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PORTUNUS Project

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The objective of the Portunus Project is to create large, automated offshore ports that will the pace and scale of international trade. Additionally, these ports would increase the number of U.S. domestic trade vessels needed, as the imported goods would need to be transported from these offshore platforms to land-based ports such as Boston, Los Angeles, and Newark. Currently, domestic trade in the United States can only be conducted by vessels that abide by the Merchant Marine Act of 1920 – also referred to as the Jones Act. The Jones Act stipulates that vessels involved in domestic trade must be U.S. owned, U.S. built, and manned by a crew made up of U.S. citizens. The Portunus Project would increase the number of Jones Act vessels needed, which raises an interesting economic concern. Are Jones Act ships more expensive to operate than foreign vessels? Would it be more economically efficient to modify the Jones Act and allow vessels manned by foreign crews to engage in U.S. domestic trade? While opposition to altering the Jones Act is strong, it is important to consider the possibility that ship-owners who employ foreign crews will lobby for the chance to enter a growing domestic trade market. Their success would mean potential job loss for thousands of Americans currently employed in maritime trade.

The purpose of this report is to analyze the effect of the Jones Act's Citizen Crew Requirement on the operating cost of vessels involved in maritime domestic trade. More specifically, the report addresses the concerns that were maritime domestic trade to expand, it would be more economical to repeal the Citizen Crew Requirement, and employ foreign seamen instead.

Because the Jones Act has been in existence since 1920, and foreigners have not been permitted to work in maritime domestic trade since its enactment, it is difficult to estimate how much it would cost a vessel manned by a foreign crew to operate in the sector. However, foreign flag vessels and U.S. flag vessel often compete in the international trade market, providing us with sufficient data to compare the cost incurred by each.

The cost of operating a vessel can be broken down into three main categories: voyage, capital, and operational. Voyage and capital costs are negligible when comparing U.S. and foreign flagged ships, as flag or registry does not impact them. However, the operational costs of U.S. and foreign flagged ships vary substantially.¹

Operational cost is made up of crew cost, stores and lube, maintenance and repair, insurance, and overhead costs.² Out of these five categories, the most significant deviation between U.S. and foreign vessel expenses comes from crew costs.

- **Average daily crew cost (U.S.):** \$13,655
- **Average daily crew cost (foreign):** \$2,590

Crew cost is made up of wages, subsistence, overtime, travel costs, training, pensions, and union fees. The U.S. Department of Transportation Maritime Administration (MARAD) attributes high U.S. crew costs to the elevated standard of living that American crewmembers enjoy compared to many of their foreign counterparts.³ It simply costs more to live in the United States, and

¹ "COMPARISON OF U.S. AND FOREIGN-FLAG OPERATING COSTS." September 1, 2011. Accessed July 13, 2015. http://www.marad.dot.gov/wp-content/uploads/pdf/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf.

² Ibid.

³ Ibid.

American vessel owners must pay a wage competitive with other trade sectors in order to keep their workers.

The other components of operational cost show a much smaller gap between U.S. and foreign vessels.

- **Average daily stores and lube cost (U.S.):** \$1,158
- **Average daily stores and lube cost (foreign):** \$1,073
- **Average daily maintenance and repair cost (U.S.):** \$2,994
- **Average daily maintenance and repair cost (foreign):** \$2,390
- **Average daily insurance cost (U.S.):** \$1,057
- **Average daily insurance cost (foreign):** \$692

While the average daily overhead cost for a U.S. vessel was 1.7 times greater than that of a foreign vessel in 2010, MARAD states that “overhead costs are subject to significant variability between carriers, even within the U.S.-flag fleet...caution should be exercised when attempting to draw conclusions based on a comparison of overhead costs between vessel types and flag registries.”⁴

When all the components of operational cost are combined, it is nearly 2.7 times more expensive to operate a vessel under a U.S. flag than a foreign flag. In 2009, the average daily operational cost for a U.S. flag vessel was \$21,774. The average daily operational cost for a foreign flag vessel during that same year was only \$7,410.⁵

Not only are foreign vessels less expensive to operate, ship owners who choose to register their vessel in an “open registry” receive additional benefits. An “open registry” is a foreign registry where over 90% of the vessels are owned by foreign entities.⁶ Vessels in these registries are not subject to government safety inspections or income tax, have no manning requirements, can be built and repaired anywhere without being fined, and can be transferred in/out of the registry at any time. This provides vessel owners with a lot of mobility not necessarily found in the United States.

Because of the significantly higher operating costs sustained by U.S. vessels as well as the benefits found in “open registries”, it seems counterintuitive for ship owners to employ U.S. ships in international trade. However, U.S. ship-owners who choose to register their vessels in the United States do receive monetary benefits not available to ship-owners who register elsewhere. The Maritime Security Program gives about **\$8,500 per day** to U.S. flag vessels, lowering the difference in operational cost between U.S. and foreign flag vessels to \$4,100. Additionally, U.S.-flag ships are able to transport cargo that foreign-flag ships cannot – such as military equipment.

⁴ Ibid.

⁵ "COMPARISON OF U.S. AND FOREIGN- FLAG OPERATING COSTS."

⁶ Ibid.

While these incentives no doubt manage to keep some U.S. ship-owners from registering elsewhere, there are still over 540 U.S. owned vessels registered in other nations.⁷

If foreign flag vessels are more cost-effective in the international trade market, it might seem logical to conclude that were they allowed to operate in U.S. domestic trade, they would also be the more economical choice. The ability to employ seamen who are not U.S. citizens could save ship-owners money. This money could be invested in the building of new ships for the domestic trade market, thereby increasing the level of domestic trade that occurs.

However, the foreign-flag ships are allowed to operate without certain restrictions in the international trade market; restrictions that would become applicable to them were they to engage in U.S. domestic trade. For example, U.S. tax burdens would almost certainly be placed on foreign ships. In 1997, Congressional Research Services stated that “a foreign-flag vessel engaged in the coastwise trade would have 100% U.S. source income”, all of which is subject to taxation.⁸ This income tax would apply to foreign-flag vessels owned by U.S. citizens, as well as foreign ship-owners. Additionally, “foreign employees who hire non-resident alien employees to work solely within the U.S. are generally subject to federal insurance and unemployment taxes.” So a foreign-flag vessel owned by a non-U.S. citizen would face additional taxation.” These taxes raise the cost of coastwise trade for foreign-flag vessels, making U.S.-flag vessel a more competitive option.⁹

In addition to these taxes, foreign-flag vessels interested in U.S. domestic trade would have to work out crew logistics with U.S. Immigration and Naturalization Services (INS). Currently, foreign crews on foreign vessels who use U.S. ports for trade are given D-visas. D-visas permit these workers to take temporary shore leave or engage in work-related activities for up to 29 days. But because a seaman with “D-visa status...may not be employed in connection with domestic movements of a vessel,”¹⁰ foreign-flag ships engaged in coastwise trade must apply for either B-visas or an H-visas for foreign employees. Unfortunately, Immigration and Naturalization Services has stated, “Alien crewmembers may not qualify for such visas.” Foreign seamen do not qualify for a B-1 visa because work done aboard a vessel such as navigation and the servicing of passengers does not meet the INS definition of a “visitor for business”, which is required for a B-1 visa. Because they would be employed in U.S. coastwise trade, a foreign seaman is also not a “visitor for pleasure”, a stipulation that must be met in order to apply for a B-2 visa. Finally, in order to qualify for an H-visa, a worker must be “coming temporarily to the United States to perform temporary...services or labor” and must not “[displace] United States workers capable of performing such services.” Not only is it doubtful that the Department of Labor would agree that there is an insufficient number of Americans able to perform the work of a foreign seaman, but only U.S. employers can seek H-visas. Because of these visa restrictions, foreign-flag vessels attempting to engage in U.S. coastwise trade would have little choice but to hire U.S. citizens at a competitive salary.¹¹

⁷ Ibid.

⁸ Beason, Sarah, Darrell Conner, Nickolas Milonas, and Mark Ruge. "Myth and Conjecture? The "Cost" of the Jones Act." American Maritime Partnership. April 27, 2015. Accessed June 29, 2015.

⁹ Beason, Sarah, Darrell Conner, Nickolas Milonas, and Mark Ruge. "Myth and Conjecture? The "Cost" of the Jones Act." American Maritime Partnership. April 27, 2015. Accessed June 29, 2015.

¹⁰ Ibid.

¹¹ Ibid.

When comparing U.S.-flag ships and foreign-flag ships in the international trade market, foreign vessels have a distinct cost advantage. Elements such as a substantially lower crew cost, no government safety inspection, and no income tax make registering U.S. vessels abroad a very attractive option for ship-owners. But, the assumption that using these foreign-flag vessels in U.S. domestic trade would also result in a lower operating cost proves flawed. Taxation and immigration laws raise the operating cost for foreign-flag ships, potentially making U.S.-flag ships equally as profitable as their foreign-flag counterparts.

The second half of this report will cover the amount of pavement damage done to roads by freight-carrying trucks, as well as the feasibility of replacing truck and rail freight services with an ocean-based service on a New York to Miami route.

North Carolina will be the central focus of this section, as the M-95 corridor could supplement traffic along I-95, should it prove a cheaper alternative. In order to determine whether or not a maritime route would incur less cost, we must first determine how much damage trucks really cause to the state's infrastructure.

A report published by the Federal Highway Administration in 2000 estimates that trucks cause roughly \$0.409 of pavement damage per mile driven.¹² Theoretically, the revenue generated from gas and diesel taxes should be enough to compensate for the damage caused by passenger cars and trucks. In North Carolina, the combined federal/state diesel tax paid by trucks is \$0.6215/gallon.¹³ If we assume that the average truck gets 6.5mpg, then they pay roughly \$0.0956/mile for pavement damage. In this case, the diesel tax covers less than 25% of the actual damage caused. Other states see even less revenue from the diesel tax. Truckers refueling in Georgia, for example, only pay \$0.0718/mile to make up for the pavement damage they cause.¹⁴

Despite the fact that trucks cause much more damage to roads and highways than they compensate for, it is still much cheaper to use trucks for long-haul routes up and down the east coast. The operating costs and cost per container for the vessels currently available for coastwise trade are simply too high to make it a cheaper means of transportation. A report published by the Port of New Bedford states that the maritime route with the greatest potential to remove trucks from I-95 in North Carolina is a route that runs from New York to Miami.¹⁵ However, even when utilizing the most efficient ship for the route (a Load on/Load off, 18kt vessel) and assuming the most favorable fuel prices, there is still a net loss of profit.¹⁶

Cost/Load	\$1,286
Revenue/Load	\$1,094
Net Loss/Load	\$192

The report states that in order for "potential [M-95] services to be economically viable, changes must occur in the underlying Marine Highway service cost and/or revenue structures."¹⁷

¹² Department of Transportation, Federal Highway Administration, "Addendum to the 1997 Federal Highway Cost Allocation Study" (May 2000): <http://www.fhwa.dot.gov/policy/hcas/addendum.htm>

¹³ "How Much Tax Do We Pay on a Gallon of Gasoline and Diesel Fuel?" U.S. Energy Information Administration. January 20, 2015. Accessed June 29, 2015.

<http://www.eia.gov/tools/faqs/faq.cfm?id=10&t=10>.

¹⁴ Ibid.

¹⁵ "East Coast Marine Highway Initiative M-95 Study." October 1, 2013. Accessed July 2, 2015.

http://www.portofnewbedford.org/documents/ECMHI_M-95_Study_Final_Report.pdf.

¹⁶ Ibid.

¹⁷ Ibid.

In the case of the Portunus Project, we are interested in whether or not this trend of cheaper trucking will continue after the implementation of offshore ports. If a sea-based port were constructed east of New York City, is it still cheaper to ship Miami-bound freight to the Port of New York and then load it onto Miami-bound trucks? Or, is it cheaper to load the cargo onto a vessel bound for Miami, eliminating the need for those long-haul truckers?

The answer to this question is contingent on many different factors. One being exactly how much freight Miami processes on an annual basis. If there is only a small amount of cargo that is destined for Miami, then it is likely cheaper to ship it to New York and load it onto trucks, rather than using smaller, less fuel efficient vessels to ship it directly to Miami.

According to the North Carolina I-95 Economic Assessment Study, 25% of all southbound traffic in the state has a final destination in Florida. If roughly 1,064 southbound trucks pass through the state each day, then we can estimate that 266 have Florida as a final destination.¹⁸

- **(266 trucks) x (200 working days) = 53,200 trucks in a work year**

If we assume that each of these trucks is carrying 2 TEUs (a 40ft trailer, the most common type of trailer on the road today), then:

- **(53,200 trucks) x (2 TEUs per truck) = 106,400 TEUs a work year**

The I-95 Economic Assessment Study does not specify where in Florida these trucks are bound. Not all of them are headed for Miami. However, because this number only takes into account trucks that utilize the I-95 North Carolina corridor and trucks that utilize other routes are not considered, the total number of Florida-bound trucks per working year is likely much, much larger. Therefore, for the sake of this report we will estimate that 106,400 TEUs of truck freight travel to Miami on an annual basis.

In addition to freight carried in by trucks, a large amount of cargo passes through the city's maritime trade sector. In 2014, the Port of Miami processed 876,708 TEUs. While Miami is not typically considered one of the United States' largest ports, a substantial amount of maritime trade does occur there, particularly cargo passing to-and-from South American and Caribbean destinations.

If we combine the freight carried by trucks and the freight processed by the port, then Miami sees a total of 983,108 TEUs a year.

Is this enough freight to justify a direct shipping route from an offshore platform to the city of Miami? Does the distance from Miami to this platform change the threshold of cargo needed to make such a route viable? These answers are beyond the scope of this report, but they are questions that will need to be answered for every port interested in utilizing these offshore platforms. Undoubtedly there will be some long haul truck routes that remain the most economically feasible option for moving freight, even as the maritime trade sector develops. Despite this, the ability to eliminate and/or ease highway truck traffic to any extent is an important benefit of the Portunus Project.

¹⁸ "North Carolina I-95 Economic Assessment Study." June 1, 2013. Accessed July 1, 2015. http://www.driving95.com/assets/pdfs/_Task-6_Trucking_and_Shipping_Analysis.pdf.