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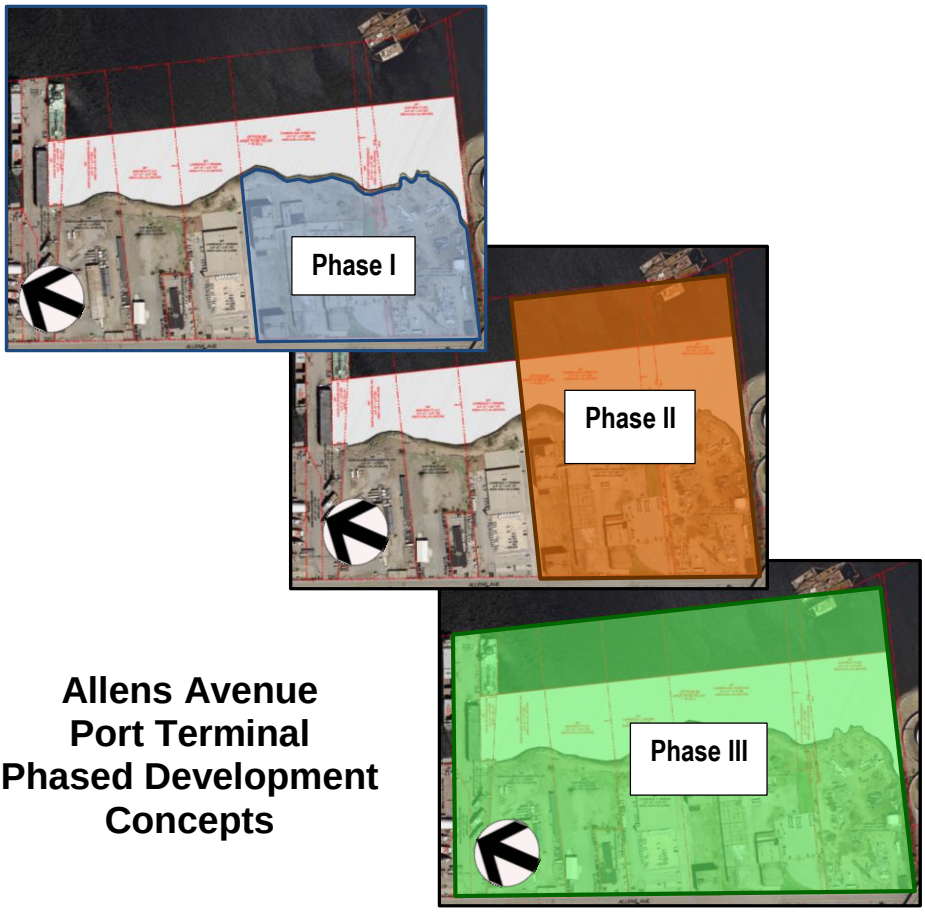
PROVPORT

ProvPort, Port of Providence, Rhode Island

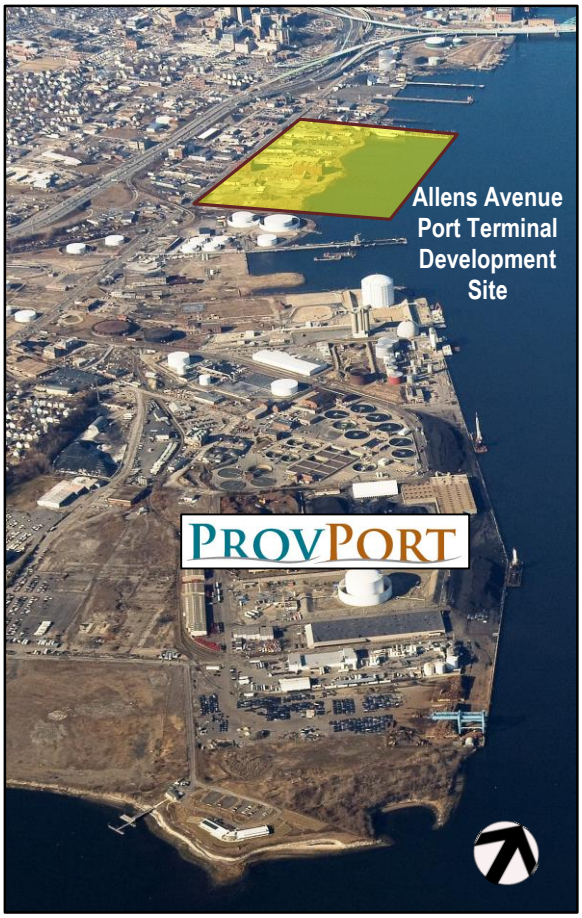
Port Strategic Master Development Planning Services

Economic Development Impact Assessment Study

Allens Avenue Marine Terminal Development, March 23, 2016



Allens Avenue Port Terminal Phased Development Concepts



ProvPort
Port of Providence, Rhode Island
Confidential Economic Development Impact Assessment Study

March 23, 2016

Mr. William G. Brody, ESQ.
General Counsel
ProvPort, Inc.
35 Terminal Road
Providence, RI 02905
Email: wgbesq@aol.com

RE: REVISED FINAL ALLENS AVENUE PORT TERMIAL DEVELOPMENT – ECONOMIC DEVELOPMENT IMPACT ASSESSMENT STUDY, Phases I, II & III of the Proposed Allens Avenue Marine Terminal Development – ProvPort Inc., Port of Providence, Rhode Island

Dear Mr. Brody,

The Vickerman firm is pleased to submit the following **REVISED ALLENS AVENUE PORT TERMINAL DEVELOPMENT – ECONOMIC DEVELOPMENT IMPACT ASSESSMENT STUDY** for ProvPort, Inc., Port of Providence, Rhode Island.

The following study is an **Economic Development Impact Analysis and Assessment** for the Phases I, II, and III of the ProvPort contemplated port terminal development located at the Allens Avenue port terminal development area. This Study is based on and coordinated with the prior scope of work findings and recommendations, in Tasks 1, 2, 3, and 4 of our most recent work products for the ProvPort / PRA / Waterson Terminal Services - Port Strategic Master Development Planning Services (A Joint Study) – Second Revised Proposal dated August 6, 2015 (executed August 13, 2015).

The Vickerman Firm specializes in the planning and design of port and intermodal terminal facilities providing strategic port master planning and port development feasibility analysis for multimodal freight logistics facilities worldwide. John Vickerman is nationally recognized for his planning and design of port and intermodal industries and is licensed in 23 states as a Registered Professional Civil Engineer and Licensed Architect for providing innovative solutions to the many operational, planning and design issues confronting the marine and intermodal transportation industries. Mr. Vickerman is currently licensed in the State of Rhode Island as an Architect (AR 2748).

John Vickerman, the Founding Principal of the Vickerman Firm was the Project Principal-In-Charge (PIC) for this study. The Vickerman Firm has worked on major port projects throughout North America and the world for more than 35 years. **67 of the 90 North American deep-water general cargo ports** have benefited from his strategic port master planning and facility development business planning. John Vickerman is a current licensed Architect in the State of Rhode Island in good standing continuously since May 16, 2001.

We are committed to providing MARKET-DRIVEN SOLUTIONS to the port and intermodal business development plans. Once a market demand is established, our approach will develop facilities that effectively respond to the marketplace, enhance the community and optimize return on investment. We are sensitive to the interests of varied stakeholders “including the public”, and the “working waterfront” and work to engage them in a proven process for pragmatic marine terminal facilities development.

Our world class port strategic business development planning approach uses proven methodologies and unique tools to aid in a SUSTAINABLE PORT DEVELOPMENT process, including a suite of sophisticated port planning, design and port capacity modeling tools.

In the past four years the Vickerman Firm have accomplished the following projects at ProvPort which has provided us with an understanding of the marketplace, an appreciation for the current ProvPort infrastructure and the capabilities at the port facilities in general.

- "*Professional Advisory Services for Technical Expert Review of the Request for Proposals (RFP) Procurement Process and Proceedings for Acquisition of Two Mobile Harbor Cranes, Associated Barge Design/Engineering and Barge Construction for ProvPort*."
  Service Duration: August 2012 to December 2012
  Client: ProvPort, RIEDC, and WTS.

- "*Professional Services for the Preparation of a Strategic Market Assessment and Recommended Growth Plan for Waterson Terminal Services, Port of Providence, Rhode Island*" (Project terminated by Ports America after Task 3)
  Service Duration: April 2013 through September 2013
  Client: Ports America (MTC Holdings), Bulk, Breakbulk and Military Division.

- "*ProvPort / PRA / Waterson Terminal Services - Port Strategic Master Development Planning Services - A Joint Study*" – SECOND REVISED Proposal dated August 6, 2015.
  Service Duration: August 13, 2015 to December 10, 2015 ProvPort Workshop All Related to the Completion of Tasks 1, 2, 3, and 4
  Client: ProvPort, PRA, WTS

We look forward to the opportunity to review with you the results of the following "*Economic Development Impact Assessment Study, Phases I, II & III of the Allens Avenue Marine Terminal Development*", dated March 18, 2016.

Sincerely,

M. John Vickerman, P.E., AIA
President

TRANSMITTAL LETTER

ProvPort, Port of Providence, Rhode Island
Port Strategic Master Development Planning Services
Economic Development Impact Assessment Study
Allens Avenue Marine Terminal Development, dated March 23, 2016

Prohibited Distribution Without Expressed Written Consent of ProvPort

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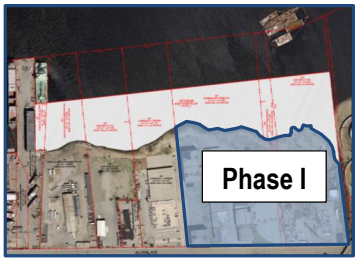
EXECUTIVE SUMMARY:

In early August 2015, Vickerman & Associates was commissioned by ProvPort, Providence Redevelopment Agency (PRA) and Waterson Terminal Services (WTS) to provide ProvPort/PRA/WTS with "*Port Strategic Master Development Planning Services*" focused on preparation of a market assessment, market growth plan and targeted market opportunities for ProvPort. Tasks 1, 2, 3, and 4 of this commission were delivered on January 2, 2016.

With the market assessment accomplished, ProvPort Inc., a Rhode Island nonprofit corporation, held in trust for the public, is proposing the development of a new deep-water general cargo - multipurpose port marine terminal with "on-dock" intermodal rail logistics capability (the "Port Terminal") generally located in the Burges Cove and Fox Point Reach area of the Providence River. The port terminal is located on the western bank of the Providence River in the general vicinity of the Allens Avenue easterly to the waterfront and generally from Corless Cove (Thurbers Ave. and the Harbor Junction Wharf) on the south perimeter to State Pier (Bay Street) on the northern perimeter.

One of the first tasks requested by ProvPort was an economic impact analysis of the proposed Allens Avenue port terminal. The following is the Executive Summary for that Economic Impact Analysis.

Conceptually the Allens Avenue project site area could be developed in Three Phases:



Phase I: Phase I would encompass approximately 14.8 acres of terminal backlands (fast land) and would be served via truck drayage from the current marine marginal wharf/crane assets and infrastructure currently operating at ProvPort/WTS. The Phase I backlands would be developed as multipurpose container terminal / automobile terminal improvements for cargo storage and terminal support operations. The terminal may have "*on-dock*" intermodal rail operational capabilities.

Phase II: Phase II would encompass approximately 31.3 acres of marine terminal acreage including the Phase I acreage. The port terminal would have a 1,570 ft. marginal wharf, multipurpose container terminal / automobile terminal improvements for cargo storage and terminal support operations**.** 16.5 acres would be developed on tidelands parcels. This port terminal would have **two berths plus one barge berth** marine terminal would have "*on-dock*" intermodal rail operational capabilities.

Phase III: Phase II would encompass approximately 60.4 acres of marine terminal acreage including the Phase I & II acreage. The port terminal would have a 2,880 ft. marginal wharf, multipurpose container terminal improvements for cargo storage and terminal support operations. 14.6 acres would be developed over submerged tidelands parcels (encompassing a total of 31.3 acres of submerged lands). This port terminal would include **three berths plus two barge berth**s and would have "*on-dock*" intermodal rail operational capabilities.

The proposed port marine terminal will ultimately occupy approximately 60.4 acres (29.31 acres of dry land and 31.1 acres of submerged lands). A potential first phase port terminal development area is located on the south end of the development area encompassing 14.82 acres of dry land. The full build out port terminal development will ultimately include but is not limited to:

- Three 900 foot vessel berths of multipurpose general cargo container port terminal with refrigerated services capabilities with barge berthing capabilities.
- Improved vessel turning and maneuvering basin adjacent to the port terminal.
- Access along the eastern edge of Allens Avenue for "on-dock" intermodal rail operations.
- Centralized automated entrance and exit gate complex with reversible access truck lanes and full automated gate processing capabilities including USCBP Radiological Portal Monitors (RPMs).
- Multipurpose refrigerated warehouse and distribution capabilities.

Port Terminal Development Cursory Capital Cost & Terminal Capacity by Construction Phase:

Cursory Capital Cost Budget Estimate & Annual Cargo Throughput Projections for
Allen Avenue Marine Terminal Phased Development

Development Phase	Gross Terminal Area - Acres	Wharf/Quay Length in Feet	Number of Wharf/Quay Cranes	CAPEX by Phase $ Millions **	Submerged Land Acres	Fast Land Acres	Approx. Annual Throughput Volume, TEUs *
Phase I	**14.8**	None (ProvPort Use)	None (ProvPort Use)	**9,187,326**	**0.0**	**14.8**	**45,886**
Phase II (Not Incl. Phase I)	**31.3** (Incl. Phase I)	1,570	3 - 4	**57,186,314**	**16.5**	**14.8** (Phase I)	**262,204**
Phase III (Not Incl. Phase II)	**29.1**	1310	5 - 6	**57,079,843**	**14.6**	**14.5**	**241,719** (Phase III, Site Only)
TOTAL	**60.4**	**2,880**	5 - 6	**123,453,483**	**31.1**	**29.3**	**462,135** (Total Terminal)

Port Terminal Land & Operational Equipment Parameters – PHASE I, II & III (Standalone Phases):

Cursory Capital Cost (CAPEX) Budget, Terminal Equipment Budget & Land Cost Estimate for
Allen Avenue Marine Terminal Phased Development

Development Phase	Gross Terminal Area - Acres	Approx. Land Acquisition Cost	Min. Number of Wharf/Quay Gantry Cranes	Gantry Cranes & Terminal Equip. Cost Allowance	TOTAL CAPEX by Phase, $ Millions (Capital Cost Only)	TOTAL Terminal CAPEX, Equipment. + Land Costs
Phase I	**14.8**	**$10,212,000**	None, No Waterfront Infrastructure	Use of ProvPort/WTS Capabilities	**$9,187,326**	**$19,399,326**
Phase II (Incl. Phase I)	**31.3** (Incl. Phase I acreage)	Included in Phase I Costs	3 – 4, 3 min	**$24 Million + $ 5 Million** (Phase II Only)	**$57,186,314**	**$86,186,314** (Phase I & II Only)
Phase III	**60.4** (Construction Site: 29.1)	**$10,005,000**	5 – 6, 5 min.	**$16 Million + $2.5 Million** (Phase III Only)	**$57,079,843**	**$85,584,843** (Phase III Only)
TOTAL	**60.4**	**$20,217,000**	**5 – 6, 5 min.**	**$40 Million + $7.5 Million** (All Phases)	**$123,453,483**	**$191,170,483** (Grand Total)

Phase I is a subset of and included within the Phase II and III standalone port terminal projects. Phase I can be defined as the acquisition and land based terminal improvements to the dry fast lands associated with the two most southern two parcels of the project property and the separating easement as described below:

- Cumberland Farms Inc.: 9.04 acres
- City of East Providence Easement: 0.51 acres
- ACR Realty Inc.: 5.27 acres

Phase I comprises a total of 14.82 acres and would include terminal improvements to the land with refrigerated container yard storage areas operated remotely using the ProvPort Wharf/Quay, crane equipment capabilities and other ProvPort assets. Phase I improvements are coordinated with Phase II and III port terminal improvements. The Phase I land costs were estimated at $10,212,000 based on an approximate current land parcel value ranging from $550,000 to $830,000 per acre. The estimated capital budget cost estimate (CAPEX) for the Phase I parcels is approximately $9,187,326 or approximately 47% of the total Phase I budget cost estimate of $19,399,326.

Phase I, job creation includes 296 direct jobs and 292 indirect/induced jobs, please refer to the MARAD Port Kit economic impact results and analysis summary below.

USDOT MARAD Port Economic Impact Kit (MARAD Port Kit) Analysis Results Summary:

MARAD Port Kit Economic Impact Kit Results Summary
(MARAD Port Kit Version 1.1 Distributed by NTIS)
for the Allen Avenue Marine Terminal Phased Development

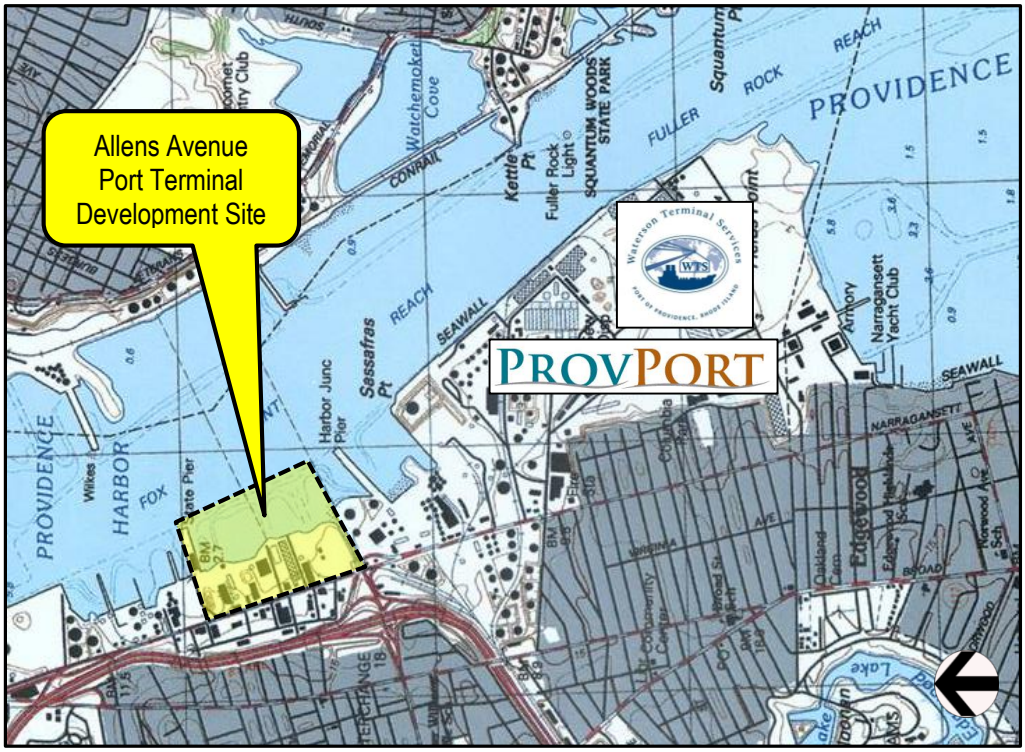
Port Development Phase (Each Phase Stands alone)	Total Effects (Direct & Indirect/Induced)					Composition of Gross State Product (GSP)			
	Employment (Jobs)	Direct (Jobs)	Indirect & Induced (Jobs)	Income (000s) *	Gross State Product GSP (000s)	Wages Net of Taxes (000s)	Local Taxes (000s)	State Taxes (000s)	Federal Taxes (000s)
Phase I	588	296	292	19,635	30,016	16,643	1,274	1,256	3,922
Phase II (Land Area Includes Phase I)	3,143	1,569	1,573	103,666	157,025	89,213	6,220	6,614	20,854
Phase III (Not Including Phase II)	6,272	3,120	3,153	208,384	317,058	179,693	12,212	13,090	41,811
	"Effects Per Million Dollars of Initial Expenditure"								
Phase I	19	--	--	622,296	951,310	--	40,381	39,801	--
Phase II	18	--	--	604,358	915,418	--	36,263	38,560	--
Phase III	18	--	--	610,966	929,636	--	35,808	38,381	--
	"Distribution of Effects/Multiplier" – Calculated Multipliers								
Phase I	1,984	--	--	1,702	1,903	--	--	--	--
Phase II	2,003	--	--	1,737	1,967	--	--	--	--
Phase III	2,011	--	--	1,728	1,946	--	--	--	--

***** It is assumed that 30% of Income would be directly derived from ProvPort operations. 6% of ProvPort's income would be paid to the City of Providence through the ProvPort, Inc 2014 Tax Exemption Agreement in addition to local taxes, estimated as follows: Phase I - $353,400 Phase II - $1,866,000 Phase III - $3,751,000. These payments are not reflected in the MARAD Port Kit Results.

I INTRODUCTION & BACKGROUND INFORMATION:

Port Terminal Development - Project Vicinity Map

The proposed port terminal development is located north along the Providence River – Fox Point Reach from the current ProvPort/WTS port operations. The map below generally is situated within the "Narragansett Bayfront" as defined by the "Providence 2020 Plan" adopted in May 2006.



Current Local Economic Development Perspectives & Background:

The Providence Working Waterfront Alliance (PWWA) has issued an "*Economic Development Statement*" for the Providence Working Waterfront. Summarized below are the key summary elements of the PWWA "*Economic Development Statement*" and serve as an overview of the economic impacts of the local waterfront.

Providence's waterfront is a key economic resource for Rhode Island and greater southern New England.

- Responsible for hundreds of millions of dollars in total economic impact for the region.
- Over 2,000 ships per year use the port to offload salt, cement, asphalt, and petroleum products, and load up with recycled metal for export to international markets.
- Over 9 million tons of cargo move through the port every year.
- One of the top 50 ports in the United States.
- Recently completed $65 million 40-foot deep water channel dredging project specifically undertaken by the U.S. Army Corps of Engineers to meet growing regional demand for shipping services.

Providence's waterfront is responsible for thousands of jobs.

- Hundreds of direct employment jobs.
- Thousands of multiplier jobs (tradesmen, truck drivers, service technicians, etc.).
- One of the few remaining sources of well-paid blue-collar jobs in Rhode Island.
- Port-sector workers earn, on average, about $50,000.

Providence's waterfront is the main source of heating oil for Rhode Island, Southeast Connecticut, and Central and Southeast Massachusetts.

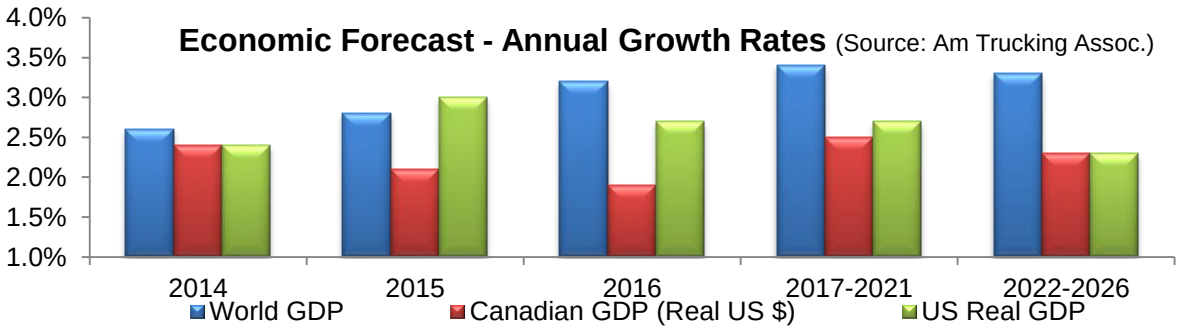
- Port fuel terminals supply virtually all of the heating oil for Rhode Island, Worcester County, Cape Cod and the islands, and eastern Connecticut households and businesses.
- There are more than 450,000 oil heat customers in Rhode Island alone.
- Port provides Rhode Island's *only* source of residual heavy fuel oil for hospitals, universities, commercial buildings, state and municipal buildings, and utilities.

Providence's waterfront has a long and proud history that has shaped the City of Providence and the State of Rhode Island.

- Providence harbor has been a center of shipping and commerce for more than 150 years.
- Several working waterfront companies have continually operated here for more than 100 years.
- The character of this neighborhood *is* a working waterfront.

General Port Terminal Development Description & MARAD Model Kit Inputs:

The expansion of the world economy is on a firm footing and the likely hood of a global recession is extremely low during the next several years. Respected economists anticipate that world GDP growth will average 3.6% per year over the medium term (2016-2010). Port development professionals are confident that conditions are falling into place for an extended period of improving global growth.



In early August 2015, Vickerman & Associates was commissioned by ProvPort, Providence Redevelopment Agency (PRA) and Waterson Terminal Services (WTS) to provide ProvPort/PRA/WTS with "*Port Strategic Master Development Planning Services*" focused on preparation of a market assessment, market growth plan and targeted market opportunities for ProvPort. Tasks 1, 2, 3, and 4 of this commission were delivered on January 2, 2016.

Ports along the west coast of North America provide the gateway for much of the cargo destined for the US east coast, but operate with significant congestion and constraints. US Northeast ports have limited capacity to accept the world's largest ships now coming through the Suez Canal and Panama Canal. It will be difficult to meet future rising cargo demands with many existing ports on the east

coast including New York and New Jersey, and other Northeastern U.S. port destinations facing barriers to expansion in their highly urbanized settings.

In order to meet these challenges, ProvPort is proposing the development of a new deep water general cargo - multipurpose port marine terminal with "*on-dock*" intermodal rail logistics capability (the "Port Terminal") generally located in the Burges Cove and Fox Point Reach area of the Providence River. The port terminal is located on the western bank of the Providence River in the general vicinity of the Allens Avenue easterly to the waterfront and generally from Corless Cove (Thurbers Ave. and the Harbor Junction Wharf) on the south perimeter to State Pier (Bay Street) on the northern perimeter.

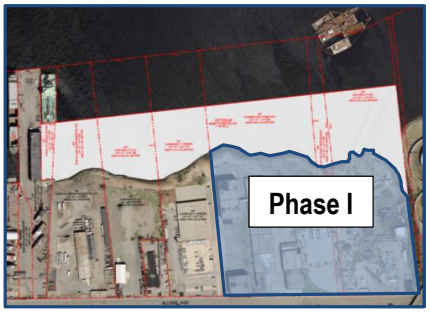
The proposed port marine terminal will ultimately occupy approximately 60.4 acres (29.31 acres of dry land and 31.1 acres of submerged lands). A potential first phase port terminal development area is located on the south end of the development area encompassing 14.8 acres of dry fast land. The full build out port terminal development could ultimately include but is not limited to:

- Three 900 foot vessel berths of multipurpose general cargo container port terminal with refrigerated services capabilities with barge berthing capabilities.
- Improved vessel turning and maneuvering basin adjacent to the port terminal.
- Access along the eastern edge of Allens Avenue for "*on-dock*" intermodal rail operations.
- Centralized automated entrance and exit gate complex with reversible access truck lanes and full automated gate processing capabilities including USCBP Radiological Portal Monitors (RPMs).
- Multipurpose refrigerated warehouse and distribution capabilities.

The terminal will be designed to accommodate current smaller container ships with capacities of up to 3,500 to 4,000 Twenty Foot Equivalent Units (TEUs) utilizing the authorized 39 foot channel depth.

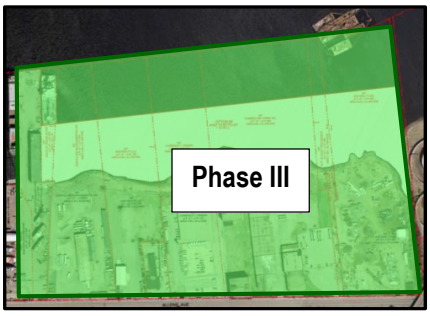
The following site survey map depicts the general parcel maps composing the potential port terminal development area produced by Waterman Engineering Company, February 22, 2016 (Project No. 98.121).

Conceptually the project site area could be developed in Three Phases as generally depicted below:



Phase I: Phase I would encompass approximately 14.8 acres of terminal backlands (fast land) and would be served via truck drayage from the current marine marginal wharf/crane assets and infrastructure currently operating at ProvPort. The Phase I backlands would be developed as multipurpose container terminal / automobile terminal improvements for cargo storage and terminal support operations. The terminal may have "*on-dock*" intermodal rail operational capabilities.

Phase II: Phase II would encompass approximately 31.3 acres of marine terminal acreage including the Phase I acreage. The port terminal would have a 1,570 ft. marginal wharf, multipurpose container terminal / automobile terminal improvements for cargo storage and terminal support operations**.** 16.5 acres would be developed on tidelands parcels. This port terminal would have **two berths plus one barge berth** marine terminal would have "*on-dock*" intermodal rail operational capabilities.



Phase III: Phase II would encompass approximately 60.4 acres of marine terminal acreage including the Phase I & II acreage. The port terminal would have a 2,880 ft. marginal wharf, multipurpose container terminal improvements for cargo storage and terminal support operations. 14.6 acres would be developed over submerged tidelands parcels (encompassing a total of 31.3 acres of submerged lands). This port terminal would include **three berths plus two barge berth**s and would have "*on-dock*" intermodal rail operational capabilities.

II PORT TERMINAL CONSTRUCTION, OPERATION, & CAPACITY

Port Terminal Development Cursory Capital Cost & Terminal Capacity by Construction Phase:

Cursory Capital Cost Budget Estimate & Annual Cargo Throughput Projections for
Allen Avenue Marine Terminal Phased Development

Development Phase	Gross Terminal Area - Acres	Wharf/Quay Length in Feet	Number of Wharf/Quay Cranes	CAPEX by Phase $ Millions **	Submerged Land Acres	Fast Land Acres	Approx. Annual Throughput Volume, TEUs *
Phase I	**14.8**	None (ProvPort Use)	None (ProvPort Use)	**9,187,326**	**0.0**	**14.8**	**45,886**
Phase II (Not Incl. Phase I)	**31.3** (Incl. Phase I)	1,570	3 - 4	**57,186,314**	**16.5**	**14.8** (Phase I)	**262,204**
Phase III (Not Incl. Phase II)	**29.1**	1310	5 - 6	**57,079,843**	**14.6**	**14.5**	**241,719** (Phase III, Site Only)
TOTAL	**60.4**	**2,880**	5 - 6	**123,453,483**	**31.1**	**29.3**	**462,135** (Total Terminal)

Port Terminal Development – Terminal Cargo Throughput PRISM Model Parameters Summary:

***PRISM Terminal Capacity Model Output* - Marine Terminal Operations & Throughput Capacity** Allen Avenue Marine Terminal Phased Development							
Development Phase	Gross Terminal Area Acres	Wharf/Quay Length in Feet	Number of Wharf/Quay Cranes	Number of Vessel Berths	Container Yard Storage Type & Acres	Operational CY Gate Parameters	Approx. Annual Throughput Volume, TEUs*
Phase I	**14.8**	(ProvPort Use)	(ProvPort)	(ProvPort)	Chassis: 14.0	5 days/week 8 hrs./day	**45,886**
Phase II	**31.3** (Incl. Phase I)	1,570	3 - 4	Two + 1 Barge	RTG: 24 Chassis: 5	5 days/week 8 hrs./day	**262,204**
Phase III	**60.4** (Phase III: 29.1)	2880 (Phase III: 1,310)	5 - 6	Three + 2 Barges	RTG: 40 Chassis: 16	5 days/week 8 hrs./day	**462,135**
Full Build Out	**60.4**	**2,880**	**5 - 6**	Three + 2 Barges	RTG: 40 Chassis: 16	5 days/week 8 hrs./day	**462,135**

***** ISO Twenty Foot Equivalent Units (TEUs)
****** Construction Cost by Construction Phase, does not represent total Phased cost (Phase I + Phase II)

State-Of-The-Art Terminal Facilities Assumption: The Allens Avenue terminal facilities will incorporate state-of-the-art container and intermodal infrastructure resulting in a fully integrated, seamless, container gateway system of port, short sea and transshipment activities, and eventually support inland logistics center operations within the Rhode Island regional area.

Submerged Land Acquisition Cost Assumption: Current parcel costs range from $550,000 to $830,000 per acre. An average of $690,000 per acre was assumed for all land side (fast land) acreage.

Port Terminal Land & Operational Equipment Parameters – PHASE I, II & III (Standalone Phases):

Cursory Capital Cost (CAPEX) Budget, Terminal Equipment Budget & Land Cost Estimate for Allen Avenue Marine Terminal Phased Development						
Development Phase	Gross Terminal Area Acres	Approx. Land Acquisition Cost	Min. Number of Wharf/Quay Gantry Cranes	Gantry Cranes & Terminal Equip. Cost Allowance	TOTAL CAPEX by Phase, $ Millions (Capital Cost Only)	TOTAL Terminal CAPEX, Equipment. + Land Costs
Phase I	**14.8**	**$10,212,000**	None, No Waterfront Infrastructure	Use of ProvPort/WTS Capabilities	**$9,187,326**	**$19,399,326**
Phase II (Incl. Phase I)	**31.3** (Incl. Phase I acreage)	Included in Phase I Costs	3 – 4, 3 min	**$24 Million + $ 5 Million** (Phase II Only)	**$57,186,314**	**$86,186,314** (Phase I & II Only)
Phase III	**60.4** (Construction Site: 29.1)	**$10,005,000**	5 – 6, 5 min.	**$16 Million + $2.5 Million** (Phase III Only)	**$57,079,843**	**$85,584,843** (Phase III Only)
TOTAL	**60.4**	**$20,217,000**	**5 – 6, 5 min.**	**$40 Million + $7.5 Million** (All Phases)	**$123,453,483**	**$191,170,483** (Grand Total)

Port Terminal CAPEX Opinion of Probable Cost Assumptions and Details for Phase I, II, and III

Port Terminal Cursory Infrastructure Capital Cost (CAPEX) Budget Estimate Assumptions Allen Avenue Marine Terminal Phased Development			
Development Phase	Gross Terminal	Wharf Length	**Opinion of Probable Construction Costs Calculations & Basic Budget Assumptions**
Phase I	14.8 Acres	None	No Waterfront Structure, No rail, No Building Structures Fast Land Development 14.8 x $434,020 =$6,275,496 Project Allowances @ 22% = $1,380,609 SUBTOTAL: $7,656,105 Project Contingency @ 20% = $1,531,221 **TOTAL = $9,187,326**
Phase II (Does not include Phase I costs)	31.3 Acres	1,570 feet	Rail: 6,000LF Rail ($264/LF) = $1,584,000 Submerged Land: 16.5 acres x $757,368/acre = $12,496,572 Wharf: 1,570LF x $12,911.54/LF = $20,271,118 Structures: (60%) = $4,710,000 SUBTOTAL = $39,061,690 Project Allowances @ 22% = $8,593,572 SUBTOTAL = $47,655,262 Project Contingency @ 20% = $9,531,052 **TOTAL = $57,186,314**
Phase III (Does not include Phase I & II costs)	60.4 Acres	2,880 feet	Rail: 6,000LF Rail ($264/LF) = $1,584,000 Fast Land: 14.5 acres x $434,020/acre = $6,293,290 Submerged Land: 14.6 acres x $757,368/acre = $11,057,572 Wharf: 1,310LF x $12,911.54/LF = $16,914,117 Structures: (40%) = $3,140,000 SUBTOTAL = $38,988,980 Project Allowances @ 22% = $8,577,576 SUBTOTAL = $47,566,536 Project Contingency @ 20% = $9,513,307 **TOTAL = $57,079,843**
TOTAL	60.4 Acres	2,880 ft.	**CAPEX Total Budget Cost: $123.453,483**

Above CAPEX Contingency & Project Budget Estimate Allowance Assumptions:

- Unit Cost Escalation = 3%
- Mobilization/Demobilization = 1.5%
- Planning & Design = 17%
- Erosion & Sediment Control = 0.5%

} = **22%**

- **Overall Project CONTINGENCY after other Allowances = 20%**

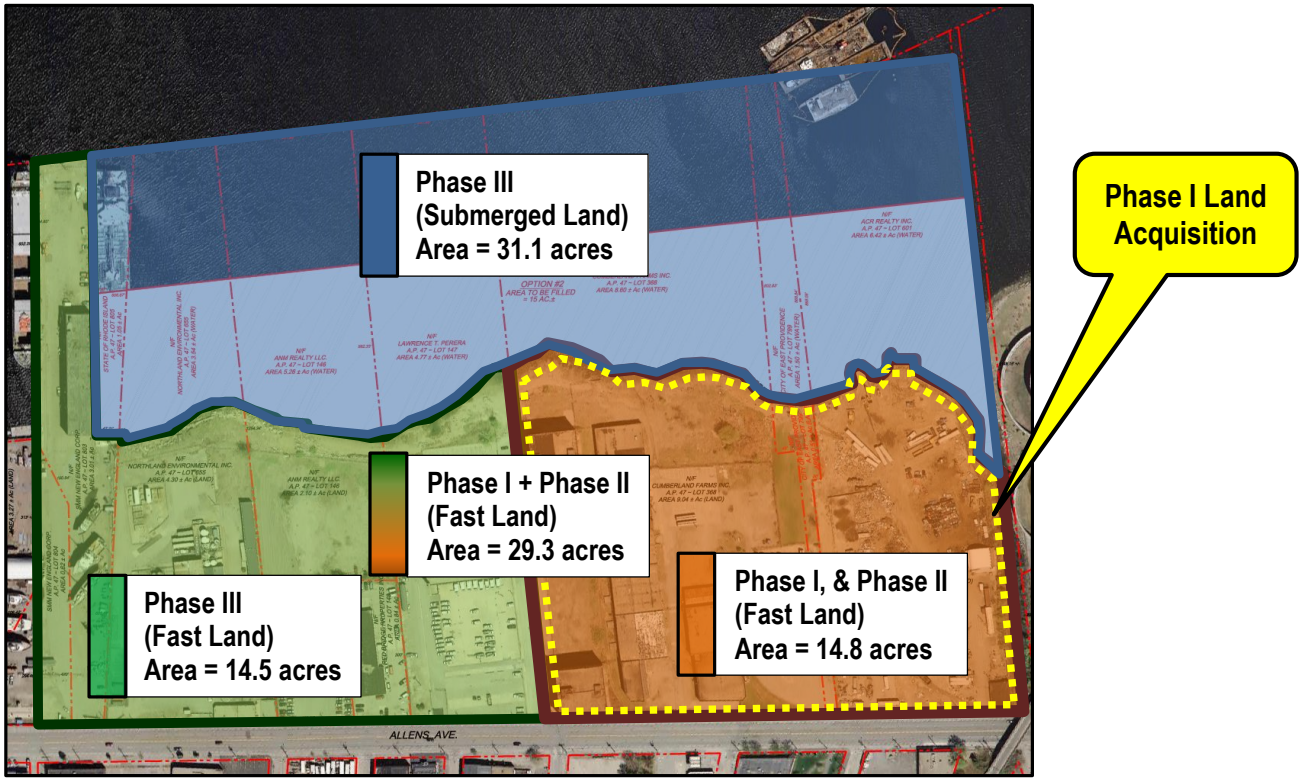
Submerged Lands Fill Assumptions:

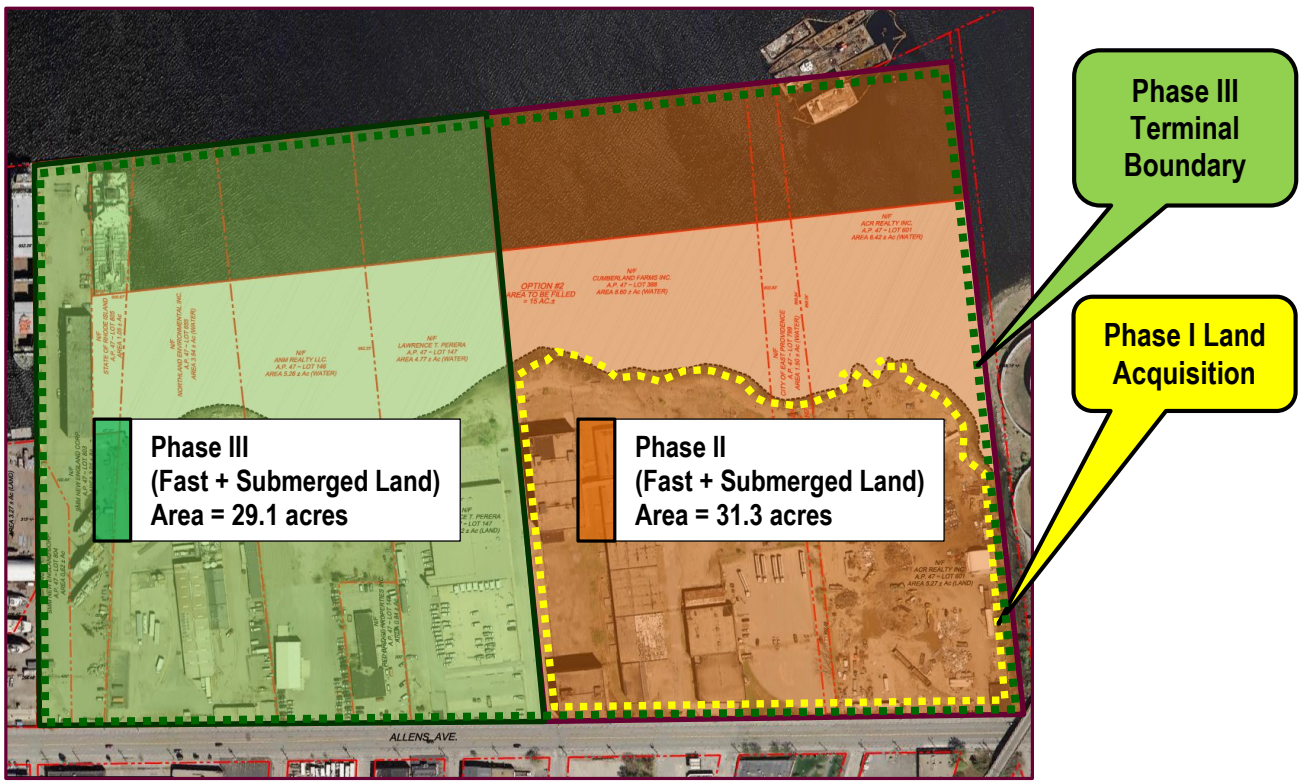
- **Site Fill:** $757,368.06/ acre (Dike, Dike Armor Rock, Soil Stabilization, Heavy Duty Pavement, Drainage, Utilities (water, lighting, fire, etc.), Reefer Plugs
- **Intermodal Rail**: $264/LF
- **Wharf/Quay:** $12,911.54/LF

Fast Land Development (Dry Construction) Assumptions:

- **Fast Land**: $434,020.62/acre (Soil Stabilization, Heavy Duty Pavement, Drainage, Utilities (water, lighting, fire, etc.) Security Systems
- **Intermodal Rail**: $246.43 / LF
- **Automated Gate Complex**: 10,000 sf @ $115/sf = $1,150,000 (Guard, Inbound/Outbound Scales, Pre-check, EIR Station, Jack in the box, Inspection Canopy, Truck Outbound Maint.
- **Administration Building**: 10,000 sf @ $150/sf = $1,500,000
- **Maintenance Building**: 28,000 sf @ $150/sf = $4,200,000
- **Longshore/Wharfinger Building**: 10,000 sf @ $100/sf = $1,000,000

Allens Avenue Port Terminal Development Parcels and Phase I Superposition





Major Assumptions Regarding Capital Budget Cost Estimates, Terminal Operational Costs and Port Terminal Throughput Capacity Estimates.

1. The Port Terminal Development Construction Cost Estimate (CAPEX) is an "*Opinion of Probable Cost*" for the proposed port terminal development and provides an order of magnitude, "*Ball Park*" probable construction cost budget estimate for the phased port terminal development (Phases I, II, and III).

2. This opinion of probable cost estimate is provided for reference only and represents a cursory professional opinion based on estimated order of magnitude costs with very limited available detailed site information or preliminary planning or design information. The capital cost budget estimates are not a guaranteed maximum figure. These capital cost budget estimates are for preliminary conceptual planning purposes only including estimated economic development impact assessments, and were not intended for construction, project finance or terminal operational purposes.

3. All budget cost estimates in this report are for the development of a new "green field" maritime port terminal project as depicted in this report only (**Total Terminal Acreage**: Phase I - 14.8 acres, Phase II – 31.3 acres, and Phase III – 60.4 acres) (**Net Construction Site Improvement Acreage**: Phase I - 14.8 acres, Phase II – 33.1 acres, and Phase III – 29.1 acres).

4. Minimum primary terminal wharf side gantry crane equipment has been estimated with an allowance for RTG and support terminal equipment. All collateral terminal operating equipment would be provided for by the terminal operator(s) or shipping line(s). Therefore, all other collateral equipment is assumed to be the responsibility of the terminal operator and is not included in the port terminal capital budget cost.

5. The capital budget cost estimate is based on very rough conceptual planning documentation and as such reflects only a rough cursory conceptual estimate of the Phase I, II, and III capital and equipment budget costs requirements for the port terminal development project.

6. Terminal operational ramp-up operating throughput estimates for each phase of terminal operations was not provided or estimated. Detailed terminal throughput capacity modeling and cargo throughput calculations were not prepared. The port terminal is assumed to have an **Annual Cargo Throughput Capacity** of approximately 45,886 TEUs for Phase I; 262,204 TEUs for Phase II; and 462,135 TEUs a year for full operational build out of the port terminal based on the Vickerman PRISM Capacity Model.

7. No facility, infrastructure, terminal mitigation measures and/or operational improvements have been included "*outside the port terminal development boundary proper*" and as such are not included in any of the capital budget cost estimates.

8. This capital budget cost estimate is based on January 2015 US dollars for Northeast US Coastwise type construction projects. No attempt was made to determine a suitable cost escalation factor for future time value of money determinations. The accuracy of this budget cost estimate, being cursory and conceptual in nature, should be within approximately plus or minus 25% of the capital budget cost figures listed.

9. Varying site conditions, material cost at time of construction variables, applicable labor rates, and other site specific circumstances can have a fundamental effect on the actual project construction and operating costs. These factors may not have been accounted for in this conceptual capital cost budget estimate.

10. No land acquisition costs (Fast or Submerged Lands) is included in the conceptual capital budget cost estimates used in the report. Current parcel costs range from $550k to $830k per acre. An average of $690k per acre for land side (fast land) acreage acquisition costs was used in the MARAD Model Kit.

11. Project environmental assessments, environmental impact reports, and regulatory permits requirements have not been included in the project capital budget cost estimate or used in the MARAD Model Kit.

III USDOT MARAD PORT KIT ECONOMIC DEVELOPMENT IMPACT ANALYSIS

Use of the USDOT MARAD Port Economic Impact Kit (MARAD Port Kit):

The MARAD Port Economic Impact Kit was used to derive the key Economic Development Impact factors using an input-output (I/O) model analysis for the planned ProvPort/WTS Allens Avenue Port Terminal Development.

The findings and results from Tasks 1, 2, 3, and 4 of the "*ProvPort / PRA / Waterson Terminal Services - Port Strategic Master Development Planning Services - A Joint Study*" – Second Revised Proposal dated August 6, 2015. Were used as direct inputs into the MARAD Port Kit for Economic Development Impact Analysis.

For 25 years, the Maritime Administration has played a leading role in the development of local and national economic impact models for the port industry. The Port Economic Impact Kit (MARAD Port Kit) was developed to help U.S. deep-draft ports and other organizations explain the value of the port industry and port facility investments to their communities.

The MARAD Port Kit combines a proven and accepted economic approach – input-output (I/O) analysis – with up-to-date portrayals of key maritime sectors. In economics, an input–output (I/O) model is a quantitative economic technique that represents the interdependencies between different elements of a project economy on associated regional economies.

On-going maritime activities modeled in the MARAD Port Kit include container, liquid and dry bulk, breakbulk, auto transport, cruise, project cargo, and passenger ferry operations. The MARAD Port Kit considers all activities directly needed to handle each specific movement. Maritime construction and dredging are also included in the model. The MARAD Port Kit underwent significant beta-testing prior to its release.

It should be recognized that the port industry specific data and information used in the MARAD Port Kit model could be crucial to determine the direct impacts, which require knowledge of data pertaining to the employment levels and transactions undertaken by the existing port-related industries, in the time period of interest, for the intended impact analysis. Currently, the direct effects embedded in the MARAD model have the most promise for providing reliable, comprehensive, and specific data inputs from which to model indirect and induced impacts.

The MARAD Port Kit is considered the most comprehensive and regularly updated I-O port model (Little, 1979; Temple *et al*, 1985). The Port Kit is a self-contained, PC-based model that has been developed to help US deep-draft ports and other organizations explain the value of the port industry and port facility investments to their communities. It uses a user-friendly, menu-driven format, model to assess the economic impact of maritime-related construction and ongoing activities at the national, state and local level. It comprises a 30-sector I/O table – with up-to-date portrayals of key maritime sectors. Ongoing maritime activities modelled in the Port Kit include container, liquid and dry bulk, break bulk, auto transport, cruise, project cargo, and passenger ferry operations. The Port Kit considers all activities directly needed to handle each specific movement. Maritime construction and dredging are also included in the model.

Economic impact analysis traces changes in economic activity through the economy to measure the cumulative economic effects of an action. For example, construction and maintenance of navigation infrastructure in a region will directly contribute to businesses under the construction, services, and manufacturing sectors.

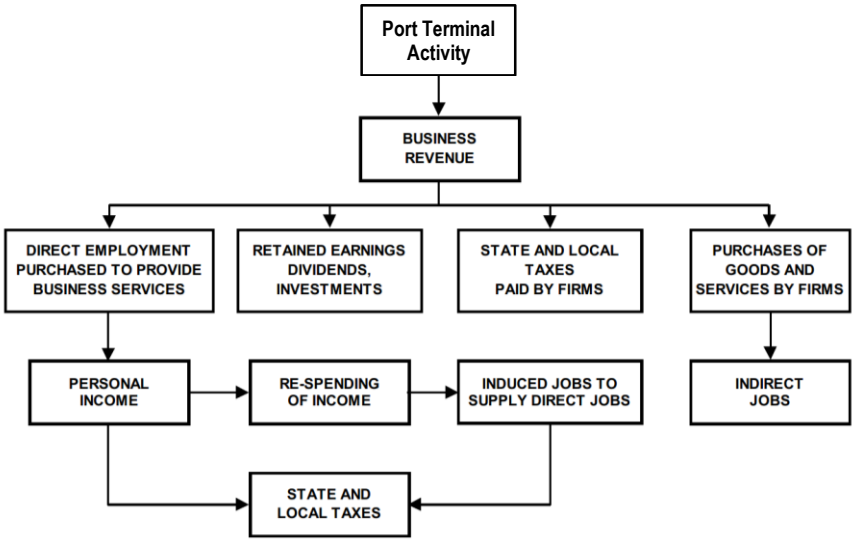
The MARAD Port Kit enables deep-draft ports and other organizations to assess the economic impacts of maritime-related construction and ongoing activities at the national, state, and local levels. The kit:

- Quantifies the economic value of deep-draft port activities in readily understandable terms such as employment, income, and tax revenues generated;
- Shows how a deep-draft port is linked to other industries;
- Can be used to investigate "what if" policy simulations (such as shifting trade patterns and dredging policies); and
- Assesses the economic implications of potential investments and changes in business activity.

The results of an economic impact assessment undertaken with the MARAD Port Kit not only shows the direct port industry impacts of an investment, cargo flows, but also identifies the total effect on the local region, state, or nation (A. Strauss-Wieder Inc. and Rutgers University, 2000).

MARAD PORT KIT METHODOLOGY

Flows of economic development impacts for a port terminal development through the regional economy can be generally illustrated as follows:



An economic impact analysis attempts to measure or estimate the change in economic activity in a specified region, caused by a specific project development activity within that region.

Typically, four types of economic development impact factors are measured for a marine terminal development:

- Jobs;
- Employee earnings;
- Business revenue; and
- State and local taxes.

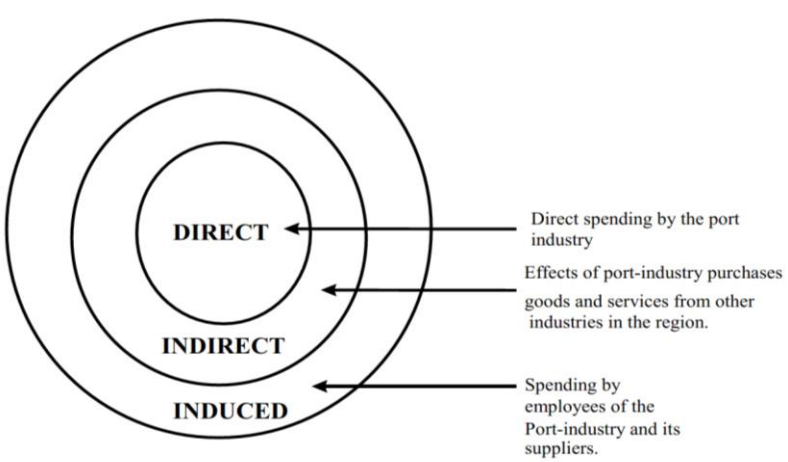
With respect to jobs, four types of job impacts are typically measured and considered. These job impacts are direct, induced, indirect and related jobs. The job impacts are generally defined as follows:

- **Direct jobs** are those jobs with local firms providing support services to the marine terminal. Port terminal direct jobs include jobs with railroads and trucking companies moving cargo to and from the marine terminal, members of the International Longshoremen's Association (ILA), steamship agents, freight forwarders, ship chandlers, warehouse operators, fruit importers, terminal operators, stevedores, etc.

- **Induced jobs** are jobs created locally and throughout the regional economy due to purchases of goods and services by those directly employed. These jobs are with grocery stores, the local construction industry, retail stores, health care providers, local transportation services, etc., and would also be discontinued if the marine terminal activity were to cease.

- **Indirect jobs** are those jobs generated in the local economy as the result of local purchases by the firms directly dependent upon seaport activity. These jobs include jobs in local office supply firms, equipment and parts suppliers, maintenance and repair services, utilities, etc.

- **Related/Induced jobs** are with distribution and manufacturing firms -- such as steel fabrication firms using the steel imported through the marine terminals. Related jobs are not dependent upon the marine terminals to the same extent as are the direct, induced and indirect jobs.



Source: A. Strauss Wieder, Inc.

The port industry is defined as any regional economic activity that is directly needed for the movement of waterborne cargo and passengers. This definition includes activities that take place on the vessel, at the terminal, and during the inland expenditures related to cargo and passenger movement. As shown below port-industry activities pertaining to cargo movement include documentation, financing, brokering and other essential services (e.g., warehousing and wholesaling) that are directly required to move international cargo.

Port-Industry Activities in Cargo Movement

VESSEL EXPENDITURES	TERMINAL EXPENDITURES	TRANSACTION EXPENDITURES	INLAND MOVEMENT EXPENDITURES
Pilotage, tugs, provisions, bunkers, etc.	Cranes, stevedoring, yard handling, etc.	Banking, freight forwarding, insurance, Custom-house	Varies by Mode and Distance

Source: A. Strauss-Wieder, Inc.

Vessels, terminals, transportation providers, and other port-industry businesses purchase goods and services from other industries to support their operations. These suppliers, in turn, purchase supplies and services to support their operations. In addition to the indirect impact of expenditure ripples, the workers employed by the port industry and the industry's suppliers also generate economic impacts. The employees of the port industry and its suppliers spend their wages and salaries on food, clothing, retail items, vehicles and other items.

The economic ripples generated by employee spending are known as the *induced/related impact.* The *total economic impact* of the port industry consists of the direct, indirect and induced/related effects.

Input-output (I/O) Analysis Historical Development:

With permission of Ms. Strauss-Wieder, the following economic impact model history is provided to establish the validity of the MARAD Port Model Kit as a basis for the development of the ProvPort/WTS Allens Avenue Marine Terminal project.

The basic framework for input-output (I-O) analysis originated nearly 250 years ago when François Quesenay published Tableau Economique in 1758. Quesenay's "tableau" graphically and numerically portrayed the relationships between sales and purchases of the various industries of an economy. More than a century later, his description was adapted by Leon Walras, who advanced input-output (I-O) modeling by providing a concise theoretical formulation of an economic system (including consumer purchases and the economic representation of "technology").

Wassily Leontief greatly advanced Walras's theoretical formulation and was awarded the Nobel Prize in 1973 for his efforts. Leontief first used his approach in 1936 when he developed a model of the 1919 and 1929 U.S. economies to estimate the effects of the end of World War I on national employment. Recognition of his work awaited wider acceptance and use of the approach. This meant development of a standardized procedure for compiling the requisite data (today's national economic census of industries) and enhanced capability for calculations (i.e., the computer). The federal government immediately recognized the importance of Leontief's development and has been publishing input-output tables of the U.S. economy since 1939.

MARAD Port Model Kit Input:

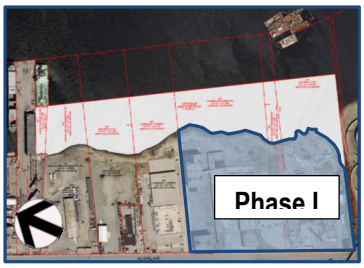
First, data regarding port terminal tonnage by type and capital expenditures were determined and are presented in this study along with key assumptions and operational parameters. The tonnage and capital expenditure data were then imported into the USDOT MARAD Port Economic Impact Kit to estimate the direct, indirect, induced, and total economic impacts of the ports industry.

Applicable publically available port terminal development economic industry information and data as well as data from the Vickerman Firm's project files and past experience in port terminal development were used to provide direct input estimates of the project's economic impacts using the MARAD Model Kit as the primary basis for determining economic development impacts.

MARAD PORT MODEL KIT RESULTS:

Total wages, output, taxes, et cetera that are reported are only the total effects due to the economic change and not the totals for all local and regional economic activities currently existing in the region.

Conceptually the project site area could be developed in Three Phases as generally depicted below:



The following table breaks out the MARAD Port Model Kit results by industry at what the US Bureau of Economic Analysis terms the division level. The following table also gives overall total economic effects summary for a set of three standard economic measures (jobs, income, and value added) and in terms of the federal, state, and local taxes generated by the specific Phase I, II, and III model analysis. It also provides a full set of multipliers to help in the interpretation of results.

USDOT MARAD Port Economic Impact Kit (MARAD Port Kit) Analysis Results Summary:

MARAD Port Kit Economic Impact Kit Results Summary
(MARAD Port Kit Version 1.1 Distributed by NTIS)
for the Allen Avenue Marine Terminal Phased Development

Port Development Phase (Each Phase Stands alone)	Total Effects (Direct & Indirect/Induced)					Composition of Gross State Product (GSP)			
	Employment (Jobs)	Direct (Jobs)	Indirect & Induced (Jobs)	Income (000s) *	Gross State Product GSP (000s)	Wages Net of Taxes (000s)	Local Taxes (000s)	State Taxes (000s)	Federal Taxes (000s)
Phase I	588	296	292	19,635	30,016	16,643	1,274	1,256	3,922
Phase II (Land Area Includes Phase I)	3,143	1,569	1,573	103,666	157,025	89,213	6,220	6,614	20,854
Phase III (Not Incl. Phase II)	6,272	3,120	3,153	208,384	317,058	179,693	12,212	13,090	41,811
	"Effects Per Million Dollars of Initial Expenditure"								
Phase I	19	--	--	622,296	951,310	--	40,381	39,801	--
Phase II	18	--	--	604,358	915,418	--	36,263	38,560	--
Phase III	18	--	--	610,966	929,636	--	35,808	38,381	--
	"Distribution of Effects/Multiplier" – Calculated Multipliers								
Phase I	1,984	--	--	1,702	1,903	--	--	--	--
Phase II	2,003	--	--	1,737	1,967	--	--	--	--
Phase III	2,011	--	--	1,728	1,946	--	--	--	--

***** It is assumed that 30% of Income would be directly derived from ProvPort operations. 6% of ProvPort's income would be paid to the City of Providence through the ProvPort, Inc 2014 Tax Exemption Agreement in addition to local taxes, estimated as follows: Phase I - $353,400 Phase II - $1,866,000 Phase III - $3,751,000. These payments are not reflected in the MARAD Port Kit Results.

The following two MARAD Port Kit Model analysis were also prepared but the model run results are not included in this report. These model runs are available upon request from the Author.

- *"**Two-digit SIC Industry**"* contains the basic results aggregated to the level of the two-digit Standard Industrial Classifications (SICs).

- *"**Direct Effects**"* like the two-digit industry results, reports at the level of the two-digit SICs. The difference is that this set of results strictly reports the industrial distribution of the direct effects. That is, the indirect effects and induced effects are omitted from this file.

The following excerpts were taken directly form the MARAD Port Kit Handbook and repeated here for clarity in interpreting the MARAD Port Kit Model run results.

Various measures are used in the MARAD Port Kit to indicate the effects of an economic activity on the total economy of the region. These measures include the changes in regional employment, output, wages, tax revenue, and value added that result from a change in economic activity. Although the meaning of most of these measures, at first glance, may appear obvious, they are discussed here to minimize the possibility of misunderstanding or misinterpretation.

Jobs is a measure of employment at the place of business. The value of this measure depends on the prevailing mix between full- and part-time employment for the industries in the region affected by the economic change. That is, no distinction is made between these two categories since the employment levels used are based on those reported by the US Bureau of Economic Analysis, which in return bases its numbers largely on those reported by state and local employment offices. These employment numbers also do not distinguish between full- and part-time employment. All jobs generated at businesses in the region are included, even though the associated wages of in-commuters may be spent by households in other regions.

State taxes are revenues collected by state governments through personal and corporate income, state property, excise, sales, and other state taxes generated by changes in output or wages or by purchases by visitors to the region.

Local taxes are revenues collected by sub-state governments, occurring mainly through property taxes on new worker households and businesses, but including income, sales, and other major local taxes in selected areas, where applicable.

Value added measures regional output in the same sense that gross domestic product (GDP) measures national output. It is the difference between the value of goods and services purchased as production inputs and the value of goods and services produced. As such it is the amount of total wealth generated by the economic activity. The MARAD Port Kit calculates value added or "gross regional product," which consists of wages, state and local taxes, federal taxes and "other value added." The latter includes changes in nonwage employee compensation, profit-type income (other than proprietors'), net interest, and capital consumption allowances.

Note that **wages net of taxes** equals changes in income minus proprietors' income and the total associated change in all federal, state and local taxes, not just those that apply to persons and households. Note further that the change in total wages paid may not equal the change in total wages received and spent in the region. This is because labor demand is met from sources outside of the study region. That is, the difference reflects the extent to which jobs in the region are held by resident households rather than by in-commuters from other regions. Household expenditures and concomitant induced effects for such in-commuters are assumed to take place predominantly in their region of residence.

To many public decision-makers, the most important results are often simply changes in total jobs and state and local taxes. The reasons for this should be obvious; but sometimes there is also strong interest in the results for a particular sector, especially if this sector has been suffering decline in the region. Jobs are often thought to be a desirable measure. Better perhaps is total income since much of income is recycled through the economy. Better still is total value added since in addition to labor income, it adds wealth accumulation through labor as well through other means.

Often a combination of these measures can provide additional guidance in economic development efforts and in making an argument about the importance of an industry. For example, income per job, which is obtained by dividing total income by total jobs, may reveal that the port industry provides wages that are higher relative to other industries in the region. Similarly certain activities may be more laden in terms of value added than in terms of income.

IV BIOGRAPHICAL INFORMATION ON THE AUTHOR

John Vickerman is the President and Founding Principal of Vickerman Associates LLC, a firm specializing in the planning and design of port, intermodal and freight logistics facilities and systems worldwide.

John has become internationally known in the maritime and intermodal industry for providing innovative solutions to the many operational, planning and design issues confronting today's marine and intermodal transportation practitioners. Much of John's work focuses on assisting ports and shipping companies to recognize and prepare for future market and technological changes.

John has worked on major port projects throughout the North America and the world for more than 35 years. **Sixty-seven of the ninety North American deep-water general cargo ports** have benefited from John Vickerman's strategic port master planning and port development designs. His international practice includes work for many of the Canadian Ports, the Ports of Rotterdam and Hong Kong, Melbourne Australia, the Panama Canal Authority, the intermodal freight analysis for the Eurotunnel between England and France, and the Port of Pecém, Brazil.

Mr. Vickerman has served as a member of the USDOT Freight Roundtable Advisory Board to the US Secretary of Transportation. He completed two terms as Chairperson for the Intermodal Freight Terminal Design and Operations Committee under the purview of the Transportation Research Board (TRB)/National Research Council (NRC), National Academy of Science. He has served on many national Policy Committees for the TRB.

Mr. Vickerman is currently serving as a Board of Director Member of the United States Maritime Research Center (USMRC) - Maritime Simulation Institute (MSI) in Newport, Rhode Island. John is also a member of the Editorial Advisory Board of the Great Lakes/Seaway Review.

John is both a licensed Civil Engineer and Registered Architect in 23 states and holds a Master's Degree in Structural Engineering from the University of California, Berkeley. He retired as a Captain in the Civil Engineer Corps of the United States Navy Reserve after 38 years of continuous service.

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