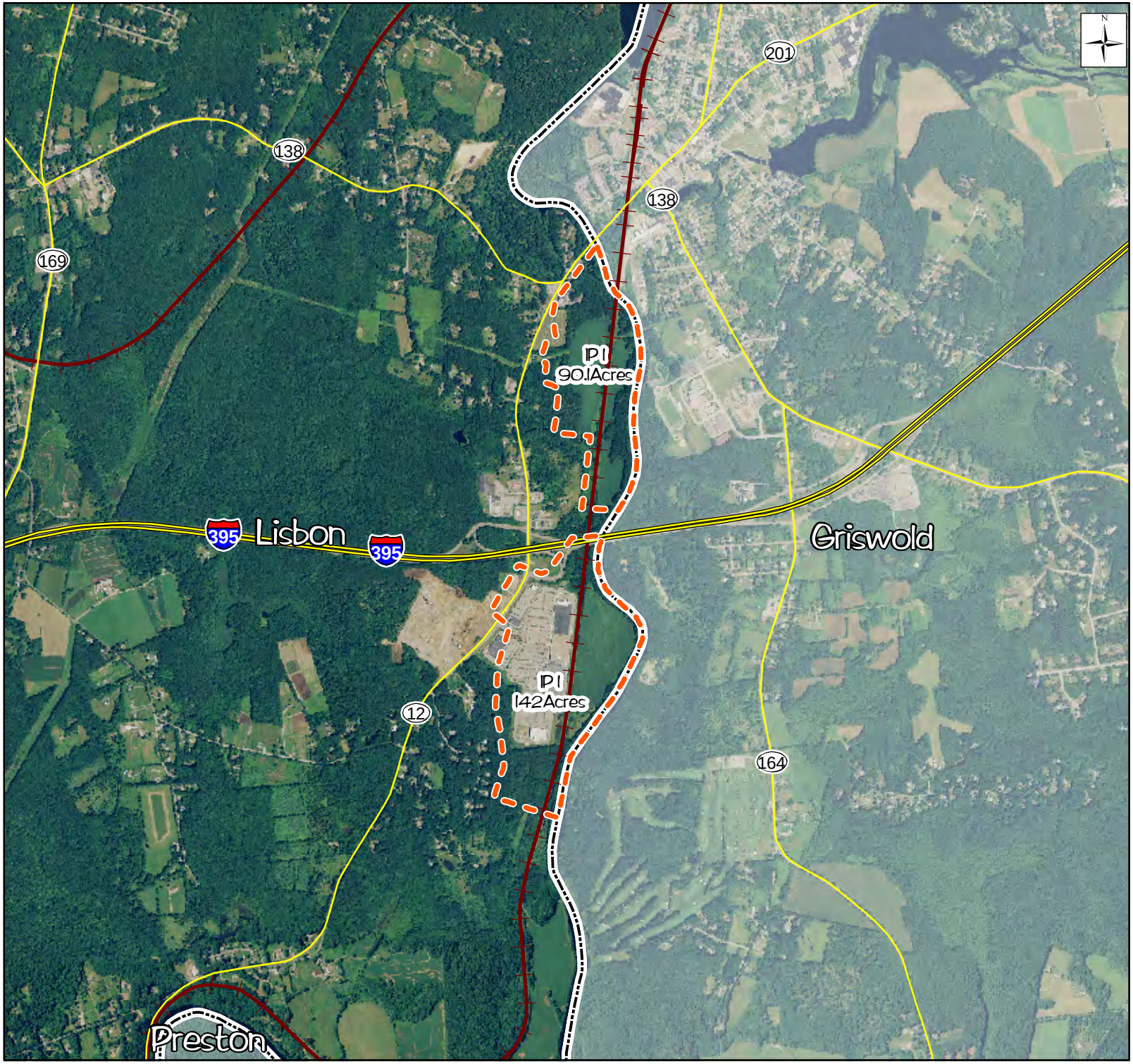
EW	EW	MZ	1433-62

DATE: October 2010



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-9
Appropriately Zoned Areas for Inland Port Operations
Lisbon, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 Miles

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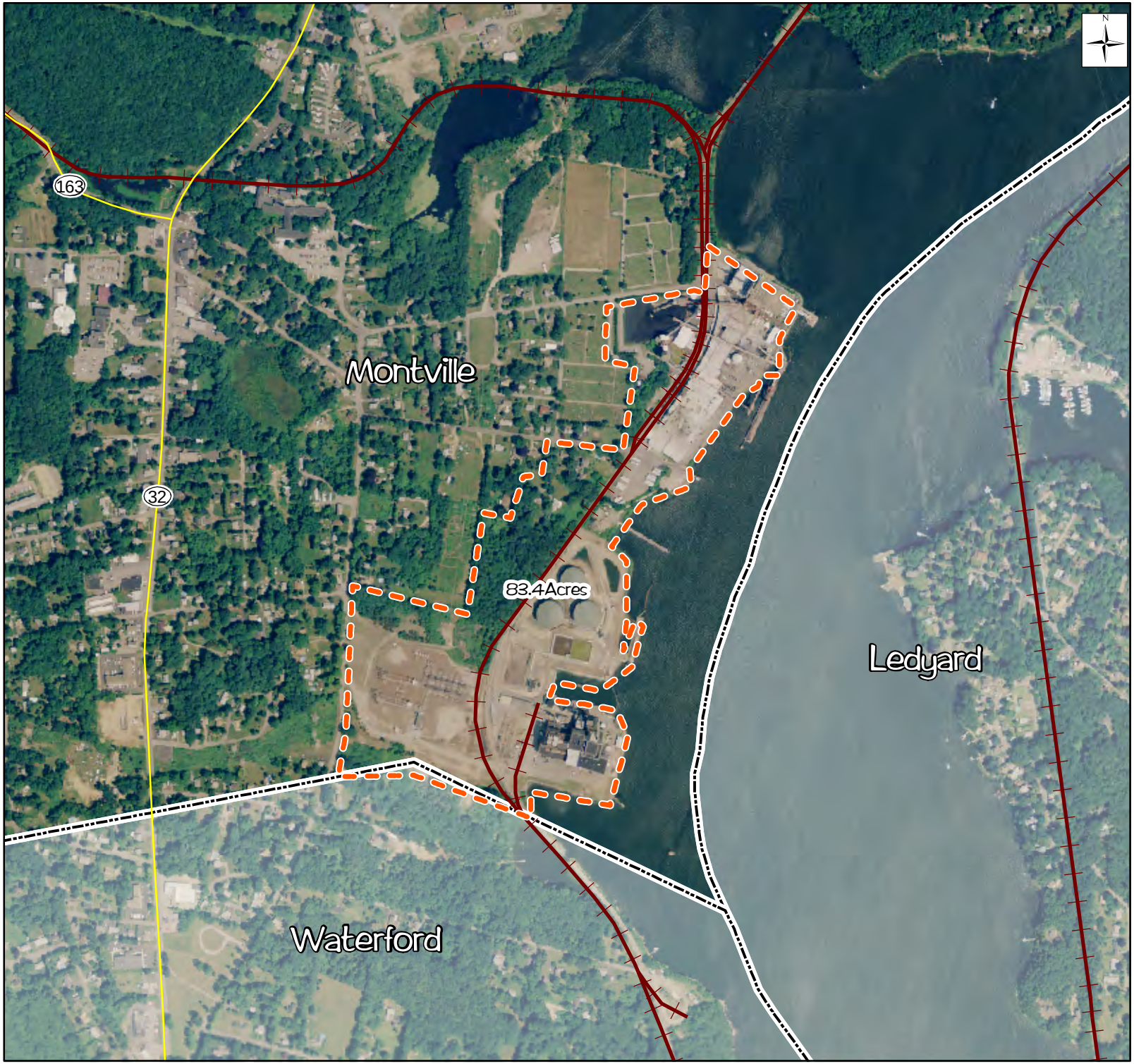

State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-10
Appropriately Zoned
Areas for Inland Port Operations
Montville, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Industrial Zones: Town Zoning Maps

0 0.05 0.1 0.2 Miles

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State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-11
Appropriately Zoned
Areas for Inland Port Operations
New London, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
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Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.125 0.25 0.5 Miles

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EW	EW	MZ	1433-62

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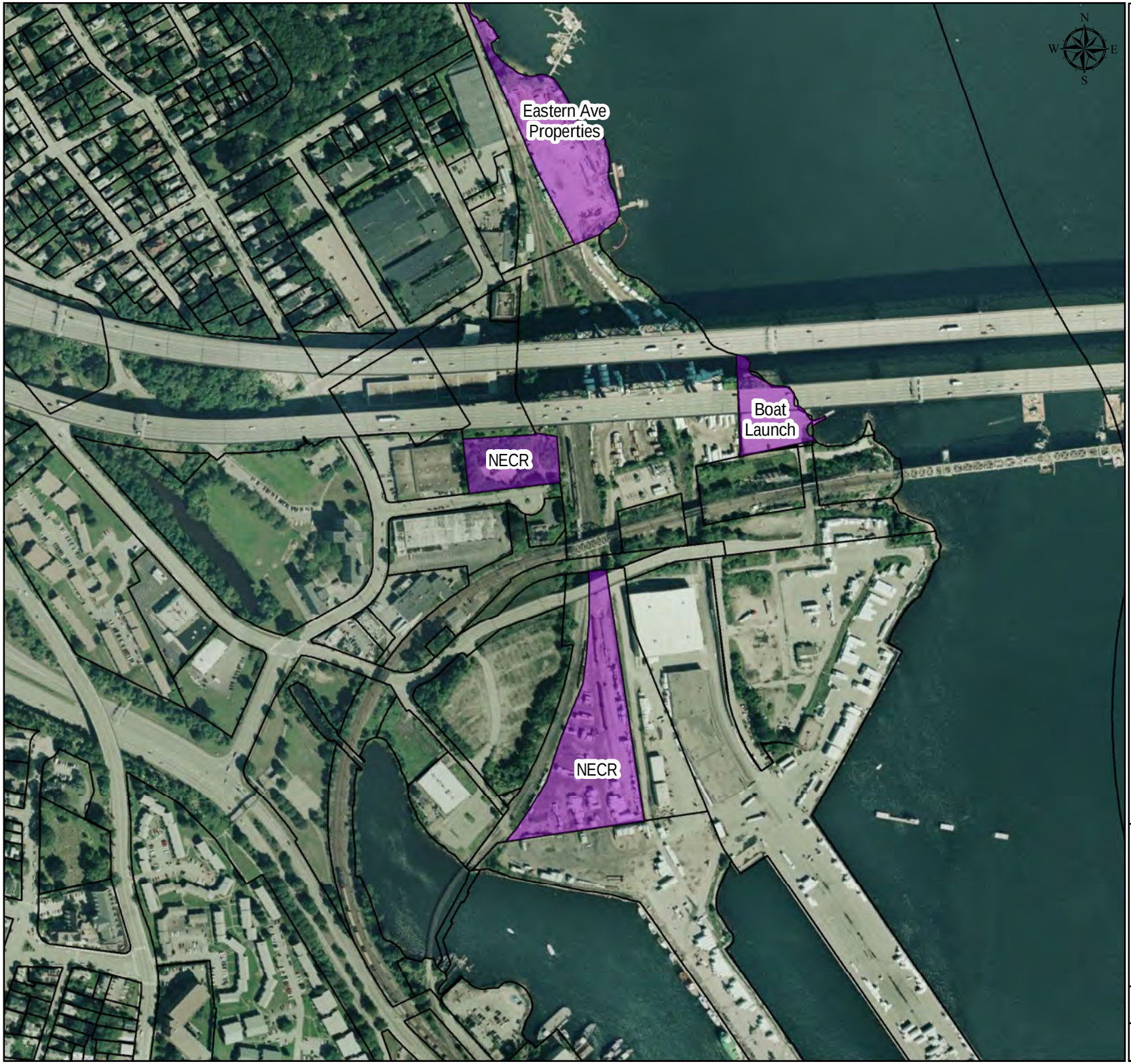

State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.14-12
Potential
Expanded
State Pier Area

Potential Areas for Expansion

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Cheshire, Connecticut 06410
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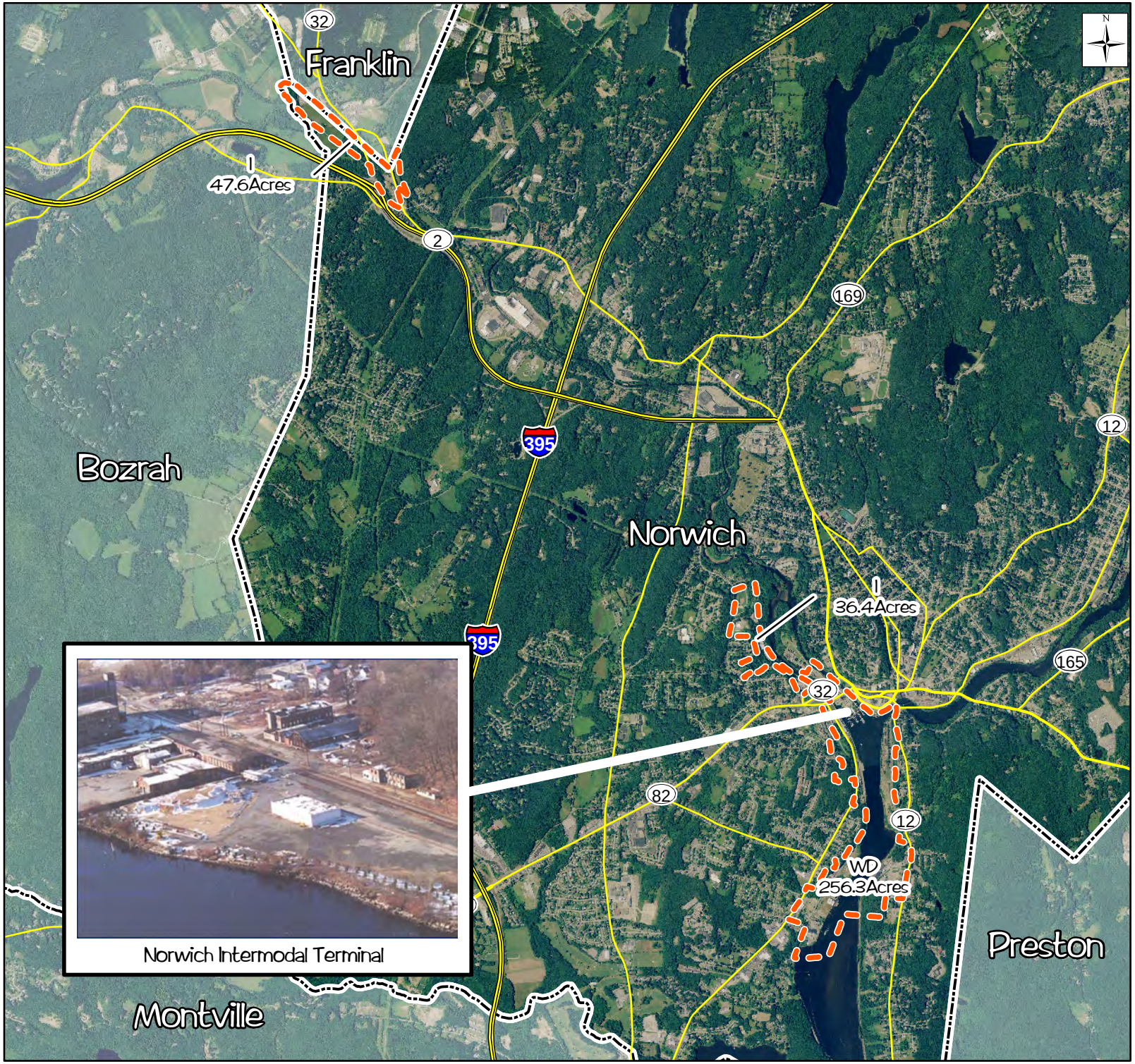
Sources:
CT DEP Geographic & Information Center, CT Parcels, 2010.
StreetMaps USA, 2010.

250 125 0 250 Feet

DESIGNED	DRAWN	CHECKED	PROJECT NO.:
RA	RA	MZ	4334-01
SCALE:	DATE: July 27, 2010		FIGURE: Figure 1



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-13
Appropriately Zoned Areas for Inland Port Operations
Norwich, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 1 Miles

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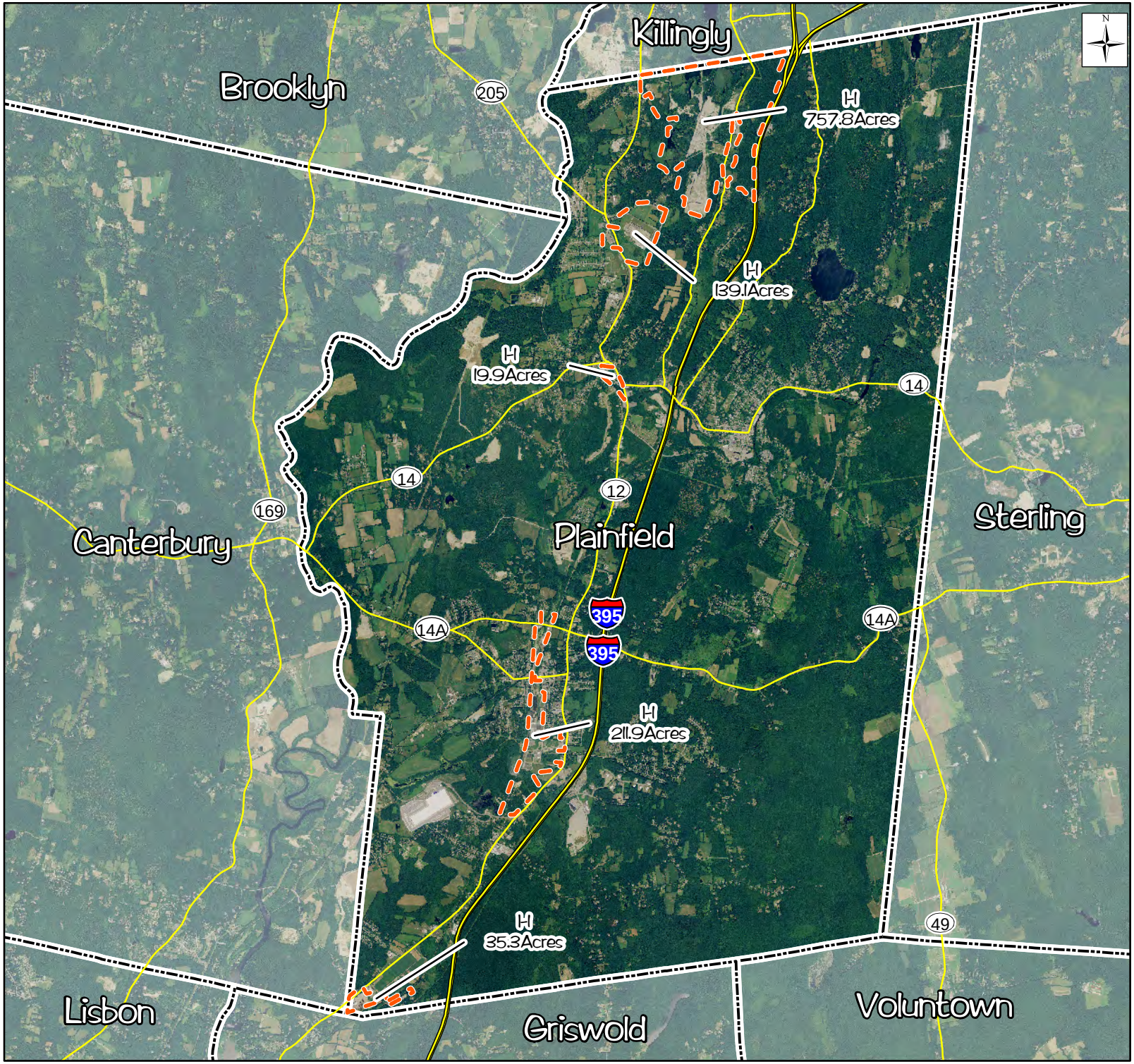
EW	EW	MZ	1433-62

DATE: October 2010



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-14
Appropriately Zoned Areas for Inland Port Operations
Plainfield, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
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United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.5 1 2 Miles

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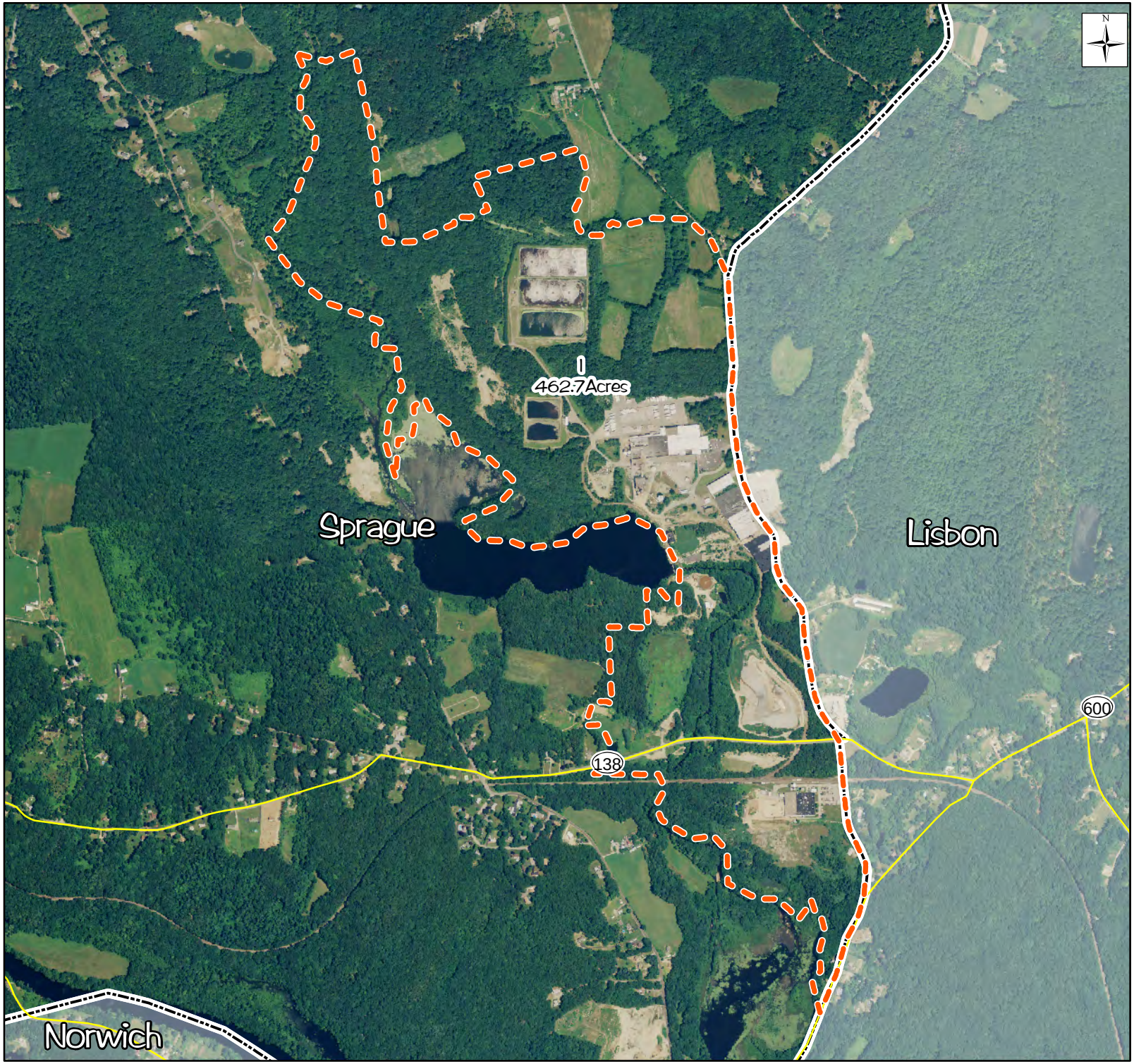

State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-15
Appropriately Zoned Areas for Inland Port Operations
Sprague, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.125 0.25 Miles

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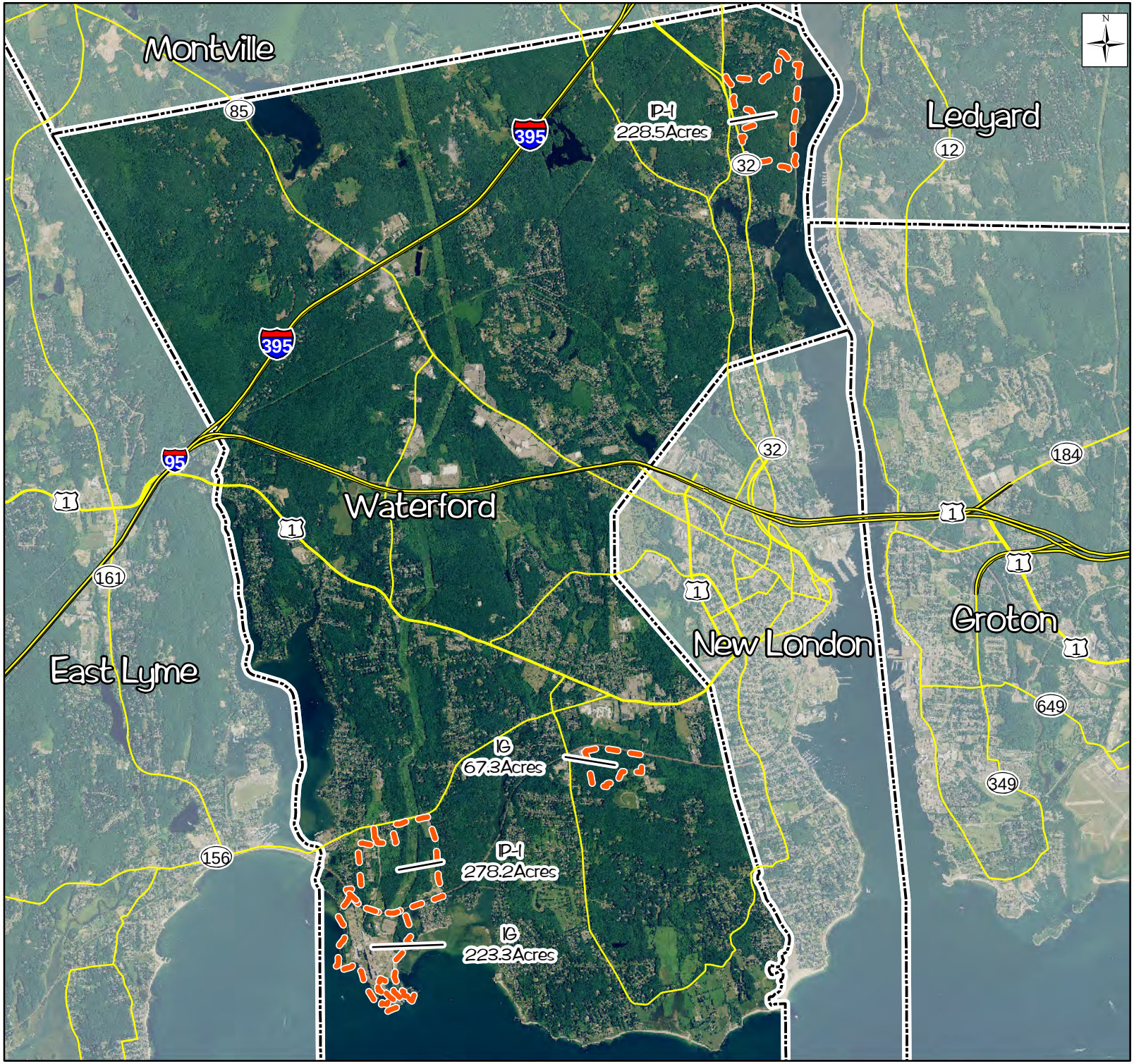

State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-16
Appropriately Zoned
Areas for Inland Port Operations
Waterford, CT

Legend

- Industrial or Heavy Commercial Zoned Areas
- Railroad

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Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 1 Miles

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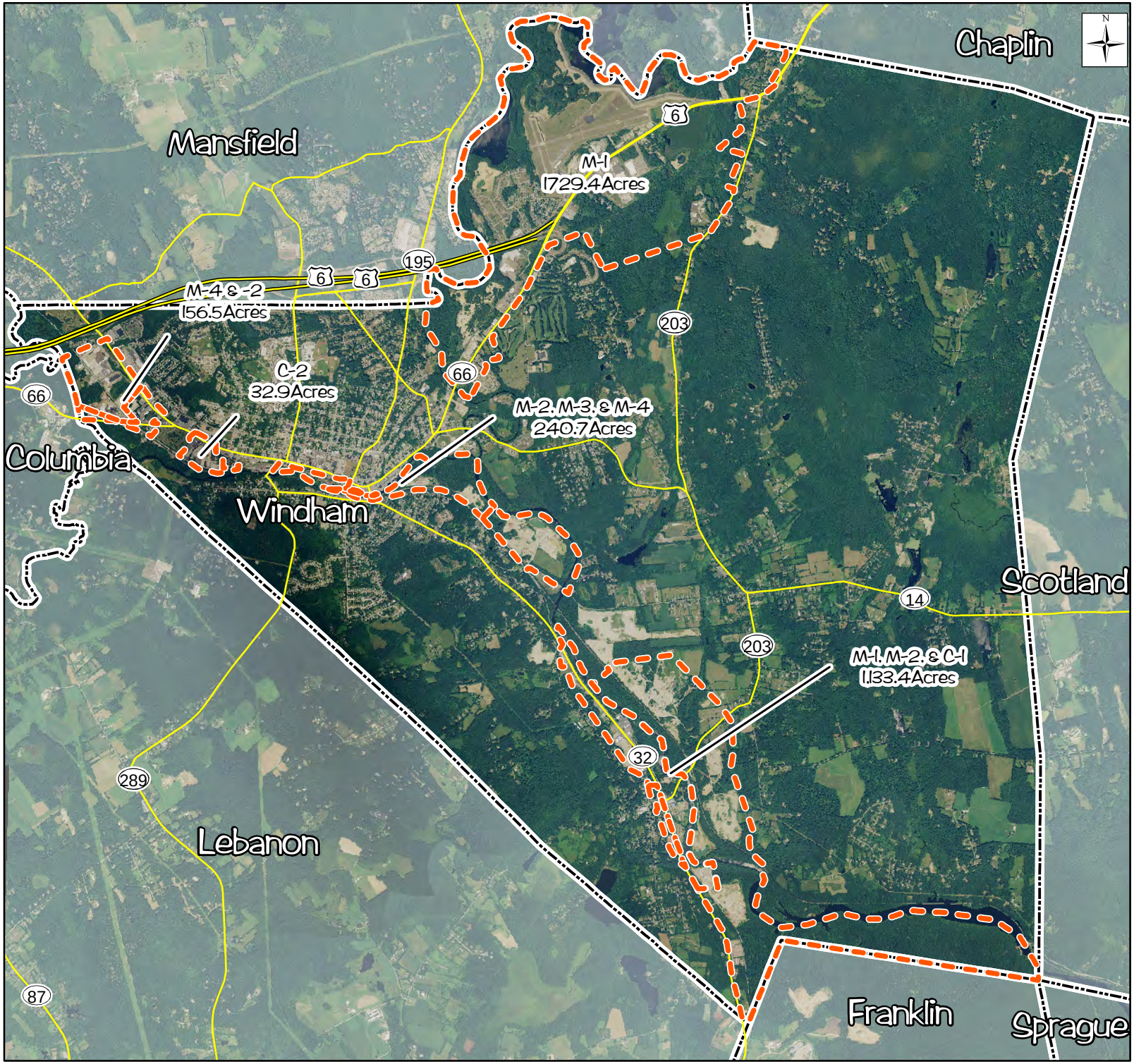
DATE: October 2010



State Pier Needs & Deficiencies Planning Study

New London, CT

Figure 3.4-17
Appropriately Zoned Areas for Inland Port Operations
Windham/Willimantic, CT

Legend

- *Industrial or Heavy Commercial Zoned Areas*
- *Railroad*

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www.miloneandmacbroom.com

Sources:
Connecticut Department of Environmental Protection
Street Map USA (2008).
United States Department of Agriculture NAIP Aerial Photographs (2008)
Industrial Zones: Town Zoning Maps

0 0.25 0.5 1 Miles

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EW	EW	MZ	1433-62

DATE: *October 2010*

Appendix E:

Study Area Geo Database Table

New London State Pier
Connecticut Department of Transportation Project #00-940222PL
Study Area Geo Database

As of October 2010

Base Map

NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Existing Land use	Existing_Landuse	Parcel data with Assessor records	Polygon	City of New London, Engineering Dept

Imagery

NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
2004 Aerials	Aerial_2004	2004 Black and White Imagery	Raster	CT Department of Environmental Protection
2008 Aerials	State_Pier_Aerial_2008	2008 Color Imagery	Raster	USDA NAIP 2008 Color Aerials
NOAA Chart	N Chart 132131.tif	NOAA Chart 132131 Navigable Channel for New London Harbor and Vicinity	Raster	U.S. Department of Commerce National Ocenaic and Atmospheric Administration Chart 13213, New London Harbor and Vicinity
Logistec Lease	Logistec_Lease.img	Logistec Lease Map	Raster	As digitized from ConnDOT Exhibit C-1A, revised 2/26/2007

Marine

NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Coastal Flood Zones	Coastal_Flood_Hazard_Areas	Major Floodways, City of New London	Polygon	City of New London; FEMA DFIRM Maps
Major Contours	Contours_Maj_dxf_Polyline	Major Water Contour Lines	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Minor Contours	Contours_Min_dxf_Polyline	Minor Water Contour Lines	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Watershed Boundaries	Watershed_Boundaries	Boundary Line of Watershed	Line	City of New London, Engineering Dept
Wetlands	Wetlands	Citywide Wetland areas, hydric soils and type	Polygon	City of New London, Engineering Dept

Planimetric New London				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Bridge	bridge	Bridges	Polygon	City of New London, Engineering Dept
Bridgeline	bridgeline	Bridge Lines	Line	City of New London, Engineering Dept
Buildings	bldgs	Building Footprints	Polygon	City of New London; updated by MMI
Center Road Lines	Roadclines	Road Center Lines	Line	City of New London, Engineering Dept
Mass Points	contourpoint	Mass Point Elevations	Point	City of New London, Engineering Dept
Contours	contourline	Contour Lines	Line	City of New London, Engineering Dept
Drainage Lines	drainageline	Ditch and Outfalls	Line	City of New London, Engineering Dept
Driveways	Driveway	Paved or unpaved	Polygon	City of New London, Engineering Dept
Driveway Lines	drivewayline	Driveway lines	Line	City of New London, Engineering Dept
Fence Lines	fence	Tree lines, stone, guard, other	Line	City of New London, Engineering Dept
Infrastructure Points	infrapoint	Catch Basins and Manholes	Point	City of New London, Engineering Dept
Long Island Sound	LIS	Thames River	Polygon	City of New London, Engineering Dept
Major Roads	Major_Centerlines	Major Road Centerlines	Line	City of New London, Engineering Dept
Misc. Points	misc_pts	Pilings and NAVAID points	Point	City of New London, Engineering Dept
Parking	parking	Paved or unpaved	Polygon	City of New London, Engineering Dept
Rail	rail	Rail Roads	Line	City of New London, Engineering Dept
Right of Way	ROW	Right of Ways with owner information and location	Polygon	City of New London, Engineering Dept
Road Lines	roadsline	Paved, unpaved, island, and invisible	Line	City of New London, Engineering Dept
Roads	roads	Paved, unpaved, island, and invisible	Polygon	City of New London, Engineering Dept
Side Walk Lines	swalkline	Side walk lines	Line	City of New London, Engineering Dept
Side Walks	swalk	Side walk	Polygon	City of New London, Engineering Dept
Structures	struct	Boardwalks, Docks, Oil tanks, Piers, Rip Rap, Ruins, Water Tanks, other.	Polygon	City of New London, Engineering Dept
Trees	tree	Trees	Point	City of New London, Engineering Dept
Vegeatated Areas	vegarea	Vegetated areas with Trees or Brush	Polygon	City of New London, Engineering Dept
Vegetated Area lines	vegarealine	Vegetated area boundary lines	Line	City of New London, Engineering Dept
Water bodies	hydro	River, Lakes, Ponds	Polygon	City of New London, Engineering Dept
Water body lines	hydroline	Streams, Rivers, Shore, Edges	Line	City of New London, Engineering Dept

State Pier Property (Extent State Pier & Surrounding)				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Catch Basins	Conn_dot_Catchbasin	Catchbasins by DOT description	Point	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Curbs	curbs	Curbing	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Drainage	Drainage	Drainage Lines	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Fences	Fences	Fence Lines	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Fire Hydrants	ConnDOT_Fire_hydrant	Location of Fire Hydrants on site	Point	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Gas Station	Gas_station_lines	Fuel Station Lines	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Gas Station	Gas_station	Location of fuel Station	Point	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Lease Areas	State_Lease_Areas	Locations of Lease and lessee	Polygon	As digitized from ConnDOT Exhibit C-1A, revised 2/26/2007
Lighting	lighting	Location of lights	Point	ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228

State Pier Property (Citywide)				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Navigable Channels	Navigable_Channel	Navigable Channel in the New London Harbor	Line	U.S. Department of Commerce National Ocenaic and Atmospheric Administration Chart 13213, New London Harbor and Vicinity
Retaining Walls	retaining_walls	Retaining Walls	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Right of Way	ConnDOT_ROW	Right of Ways on site	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Signs	Signs	Signage on property	Point	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Spot Elevation	Topo_spot_elevation	Spot elevation	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
State Pier Contours	Topography	2 & 10 Ft Contours	Line	As digitized from ConnDOT Site Lighting Improvements Admiral Shear State Pier in the Town of New London Survey, State Project 94-228
Structurally Unsound Areas	Structurally_Unsound	Locations at Pier that are structurally unsafe	Polygon	As digitized from Milone and MacBroom, Inc.
Utility				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Catch Basins	catch_basin	Catch Basins	Point	City of New London, Engineering Dept
Sanitary Pipe Line	san_pipeline	Type, Plan #, and size of pipelines	Line	City of New London, Engineering Dept
Sanitary Pipe Node	san_pipenode	Locations and identification	Point	City of New London, Engineering Dept
Sanitary Structure Point	san_structpoint	Type, ID, and source	Point	City of New London, Engineering Dept
Water Pipe Line	wat_pipeline	Type, Plan #, and size of pipelines	Line	City of New London, Engineering Dept
Water Pipe Point	wat_pipepoint	Type and Source	Point	City of New London, Engineering Dept

Utility				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
Water Structure Point	wat_structpoint	Blowouts, hydrants, manholes, valves, ect.	Point	City of New London, Engineering Dept
Fiberoptic	Fiberoptic	Fiberoptic Lines	Line	As digitized from Fibertech Networks LLC Reel # 725 and AS-Built State Pier Road @ Fraser Street, dated: 12/16/04
Gas Lines	Gas	Gas Lines	Line	As digitized from maps provided by Yankee Gas
Light Poles	Lightpoles	Location of Light Poles	Point	As digitized from maps provided by Connecticut Light and Power
Overhead Light Wires	Overhead_Wires	Location of overhead wires	Line	As digitized from maps provided by Connecticut Light and Power
Utility Poles CL&P	CT_utilitypoles_clp	Location of Poles	Point	As digitized from maps provided by Connecticut Light and Power
Telephone Wires	Telephone	Location of Telephone Lines	Line	As digitized from maps provided by Connecticut Light and Power
Underground Electric Wires	Underground_Elec	Location of Underground Electric wiring	Line	As digitized from maps provided by Connecticut Light and Power
3-D Model				
NAME	LAYER NAME	DESCRIPTION	TYPE	SOURCE
3-d Model	Tin_Final_feet	3-D Model of Slope surrounding the State Pier	TIN	Generated in ARCGIS 3-D Analyst, ConnDOT Bathymetric Meter Survey (2009), NOAA LIDAR Multi-Beam Scan (2008), & City of New London Topography