



FINAL REPORT

Searsport Intermodal Commodity Study

Maine Port Authority/Maine DOT

HDR Project No. 10040573

Searsport, Maine
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1 Executive Summary

The Port of Searsport, is an intermodal distribution center serving coastal Maine and inland areas such as Bangor and Augusta, as well as extending into Quebec. Located on the Penobscot Bay near the entrance of the Penobscot River, The Port is well suited to handle a multitude of cargoes including bulk, neo-bulk, break bulk, project and containerized cargo.

With available property area for expansion and direct access to rail, road and pipeline infrastructure. The Port of Searsport has several advantageous attributes for a successful intermodal marine operation. Searsport is one of the most versatile Port facilities in New England. The facilities at the Mack Point Terminal are diversified, flexible and capable of handling a wide range of cargoes of all types. The terminal is professionally managed, with a skilled workforce, adequate equipment, ample dry and liquid bulk storage, warehouse space, on-site rail, and good highway access.

Some improvements are needed, however to bring the infrastructure at the Port up to current operating standards, particularly with respect to channel dredging and rail yard improvements. Rail improvements are currently under construction, however, thanks to a FY-2015 TIGER VII grant awarded to Maine DOT to help support the Maine Regional Railways Project.

Searsport has a number of potential cargo development opportunities. Including available land for industrial park development with potential integration into a Foreign Trade Zone, as well as connections for marine highway trade (i.e. short sea shipping). The first step in new business development relies on the ability to grow industrial activities, particularly those that can support waterborne transportation, both domestically and internationally. Business opportunities identified and discussed in this report include:

- Petroleum and gas distribution
- Vessel bunkering
- Dry bulk-biomass, wood chips, wood pellets and lumber
- Cement
- Chemicals, fertilizer and urea
- Road salt
- Scrap metal
- Project cargo and containerized cargo
- non petroleum bulk liquids

While the Port of Searsport's core business is most likely to remain bulk commodities, the facility can also handle containers and project cargoes on a regular basis, as demonstrated by the terminal's recent experience with handling material and equipment for the wind power industry. Infrastructure improvements recommended for Searsport include channel maintenance dredging, rail yard improvements, and upgrades in cargo handling equipment to improve operations. Development of available land near the port facilities into an industrial park is also recommended for generating future growth for Searsport.

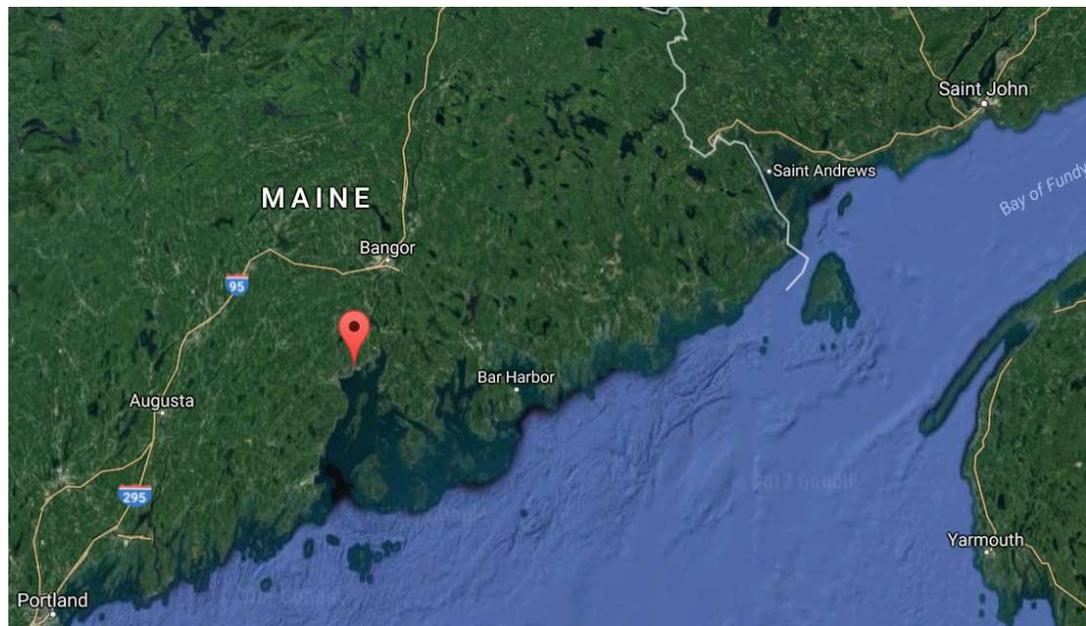
2 Introduction

2.1 Purpose and Scope

The Maine Port Authority is conducting a study for the Port of Searsport to assist with its efforts to identify potential business development opportunities for this important Maine community. Through a three port strategy, the Maine Port Authority’s mission is to “improve the global competitiveness of Maine Business by developing and operating marine and rail facilities, in a responsible fashion, for the intermodal movement of people and cargo.” From this study, the Maine Port Authority will gain a clear understanding of Searsport’s strengths and identify commodities moving through the region to be able to prioritize business development opportunities at the Port.

The Port of Searsport, located on the Penobscot Bay near the entrance of the Penobscot River, serves as a distribution Port for the coastal area and inland areas between Bangor and Augusta. Additionally, inland areas extending up through the Province of Quebec into Canada rely on the Port. The Port is well suited to handle a multitude of cargoes including bulk, neo-bulk, break bulk, project and containerized cargo. Though some improvements are needed to bring the infrastructure at the Port up to current operating standards, the elements that make the Port advantageous to existing and potential businesses include available property area for expansion and direct access to rail, road and pipeline.

Figure 1: Port of Searsport Aerial Map¹



¹ Source: Google Earth

2.2 Work Approach

The work approach for this study consisted of the identification of potential market opportunities through a series of key steps that were built on available previous research and studies, new data collection, an analysis of existing facilities, and information from potential shippers.

The general methodology was as follows:

1. Reviewed existing reports and historical data related to cargoes that have been handled in the Port of Searsport and within the region, including Northern New England, Southern New Brunswick and other identified geographic market areas.
2. Functionality analysis of the Port's facilities, including a cursory physical review of existing Port assets, equipment, and marine infrastructure.
3. Interviews with representatives from Maine Port Authority, Sprague Energy, Penobscot Bay & River Pilots Association, and the Central Maine & Quebec (CMQ) Railroad.
4. Analysis of potential international and domestic business partners that could utilize Searsport as an intermodal facility.
5. Identification of potential primary, secondary and tertiary opportunities including potential business development contacts.

Access to previous studies and collected data were provided by a variety of sources to help develop this study. For example, Searsport representatives were able to share non-proprietary business opportunities that need support in order to develop further. Additionally, site visit and interviews allowed for review of existing Port infrastructure assets and supported development of a functionality assessment of the Port's operational capabilities and constraints.

The commodity assessment for Searsport took into account the Port's physical capabilities and constraints, shipper interests, worldwide commodity flows relevant to the Port, resource availability, and it identified potential markets and plausible business partners. The analysis included a review of both domestic and international opportunities.

The economic analysis is based on a review of publicly available data, as well as data available from the Port of Searsport. This information combined with the interview findings, was used to establish a complete understanding of what goods are currently being moved through the facilities, what services are provided at the Port, and whether there are impediments to growth.

2.3 Literature Review

The commodity study developed for the Port of Searsport was inspired and supported through the review of existing Port and Freight studies in New England. These examples identified a need for further research into possible market opportunities at the Port of Searsport based on the existing facilities capabilities, Port constraints, and current market trends. The following reports were identified and reviewed for reference in this study.



- 2007 “Port Development Strategic Plan” – Maine Port Authority
- 2014 “Maine Integrated Freight Strategy Final Report” – Cambridge Systematics, Inc.
- 2016 “Massachusetts State Piers Economic Analysis” – Karl F. Seidman Consulting Services and UrbanFocus, LLC

The “Port Development Strategic Plan” identifies a number of key economic factors and industry changes that drive demand for additional container facilities on the U.S. East Coast. The plan highlights Searsport, Maine as having a naturally deep-water approach, to within a mile of the Port, which is suitable, economically and competitively, to meet the increasing demand for container handling facilities. The strategic plan identifies growth in container and dry bulk cargo for the Port of Searsport through infrastructure development and a marketing strategy to attract Midwest cargo.

The “Port Development Strategic Plan” presents the travel distances and the number of days to ship commodities from Northern Europe to various Northeastern Ports shown in Table 1. A business case can be presented to potential shippers if goods can be moved through Maine Ports more efficiently and cost effectively, than other East Coast ports.

Table 1: Vessel Travel Time - North Europe to US North Atlantic Region

U.S.-Canadian Port	Distance from Rotterdam (Nautical Miles)	Hours @ 25 Knots Per Hour	Days
Montreal ²	3135	125.4	5.2
Halifax	2742	109.7	4.6
Searsport	2972	118.9	5.0
Boston	3090	123.6	5.2
Newark (NY)	3276	131.0	5.5
Baltimore	3570	142.8	6.0
Norfolk	3454	138.2	5.8

The Integrated Freight Strategy Report for Maine aims to identify emerging issues and challenges faced by both system users and state transportation planners and policy makers, describe the implications of those challenges, and outline a vision for the next decade’s transportation policy and investment activities.

The current freight system in Maine, freight related programs and investments, key trends impacting the freight system, both locally and internationally, and key issues and challenges were all areas addressed in the 2014 “Maine Integrated Freight Strategy Report.” This report, echoing the “Port Development Strategic Plan”, noted that “While Maine’s transportation infrastructure accommodates current demand reasonably well,

² Vessels to Montreal have long sailing times in and out of the St. Lawrence Seaway.

future economic growth might outpace capacity”. Infrastructure improvements at Port of Searsport could support future economic growth across Maine’s Port system vital to this region.

The findings of these studies were considered throughout the functionality assessment, commodity analysis, and development of final recommendations.

3 Functionality Assessment

As part of the Searsport Intermodal Commodity Study, the team conducted an on-site inventory of existing facilities. This section describes the facilities and equipment available at Searsport, as well as the transportation system in and around the Port.

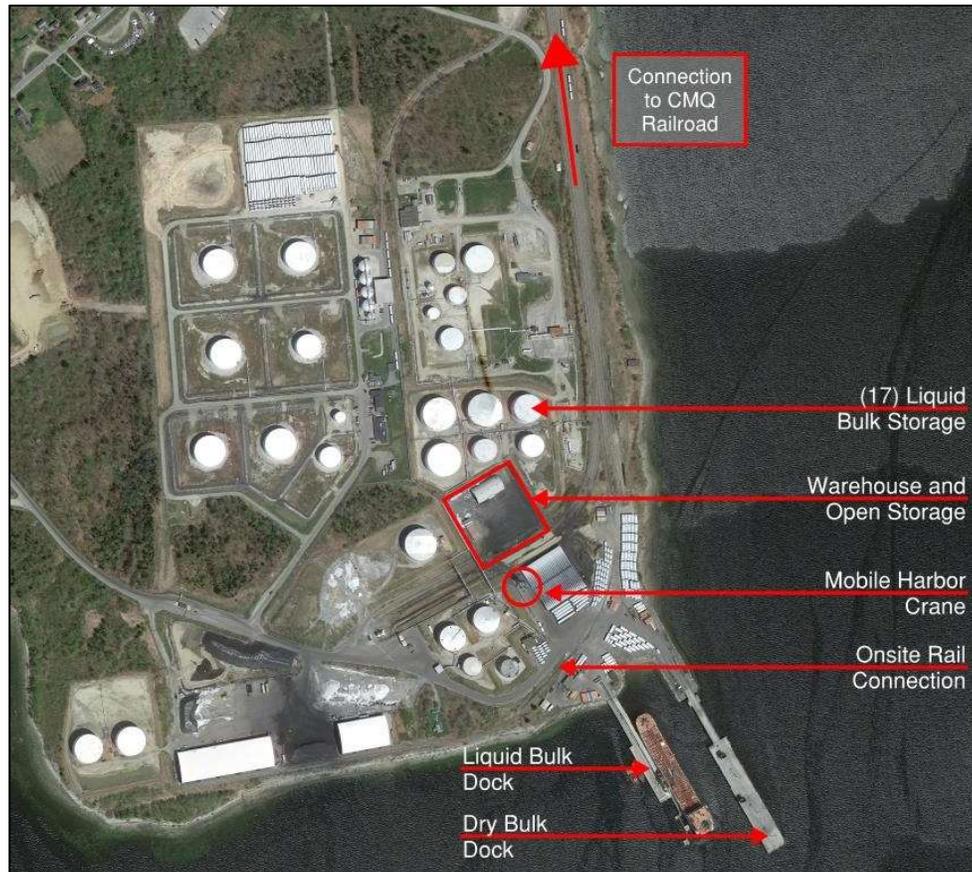
3.1 Property Overview

The Port of Searsport is an active bulk cargo Port located mid-coast near the metropolitan area of Bangor, Maine. Located on Penobscot Bay near the entrance to the Penobscot River, the Port has been active since the 1700’s. Originally developed as a shipbuilding community, it also served local fisheries and was a key Port in the handling of ammunition and materiel in the 20th century. Landholdings at the primary Port location, Mack Point, are held by Sprague Energy, Irving Oil and the State of Maine. The Searsport facilities serve as a refined product distribution hub for the coastal area and inland areas between Bangor and Augusta. The Port also serves inland areas extending into the Province of Quebec into Canada. It is one of the largest continuously active Port facilities in the State second only to Eastport in property size. The Port is very well equipped and set up for a multitude of cargo handling operations.

The Port’s facilities are capable of supporting a wide range of bulk cargoes, and have handled a number of different cargoes in the last few years; although a decreased number of ship calls indicate the throughput tonnage is declining. Some of these cargoes such as salt, cement, and some petroleum products remain stable. Liquid bulk commodities handled at the Port have included chemicals, light refined oils (including home heating oil), gasoline and diesel fuel, and bio-fuels. In addition, the Port has supported many dry and neo-bulk commodities including; kaolin, asphalt, petcoke, coal, scrap metal, pig iron, seaweed, cement, wood pulp, paper, wood pellets, fertilizer, agricultural products, gypsum, aggregate, iron oxide, copper slag, and minerals such as salt. Project cargoes have also been historically successful at the Port. Wind power turbine components intended for regional energy projects are well suited for the terminal. The Port is slated for a test project involving offshore floating wind turbines which will be assembled on site. Currently, most of the cargo moved in and out of the Port is liquid bulk. The dry cargo pier is utilized by only 20 percent of the vessels³ calling at the terminal.

³ Sprague Energy Interview (9/14/16)

Figure 2: Aerial View of Mack Point Cargo Facility at Searsport⁴



3.2 Existing Equipment

The Port of Searsport boasts a 145-acre site, which contains 17 bulk liquid tanks with a total capacity of 1.1 million barrels. Some of the tanks are equipped with heating systems for heavy residual fuels. There are also 15 heavy lift pads totaling 857,000 square feet and inside warehouse storage in two buildings totaling 90,000 square feet.

The Port's operations are supported by a substantial inventory of lifting and loading equipment, which includes the following;

- one 140-metric ton mobile harbor crane,
- crawler cranes and lift trucks,
- variety of cargo spreaders,
- two dockside truck hoppers,
- trackmobile, telestacker & segment conveyors,
- two Razor-Tail truck unloaders,
- front end loaders & dozers,
- truck scales,
- portable light towers, and a backup generator system

⁴ Source: Google Earth & HDR

The site is also equipped with approximately 15,000 linear feet of rail siding, a four-track liquid offload siding with a rack system for loading rail cars, heavy weight rail for handling heavy lift transfers and a trackmobile for shifting rail cars.

Approximately \$1.5 million in rail and yard improvements at Searsport are being funded through a FY-2015 TIGER VII grant as part of the Maine Regional Railways Project. The improvements include 8 new turnouts and 18,000 linear feet of new track to accommodate longer rail cars for wind turbine blades and upgrade switching operations. These betterments will greatly enhance rail access to the port by removing previous “last mile” impediments, increasing reliability of switching, and provide greater speed and capacity along the line. There is a strong working relationship between Sprague, Maine Department of Transportation and Maine Port Authority at Searsport. Improvements made to the railroad system in Searsport under the TIGER VII grant award will help support this relationship.

There are two deep-water piers at Mack Point located approximately 250 feet apart. The west pier serves as a bulk liquid dock and the east pier handles dry cargo. The dry cargo pier is owned by Maine Port Authority (MPA), which they lease to Sprague to operate. Sprague owns and operates the liquid bulk pier. The larger dry cargo pier on the southeast end of Mack Point is capable of handling bulk, neo-bulk, break-bulk, project and containerized cargoes. The pier includes a 544-foot long by 100-foot wide concrete deck supported by piles. The berth at the dry cargo dock has a depth of approximately 40 feet at MLW, and is designed to accommodate 80,000 deadweight tons (DWT) vessels of up to 750 feet in length and 106 feet beam.

Figure 3: Warehouse⁵



⁵ Source: HDR

Figure 4: Mobile Harbor Crane⁶



Figure 5: Mack Point Dry Cargo Pier⁷



The liquid bulk pier is 500 feet long and 65 feet wide, with three detached mooring dolphins which allows for 625 feet of berthing space along its east side. Liquid bulk cargoes of chemicals and petroleum products are handled on this pier. Transloading of fuel oil for vessels is also supported at the pier. The berth was originally dredged to a depth of -32 feet mean low water (MLW), however Sprague recently performed improvement dredging to bring the berth to a depth of -40 feet (MLW). To prevent undermining of the piles supporting the pier by the deeper dredging, Sprague intends to construct new fender dolphins at the berth to stand deeper vessels farther off the pier

⁶ Source: HDR

⁷ Source: HDR

face. The pier is equipped with petroleum manifolds for handling liquid bulk cargoes intended for Irving Oil, which leases property from the Maine Port Authority located adjacent to the Port.

Figure 6: Liquid Bulk Pier⁸



3.3 Transportation Links

ROAD, RAIL AND PIPELINE

The main highway servicing Searsport is Coastal Route 1, which connects through east-west roadway corridors to Interstate 95 at both Augusta and Bangor.

The Port's rail infrastructure can connect to the both U.S. and Canadian national rail systems through the Central Maine and Quebec Railway; a Class-II railroad that operates a portion of the former Bangor and Aroostook Railroad. The active line, which has had several recent ownership changes, operates from the Port west to St. Jean in Quebec where it connects to the Canadian Pacific railway. It also has a connecting line to Sainte-Rosaile (Municipality of Sainte-Hyacinthe), Quebec where it interchanges with the Canadian National railway. It also connects with Pan Am's railway, the State's largest regional carrier. There are additional spur lines to East Millinocket, Maine and to Newport, New Hampshire; where it then connects to the Vermont Rail System.

The railroad at Searsport is currently handling 3,000 rail cars per quarter with goals of increasing to 7,000 rail cars per quarter. The rail line consists mostly of 100-pound stock with an allowable speed of 25 miles per hour on most of the trackage. The rail will support 286,000 pounds including the rail car, which is comparable with most railroads of this size.

Improvements to rail infrastructure at the Port of Searsport is included in Maine's most recent TIGER grant award. The present state of the yard in Searsport makes it challenging to efficiently handle wind turbine blades and other imports and exports. The project, funded by the 2015 TIGER VII grant award, will allow for a significant rehabilitation and capacity expansion to the yard improving conditions to allow for greater reliability. The project will install 8 new turnouts, critical for handling the long cars that

⁸ *Ibid.*

the blades require, as well as install 18,000 linear feet of new rail. The reliability of switching operations will greatly increase allowing more goods to flow through the port.

An existing fuel oil pipeline runs from the Searsport terminal, through Bangor, to the Loring Commerce Centre (former Loring Air Force Base) in Limestone, Maine as shown in Figure 7. The 200-mile long pipeline was decommissioned in 1994. A portion of the corridor is now used for natural gas transmission by Bangor Natural Gas, which purchased the rights to the pipeline in 2012. Proposed uses for the pipeline corridor have included a possible refinery at Loring, a fiber optic cable right-of-way and a gas pipeline connector.

Figure 7: Bangor Gas Pipeline Corridor⁹



WATERWAY ACCESS

Searsport Harbor is located on the western side of Penobscot Bay, which has naturally deep-water for most large vessels from the ocean to the harbor entrance. The approach to the Mack Point facility is between Sears Island and the southeast side of Long Cove Ledge through the federal channel¹⁰. The natural depth of the main channel in Penobscot Bay is over 40 feet to within approximately one mile of the marine terminal at Mack Point. From the harbor entrance, there is a dredged channel leading to the facilities with a federally authorized depth of 35 feet MLW. The channel leads to a turning basin off the facilities, which also has an authorized depth of 35 feet¹¹. Information, recently provided by the Penobscot Bay Pilots, indicates that the actual realized depth of the dredged channel is between 31 and 32 feet MLW. There is also shoaling at the terminal wharves which currently leaves 35 feet of water at MLW along the dry bulk dock, and 28 feet alongside the liquid bulk berth¹².

The Port has safe anchorage located within about a mile south of Mack Point that can be used by all classes of vessels. The anchorage has minimum water depths of 18- to 32-

⁹ Source: Bangor Gas Company website: <http://www.bangorgas.com/loring-pipeline.html>

¹⁰ U.S. Coast Pilot #1, National Oceanic and Atmospheric Administration (NOAA)

¹¹ U.S. Coast Pilot #1, National Oceanic and Atmospheric Administration (NOAA)

¹² PenBay Pilot Interview, Capt. David Gelinias

feet, a soft bottom, and is sheltered from northerly winds. The anchorage location should also be dredged.

A primary reason for dredging at Searsport is its large tidal range, which typically runs between 9 and 11 feet. Larger vessels can come into the berths during the high tides, but have to be breasted off the pier with additional fenders to avoid potential grounding on the shoaled areas in the berth at low tide¹³.

4 Site Visit and Interviews

4.1 Stakeholder Interviews

Site visits were conducted in Searsport on September 13-14, 2016. HDR conducted interviews with town officials, Maine Port Authority personnel, the terminal operators, and various local stakeholders. The primary purpose of these meetings was to identify Port capabilities, existing conditions at the terminal, and commodities moving through the Port. Also discussed were necessary infrastructure improvements, current challenges, and ideas for future opportunities at the Port. A summary of the site visits and interviews conducted, as well as the focus of each discussion, are presented in Table 2. Greater detail on the interviews is provided later in this section.

4.1.1 Meeting with Town of Searsport

Discussions held on September 13, 2016, with Searsport’s Town Manager, James Gilway and Town Selectman, Jack Merrithew emphasized the town’s commitment to embrace its maritime heritage. Searsport has recently hired a part time economic development employee to support this initiative. The primary focus of this position is to explore development opportunities to grow markets connected to the marine industry.

Table 2: Searsport Site Visit & Interview Summary

Interview	Participants	Discussion Focus
9/13/16: Meeting with Town of Searsport Officials	James Gilway (Town Manager) Jack Merrithew (Town Selectman)	<ul style="list-style-type: none"> • Commitment to marine industry focus
9/14/16: Sprague Terminal Tour & Discussion	Jim Therriault (Sprague) Peter Fogg (Sprague)	<ul style="list-style-type: none"> • History of the Port • Current terminal capability and capacity • Port improvement needs
9/14/16: Meeting with Central Maine & Quebec Railroad and Maine DOT	Chris Caldwell (CM&Q) Brock Mooney (MDOT) John Henshaw (MDOT)	<ul style="list-style-type: none"> • Rail infrastructure • Access and connections • Freight movement in and out of the Port • Challenges

¹³ *Ibid.*



4.1.2 Meeting at Mack Point Terminal – Sprague Energy & MDOT

The Port of Searsport’s primary location, Mack Point Terminal, is owned and operated by Sprague Energy. The opportunity to meet with primary stakeholders and tour of the terminal was conducted on September 14, 2016. This tour provided a visual assessment of the existing Port facilities.

Information obtained during interviews with Sprague and Maine Port Authority personnel was used to develop a functionality assessment of the terminal, identify historic and existing commodities moving through the Port, and assess what areas could support opportunities for growth at the terminal. One of the major attributes of the Searsport facilities is the size of the terminal property and the opportunity to expand. The terminal area is 140 acres and has an additional 45 acres of undeveloped land available.

The terminal’s capacity for dry and liquid bulk storage is extensive. According to Sprague personnel, the liquid tanks can hold nearly 1.2 million barrels, which “is currently more storage than is needed by the State of Maine”. The tanks typically store light fuels, sodium hydroxide and liquid asphalt.

One of the biggest challenges faced by the terminal is the shoaled channel depth. The need to dredge the channel to accommodate larger ships being used in the shipping industry today was made apparent during these discussions. Strong debate among locals over where to dispose of the dredged material has resulted in the U.S. Army Corps of Engineers turning its attention to many other high-priority dredging projects across the U.S.¹⁴.

4.1.3 Meeting with Central Maine & Quebec Railroad

Conversations with Central Maine & Quebec (CMQ) railroad personnel on September 14, 2016, focused on the current state of the rail infrastructure, access and connections regionally, and highlighted potential business interests at the Port. CMQ stated that the frustrations and challenges faced by interested parties, the greenfield status and need for infrastructure development has previously resulted in shippers seeking other viable alternatives with infrastructure in place¹⁵.

CMQ rail infrastructure extends through Maine into St. Jean, Quebec to the west, where it connects to the Canadian National (CN) and Canadian Pacific (CP) Railroad. The CMQ rail line also has good connection with the Vermont Rail System. Notably, there are no clearance limitations on the existing line¹⁶.

¹⁴ Sprague Energy Interview (9/14/16)

¹⁵ CMQ Interview (9/14/16)

¹⁶ *Ibid.*

5 Commodity Analysis

5.1 Introduction

Effective business development for new and existing Port facilities relies on regular information gathering and custom analysis. There is no single source of information that provides a “go to” location where data can be mined. Instead, business development professionals must capture data from numerous sources, including conversations with prospective facility users as well as public sources.

Port business development follows a methodical process beyond simply marketing. It requires information to be gathered and analyzed to develop targets for growth. Key steps include:

- Understanding of the most effective current and potential utilization of existing assets;
- Good shipper research and essential real-time data;
- Development of diversified and realistic business opportunities;
- Short- and long-term comprehensive planning;
- Identification of reasonable investments driven by business opportunities;
- Comparative and competitive market pricing;
- Targeted sales efforts and related effective tracking;
- Preservation and expansion of good stakeholder and customer relationships and service satisfaction.

The effort begins with a comprehensive look at current assets. It is critical to understand, for instance, what commodities can be handled, facility condition, whether the facility has the right infrastructure, if the water is of sufficient depth in the associated berths, whether equipment is well maintained and able to handle loads efficiently, and what expansion opportunities are available to the facility if its business development efforts are successful.

Good information is the key to effective business development. It is gathered from a wide variety of sources, compared and analyzed to paint a picture that allows the business development effort to quantify and then tackle realistic opportunities. A first step in developing this understanding is determining what is moving into and out of a region and by what mode it is being moved. This informs a determination of who controls cargo movement, how they make decisions on mode of transport, and how sensitive they are to price.

HDR began this study with a general overview of the Port facilities, then followed up with an analysis of what was moving in the region by water, truck and rail. Waterborne movements tend to be slower, but are less expensive than over-land methods because a higher volume of cargo can be moved in a single shipment. Time sensitive cargo, however, generally moves by truck, even when it costs more. The analysis also takes into account transportation limitations such as rail and road congestion, access, waterway and harbor issues.

Development of diversified and realistic business opportunities results from a thorough understanding of how cargo moves from one region to another domestically or from a

region to and from international markets. Once understood at the macro level, commodity movements that can be captured can be identified at the micro level. This is dependent not only upon facility capabilities and competitive transportation mode advantages and disadvantages but also cost to the shipper.

Business activities should always be diversified so a facility is not dependent upon one single type of cargo, as all cargo activity and its related industry goes through cycles. Bulk minerals may be substantial one year, and drop off significantly in the next; this is what happened with coal in the mid-west. In 2008, the economic crisis decreased the amount of retail commodities being shipped, leading to the current glut of containers and low shipment prices. A mix of compatible activities, dry and liquid bulk, neo-bulk, container and project cargo and their respective value added services creates the best opportunity for Searsport’s long term viability.

5.2 Existing Commodity Flows

The existing material handling services at Searsport include dry bulk, break bulk, heavy lift and liquid bulk cargoes. Though most of the cargo through the Port is liquid bulk, over the past few years the Port has handled a variety of other commodities including salt, petroleum products and wind turbine components, which are presented in Table 3. Existing infrastructure for liquid bulk storage and transloading fuels is in place, and with minor modifications the Port could support expansion in these operations.

Additionally, Searsport has had some success with project cargoes. European turbine manufacturers have continued to provide a steady flow of wind energy components through Searsport to support many projects all over New England. Searsport’s ample laydown and warehouse facilities have also served as storage for some of the turbine components during the winter months.

Identifying opportunities to expand liquid bulk and project cargo operations at the Mack Point Terminal is recommended for this facility. These types of commodities are well suited at the Port.

Table 3: Existing Commodities at Searsport for All Transportation Modes

Dry Bulk	Liquid Bulk	Project Cargo
• Minerals (Salt)	• Light Refined Oils:	• Wind Turbines
• Cement Clinker	○ Heating oils	
• Chemicals	○ Gasoline	
• Fertilizer	○ Diesel Fuel	
• Aggregate	• Bio-fuel	
• Agricultural products	• Petroleum products	
• Gypsum	• Kaolin	
• Iron oxide		
• Copper Slag		

Regional Commodity Flows

One component of understanding potential opportunities for expanded operations at the Port of Searsport is an examination of market trends at other regional ports. Searsport's direct access to rail, road and pipeline, in addition to underutilization of the Port facilities¹⁷, would allow Searsport to assume the overflow of imports and exports being shipped to and from the region. Other ports in the region have limited space to expand while Searsport has both available land and solid infrastructure already in place.

Regional ports examined in this section were chosen based on their location and the type cargoes in and out the Port. Included are the Canadian ports in Montreal, QC; Saint John, NB; and Halifax, NS as well as the northeastern U.S. ports in Portland, ME; Portsmouth, NH; Boston, MA; and Providence, RI.

Montreal, Quebec

Located along the St. Lawrence Seaway, the Port of Montreal is a major intermodal link between the North American and the Northern European and Mediterranean markets. Montreal handles a variety of imports and exports including containerized cargo, non-containerized general cargo, dry bulk, liquid bulk and grain.

The 2015 commodity flows for liquid and dry bulk in and out of the Port of Montreal are shown in Tables 4 and 5, respectively. The largest liquid bulk commodity in 2015 was gasoline at nearly 4.4 million metric tons. Other significant liquid bulk cargoes included other petroleum products such as fuel oil, crude oil, diesel oil and jet fuel. The largest components of the dry bulk cargo portfolio included grain and iron ore at 3.2 and 2.3 million metric tons, respectively.

Table 4: Port of Montreal 2015 Liquid Bulk Cargo (Metric Tons) ¹⁸

Liquid Bulk Cargo	Import	Export	Total	Var. from 2014
GASOLINE	4,045,911	339,524	4,385,435	-2.52%
FUEL OIL	849,335	940,969	1,790,304	-14.30%
CRUDE OIL	1,067,022	461,363	1,528,385	280.74%
DIESEL OIL	368,506	486,957	855,463	1.15%
JET FUEL	674,657	21,484	696,141	37.51%
OTHER HYDROCARBONS	143,647	89,081	232,728	-35.81%
ASPHALT	70,060	69,332	139,392	-11.93%
ETHYL ALCOHOL	109,084	0	109,084	-23.71%
NAPHTHA	76,914	25,486	102,400	0.1595
KEROSENE	59,509	0	59,509	-30.97%
FERTILIZER	39,879	0	39,879	16.17%
OTHER	11,064	6,006	17,070	15.45%
MOLASSES	14,876	0	14,876	-18.15%
TOTAL	7,530,464	2,440,202	9,970,666	7.83%

¹⁷ Sprague Energy Interview (9/14/16)

¹⁸ Montreal Port Authority 2015 Statistics

Table 5: Port of Montreal 2015 Dry Bulk Cargo (Metric Tons) ¹⁹

Dry Bulk Cargo	Import	Export	Total	Var. from 2014
MARINE GRAIN	1,505,268	1,707,522	3,212,790	4.91%
IRON ORE	2,352,529	0	2,352,529	1.79%
GRAIN-RAIL AND TRUCK	447,838	244,352	692,190	-31.69%
SALT	680,566	0	680,566	1.46%
RAW SUGAR	439,047	0	439,047	-13.64%
FERTILIZER	413,326	0	413,326	44.50%
GRAVEL	66,093	259,260	325,353	667.96%
GYPSUM	164,632	0	164,632	50.48%
CEMENT	10,950	127,868	138,818	N/A
OTHER ORES	84,079	0	84,079	-24.53%
COAL	67,949	0	67,949	110.15%
SCRAP METALS	0	66,925	66,925	-64.61%
SLAG, DROSS	0	38,743	38,743	50.16%
FERRO-ALLOYS	37,573	0	37,573	51.08%
OTHERS	25,759	0	25,759	170.04%
INDUSTRIAL SAND	0	0	0	-100.00%
TOTAL	6,295,609	2,444,670	8,740,279	3.64%

With some improvements, Searsport’s existing infrastructure and facilities are very well equipped to support activity through Canadian ports. As mentioned above, Searsport has the capabilities to handle dry bulk, liquid bulk, and smaller containerized cargo. The Port has direct access to rail, road and pipeline, which could be used to transport imported goods to cities in the Northeast U.S. and Eastern Canada. While other ports are space limited, Searsport’s facilities have the potential to expand.

The Port of Searsport could also leverage existing trade routes between eastern Canadian ports and those in Europe, Asia, Latin America, and the Middle East. The Port of Montreal’s shipping traffic by trading partner can be seen in Table 6, the top region in 2015 was the UK/Europe at 28 percent. The largest trading regions for liquid bulk cargo were the United States followed by the UK / Europe. Dry bulk commodity trading is mainly occurring with countries in Latin America, the Mediterranean, Europe and the U.S.

¹⁹ Montreal Port Authority 2015 Statistics

Table 6: Port of Montreal 2015 Shipping Traffic by Trading Partner (Thousands of Metric Tons)²⁰

Business Partner	General Cargo		Bulk		Total	
	Containerized	Non-Containerized	Dry	Liquid	Metric Tons	Approx. %
UK / Europe	5,414	15	296	3,009	8,734	28
U.S.	0	0	216	4,501	4,717	15
Mediterranean	2,682	10	341	274	3,307	11
Asia	2,215	35	0	0	2,250	7
Latin America	697	55	583	212	1,547	5
Middle East	1,105	0	121	54	1,280	4
Africa	511	15	28	0	554	2
Oceania	63	0	0	0	63	< 1
Other	N/A	N/A	N/A	N/A	N/A	27

The Port of Montreal is equipped with several different options to accommodate bunkering for vessels. The Port's fuel bunkering operations are supported by pipeline, barge and truck. Pipeline operation are connected to Le Vopak Canada, Terminal Montreal Est (TME) and Suncor Energies²¹. All barge and anchorage bunkering is serviced by Shell Canada and requires prior approval from the Harbor Master's Department.

Halifax, Nova Scotia

The Port of Halifax is a high capacity Port facility located on the eastern coast of Nova Scotia, Canada. The Port is an important player in servicing many global markets. Services through the Port of Halifax include many of the leading global shipping lines, including transshipment and feeder services²². Over the past few years trading with Europe and Asia has grown. The percentage of Port's shipping traffic by region is presented in Table 7. The major export and import cargoes moving in and out of the primary trading regions is also identified²³.

²⁰ Montreal Port Authority 2015 Statistics.

²¹ Montreal Port Authority - Ship Services: <http://www.Port-montreal.com/en/ship-services.html>

²² Halifax Port Authority - Cargo: <http://portofhalifax.ca/cargo/>

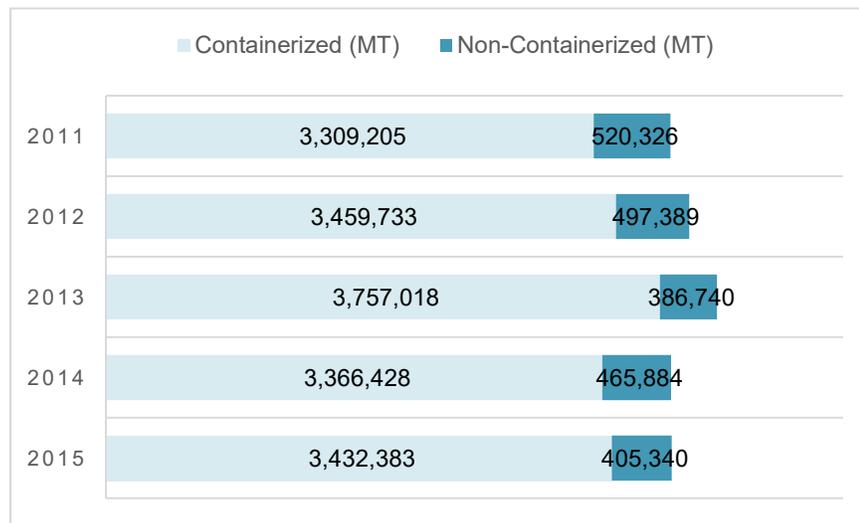
²³ Halifax Port Authority – Global Markets: <http://portofhalifax.ca/cargo/global-markets/>

Table 7: Port of Halifax - Shipping Traffic by Trading Partner

Region/Country	Percentage	Major Cargoes
Europe	38%	Exports: Wind turbine components Imports: Forest products
Asia	49%	Exports: Retail Imports: Soybeans
Latin America & Caribbean	12%	
Other	1%	

Home to numerous cargo, cruise, and business terminals, Halifax’s import and storage capacity is extensive. The Port of Halifax is equipped to handle a variety of cargo types including containerized cargo, break bulk, Ro/Ro, and bulk cargoes. The container terminals have the ability to handle 2.5 million TEUs and dry bulk storage can support up to 135,000 metric tons of grain²⁴. The total number of metric tons of containerized and non-containerized general cargo for the past five years can be seen in Figure 8. Total volume remained relatively consistent at 3.8 million metric tons in 2014 and 2016. As compared to the first three quarters of 2015, metric tons of containerized cargo is up 13.2 percent and non-containerized general cargo was up 27.6 percent in 2016²⁵.

Figure 8: Port of Halifax Total Cargo Volume (Metric Tons)²⁶



²⁴ Halifax Port Authority – Cargo: <http://portofhalifax.ca/cargo/>

²⁵ *Ibid.*

²⁶ *Ibid.*

Searsport could benefit from its geographic location along existing shipping routes from Halifax south to New York, Baltimore, and ports in the Caribbean and South America. Since Searsport is well equipped to handle many of the bulk and smaller containerized commodities coming in and out of Halifax, the Port could accommodate overflow and tap into the existing routes through the region.

St. John, New Brunswick

Port St. John typically handles 28 million metric tons of cargo annually, consisting of both containerized cargo and dry, liquid, and break bulk cargoes²⁷. The Port is the largest by volume, due to petroleum, and is the most diverse port in eastern Canada. Big investments by the Canadian Federal Government and Dubai World Port, the Port's current operator, result in the Port of St. John being the more likely focus for all container shipping in this region. The Port is also focused on growing its cruise industry.

Typical dry bulk commodities moving through St. John include, recycled metal, potash, salt, petroleum coke, and limestone. In 2015, the Port moved 1.36 million metric tons of dry bulk cargo²⁸. The Port also handles breakbulk cargoes, and moved 17,000 metric tons of breakbulk cargo through the Port in 2015²⁹.

Additionally, the Port is known as one of the largest liquid bulk ports in North America due in part to the long-term major partnerships between St. John Port Authority and Irving Oil. In 2015, 24.5 million metric tons of liquid bulk was moved through the Port³⁰. Liquid commodities included crude oil, petroleum products, liquefied natural gas (LNG), fish oil, molasses, caustic soda, calcium chloride, and magnesium chloride. Canada continues to support and discuss energy sector opportunities in the eastern region with Irving Oil, TransCanada and Canaport LNG³¹.

Portland, Maine

The Port of Portland provides cargo, containerized and passenger terminals along the coast of Southern Maine. The Port is home to nine terminals with the capability to accept a variety of cargoes including petroleum, bulk, break-bulk, project and containerized commodities³². Recently Eimskip built its northeast facility in Portland, helping to solidify the Portland International Marine Terminal as the container shipping hub for the State of Maine. It would make sense for Searsport to explore opportunities in in both the liquid bulk and project cargo areas, both historically successful at the Port, to maintain diversity in the state. That said, Searsport has a mobile harbor crane on site and is capable of supporting small scale container operations at the terminal, should the opportunity arise.

Portland is currently participating in the New England Marine Highway Project (NEMHP), sponsored by the Maine Port Authority. The NEMHP is a short-sea shipping initiative to

²⁷ Port St. John, Port Authority: <https://www.sjport.com/>

²⁸ *Ibid.*

²⁹ *Ibid.*

³⁰ *Ibid.*

³¹ St. John Port Annual Report – 2015: <https://www.sjport.com/about-us/reports/>

³² Maine Port Authority - Ports



design, build and operate a containerized Articulated Tug Barge (ATB) along the M-95 Marine Highway servicing ports from Portland to New York/New Jersey³³.

Portsmouth, New Hampshire

Located along the southern banks of the Piscataqua River, the Market Street Terminal in Portsmouth is New Hampshire’s only seaport. The Port is run by the NH Division of Ports and Harbors (DPH), which operates as part of the Pease Development Authority. The area surrounding Portsmouth is a mix of small town and suburban communities and relies on the City and Port as a regional trade center. Portsmouth’s terminal handles bulk cargoes, break bulk, project cargoes and some containerized cargoes. The top commodities by value that are shipped through the Port are listed in Table 8. Additionally, the DPH manages and operates a variety of passenger vessel facilities at the Port that serve charter boats for fishing, diving, cruising and sightseeing off the coast of New Hampshire.

Table 8: Port of Portsmouth – Top Five Commodities (by YTD Dollar Amounts)

Rank	Export	Import
1	Insulated Wire, Cable	Gasoline, other fuels
2	Pumps for dispensing liquids	Petroleum Products
3	Landline, Cellular phone equipment	Petroleum gases, other gaseous hydrocarbons
4	Isotope-separating machinery, nuclear equipment	Imports of returned exports
5	Civilian aircraft and parts	Military aircraft

Notable foreign trade growth at the Port of Portsmouth in 2016 included a 7.5 percent rise in insulated wire and cable exports and a 95 percent rise in civilian aircraft and parts exports over 2015 totals. New exports to Portsmouth in 2016 were isotope-separating machinery and nuclear equipment, bringing just over \$30 million in export trade³⁴.

Portsmouth’s foreign trade totaled \$404 million and \$335 million for imports and exports, respectively, during 2016. The top countries sending goods to and from Portsmouth were Canada, Brazil, South Korea, Thailand and Italy³⁵.

In addition to the commodities included in Table 8, the Port handles significant road salt tonnage and a variety of other project cargoes, including wind mill components and power plant components.³⁶

³³ Maine Port Authority - NEMHP

³⁴ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-portsmouth-nh/>

³⁵ *Ibid*

³⁶ The Economic Impact of the Piscataqua River and the Ports of Portsmouth and Newington, http://www.portofnh.org/documents/port_study_mm_6_7_12FINAL.pdf

Boston, Massachusetts

In addition to many private petroleum and liquefied natural gas terminals, the Port of Boston is home to the Conley Container Terminal, Black Falcon Cruise Ship Terminal, Moran Auto Terminal, two shipyards, marine research institutions, a Coast Guard facility, private and public ferry operations, and seafood processing facilities.

During the first 11 months of 2016, the top foreign trades through the Port of Boston included commodities such as fuel products, various metals, paper and seafood, presented in Table 9.

Table 9: Port of Boston - Top Five Commodities (by YTD Dollar Amounts)

Rank	Export	Import
1	Scrap iron, steel	Gasoline, other fuels
2	Paper, paper board scrap	Motor vehicles for transporting people
3	Scrap of precious metal	Petroleum gases, other gaseous hydrocarbons
4	Mussels, scallops, other mollusks	Wine
5	Raw hides, skins of cows and horses	Fish fillets, chilled or frozen

All of the top exported goods, except for raw hides, skins of cows and horses, rose in total value compared to 2015³⁷. In contrast to the top exported commodities, only the total value of wine imports rose compared to 2015 values³⁸.

Foreign trade through the Port of Boston totaled just over \$8 billion in 2016. The top foreign trading partners for the Port included China, Canada, Japan, the UK and Italy³⁹.

Providence, Rhode Island

During the first eleven months of 2016, the Port of Providence's foreign trade totaled nearly \$7 million. The top trading partners included Germany, Mexico, Japan, United Kingdom, and Slovakia, which made up 82 percent of the Port's total foreign trade⁴⁰.

Top commodities coming in and out of the Port of Providence in 2016 are listed in Table 10. Notable growth in exports included a 143 percent rise in ethyl alcohol and a six percent rise in cranes and mobile lifting frames from the previous year. Additionally, the import of portland cement, aluminous cement, and slag cement grew 824 percent in 2016 over the previous year.

³⁷ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-boston/>

³⁸ *Ibid*

³⁹ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-boston/>

⁴⁰ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-providence-ri/>

Table 10: Port of Providence - Top Five Commodities (by YTD Dollar Amount)

Rank	Export	Import
1	Scrap Iron, Steel	Motor vehicles for transporting people
2	Ethyl alcohol	Gasoline, other fuels
3	Motor vehicles for transporting people	Petroleum products
4	Ship's derricks, cranes, mobile lifting frames	Yachts and other boats
5	Misc. iron or steel structures and parts	portland cement, aluminous cement, and slag cement

5.3 Potential Development Opportunities

Searsport Industrial Park

One opportunity that could be considered at the Searsport Terminal is the development of an industrial park. The town identified industrial property near the Port, which could include some 100 acres of industrial land for new development. This could be enhanced for development by master planning the property and identifying utility capabilities, including the provision of gas through Bangor Gas's line into the Port. Industrial development is one of the fastest growth business sectors for seaports on the U.S. East Coast.⁴¹

Searsport has the available land to develop, adequate transportation infrastructure, skilled labor supply and the ability to expand the foreign trade zone (FTZ) #186 to include Searsport. Foreign-Trade Zones (FTZ) are secure areas that are considered outside the customs territory of the U.S. for the purposes of duty payments and are under supervision of U.S. Customs and Border Protection⁴². These factors support exploring the development of an industrial park and FTZ opportunities that may also be available.

Searsport could use the FTZ designation, which saves costs with fewer restrictions, to attract businesses interested in manufacturing facilities along the East Coast. Businesses could utilize the industrial park to add value, modify or store goods moving from South America to Europe or the Arctic Circle to the Caribbean, by adding jobs and saving on administrative costs and processing fees. A complete list of FTZ benefits is provided in Table 12⁴³.

⁴¹ Port of Savannah, Annual Report, CY 2016.

⁴² U.S. Foreign-Trade Zone Board. 76th Annual Report of the Foreign-Trade Zone Board to the Congress of the United States. August 2015. <http://enforcement.trade.gov/ftzpage/annualreport/ar-2014.pdf>

⁴³ FTZ 186: Bonded Warehouse vs. Foreign Trade Zone Comparison (email)

Table 11: Foreign-Trade Zone Functions & Benefits

Function	Foreign-Trade Zone
Customs Entry	A zone is not considered within Customs territory. Customs entry is, therefore, not required until removed from a zone.
Cargo Permitted	All merchandise, whether domestic or foreign, may be placed in a zone
Customs Bonds	No bond is required for merchandise in a zone.
Payment of Duty	Duties are due only upon entry for U.S. consumption. The rate can be that which is in effect at time of admission or withdrawal.
Manufacturing Goods	Manufacturing is permitted with duty payable at the time the goods leave the Zone for U.S. consumption. Duty is payable on either the imported components or the finished product, whichever carries a lower rate. No duty on waste material or on value added in manufacturing, such as labor, overhead and profit. No duty paid on goods exported from a zone.
State & Local Inventory Tax	Foreign merchandise is not taxed. Domestic merchandise to be exported is not taxed.
Storage Terms	Unlimited.
Permitted Activity	Merchandise may be stored, inspected, repackaged, repaired, tested, cleaned, sampled, displayed, manipulated, mixed, processed, assembled, salvaged, destroyed, or re-exported
Drawback of Customs Duties or Federal Excise Tax	May apply to goods admitted to the Zone if approved by Customs.
Waste & Damaged Goods	No duty paid on waste, damaged or otherwise non-usable merchandise that is destroyed in the Zone.

Expanding the FTZ offers businesses looking for manufacturing or industrial facilities near Port the opportunity to bring in goods, assemble components or add value to products within the FTZ limits, and then ship their completed products to their final destination overseas. For example, bulk shipments of commodities (e.g., beef or other agricultural goods) from Latin America could land in Searsport; packaging, labeling, or other value added services could be completed on site (within the FTZ), and finished products would then be shipped from Searsport to their final destination in Canada, the Baltic, or Northern Europe. Searsport’s location along established shipping routes on the East Coast U.S., as well as the available land to develop an industrial park, put the Port in a prime position to take advantage of this possible opportunity.

In order to create a foreign trade zone, a local organization (a city, county or Port authority) applies to the FTZ Board for a grant to establish and operate a zone for a defined geographic area. The organization then becomes known as the FTZ “grantee”



and is required to operate their zone as “public utilities” and provide “uniform treatment under like conditions” to companies using their zone”⁴⁴.

Millinocket Industrial Park – Former Mill Site

Recently the nonprofit group, Out Katahdin, purchased the former Great Northern Paper mill and adjacent land in Millinocket, Maine. According to the new owners, the long-term plan for the site is “to help transform this idle industrial site into a productive, innovative bio-industrial park that leverages the comparative advantages of our region.”⁴⁵

There could be opportunity for Searsport to support business in Millinocket. The town of Millinocket is located approximately 100 miles north of Searsport, and both towns are located along the Central Maine & Quebec (CMQ) railroad line. Connection via rail would allow for a variety of goods and material to be shipped to and from Millinocket through the Searsport’s terminal. Establishing a relationship between the Port and potential business interests in Millinocket could be mutually beneficial.

This development would be a long-term business opportunity for the Port, but would be worth further investigation. Mack Point Terminal has the equipment, storage capabilities and transportation access to support bio-industrial industry operations from Millinocket.

Short-Sea Shipping - NEMHP

In 2010, the Maine Port Authority received MARAD designation for the New England Marine Highway Project (NEMHP). The purpose of this project was to design and build a containerized Articulated Tug Barge (ATB) and operate service along the M-95 marine corridor between ports in Northern New England and New York/New Jersey⁴⁶. The primary goal of this project is to stimulate growth for American manufacturers, food and beverage processors, and industries providing raw materials for those operations by introducing low-cost freight alternatives to shippers. The key benefits of this project include: reduced freight transportation cost (per ton/mile); increased market access for lower-margin freight; and increased weight capacity per unit (heavier loads in each container)⁴⁷.

As the regional success of the NEMHP is reflected through these key benefits, Searsport could be in a position to take advantage of this short-sea shipping initiative. Searsport has seen success in bulk cargo and project cargo operations. The Port is well versed and equipped to expand in this area. There is adequate infrastructure to support the import of material intended for regional projects, ample space to store or assemble project components, and close proximity to the M-95 marine corridor to distribute to regional ports.

⁴⁴ U.S. Foreign-Trade Zone Board. 76th Annual Report of the Foreign-Trade Zone Board to the Congress of the United States. August 2015. <http://enforcement.trade.gov/ftzpage/annualreport/ar-2014.pdf>

⁴⁵ MaineBiz.biz (Maine Business News Source) – January 13, 2017 (Sean DeWitt, president of Our Katahdin): <http://www.mainebiz.biz/article/20170113/NEWS01/170119971>

⁴⁶ NEMHP Service Design, October 15, 2013: <http://www.maineports.com/new-england-marine-highway-project>

⁴⁷ NEMHP Service Design, October 15, 2013: <http://www.maineports.com/new-england-marine-highway-project>

6 Identification and Evaluation of Business Opportunities

Most cargo moves along a multi-modal path, being transferred several times from one mode to another. Each transfer has a cost impact. For low cost, high volume cargo moves, transfers can make the movement cost prohibitive. Modern marine facilities can be very efficient and offer lower costs to common carriers moving cargo if they have key characteristics. These include:

- Deep-water access for the vessels and cargo intended to be handled;
- Heavy weight and designated access roadways;
- Direct on-dock or near-dock rail access for high volume cargo moves for markets more than 250 miles away;
- Adequate land for expansion, efficient operational functionality and storage; and
- Proper equipment.

The Port of Searsport has all of the identified attributes for a successful intermodal marine operation. By completing the necessary dredging along the channel, the port could accommodate all vessels at the Terminal facilities.

If Searsport is to develop as a seaport, it needs an expanded industrial base. The Port's most significant asset is its onsite rail access, connecting the Port to the larger national rail systems in the U.S. and Canada. The development of this area into industrial parcels by business interests that have FTZ designations is critical. This creates the basis for future development of expanded shore-side access including rail and roadways improvements. The first step in new business development relies on the ability to grow industrial activities, particularly those that can support waterborne transportation, both domestically and internationally. With its current assets, but small industrial base, this should be a key target of the business development effort at the Port of Searsport

General Costs

Northeast Trucking Costs

Average marginal costs by region were obtained from the American Transportation Research Institution (ATRI) An Analysis of the Operational Costs of Trucking: 2016 Update. The northeast region has the highest average costs reported by carriers operating in the U.S. at a total average cost of \$2.331 per mile⁴⁸. The average costs are comprised of vehicle-based costs as well as driver-based costs.

Tariff Comparison

A comparison of publically available tariffs was conducted between the Port of Searsport Maine and other regional ports with the purpose of showing how competitive the Port of Searsport is in terms of shipper costs. The tariffs for Eastport, ME, Searsport, ME, Portland, ME, Montreal, QC, St. John, NB, and Halifax, NS are presented in Appendix B.

⁴⁸ ATRI – An Analysis of the Operational Costs of Trucking: 2016 Update (Table 18)

6.1 Business Case 1: Import Petroleum

Searsport-Loring Pipeline Corridor (Distribution)

The Searsport-Loring Corridor ("SL-ROW") is a continuous easement corridor, or "right-of-way", that was created by the U.S. Air Force in the 1950's for the installation of a 6-inch diameter pipeline to deliver jet fuel from Searsport to the Bangor International Airport and the former Loring Air Force Base. The SL-ROW is 50 feet wide, and extends approximately 190 miles between Searsport and Limestone, Maine. The corridor is owned by Loring Development Authority, a nonprofit that oversees the Loring Commerce Center.

The pipeline was decommissioned in 1994. In 2012, the Bangor Gas Company purchased the rights to access the pipeline, and in 2014 it began using the first 60 miles of the pipeline for distribution of natural gas to paper mills, schools, hospitals, and local residences and businesses. The pipeline is operational, and can be used for product flow in either direction. Furthermore, the 50-foot wide corridor could be used for access by additional pipelines or utilities interested in moving liquid or gas commodities through the Searsport terminal.

Access to the existing pipeline corridor would be advantageous for businesses interested in shipping liquid or gas commodities through Searsport. As mentioned previously, Searsport is very well suited for liquid bulk, various fuels and oils, which are already being shipped through the Port. The key advantage is the ability of Bangor Gas to provide low cost gas utility service to the Searsport area in support of industrial development which would benefit the Port.

Additionally, the pipeline right of way corridor could potentially be used for fiber optic cable. The existing pipeline corridor could help to support building an industrial park near Searsport. Access to utilities for the industrial park would help to keep the energy costs relatively low for businesses interested in expanding operations in Searsport.

Fuel Bunkering and Distribution

Currently, only a portion of the available onsite liquid bulk tanks are being utilized for home heating oil and similar light oils⁴⁹. Should production of petroleum products from U.S. oil refineries decline, a storage of fuel would become critical. Searsport is equipped with existing infrastructure in place to import, store onsite, and transload fuel via rail, truck or pipeline for regional distribution. Bunkering operations would also be well suited at the Port. Imported fuels could be stored in tanks and used for refueling ships that call to Port.

Liquefied Natural Gas (LNG) bunkering presents another liquid bulk opportunity for Searsport. LNG is a low energy, long term fueling option potentially providing both an environmentally and economically attractive choice for marine vessels. Environmentally, LNG exceeds the air quality standards set forth by in the North American Emission

⁴⁹ Sprague; Working Waterfront Archives – Searsport's Mack Pont is Pivot in Maine's Port Strategy

Control Area (ECA) and the cost of LNG is cheaper than many other ECA-compliant fuels⁵⁰.

LNG bunkering is still relatively new fuel technology in the maritime community. As more vessels and facilities change over to LNG fueling, the demand for LNG bunkering will increase. Since most U.S. ports do not have LNG liquefaction and storage facilities yet, Searsport could be in a position to capitalize on this opportunity. Developing LNG bunkering infrastructure in the Port would draw in regional ships relying on small-scale bunkering operations⁵¹.

The Port of Rotterdam, Netherlands is an example of a successful LNG program. The Port is a hub for importing and re-exporting LNG via smaller vessels and trucks or through pipelines in a gaseous state. LNG bunkering is permitted, supported and encouraged according to the Port of Rotterdam's Port authority⁵². The Port recorded its first tanker vessel, a 15,000 DWT Tursand chemical tanker, to bunker at Port in August of 2016. The Dutch Port offers financial incentives to support this initiative and attract vessels to bunker the chilled fuel in the Port⁵³.

The Port of Searsport could be a prime U.S. location to implement an LNG program similar to the Port of Rotterdam. Searsport has land side facilities equipped to handle liquid bulk and has direct access to road, rail and pipeline to distribute LNG products. Searsport has space to support LNG bunkering infrastructure and could use an incentive program to attract tanker vessels traveling along existing North American shipping routes to and from Europe, Asia, Latin America/Caribbean, and the Middle East.

Additionally, an LNG fueling station in Searsport could be used for servicing cruise ships in Portland and Bar Harbor. Cruise Maine industry statistics, released in November 2016, indicates there are 421 cruise visits scheduled for Maine in 2017. This represents an increase of 43 cruise ships calling to Maine ports from 2016⁵⁴. Searsport, geographically located along Maine's coast only 70 and 90 nautical miles between Portland and Bar Harbor, respectively, would be a prime location for servicing cruise ships from both ports. Searsport's 145 acre Port facility is well equipped to take and store liquid fuels and has the space to build and support the bunkering infrastructure required⁵⁵.

If Searsport were to invest in infrastructure to support fuel bunkering, some of the energy companies operating at the Port of Montreal could be possible options for servicing Searsport. These energy companies and their focus are listed in Table 11.

⁵⁰ DNV LNG Bunkering Study report no. PP087423-4, Rev. 3 – 2014

⁵¹ Ingworldnews.com, March, 2015: <http://www.ingworldnews.com/uscg-releases-lng-bunkering-policy-letters/>

⁵² Port of Rotterdam: <https://www.portofrotterdam.com/en/cargo-industry/lng-import-export-and-bunkering>

⁵³ Ingworldnews.com, August, 2016 <http://www.ingworldnews.com/Port-of-rotterdam-in-lng-bunkering-first/>

⁵⁴ 2016 and 2017 Cruise Industry Statistics and Milestones

⁵⁵ Distances between US Ports 12th edition (2012) – Pg. 11

Table 12: Energy Companies - Bunkering Capabilities⁵⁶

Company	Focus
Vopak www.vopak.com	<p>Vopak operates in bulk liquid storage terminals in key strategic ports and is focusing its network on four types of terminals:</p> <ul style="list-style-type: none"> • Hub terminals, supporting intercontinental product flows; • Import distribution terminals in major markets with structural deficits; • Terminals facilitating growth in global gas markets (LNG, NGL, LPG); • Industrial terminal and chemical terminals in the Americas, the Middle East and Asia.
Suncor www.suncor.com	<p>Suncor is a Canadian based energy company;</p> <ul style="list-style-type: none"> • Pioneered commercial development of Canada’s oil sands • Investing in clean, renewable energy sources (wind, biofuels, and solar)

6.2 Business Case 2: Dry Bulk

Biomass – Wood Pellets, Wood Chips, Lumber

The demand for biomass fuel products will most likely see an increase in the coming years as the European Union (EU) implements renewable energy mandates on its member countries. The EU is requiring member countries obtain 20 percent of their overall energy supply from renewable sources by 2020⁵⁷. Other countries, including Sweden, Canada, Japan and South Korea, are also projected to be top markets for biomass fuel and will add to the demand pressure globally for biomass products in the coming years⁵⁸.

It is anticipated that by 2020 the demand for biomass based heating in Europe alone will increase to more than 20 million metric tons, which is double the demand for solid biomass in 2012⁵⁹. In 2012, Europe comprised 60 percent of the demand for wood pellets across the world.

The EU regulation requires all imported wood to be heat-treated to kill insects. Suppliers are to apply for and receive government certifications for their wood treatment process,

⁵⁶ Port of Montreal, Port Authority – Ship Services: <http://www.Port-montreal.com/en/ship-services.html>

⁵⁷ Portland Press Herald, Nov 8, 2016, “Maine ports gearing up to export wood chips to Europe”: <http://www.pressherald.com/2016/11/08/ports-gearing-up-for-chip-exports-to-eu/>

⁵⁸ Renewable Fuels Top market Report 2016: http://trade.gov/topmarkets/pdf/Renewable_Fuels_Top_Markets_Report.pdf

⁵⁹ World markets 2013 & IRENA paper 2014

known as phytosanitation. The Eastport Port Authority has been working to develop a system of heating and treating the wood once loaded onto the ships. Eastport's operators are said to begin exporting wood chips in 2017. Though Eastport will be the state's first opportunity to break into the biomass exporting industry, Searsport may also be well suited to capitalize on this emerging industry.

Currently, the Southeastern region of the U.S. is the top exporter of biomass fuels. Though Maine did not contribute to the estimated \$685 million of wood fuel sent in 2015 from the U.S. to the European Union, Maine ports could have the distinct advantage of being physically closer to European and Asian markets⁶⁰. In addition, Asian countries with high demand for biomass fuel, including Japan and South Korea, are currently relying on imports from Canada, China and Vietnam⁶¹. High logistical costs associated with shipping biomass products from the Southeastern U.S. could partially account for the lack of U.S. presence in these areas. Maine could be in a position to benefit as trade routes through the Arctic's Northwest Passage continue to open and become more reliable, connecting ports along the Northeast Atlantic with Asian markets. Investing in biomass production and export could be an opportunity for Maine to connect the U.S. with these global markets in addition to supporting the demands of countries in Europe.

Opportunities presented by Maine Woods Biomass Exports LLC to export wood products through Searsport is an example of Searsport's potential in the biomass fuel industry. The company is perfectly located along the existing rail line that connects Searsport to the north woods of Maine. The company has recently started production of railroad ties and other wood products. Ties are already being sent to Quebec via rail, with the intention of exporting logs through Searsport to India in 2017, and chip board to Europe by early 2018⁶².

Cement

According to the Port of Montreal's 2015 Annual Report, increased cement exports to the U.S. was one of the areas that accounted for the Port's overall growth in the dry bulk sector⁶³. Searsport is currently used to ship and receive aggregate and cement clinker, an element necessary for manufacturing Portland cement. If the demand for cement in North America increases, based on the export growth reflected in the Port of Montreal 2015 Annual Report, perhaps this is an opportunity for Searsport to expand current operation by increasing the quantity of aggregate and cement clinker shipped through Searsport. Searsport's direct rail connection to the national rail systems in both the U.S. and Canada, available land to develop, and good road access make the Port a very suitable option for moving commodities through the Searsport terminal.

⁶⁰ Portland Press Herald, Nov 8, 2016, "Maine ports gearing up to export wood chips to Europe": <http://www.pressherald.com/2016/11/08/ports-gearing-up-for-chip-exports-to-eu/>

⁶¹ Renewable Fuels Top market Report 2016: http://trade.gov/topmarkets/pdf/Renewable_Fuels_Top_Markets_Report.pdf

⁶² Portland Press Herald, Nov 8, 2016, "Maine ports gearing up to export wood chips to Europe": <http://www.pressherald.com/2016/11/08/ports-gearing-up-for-chip-exports-to-eu/>

⁶³ Port of Montreal: A Force for Growth – 2015 Annual Report

Chemical Manufacturing/Fertilizer/Urea

As shown in the regional commodity analysis section of this report, fertilizers from the Middle East, Africa, and Asia are some of the top imported goods through the Port of Montreal. In winter months, the eastern section of the St. Lawrence Seaway is typically open from the Atlantic all the way to Montreal. During severe winters, however, excessive ice in the river can limit shipping and increase transit times in the Seaway. Shippers may therefore find that Searsport could be an attractive alternative to uncertain winter routes through the Seaway. Commodities could be shipped to Searsport and transferred via onsite rail; potentially providing a more consistent and time-saving connection to Montreal and other destinations in Canada and the US during winter months.

Road Salt

Many of the top imported goods through the Port of Montreal and other Eastern ports could be opportunities for Searsport to expand existing importing operations. Road salt is currently being imported through the Port of Searsport from Morocco and Peru to be used in eastern Maine. This operation could be grown to support regions in eastern Canada that rely on salt imports through ports along the St. Lawrence Seaway.

As identified in the regional commodity analysis section of this report, salt was one of the top five imported commodities through the Port of Montreal in 2014 and 2015. Salt is used mainly during the winter months in Canada, with the highest demand occurring between the months of December through March, when ice typically closes the St. Lawrence Seaway. This could be an opportunity for ports like Searsport, with existing rail connections to the larger national rail network in Canada and the U.S. to support the demand for salt in these areas. Searsport could increase its current imports of salt, and ship the surplus to Montreal and other parts of Eastern Canada via rail for use during the winter months.

Scrap Metal

Globally, the scrap metal industry has seen reduction in prices, mine closures, and increased layoffs in 2016. Alter Trading Corp and Sims Metal Management are both scaling back operations in the U.S. Overall, the global market for metals is not promising, but specific steel and zinc markets are projecting some growth.

Steel demand globally shows a slow growth of 0.7 percent in 2016 (1,523 million metric tons) following a 1.7 percent drop in 2015 (1,513 million metric tons)⁶⁴. According to the World Steel Association, positive domestic demand and progress in reform will help to maintain growth in emerging markets including India and Mexico⁶⁵.

Large growth opportunities in the movement of scrap metals through Searsport seems unlikely as the global market remains fairly constant, but existing operations could remain.

⁶⁴ World Steel Association: <https://www.worldsteel.org/media-centre/press-releases/2015/worldsteel-Short-Range-Outlook-2015-2016.html>

⁶⁵ *Ibid.*

6.3 Business Case 3: Project Cargo

Project Cargo – Wind Turbines

Over the past 10 years, European and Asian manufacturers have been shipping turbine components through Searsport's Mack Point Terminal to inland wind developments. The Port has become a hub for this type of project cargo and could continue to service this industry. In 2016, turbines shipped through the terminal were routed inland to Pisgah Mountain Wind Farm (Clifton, Maine), Hancock Wind, and Bingham Wind projects. Following a period of volatility and possible bankruptcy earlier in 2016, major energy company, SunEdison has been working towards successfully restructuring which could likely support continued interest in wind development projects⁶⁶.

In addition to being a shipping hub for components, Searsport's terminal provides ample space for turbine storage should it be needed. The Port is also slated for a test project involving offshore floating wind turbines which will be assembled on site. Offshore wind development is slowly becoming realized in the U.S. This could be an opportunity for Searsport to support development along the Northeast Atlantic Coast. Challenges exist here, special purpose-built vessels for offshore wind turbine assembly have been used in Europe, but are not U.S. flagged vessels as required by the Jones Act. Most people in the industry believe that initially, developers will modify existing jack-up vessels and rigs from the U.S. offshore oil industry to try and meet the needs of the offshore wind industry. Eventually, it is thought that U.S. shipbuilders will construct suitable vessels as more offshore wind projects come on-line, making them more economically feasible. The Port's existing relationship with foreign manufacturers and direct access to the marine corridor could present a business opportunity to expand into this arena.

6.4 Additional Opportunities

There are several other commodities that are not identified as the top three business cases for Searsport, but could be considered opportunities for the Port should additional steps be taken by Searsport to support the trade

Containerization

The Port facilities in Boston, Portland, Halifax and Montreal all support large scale containerized shipping operations. Although Searsport's Mack Point Terminal is capable of handling containerized commodities, it seems unlikely that a container operation would be viable at Searsport except on a small scale for cargo moving in the region along the coast and inland, primarily between Bangor and Augusta.

Kaolin Facilities

The Searsport terminal has a rail transfer facility which is currently set up to move kaolin, which is used in the paper manufacturing industry. The general decline of Maine's paper

⁶⁶ Bangor Daily News, April 10, 2016: <http://bangordailynews.com/2016/04/10/the-point/what-a-sunedison-bankruptcy-would-mean-for-maine/>

industry over the past several years, however has also reduced the demand for kaolin. To preserve this business, alternative uses for the kaolin as well as alternative uses for the kaolin transloading facilities, which are in excellent condition, could be considered.

Figure 9: Trackmobile and Rail Car Transfer Facility⁶⁷



7 Port Development Plan

7.1 Intermodal Access

Overall, Searsport is one of the most versatile Port facilities in New England. The terminal is professionally managed, and has a skilled workforce, adequate equipment, ample dry and liquid bulk storage, warehouse space, on-site rail, and good highway access. The facilities at the Mack Point Terminal are diversified, flexible and capable of handling a wide range of cargoes of all types. While the Port of Searsport's core business is most likely to remain bulk commodities, the facility can also handle containers and project cargoes on a regular basis, as demonstrated by the terminal's recent experience with handling material and equipment for the wind power industry.

The coastal area of Maine above Belfast and extending inland to Bangor and Augusta have a population level that could sustain commodity imports into Searsport that move by water connecting to either the Port of Halifax, NS or Port of St. John, NB. Searsport's Mack Point Terminal is also directly connected to these communities through Interstate 95 South to Augusta and Interstate 95 North to Bangor. Both cities are approximately 1 hour away by road.

Searsport's most distinct advantage is its connecting rail line, which has become more financially stable in recent years and could open the Port to a number of new opportunities. The rail corridor could adequately address east-west cargo flows in large volumes, and could conceivably handle small quantities of containerized cargo during the winter months as well, when inland waterways to the Port of Montreal are restricted by ice. Particularly noteworthy is Canadian Pacific (CP) Rail's interest in developing a better year round access to the Atlantic. Its eastern terminus at Montreal is seasonal

⁶⁷ *Ibid.*

and constraints in the Port limits a wider range of growth.⁶⁸ Recently, CP Rail attempted a merger with CSX in an effort to accomplish that goal.

Searsport is also equipped to address the potential export of liquefied natural gas and Canadian crude oil out of the Mack Point Terminal. Substantial improvement dredging would be required in the channel to accommodate these larger ships, however there are a number of mid-size vessels and a developing fleet of specialized barges that can also handle these cargoes and are able to call on the Port without the improvement dredging. LNG and oil exports from Canada are expected to expand in the Port of St. John, NB and in Beldune, NB. These are generally moved in large quantities that would not be appropriate for the Searsport because of its limited infrastructure. However in smaller quantities, these commodities are very well suited to the Searsport terminal. The former Loring Pipeline corridor is a valuable infrastructure component of the Port allowing the Port to take advantage of all modes of bulk transportation.

7.2 Recommended Infrastructure Improvements

Dredging

A lack of maintenance dredging along a small section of the Federal navigation channel (less than one nautical mile long) is the biggest constraint to what would otherwise be a deep-water Port. Penobscot Bay has some of the deepest natural waters on the coast and the shoaled areas of the channel to the Port have produced a choke point that needs to be addressed before this maritime facility can become fully successful.

Dredging is the single most significant issue facing Searsport today, as shoaling within a one-mile long section of the Federal navigation channel is creating a choke point that prevents today's larger ocean-going vessels to safely access the terminal facilities. Vessel calls have declined 40 percent in the last six years, due in part to the depth restrictions. Currently the Port handles around 90 ships per year, as compared to 120 ships per year a decade ago⁶⁹.

Most of the smaller-class ships that previously called on the Port are no longer in service, and have been replaced by larger vessels with deeper draft requirements as well as wider channels with straighter reaches. The lack of dredging is therefore a serious barrier to business growth and utilization of the Mack Point facility, on which the regional communities depend on for employment as well as for the import of vital commodities such as gasoline, diesel oil, home heating oil, road salt, and other cargoes.

Maintenance and improvement dredging is a critical issue for nearly all ports. The volume of material that must be removed for Searport however, is only estimated to be between 300,000 to 1 million cubic yards. This is much smaller than typical dredging projects for other ports along the east coast. Expansion of the turning basin, widening and deepening of the channel and increased depth at the berths must be addressed in the same manner as road and rail improvements, as they are also essential elements of Port access and success.

⁶⁸ HDR Montreal Analysis, 2012

⁶⁹ PenBay Pilot Interview, Capt. David Gelinas

Cargo Handling Equipment

The Port has identified a number of items that would improve the facility’s cargo-handling capabilities, which should be implemented over the next several years to help enable future business growth at the terminal⁷⁰. To facilitate efficient biomass and other bulk loading operations, a new dock stand is required that can accommodate the Terminal’s existing telestacker conveyor system for ship loading. Expansion of the fixed electrical cabling for this cargo handling equipment will also be needed.

Figure 10: Dock Bulk Loader and Telestacker⁷¹



The acquisition of additional heavy lift cargo handling, heavy weight transfer equipment, and a jack-up-and-slide transfer system is also recommended, in order to better accommodate the handling of wind turbine components and/or other oversized project cargoes.

Figure 11: Typical Oversized Vehicle Movers for Project Cargoes⁷²



One major constraint at the dry cargo pier is constricted traffic flow due to the limited apron width on the pier. The addition of yard hostlers, which have a much shorter turning radius than standard semi-trucks, to the Terminal’s fleet of cargo handling equipment would increase efficiency by enabling smoother flows of cargo on and off the

⁷⁰ Sprague MDOT survey response

⁷¹ Source: HDR

⁷² *Ibid.*

dry cargo pier. In order to better handle containerized cargo, the Port would also need to develop a chassis pool for handling standard intermodal ocean containers.

Figure 12: Typical Yard Hostler for Cargo Handling⁷³



Rail Improvements

The terminal's rail yard and on-site trackage is also in need of improvements, which primarily consist of drainage and additional ballast. It is also recommended that a heavy weight track be added to accommodate project loads and high weight cargoes⁷⁴. This could be best handled by the extension of heavy rail to Pad 106, including paving the pad to handle an increased static landing weight for bulk and heavy lift transfers. This would eliminate the need for intermediate moves using vehicle trailers. Other suggested rail equipment improvements include a rail car dumper pit or rotator and a bottom recovery conveyor system for offloading biomass and aggregates.

Several improvements to the existing rail infrastructure at the Port of Searsport are included in Maine's most recent TIGER VII grant award. The present state of the yard in Searsport makes it challenging to efficiently handle wind turbine blades and other imports and exports. The project, funded by the FY-2015 TIGER grant, will provide \$1.5 million for infrastructure investments that will provide significant rehabilitation and capacity expansion to the yard improving conditions to allow for greater reliability. The project will install eight new turnouts, critical for handling the long cars that the blades require, as well as install 18,000 linear feet of new rail. The reliability of switching operations will greatly increase allowing more goods to flow through the port.

⁷³ Source: HDR

⁷⁴ HDR visual site survey

Figure 13: Existing Main Rail Yard and Heavy Weight Pad Area⁷⁵



Land Expansion and Industrial Park Development

Another primary concern is the availability of land for Port expansion. Development of Sears Island has been a controversial issue for a number of years, but Searsport represents one of the most flexible and adaptable Port facilities in the Northeast. If the Port were to grow with the removal of constraints, additional land would be needed for handling of cargo. Future development of an efficient, major container terminal on Sears Island is impractical. This site, however, could be used for project cargo, specialized production or assembly of offshore wind components, or neo-bulk cargoes. While not an immediate need, preservation of the Sears Island site for future Port use should be considered since lack of land for expansion is often the major constraint in the growth of successful ports.

Developing an industrial park near the Port should be included in Searsport's future town planning. The Town has identified industrial property near the Port which could include some 100 acres of industrial land for new development. This could be enhanced for development by planning the property and identifying utility capabilities, including the provision of gas through Bangor Gas's line into the Port. Additionally, during interviews with Town officials, it was made apparent that the Town is committed to embracing its maritime heritage. It is therefore recommended that the Town consider appointing an employee to be responsible for focusing on Port planning and industrial issues for future growth.

⁷⁵ Source: HDR

8 Conclusion

The Port of Searsport is one of the most versatile port facilities in New England, and has several advantageous attributes for a successful intermodal marine operation. Some improvements are needed however, to bring the infrastructure at the Port up to current operating standards - particularly with respect to the needs for channel dredging, which remains a critical constraint for vessels to safely access the port's facilities.

Upgrades in cargo handling equipment such as yard hostlers and a bulk loader would also improve operational efficiency at the space-constrained piers, which helps lower costs and makes the port more attractive for shippers. Development of available land near the port facilities into an industrial park is also recommended for generating future growth for Searsport. Future development of nearby land into an industrial park would also foster growth within the port.

With respect to the development of business opportunities for the port, it should be recognized that Searsport's core business is most likely to remain bulk commodities. Handling of containerized and project cargoes are other opportunities for future business development, as demonstrated by the terminal's recent experience with handling material and equipment for the wind power industry.

It is recommended that Maine Port Authority contact the following groups for to explore new or continuing development of cargo opportunities at the facility:

Siemens AG

Werner-von-Siemens-Straße 1
80333 Munich, Germany
International (English): +49 (69) 797 6660
<https://www.energy.siemens.com/hq/en/renewable-energy/>

Vestas-Canadian Wind Technology. Inc.

1417 NW Everett Street
Portland, OR 97209
Phone: (+1) 503 327 2000
vestas-america@vestas.com
<https://www.vestas.com/>

Sprague Energy

185 International Drive
Portsmouth, NH 03801
1-800-225-1560
customercare@spragueenergy.com
<http://www.spragueenergy.com/>



Irving Oil

190 Commerce Way
Portsmouth, NH 03801
1-866-865-8800

<http://www.irvingoil.com/>

Bangor Natural Gas

498 Maine Avenue
Bangor, ME 04401
info@bangorgas.com
(207) 941-9595

<http://www.bangorgas.com/>

Phyto-Charter Solutions

Stephean Chute, Managing Director
stephean@phytocharter.com
(207) 650-4216

<http://www.phytocharter.com/>

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Bangor Daily News

2016 “What a Sun Edison Bankruptcy Would Mean for Maine”

Cambridge Systematics, Inc.

2014 Maine Integrated Freight Strategy Final Report

DNV - GL

2014 Liquefied Natural Gas (LNG) Bunkering Study – Maritime Administration

Karl F. Seidman Consulting Services and Urban Focus LLC

2016 Massachusetts State Piers: A Business and Operations Assessment

LNG World News

2016 “Port of Rotterdam in LNG bunkering first”

Maine’s Business News Source

2017 “Nonprofit acquires Millinocket Mill Site, plans collaboration with town on redevelopment”

Maine Port Authority

2007 Port Development Strategic Plan

Portland Press Herald

2016 “Maine Ports Gearing up to Export Wood Chips to Europe”

The Cruise Ports of Maine

2016 Cruise Industry Statistics and Milestones

The Cruise Ports of Maine

2017 Cruise Industry Statistics and Milestones

U.S. Department of Commerce – International Trade Administration

2016 2016 Top Markets Report – Renewable Fuels: A Market Assessment Tool for U.S. Exporters

U.S. Foreign-Trade Zone Board

2015 76th Annual Report of the Foreign-Trade Zone Board to the Congress of the United States

worldsteel Association

2015 worldsteel Short Range Outlook 2015-2016 (Chicago, worldsteel-49, annual conference)



Bayside Port Corporation, New Brunswick web site: www.portofbayside.com

Halifax Port Authority, Nova Scotia web site: www.portofhalifax.com

Maine Port Authority web site: www.maineports.com

Port of Rotterdam Authority, the Netherlands web site: www.portofrotterdam.com/en

Port St. John, New Brunswick web site: www.sjport.com

Appendix A. Meetings with Searsport Authority and Stakeholders (9/14/16)

Project:	MEDOT Intermodal Commodity Study	
Subject:	Meetings with Searsport and Stakeholders	
Date:	Wednesday, September 14, 2016	
Location:	Searsport, ME	
Attendees:	William Littlefield (Sprague)	Peter Fogg (Sprague)
	James Nelligan (Sprague)	Robert Thomas (Central Maine & Quebec)
	Chris Caldwell (Central Maine & Quebec)	Brock Mooney (Maine Port Authority)
	Jeff Monroe (HDR)	Marissa Birtz (HDR)
	Bryan Jones (HDR)	

Dinner Meeting at Anglers Restaurant with the Town of Searsport (James Gillway and Jack Merrithew)

- Searsport has hired an economic development person to work part time as they are looking to embrace the town's maritime heritage.

Site Meeting at Sprague Terminal

- Historically, this has been a fuels port and coal terminal. During World War-II, the terminal saw a lot of ammunition exports.
- The terminal has about 140 acres, with another 45 acres of undeveloped land to the north.
- There is a dry bulk dock (40 feet deep), which is only utilized about 20% of the time.
- There is a liquid bulk dock (35 feet deep), which receives about 160 ships/year.
- Fenders are only located on one side (the east side) of each dock.
- The terminal has on-site (but not on-dock) rail access. The dry bulk dock was designed and constructed for possible future implementation of on-dock rail.
 - There is a 4-track rail loading facility that needs a bit of upgrading
- The terminal has 90,000 square feet of warehouse space, but that is easily expandable to 120,000 square feet.
- The port has a 12-foot tidal range (typically), with a working channel depth of only 33 feet currently.
- The US Army Corps does not want to fight locals on where to place dredged materials for disposal. They have too many other projects that are begging for them to do dredging – so those take priority.
- Cargoes include liquid asphalt, heavy oil, specialty chemicals, and scrap metals
- The terminal has pipeline and rail connections to Loring Air Force Base.
- The tank capacity on terminal is about 1.2 million barrels, which is “more than the entire state needs.”
 - Tanks typically store light fuel, sodium hydroxide and liquid asphalt.
 - Recently removed one storage tank to create an additional laydown pad.



- Have a state-owned Liebherr crane on site. This has been very useful for wind components and allows better capabilities to move heavy lift components.
- They have given consideration to using as a crude export facility, but the location reduces the viability of this option (too far from east coast refineries and too close to Irving facility).
- The adjacent Irving property handles heating oil, kerosene, and biofuels.
- Maine Materials has a salt facility between the Sprague Terminal and US Route 1.
- The nearby GAC chemical plant on Sears Island has approximately 100 acres of undeveloped land with rail access
- Salt demand through the Port remains fairly steady.
- Heavy Oil is a dying commodity (used primarily by mills, which are closing).
- Clay slurry facility at the terminal handles kaolin from Brazil. It is shipped to Canada via rail, or to supply the Maine paper mills (used to make glossy finish on paper).
- The port also does a lot of project cargo for onshore wind projects. Demand is steady but depends on tax incentives. They expect a lighter demand next year.
 - The port has sufficient laydown area for blades, nacelles, and towers.
- The State owns the pier, but Sprague has exclusive marketing rights to use it.
- The existing pipeline is not being used currently. It has a separate right-of-way from the rail.
- Bulk commodities have ranged between 300,000 to 600,000 tons/year over the past 8 years and include:
 - Salt
 - Petroleum
 - Gypsum
 - Iron oxide
 - Copper slag
 - Occasionally fertilizer, pulp & paper
 - Commodities for cement products
- Bulk volumes have remained fairly steady in the past several years, though the composition of commodities varies depending on the year.
- It typically takes 2 or 3 days to unload a ship full of wind components. The towers, blades, nacelles and drive trains typically come from various places. The crew can move approximately 3 tower segments per hour during unloading. The speed is slow due to the number of people and surveyors that must be present and the amount of care taken to assure that the components remain completely in tact, with no dents or scratches.
 - Blades can be up to 57' and require the use of custom trailers
- Non-union labor at the terminal. The maximum gang size is 20.
- Wind components leave by truck primarily, and rail movements have been a recent development.
- The terminal is somewhat flexible in its arrangement and storage. They have recently added a new laydown pad, moved some commodities into different portions of the terminal, and positioned the scrap metal in a place that will minimize noise and aesthetic disturbances for the nearby population.
- There is the potential, with a bit of upgrade, to accommodate unit trains at the facility for commodity movement.
- Searsport would like a couple of reach stackers.

Meeting with Central Maine & Quebec Railroad

- Rail is of critical importance to a bulk cargo facility

- Lots of interest, but they are often frustrated by the greenfield status and need for infrastructure development. This is particularly true when there are viable alternatives with existing infrastructure available.
- Maximum speeds on the CMQ line is 25 mph, though this is not a limiting factor. The CMQ rail infrastructure extends through Maine to St. Jean, Quebec to the west, where it connects to CN and CP. The line also has good connections with the Vermont Rail System.
- There are no clearance limitations on the line.
- CMQ has a self-imposed embargo on crude oil for 2016. Beyond this, the market for crude oil rail movements has declined significantly and is expected to remain low unless crude prices increase. Thus, the movement of crude oil is likely not a good area to explore.
- They have noted that there may be a significant reduction in the lumber harvest in two years if infrastructure is removed. Without the infrastructure, they will not be able to harvest. That said, the JD Irving Sawmill was recently reopened, and presents a potential opportunity of 300,000 tons per year for 2018.
- Pig Iron and Scrap Iron present potential opportunities for 40,000 and 150,000 tons per month, respectively.
- Other potential commodities include:
 - Fertilizer
 - Chemical salt (though this requires covered storage)
- Blending of fuels could be a potential business opportunity?
 - Searsport is generally underutilized for fuel/ethanol.
- Automobiles to St. John might be an opportunity if the facility can find space.



Appendix B. Tariff Comparison

Port Tariffs:	Eastport, ME		Searsport, ME*	Portland, ME		Montreal, QC		St. John, NB		Halifax, NS	
Dock Charge:											
Commercial Vessel	\$1.20	per foot	N/A	\$2.20	per foot	N/A		N/A		N/A	
Fuel Bunker/Tanker (if available)	N/A		N/A	\$2.00	per foot	N/A		N/A		N/A	
Berthing	\$300.00	per port call	N/A	N/A		N/A		\$0.052	per ton (first 24 hrs)	N/A	
	N/A		N/A	N/A		N/A		\$0.0029	per ton (subsequent hrs)	N/A	
Rentals:											
Gangway / Fender	N/A		N/A	\$500.00	per day	N/A		N/A		N/A	
Wharf Charge:											
Unrefined Cargo (Dry Bulk Cargo)	\$1.00	per ton	N/A	N/A		\$1.43	per ton	\$1.25	per ton	\$1.19	per ton
Refined Cargo (Break Bulk Cargo)	\$1.20	per ton	N/A	N/A		\$4.33	per ton	\$3.71	per ton	\$3.55	per ton
Liquid Bulk Cargo	N/A		N/A	N/A		\$2.62	per ton	\$2.18	per ton	\$2.12	per ton
Containers (Full)	N/A		N/A	\$40.00	per container	\$4.33	per ton	\$3.51	per ton	N/A	
Containers (Empty)	N/A		N/A	\$20.00	per container	N/A		N/A		N/A	
Thruput Rates:											
Inside Storage	\$1.25	per ton	N/A	N/A		N/A		N/A		N/A	
Outside Storage	\$0.75	per ton	N/A	\$25.00	per container (11+ days)	N/A		N/A		N/A	
Special Project Cargo	As negotiated		N/A	\$0.01	per sqft/day	N/A		N/A		N/A	

Sources:

Eastport, ME: <http://www.calaiscomputerplus.com/port/rates.php>

Searsport, ME: * Tariff information not available on Port website

Portland, ME: <http://www.portlandmaine.gov/DocumentCenter/View/12612>

Montreal, QC: <http://www.port-montreal.com/en/fees.html>

St. John, NB: <https://www.sjport.com/cargo/tariffs/>

Halifax, NS: <http://portofhalifax.ca/port-operations/port-tariffs/>



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