



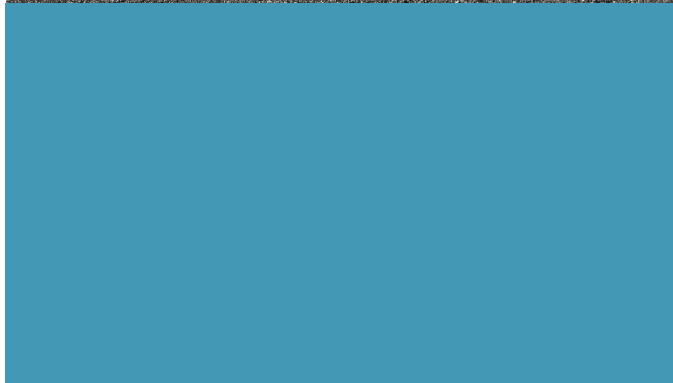
FINAL REPORT

Eastport Intermodal Commodity Study

Maine Port Authority/Maine DOT

HDR Project No. 10040573

Eastport, Maine
August 3, 2017



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1 Executive Summary

This study was commissioned by the Maine Department of Transportation and the Maine Port Authority to assist the Port of Eastport with its efforts to identify potential business development opportunities.

Situated along the US-Canada border in Cobscook Bay, the Estes Head Cargo Terminal in Eastport features a naturally deep harbor able to accommodate large vessels. The property includes multiple warehouses, a new bulk conveyor system, and 140 acres of open land for development. The facility can handle a wide variety of cargo types, but is primarily set up for dry bulk, neo-bulk and break bulk cargoes. There is no direct rail access to the terminal, but the road access for trucks is adequate to support current operations.

This study included a review of existing reports and historical data of ports and cargoes that have been handled at Eastport and other regional ports in Northern New England and Southern New Brunswick. A functionality assessment of the port's infrastructure and facilities was also performed, including interviews with facility managers and port stakeholders. HDR also conducted an analysis of potential international and domestic business partners, to identify a list of primary, secondary, and tertiary opportunities for the Port.

As an intermodal marine terminal, Eastport has the following advantages:

- Natural deep-water access for large vessels that does not require any maintenance dredging,
- Heavy weight and designated access roadways to facilitate efficient cargo movements into and out of the terminal,
- Adequate land adjacent to the terminal for future expansion, as well as efficient operational functionality and storage at the existing facility, and
- A new dry bulk materials handling conveyor for ship loading.

The Port of Eastport has all of the identified attributes for a successful intermodal marine operation except for direct rail access. Lack of onsite or near-dock rail access is the biggest challenge faced by the Port, because it limits the potential business opportunities available for high volume, low cost bulk cargoes moving through the region, which are most efficiently moved by rail. Successful growth of current opportunities, however, may eventually justify expanding rail service to Eastport in the future. It is essential, therefore, for the community to identify and preserve a suitable right-of-way corridor for future rail development.

The future growth of this seaport requires an expanded industrial base near Eastport to help generate movement of raw materials, commodities, and finished goods throughout the region. The Port's most significant asset is its adjacent property which is available for development into industrial parcels. 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. Therefore, designation of this property as a Foreign Trade Zone is critical to encourage business interests to move into the area.



The primary opportunities for business development at Eastport include biomass (i.e. treated and untreated wood chips), processed wood products (e.g. chip and particle board), aggregates, and petroleum products. Secondary opportunities were also identified, including livestock and agricultural goods; containerization; cruise and service industry; scrap metals; and seafood, however these are more limited in size or potential based on existing conditions.

The following recommendations are made regarding the Port's development:

1. Development of an industrial park on available property located adjacent to the Estes Head Terminal.
2. Designation of a Foreign Trade Zone for activities in the newly formed industrial park.
3. Continued improvement of the Terminal infrastructure to support flexible cargo handling capabilities for a wide variety of bulk, break bulk, and project cargoes; as well as improve truck access to the docks.
4. Identification and preservation of an adequate right-of-way to enable future development of a rail and pipeline corridor to serve the Port.

2 Introduction

2.1 Purpose and Scope

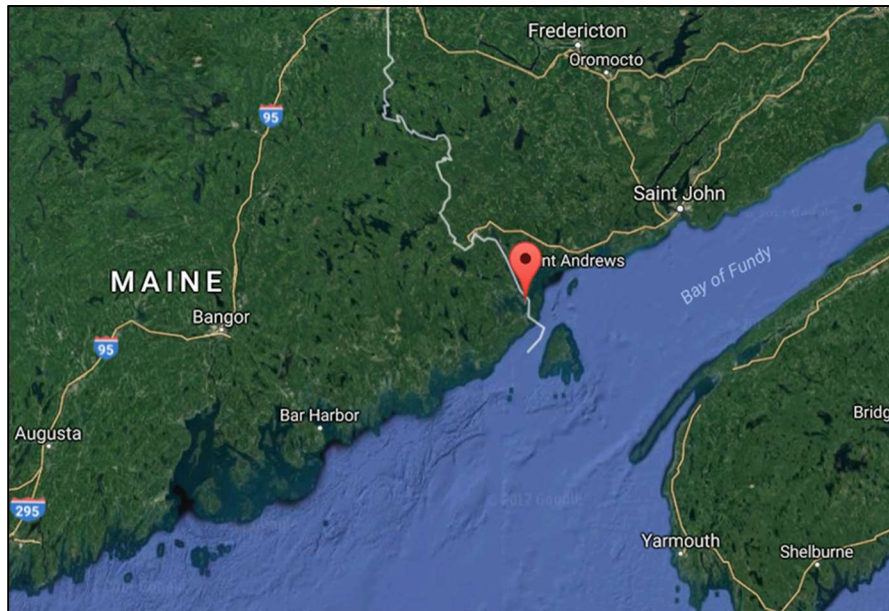
The Maine Department of Transportation and the Maine Port Authority is conducting a study for the Port of Eastport to assist the Eastport Authority with its efforts to identify potential business development opportunities for this important Maine community. The mission of Maine Port Authority's three Port strategy 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 Eastport's strengths and identify commodities moving through the region to be able to prioritize business development opportunities at the Port.

The Port of Eastport shown in Figure 1, located in Cobscook Bay along the US-Canadian border, is home to the Estes Head Cargo Terminal. The naturally deep harbor provides virtually unrestricted access for the larger ships typically calling at today's modern ports. Vessels up to 900 feet in length can be accommodated along the terminal's main berth, which has a depth of 64 feet at mean low water (MLW).¹ Additionally, there is a secondary berth, primarily used for tugs and barges, located on the inshore side of the 635-foot long by 100-foot wide concrete pier.

The terminal property features multiple storage warehouses, bulk cargo handling equipment, a dump pit and new conveyor, and good road access. The Port's facilities can handle bulk, neo-bulk and break bulk cargo, but does not currently have access to a rail line. The Port property includes approximately 140 acres of open land able to accommodate a variety of possibilities for growth in Eastport.

¹ Port of Eastport

Figure 1: Port of Eastport Aerial Map²



2.2 Work Approach

Potential market opportunities were identified in 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 Eastport 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 the Eastport's Port Director and representatives from Maine Port Authority, Eastport Pilots, Phyto-Charter, and Moose Island Marine, Inc.
4. Analysis of potential international and domestic business partners that could utilize Eastport 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, Eastport 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.

² Source: Google Earth

The commodity assessment for Eastport 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 Eastport. 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 Eastport 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 Eastport based on the existing facilities’ capabilities, Port constraints, and market trends. The following reports were identified and reviewed for reference in this study.

- 2007 “Port Development Strategic Plan” – Maine Port Authority
- 2009 “Eastport Freight Rail Restoration Study” – HNTB
- 2013 “An Assessment of Market Factors for Proposed Eastport Northeast Trade”
- 2014 “Maine Integrated Freight Strategy Final Report”
- 2016 “Maine Forest Initiative, Emerging Phytosanitary Technology - Phyto-Charter”

The “Port Development Strategic Plan” identifies infrastructure constraints faced by the Port of Eastport, including a lack of operational rail infrastructure and remote geographic location outside of a largely populated or significant industrially active area. Two long term investment opportunities were highlighted in the strategic plan for Eastport, which also provided foundational information for this study. First, the study recommends constructing an LNG facility in the harbor as it would present a local energy source that could draw an industry that would utilize the Eastport facility. A second recommendation supports investing in an industrial park in Eastport; the Port could support the import of an industry’s raw material and its foreign trade markets. Both opportunities aim to combat the Port’s biggest constraint, location.

The 2009 “Eastport Freight Rail Restoration Study” emphasizes the need for direct rail access at the Eastport terminal, which would connect to the larger North American Rail system. Without rail connection, Eastport is restricted to trucking marine commerce in and out of the Port, further limiting the Port’s ability to market itself as an international contender. Though restoring rail service to Eastport is possible through existing corridors, it is recognized as a long term investment for the state. The “Eastport Freight Rail Restoration Study” not only provided a cost estimate for restoring rail service to Eastport, but also provided a feasible location, layout and cost for a rail-to-truck trans-load facility.

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

The 2013 study, “An Assessment of Market Factors for Proposed Eastport Northeast Trade”, provided key data regarding market trends for Eastport, and other Maine Ports. This study discussed potential future opportunities for Eastport, including global trends in biofuel and wood products and investing locally in equipment and technology. Additionally, this study examines the competitiveness of deep water ports in the North East and landside transportation issues servicing Eastport, specifically moving freight inland in Maine via truck and rail. The study concludes that “to establish Eastport’s competitiveness with other major ports, careful evaluation should be given to current agreements between Maine’s regional railroads and Class I carriers in the U.S. and Canada, along with capital investments needed to establish competitive service.” The recommendations of this study, helped to guide our analysis and support our recommendations.

The Port Development Strategic Plan, Freight Rail Restoration Study, and Integrated Freight Strategy Report all support the basis of this Commodity Study at the Port of Eastport. In order to support long-term economic growth at the Port, investing in direct rail access should be considered. At the very least, the existing right-of-way corridors should to be maintained and remain available for future rail, pipeline and other liquid bulk commodity infrastructure development.

A final report reviewed by the team is the “Maine Forest Initiative, Emerging Phytosanitary Technology - Phyto-Charter.” According to the study, the European Union regulation requires all imported wood to be heat-treated to kill insects. Suppliers are to receive government certifications for their wood treatment process, known as phytosanitation. In order to meet the European Union’s demand for forest products while complying with their regulations, Phyto-Charter, a Maine based company is working with the University of Maine to develop a patent-pending system that heats wood after loaded into the hulls of the chip carriers in Eastport, Maine. The 2016 “Maine Forest Initiative,” produced by Phyto-Charter, provides in depth understanding of phytosanitary technology, resource procurement and merchant marketing of wood fiber in order to meet the requirements of the European Union. This initiative helped to justify investment in this business opportunity, and recently, to secure funding from the State of Maine to bring phytosanitation into operation at Eastport.

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

3.1 Property Overview

The primary cargo facility in the Port of Eastport is the Estes Head Cargo Terminal, which boasts ample open land, deep-water marginal wharf, multiple warehouse structures for storage, bulk cargo handling equipment and good road access and are presented in Figures 2 and 3. The facility, designed for bulk, neo-bulk and break bulk handling does not currently have any rail infrastructure. The berth and related pier can accommodate vessels up to 900 feet along the main outside berth, designated as Berth A. Additionally, the Port has one of the deepest harbors in the Northeast, with approach depths to the pier in excess of 100 feet.³

Figure 2: Estes Head Terminal Property Overview⁴



³ US Coast Pilot #1, National Oceanic and Atmospheric Administration.

⁴ Source: Google Earth & HDR

Figure 3: Estes Head Cargo Terminal, Port of Eastport⁵



There are two mooring dolphins, 900 feet apart on the primary berth (A). There is a second berth (B) on the inshore side of the pier that can handle vessels up to 550 feet long. The concrete pier measures 635 feet long by 100 feet wide with a static landing weight of 1,000 pounds per square foot. Berth A is 64 feet deep at MLW.⁶ The facility has good weather protection with a normal tide range of just under 19 feet.

Figure 4: Pier Deck and Access Ramp⁷



The pier has limited traffic circulation with only a single access corridor and connecting pier structure to the main terminal. The terminal's 55-acre site has multiple open storage areas, three 20,000 square foot warehouses, and one 43,000 square foot warehouse. The terminal operator is Federal Marine Terminal, under assignment by the Eastport Port Authority. In recent years, the facility has handled wood pulp/wood chips and containerized livestock as exports, and road salt and wind turbine components as imports.

⁵ Source: Eastport Port Authority: <http://www.portofeastport.org/>

⁶ Port of Eastport

⁷ Source: HDR

Figure 5: Storage Sheds and Open Storage Area⁸



There is a great deal of storage capacity on the site, both covered and open. The warehouse structure are adequate for handling most bulk and neo-bulk commodities, and are currently used for packaged wood pulp storage. According to Port operators, the floor capacity has an estimated rating of 1,300 pounds per square foot and would be able to handle heavy weight and stacked cargo such as rolled paper or steel.⁹

Figure 6: Conveyor System and Ship Loader¹⁰



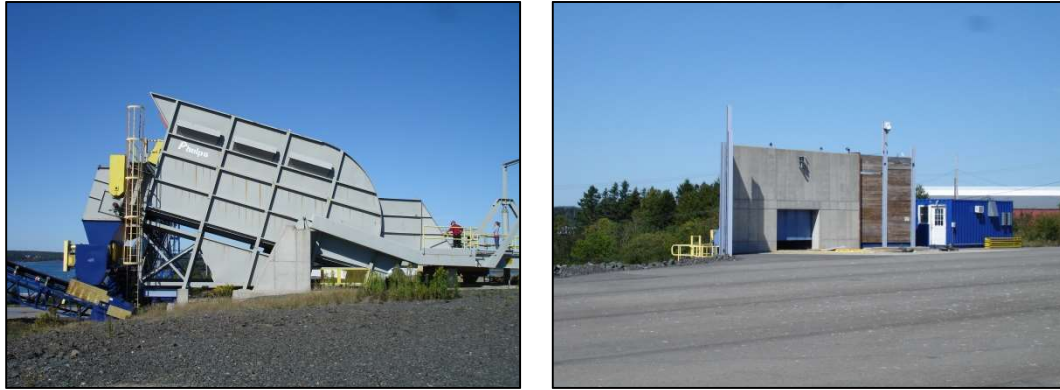
The Port is equipped with a state-of-the-art bulk handling conveyor system that includes an elevated truck dump station, a conveyor tied to the open storage area, pier conveyor system, and ship loader. The unit is one of the best available in a number of similar ports that handle bulk cargo. The Port has an elevated dump area for truck unloading, storage area for piled commodities and dump connector to the pier conveyor system, which can handle 1,000 tons per hour for most commodities. The system is laid out in an effective manner, is capable of handling a wide range of dry bulk commodities and can support the largest bulk vessels available in the industry today. The Port's truck dump area and dump-to-pier conveyor system can be seen in Figure 7.

⁸ *Ibid.*

⁹ Port of Eastport

¹⁰ Source: HDR

Figure 7: Truck Dump and Dump-to-Pier Conveyor System¹¹



The Port also has a truck weigh station and scale for bulk cargo that could also be used to meet the new Verified Gross Mass Export Container regulations if the Port were to handle export containers in the future. The scale is currently being relocated in order to align with the new main access road, and a second scale is planned for the inbound side at a later date, as volume dictates. This will facilitate rapid weighing of bulk and containerized commodities moving both inbound and outbound. The scale house and new location along the main access road can be seen in Figure 8. The Port has made some improvements to the terminal access roads to better accommodate trucks accessing the terminal facility, specifically at the intersection of Route 190 and Barron Road where previously there was a sharp turning radius.

Figure 8: Existing Scale House and Relocation Site on Main Road¹²



One of the Port's best assets is the large amount of available property located adjacent to and included in the Port's boundaries, these areas are presented in Figure 9. Port property is estimated to be approximately 140 acres, which provides a wide range of possibilities for expansion. Near-berth properties have been developed very successfully for industrial uses whose activities are compatible with marine facilities.

¹¹ *Ibid.*

¹² Source: HDR

Figure 9: Approx. Boundary of Adjacent Port Owned Property¹³



Currently the Port has 120 contiguous acres, 40 of which comprise the terminal. There are another 80 acres available for immediate development. Additionally, the Port could potentially acquire another 20-25 contiguous acres, if deemed necessary and appropriate by the Eastport Port Authority.

Figure 10: Breakwater Terminal Reconstruction¹⁴



In addition to the Estes Head Facility, the Eastport Port Authority is responsible for the Breakwater Terminal, which is located in downtown Eastport. The Breakwater Terminal is 420 feet long and is able to berth vessels up to 700 feet long. The terminal also includes several administrative offices for the Eastport Port Authority, US Customs, and

¹³ Source: HDR & Google Earth

¹⁴ Source: HDR

US Coast Guard. The approach channel to the Breakwater Terminal is more than 100 feet deep, with a minimum depth of -42 feet MLW at the berth. The Breakwater Terminal is also used by the aquaculture industry, commercial and recreational fishermen, recreational boaters, and occasional small cruise ship calls. There is a private facility for hauling out small craft of up to 40 feet in length.¹⁵ The pier is currently undergoing extensive reconstruction expected to be completed in 2017. This was necessitated by a structural failure of the sheet pile wall on the inshore side of the breakwater in December of 2014.

3.2 Existing Equipment

The equipment assessment focuses primarily on the intermodal facility at the Estes Head Cargo Terminal. As mentioned above, the Port of Eastport possesses one of the best bulk handling facilities in the Northeast US and Atlantic Canada. It has a natural deep-water harbor capable of handling most of the largest ships in the world. The Port also has a concrete bulk handling dock in good condition with a wide apron, new bulk handling equipment and adequate mooring points. Access to the dock is constrained by a single access ramp that supports the bulk loading conveyor system but is only wide enough for single direction vehicle movement. During conversations with Port Authority representatives, a member of the Port Authority Board indicated that the potential for an additional access ramp had been looked at and was possible.¹⁶

There is adequate property to handle a wide range of cargo activities, including covered and open storage, project cargo staging, load staging inbound or outbound, inventory management and distribution, as well as near terminal industrial development. One of the Port's most significant advantages is the ability to expand its property, which in many ports is a major constraint. Even with irregular topography, the Port's land could be designed to handle a number of cargo related and industrial activities. Such activities could include pier road access improvements, business or industrial park development, rail service extension, and more storage facilities for forest products, salt and other bulk commodities.

The current facility can handle a wide range of cargoes in its current configuration. These include:

1. Dry Bulk Cargo such as salt, wood chips, aggregate and minerals.
2. Project Cargo such as machined plant and wind turbine components.
3. Neo-Bulk cargo such as steel, lumber and wood pulp.
4. Containerized cargo in small volumes with ship's gear or shore-based crane.
5. Break-bulk cargo including a wide range of palletized commodities.

If new infrastructure was put in place, liquid bulk cargo such as petroleum, kaolin, bulk water and liquefied gas including LNG and propane could be handled. Current cargo restrictions in Passamaquoddy Bay, however, would challenge the development of a petroleum operation through the Port of Eastport. In order to capitalize on this opportunity, modifications to the existing regulations would need to be made.

¹⁵ US Coast Pilot #1, NOAA

¹⁶ Eastport Port Authority Interview (Capt. Peacock) and Boat Tour (9/13/16)

In addition, there are several water side constraints that could be mitigated with equipment. First, the large tidal range may prevent smaller vessels from using their own cargo handling gear. A shore-based crane, however, including commonly available construction crawler cranes, can compensate for this. A second constraint is the narrow access ramp to the pier. This may be an issue for handling large project cargo, such as wind turbine components. For other types of cargo, a directional flow management effort could be put into place to mitigate the narrow access ramp, postponing the need to expand the current ramp or build a new one unless dictated by market forces.

3.3 Transportation Links

Roadway access to the terminal is via US Route 1, which is adequate for the terminal's current needs, though it travels through the center of the community. It should be noted that loading and/or unloading a full shipload of cargo from a "standard" 40,000 deadweight ton vessel would generate nearly 1,000 truck moves¹⁷. This obviously would create a major impact on the local residents, even if ship calls were only occasional. Ultimately, as the cargo business development in Eastport grows, a new access road and transportation corridor to the Port will need to be considered in order to alleviate growing impacts to the Eastport community.

The lack of rail infrastructure is the most significant limitation for bulk cargo to access the Port today. A study was conducted by the Port Authority in 2009 to look at the feasibility and cost to develop a remote rail facility near Calais, Maine that would connect to the New Brunswick & Maine Railway, several miles from the Estes Head Terminal. While this might be the least expensive approach in the short term, it will be inadequate if Eastport were to ever develop as a higher capacity dry bulk Port. This is because of the extra handling cost required to move cargo from rail cars at Calais onto trucks to/from the terminal. Maps for the Central Canada & Quebec Railway and the Maine rail system are provided for reference in Appendices A and B, respectively.

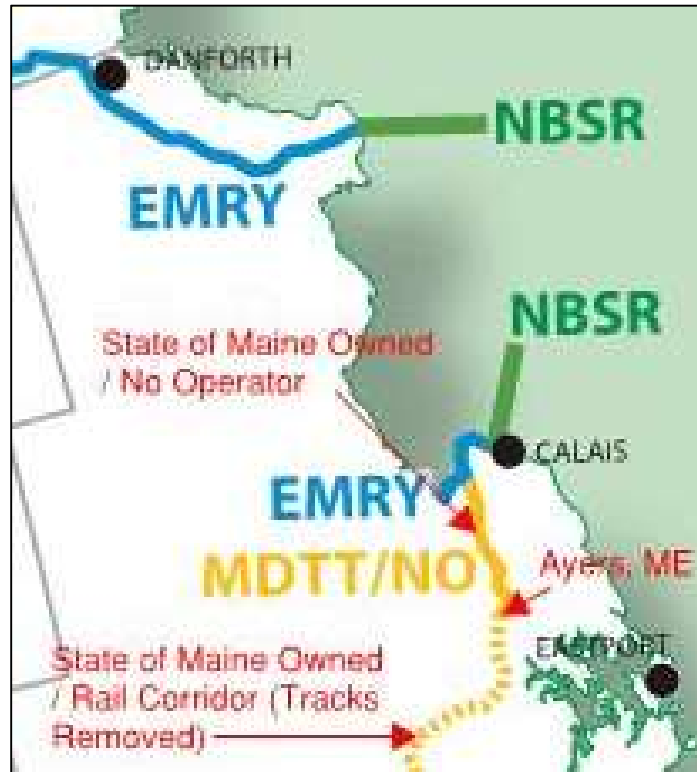
Dry and liquid bulk commodities are, in most cases, low value commodities generating lower profits for the service provider. To make up for lower profit margins, carriers look to move higher volumes in the most cost efficient manner. The current class of largest bulk ships can carry in excess of 80,000 metric tons of cargo. This class of ship could navigate and dock adequately into Eastport and could handle a high volume of cargo, but all of it would have to be trucked out of the Port, which is less efficient than via rail. Modern successful bulk terminals have direct rail access via on-terminal track that connects to either a short line or Class 1 railroad. Cargo is transferred between the ship and the rail cars on-site minimizing handling and keeping costs low.

There is an existing rail corridor near Eastport that could be extended to provide a direct connection into the terminal. A former spur to Eastport, shown as a dotted yellow line in Figure 11, ran for a distance of 12.6 miles from St. Croix Junction and joined the former Calais Branch at Ayers Junction. The Eastport spur was discontinued in 1974 and was bought by the Maine Department of Transportation to provide for a future rail connection into Eastport.

¹⁷ HDR estimate based on average vessel size and average truck capacity.

The extension of a rail line from St. Croix Junction to the Estes Head Terminal in Eastport is a very expensive proposition, however, which would require approximately 25 to 30 miles of new track infrastructure, at a cost ranging between \$1 million to \$2 million per mile¹⁸. Extending rail to Eastport would also require a new rail right-of-way corridor into the Port's cargo facility. In addition, the proposed new corridor would require extensive permitting and construction of a new bridge, which would further increase the costs of the project.

Figure 11: Former Rail Spur to Eastport from St. Croix Junction¹⁹



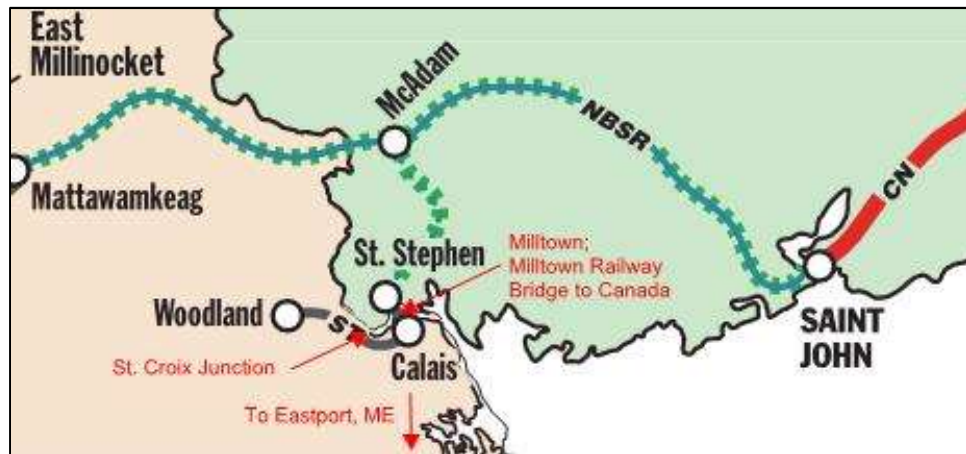
Alternatively, there is a small section of the Calais Branch that is in operation from St. Croix Junction to Milltown, where a connection is made with the New Brunswick Southern Railway (NBSR) at the Milltown Railway Bridge into Canada. This branch is identified in Figure 12.

At St. Croix Junction, the Woodland Spur continues northwest to Woodland Junction in Baileyville, and onto the Woodland mill complex. Both the non-carrier rail company and the mill are owned by Woodland Pulp LLC. Although the mill ships most of the wood pulp it produces to New York and the midwest via rail, it also trucks a small amount of pulp from Baileyville to Eastport for export. Currently, there is insufficient volume shipped by the mill to justify the construction of rail to Eastport solely for the pulp business.

¹⁸ ACW Railway general estimate.

¹⁹ Source: Maine Rail System 2016 – MaineDOT

Figure 12: Calais Branch²⁰



Together, the operable sections of the Calais Branch and the Woodland Spur are a total of approximately 11.8 miles. The spur was owned and operated by Pan Am Railways until being sold in 2012 to Woodland Rail, which has now contracted their mill yard and rail operation to the New Brunswick & Maine Railway. If extended, this would provide the most probable connection to the Port of Eastport.

In addition to track infrastructure, rail corridor right-of-ways are often used for pipeline and utility corridors as well. The 217-mile long Calais Branch right-of-way connects Brewer to Calais, and would provide a direct pipeline connection into Bangor and Brewer, one of the State's most populated areas.

4 Site Visit and Interviews

4.1 Stakeholder Interviews

Site visits and interviews were scheduled in the Town of Eastport, Maine on September 12-13, 2016. During this time, conversations were facilitated with local and state Port Authority representatives and various local business owners operating at or near the Port. The primary purpose of these meetings was to identify Port capabilities, existing conditions and commodities currently 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 1. Greater detail on the interviews is provided later in this section. Meeting minutes from the interviews can be found in Appendix C.

²⁰ Operating between Calais, Maine and Woodland Junction; Source: Central Maine & Quebec Railway

Table 1: Eastport Site Visit & Interview Summary

| Interview | Participants | Discussion Focus |
|--|---|---|
| 9/12/16: Tour & Meeting at Eastport Offices | Chris Gardner (Eastport Authority) Capt. Bob Peacock (Eastport Pilots) Brock Mooney (Maine Port Authority) Stephean Chute (Phyto-Charter) Dean Pike (Moose Island Marine, Inc.) | <ul style="list-style-type: none"> • Transportation options • Port Capabilities; onsite equipment • Phyto-Charter: Biomass opportunities in the EU • Other business interests |
| 9/13/16: Meeting at St. Croix Tissue, Inc. | Roger McIver (Logistics Manager) | <ul style="list-style-type: none"> • Rail improvements • Paper/tissue industry |

4.1.1 Tour and Meeting at Eastport Offices

A meeting at the Eastport Port Office on September 12, 2016, included both Port Authority personnel and local business representatives and also provided access to tour the terminal facilities. The focus of these discussions was on transportation challenges and needs, new facility equipment, wood industry opportunities and other possible business interests.

The information obtained from these interviews was used to develop a functionality assessment of the terminal, identify commodities moving through the Port and assess possible areas where operations could expand. The Port’s major assets are its naturally deep water, ample land to expand (approximately 145 acres) and state-of-the-art equipment. From a Port growth perspective, the biggest hindrance is the lack of transportation infrastructure to match the shipping capabilities at the Port. Currently all goods are shipped by truck in and out of Eastport, and the possibility of extending rail service into Eastport to support operations was brought up during this meeting. A full discussion on the current capabilities and infrastructure improvement needs at the terminal can be found in the functionality assessment section of this report.

The Phyto-Charter representative, Stephean Chute, provided insight into the wood chip export operations currently underway at the Port of Eastport. The company has purchased a patent for a new phytosanitary system to treat wood chips for export to the UK and Ireland. Phyto-Charter has been working with the University of Maine at Orono to improve the patent, and believes they have successfully developed a shipboard treatment process that can make this a realistic business opportunity in Eastport. The Port is equipped with a state of the art conveyor system intended for wood chip export operations, but is set up to both import and export cargo.

It was noted that fishing industries in the area include lobster, scallops and urchin, but fishing at the Port has been temporarily displaced by the collapse of the Eastport Breakwater Terminal structure in December of 2014, currently under repair.

The workforce in Eastport is engaged, relatively less expensive and belong to a local union, the Northeast Longshoremen's Association. Longshore services at the Port are provided primarily by local lobstermen working as independent contractors to the Port. It was noted, during conversations with Eastport employees, that labor production, measured in tons moved per hour at the Port is high compared with values in other ports²¹.

4.1.2 Meeting at St. Croix Tissue, Inc.

On September 13, 2016, a meeting with Roger Mclver, the logistics Manager at St. Croix Tissue, Inc. was held to discuss current operations and possible future business opportunities at the mill.

Currently, the mill produces tissue that is trucked in large rolls to Strasburg, VA, for conversion and packaging.²² Shipping via truck is driven by the Strasburg facility's "on-demand" production cycle. There is no advantage to ship this light material via barge or rail. In addition, the tissue is hydrophilic material and is damaged easily by water. If the tissue is shipped in bulk, it must also be stored in bulk and warehousing costs in Maine are cheaper than in Virginia. The distance between the Port of Richmond and the Strasburg facility is too far to economically ship tissue products along the coast. Additionally, returning empty containers to Maine is expensive due to the repositioning cost of empty containers. Shipments may be time sensitive because of production demands in Virginia, which scheduled water service may not be able to meet in the most cost effective manner because of storage and dray costs in Virginia. There is an offsetting cost of truck shipment due to the lower cost of storage in Maine and the fact that shipments are able to be coordinated with production schedules. Additionally, the product quality is a big concern for the mill; the more times the rolls are handled, the greater the chance for damage to the product. Mr. Mclver acknowledged that with higher volumes or new/different markets, marine shipping would be more viable. Reducing the transportation costs is a priority for the mill, and they are open to different options. For example, the mill has expressed interest in importing eucalyptus pulp from Brazil to be used in tissue production.²³ Mr. Mclver echoed the sentiment of Eastport Port Authority representatives that extending rail to Eastport could be a long-term prospect for the Port if shipping volumes grow to support it. He noted that if rail were extended, there is a potential that the mill would utilize it for the eucalyptus shipments.²⁴

²¹ Interview with Federal Marine Terminals, Eastport's Stevedoring Company.

²² Interview with Roger Mclver (Logistics Manager) at St. Croix Tissue, Inc. (9/13/16)

²³ *Ibid.*

²⁴ *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. It is important to note that while data is often available from numerous public sources, how the data is gathered and presented may be different. For example, tonnage may be reported in metric tons, short tons or long tons; tonnage estimates may be based on actual reporting or by estimates based on vessel capacities; or containers may be reported as overall totals when, in fact, the total may be comprised of both empty and full container moves. It is important that these factors be well-understood to ensure a robust and methodical assessment of commodities.

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
- Positive and balanced customer information including information needed for target marketing

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 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. Time to transit is the first consideration related to cargo movement. With cargo that is perishable or needed to meet production schedules. 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 at the micro level can be identified. 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 Eastport's long term viability.

Based on those potential opportunities activities, short- and long -term comprehensive planning can be undertaken with investment driven by realistic business opportunities. That planning also leads to the understanding of how comparative and competitive market pricing of services will factor in. It is not the cost of facility services that is most critical, but instead the total cost of moving cargo from the point of origin to the point of destination. Attracting cargo to a facility is based upon approaching a potential customer with an understanding of their needs and challenges, including the knowledge of knowing what is shipped, how much the time it takes to move, which mode works best, and what the total cost of the entire movement is. This is the basis of the origin and destination pathway for all supply chain logistic models. Once understood, the business development effort can quantify and target the most likely potential customers. Targeted sales efforts must be tracked to determine if the investment in the effort is developing a return.

Stakeholder and customer relationships and service satisfaction are key to attracting and maintaining business. Many opportunities have been lost because of poor service, even when cost is an advantage. Positive and balanced customer information, including marketing efforts to develop and sustain the image of the facility, is essential for consideration by potential shippers; but is ineffective without the informational foundations necessary to support successful business development. This is the core of critical database development that provides an accurate and not subjective understanding of potential cargo and business development opportunities.

5.2 Existing Commodity Flows

Foreign trade through Eastport fell just over 30 percent during the first ten months of 2016.²⁵ While overall trade in Eastport is down, trade growth with a few key partners should be noted. For example, trade with both Canada and Sweden rose in 2016. Imports and exports from both countries saw a rise through October as well. Eastport’s top five trading partners, which includes all trade modes and not just via vessel, represent 98.63 percent of its total trade and include Canada, China, Italy, Sweden and Poland.²⁶

The top five commodities moving out of Eastport through October of 2016 made up 99.18 percent of the total trade export of \$105.5 million. Trade growth was seen in the export of fish (fresh or chilled) which rose by 208.9 percent in 2016 from 2015 exports. Commodities including optical fibers and live crustaceans were exported through Eastport in 2016, after having no exports in 2015. The top five imports through October 2016 accounted for 95.94 percent of its total imported trade of \$10.21 million. All top five imported commodities saw a rise over 2015 numbers. The top ten imports and exports through October 2016, which includes goods moving via all transportation modes through Eastport, Maine, can be seen in Table 2.²⁷ Note that the only commodities to be imported and exported “over the docks” at the Port of Eastport in 2016 were road salt and wood pulp. All other commodities moved through the Port via freight trucks.

Table 2: Eastport, Maine Top Commodities (Jan-Oct 2016)

| Rank | Exports | Imports |
|------|---|--|
| 1 | Fish, fresh or chilled | Live crustaceans |
| 2 | Chemically processed wood pulp | Rafts, buoys, other misc. floating structures |
| 3 | Wood in the rough, stripped or not of sapwood | Imports of returned exports |
| 4 | Optical Fibers | Mussels, scallops, other mollusks |
| 5 | Live crustaceans | Rendered animal products |
| 6 | Misc. iron and steel articles | Various forms of salt |
| 7 | Yachts and other boats | Yachts and other boats |
| 8 | Commercial vehicles | Plastic boxes, containers |
| 9 | Rendered animal products | Exports of charitable items, returned as imports |
| 10 | Fork-lifts, other trucks with lifts | Frozen fish |

²⁵ US Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-eastport-me/>

²⁶ *Ibid.*

²⁷ US Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-eastport-me/>

Although not reflected in the relatively few commodities that account for the bulk of exports and imports, the Port facility is equipped to handle a wide range of cargoes. In its current condition, the Port is capable of handling dry bulk, project, neo-bulk, break bulk and small volume containerized cargo. With some modifications of existing infrastructure, liquid bulk cargo also could be accommodated at the Port.

The biggest challenge faced by the Port of Eastport is the lack of near dock rail infrastructure. The functionality assessment section of this report elaborates on this barrier; many of the potential opportunities for the Port would benefit from investment by the Port, state, and railroad to extend rail service to the terminal.

5.3 Regional Commodity Flows

In order to help identify potential opportunities for the Port of Eastport, market trends at other regional ports and existing shipping routes along the eastern U.S. coast were examined. Eastport's greatest assets are its naturally deep waters and access to approximately 140 acres of land ready to accommodate expansion. Activity at other regional ports may help Eastport identify some potential new cargoes or opportunities to expand their existing cargo services.

Regional ports examined in this section were chosen based on their location and the type of cargoes moving in and out the Port. Included are the Canadian ports in Halifax, Nova Scotia, St. John, New Brunswick and Bayside, New Brunswick as well as the northeastern U.S. ports in Providence, Rhode Island, Boston, Massachusetts, and Portsmouth, New Hampshire.

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 services.²⁸ 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 3. The major export and import cargoes moving in and out of the primary trading regions are also identified.²⁹

Home to numerous cargo, cruise and business terminals, the Port's import and storage capacity is extensive. The Port is equipped to handle a variety of cargo types including containerized cargo, break bulk, RO/RO, and bulk cargoes. The container terminals have the capacity to handle 2.5 million TEUs and dry bulk storage can support up to 135,000 metric tons of grain.³⁰ The total number of metric tons of containerized and non-containerized general cargo for the past five years can be seen in Figure 13. Total volume remained relatively consistent at 3.8 Million MT in 2014 and 2015. As compared

²⁸ Port of Halifax, Port Authority - Cargo: <http://portofhalifax.ca/cargo/>

²⁹ Port of Halifax, Port Authority – Global Markets: <http://portofhalifax.ca/cargo/global-markets/>

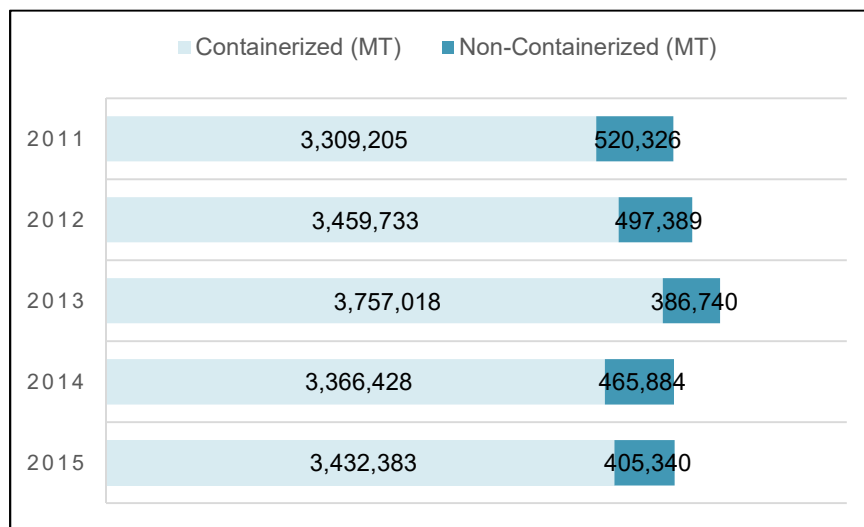
³⁰ Port of Halifax, Port Authority - Cargo: <http://portofhalifax.ca/cargo/>

to the first three quarters of 2015, metric tons of containerized cargo are up 13.2 percent and non-containerized general cargo was up 27.6 percent in 2016.³¹

Table 3: Shipping Traffic by Trading Partner

| Region/Country | Percentage | Major Cargoes |
|--------------------------------------|------------|--|
| Europe | 38% | Exports: Wind turbine components Imports: Forest products |
| Asia | 48% | Exports: Retail Imports: Soybeans |
| Latin America & Caribbean | 13% | |
| Other | 1% | |

Figure 13: Port of Halifax Total Cargo Volume (Metric Tons)



Eastport could benefit from its location along existing shipping routes from Halifax south to New York, Baltimore and ports in the Caribbean and South America due to its geographic location along common shipping routes.

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 cargoes.³² The Port is the largest by volume and most diverse Port in Eastern Canada. Big investments by the Canadian Federal Government and DP World, the Port’s current operator, result in Port St. John

³¹ *Ibid.*

³² Port St. John, Port Authority: <https://www.sjport.com/>

being the more likely focus for all container shipping in this region. Port St. John is also focused on growing its cruise industry.

The Port has had a long standing service into the Caribbean and South America through Tropical Shipping. In 2016, the Tropical Shipping operation moved to Halifax, Nova Scotia, leaving the primary service provided as Mediterranean Shipping Company (MSC). Added In 2012, MSC provides Port St. John with shipping container services. The addition has been a major contributor to the Port's container shipping growth over the past four years. More than 600,000 metric tons (97,465 TEUs) were moved through the Port St. John in 2015, nearly double the tonnage in 2012.³³

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 cargo.³⁴ The Port also handles breakbulk cargoes and moved 17,000 metric tons of breakbulk cargo through the Port in 2015.³⁵

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 Port.³⁶ Liquid commodities include 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 LNG.³⁷

Bayside, New Brunswick

The Port of Bayside, located in an ice-free zone along the U.S.-Canadian border, is privately owned and operated by the Bayside Port Corporation. The available facilities found at the Port include a single wharf with up to three berths, a multi conveyor and hopper system used to load and unload vessels carrying aggregate, and frozen food and dry storage facilities are located adjacent to the wharf. The frozen food storage facility, Kloosterboer Bayside, and dry storage warehouse, Fundy Stevedoring facility, offer more than 7000 metric tons and 38,000 square-feet of storage capacity, respectively.³⁸

The Bayside Port is capable of handling bulk cargo and frozen food. Top commodities handled at the Port include the following:

- Aggregate
- Lumber
- Paper Products
- Frozen Fish
- Potatoes
- Salmon

³³ St. John Port Annual Report – 2015: <https://www.sjport.com/about-us/reports/>

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ *Ibid.*

³⁷ St. John Port Annual Report – 2015: <https://www.sjport.com/about-us/reports/>

³⁸ Port of Bayside web site: <http://www.portofbayside.com/index.php>



- Fish feed
- Fertilizer

The top foreign markets partnering with the bayside food terminal are the U.S., Russia, Cuba, and other Caribbean and South American Countries. In terms of commodities shipped, they are primarily imported fish from Alaska, exported pork to Russia and potatoes to Cuba.³⁹ Additionally, the Fundy Stevedoring dry storage facility stores potatoes headed to Cuba, forest products to South America and the U.S., and fertilizer for Canadian Potato farmers.

The Port faces financial challenges because of their private status. They pay income taxes at a high corporate rate, which limits the funds available to develop infrastructure and expand the Port. Fees and tariffs are paid on commodities shipped through the Port and range from \$0.49 to \$1.04 per unit.⁴⁰

Portsmouth, New Hampshire

Located along the southern banks of the Piscataqua River, the Market Street Marine 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 primarily suburban/rural 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 shipped through the Port are listed in Table 4. 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.

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 trade.⁴¹

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 Italy.⁴²

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-portsmouth-nh/>

⁴² *Ibid*

Table 4: 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 |

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 are listed in Table 5 and included commodities such as fuel products.

Table 5: 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, 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 2015.⁴³ In contrast to the top exported commodities, only the total value of wine imports rose compared to 2015 values.⁴⁴

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 Italy.⁴⁵

⁴³ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-boston/>

⁴⁴ *Ibid.*

Providence, Rhode Island

During the first 11 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 trade.⁴⁶

Top commodities coming in and out of the Port of Providence in 2016 are listed in Table 6. Notable growth in exports included a 143 percent rise in ethyl alcohol and a 6 percent rise in cranes and mobile lifting frames from the previous year. Additionally, the import of portland, aluminous and slag cements grew 824 percent in 2016 over the previous year.

Table 6: Port of Providence - Top Five Commodities (by YTD Dollar Amounts)

| 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, aluminous and slag cement |

The purpose of examining existing market trends and shipping services at a variety of other New England and Southern Canadian ports is to identify and assess viability of potential opportunities for the Port of Eastport. Eastport’s greatest assets are its naturally deep waters and access to approximately 140 acres of land ready to accommodate expansion. Activity at other regional ports may help Eastport identify some potential new cargos or opportunities to expand their existing cargo services.

⁴⁵ *Ibid.*

⁴⁶ World City Trade Numbers: <https://www.ustradenumbers.com/ports/Port/Port-of-providence-ri/>

6 Identification and Evaluation of Business Opportunities

Most cargo moves along a multi-modal path, and may be transferred several times from one mode to another from its origin to its destination. Each transfer has a cost impact. For low cost, high volume cargo, multiple 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 Eastport has all of the identified attributes for a successful intermodal marine operation except for direct rail access. Lack of onsite or near-dock rail access is the biggest challenge faced by the Port when identifying potential business opportunities.

Without investing in an existing rail service extension to Eastport, there are a limited number of potential business opportunities available at the Port. Successfully developing some opportunities could support the case for expanding existing rail service, but keeping the right-of-way corridor available for future development would be essential.

If Eastport is to develop as a seaport, it needs an expanded industrial base. The Port's most significant asset currently is its adjacent land and property. 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 Eastport.

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 mile⁴⁷. The average costs are comprised of vehicle-based costs as well as driver-based costs.

⁴⁷ ATRI – *An Analysis of the Operational Costs of Trucking: 2016 Update* (Table 18)

Tariff Comparison

A comparison of publically available tariffs was conducted between the Port of Eastport Maine and other regional ports with the purpose of showing how competitive the Port of Eastport 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 D.

6.1 Business Case 1: Biomass & Wood Chips

Biomass Products – Wood Chips

For more than 30 years, the Port of Eastport has been in direct partnership with the Woodland Pulp Mill, located 26 miles to the north in the town of Baileyville, exporting an average of 300,000 tons of pulp annually to Europe and Far East markets. In the last few years, Woodland Pulp has expanded into tissue production, used more of its own wood pulp and reduced the pulp export volumes through Eastport.

The St. Croix Tissue Mill has expressed some interest in importing eucalyptus plants from Brazil to be used to produce pulp. The eucalyptus pulp would be used in the mill's tissue and paper making operations. The mill's logistics manager, Roger McIver, acknowledged that extending rail service to the Port could be a long-term prospect for Eastport if commodity volumes existed to justify the cost.⁴⁸ He noted that there is the potential that the mill would utilize the rail for its eucalyptus shipments through Eastport should the investment be made. Recognizing the needs of the mill and the desire to maintain a symbiotic relationship, there could be other opportunities at the Port to export forest products to Europe and Asia as the global demand for biomass products grows.

Assuming the implementation of all realistic renewable energy technologies, the bioenergy projections estimate renewable energy could account for up to 36 percent of the global energy makeup by 2030.⁴⁹ Biomass could make up 60 percent of the total renewable energy used by 2030 and has potential in all sectors including cooking, heating, manufacturing industry, building, and power.⁵⁰ In order to meet the global demand for biomass, international trade will need to play a key role and could account for between 20 and 40 percent of the total global demand by 2030.⁵¹

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 2012.⁵² In 2012, Europe comprised 60 percent of the demand for wood pellets across the world. The European Union has implemented a renewable energy mandate requiring member countries to obtain 20 percent of their overall energy supply from renewable sources by 2020.⁵³ Other countries, including Sweden, Canada, Japan

⁴⁸ Interview with Roger McIver (Logistics Manager) at St. Croix Tissues, Inc. (9/13/16)

⁴⁹ IRENA http://www.irena.org/REMAP/IRENA_REmap_2030_Biomass_paper_2014.pdf

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² IRENA http://www.irena.org/REMAP/IRENA_REmap_2030_Biomass_paper_2014.pdf

⁵³ 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/>

and South Korea, are also projected to be top markets for biomass fuel and will add to the demand pressure globally for wood based fuel products in the coming years.⁵⁴

Currently, the Southeastern region of U.S. is a 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 in terms of location and supply.⁵⁵ Being physically closer to European and Asian countries and having an ample supply of low-grade forest product could work in the state's favor. Asian countries with high demand for biomass fuel are currently relying on imports from Canada, China and Vietnam.⁵⁶ Higher 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. 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 the Europe.

As discussed previously, the European Union regulation requires all imported wood to be heat-treated to kill insects. Suppliers are to receive government certifications for their wood treatment process, known as phytosanitation. In order to meet the European Union's demand for forest products while complying with their regulations, Phyto-Charter, a Maine based company is working with the University of Maine to develop a patent-pending system that heats wood after loaded into the hulls of the chip carriers in Eastport, Maine.

At the end of 2016, the MaineDOT had approved financing to complete the phytosanitation technology efforts in Eastport. According to reports, a loan of \$1.65 million will be made available to construct the required equipment at the Port of Eastport.⁵⁷ MaineDOT signed an agreement with Eastport, who bought a license from Phyto-Charter to utilize this technology. The terms of the agreement prevent the use of the equipment at any other location and will be in effect for 10 – 15 years, equaling the repayment period for the loan from the state. The loan repayment plan consists of a \$1 tariff per ton of chips that is shipped through Eastport using this technology with \$0.50 in royalties paid to Phyto-Charter.⁵⁸ Eastport Port Authority personnel anticipate the first shipment to be in April 2017.

Heat treatment of wood products at other facilities is typically conducted on-shore. The new phytosanitation technology will provide a more cost-effective means of heat treating the wood chips as they are loaded on the vessel. On-board treatment reduces both the need for landside storage space for stockpiling treated product, as well as rehandling required to retreat any product that is not shipped immediately.

Approximately 70 percent of Maine's wood supply is low-grade product that can be used for wood chip and other biomass operations. This business is "large volume, low-

⁵⁴ Renewable Fuels Top market Report 2016: <http://www.trade.gov/topmarkets/renewable-fuels.asp>

⁵⁵ 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/>

⁵⁶ Renewable Fuels Top market Report 2016: <http://www.trade.gov/topmarkets/renewable-fuels.asp>

⁵⁷ Mdislander, January 10, 2017, "Eastport hopes to step up wood chip exports": <http://www.mdislander.com/maine-news/eastport-hopes-step-wood-chip-exports>

⁵⁸ *Ibid.*



margin,” so keeping the shipping cost low is essential to success.⁵⁹ During the December board meeting, the Eastport Port Authority also approved wharfage rate reductions for existing lessor, Costigan Chip LLC, in order to keep shipping costs competitive.⁶⁰

Additionally, growing the forest product export business would result in more work for loggers around Eastport and provide more work for longshoremen located in Eastport. The approval for project financing will make Eastport the state’s first realized opportunity to break into the biomass exporting industry.

Chipboard / Particle Board

Chipboard is primarily used in the furniture manufacturing and housing construction industries, therefore regions that have recovering construction markets could be targeted for export. Regions in North America, South America, the Middle East and Africa will drive the demand for manufactured boards.⁶¹

The Port of Bayside, New Brunswick, located approximately 25 miles from Eastport, Maine, is currently shipping forest products to South America. As Eastport continues to establish itself as a hub for forest products, including shipping wood chips to Europe later this year, they may be able to find opportunities to tap into the chipboard and particle board business.

Though most of the higher grade wood in Maine is spoken for, one possible use for low grade forest product is to supply IKEA manufacturing facilities looking to produce particle board furniture. Currently, IKEA consumes about one percent of the world’s wood annually.⁶² The U.S.-based manufacturing facility is located in Danville, Virginia. It is unknown whether IKEA is able to take chipboard delivery via ship, however wood product from Eastport could be delivered to Danville via freight rail on Norfolk Southern after landing approximately 125 to 175 miles away at either the Ports of Richmond or Norfolk. Partnering with IKEA would continue to support the forest industry in Maine and would promote full use of all wood components. As Eastport looks to establish itself as a biofuel hub, identifying alternative supply opportunities for the low grade wood product would be economical.

Costs

Approximately 18.6 million tons of wood was harvested in Maine in 2014⁶³. If we assume 23 percent of the total annual wood is low-grade wood product (2.6% firewood/pellets and 19.9% biomass) and of that we assumed 1 percent could be used to serve Eastport to support the export demand of low-grade wood products for the purpose of this

⁵⁹ Mdislander, January 10, 2017, “ Eastport hopes to step up wood chip exports”:
<http://www.mdislander.com/maine-news/eastport-hopes-step-wood-chip-exports>

⁶⁰ *Ibid.*

⁶¹ Production of particle board will outgrow the consumption of particle board by 2017, demand growth will rely on non-producing countries in the Middle East, Africa and South America to make up the difference. <http://www.wbpionline.com/features/global-prospects-for-mdf-and-particleboard-4376280/>

⁶² Daily Mail: <http://www.dailymail.co.uk/news/article-2357216/IKEA-uses-staggering-1-worlds-wood-year.html>

⁶³ Maine’s Forest Economy, October 12, 2016: <http://maineforest.org/wp-content/uploads/2016/09/Maines-Forest-Economy-10-12-2016.pdf>

comparison. Annually, 1 percent would amount to 42,000 tons of wood product shipped through the Port of Eastport. This volume would require an additional 134 one-way truckloads per month traveling on average 168 miles to Eastport, at an approximate cost of \$650,000 per year. An average distance from seven local Maine wood mills and lumber companies was assumed for this calculation.

The cost of shipping via truck through Portland, ME, St. John, NB and Montreal, QC were also calculated as a comparison utilizing the same logic (See Table 7). Though the cost to ship through Portland, ME appears initially to be less expensive based on a shorter average distance from mills/lumber yards, the infrastructure in place in Eastport and the available space for storage may make Eastport more attractive for companies that may want to expand a low-grade wood product operation in Maine.

Table 7: Trucking Cost Comparison – Low-grade Wood Products

| Eastport, ME | Portland, ME | St. John, NB | Montreal, QC |
|---|--------------|--------------|--------------|
| Average Distance from Wood Mill Source (miles) | | | |
| 168 | 149 | 227 | 282 |
| Monthly Cost (2017\$) – Trucking | | | |
| \$54,100 | \$48,078 | \$72,899 | \$90,825 |
| Annual Cost (2017\$) – Trucking | | | |
| \$649,201 | \$576,945 | \$874,795 | \$1,089,908 |
| Annual Cost Difference from Eastport, ME | | | |
| - | -\$72,256 | \$225,593 | \$440,707 |

6.2 Business Case 2: Aggregate (salt, gravel)

In 2016, the New England Salt Company imported 35,000 tons of Moroccan rock salt through the Port of Eastport, demonstrating the viability of the Port’s newly installed bulk conveyor. At that time, New England Salt was expecting to continue importing 40,000 to 50,000 tons of salt on two or three shipments a year from Morocco and Peru.⁶⁴ However, we understand that only the single shipment has been received to date. The imported salt is used to service roads in eastern and northern Maine. In the past, New England Salt Co. has considered expanding their operations and utilizing Eastport’s deep water port and brand new conveyor system.

During the winter months, Potash Corp’s Piccadilly mine near Sussex has been the sole source for servicing roads in New Brunswick. With the 2016 closure of the Piccadilly mine, however, the New England Salt Company may be able to capitalize on the reduced supply in the region to expand its operations.⁶⁵ Eastport’s terminal is currently capable of accommodating this expanded operation, and could serve as a distribution and storage center for supplying road salt to the regional towns and MaineDOT.

The Eastport facility is also well suited to handle a variety of other bulk cargo. There is plenty of storage on site, adequate road access for transporting goods to and from the Port. Iron ore and other ores are some of the top imports in the region. There could be

⁶⁴ The Quoddy Tides, April 8, 2016: <http://quoddytides.com/salt-shipments-through-to-start-in-july-4-8-2016.html>

⁶⁵ *Ibid*

an opportunity for Eastport to send ore north into Canada via truck. A preferred approach to growing this type of bulk commodity operation, however, is via rail access at the Port since bulk movement by rail is less expensive and it would provide the Port with better access to regional and national markets in U.S. and Canada. Investing in rail service could improve shipping efficiency, cost and speed in delivering commodities to their final destinations.

Costs

Assuming the New England Salt Co. increases their operations by 20 percent, the cost to transport the additional salt to Bangor from Eastport via truck would be approximately \$188,000. This expansion would result in an additional 654 one-way truckloads moving from the Port of Eastport to the New England Salt Co. and then out to various municipalities in Northern Maine per year.

6.3 Business Case 3: Petroleum Products

Liquid Fuels

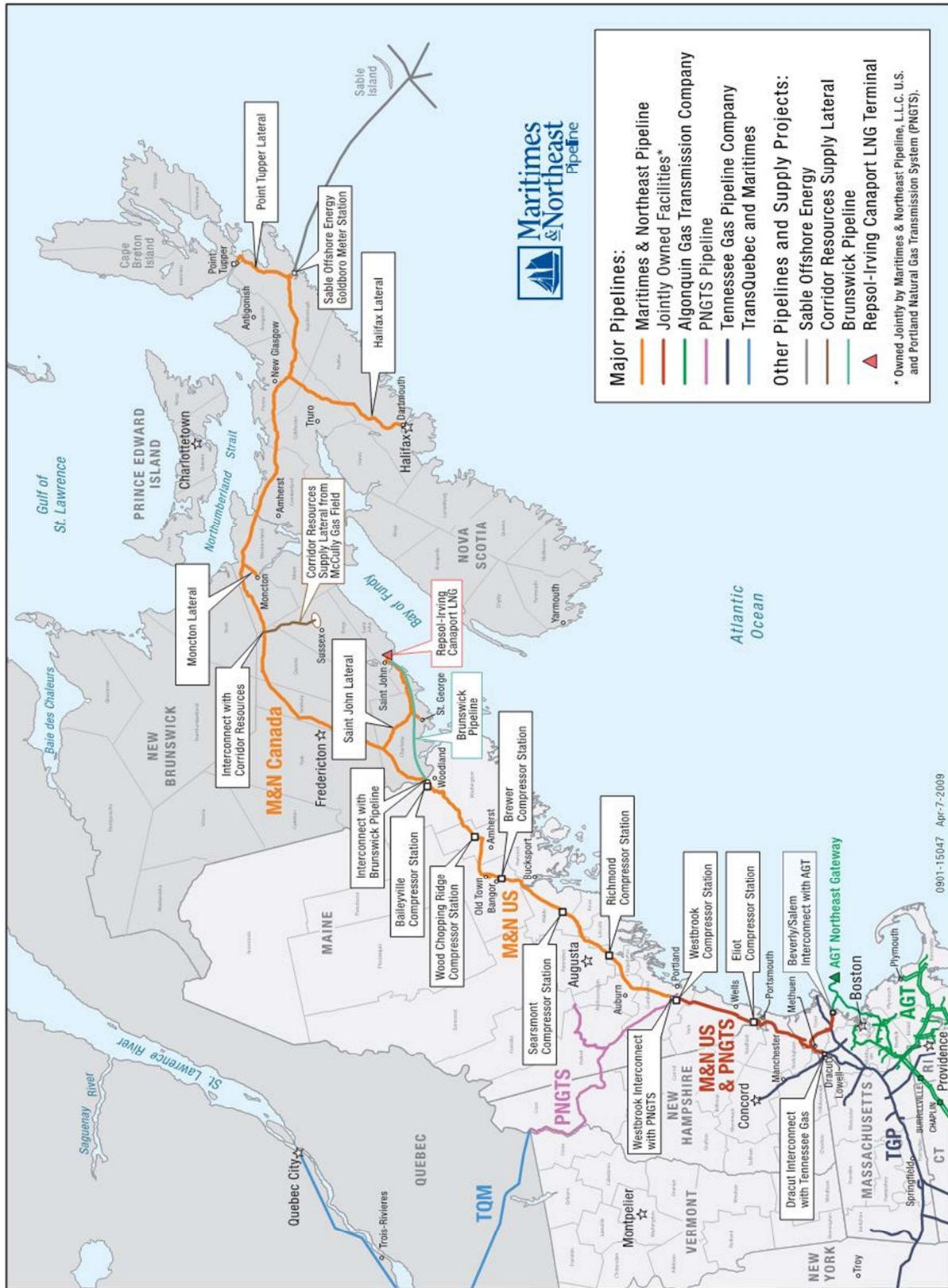
Import or export of petroleum products like crude oil and Liquefied Natural Gas (LNG) would be the easiest to implement at Eastport due to deep channel and existing pipeline Right-of-Way. The former Calais Branch, part of which is now used as a recreational trail, could support a pipeline corridor. Estimated construction cost per mile is between \$500,000 and \$2.5 million per mile depending on its size and whether the pipeline is used for gas or petroleum.⁶⁶

There are several LNG projects that were proposed for the region. The U.S. Coast Guard had given its approval, with specific conditions, for liquefied natural gas tankers to sail into Passamaquoddy Bay in the regulatory process for two proposed LNG facilities in Maine. The approval that was sent in a letter to the U.S. Federal Energy Regulatory Commission, which stipulates that ships carrying LNG sail only in daylight at slack tide when visibility is good, means an LNG terminal on the Maine side of the bay is one step closer to being built within sight of St. Andrews. The application to build an LNG terminal in Robbinston, Maine, opposite St. Andrews, was dismissed by the Federal Energy Regulatory Commission (FERC) in August of 2016. The proposal was the latest of three separate Maine LNG plans to be dismissed and marked the end of 10 years of process undertaken by Downeast LNG, the group responsible for the proposal.⁶⁷ The Downeast LNG proposal was the most recent LNG proposal to be dismissed by FERC. In 2008, the first LNG project, Quoddy Bay LNG was dismissed and then in 2012, Calais LNG was dismissed as well. Although LNG may be perceived as a safety issue, a similar LNG plant was successfully built in St. John, New Brunswick. Any future Eastport LNG plant could be a competitor to the Canadian facility. A number of pipelines already exist in the State of Maine, with major gas pipeline network owned by Maritimes and Northeast Energy identified in Figures 14 and 15.

⁶⁶ Oil and Gas Journal website.

⁶⁷ CBC News August 18, 2016

Figure 14: Maritimes and Northeast Gas Pipeline Network⁶⁸



⁶⁸ Source: Maritimes & Northeast Pipeline web site: <http://www.mnpp.com/canada/map>

Figure 15: Current CNG Pipeline Companies and Locations⁶⁹



⁶⁹ Source: State of Maine

Construction of a pipeline corridor connecting into the Greater Bangor area could be done effectively on what is mostly a discontinued rail corridor. The Brewer-St. Croix Junction segment was abandoned in 1987 and later acquired by the Maine Department of Transportation. The Washington Junction-Ayers Junction segment was dismantled in 2011. Passenger service along this right of way discontinued in 1957 and freight service was discontinued over the majority of the western end of the line in 1984.

Connecting to the Woodland Spur for rail, and using the Calais Branch into Brewer for a future pipeline corridor, would provide the Port with key liquid bulk and dry bulk connections for high volume moves. This is not an immediate action item for the State but should be put into the State's long term transportation planning to prevent new infrastructure limitations from developing. These corridors should be public-private partnerships and the planning window for these concepts can extend out 25 years, unless an immediate opportunity arises. The corridor however, should be defined and planned in the near term.

Challenges with bringing petroleum through Eastport exist. Importing petroleum products through Eastport requires lifting regulatory restrictions, as well as constructing a new bridge and/or pipeline to move product without crossing through an existing Native American Reservation. The bridge cost is estimated at \$200 million. If these challenges cannot be met, a better option for fuels in Northern Maine would be Calais.

Costs

In order to compare of the overall cost of shipping petroleum products through Eastport verses other regional Ports we need to know a lot of existing, typically private, information including negotiated prices with petroleum shipping companies, infrastructure, clients, etc. For the purpose of this analysis, trucking costs to move imported petroleum products to the limits of Washington County, ME were calculated from Eastport, ME, Portland, ME, and St. John, NB.

In 2015, 34.8 million barrels of petroleum was consumed in Maine equaling approximately \$4 billion in expenditures for the state.⁷⁰ According to 2016 U.S. Census data, the population of Washington County, where Eastport is located, was 31,450 people, 2% of the recorded population of Maine that same year.⁷¹ Using a ratio of 2 percent, the estimated annual petroleum consumption in Washington County, ME was 821,988 barrels (or 34.5 thousand gallons). It would therefore require 3,836 one-way truck runs per year (or 320 runs per month) to meet the consumption needs of the county, based on the assumption that a large tanker truck has an average max load of 9,000 gallons⁷². Based on average driving distance from each Port to the limits of Washington, County, ME and the cost per mile for shipping via truck in the Northeast, the annual cost to move petroleum from Eastport is \$523,870. A comparison of the trucking costs for Eastport, ME, Portland, ME, and St. John, NB is shown in Table 8.

⁷⁰ EIA: <https://www.eia.gov/state/data.php?sid=ME#ConsumptionExpenditures>

⁷¹ 2016 US Census: <https://www.census.gov/quickfacts/table/PST045216/12133,23>

⁷² Source: <http://sciencing.com/capacity-tanker-truck-7505350.html>

Table 8: Trucking Cost Comparison - Liquid Bulk Petroleum

| Eastport, ME | Portland, ME | St. John, NB |
|--|--------------|--------------|
| Average Distance to limits of Washington County, ME (miles) | | |
| 57 | 229 | 117 |
| Monthly Cost (2017\$) – Trucking | | |
| \$43,655 | \$175,650 | \$89,770 |
| Annual Cost (2017\$) – Trucking | | |
| \$523,870 | \$2,107,800 | \$1,077,247 |
| Annual Cost Difference from Eastport, ME | | |
| - | \$1,583,930 | \$553,377 |

6.4 Additional Opportunities

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

Livestock & Agricultural Goods

Eastport was granted a temporary exemption for trading pregnant dairy cows with Turkey in 2010. This exemption was not renewed and trading ceased in 2013. The cow market has been growing again in recent years, but so has the competition for it.

Earlier in 2016, Irish and Canadian exporters of breeding cattle successfully bid for Turkey’s import tender and have made several shipments of cattle this fall.⁷³ According to USDA livestock 2010-2017 data, presented in Table 9, the number of cattle imports to Turkey has grown annually following a record low year in 2014.⁷⁴ Approximately 400,000 heads of cattle were imported in 2016 and 490,000 heads of cattle is projected for 2017.⁷⁵

⁷³ Ireland made three shipments of live cattle to Turkey in the fall of 2016. Source: www.agriland.ie

⁷⁴ USDA Livestock data, 10/12/2016: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads>

⁷⁵ *Ibid*

Table 9: Turkish Cattle Imports Since 2010

| Year | Imported Heads of Cattle |
|------|--------------------------|
| 2010 | 140,000 |
| 2011 | 470,000 |
| 2012 | 472,000 |
| 2013 | 193,000 |
| 2014 | 49,000 |
| 2015 | 203,000 |
| 2016 | 400,000 |
| 2017 | 490,000 |

Egypt could be another market to consider for cattle exports. Based on the USDA cattle import data, Egypt’s import of cattle was 190,000 and 300,000 heads of cattle in 2015 and 2016, respectively, and is projected to import another 300,000 heads of cattle in 2017.⁷⁶ The Port has in place the infrastructure to support this operation, but would need to re-apply for required certifications through Albany, NY, USDA regional.

Additional agricultural opportunities include the export of blueberries and blueberry products, animal feed, hay, and potato products. Northeastern Maine has a readily available supply of low quality potatoes. Eastport could consider investing in a dehydration facility to produce dehydrated potato flakes that could be shipped for distribution in Latin America. In return, imported fresh vegetables could be sent from South America through Eastport, to meet demand in Maine.

Containerization

The closest multi-modal Port to Eastport is the Port of St. John in New Brunswick. The Port has had a long standing service into the Caribbean and South America through Tropical Shipping. That operation moved to Halifax at the end of 2016 leaving the primary service provided as Mediterranean Shipping Company (MSC). MSC is the second largest ocean carrier in the world and connects Port St. John to the Caribbean, South America and into its worldwide service markets. The Port reported that this trade continues to grow and one of the largest terminal operators in the world, DP World, just took over operation of the Port St. John cargo facilities. Eastport can connect to Port St. John by road and water. If the Port of Eastport develops its industrial complex, it could move cargo initially via truck to St. John and then, as volumes increase, offer a potential waterborne connection. The Tropical operation involves smaller vessels well suited for the limited container handling capabilities in Eastport.

Ocean carrier calls are driven by existing and potential container volume. In order to justify a stop in Eastport, a minimum of 50 containers of product would need to be generated. While not an immediate opportunity, the Port of Eastport needs to consider

⁷⁶ USDA Livestock data, 10/12/2016: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads>

first developing a base of containerized freight that can move by truck and water through Port St. John. Potential future targets could be Halifax and Caribbean connection with Tropical. The Halifax connection is better suited to a potential vessel call while St. John would be effective for over the road freight movement trans-loaded onto MSC services. To handle containers on a small vessel such as with Tropical, a standard construction crane with a lifting capacity of 40 tons would suffice in the short run until volumes increased to the point where a multi-purpose cargo handling crane investment would be in order.

Manufactured wood products, frozen fish agricultural products and machinery are appropriate for containerized export, while wood pulp, fruit, beef and machinery are appropriate for containerized import. All of these commodities are well suited to be handled at the Port of Eastport.

Cruise & Service Industry

According to the 2016 Cruise Maine Statistics and Milestone report, Eastport, Maine, hosted four cruise ship visits, approximately 400 passengers, through the summer season (July 31, 2016, through October 11, 2016).⁷⁷ Additionally, Bar Harbor, Portland and Rockland, Maine, saw cruise activity totaling 378 cruise visits to the State of Maine. The 2017 Cruise Industry Statistics and Milestone report anticipates 421 cruise visits state wide, up 43 visits from the previous year. There are currently no identified visits in Eastport for 2017. In September 2016, the first large cruise ship to traverse the Arctic's Northwest Passage made its first ever call to an American Port.⁷⁸ There could be an opportunity for Eastport to capitalize on the overall growth in the cruise industry throughout Maine. Eastport would be a good stop for clearing customs easily, as the U.S. Coast Guard Station is in Eastport, and repositioning vessels, which is usually a one-off type of vessel call. The Port's location as Maine's northeastern most Port would put it in a prime position to support cruise activity, as more cruise ships begin to make the trip through the Arctic's Northern Passage. Eastport's deep approach harbors are capable of accommodating cruise ships of any size and would support growth in this industry. Eastport's downtown berth can accommodate most cruise ships with low tide depths of 40 feet.⁷⁹ The berth's accessibility allows for ship to sit right at the pier and provides passengers direct access to downtown Eastport. Growing the cruise industry would be linked with a growth in the service industry in Eastport. This effort would require a collaboration between the Port and the town to work with local businesses to consolidate their marketing efforts to draw travelers to the area.

Scrap Metal

Mexico, Canada and Asia are some of the top markets for U.S. scrap metal exports.⁸⁰ As access to Asian markets becomes more realistic for Maine, Eastport could be in a good

⁷⁷ 2016 Cruise Maine Statistics and Milestones

⁷⁸ Mitc: <http://www.mitc.com/conference-hints-potential-maines-maritime-economy/>

⁷⁹ Bangor Daily News Maine: <http://bangordailynews.com/2013/02/18/business/cruise-ship-visits-to-eastport-in-2012-considered-blind-dates-with-promise/>

⁸⁰ US Trade Numbers: <https://www.ustradenumbers.com/commodities/exports/exported-misc-iron-and-steel-articles/>

position to grow dry bulk and neo-bulk export operations to places like China, Japan and South Korea. Eastport has the infrastructure, space and equipment to handle bulk cargo and could easily expand to handle demand needs. Similar to other potential opportunities, Eastport will eventually need to have access to rail services in order for the Port to explore these opportunities when potential demand warrants such investment.

Seafood

In 2016, Eastport’s top commodity sold abroad was fresh or chilled fish; though none of this seafood is presently exported “over the docks” via vessels from the Estes Head Terminal. Exploring opportunities to expand existing operations could be worthwhile for the Port. In general, Maine’s lobster industry is currently on pace to have its best year ever. In the first half of 2016, \$103 million worth of lobster was sold internationally, which is more than double the amount over the same time period in 2015 and even better than record numbers in 2014.⁸¹

Recently, Eimskip, a private transportation company in the north Atlantic that provides an extensive worldwide network of refrigerated logistics services, moved its North American location to Portland, Maine. Maine is now connected to Newfoundland, Iceland, Norway, the Faroe Islands, Scotland and Mainland Europe. Eimskip carries dry, fresh, salted and frozen seafood products in full container and partial container shipments. Eastport’s existing seafood industry could stand to benefit from its proximity to Eimskip’s new Maine location in addition to its location along many existing shipping routes through the Port of Halifax, Nova Scotia and Portland, Maine.

Maine could be in a position to benefit as the Arctic’s Northwest Passage thaws and becomes navigable. This passage way connects the ports along the Northeast Atlantic with Asian markets. Eastport could see an opportunity here to expand seafood exports into Asia.

On a smaller scale, there are several existing programs in place to help grow revenue from Maine’s fishing industry, which would also benefit the Port. The Cobscook Bay Resource Center located in Eastport, Maine, has identified several needs common to many local fisherman, farmers and restaurateurs.⁸² The resource center developed a shared-use commercial kitchen to test and develop product. Guidance on labeling to distribution of their products is also provided to members.

As previously established in the functionality assessment section of this report, the Port of Eastport is well suited to handle vessels of all sizes due to its naturally deep berth. The Port also has the space to process and store seafood and the capability to expand its seafood export business.

⁸¹ 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/>

⁸² Island Institute: <http://www.islandinstitute.org/resource/problem-declining-revenue-fishing>

7 Port Development Plan

7.1 Recommended Infrastructure Improvements

The Port's greatest asset is its Estes Head Cargo Terminal. A deep-water berth, dock with wide apron and in good condition, modern bulk cargo handling equipment, extensive open and closed bulk handling space and adjacent expandability make this facility one of the best, capable of handling large quantities of bulk commodities.

In most Ports along the U.S. East Coast, rail and highway access is adequate and water depth inadequate. The Port of Eastport has the opposite situation with very deep water but limited road and no rail access. The Port's infrastructure lends itself to the handling of bulk cargo. This includes break bulk, neo-bulk, dry bulk and liquid bulk commodities. The Port's primary limitation is the lack of rail, which is critical to most bulk ports because of the volume of commodity moved. While the Port does have decent roadway access, handling of large ships at the Port would generate a very high number of truck moves which impact quality of life as well as increase handling costs.

Rail and pipeline connections are plausible because of existing corridors along former rail lines. Since bulk commodities have to be handled in large volumes to generate a reasonable return on investment, the infrastructure allowing for those quantities to be handled between the terminal and the national rail and pipeline network needs to be restored. The Port should also plan on expanding its infrastructure to include all types of bulk commodities. Cycles in the various industries dependent upon deep-water ports vary greatly, and a diversified number of dry and liquid bulk handling operations would provide a steady stream of activity for the Port.

Industrial Park & Foreign Trade Zone (FTZ)

One of Eastport's most realistic options is to develop available acreage into an industrial park. As highlighted in previous state strategic plans, Eastport's location and limited ability to improve transportation infrastructure requires the Port to identify alternative methods for drawing industry into the Port. While these shortcomings do limit the Port in some ways, Eastport has ample available land to develop, skilled labor supply, and the ability to expand foreign trade zone (FTZ) #186 to include Eastport. 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 Protection (BCP).⁸³ These factors support exploring the development of an industrial park and FTZ opportunities that may also be available.

Eastport 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

⁸³ 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>

saving on administrative costs and processing fees. A complete listing of FTZ benefits is provided in Table 10.⁸⁴

Expanding the FTZ offers businesses looking for manufacturing or industrial facilities near a 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 Eastport; packaging, labeling, or other value added services could be completed on site (within the FTZ), and finished products would then be shipped from Eastport to their final destination in Canada, the Baltic, or Northern Europe. Eastport'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 potential 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.⁸⁵

⁸⁴ FTZ 186: Bonded Warehouse vs. Foreign Trade Zone Comparison (email)

⁸⁵ 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>

Table 10: 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. |

8 Conclusion

Eastport's Estes Head Marine Terminal has several advantages as an intermodal facility including naturally deep water accessible by large vessels, a new bulk conveyor system, and nearly 140 acres of developable land adjacent to the terminal to support future business growth. Although challenged by the lack of onsite or near-dock rail access to the terminal for bulk and neo-bulk cargoes, the existing road access for trucks is adequate to support current operations. Successful growth of current and new opportunities, however, would justify expanding rail service to Eastport in the future. It is essential, therefore, for Maine DOT to identify and preserve a suitable right-of-way corridor for future rail development.

Business growth at the Port would be accelerated by expanding the industrial base near Eastport, which would provide jobs for the community as well as generate the movement of raw materials, commodities and finished goods in the region. Development of an industrial park on the property adjacent to the port would help promote this growth, as would designating the park as a Foreign Trade Zone for activities within it.

The primary opportunities for business development at Eastport include biomass (i.e. treated and untreated wood chips and pellets), processed wood products (e.g. chip and particle board), aggregates, and petroleum products. Secondary opportunities were also identified, including livestock and agricultural goods; containerization; cruise and service industry; scrap metals; and seafood, however these are more limited in size or potential based on existing conditions.

The following recommendations are made regarding the Port's development:

1. Development of an industrial park on available property located adjacent to the Estes Head Terminal.
2. Designation of a Foreign Trade Zone for activities in the newly formed industrial park.
3. Continued improvement of the Terminal infrastructure to support flexible cargo handling capabilities for a wide variety of bulk, break bulk, and project cargoes; as well as improve truck access to the docks.
4. Identification and preservation of an adequate right-of-way to enable future development of a rail and pipeline corridor to serve the Port.

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

Agricultural Council of Maine

4 Gabriel Drive, Suite 1
 Augusta, ME 04332
info@maineagcom.org
 207-873-2108
<http://maineagcom.org/>

Bangor Natural Gas

498 Maine Avenue
 Bangor, ME 04401
info@bangorgas.com
 (207) 941-9595
<http://www.bangorgas.com/>



Eastern Maine Development Corporation

Main Headquarters
40 Harlow Street
Bangor, ME 04401
(207) 942-6389
<https://www.emdc.org/>

Hancock Lumber

Administrative Office
4 Edes Falls Road
Casco, ME 04015
<https://www.hancocklumber.com/>

IKEA Industry Danville

100 IKEA Drive
Ringgold, VA 24586
(434) 822-6080
<http://www.ikea.com/us/en/>

Irving Oil

190 Commerce Way
Portsmouth, NH 03801
1-866-865-8800
<http://www.irvingoil.com/>

New England Salt Company

500 Odlin Road
Bangor, ME 04401
(508) 520-3900
<http://newenglandsalt.com/>

Phyto-Charter Solutions

Stephean Chute, Managing Director
stephean@phytocharter.com
(207) 650-4216
<http://www.phytocharter.com/>

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/>

Sprague Energy

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

St. Croix Tissue, Inc.

144 Main Street
Baileyville, ME
info@stcroixtissue.com
(207) 427-3311
<http://www.stcroixtissue.com/>

Vestas-Canadian Wind Technology, Inc.

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

Wild Blueberry Commission

5784 York Complex, Suite 52
Orono, ME 04469-5784
(207) 581-1475
<https://extension.umaine.edu/blueberries/commission-advisory-members-researchers/>

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Maine Department of Transportation; Prepared by: Cambridge Systematics, Inc.

2014 Maine Integrated Freight Strategy Final Report

Maine Port Authority

2007 Port Development Strategic Plan

Mount Desert Islander; by Stephen Rappaport

2017 “Eastport hopes to set up wood chip exports”

Phyto-Charter

2016 Maine Forest Initiative – Emerging Phytosanitary Technology

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

The Quoddy Tides; by Edward French

2016 “Salt Shipments through to state in July”

U.S. Department of Agriculture

2016 USDA Livestock Data; found at:
<https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads>

U.S. Department of Commerce – International Trade Administration

2016 Top Market Series: Renewable Fuels Report

U.S. Foreign-Trade Zone Board

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



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

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

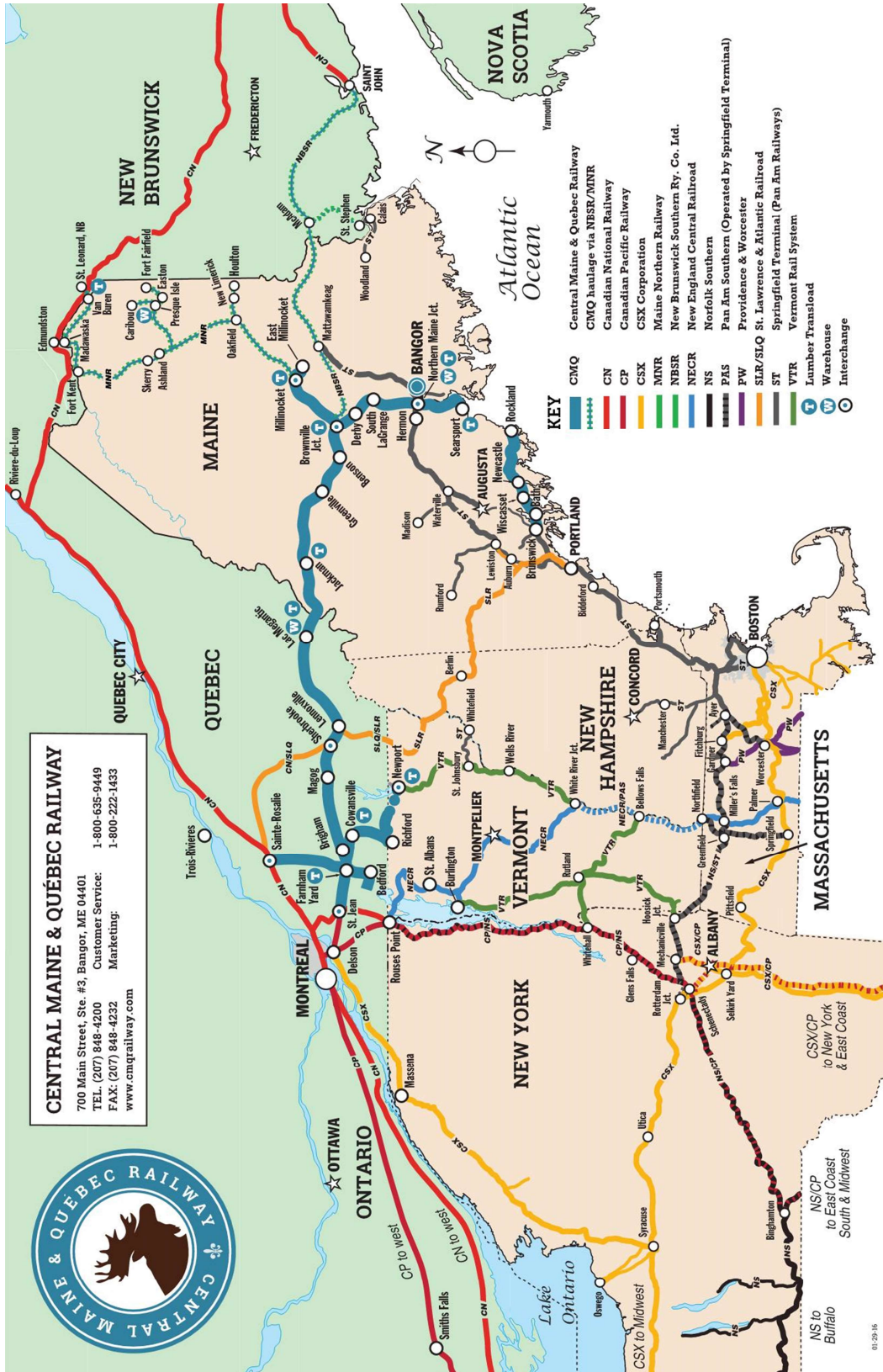
Maine Port Authority web site: www.maineports.com

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

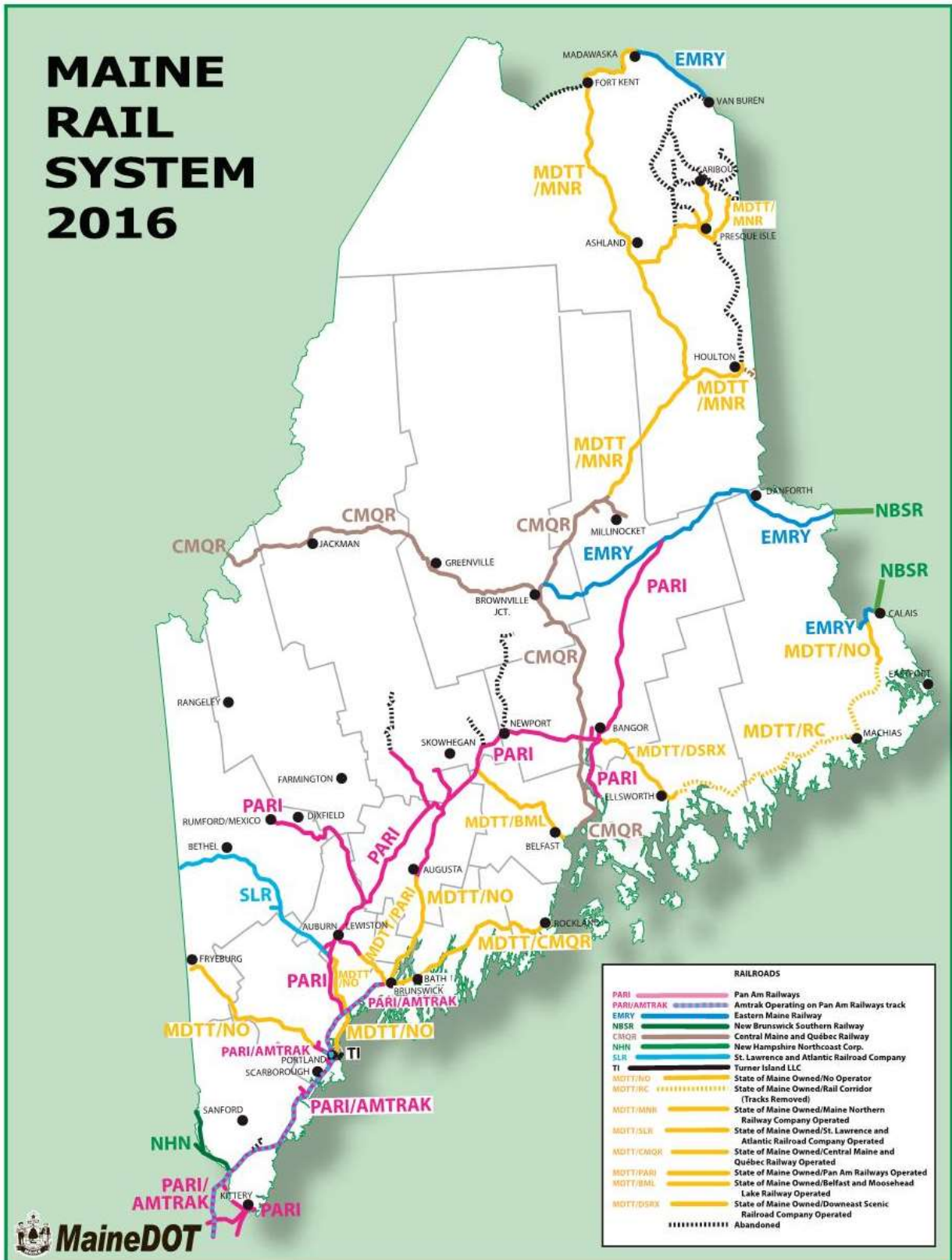
Port Saint John, New Brunswick web site: www.sjport.com



Appendix A. CMQ Railroad Map



Appendix B. MaineDOT – Maine Rail System Map



Appendix C. Meetings with Eastport Authority and Stakeholders (9/12/16)

Meeting Minutes

| | | |
|------------|--|---------------------------------------|
| Project: | MEDOT Intermodal Commodity Study | |
| Subject: | Meetings with Eastport Port Authority and Stakeholders | |
| Date: | Monday, September 12, 2016 | |
| Location: | Eastport, ME | |
| Attendees: | Chris Gardner (Eastport Port Authority) | Stephean Chute (Phyto-Charter) |
| | Capt. Bob Peacock (Eastport Pilots) | Dean Pike (Moose Island Marine, Inc.) |
| | Brock Mooney (Maine Port Authority) | Jeff Monroe (HDR) |
| | Marissa Birtz (HDR) | Bryan Jones (HDR) |

Lunch Meeting at the Eastport Port Office and the Eastport Chowder House

- The Eastport Port Authority controls approximately 146 acres of land.
- Truck access to Eastport needs improvement to enable greater capacity.
 - The route currently runs through native lands, and passes by a ball field and school.
 - The existing causeway into Eastport was built by the US Army Corps in the 1950's, and has since been considered a disaster for cutting off the natural water flows through the estuary.
 - The Eastport Port Authority recently constructed a new truck route, which now provides access to its undeveloped parcels of land. Chris would like to see the State remove the causeway and build a new bridge to further improve the environment and truck access to the port.
- HNTB developed a rail study for the Port in 2009. It is available from the Eastport website at www.portofeastport.org/railstudy.
- The Port has a new conveyor system
 - It has been used only once (for salt) to prove that it works. Chris reports that they achieved 700 tons/hour.
 - The conveyor is set up to work for both inbound and outbound cargo.
 - Intended for wood chips. Wood chips are less costly and require less infrastructure than wood pellets.
- Phyto-Charter purchased a patent for a new phyto-sanitary system to treat wood chips for export to the UK and Ireland. Phyto-Charter has been working with The University of Maine at Orno to improve the patent, and believes they have successfully developed a shipboard treatment process that can make this a business opportunity.
 - The treatment requires the biomass to be heated to 56 degrees Celsius for a minimum of 30 minutes.
 - The wood fiber biomass is used for power generation, due to new European pollution standards that limit coal and fossil fuels.



- Ireland's demand is 3 million tons/year.
- The initial business model would have Eastport moving 40,000 metric tons/shipment at 4 times per year.
- A test shipment of 5,000 tons is needed to prove the concept. Chris needs about \$2 million to do this.
- The heating unit is the most costly part of the equipment, and is removed from the ship after treatment at the dock (prior to disembarking for Europe). The rest of the system (primarily ductwork) is removed at discharge and shipped back to Eastport for re-use.
- The USDA would issue certificates for the phyto-sanitation process.
- The chips consist of softwoods including pine, spruce, fir, and hemlock. This is unused biomass that is "rotting in the forest" now, for which there is no US market demand.
- St. Croix Tissue, Inc. (Woodland Pulp, LLC) runs the local mill, and produces toilet tissue and wood pulp. They are the key customer for the Port at present.
- The workforce in Eastport is engaged, relatively cheap, and non-unionized. Primarily consisting of lobstermen working as independent contractors to the Port.
 - Lobstering is their primary focus, but the port labor work provides them with health care benefits. They would rather be lobstering, so they work hard to finish the longshore work quickly to get back to their own boats.

Meeting on Tuesday, September 13 with Roger McIver (Logistics Manager) at St. Croix Tissue, Inc.

- All of the mill's tissue business is shipped by truck. The port business consists solely of wood pulp. The mill is pleased with the Port with its pulp business.
- The mill might be interested in importing eucalyptus pulp from Brazil (by rail).
- The mill's tissue is shipped in large rolls (112" high x 86" diameter)
- The rolls weigh 6,000 pounds each, due to forklift load limits.
- Can only fit 4 rolls per standard 40-ft container, but can fit 5 rolls per 53-ft truck.
- Ideally, the mill would like to be able to use tandem 53-ft trailers for truck hauling. Current DOT regulations limit them to two 28-ft trailers, however.
- There is no room to stockpile rolls at the mill, so they are "hot loaded" from the machine and trucked to a warehouse in Bangor, ME.
 - ~ 20 trucks/day on average
 - ~ 30 trucks/day at maximum production
- The tissue is sent to a facility in Strasburg, VA for conversion and packaging. Roger says the truck dray from the Port of Richmond to Strasburg is too long to make shipment of tissue by sea economical.
- Product quality is also a big issue. The more times the rolls are handled, the more chances they get damaged.
- Roger says that rail rates to VA are also too high. The closest rail access to the Strasburg facility is in Chambersburg, PA.

Appendix D. 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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