FY2018 BUILD Grant Application

July 19, 2018

Seagirt Marine Terminal Berth 3 Modernization P3 Project

Submitted by:

Maryland Port Administration
In association with Ports America Chesapeake, LLC

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ACRONYMS AND ABBREVIATIONS

BCA	Benefit-cost analysis
BCD	Baltimore City Datum
BRTB	Baltimore Regional Transportation Board
BUILD	Better Utilizing Investments to Leverage Development
CAPEX	Capital expenditure
CE	Categorical exclusion
CTP	Consolidated Transportation Program
DMCF	Dredged Material Containment Facility
FTE	Full-time equivalent
I-70	Interstate 70
Jacobs	Jacobs Engineering Group Inc.
MARAD	United States Maritime Administration
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MDSPGP	Maryland State Programmatic General Permit
MPA	Maryland Port Administration
MPO	Metropolitan Planning Organization
MTC	Maryland Transportation Commission
NEPA	National Environmental Policy Act
OCR	Optical Character Recognition
PAC	Ports America Chesapeake, LLC
Ports America	Ports America Inc.
RFID	Radio frequency identification
RoRo	Roll-on/Roll-off
RTG	Rubber Tired Gantry
Seagirt	Seagirt Marine Terminal
TAR	Tenant Alteration Request
TEU	Twenty-foot equivalent unit
TIP	Transportation Improvement Plan
TOS	Terminal operating system
ULCV	Ultra Large Container Vessel
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled
WIM	Weigh in Motion

Project Summary

The Maryland Port Administration (MPA) requests a grant of **$6.6 million** from the Better Utilizing Investments to Leverage Development (BUILD) program for the **$32.8 million Seagirt Marine Terminal Berth 3 Modernization P3 Project** to add a second berth capable of serving 50-foot draft Ultra Large Container Vessels (ULCVs) and the necessary supporting landside improvements. As the size of container vessels continue to increase, Baltimore is becoming berth-constrained and will soon be excluded from continued international trade growth unless it can provide an additional deep-draft berth. The MPA and its private sector partner are committed to a significant non-federal match and are investing millions of dollars in complementary and supporting projects. The Project aligns to the BUILD Program's goals as summarized below and detailed throughout this application.

Cost Sharing, Matching, and Leverage

- ✓ More than 56 percent privately-funded with a committed and dependable source of funding
- ✓ Part of a $400 million investment program to modernize, upgrade, and expand Seagirt

Safety

- ✓ Reduces the occurrences of crashes, fatalities and injuries among transportation users
- ✓ Improves navigational safety, thereby reducing the potential for release of hazardous materials into the nation's waterways

Good Repair

- ✓ Upgrades nationally-significant infrastructure that enables shipments to and from rural communities
- ✓ Sustainable revenue and robust asset management provide confidence in long-term maintenance

Economic Competitiveness

- ✓ Reduces the cost of transporting containerized cargo, representing savings to the U.S. economy and making U.S. exports, including those from rural areas, more competitive in the global marketplace.
- ✓ Extremely competitive benefit-cost ratio

Environmental Protection

- ✓ Reduces emissions from trucks, ships, and heavy equipment
- ✓ Potential for beneficial reuse of dredged material

Quality of Life

- ✓ Provides new high-paying jobs in an economically distressed area
- ✓ Improves local neighborhoods through reduced noise and traffic

Innovation

- ✓ Leverages and expands upon a first-of-its-kind Public-Private Partnership to provide infrastructure improvements with state and private entities that are committed to long-term asset performance
- ✓ Provides supporting infrastructure for state-of-the art technologies and leverages recent technology improvements to increase cargo velocity

Partnership

- ✓ Demonstrated collaboration by a diverse group of local, state, bi-state, federal, and private partners
- ✓ Significant leveraging of private and state investment from committed, reliable sources

Readiness

- ✓ Fully able to meet BUILD obligation and expenditure deadlines
- ✓ Few and well-mitigated risks

1 PROJECT DESCRIPTION

1.1 Port of Baltimore Overview

Founded in 1706, the Port of Baltimore, which is located in the Chesapeake Bay, Maryland, is the eighth largest container port on the U.S. East Coast. It is one of four ports that are served by a 50-foot channel, allowing it to accommodate some of the largest ships in the world. The Port of Baltimore, the nation's leading automobile and Roll-on/Roll-off (RoRo) port, and handles containers, passengers, automobiles, and liquid, dry, break bulk, and farming equipment. In 2017, the Port handled almost 1,000,000 Twenty-Foot Equivalent Units (TEUs), a standard measurement of containerized cargo.

Located in one of the country's strongest urban markets, the Port is also an important gateway for the import and export of cargo to and from rural areas, including heavy farming equipment such as combines, tractors, hay balers, hereby providing critical connectivity between domestic and international markets and serving as a vehicle for industrialization, modernization, and for growing both the urban and rural economies.

Containerized cargo in the Port of Baltimore has reached record levels for each of the last 8 years, as shown in Figure 1-1. Container volumes grew 12 percent year-over-year from 2016 to 2017,[1] increasing at an annual growth rate that is greater than its neighboring container ports on the North Atlantic. Between 2003 and 2017,[2] imported container cargo has grown at an annual rate of 4.9 percent, compared to a 3 percent annual growth rate for containerized imports at all U.S. ports, a 3.6 percent annual growth rate at the Port of New York and New Jersey, and a 3.1 percent growth rate at the Port of Philadelphia. With respect to containerized exports, the Port of Baltimore has posted a 7.2 percent annual growth rate compared to a 5.8 percent annual growth rate for containerized cargo exports at all U.S. ports, and a 5.7 percent annual growth rate at the nearby Port of New York and New Jersey.

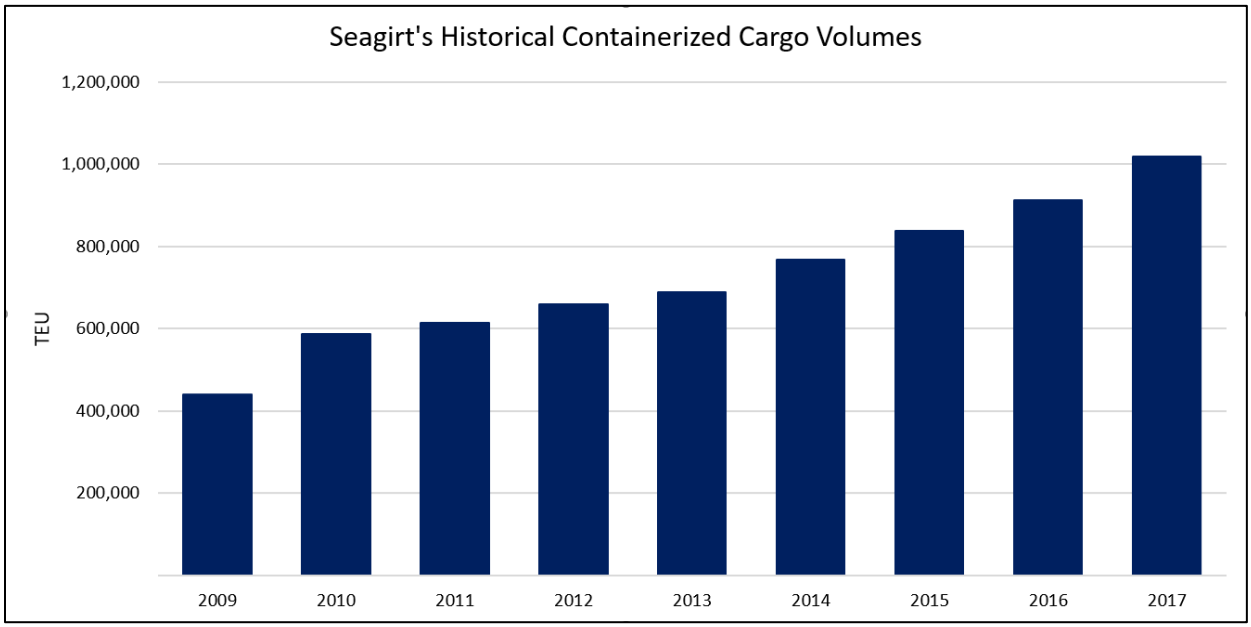

FIGURE 1-1 – SEAGIRT MARINE TERMINAL'S HISTORICAL VOLUMES [3]

[1] Source: PAC
[2] American Association of Port Authorities, 2017
[3] Source: PAC

The overall economic impact of the Port of Baltimore measured for cargo and cruise activity are as follows: [4]

- Approximately 33,920 jobs in Maryland are generated by port activity, including
  - **13,650 direct jobs**
  - **15,890 induced jobs**
  - **4,380 indirect jobs**
- The Port of Baltimore is a major source of personal and business revenues in the State of Maryland.
  - The Port was responsible for **$2.9 billion in personal incom**e.
  - The Port's average annual salary for the direct job holder is 16.4 percent higher than the average annual wage for the State of Maryland, (as reported by the U.S. Bureau of Labor Statistics).
  - The Port generated **$2.2 billion in business revenues**.
  - Port activities generated **$310 million in state, county, and municipal tax revenues**.
- **Approximately 93,700** other jobs in Maryland are directly **related to activities at the Port**.
- Combining direct, induced, and indirect jobs with related jobs, there are more than **127,600 jobs linked to the Port**, including jobs in the outlying rural areas.

The Port of Baltimore is expecting significant organic growth in the coming years, as the regional population grows, and thereby the demand for goods, grows. Trends in the global supply chain also suggest new markets may create additional growth in East Coast port activity. For example, the raised Bayonne Bridge in New Jersey allows larger container vessels to call on East Coast ports, including Baltimore, creating a more beneficial direct all-water route to the East Coast as well as attracting shifting production capacity in Asia, which favors a Suez Canal all-water route. Shell Chemicals recently accounted that it is developing a large ethylene cracker facility in Monaca, PA that will convert ethylene into derivative products such as low- and high-density polyethylene. The facility, once built, will be a significant potential exporter from the region and could use the Port of Baltimore.

The MPA's goal is to increase the amount of container imports and exports at a rate higher than the average annual growth for Mid-Atlantic ports overall. These ports include New York, Philadelphia, Wilmington, and Norfolk which represent the most immediate competition for containerized cargo imports and exports within Baltimore's market area.

1.2 Seagirt Marine Terminal Overview

Owned by the MPA, the 284-acre Seagirt Marine Terminal (Seagirt) is the Port of Baltimore's dedicated container terminal, handling more than 97 percent of the Port's container volumes. Seagirt handles an annual volume of 1,000,000 TEU and has the highest vessel productivity rates in the country with 38 moves per hour.[5] An overview photo of Seagirt is shown in Figure 1-2.

Seagirt has four container berths, one of which is 50 feet deep alongside, supported by 11 ship-to-shore container cranes. Its upland facilities include more than 240 refrigerated container plugs, 134 acres of outside container storage, state-of-the-art new truck gates, 22 Rubber Tired Gantry cranes (RTGs), and an on-dock intermodal yard that is serviced by CSX and Norfolk Southern.

[4] Source: Economic Impacts Generated by The Port of Baltimore, Maryland Port Administration.
[5] For 2014 and 2015, according to Journal of Commerce

In 2010, the MPA entered into a unique $1.3 billion public-private partnership with Ports America Chesapeake, LLC (PAC), signing a 50-year lease to operate Seagirt. PAC has committed to investing $500 million in the terminal. Under the agreement, PAC constructed a new 50-foot-deep container berth (Berth 4) and purchased four state-of-the-art, all-electric, high-efficiency, Super-Post Panamax cranes that can serve ULCVs, which are 22 containers wide and carry 14,000 TEUs. PAC also modified the existing seven cranes at Berths 1, 2, and 3 to handle ships 18 containers across, and has successfully executed more than $142 million in equipment and environmental initiatives.

Seagirt's impressive vessel loading and unloading productivities are matched by its truck turn times, which are less than 30 minutes for single moves and 60 minutes for double moves. This industry-leading productivity has helped drive a significant increase in new business, with a 12 percent increase from 2016 to 2017. However, the increased volumes are beginning to reach the terminal's capacity, especially of ULCV-capable berths and future growth will not be possible without the **Seagirt Marine Terminal Berth 3 Modernization P3 Project.** This project will provide additional capacity and allow the vessels to safely and efficiently navigate through the Port's channels.

PAC currently has 774 full-time equivalent (FTE), highly compensated, union employees at the terminal, and this number will increase with growing cargo volumes. With the additional cargo volumes that this project will enable, PAC expects to additional union jobs.

For every job that PAC creates, many other indirect jobs are created in Baltimore City, an economically distressed area, in fields such as marine-related activities, warehousing, trucking, logistics, freight forwarding, manufacturing, industrial, and retail. Countless additional jobs are created throughout the region, beyond Baltimore City, as a result of economic activity at Seagirt. This project will create well-paying jobs directly and indirectly, thereby providing economic competitiveness in an economically-distressed region.

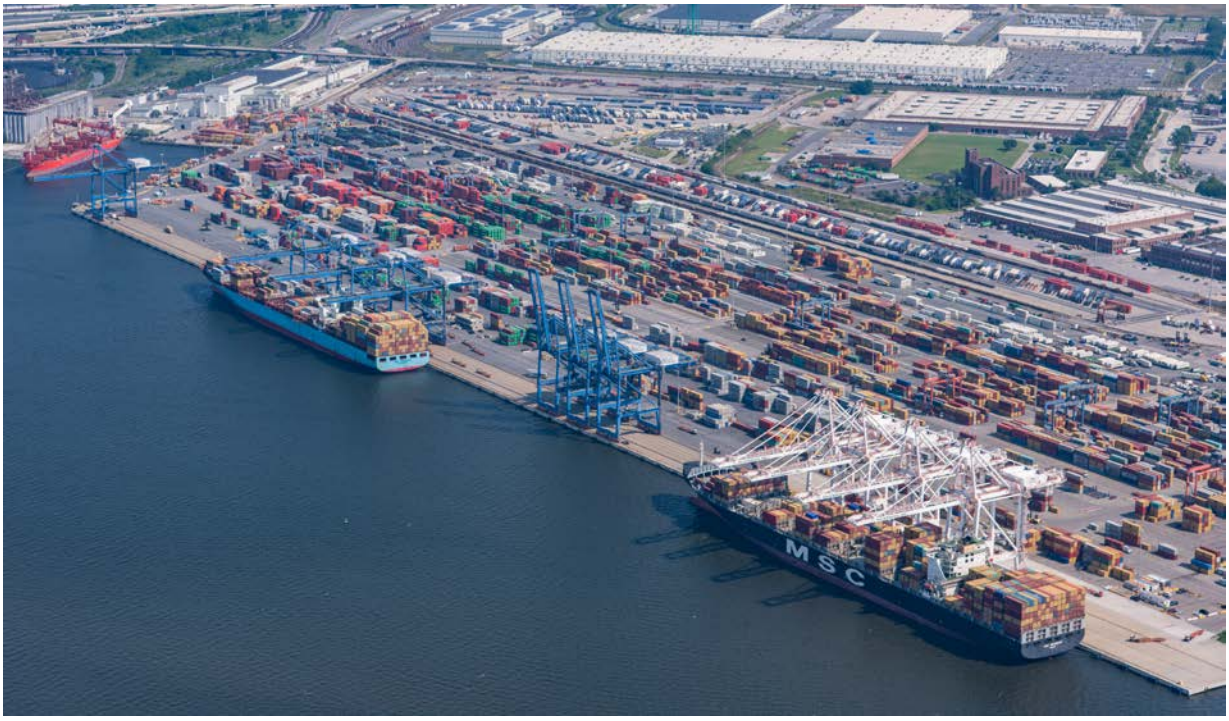

FIGURE 1-2 – SEAGIRT MARINE TERMINAL OVERVIEW

1.3 Seagirt Marine Terminal Berth 3 Modernization P3 Project

With only one 50-foot draft berth, Seagirt lacks the capacity to handle the increasing number of ULCVs that are calling on the terminal due to the ever-increasing size of container ships (see Section 1.5).

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project**, which has been envisioned since PAC's concession started in 2010, includes the following scope of work:

- Upgrading the existing Berth 3 wharf structures to accommodate a deeper dredge depth
- Dredging the existing Berth 3 pocket from a depth of 45 feet to a depth of 50 feet to accommodate deep-draft ULCVs
- Dredging the access channel from the 50-foot-deep federal channel to Seagirt Berth 3
- Widening the turning basin to provide better safety clearances for ULCVs
- Installing hardware to support large ship to shore cranes that will service ULCVs
- Repairing the existing wharf substructure, superstructure, and paving
- Installing concrete runways in the container yard to allow for new, efficient RTG cranes to provide additional capacity and better cargo velocity

This **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will:

1. Relieve the terminal's berth capacity bottleneck.
2. Support the region's cargo growth demand.
3. Provide growth opportunities for capturing additional containerized cargo, including the ability to immediately accommodate one additional weekly service at Seagirt, with a second additional weekly service within 5 years.
4. Increase operational and commercial flexibility, and enable vessels to more efficiently move in and out of the terminal.
5. Allow MPA to maximize the use of all its infrastructure assets, thereby increasing utilization, capacity, and productivity.
6. More cost effectively serve the growing export and import markets in the Port of Baltimore's hinterland.
7. Upgrade the Berth to a better state of repair, thereby reducing MPA's maintenance costs and providing better assurance of continued operations and capacity.
8. Reducing the all-in cost to the container shipping lines calling at the Port of Baltimore.

It is estimated that, with appropriate funding, the project will be completed in 2020. BUILD grant funding awarded for the project will be fully obligated and fully expended well before the September 30, 2020, and September 30, 2025 deadlines, respectively. A project schedule is presented in Figure 5-5**.**

The BUILD grant is projected to have a catalytic effect on Seagirt. The capital improvements proposed for acceleration directly relate to the terminal's capacity to service increased demand and its ability to handle containerized cargo in a timely and cost-effective manner. The investment will also ignite Seagirt's ability to attract more discretionary intermodal cargo. In many cases, U.S. export cargo is extremely sensitive to

incrementally high transport costs. This increase in efficiency will translate into lower costs for export cargo, and therefore increased opportunity for cost-sensitive U.S. exports.

1.4 Transportation Challenges

Increasing Population Growth and Container Volume

Maryland's population is expected to increase by 9.8 percent overall between 2010 and 2020, and by 15.8 percent from 2010 to 2030.[6] This population growth will create continued demand for imported goods, driving substantial container volume growth. As mentioned above in Section 1.2, the Port of Baltimore saw a 12 percent increase in container volumes from 2016 to 2017, growing faster than the population. The difference is largely due to Seagirt's efficiency that attracts discretionary cargo bound for /exported from other regions of the U.S.

Terminal Capacity Limits

The improvements associated with this project are necessary if the terminal is to keep pace with the growing population and the accompanying cargo volumes. If improvements under this project and at other terminals are not made, Seagirt and other terminals within the Metropolitan Washington, D.C. area will reach capacity, and cargo intended for the northeast region will be diverted to other ports, such as ports in New York and New Jersey; Norfolk, Virginia; or Canada. This diversion will increase the cost to shippers, reduce on- and off-terminal efficiencies and cargo velocities, and stall job growth throughout the region. The added expense and reduced efficiencies will drive up prices for consumers and businesses in the region. Some businesses will choose to leave the region, or some cargo (such as low-value exports) will just not ship. Figure 1-2 highlights the fact that demand will surpass capacity around 2026, beyond which the Port of Baltimore will need to identify additional sites or operating methods to support continued growth. This project helps mitigate the predicted capacity constraints.

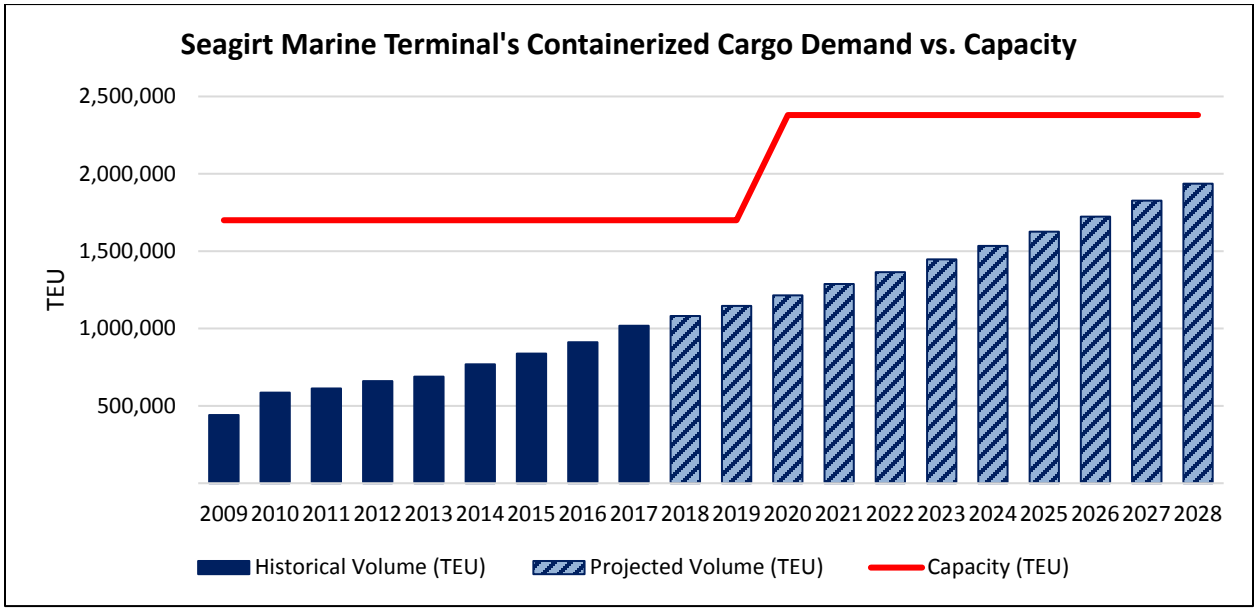

FIGURE 1-3 – SEAGIRT MARINE TERMINAL'S CONTAINERIZED CARGO VOLUMES AND CAPACITY [7]

[6] Source: Maryland State Archives
[7] Source: Martin Associates

Roadway Congestion

Cargo volume growth and population growth will increase traffic on the roads unless measures are taken that would allow additional cargo to be shipped via water. According to the 2017 INRIX Global Traffic Scorecard [8], Baltimore ranked 26th and Washington D.C. ranked 6th in the nation for having the most traffic congestion, with the peak hours spent in congestion averaging between 27 to 63 hours per commuter for the two cities in 2017. Without this project, the hours spend in traffic is expected to rise due additional heavy truck traffic.

By providing adequate capacity for container traffic volumes continue to be shipped by water routes, this **Seagirt Marine Terminal Berth 3 Modernization P3 Project** dovetails with the strategies of the study by aiding in managing the increased number of trucks needed to meet the requirements of shipment volumes in and out of the Baltimore region. This project will allow containers to bypass critical, congested surface arteries of the Northeast U.S. by enabling containers to arrive into and depart from Baltimore, rather than entering the U.S. at another port and being trucked to Baltimore. This benefits all users of the regional transportation system through reduced congestion, improved road safety, and better air quality that will follow the traffic reduction.

Ship Size Trends

Global trends in shipping have introduced larger, more economically and environmentally efficient ships—ULCVs—to the world's shipping fleet. The trend toward larger ships has required large-scale infrastructure investments to accommodate these ships, ranging from the widening of the Panama Canal to improvements in the U.S. national and regional rail systems, and improvements to ports and harbors.

The expansion of the Panama Canal, which was completed in June 2016, is particularly important because it allows container ships of up to 14,000 TEUs (ULCVs) to transit its locks. Prior to the expansion, the largest vessel that could transit the locks was about 5,000 TEUs. These ULCVs are now transiting the Canal and calling on U.S. East Coast ports, including Baltimore, which does not have enough deep-water berths to service the demand for these big ships.

In particular, the MPA and USACE have invested heavily in dredging and maintaining the Port of Baltimore's channels to 50-foot depths. Additionally, MPA and PAC have invested heavily to improve Seagirt's intermodal connectivity (which also helps the Port compete for discretionary intermodal cargo volumes destined for distribution throughout the country). These efforts have allowed ULCVs to start calling on Seagirt. The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will enable Seagirt, and the broader Port of Baltimore, to accommodate more of these ULCVs that would otherwise not be able to call on the Port due to the lack of available infrastructure.

Shifting Trade Routes

As vessel sizes increase, deeper channels, Super-Post Panamax cranes, and efficient terminal operations will become a necessity at those ports serving the larger vessels, now deployed on the Asian all-water services. In addition, as the larger ships cascade from one trade lane to another, there will be constant growth in the size of vessels deployed on all trade routes. For example, the largest container vessels, those 18,000 TEU and above, are deployed on the Asia-Europe trade routes, as the economies of the largest container vessels are realized on the longest trade routes with minimal port calls. As these larger ships (18,000 TEU and greater), are deployed on the Asia-Europe routings, the current vessels on that route are moved to the Transpacific routing, which is the routing offering the next level of distance and minimal port calls. These newly deployed vessels on the Transpacific trade (from the Asia-Europe trade) displace the current sized fleet on the Transpacific trade, and these displace vessels then cascade to the all-water Asia-U.S. East Coast/Gulf Coast trade via the Panama Canal.

[8] Source: 2017 INRIX Global Traffic Scorecard

1.5 Expected Users/Beneficiaries

The primary beneficiary of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will be the general public in the Metropolitan Washington, D.C. area, as the goods they purchase will be able to come directly into the region. As presented in this application, the container demand at Port of Baltimore will reach its current capacity before 2025 unless additional capacity is provided. This restricted capacity could divert cargo to other regions and/or Canada, which would lead to longer shipping times and higher costs for goods. By completing the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**, and all currently envisioned projects, Seagirt's capacity would be increased to handle forecasted demands for years to come.

The community surrounding the Port of Baltimore is affected by congested streets and highways carrying an ever-increasing number of trucks to and from Seagirt. The mixed use of passenger and truck traffic in congested conditions presents safety concerns for the public and motor carrier communities. The reduction in truck traffic that this project provides will reduce traffic congestion on the local roads.

Container vessels, container handling equipment, and diesel truck emissions negatively affect air quality. These conditions will get worse as container volumes grow. This project will reduce harmful emissions by shifting a portion of the truck volumes to other transportation modes, thereby benefitting residents, port workers, and businesses. This project's completed design also includes provisions for future electrification of the RTGs, thereby reducing emissions from container handling equipment.

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will create high-paying jobs in the economically distressed City of Baltimore. The increased cargo demand that the modernized berth will accommodate will create will allow PAC to retain 774 FTEs and directly hire additional well-paid employees. In addition to the direct jobs, indirect jobs in the immediate vicinity and surrounding rural areas will multiply well beyond those gained at Seagirt.

Rural communities will benefit from the project since exported and imported cargo from and bound for these areas often passes through Seagirt. The national economy will directly benefit from increased freight volume. This project supports the forecasted increased volumes by allowing Seagirt to adequately handle freight volume on the terminal and prevent congestion on the roads.

1.6 Leveraging Other Projects, Initiatives, and Investment

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will leverage the following major local, state, federal, and private sector infrastructure projects and initiatives, a few of which are summarized below.

Significant Regional Projects and Initiatives

Baltimore Harbor Deepening Project [9]

USACE, in conjunction with the MPA, have invested hundreds of millions of dollars to deepen the Port of Baltimore's harbors and channels to 50-foot depths. These deep channels provide vessels access to Seagirt and other cargo terminals within the Port and are required to support ULCVs.

M-95 Marine Highway [10]

While the federal government, state agencies, and private entities are investing in the Baltimore's ability to handle these much larger vessels and additional cargo, many ports on the East Coast will not be able to handle these ships, necessitating a short sea route via barge or feeder vessels. The Port of Baltimore is specifically listed as a port of call on the MARAD-designated M-95 Marine Highway

[9] Source: United States Army Corps of Engineers
[10] Source: USDOT MARAD

Howard Street Tunnel

The State of Maryland and CSX are in discussions to partner to remove a key bottleneck in the region's freight system, the Howard Street Tunnel. Currently, the tunnel's height prevents double-stack trains from accessing the Port of Baltimore, including Seagirt. This puts the Port at a competitive disadvantage against all other major East Coast ports, which have the ability double-stack rail cars. MPA, MDOT, and CSX continue to engage in positive discussions to enable double stacking the Howard Street Tunnel.

Complementary Seagirt Projects

This **Seagirt Marine Terminal Berth 3 Modernization P3 Project** is part of a larger plan to modernize and expand capacity at Seagirt Marine Terminal. PAC and MPA have spent more than $160 million in capital expenditure (CAPEX) since 2010, and committed over $235 million more. Assuming completion of this BUILD project, PAC plans to spend more than $397 million from 2010 to 2022 to upgrade and improve the terminal. The 2012 New Berth 4 project and this Berth 3 project addresses berth capacity, while other PAC and MPA projects provide additional storage yard, intermodal rail yard, and truck gate capacity to match the expanded berth demand. Some other key projects are summarized below.

Terminal Operating System Upgrades

The Terminal Operating System (TOS) is the IT system that ports use to control the movement of containers into, through, and out of the terminal. PAC has committed to implement the latest, state-of-the-art system called Navis N4. N4 will allow Seagirt to continue to leverage technology to the community with increased transparency and capabilities. In addition, various yard technologies will be deployed that will increase visibility to yard flows and allow aggressive management with equipment and labor to help reduce congestion and decrease truck turn times. The new yard technology cannot move forward without the increased capabilities of N4, and the investment in N4 is pivotal for the subsequent investments in gate upgrades. Hardware and virtual testing has started, and the anticipated "go live" date is in fourth quarter 2018.

Main Gate Upgrades

PAC is investing $1.5 million into the Seagirt main truck gate to increase truck flow and reduce truck turn times. The gate will include an Optical Character Recognition (OCR) building that will continuously capture truck license plate, chassis, and container numbers, as well as a radio frequency identification (RFID) tag all during truck arrival at the terminal. A weigh in motion scale, or WIM, will also be installed to allow inbound trucks to be weighed without stopping on a conventional static scale. By reducing stops an inbound truck will make, the time a truck will spend in the terminal will be reduced, thereby increasing cargo velocity and benefiting local truckers by increasing their turn times.

RTG Electrification

PAC is in the process of studying an operating conversion from a split top-loader and RTG operation to a pure RTG operation. This process is focusing on the benefits associated with electrification of RTG equipment, which include reduced in emissions, propulsion costs, and lower maintenance and repair costs associated with comparing diesel electric to pure electric equipment. The early results of the study being conducted by AECOM show an operational benefit with pure electric RTGs as container volumes grow. RTG electrification as we prepare the terminal to handle higher container throughput and increasing terminal velocity to better serve our customers and other stakeholders.

In addition to the three projects summarized above, PAC and MPA have invested significantly in a multitude of complementary projects, which are shown in Table 1-1.

Table 1-1 – Most Significant Recent and Ongoing Projects at Seagirt

Project Description	Project Dates	Funding Type	Amount ($m)
Build new ULCV-capable Berth 4	2010-2012	Bonds issued by PAC	55.7
Purchase four ULCV-capable ship-to-shore cranes	2010-2012	Bonds issued by PAC	39.5
Terminal electric upgrades	2012-2013	Bonds issued by PAC	0.8
Purchase four RTGs	2014-2015	Bonds issued by PAC	2.5
SMT Access Channel Widening	2015	State Funding	9.8
Land acquisition for 39-acre expansion	2017	State Funding	53.6
Purchase six RTGs	2017-2018	Bonds issued by PAC / Cash	12.0
Vail Street Gate	2017-2018	Cash	1.0
Navis N4 Terminal Operating System implementation	2017-2018	Cash	3.0
Purchase new terminal operating equipment	2018-2019	Cash	15.0
Upgrade Berth 3 to Super-post Panamax with related facility improvements	2018-2020	Bonds issued by PAC and potentially BUILD	30.4
Purchase four ULCV-capable ship-to-shore cranes	2018-2020	Bonds issued by PAC	60.0
Purchase new RTGs	2018-2020	Bonds issued by PAC	24.0
Berths 2 and 3 capital repairs	2018-2020	Cash	2.8
Purchase new terminal operating equipment	2019	Cash	23.1
Purchase new terminal operating equipment	2020	Cash	31.0
Purchase new terminal operating equipment	2021	Cash	16.8
Purchase new terminal operating equipment	2022	Cash	16.3
TOTAL			**397.3**

2 PROJECT LOCATION

2.1 Project Location

The Seagirt Marine Terminal is located at latitude 39°15'14.2"N and longitude 76°32'41.2"W, in the Chesapeake Bay, within the Port of Baltimore, in Baltimore City, Maryland (Figure 2-1). The location of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** within the Seagirt Marine Terminal is presented in Figure 2-2.

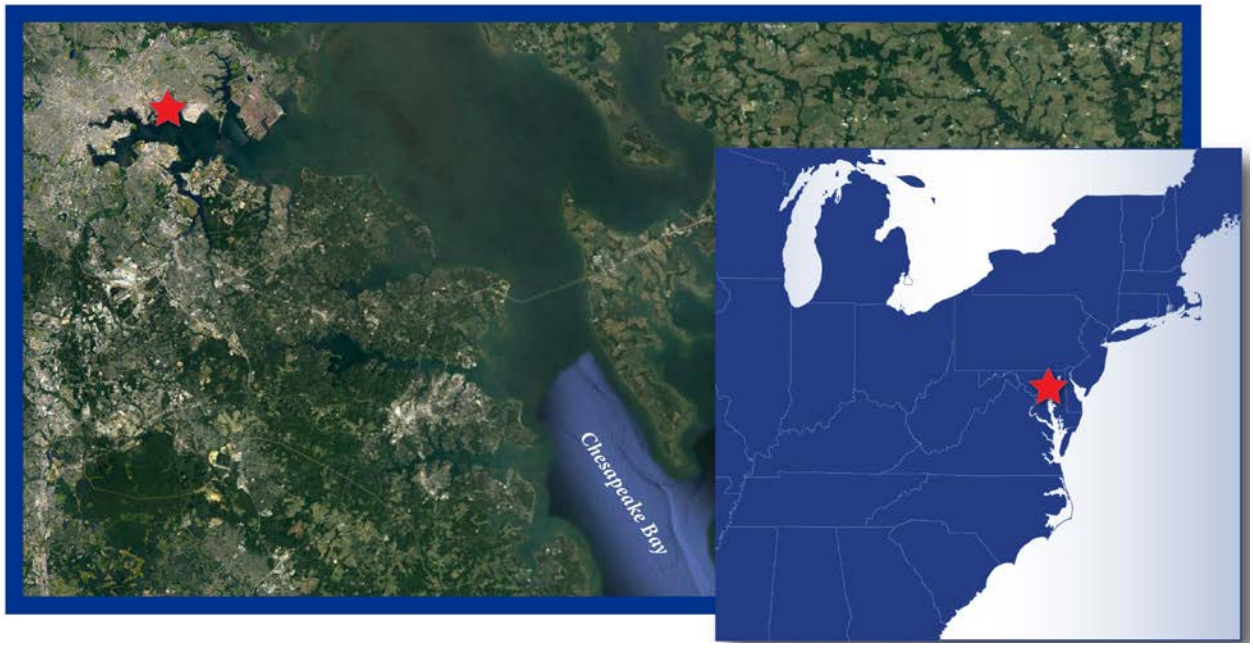

FIGURE 2-1 – SEAGIRT MARINE TERMINAL'S LOCATION

FIGURE 2-2 – PROJECT LOCATION [11]

[11] Graphic is an artistic representation; refer to the engineering drawings for details

2.2 Connections to Existing Transportation Infrastructure

Seagirt has direct access to multiple modes of transportation – rail, road, and water. Many of the major transportation arteries are within minutes of Seagirt - East/West corridors include Interstate 70 (I-70), and North/South corridors include I-81, I-83, I-95, I-97, and I-895. Seagirt's proximity and access to these dense roadway hubs provides connectivity of goods and supplies to remote communities ranging from Pittsburgh to New York City, down through rural Virginia, southern Maryland and the surrounding Chesapeake area.

Seagirt has its own on-dock intermodal rail facility that has forthright connection to its marine terminal and to major rail lines with rail service provided by CSX and Norfolk Southern.

Located up the Chesapeake, Seagirt has direct access to Baltimore Harbor and other local waterways. As the designated container terminal at the Port of Baltimore, it is on the United States Maritime Administration (MARAD)-designated M-95 Marine Highway Corridor.

Seagirt's proximity to major local, state, and interstate roads, major rail lines, and Baltimore Harbor, are illustrated in Figure 2-3.

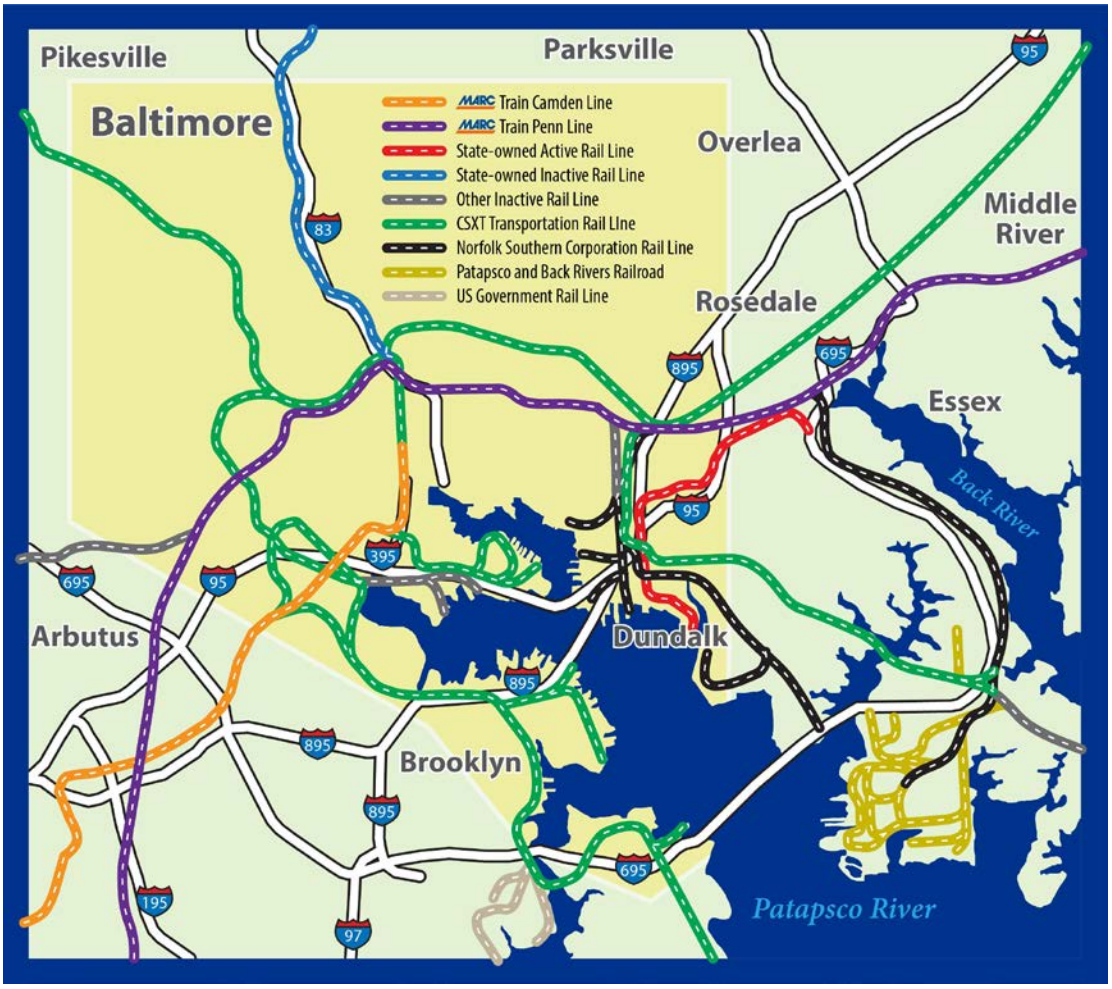

FIGURE 2-3 – SEAGIRT'S PROXIMITY TO RAIL LINES AND ROADWAYS [12]

[12] Source: Jacobs, based on Google Maps and MDOT

2.3 Area Description

Seagirt is located in an Urbanized Area, as defined by the 2010 Census Urban Area designation. The Urbanized Area name is **Baltimore, MD**, and the **Urbanized Area Code is 04843**. According to the 2010 Census, this Urbanized Area has a population of 2,203,663.[13]

Baltimore City is an economically distressed region, with an unemployment rate over 7 percent,[14] compared to the national average of under 5 percent.[15] The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will support redevelopment of the area and serve as a catalyst for future redevelopment.

3 GRANT FUNDS, SOURCES, AND USES OF PROJECT FUNDS

3.1 Project Costs Budget

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** has a construction cost of $32.8 million and meets the requirements for a BUILD grant. **Appendix A** includes a Cost Estimate and Section 5 discusses the Project's readiness. This total project cost excludes previously incurred planning, engineering design, and permitting costs, which were paid for by PAC and MPA as part of the larger Seagirt expansion program.

3.2 Sources and Amount of Funds

The MPA requests $6.6 million in BUILD grants to complement $26.2 million of private and state funds for construction of the $32.8 million **Seagirt Marine Terminal Berth 3 Modernization P3 Project**. The project would therefore be funded 20 percent by BUILD, 56.2 percent by private investment, and 23.8 by State of Maryland funds, with no additional Federal Funds.

Table 3-1 summarizes project costs and percentage of funding respective grant allocation. The breakdown of funding is presented below:

TABLE 3-1 – SOURCES AND AMOUNTS OF PROJECT COST

	Sources and Amounts of Project Costs	
	Dollar Amount	**Percentage of Project Cost**
BUILD Request Funding	**$ 6,554,575**	20.0%
Other Federal Funding	**$ 0**	**0.0%**
State Funding	*$ 7,809,340*	*23.8%*
Private Funding	$18*,408,961*	56*.2%*
Total Non-Federal Funding (State and Private)	**$26,218,301**	**80.0%**
Total Cost	**$ 32,772,876**	**100.0%**

There are no conditions on the timing or sequence of the non-federal funding. Federal funds will not be used for dredging; this will be fully funded by the State of Maryland and Ports America Chesapeake, LLC.

[13] Source: US 2010 Census
[14] Source: FHWA HEPGIS
[15] Source: US Bureau of Labor Statistics

3.3 Non-Federal Funding

Private Funds

If the BUILD grant is awarded, PAC will fund its $18,408,961 portion of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**'s capital cost through private contributions that consist of free cash flow, parent company contributions, and potential third-party financing. PAC generates operating cash flow through handling charges for each container moved as well as ancillary charges for storage, inspections, and maintenance.

PAC is committed in its lease with the MPA to improving and expanding Seagirt, and commits to funding the private share. A funding commitment letter is included in **Appendix E**.

State of Maryland Funds

MPA has committed to fully funding the $7,809,340 dredging component of the project. A letter stating MPA's commitment to funding its portion is attached in **Appendix E**.

3.4 Federal Funds

No Federal funds, other than those that may be awarded under the Fiscal Year 2018 BUILD program, will be used for the project.

3.5 Managing Grant Funding

The MPA and Ports America, Inc. (PAC's Parent company) are experienced with managing federal grant funds, and the procurement processes that accompany such an award. MPA and PAC have excellent records of successfully completing significant infrastructure projects on time and within budget, while maintaining a high level of operational performance in the terminal. Of note is the privately-funded 50-foot draft, 1,200-linear-foot Seagirt Berth 4 project, which opened in January 2013 ahead of schedule and under budget.

The MPA has prepared this BUILD grant application to be in full compliance with the United States Department of Transportation's (USDOT's) Notice of Funding Opportunity. The MPA has ongoing experience with a TIGER V Transportation Discretionary Grant, and successfully executes capital projects of this size annually. The MPA also confirms that it has sufficient funds to assure operation and maintenance of items funded under the BUILD Transportation Discretionary Grant that MPA will own or control. The MPA confirms that these funds are available only for this project and will remain available until the project is completed and closed out.

4 MERIT CRITERIA

4.1 Safety

As the country's largest terminal operator and stevedore, Ports America is committed to providing a safe environment for employees, contractors and visitors at each of its facilities. Ports America brings industry-leading loss time incident frequency rate and a culture of safe practices throughout the organization. PAC is committed to implementing projects that not only improve efficiency and capacity, but more importantly, do so in a way that enhances safety. Several safety-enhancing components of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** are described below.

Navigational Safety

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** widens the existing turning basin, thereby providing greater clearances and tolerances for the ULCVs calling on the Port of Baltimore. As the size and

number of vessels increase, it is critical to ensure that adequate clearances be provided between vessels and that there is adequate depth in the channels for them to maneuver. Improved navigational safety reduces the potential for ship collisions and groundings, thereby helping to minimize the release of hazardous materials (i.e., vessel bunker fuel or hazardous cargo) into the nation's waterways.

Reduced Vehicle Truck Miles Traveled

The public will benefit from fewer accidents and associated injuries as the result of the reduced vehicle truck miles traveled on local, state, and interstate roadways due to the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**. In 2013, large trucks accounted for 4 percent of all registered vehicles but resulted in 7.8 percent of all vehicles involved in fatal crashes[16]. Furthermore, according to MARAD[17], there were 2.36 fatalities per billion ton-miles moved for cargo moved by truck, versus 0.23 fatalities per billion ton-miles moved for cargo moved by waterborne vessels. By reducing the number of trucks on the roads, accidents, fatalities, injuries, and property damage will be reduced. This project is expected to reduce the Vehicle Miles Traveled (VMT) by over 100 million miles. The VMT reduction calculation and quantified benefits are included in the Benefit-Cost Analysis (BCA) in Section 6 and **Appendix B**.

Terminal Workers

PAC is committed to the safety of its workers. The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will enhance the safety of the terminal's longshoremen through strengthening the deteriorating wharf structures, resurfacing pavement, and providing the enabling infrastructure for modern technology and equipment. Modern ship-to-shore gantry cranes will be installed on the upgraded wharf, which will have state-of-the-art safety systems. Smart Landing Systems in the cranes would automatically profile the working area under the gantry crane with lasers, and prevent the cargo or containers from contacting the ship, crane, or safe zones for personnel, thereby decreasing the opportunity for accidents to occur. The Smart Landing Systems will also reduce on-dock noise.

4.2 State of Good Repair

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** is consistent with relevant plans and actions to maintain the transportation network in a state of good repair. This is accomplished through deepening and strengthening the existing wharf structure, replacing deteriorated pavement, and implementing repairs to the wharf's sub- and superstructures, thereby allowing Berth 3 to operate efficiently for years to come. The better state of repair will allow for additional revenue due to increased volume of goods moved. The increased revenue will provide funds for future improvement and similar upgrades to other berths, which will in term provide the facility and port transportation system with a state of good repair.

Currently, PAC operates top picks for the container handling equipment in the yard on asphalt paving. By installing the new reinforced concrete, RTG runways will eliminate the need to, and $25,000 cost of, resurface the asphalt paving every 3 years. Similarly, the replacement of the existing wharf block pavers with a new, modern, heavy-duty asphalt will reduce the cost of the 10-year repair cycle by over $350,000 every 10 years.

External truck cost savings consist of reduced costs of highway/pavement repair, and less highway congestion and noise pollution, due to reduced truck vehicle miles traveled resulting from the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**. The cost metrics and quantified benefits are represented in **Appendix B** and summarized in Section 6.

[16] Source: Traffic Safety Facts – Large Trucks, 2015, NHTSA, DOT HS 812 373.
[17] Source: America's Marine Highway Report to Congress, MARAD, April 2011

Both MPA and PAC are committed to the facility and its long-term asset performance, as demonstrated through its recent and planned capital investments. PAC maintains an in-house asset management system and a robust terminal maintenance plan to optimize its long-term performance. Seagirt's sustainable source of revenue, the handling of import and export containerized cargo, ensures that these funds will be available to maintain the terminal's condition and competitiveness following the award of the BUILD grant.

4.3 Economic Competitiveness

Decreased Transportation Costs

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** reduces transportation costs to the nation's importers and exporters as the result of lower truck distances traveled to the key consumption destinations and export origins in Baltimore's hinterland. Currently, these markers are served via the container terminals in Newark, New Jersey because since Seagirt Marine Terminal can offer only one 50-foot-deep berth. With this project, additional container volume will move through Baltimore directly to the consumption and production points at lower transportation costs. More detail, including quantified cost savings, are included in Section 6 and **Appendix B**.

The shipping industry's trend towards larger ships reduces the cost per unit imported to and exported from the U.S. The additional ULCVs that will call on Seagirt after the modernized Berth 3 will result in reduced shipping costs to U.S. consumers, businesses, and workers.

Improved Reliability and Efficiency of Freight Movement

In addition to the reduced freight transportation costs outlined above, the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will improve long-term efficiency and reliability of the movement of good into and out of the region. The terminal's improved condition will provide long term asset reliability, the ability to handle the region's continued cargo demand growth via water versus roadways provides reliability of shipping costs and schedules, the ULCVs provide enhanced efficiency when compared to smaller vessels or trucked cargo from other ports. Seagirt's on-dock rail provides connectivity directly to rural areas of the U.S., which allows for reliability and efficient importing and exporting of cargo. Seagirt's high productivity and operational efficiencies versus that of other East Coast ports allow it to provide long-term reliability, efficiency, and lower costs for cargo bound not just for the region but also rural parts of the country.

Increased Economic Productivity

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project a**llow MPA to maximize the use of all its infrastructure assets, thereby increasing utilization, capacity, and economic productivity.

Long-term Job Creation and Economic Opportunities

Seagirt is a significant job creator, employing 774 FTE well-paid union employees. Based on market growth forecasts, PAC will add jobs after the construction of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** and other PAC and MPA projects. The construction of this project will create more than 400 FTEs.[18]

The improvements and job creation are also likely to have a domino effect. As the improvements are constructed, and more employees hired, Seagirt's productivity will increase. As productivity increases, Seagirt will continue to become more cost-competitive, thus enhancing its ability to capture and sustain an increasing share of cargo volume and create additional jobs. The resulting increases in cargo volumes will generate a multiplier effect in the form of increased employment and investment in warehouse and distribution operations. The improved cargo services will provide direct, as well as indirect and induced, employment in the region as a whole.

[18] Per the FWHA's estimate that $1B of transportation spending creates 13,000 jobs

In its concession with MPA, PAC has committed to an extensive program of affirmative action to encourage maximum opportunities for employment and contracting by minorities and women. PAC has committed to not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability, or marital status, and will undertake or continue existing programs of affirmative action so that minority group persons and women are afforded equal employment opportunity without discrimination. Such programs will include, but not be limited to, recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, termination, rates of pay or other forms of compensation, and selections for training or retraining, including apprenticeship and on-the-job training.

Competition in Global Economy

This project will directly help the United States compete in a global economy through facilitating long-term, efficient, and reliable freight movement. As several new ports are being developed and in Nova Scotia, and major expansions are underway in Montreal and New Brunswick, Canadian ports are aiming to be the first port of call for US-bound imports, and the port of choice for exports from the US. Investment in US ports is therefore critical to maintain the US's competitiveness in freight movement.

Without additional cargo and ULCV capacity, import and export cargo could be diverted through these new Canadian ports. The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** provides a much needed additional deep-draft berth at a key US port. The additional capacity created will also enable lower unit costs for imports and exports, further enhancing the US's competitive in the international trade marker.

4.4 Environmental Protection

Reduced Air Pollution

Reduced Truck Emissions. This project would substantially reduce truck emissions, through a preventing a major increase in Vehicle Miles Travelled (VMT). The benefits are outlined in more detail and quantified in the BCA in **Appendix B**. Emissions of air pollutants are generated per VMT, and the metrics used to estimate the cost benefits are represented in **Appendix B**. The summarized benefits are also shown in Section 6. The reduction of truck miles driven will also reduce noise at on the region's roadways.

Reduced Ship Emissions. The additional ULCVs that will call on Seagirt following completion of this project are significantly more fuel efficient per unit than the current vessels; a conservative analysis shows a 50 percent reduction in carbon dioxide emissions and a 25 percent reduction in other pollutants, on a per-container basis, compared to the existing container ships calling on Seagirt.[19]

Green Technology. MPA and PAC are committed to the implementation of green technology in its operations. The new ship-to-shore and RTG cranes will have the latest energy-saving technology, such as power regeneration when lowering containers or when braking.

Avoidance of Environmental Impacts – Beneficial Reuse of Dredged Material

MPA has significant experience with prior dredging projects in Baltimore Harbor and at Seagirt, including the new Berth 4 pocket, access channel, and turning expansion. As such, it is expected that a large quantity of the material dredged will be sand, which can be beneficially reused rather than sent for disposal. As it has done in the past, MPA will make every effort to segregate the dredged material in the Dredged Material Containment Facility (DMCF) at the time the dredging occurs, and segregate the sand material. The sand can then likely be beneficially reused for other construction purposes.

[19] Source: Jacobs Engineering Group, based on prior research

4.5 Quality of Life

In addition to the monetized benefits included in the BCA, the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** may increase property values by improving the future quality of life in the neighborhoods near the terminal because of the reduced numbers of ships required to move the same volume of freight compared to the baseline. By moving more freight with fewer larger ships, the nearby neighborhoods would benefit from improved air quality standards (larger ships are more energy efficient on a per-container basis than smaller vessels), noise control, and improved marine channel safety and congestion concerns. These property value-increasing benefits are difficult to quantify and therefore are not included in the quantitative BCA.

Seagirt's direct connection to existing transportation infrastructure, as discussed in Section 2.2, provides connectivity to goods for many individuals in the Northeast. This narrative has discussed throughout how the modernizing Seagirt's Berth 3 will allow for an increased number of goods coming to the region. Rural areas in the Mid-Atlantic, parts of the Midwest, and elsewhere will see an influx of goods efficiently transported as they will now be along the critical path of international goods arriving on ULCVs. Although this project does not directly allow for concurrent installation of fiber or broadband deployment, this project will allow for the required materials to be efficiently transported to areas that do not have this infrastructure in the future.

4.6 Innovation

Innovative Technologies

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will leverage other projects identified earlier (Table 1-1), including Seagirt's new truck gate, expanded container storage yard, and new container handling equipment. These projects have the latest, state-of-the-art technology, including OCR and WIM scales at the gate. The equipment will include power regeneration and state-of-the-art systems, such as Smart Landing Systems, to automatically profile the working area under the crane with lasers, and prevent the cargo or containers from contacting the ship, crane, or workers and reducing on-dock noise. Seagirt's long-term investment plan is full of technological innovation that will improve the speed with which cargo moves through Seagirt and the overall supply chain.

The new TOS described in Section 1.6 that PAC is implementing as a complementary project, NAVIS N4, and the main gate upgrades, will provide state of the art technology at Seagirt to increase cargo velocity, enhance productivity, and expand capacity. This TOS will enable future technology implementation.

Innovative Project Delivery

While this project does not utilize specific Federal experimental delivery programs such as FHWA SEP-14 and SEP-15, it is being performed as a Public-Private Partnership through one of the first concessions of its type.

Innovative Financing

As stated in Section 1, Seagirt is operated by PAC under a public-private partnership with MPA through a 50-year concession. More than 56 percent of the project's cost will be funded through the private sector.

4.7 Partnership

As presented throughout this application, the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** involves strong collaboration among multiple partners and stakeholders, including local, regional, state, and federal agencies, as well as private entities.

Public-Private Partnership

As stated earlier, MPA and PAC entered in a public-private partnership in 2010 for the right to operate Seagirt on a concession basis for 50 years. PAC has committed to investing $500 million in the terminal. To date, these

improvements have included the construction of a 1,225-foot-long marginal wharf with 50-foot water depth; the procurement of four ship-to-shore cranes; upland container yard improvements; and the purchase of additional container handling equipment. Together, these investments provided the capability to handle ULCVs, and have stimulated demand for even more ULCV calls that the terminal cannot handle without the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**.

This unique partnership was developed to encourage long-term asset performance. The concession agreement provides commercial incentive for both MPA and PAC to invest in and maintain Seagirt's infrastructure, and both parties will reap the benefits associated with a modernized and expanded facility. Therefore, both parties are aligned and focused on typical performance criteria such as project delivery schedule, asset preservation, additional investment to leverage this project, and asset handback.

Project Parties

To realize the full benefits from this project, multiple government and non-government organizations are and will be involved with the project execution and long-term use. The diverse list of stakeholders is significant, with several listed below.

Maryland Port Administration (MPA) – Project Sponsor, Owner, Key Beneficiary, Funding, and Approvals. The Maryland Port Administration (MPA) is the State agency responsible for increasing waterborne commerce through Maryland ports for the benefit of the citizens of the State. ***MPA is the project sponsor and will maintain ownership of the existing and proposed terminal facilities.*** MPA will procure, administer, and provide technical oversight of the engineering and construction contract associated with the access dredging.

The MPA owns Seagirt and serves as the landlord to PAC. It is committed to Seagirt's long-term success, asset performance, and funding of major capital projects in accordance with its concession with PAC.

Maryland Department of Transportation (MDOT) – Key Beneficiary. MDOT, the parent agency of MPA and the agency responsible for transportation issues and policy within Maryland, stands as one of the key beneficiaries of the project through managing forecasted traffic growth from increased shipping volumes and associated traffic congestion on its highways. The agency manages transportation infrastructure connecting Seagirt to the regional and national networks.

Ports America Chesapeake, LLC – Construction, Implementation, and Management. PAC will lead all aspects of the berth improvements, berth pocket dredging, and crane hardware from management to construction contracting, and construction management. PAC has contracted, delivered, and committed more than $100 million in capital development projects since its concession began in 2010, and has another $234 million planned over the next 4 years. PAC's ongoing projects to upgrade cargo handling capacities will complement efforts made through this project. With this recent investment, PAC has demonstrated a successful record of delivering projects on or ahead of schedule, and within or under budget.

Ports America, Inc.– Funding and Governance. As the shareholders of PAC, Ports America, Inc. (Ports America) will provide the private portion of the funding required for the project. Ports America has committed to supporting PAC's effort to develop the terminal by reinvesting profits from the terminal as well as supporting funding of capital projects. Ports America is the country's leading terminal operator and provides expert engineering, contracting, financial, and management resources to PAC for developing projects such as this **Seagirt Marine Terminal Berth 3 Modernization P3 Project**. Ports America will also provide financial and governance oversight.

Ports America is the largest U.S. terminal operator and stevedore, with operations in every major port in the nation. Ports America has more than 90 years of experience through predecessor companies, and its operations span all three U.S. coasts. With a primary focus on containers, Ports America provides stevedoring, and in some

cases terminal management services, for containers, RoRo, cruise, bulk, and breakbulk cargos. Currently, the company has operations in more than 80 locations at 42 ports. This unique footprint serving all of the largest U.S. markets provides Ports America with a strong and stable market position. Its longstanding customer base includes many of the world's leading shipping lines.

The City of Baltimore and Local Counties. The City of Baltimore has been a strong supporter of the Port of Baltimore because of the major economic advantages the Port provides. The City has worked proactively with the MPA to mutually resolve all community and permit concerns associated with terminal development projects. Many local counties will benefit from the direct, induced, and indirect jobs created by this project. Letters of Support from Baltimore Mayor Catherine Pugh, as well as Baltimore Department of Transportation, Anne Arundel County, Baltimore County, Harford County, and Washington County are included in **Appendix D**.

Baltimore Regional Transportation Board (BRTB). The BRTB is the Metropolitan Planning Organization (MPO) for the Baltimore region and is a strong supporter of this project and development at the Port of Baltimore. Should this project be awarded a BUILD grant, it will be included in the Transportation Improvement Plan (TIP). It is their practice to add grant-funded projects to the TIP once funds become available. A letter of support is included in **Appendix D**.

Class 1 Railroads. CSX Transportation and Norfolk Southern Railroad, both Class 1 Railroads, provide direct rail service to Seagirt's intermodal yard and the broader Port of Baltimore, and have facilities within a short dray from Seagirt. This project will further enhance the intermodal volumes expected to come through Seagirt, including those on rail between the Port and the Midwest.

Adjacent Terminal Operators and Tenants. This grant application is strongly endorsed by the operators of the nearby Fairfield marine terminal, as well as Hoegh and Auto Warehousing, which have lease agreements with MPA at Fairfield Marine Terminal.

Jacobs Engineering Group. Jacobs Engineering Group, the top-ranked *Engineering News-Record* multidisciplinary and Port engineering firm, will prepare detailed engineering documents for the **Seagirt Marine Terminal Berth 3 Modernization P3 Project**. Jacobs has completed dozens of similar wharf upgrade and modernization projects, including obtaining environmental permits and approvals. Jacobs' experience, including projects for Ports America, will help keep the project on-schedule and within budget.

4.8 Non-Federal Revenue

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will create new non-Federal revenue for Transportation Infrastructure Investment through the additional cargo volumes that will pass through the Port of Baltimore as a result of the increased capacity, cost-competitiveness, and terminal efficiency. PAC and MPA will continue to reinvest in Seagirt, as evidenced by their recent and committed investments.

5 PROJECT READINESS

5.1 Technical Feasibility

Engineering, Design, and Cost Estimate

Engineering and design for this project is underway. MPA, PAC, and their consultants all have considerable experience designing and planning terminals and are currently undertaking the project's planning, conceptual design, and ship simulation studies. The designs utilized for the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** include a basis of design specifically tailored to the site conditions and intended uses. As the owner and approver, MPA is committed to efficiently working to review and approval the final design. **Appendix A** includes a cost estimate and Basis of Estimate for the project.

Statement of Work

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** includes:

- Installing a toe wall at Berth 3 and part of Berth 2
- Dredging of berth pocket from a depth of -45 feet to -50 feet, plus a 2-foot allowable overdredge
- Installing new crane hardware to support future installation of new ship-to-shore cranes
- Dredging the access channel and turning basin
- Repairing the Berth 3 wharf structure and replacing the pavement
- Extending RTG runways

Berth 3 Toe Wall

The design dredge depth of the existing Berth 3 structure is -45 feet Baltimore City Datum (BCD). In order to dredge Berth 3 to -50 feet, the wharf structure must be reinforced to allow for dredging by installing a combi-wall bulkhead toe wall outboard of the existing structure. This toe wall allows for the outboard soil to be dredged by retaining the soil under the wharf. It also stabilizes the existing structure and protects the existing slope from propeller wash. During the construction of Berth 4 in 2012, a toe wall was installed in the first 261 feet of Berth 3 to allow for the dredged slope transition from the -50 foot depth at the new Berth 4 to the existing -45 foot depth at Berth 3. Similarly, the new Berth 3 toe wall will extend into Berth 2 to allow for a dredge slope transition from the new -50 foot depth at Berth 3 to the existing -45 feet depth at the remaining Berth 2.

The toe wall designed for this project will be similar to the Berth 4 toe wall, but modified to allow for currently available steel sections. It will utilize an equivalent structural system and will accommodate the existing battered piles that slope in the outboard direction of the wharf structure. Figure 5-1 presents the existing and proposed cross sections.

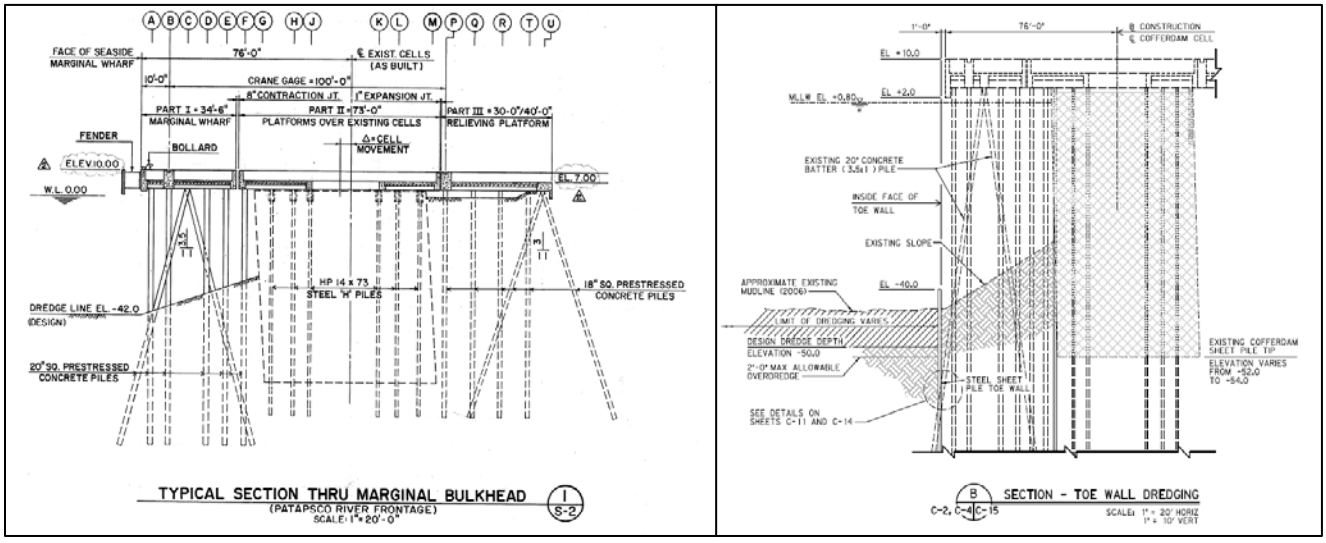

FIGURE 5-1 – TYPICAL EXISTING [20] CROSS AND PROPOSED SECTIONS AT SEAGIRT BERTH 3 [21]

[20] *Source: Marginal Bulkhead, Seagirt Marine Terminal Sheet S-2, by STV/Lyon Associated, 1986.*

[21] *Source: Seagirt Marine Terminal Berth 4 Record Drawings, McLean Contracting Company, 2012.*

Access Channel, Turning Basin, and Berth 3 Dredging

In order to safely increase the number of ULCVs calling on Seagirt, the turning basin must be slightly widened to allow the ULCVs to turn when entering or departing the terminal while the existing Berth 4 services another ULCV. Likewise, the access channel to Berth 3 must also be widened to allow the larger ships to access the improved facility while servicing a larger vessel at Berth 4. Both of these areas are shown in Figure 5-2 below. Upon completion of the dredging and installation of the toe wall, Berth 3's existing pocket will be dredged from -45 feet to -50 feet plus 2 feet of allowable overdredge. The dredging will extend along the length of Berth 3, which is also shown in Figure 5-2.

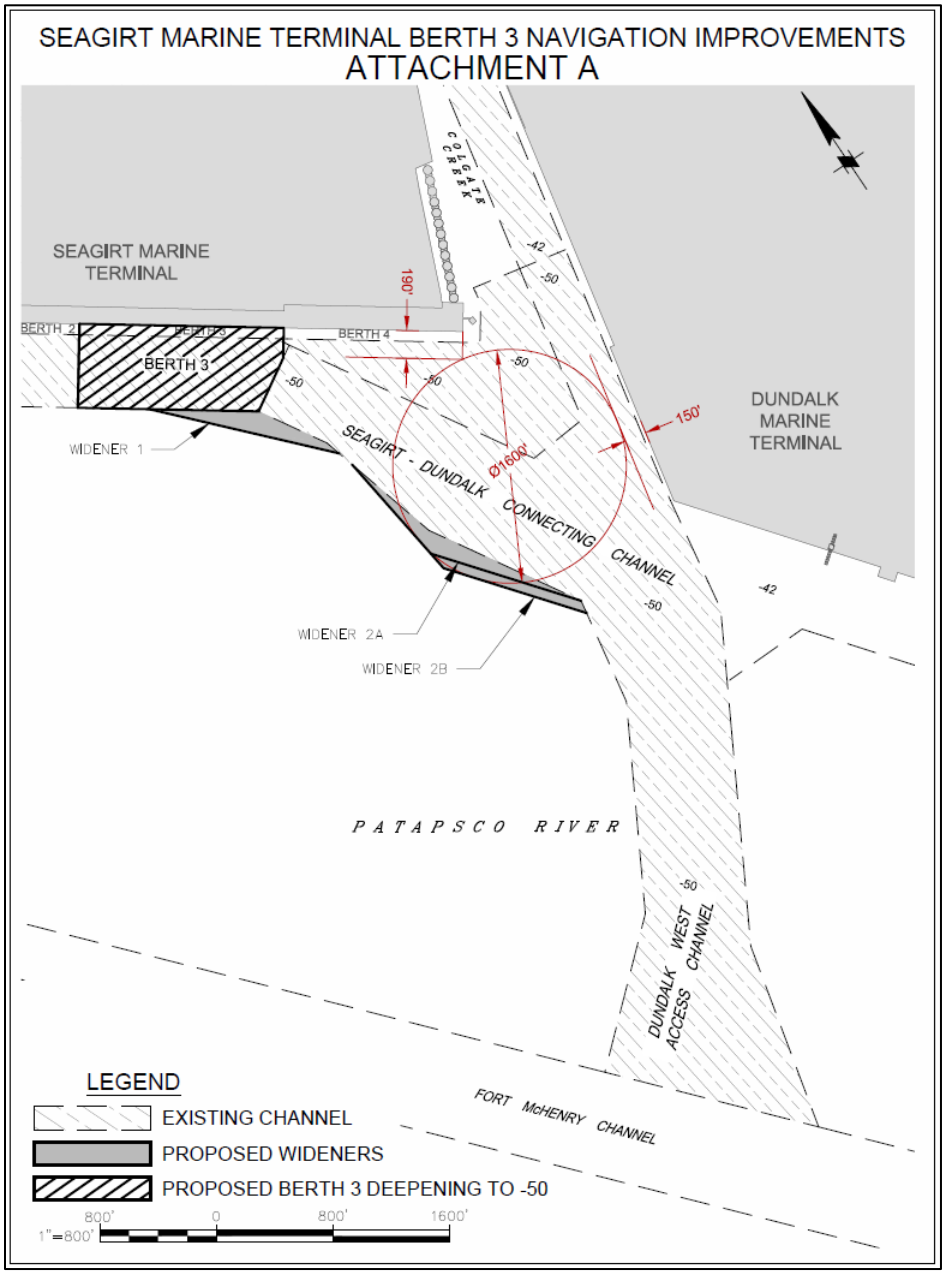

FIGURE 5-2 – DREDGING PLAN [22]

[22] *Source: Maryland Port Administration.*

New Hardware

The modernized Berth 3 will provide the physical infrastructure to allow deeper draft ULCVs to call at Seagirt's Berth 3. The size and tonnage of the ULCVs also necessitates more modern fenders and mooring hardware to berth the vessels. These fenders and mooring hardware will be retrofit onto the existing wharf structure.

With the physical infrastructure in place, PAC will separately acquire the most modern ship-to-shore cranes to service the ULCVs. These cranes require new tie downs and stow pins installed in the wharf deck. This project includes the structural retrofit of the existing wharf, including select demolition and new construction, to provide this crane hardware.

Wharf Repairs

PAC has identified structural issues at Berth 3 requiring repairs, including two depleted anodes that provide cathodic protection against corrosion and four broken piles that support the wharf. This project will replace both anodes and fix the four piles, thereby returning this berth to its original structural capacity and ensuring long-term structural integrity and the ability to maintain operations for vessel berthing and for operating the larger ship-to-shore cranes.

Pavement Replacement

Designed in the 1980s, Seagirt has concrete block pavers on the wharf deck for the wearing surface. The pavement system has failed due to the regular wear and tear of heavy duty cargo operations combined with the expiration of the pavement service life. Block pavers are missing, cracked, or settled/heaved. PAC hired a port pavement engineer who has designed a new, modern port-specific pavement system that consists of an asphalt wearing surface, an asphalt subgrade, and an aggregate base course. It runs the full length of berth between the 100-foot gage crane rails. The new pavement will reduce maintenance costs of the pavement itself and the equipment that is often damaged after operating on it.

New RTG Runways

PAC currently operates RTG and top pick equipment in the container storage yard, which is where the containers destined for and unloaded from the vessels at Berth 3 are stored. This project will upgrade the yard to better accommodate RTG cranes in the Berth 3 container yard and in other areas of the terminal were containers offloaded from Berth 3 can be stacked. Figure 5-3 shows a comparison of the two types of operation.

FIGURE 5-3 – TOP PICK AND RTG COMPARISON [23]

[23] *Source: PAC and Jacobs*

To balance and leverage the modernized Berth 3, improvements to enable the use of RTGs are necessary, as this type of equipment is more efficient and can handle more cargo, but imposes different loads into the pavement. Reinforced concrete runways that are 7 feet wide by 1 foot deep will be installed to enable RTG operations in container stacks H, I, J, K, and L. A typical RTG runway detail is included in Figure 5-4.

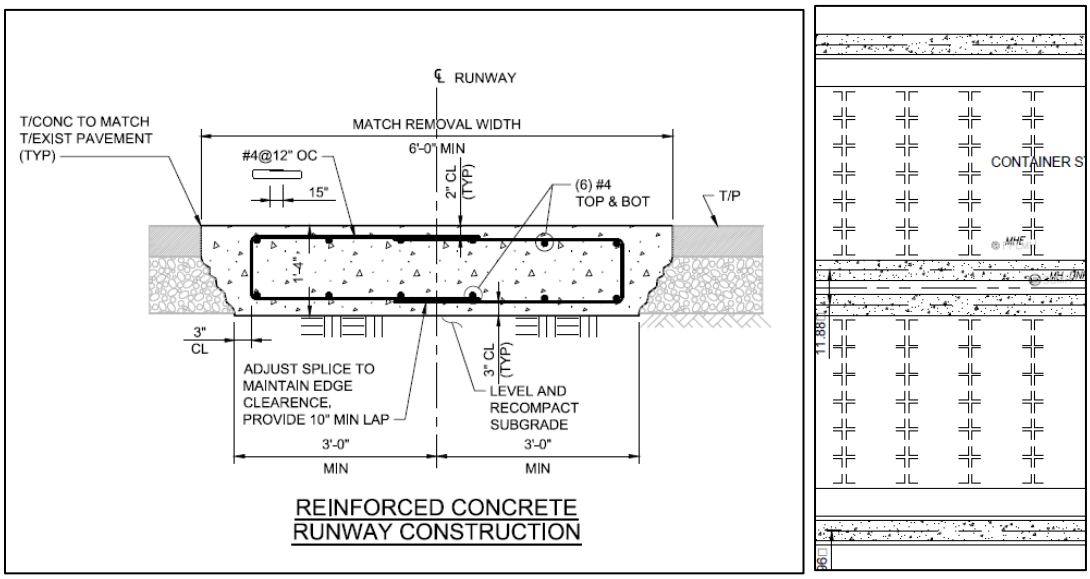

FIGURE 5-4 – TYPICAL RTG RUNWAY CROSS SECTION AND PLAN VIEW DETAIL [24]

Financial Feasibility

This **Seagirt Marine Terminal Berth 3 Modernization P3 Project** is financially feasible, and as summarized in Section 6, provides high benefit-to-cost ratios. This project, which utilizes and leverages significant private and state funding, has firm funding commitments from the MPA and PAC. Both parties are confident that the project will enhance the terminals' efficiency and operations, and will maintain the improvements undertaken through this project. Maintenance dredging will be performed under the annual harbor-wide dredging contract which is cost shared between MPA and the Corps of Engineers.

Upon approval of the BUILD grant, MDOT will allocate the funding necessary to cover the balance of the project including 100 percent of the funding for dredging to widen the Seagirt Access Channel and Turning Basin. The State's Consolidated Transportation Program (CTP) will be updated to budget the funds in accordance with the schedule presented above.

PAC will assume responsibility for maintaining the infrastructure improvements. Maintenance dredging will be performed under the annual harborwide dredging contract, which is cost shared between MPA and the USACE.

5.2 Project Schedule

All funds can be obligated in advance of the September 30, 2020 statutory deadline and expended by the September 30, 2025 deadline. Design of the **Seagirt Marine Terminal Berth 3 Modernization P3 Project** is underway, with final bid documents expected by December 2019. Permits and approvals are not expected to be an obstacle.

[24] *Source: Jacobs*

The project is expected to take a total 32 months, as shown in Figure 5-5 and **Appendix C**. No property or right-of-way acquisition is required.

ID	Task Name	Duration	Start	Finish
1	**Seagirt Marine Terminal Berth 3 Modernization P3 Project**	**960 days**	**Thu 3/1/18**	**Thu 10/15/20**
2	NTP	0 days	Thu 3/1/18	Thu 3/1/18
3	**Design**	**510 days**	**Thu 3/1/18**	**Tue 7/23/19**
4	Planning	2 mons	Thu 3/1/18	Sun 4/29/18
5	Ship Simulation	5 mons	Mon 4/30/18	Wed 9/26/18
6	Infrastructure Plans, Specification, and Estimate	6 mons	Sat 9/1/18	Wed 2/27/19
7	Final Alignment, Layout and Permit Drawings	1 mon	Thu 9/27/18	Fri 10/26/18
8	Geotechnical Investigation	3 mons	Sat 10/27/18	Thu 1/24/19
9	Dredging Plans, Specifications, Estimate	6 mons	Fri 1/25/19	Tue 7/23/19
10	PSE Completion	0 days	Tue 7/23/19	Tue 7/23/19
11	**Permitting and Approvals**	**416 days**	**Sat 9/1/18**	**Mon 10/21/19**
12	NEPA Approval	3 mons	Sat 9/1/18	Thu 11/29/18
13	MPA Approval of Infrastructure Design	1 mon	Thu 2/28/19	Fri 3/29/19
14	State Permitting	6 mons	Sat 10/27/18	Wed 4/24/19
15	USACE Harborwide Dredging Permit Modification	12 mons	Sat 10/27/18	Mon 10/21/19
16	All Permits/Approvals Obtained	0 days	Mon 10/21/19	Mon 10/21/19
17	**Construction**	**360 days**	**Tue 10/22/19**	**Thu 10/15/20**
18	Infrastructure Bidding and Mobilization	2 mons	Tue 10/22/19	Fri 12/20/19
19	Install Toe Wall	3 mons	Sat 12/21/19	Thu 3/19/20
20	Repair Wharf and Replace Pavement	2 mons	Sat 12/21/19	Tue 2/18/20
21	Install RTG Runways	3 mons	Sat 12/21/19	Thu 3/19/20
22	Dredging Bidding and Mobilization/MES Procurement	6 mons	Tue 10/22/19	Sat 4/18/20
23	Dredge Turning Basin and Access Channel	4 mons	Sun 4/19/20	Sun 8/16/20
24	Dredge Berth Pocket	2 mons	Mon 8/17/20	Thu 10/15/20
25	Project Completion	0 days	Thu 10/15/20	Thu 10/15/20

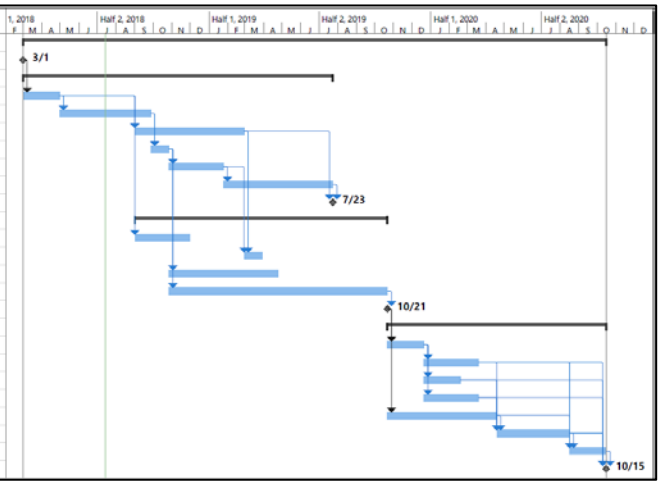

FIGURE 5-5 – PROPOSED PROJECT SCHEDULE

5.3 Required Approvals

National Environmental Policy Act

The project's dredging scope has been through NEPA reviews and approvals as part of the USACE issuance of a permit. Because the USDOT's issuance of a BUILD grant would be the agency's only federal action on this project, MPA has not yet asked the USDOT for a NEPA review. However, given that the USACE undertook a NEPA review with public comment period [25] as part of their permit issuance, MPA is confident that should a BUILD grant be awarded and the USDOT require its own NEPA review, it can be completed quickly and efficiently or may even be able to adopt the review completed by USACE. Similarly, the non-dredging aspects are straight forward and are expected to result in minimal, if any, environmental impacts. Therefore, it is expected that MARAD would either default to the USACE's NEPA review or issue a Categorical Exclusion.

MPA and PAC have hired consultants to advise on the NEPA reviews, thereby satisfying the BUILD program's condition that NEPA be underway or complete.

Other Federal Approvals

Proposed wideners 1, 2a, and 2b will require minor modifications to the MPA's existing USACE permit, CEN-OP-RMN (Harborwide Maintenance Dredging) 2014-60672-M02 dated September 2014, which is attached in **Appendix G**, and State Tidal Wetlands License. MPA will prepare the applications for modification and work with the State and federal regulatory agencies to update the permits. Berth 3 dredging to is authorized through the existing permit. The time to obtain the permit modification is accounted for in the Project schedule shown in Section 6 and **Appendix C**.

USACE Baltimore District issued the *Maryland State Programmatic General Permit-5 (MDSPGP-5)* [26] in 2016. The MPA has held discussions with the USACE regarding the installation of the new toe wall at Berth 3. USACE

[25] http://www.nab.usace.army.mil/Missions/Regulatory/Public-Notices/Public-Notice-View/Article/494208/pn-14-37-mpa-harborwide-maintenance-dredging-baltimore-city-baltimore-anne-arun/
[26] http://www.nab.usace.army.mil/Portals/63/docs/Regulatory/MDSPGP-5.pdf

instructed that the project will be permitted under MDSPGP Category A, which states that USACE "review [is] not required. Submittal of a Federal/State Joint Permit Application to [Maryland Department of the Environment] MDE may or may not be required for verification of MDSPGP-5."[27] See the following subsection for a discussion of the MDE permits.

State Permits and Approvals

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** will be processed under the Maryland Department of the Environment's (MDE's) general license. Public notice and Board of Public Works involvement will therefore not be required, and it is expected that permits will be obtained by the time the project is bid in late 2019 or early 2020.

Typical site development permits will be required as project designs are finalized, including Chesapeake Bay Critical Area and MDE stormwater management and erosion/sediment control plan approvals. PAC and MPA will apply for wetlands licensing as well.

As a modal agency of the MDOT, MPA's projects must be approved for capital funding by MDOT. This project is fully supported by MDOT, and if a BUILD grant is awarded, it will be incorporated into the Consolidated Transportation Program (CTP), which is presented to the Maryland State Legislature for approval each year. Once the CTP is approved by the state legislature, specific project approvals are not required. Since this project has the support of MDOT and elected officials because of its importance, CTP approval will be routine.

When a construction contract is advertised and released for bid by MPA, award is contingent on approval of the State Board of Public Works. As long as State procurement regulations have been followed and Minority-owned Business Enterprise goals complied with, the contract is usually approved and awarded.

Maryland Port Administration Tenant Alteration Request

MPA, the primary permitting agency, issues permits to its tenants through issuance of a Tenant Alteration Request (TAR), which is a formal review process of the design that requires submissions of engineering design documents (such as technical calculations, specifications, and drawings). MPA also checks for signed drawings and code compliance. PAC has undertaken dozens of projects and knows the TAR process. As Project Sponsor, MPA will work with PAC to ensure a smooth TAR process.

State and Local Planning

If MPA is awarded a BUILD grant, the MDOT's CTP will be amended to include funding for this project. As stated in Section 1.7, Baltimore's MPO, BRTB, supports this project and will include it in its TIP should MPA be awarded a BUILD grant.

The Maryland Transportation Commission (MTC) is authorized by the State of Maryland to study the State's transportation system and advises the Secretary of Transportation and Department Administrators on policy and programs. The MTC is fully supportive of this project.

Letters of Support

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** has complete support from throughout the region as confirmed by the Letters of Support attached in **Appendix D**.

5.4 Assessment of Project Risks and Mitigation Strategies

Table 5-1 identifies the project's potential risks and associated mitigation strategies.

[27] http://www.nab.usace.army.mil/Portals/63/docs/Regulatory/MDSPGP-5.pdf, page 5

Table 5-1 – Risk Analysis

Risk	Description	Risk Handling Strategy
Low	Market Risk – lack of demand	Seagirt is the Port of Baltimore's dedicated container terminal and it is reaching capacity. With cargo growth exceeding the national average, Seagirt and the Port of Baltimore are at risk for inadequate capacity rather than inadequate demand. The mitigation strategy is to accept this risk.
Low	Non-Federal Funding Match	The non-federal funding will be provided by MPA and PAC. Both entities are committed to funding the project and have prepared commitment letters for this application. The mitigation strategy is to accept this risk.
Low	Design and Construction Schedule	MPA, PAC, and their consultants have undertaken many similar projects recently, including a berth deepening at one of Ports America's other terminals. Therefore, MPA and PAC have a high degree of confidence in the design and construction schedules. The mitigation strategy is to accept this risk.
Medium	USACE and MDE permits	The MDE has indicated that permits will fall under its general license, and USACE indicated that the permit will be a General Permit Category A. Public notice and Board of Public Works involvement will therefore not be required, and MPA does not anticipate issues with the permitting process. The mitigation strategy is to accept the risk and for MPA, PAC, and their consultants to work closely with the agencies to obtain permits.
Medium	Construction Cost Overrun	PAC, MPA, and their consultants have a high degree of confidence in the construction cost estimates, based on similar, recent, and ongoing projects in the Northeast U.S. Any cost overrun can be absorbed by PAC and MPA, or value engineering may be used to meet the estimated cost. The mitigation strategy is to accept this risk and implement cost oversight controls and value engineering designs, where applicable.

6 BENEFIT COST ANALYSIS [28]

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** is cost-effective, as indicated in the BCA in **Appendix B** and summarized below. The project will provide additional cargo and ULCV capacity at the Port of Baltimore, preventing the diversion of cargo bound for the Metropolitan Washington, D.C. area from other ports. This project's monetized benefits, due to the reduced VMTs, are summarized below with a full BCA undertaken in accordance with USDOT requirements in **Appendix B**:

- **Environmental** – reduced NOx, VOC, PM, and SO2 emissions
- **Safety** – reduced number of roadway accidents and associated injuries
- **External truck cost savings** – reduced highway pavement repair costs, highway congestion, and noise pollution
- **Transportation cost savings** – labor, fuel, and maintenance savings

6.1 Benefit-Cost Analysis Results Summary

In support of this application, costs and benefits of the project have been estimated over a 30-year period at present value using the required 3 and 7 percent discount rates. All benefits are estimated using monetized

[28] BCA was prepared by Martin Associates in July 2018

values prescribed by USDOT or, where specific guidance was not provided, standard industry practice as detailed in **Appendix B**. All cost and benefit are measured in 2018 constant dollars prior to discounting.

Table 6-1 provides a high-level summary for the BCA. A summary of methods, data, and assumptions is in **Appendix B**, and the full BCA model is included in the submission.

Table 6-1 – Benefit-Cost Analysis Summary

<table>
<tr><td>Current Status/Baseline and Problem to be Addressed</td><td>Current Seagirt berths have capacity limitations. Seagirt will not be able to serve multiple ULCVs or handle increased cargo volumes.</td></tr>
<tr><td>Change to Baseline/ Alternatives</td><td>Modernizing and upgrading Berth 3 will allow Seagirt to handle additional ULCVs and increased cargo volume.</td></tr>
<tr><td>Type of Impacts</td><td>1. Reduced traffic accidents and injuries
2. Reduced highway maintenance costs, congestion, and noise pollution
3. Reduced NOx, VOC, PM, and SO2 emissions
4. Reduced truck operating costs</td></tr>
<tr><td>Population Affected by Impacts</td><td>Roadway users, local residents, consumers, business (such as exporters and beneficial cargo owners) in and around Baltimore and the Metropolitan Washington, D. C. region.</td></tr>
<tr><td>Economic Benefit</td><td>
<table>
<tr><th>Benefit</th><th>Present Value at 3% Discount Rate</th><th>Present Value at 7% Discount Rate</th></tr>
<tr><td>Safety</td><td>$326.53 M</td><td>$185.26 M</td></tr>
<tr><td>Emissions</td><td>$74.02 M</td><td>$41.99 M</td></tr>
<tr><td>External Truck</td><td>$855.7 M</td><td>$485.51 M</td></tr>
<tr><td>Economic Competitiveness</td><td>$3.50 B</td><td>$2.70 B</td></tr>
</table>
</td></tr>
<tr><td>Summary of Results</td><td>
<table>
<tr><th>Result</th><th>Present Value at 3% Discount Rate</th><th>Present Value at 7% Discount Rate</th></tr>
<tr><td>Total Discounted Benefit</td><td>$4.76 B</td><td>$2.70 B</td></tr>
<tr><td>Total Discounted Costs</td><td>$36.87 M</td><td>$32.96 M</td></tr>
<tr><td>Benefit-to-Cost Ratio</td><td>129.00</td><td>81.87</td></tr>
</table>
</td></tr>
<tr><td>Reference</td><td>Appendix B</td></tr>
</table>

A detailed breakdown and explanation is included in **Appendix B**.

6.2 Non-Monetized Benefits

The **Seagirt Marine Terminal Berth 3 Modernization P3 Project** includes many other benefits that have not been monetized and captured in the BCA model.

State of Good Repair

Currently, PAC operates top picks for the container handling equipment in the yard on asphalt paving. By installing the new reinforced concrete RTG runways will eliminate the need to, and $25,000 cost of, resurface the asphalt paving every three years. Similarly, the replacement of the existing wharf block pavers with a new, modern heavy-duty asphalt will reduce the cost of the 10-year repair cycle by more than $350,000 every 10 years. The container handling equipment (such as trucks and RTGs) currently require significant maintenance as a result of operating on poor, uneven pavements with potholes and major settlement. Because of the new pavements and RTG runways, the container handling equipment will require less maintenance.

Indirect Job Creation

In addition to the direct economic benefits of the proposed project, construction jobs, resulting increased capital investment in productivity, and resulting increases in cargo volumes, the project will generate a multiplier effect in the form of more jobs and investment in warehouse/distribution operations in the Portfields.

The improvements and job creation are likely to have a domino effect. As the improvements are constructed, and more employees hired, port productivity will increase. As port productivity increases, Seagirt will continue to become more cost-competitive, thus enhancing its ability to capture and sustain an increasing share of cargo volume and create additional jobs.

Maintaining Existing Trade and Supporting Trade Growth

Seagirt and the Port of Baltimore cannot service multiple ULCV ships. The **Seagirt Marine Terminal Berth 3 Modernization P3 Project,** therefore, will not only allow Seagirt to meet future demand by providing additional berthing space for modern, large container ships, but it also allows it to maintain existing container volumes by accommodating the shift of current cargo to larger ships.

Environmental Benefits

The additional ULCVs that will call on Seagirt following completion of this project are more fuel efficient per unit than the current vessels, with significantly lower emissions of Particulate Matter, NOx, VOC, CO_2, and SO_2. Similarly, the RTGs in the container yard electric, whereas the current top picks they are replacing are diesel. This leads to a further reduction in emissions and noise. None of these emissions or noise reduction benefits have been captured in the BCA.

Supply Chain Security

As discussed earlier, new port developments and expansions are underway in New Brunswick, Quebec, and Nova Scotia, Canada. By providing an economically competitive port to offload discretionary goods, such as agricultural imports and exports from U.S. rural areas, within the U.S. rather than Canada, the security of the national and regional supply chain will be maintained.

7 FEDERAL WAGE RATE CERTIFICATION

MPA, as the applicant for this BUILD grant, and PAC, as a related party, will comply with the Federal wage rare requirements included in Subchapter IV of Chapter 31 of Title 40, United States Code (U.S.C.), as required by the Consolidated Appropriations Act, 2018. A letter certifying this commitment is included in **Appendix F.**