

NORTH CAROLINA
MARITIME Strategy

**NC Maritime Strategy
Short Sea Shipping Technical Memorandum**

**Prepared for the
North Carolina Department of Transportation**

by

**AECOM
in association with URS**

May 31, 2012

This page intentionally blank

ACKNOWLEDGEMENTS

Initiated by the Governor's Logistics Task Force (GLTF), the *North Carolina Maritime Strategy* takes a fresh look at North Carolina's maritime assets and the needs for improvement to ensure that our State remains competitive in the future. A *Maritime Strategy* Executive Team has been formed to oversee this process, evaluate the results and provide an objective technical and economic analysis. The *Maritime Strategy* Executive Team includes: Lieutenant Governor Walter Dalton; the Governor's Senior Policy Advisor, Al Delia; Secretary of Transportation, Gene Conti; Secretary of Commerce, J. Keith Crisco; and Secretary of Environment and Natural Resources, Dee Freeman. The following North Carolina Department of Transportation (NCDOT) and North Carolina Department of Commerce (NCDOC) staff have provided day-to-day direction, guidance and support for study execution: NCDOT Director of Strategic Initiatives, Roberto Canales PE; NCDOT Project Manager, Virginia Mabry; NCDOT Liaison to the Lieutenant Governor, W. Seth Palmer; NCDOT/Commerce Liaison Joseph (Jed) McMillan; and Transportation Consultant to NCDOT and Global TransPark, Charles Diehl.

A Maritime Advisory Council, comprising State officials and staff, along with industry representatives from ocean shipping, trucking, rail and manufacturing interests, as well as community-at-large representatives, has provided further guidance and support to the study team. A roster of Advisory Council membership is included in the appendix of this report.

Finally, broad-based stakeholder outreach is key to successful development of the statewide *Maritime Strategy*. A comprehensive and ongoing public involvement program has provided additional input to the study by engaging the public, agencies and others through a series of informational meetings, public workshops and focused discussions with industry, as well as environmental and community groups.

This page intentionally blank

EXECUTIVE SUMMARY

The *North Carolina Maritime Strategy* is being developed to connect maritime goods and economic development in North Carolina. This is accomplished through the following primary tasks:

- Facilitated collaboration of freight transportation, economic development and community interests as input to the statewide strategy,
- Definition of North Carolina's economic context and maritime market positioning strategies that would offer the greatest economic benefit to the State, and
- Identification of infrastructure investments and policies that would most significantly enhance North Carolina's economy through improved performance of the State's maritime gateways and related trade corridors.

The *North Carolina Maritime Strategy* will define maritime market scenarios in which the State could realize economic and public benefit. Opportunities to be explored will include those associated with import and export of containerized cargo, as well as the potential for expanded bulk, breakbulk, petrochemical and military cargos. Special emphasis will be made to link potential market positions with industry in the State. The range of market position alternatives to be investigated may include regional transshipment of goods, container-on-barge service and major international container terminal operations.

For each viable market scenario, the Strategy will define its infrastructure needs. Transportation investments to be examined may include reconfiguration or modernization of existing port facilities, new terminal developments, wharf and channel improvements, road and rail connections, and inland intermodal facilities. A comparative analysis of development alternatives will be conducted to measure the relative benefits, effectiveness and costs associated with various alternatives for market positions and associated infrastructure.

As input to the definition of infrastructure needs and opportunities, this *Short Sea Shipping* technical report examines trends and opportunities for the use of short sea shipping and barges to serve North Carolina's international maritime trade.

This page intentionally blank

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	III
EXECUTIVE SUMMARY	V
TABLE OF CONTENTS	VII
LIST OF FIGURES	VII
1 INTRODUCTION.....	IX
2 WHAT DRIVES SHORT SEA SHIPPING?	1
2.1 Short Sea Shipping Abroad.....	1
2.1.1 <i>Europe</i>	1
2.1.2 <i>Asia</i>	3
2.2 Federal Programs to Grow Short Sea Shipping in the US	3
2.3 Implications of Federal Policies and Regulations on Short Sea Shipping.....	5
2.3.1 <i>US Cabotage Laws</i>	5
2.3.2 <i>National Security Regulations</i>	5
2.3.3 <i>Harbor Maintenance Tax</i>	6
3 SHORT SEA SHIPPING EXAMPLES.....	7
4 APPLICABILITY OF SHORT SEA SHIPPING TO NORTH CAROLINA.....	9
5 OPPORTUNITIES FOR NORTH CAROLINA	11
REFERENCES	13

LIST OF FIGURES

Figure 1: European Short Sea Shipping Network and Tonnages	1
Figure 2: Priority EU “Motorways of the Sea”	2
Figure 3: Map of Short Sea Shipping Routes in the United States	4
Figure 4: US Short Sea Shipping Operations circa 2006.....	7
Figure 5: ACL Network.....	8
Figure 6: Map of Proposed AFL Feeder Routes	8
Figure 7: Potential Service Patterns between the Panama Canal and the US East Coast	9



This page intentionally blank

1 INTRODUCTION

Short sea shipping is the practice of transporting goods on marine vessels between two or more ports in the same country or neighboring countries across a short distance, generally across lakes, along rivers, and coastwise. Short sea shipping is a popular freight transport method abroad. The European Union primary ports moved 22.2 million twenty foot equivalent units (TEU) via short sea shipping in 2005. Like other transportation modes, it is guided by legislation (taxation, regulation) and standards (operations, safety).

Discussed herein are short sea shipping practices in the United States – what guides them, how they compare to other countries, examples of current and past operations, applicability to the North Carolina maritime industry, and future opportunities for short sea shipping in North Carolina.



This page intentionally blank

2 WHAT DRIVES SHORT SEA SHIPPING?

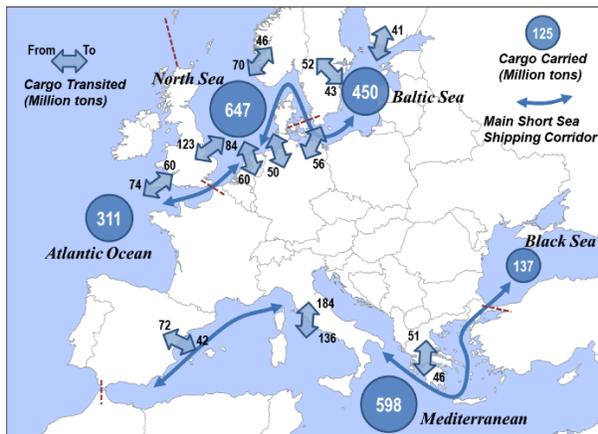
This section is divided into three parts. The first profiles well-established short sea shipping networks abroad. The second reviews Federal programs that might apply to the project. The third examines state and local funding approaches.

2.1 Short Sea Shipping Abroad

2.1.1 Europe

Unlike road and rail networks, marine networks are based upon existing natural waterways (oceans, seas, rivers, lakes) and, to a lesser degree, constructed facilities such as canal and lock systems. As of 2007, the EU had an extensive short sea shipping network with significant freight volumes (see Figure 1).

Figure 1: European Short Sea Shipping Network and Tonnages



Source:
http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/sss_europe.html

In recent decades, the European Union (EU) has been striving to create a strong market for short sea shipping to shift freight movements away from overland transport.¹ Greater use of short sea shipping and inland waterways is aimed to support Europe's goals to realize an 80 percent CO₂ emissions from 1990 levels by 2050; the transport sector is responsible for about one-quarter of EU's greenhouse gas emissions. According to recent studies, the total external costs of inland navigation (in terms of accidents, congestion, noise emissions, air pollution and other environmental impacts) are one seventh of those for road transport.

Intra-EU shipping programs aimed to promote and fund short sea shipping include the Marco Polo Program for the European

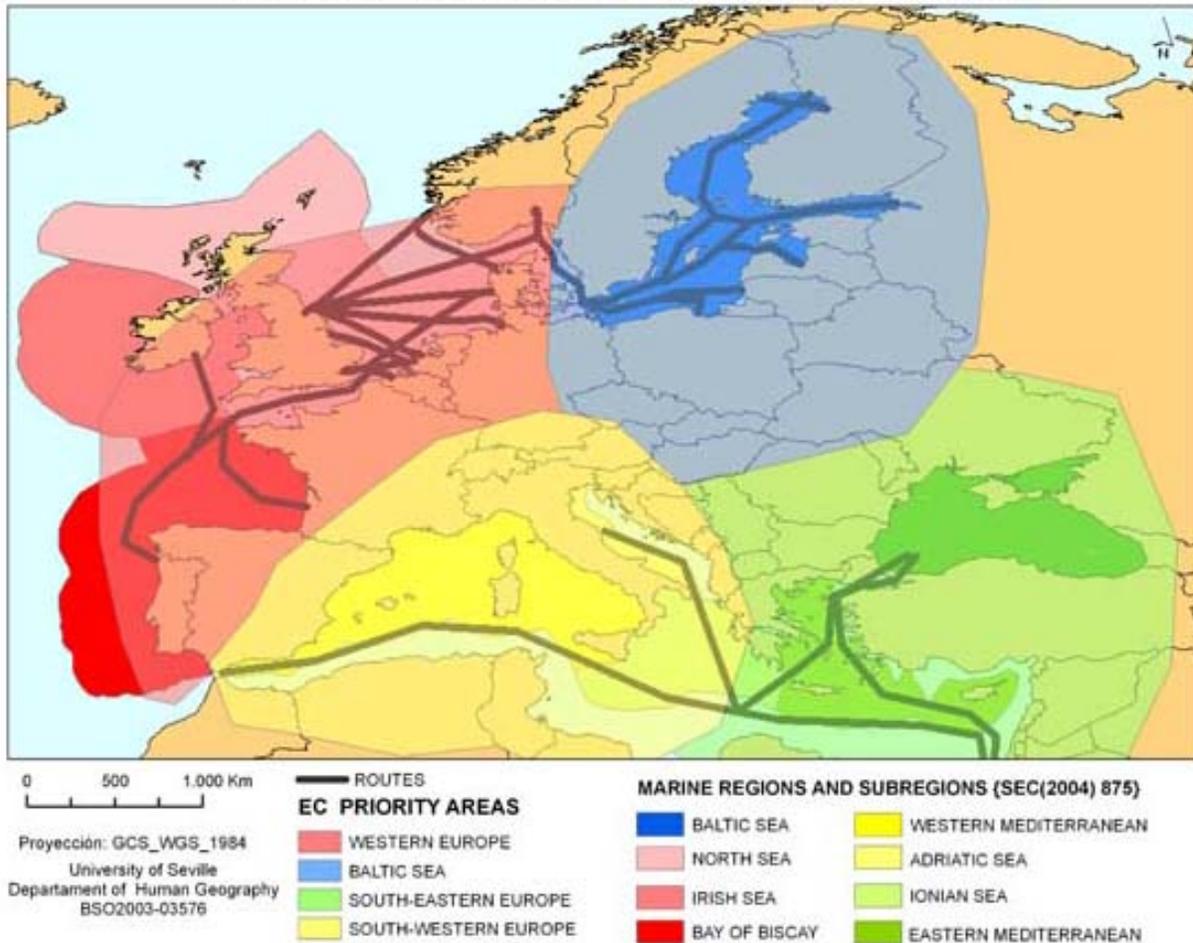
Union and bordering countries and the Freight Facilities Grant within the United Kingdom (UK).

The latter has the goal of shifting modes from truck to short sea shipping to reduce pollution and congestion on UK roads. Specifically, the Water Freight Grant will pay up to 50 percent of short sea shipping operating costs for a maximum of three years. The amount paid is tied to the environmental benefit values of pollution and congestion reductions calculated by accounting for: (1) road miles reduced, (2) level of congestion on each road section, and (3) urban versus rural area classification. Grants between 2000 and 2007 in Scotland ranged from £74,000 to £10,969,000.

¹ http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/sss_europe.html

The Marco Polo Program also provides operating subsidies tied to reducing road transport and increasing on-road transport alternatives, but it differs in its breadth and complexity. The goal is to maintain the modal shift level held in 1998² by funding projects (new or highly upgraded) that are in the “high-risk” start-up phase.

Figure 2: Priority EU “Motorways of the Sea”



Source: <http://www.eurocean.org/np4/125.html>

As illustrated in Figure 2, “Motorways of the Sea” is one of the five action areas for the program.³ Each action area has strict criteria and a grant structure, for example, Motorways of the Sea grants are large (minimum €2.5 million) but so are the requirements (such as 1.25 billion ton-km removed from the road).

While Europe seeks to promote the environmental benefits of short sea shipping, maritime regulations and logistics struggle to keep up. According to a recent study, an EU-registered ship travelling from Antwerp to Rotterdam can require the same amount of paperwork as a ship travelling to Rotterdam from Panama.

² Intermodal transport: The Marco Polo Programme, <http://europa.eu/scadplus/leg/en/lvb/l24159.htm>

³ In addition to Motorways of the Sea, the other action areas of the Marco Polo Program are: catalyst, common learning, modal shift, and traffic avoidance.

2.1.2 Asia

Short sea shipping networks in China, Japan, and Korea are described in a study for the Asia-Pacific Economic Cooperation (APEC) group (2007). It was found that Asia in general was behind Europe in integrating short sea shipping into the door-to-door intermodal supply chain but that SSS is a significant transport mode that is gaining ground. For example, COSCO, a major carrier in China, has a “full-fledged domestic cabotage maritime circuit between the three port ranges” in China. Three national hubs are currently defined by this network, Qingdao, Shanghai, and Hong Kong. Hong Kong is key because of its “established trading networks, legal system, ease of communications, and efficient support services.”

Japan, being an island nation, has a thriving SSS industry. In the mid-2000’s there were 112 ports connected by a network of 23 routes serviced by 48 operators of 101 ships going on approximately 196 sailings per week. Vessels in Japan are typically roll on/roll off (Ro/Ro) and conventional ships plus ferries that can all access small ports and are “handy to accommodate local niche cargo demand.” As might be expected in a densely-populated country where land is at a premium, cost is often the deciding factor in using the SSS network instead of the road network. An interesting fact regarding Japan’s SSS network is that in-country container ships from the large ports rarely drop anchor at the smaller container ports. These smaller ports are well-served by feeder ships moving containers directly from Korea and China.

2.2 Federal Programs to Grow Short Sea Shipping in the US

Initially, the short sea shipping concept was formally introduced in the United States under the name of the Short-Sea Shipping Initiative of the USDOT Maritime Administration (MARAD). In the middle of the past decade, a push was made for a name that might not only avoid the tongue-twisting nature of the “short-sea shipping” moniker but that would also reflect the fact that much of this initiative is directed toward use of inland water routes that never touch the sea.

USDOT has now identified 18 marine corridors, eight projects and six initiatives for further development as part of “America’s Marine Highway Program” or AMH⁴. According to USDOT, the identified AMH corridors are seen as offering routings that can serve as extensions of the surface transportation system, offering potential relief to landside corridors that suffer from traffic congestion, excessive air emissions or other environmental concerns and other challenges.

As part of AMH, MARAD made available \$7 million to fund planning projects on a competitive basis. This initial funding was awarded to three projects and additional funding has been provided to examine further short sea shipping corridors that demonstrate promise.

Projects that received direct funding in the first round included:

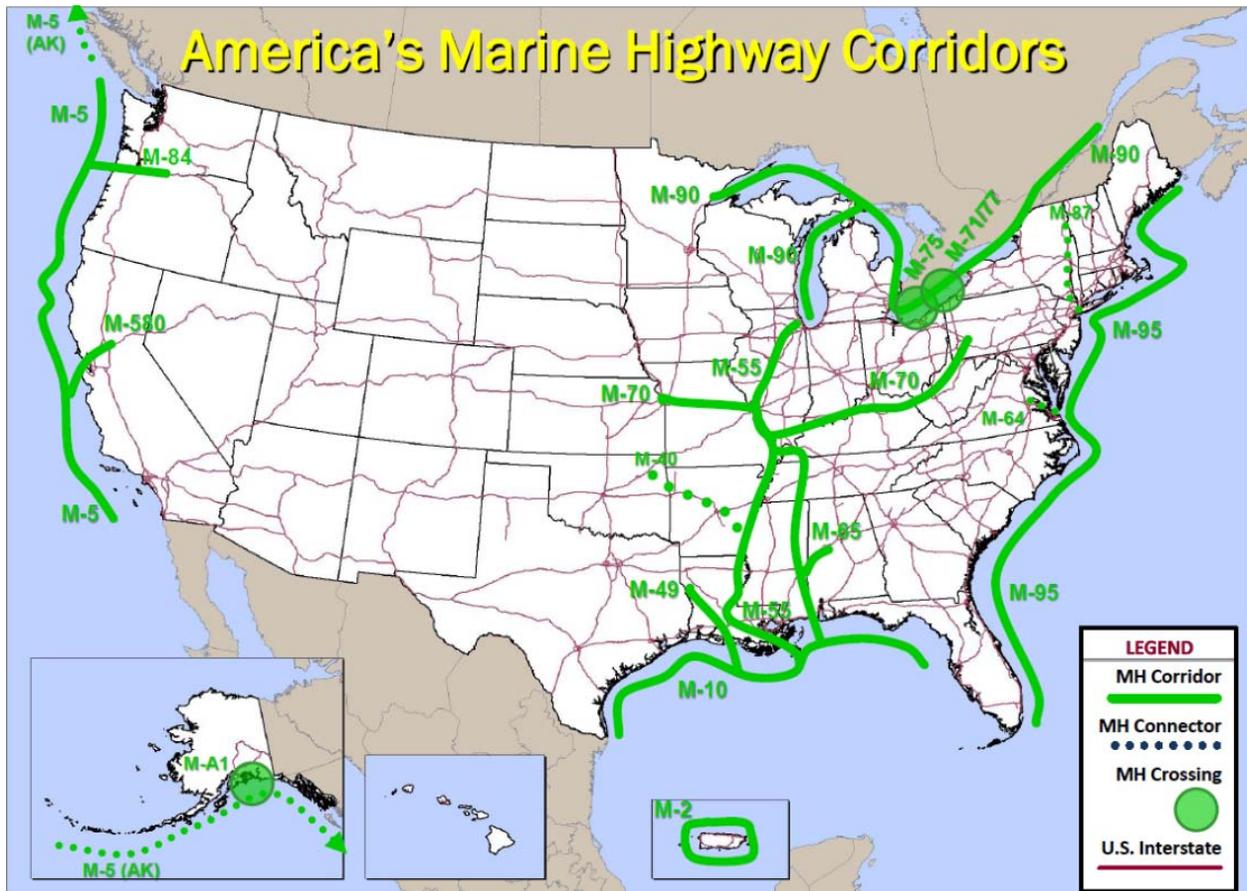
- \$3.34 million for the Ports of Brownsville, TX and Manatee, FL to modify two barges and purchase equipment,
- \$1.1 million for the James River container Expansion Project sponsored by the Virginia Port Authority to purchase two barges to increase and expand service, and
- \$1.76 million to buy and modify nine barges for the Tennessee-Tombigbee Waterway Pilot Project, sponsored by the Port of Itawamba, MS

⁴ The America’s Marine Highway Program was fully implemented in April 2010 through publication of a Final Rule in the Federal Register, which may be found online at <http://edocket.access.gpo.gov/2010/pdf/2010-7899.pdf>.

Projects to receive funding for further study include:

- An initiative among the ports of Baltimore, MD, New Bedford, MA and Canaveral FL to divert traffic from I-95. Of note for North Carolina, there is the option to add additional ports to this initiative as it advances and the state is well located between the existing Florida and Maryland stops.
- The West Coast Hub-Feeder and Golden State Marine Highway, a service connecting 13 ports on the west coast, and
- The Illinois-Gulf Marine Highway that would support Midwest industrial production with service between Peoria, IL and Gulf Coast seaports.

Figure 3: Map of Short Sea Shipping Routes in the United States



Source: http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm

In addition to its corridor-specific studies, MARAD has supported an assessment of the types of vessels suitable for AMH trade, finding them generally not unique, but similar to ships already in service. Identifying eleven different designs that would adequately address the spectrum of vessel types envisioned, including configurations suitable for existing North Carolina navigation conditions. The designs range in size, type and speed, from Articulated Tug Barge (ATB) roll-

on/roll-off (Ro/Ro) vessels to conventional Ro/Ro-type trailer ships, combination Ro/Ro and container carriers, and special high-speed vessels.⁵

2.3 Implications of Federal Policies and Regulations on Short Sea Shipping

2.3.1 US Cabotage Laws

Many nations, including the United States, have cabotage⁶ laws which require national flag vessels to provide domestic interport service. In the US, the Jones Act (46 U.S.C. § 55102) of 1920 requires all domestic short sea shipping be conducted on US built ships owned by US citizens, and crewed by US citizens and/or permanent residents. Exceptions are rarely granted. The prime reasons for the US cabotage law are: (1) to provide national security and maritime expertise in times of need, (2) to protect our economic interests by restricting foreign cargo ships and crews access, and (3) to ensure high quality vessels and personnel operate in our waters.

To the detriment of the domestic shipping market, the cost of US built ships are "generally believed to be three or four times that of ships in the world market."⁷ Although good for the ship-building industry, the Jones Act is claimed to raise the cost of domestic shipping so that it can no longer compete with truck and rail. Even so, as of 2008, there were 42 active Jones Act-compliant ships suitable for deepwater marine highway service including, 27 containerships and 15 Ro-Ro ships.

Canada has a similar cabotage law, the Coasting Trade Act of 1992; exceptions are granted if applied for to Transport Canada and vessels do not have to be built in Canada but must be registered there.⁸ One Canadian option to enable cross-border shipping is to operate as an "international shipping company" as defined in their Income Tax Act (Brooks, 2006). Such a vessel must be Canadian-owned, foreign-flagged, and foreign-crewed. Such a company must be incorporated abroad with "mind and management" in Canada (hence, no Canadian corporate income taxes are assessed). Shore-based jobs could be held by Canadians. The prime drawback is that domestic shipping is prohibited.

2.3.2 National Security Regulations

Where short sea shipment must cross international borders, other restrictions exist. Research commissioned jointly by Transport Canada, MARAD, and the International Mobility Trade Corridor examined cross-border short sea shipping between the US And Canada with a specific focus on the Cascade Gateway region (Pacific Northwest) and found that US-Canada short sea shipping trade was affected by 24-hour rules.⁹ Specifically, 24-hour advance notice of cross border shipments¹⁰ are unequal and may be a hindrance; especially since the US requires this on all shipments but Canada has relaxed it so if a shipment's transit time is less than 24 hours, then notice only need be given at time of departure.¹¹

⁵ USDOT, Maritime Administration in Consultation with the Environmental Protection Agency, *America's Marine Highway – Report to Congress* (April 2011)

⁶ Cabotage is a water transportation term applicable to shipments between ports of a nation, referring to coastal or intercoastal navigation or trade

⁷ Frittelli (2011)

⁸ Cambridge Systematics, Inc. and Moffatt & Nichol Engineers. 2004. Cross Border Shortsea Shipping Study: Final Report. Prepared for Transport Canada.

⁹ Cambridge Systematics, Inc (2004 and 2007)

¹⁰ Trade Act of 2002 (US) and Advance Commercial Information initiative (Canada)

¹¹ Customs Notice N-565 (Canada)

2.3.3 Harbor Maintenance Tax

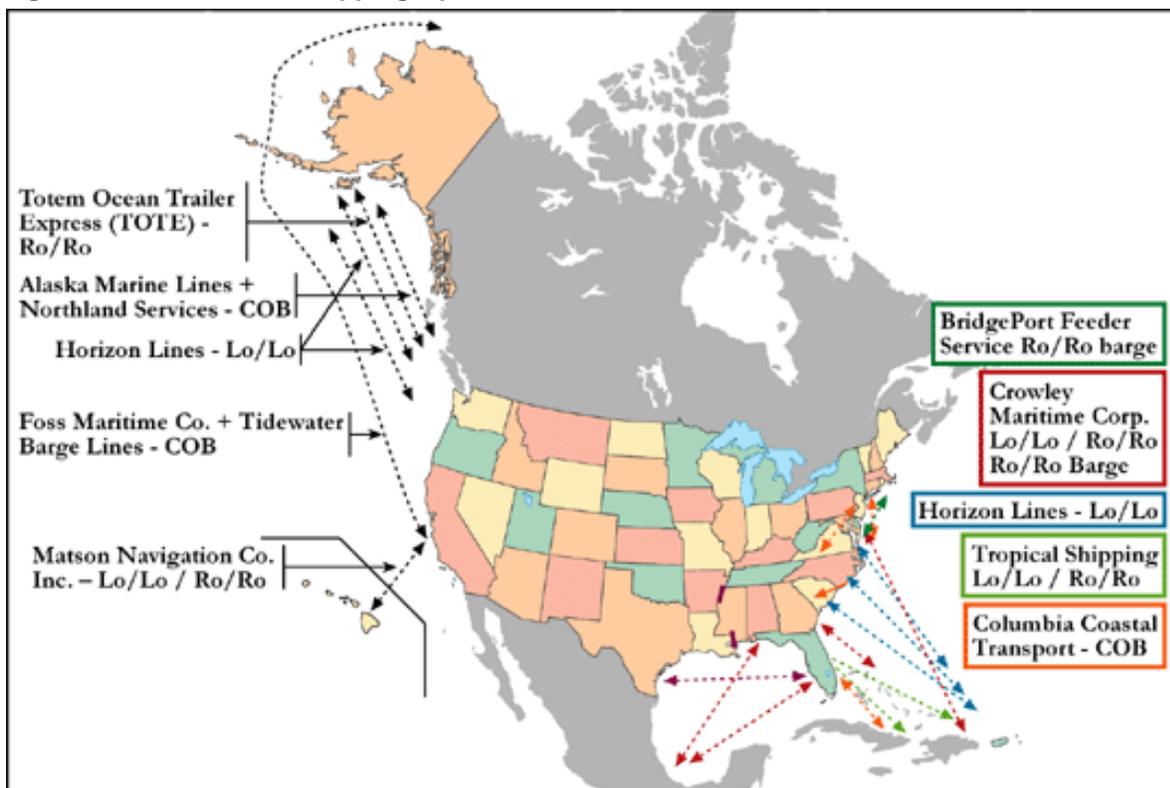
The Harbor Maintenance Tax, created in 1986 under the Water Resources Development Act is assessed on cargo moving between ports in two cases: (1) domestic cargo moving from one US port to another US port, and (2) international cargo entering the country (imports). This comprises a 0.125% tax on marine shipments moving between US ports. No such tax is imposed on truck or rail shipments, creating a cost disincentive to use domestic short sea shipping.

3 SHORT SEA SHIPPING EXAMPLES

Current short sea shipping in the US typically comprises barge services, such as along the Mississippi River. Cross-border short sea shipping exists in the Pacific Northwest between Puget Sound (US) and Vancouver (Canada). Bulk cargo is the predominant type carried. However, according to a small sample of Atlantic Canadian exporters (Brooks, 2006) only a handful of them serve or want to serve the Southeastern US markets.

In 2006, US short sea shipping operations along the coasts were fairly rare (see Figure 4), but a variety of service types did exist – Roll-on/Roll-off, Lift-on/Lift-off, and Container-on-Barge. Much more extensive is the inland waterway system with the Mississippi River as its backbone. For example, one company, American Commercial Lines (ACL), successfully serves the network in Figure 5 with approximately 2,400 barges and 130 tow boats.¹²

Figure 4: US Short Sea Shipping Operations circa 2006



Source: <http://www.ahoycargo.com/vessel-operations/ship-operations/650-us-short-sea-shipping-operations-definition-and-map.html> (MARAD, Nov. 2006 and Perakis, 2008)

Newer services that have been attempted have not always succeeded. For example, the Albany Express Barge service that transited the Hudson River in New York was a 2003 pilot program that could not capture enough container traffic to keep it viable.¹³

¹² Headquartered in Jeffersonville, Indiana, ACL has operated on the United States Inland Waterways System, which consists of the Mississippi River System, its connecting waterways and the Gulf Intracoastal Waterways, since 1915. (<http://www.aclines.com/site/aboutus/about-us.html>)

¹³ <http://urbanomnibus.net/2011/05/from-trucks-to-tugs-short-sea-shipping/>

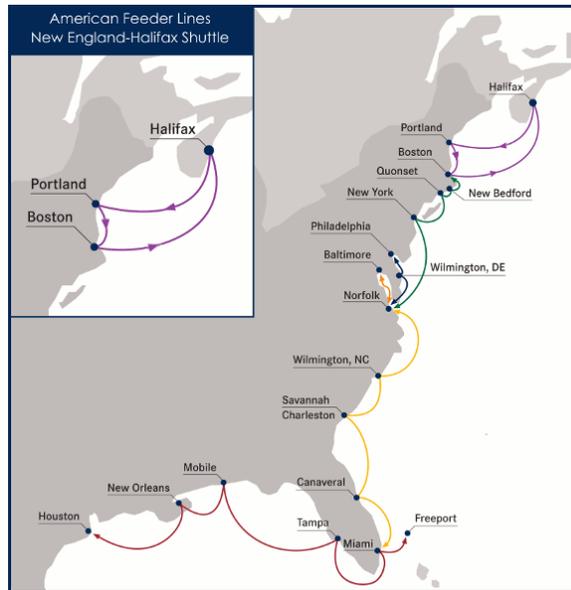
Another service started in 2008 with CMAQ funds along the James River in Virginia between Norfolk and Richmond. It is hoped that 2,000 truckloads per week can be displaced to the Norfolk Tug Company service.¹⁴

Figure 5: ACL Network



Source: <http://www.aclines.com/map.shtml>

Figure 6: Map of Proposed AFL Feeder Routes



Source: <http://www.american-feeder-lines.com/en/routes/index.html>

The newest entrant into the US short sea shipping market was American Feeder Lines, Inc. (AFL). Service began in July 2011 with a cross-border short sea shipping loop between Boston MA and Halifax NS as shown in the Figure 6 inset, with hopes to extend its service down along the East Coast and Gulf Coast upon completion of the Panama Canal expansion. Although the company's first feeder ship was German-built, AFL signed two letters of intent, one with Aker Philadelphia Shipyard and the other with Bay Shipbuilding in Green Bay, Wisconsin to produce a total of ten 1,300 TEU vessels that would be Jones Act compliant.¹⁵ AFL received a \$500,000 loan guarantee from the Canadian province of Nova Scotia in April 2012 to support the weekly container service; however, AFL suspended service, citing insufficient volumes to support the service, later than same month.¹⁶

Existing barge services offer a more successful example of short sea shipping. PCS Phosphate Company operates its own Bollinger-built barges from mines in Aurora NC to their bulk marine terminal at the Port of Morehead City.¹⁷ 260 ft-long, 60 ft-wide covered hopper barges have the capacity to transport 3,000 metric tons of dry bulk phosphate. Tank barges carry up to 12,000 barrels of sulfuric or phosphoric acid from the Morehead City port to the PCS facility.

¹⁴ Miller, Rich, "US Mounts Effort to Shift Cargo from Highways and Railroads to Ships" (Feb. 2009) <http://www.professionalmariner.com/ME2/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=07031DC211544CF9B4B6B8994A18E5D5>

¹⁵ http://seshippingnews.typepad.com/south_east_shipping_news/2011/07/first-steps-along-the-marine-highway.html

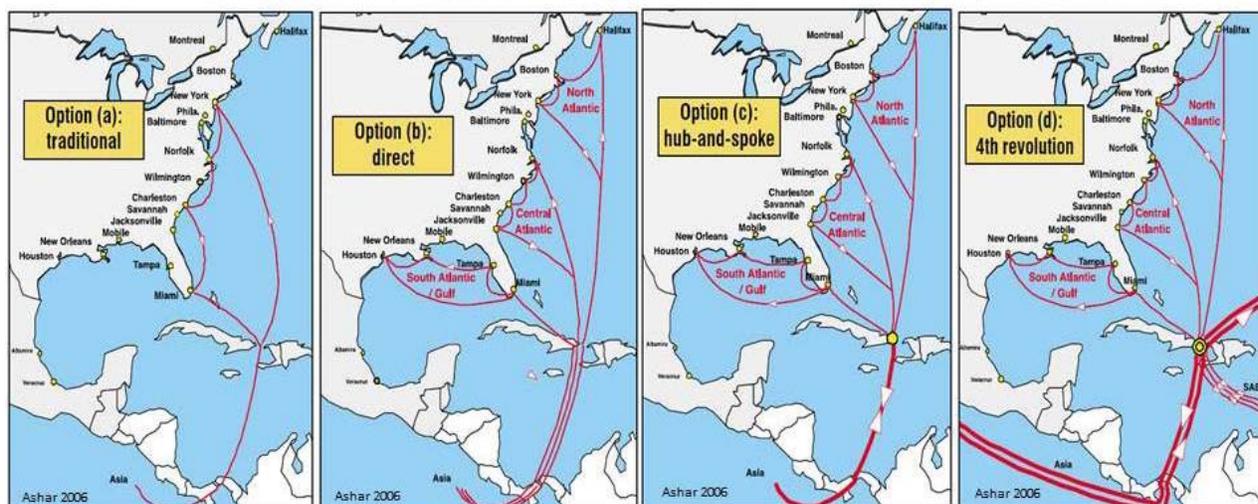
¹⁶ Leach, Peter T., "American Feeder Lines Going Out of Business" *Journal of Commerce* (April 27, 2012)

¹⁷ <http://marinelink.com/news/article/barge-business-is-booming-at-bollinger/302782.aspx>

4 APPLICABILITY OF SHORT SEA SHIPPING TO NORTH CAROLINA

Smaller ocean going vessels can more readily navigate North Carolina's existing ship channels than the ever-larger containerships now in global service. North Carolina could benefit from a hub-and-spoke or 4th revolution service configuration as illustrated in Figure 7, where cargo is transshipped from Neo Panamax vessels to smaller feeder ships at major North American ports. While there has been much speculation and anticipation of the demand for these services, the market for short distance container service is as yet unproven.

Figure 7: Potential Service Patterns between the Panama Canal and the US East Coast



Source: Ashar, A. ,Revolution #4. Containerisation International (December 2006) <http://www.asafashar.com/images.html>.

North Carolina's position on the M-95 Corridor creates a potential avenue to identify and support short sea shipping opportunities as part of the AMH program. The M-95 Corridor designates an Atlantic coastal route generally paralleling heavily-traveled I-95 from Florida to Maine. The East Coast Marine Highway Initiative Study of the M-95 Corridor seeks to further advance the AMH Program by identifying corridor-specific Marine Highway markets, developing tailored business plans and optimal operational models for those markets along and related to the M-95 Corridor. In support of the development of the M- 95 Corridor, a final report on the East Coast Marine Highway Initiative was scheduled for delivery in March 2012. Future funding allocations to the program, however, are uncertain at this time.

Based on research and analysis commissioned by MARAD, short-sea shipping opportunities typically can be cost-competitive with trucking only if the beginning and ending points are 400 miles or more apart. Thus, for example, a route between North Carolina and Virginia is unlikely to prove to be cost-competitive. Some AMH routes being explored have included Gulf of Mexico routes between Brownsville TX and Port Manatee FL where the water route is significantly shorter than routings by land; along the M-95 Corridor between New Bedford MA and Port Canaveral FL, and even a longer route along M-95 and across the Gulf of Mexico between New York/New Jersey and Galveston TX.

As demonstrated by PCS, point-to-point, on-demand barge service has the potential to offer effective low-cost marine transport when shipper facilities are located on or near one of North Carolina's waterways such as the Atlantic Intracoastal Waterway and the Neuse, Tar, and Pamlico Rivers. Requiring water depths of only 15 to 30 feet, barges can take advantage of

existing water and port infrastructure without the need for major channel deepening or additional highway access improvements to North Carolina's ports.

The introduction of an additional mode into cargo flows can increase the complexity of logistics and delivered costs. This combined with low vessel speeds and the limited geographic reach of North Carolina's waterways serves to constrain the viability of container-on-barge service to reach North Carolina manufacturing and distribution centers. Cargo eligible for barge service typically requires an origin or destination near the coastline and is not highly sensitive to delivery time.

Research by Frittelli (2011) indicates that clear cost savings, incentives or discounts are required to cause shippers to switch from truck or rail to barge service. Holding travel time constant, a 20 percent discount is necessary to trigger switching behavior to short sea shipping, 10 percent being insufficient. If faster service could be realized by barge a 10 percent premium was determined to be acceptable.

While the potential for barge service along North Carolina's waterways was identified by several *Maritime Strategy* industry stakeholders,¹⁸ no clear market demand has been identified. Lacking reliable market data, further discussion with targeted shippers is needed to validate barge opportunities.

¹⁸ Barge service was identified as an opportunity, but without specific proposals for use, at the *NC Maritime Strategy* Industry Workshops held with Agricultural Shippers (August 16, 2011), Non-Ag Shippers (August 10, 2011), Bulk and Breakbulk (October 21, 2011), Special Zones (October 5, 2011), and US Military (October 6, 2011).

5 OPPORTUNITIES FOR NORTH CAROLINA

To promote opportunities for short-sea shipping and barge services as a cost-effective, environmentally sound and low-congestion alternative to traditional truck routings, the following potential actions are offered for consideration:

- Establish an information clearinghouse, through NCDOT or NCDOC, to provide information to movers of freight that may be interested in considering water routings and seeking to match potential short-sea shippers with each other to help facilitate reliable regular service in each direction.
- Advance joint exploration, including through the I-95 Corridor Coalition, MARAD and/or other appropriate bodies, to identify potential partner ports that are 400 or miles from North Carolina ports, to and from which short-sea service may be attractive to existing North Carolina port users and/or that may attract new business.
- Evaluate the ability of promising short-sea shipping opportunities using the Marine Highways Benefit Calculator (www.marinehighways.org/benefits_calculator/), which can estimate monetary value (congestion, pollution and carbon reductions; safety benefits; reduced infrastructure development and maintenance; and operational cost reductions) of using water routes as opposed to truck or rail and of locating distribution centers directly on the water to facilitate transferring containers or trailers between water and truck or rail.
- Through engagement of I-95 Corridor Coalition and others, support legislative and regulatory actions (including regarding the Jones Act and HMT) that foster short-sea shipping, should it be determined that same would be of benefit to North Carolina.
- Seek grant funding to advance specific short-sea initiative(s), including pursuit of opportunities that may be brought to light upon the release of the East Coast Marine Highway Initiative final report.
- Consider incentives to encourage modes to work together to offer modally integrated service under a single contract of carriage, with liability and convenience built in. State policies to promote barge service could include tax credits or subsidies for early adopters. Seed funding (similar to the EU Marco Polo Program) could be tied directly to measurable reductions in surface transport vehicle miles traveled, greenhouse emissions, or tonnage eliminated from the State's highways.



This page intentionally blank

REFERENCES

- Asia-Pacific Economic Cooperation (APEC) Transportation Working Group and Inha University, 2007. Short Sea Shipping Study: A Report on Successful SSS Models that Can Improve Ports' Efficiency and Security while Reducing Congestion, Fuel Costs, and Pollution. APEC#207-TR-01.3, October 2007.
- Brooks, M.R., J.R. Hodgson, and J.D. Frost, 2006. Short Sea Shipping on the East Coast of North America: An analysis of opportunities and issues. Canada-Dalhousie University Transportation Planning/Modal Integration Initiative Project ACG-TPMI-AH08. March, 31, 2006.
- Cambridge Systematics, Inc., 2005. Short-Sea and Coastal Shipping Options Study: Final Report. Prepared for the I-95 Corridor Coalition, November 2005.
- Cambridge Systematics, Inc. and Moffatt & Nichol Engineers. 2004. Cross Border Shortsea Shipping Study: Final Report (Phase I). Prepared for Transport Canada.
- Cambridge Systematics, Inc., Moffatt & Nichol Engineers, and Seaworthy Systems. 2007. Cross Border Shortsea Shipping Study: Final Report (Phase II). Prepared for the International Mobility and Trade Corridor (IMTC) Project.
- Frittelli, J. 2011. Can Marine Highways Deliver? Congressional Research Service. Jan. 24, 2011.
- Fitzgerald, J. 2011. First steps along the marine highway: short-haul ships with a long view. South East Shipping News. July 5, 2011.
(http://seshippingnews.typepad.com/south_east_shipping_news/2011/07/first-steps-along-the-marine-highway.html)
- IHS Global Insight, Inc. 2009. An Evaluation of Maritime Policy in Meeting the Commercial and Security Needs of the United States. January 7, 2009.
(www.ihsglobalinsight.com/gcpath/MARADPolicyStudy.pdf)
- Kruse, C.J., C.A. Morgan, and N. Hutson, 2009. Potential Policies and Incentives to Encourage Movement of Containerized Freight on Texas Inland Waterways (FHWA/TX-09/0-5937-1). Prepared for the Texas Department of Transportation. March 2009.
- National Ports and Waterways Institute (A. Ashar at NPWI), 2003. High Speed Ferry and Coastwise Vessels: Assessment of a New York / Boston Service: Final Report (Program Element 3-17, FY01). Prepared for the Center for the Commercial Deployment of Transportation Technologies (CCDoTT), May 2003.
- Perakis, A.N. and A. Denisis, 2008. "A Survey of Short Sea Shipping and its Prospects in the USA." Maritime Policy & Management, Vol. 35, No. 6, pp 591-614.



This page intentionally blank