

CITY OF PHILADELPHIA PENNSYLVANIA

OFFICE OF THE CONTROLLER

Promoting honest, efficient, and fully accountable government

Southport's Economic Potential

Utilizing Land to Maximize Local Jobs

May 2015



City Controller
ALAN BUTKOVITZ

Executive Summary

Why the Controller undertook this study

Since taking office in 2005 as the City’s fiscal watchdog, Controller Alan L. Butkovitz has focused on ways to raise revenues and otherwise improve the City’s fiscal health without raising taxes. Like many other older industrial cities, Philadelphia possesses numerous ‘legacy’ infrastructure assets, such as bridges and rail lines that are in need of major upgrades. This includes the Port of Philadelphia - another critical asset.

In 2010, the Commonwealth of Pennsylvania created a new 239-acre site called Southport at the Philadelphia Navy Yard. In October 2014 the Philadelphia Regional Port Authority (PRPA) issued a Request for Expression of Interest (REI) “seeking interested parties to explore entering into one or more Public-Private Partnerships for the design, build, finance, operation and maintenance” of the Southport complex. The PRPA’s promotional materials suggest three uses for the parcels that comprise Southport: a container terminal, an automobile or logistics facility, and/or an energy port. The REI explicitly stated that the PRPA “encourages respondents to not feel constrained by previously-envisioned uses for the Southport sites” and that “all development concepts consistent with PRPA’s mission to enhance trade and commerce will be considered.”

In November 2014, PRPA reported that 16 firms had submitted proposals. PRPA staff is in the process of evaluating these proposals. The Controller’s Office evaluated the possible configurations of the redeveloped Southport terminal to determine the economic impact for each, and to produce an overall recommendation about the highest and best use of this 239-acre parcel.

What the Controller found

The Controller analyzed the 3 most-discussed uses for Southport – as a modern container terminal, as an automobile or logistics facility, and as an energy port, or some combination thereof. The Controller’s analysis clearly shows that the greatest economic impact, measured by jobs created and tax revenues generated, would flow from devoting as much acreage as possible to the creation of a modern container terminal. In the context of recent interest in developing Philadelphia’s potential as an “energy hub,” the Controller also believes that making accommodations for an energy port also seems to make long-term economic sense. While the direct employment impact of an energy port would be small, especially relative to the container terminal, the indirect possibilities are immense; as long as the acreage devoted does not impinge upon the scale necessary to create a modern container terminal.

The impact numbers are summarized in the table below:¹

Use	Direct Jobs	Indirect Jobs	Wages	Indirect impact	Wage Tax Rev
Container	8,100	12,150	\$336.0 mil	\$504.2 mil	\$13.4 mil
Container + Auto	5,815	8,722	\$241.3 mil	\$362.0 mil	\$9.6 mil
Container + Energy	6,841	10,262	\$287.4 mil	\$431.0 mil	\$11.4 mil

¹ Derivation of job numbers and economic impact are explained in Appendix A

Introduction

The Navy Yard has been a Philadelphia institution since the end of the Civil War. When the United States Navy left the Navy Yard in 1996, Philadelphia was left with a large plot of vacant waterfront property. In 2000, Philadelphia Industrial Development Corporation (PIDC) took over the Navy Yard to develop the parcels to fit the new evolving urban form. In 2004, a section of the land where the Delaware River bends north – giving it tremendous access and therefore a prime location for an additional port – was set aside for port expansion, something that has not happened since the 1970s.

The additional port comes at an important time in the evolution of the shipping and port industry. Specifically for the Delaware River ports, in 2017, after nearly 25 years of planning and legal battles, five feet will be added to the river's depth, making it 45 feet deep. Deepening would allow 80-85% of the world's container ship fleet to access ports on the Delaware River. At 45 feet, these ships would be able to carry up 10,000 Twenty Foot Equivalent Units (TEUs) in high water, twice as much as the largest ship to come to the Port of Philadelphia at present.²

It is an even more significant time internationally as the Panama Canal expansion nears completion. The expansion will allow ships to carry nearly three times the amount of cargo than before the expansion from the Pacific to the Atlantic Ocean. This will fundamentally change supply chains and distribution of goods throughout North America. Currently 55% of the goods that arrive on the East Coast from Pacific Asia arrive via a land route after being unloaded on the west coast, mostly California.³ Shipping goods to the East Coast through the Panama Canal adds just five to ten days of travel time, but is significantly less expensive than moving cargo by rail or truck.⁴

The other East Coast ports are preparing for the dramatic increase in shipping activity once the Panama Canal opens to the larger ships. The Port of Baltimore has deepened its channel to 50 feet and set aside acreage for future development.⁵ The Port Authority of New York & New Jersey is deepening its channel, has set aside brown fields for additional warehouses, and is raising the Bayonne Bridge to reduce air-draft constraints.⁶ Virginia ports are already dredged to 50 feet and are planning considerable expansion between now and 2032.⁷ Thus, Philadelphia is not alone in creating or proposing to create new capacity for the expected increase in cargo; most analysts believe that there will be plenty of business to go around for every port on the East Coast. While Philadelphia will not be able to accommodate the largest ships afforded by the expansion of the Panama Canal, it could be well positioned to see increases from spill-over and ships crowded out from the larger ports.

² TEU = a standard shipping container; Peter T. Leach, "Third Try for Philadelphia in Developing Southport Terminal," JOC.com, October 29, 2014.

³ Jean-Paul Rodrigue, "Factors Impacting North American Freight Distribution in View of the Panama Canal Expansion," The Van Horne Institute, 2010.

⁴ Ibid.

⁵ Port of Baltimore, <http://msa.maryland.gov/msa/mdmanual/01glance/html/port.html>

⁶ "America's Ports and Intermodal Transportation System" U.S. Maritime Administration, January 2009

⁷ Economy League of Greater Philadelphia, "Maritime Commerce in Greater Philadelphia: Assessing Industry Trends and Growth Opportunities for Delaware River ports," July 2008.

This brief analyzes the current strengths of the Port of Philadelphia and regional and international shipping trends against the economic impact and job growth of the different proposed port developments.

Developing Southport

In June 2010, Governor Edward G. Rendell signed Act 38, which set aside 239 acres of land and water in the Navy Yard to create the Southport Marine Terminal, just south of the Walt Whitman Bridge along the Delaware River. Act 38 expanded the 47 acres originally set aside for Southport.⁸ Initially, Southport's acreage was marketed as a single development opportunity, but in the most recent Request for Expression of Interest (REI) by the Philadelphia Regional Port Authority (PRPA), it has been represented as three distinct parcels: the Marine Terminal is 119 acres, the West Terminal is 75 acres and Piers 122- 124 North Berth is a 1,132 foot long finger pier adjacent to the Marine Terminal. Taken together, Southport would become the largest port controlled by the PRPA, a state-run authority. Southport is located adjacent to two major First Tier rail lines, Norfolk Southern and CSX, as well as Interstates 76 and 95.

In October 2014, PRPA initiated its third attempt to develop Southport. The scope of the project has evolved since the previous two attempts. The first attempt, made prior to the passage of Act 38, fell apart because PRPA did not control enough land to develop a functional terminal.⁹ The second attempt, immediately after Act 38 passed, unraveled due to delays in dredging the Delaware River along with environmental and habitat concerns.¹⁰ In the first two proposals, Southport was conceived solely as a container terminal. But in 2014, PRPA began marketing Southport as three different parcels, each with a different function. Promotional videos released by Port of Philadelphia show potential development ideas, with the Marine Terminal as a container port, Pier 122- 124 as a breakbulk port, and West Terminal as an automobile import hub or logistics center.¹¹

The options for Southport's development are not limited to those proposed in PRPA's marketing materials, but will be driven largely by market considerations. As discussion surrounding Philadelphia's ability to leverage its location to Marcellus Shale has intensified, interest has increased in liquid bulk cargo along with exporting chemicals manufactured from natural gas and petroleum. This would anchor a Philadelphia "energy hub" as it evolved to export small amounts of natural gas along the East Coast and to boutique markets.¹² Because the air-draft allowed by Delaware River bridges is too low and the shipping channel too narrow, larger-scale traffic in importing or exporting liquid natural gas internationally is neither a short nor medium-term possibility. Two different energy companies are

⁸ Philadelphia Regional Port Authority, "Governor Rendell Approves Measure Expanding Port's Waterfront Holdings," March 19, 2004.

⁹ Linda Loyd, "Senate Panel Approves Southport Terminal Deal," Philadelphia Inquirer, May 26, 2010.

¹⁰ Linda Loyd, "Southport Marine Terminal work Restarts at Navy Yard after Eagles'-nest delay," Philadelphia Inquirer, February 24, 2012.

¹¹ <https://www.youtube.com/watch?v=A2xV9mQotzA> (released September 17, 2014).

¹² Philip Rinaldi's testimony to City Council of Philadelphia, resolution 150072, March 14, 2015

currently leasing Piers 122-124 to handle both ethanol and fertilizer, believing that expanding the energy port would work in tandem with a container terminal, helping to underwrite the costs.¹³

On October 1, 2014, PRPA released its Southport REI, and by the November 14, 2014 due date, 16 companies had submitted potential ideas for development. PRPA staff will evaluate these proposals and make its recommendation to the Board of Directors on how to develop Southport.¹⁴ The interested parties could choose to develop parts or all the vacant land.

In evaluating the proposals to develop Southport, PRPA needs to anticipate how Philadelphia's industrial base will evolve in the face of changing conditions, within the framework of a current economically viable project. At the same time PRPA must weigh the historical strengths of the Port of Philadelphia against the changes of shipping and freight distribution, all the while trying to maximize and grow employment in Philadelphia.

Philadelphia's Position as a Port

The Port of Philadelphia has been fighting an uphill battle for relevance for over a century. This struggle has forced port leaders to constantly consider alternative categories of cargo to service and to create a logistical advantage over neighboring ports. Philadelphia is home to one of the largest petroleum refineries in the country, and cargo related to refining comprises a majority of the Port's cargo in both tonnage and dollar value.¹⁵ Philadelphia's venerable history as an importer of such niche cargo as fruit and other perishable materials has helped maintain its viability. It is important for the port to keep its niche advantage in certain industries while trying to expand into other cargo categories. In 2008, the Economy League released a study entitled "Maritime Commerce in Greater Philadelphia," outlining the history of containerization in the cargo shipping industry, how Philadelphia has responded, and how it needs to evolve to compete in the future.¹⁶

The Port of Philadelphia has been at a disadvantage since the beginning of the twentieth century. As ship sizes began to increase, the channel up the Delaware River was not deep enough to compete with neighboring ports. In the mid 1950s containerization changed the economics of cargo shipping. The ships became larger, ports required increasingly expensive infrastructure to on- and off-load cargo, and terminals made long finger piers obsolete. The City was more than a decade slow in responding by developing Packer Avenue Marine Terminal (PAMT) and Tioga Marine Terminal (TMT) in 1967 and 1972 respectively. While the new terminals allowed Philadelphia to participate in the containerized shipping industry, the delay was costly, compounded by the inherent disadvantage of the long and shallow channel between the Atlantic and Philadelphia; consequently, a huge proportion of the business was beyond the port's capacities.

¹³ Linda Loyd, "Deal Could Make Phila. A Fertilizer Shipping Hub," Philadelphia Inquirer, April 20, 2015; Loyd, "Authority Widens Net for a Port Developer at Navy Yard," Inquirer, September 17, 2014

¹⁴ Linda Loyd, "16 Companies vie for Vacant Navy Yard Site," Philadelphia Inquirer, November 20, 2014.

¹⁵ Economy League, "Maritime Commerce in Greater Philadelphia."

¹⁶ Ibid.

Even with those disadvantages, the volume of containerized cargo has significantly increased in the Port of Philadelphia, more than doubling since 2005, following the trend on the East Coast.¹⁷ Along with this growth, the same confluence of factors that pushed it out of the top tier of ports has provided the opportunity for Philadelphia to carve an international niche in certain categories that offer tremendous growth possibilities. While the Port of Philadelphia lags behind in container cargo, it thrives in roll on/roll off (“ro-ro”) cargo such as cars, machinery, and farm equipment and bulk cargo like petroleum, pulp, fruit, and cocoa beans. The port’s massive dry and refrigerated storage facilities give it an advantage in these commodities. Philadelphia’s union contracts with the longshoremen and others also provide an advantage, with 19 start times throughout the day, three times as many as New York.¹⁸ The multiple start times give Philadelphia an advantage by improving turnaround time, which in turn reduces shipping cost.

Despite areas of growth and proximity to dense intermodal transportation networks and impressive warehousing capabilities, the Port of Philadelphia’s potential is limited by aging infrastructure and antiquated cargo-yard organization. Ship sizes have become so large that the cranes which move the containers to dry land are no longer able to reach the furthest stack on the vessel. In some cases the cranes are not tall enough to reach over the tallest tier.¹⁹ Furthermore, all of the container yards at the ports in Philadelphia are filled with a tremendous amount of warehouse space, a legacy of the pre-container era, making container storage difficult.²⁰

Port Growth Industries

The Port of Philadelphia has benefited from general increases in East Coast port activity and is in a prime position to leverage some proportion of the New Panamax influx.²¹ It is however caught between its traditional strengths and modern trends. On the one hand, the Port of Philadelphia has a long history of importing break bulk cargo and has developed a considerable warehouse infrastructure to support it. On the other hand, for the past several decades the shipping industry has been continually trying to standardize cargo by placing it inside containers. Once in containers, the cargo travels more quickly to its destination and is less likely to incur damages.²²

These dueling trends are manifest at the Philadelphia port. In 2014 the growth of breakbulk did not increase at the same rate as containers because of the increased use of refrigerated containers for perishable cargo. On October 17, 2014, the 5,500 TEU Monte Rosa docked at PAMT, the first of seven

¹⁷ Joseph Bonney, “Philadelphia Reports Double Digit Container Growth,” JOC.com, Jan 29, 2015.

¹⁸ Economy League, “Maritime Commerce in Greater Philadelphia.”

¹⁹ Conversations with officials of Local 1291 of the International Longshoremen’s Association, March 30, 2015.

²⁰ Economy League, “Maritime Commerce in Greater Philadelphia.”

²¹ Panamax and New Panamax are terms for the size limits for ships traveling through the Panama Canal. Formally, these limits and requirements are published by the Panama Canal Authority (ACP). The plans to build a new, larger set of locks have led to the creation of a New Panamax standard based on new lock dimensions. After the expansion, the Panama Canal will be able to handle vessels of cargo capacity up to 13,000 TEU.

²² Markku Yli-Kahri, “Increased Volumes of Containerized Breakbulk Cargoes,” Lough Ship Cargo Solutions, September 22, 2014.

“Monte” class ships to make weekly runs between the East Coast of the United States and South America. The Monte Rosa has 1,356 slots for refrigerated containers.²³

As shipping technology advances increasingly toward containerization, Philadelphia’s ports are nearly maxed in their capacity to handle the boxes. PRPA’s terminals will either expand or become plagued by the same turnaround delays that separate Philadelphia from its competition; as other ports expand and modernize, this could drive container business away from Philadelphia altogether. The Packer Avenue Marine Terminal is already at capacity, according to Tom Holt of Holt Logistics Corporation, which operates PAMT.²⁴ Containers are expected to comprise the vast majority of the New Panamax shipping increase from Asia; thus, the only way to participate fully in the gains of that reallocation is to increase container terminal capacity.

Philadelphia is also centrally located to warehouses throughout the region, which is becoming more concentrated. Currently, the Port of Philadelphia is surrounded by 300 different warehousing operations.²⁵ The largest cluster of warehouses on the East Coast is located at Exit 8a on the New Jersey Turnpike, which is virtually equidistant from New York City and Philadelphia; however Philadelphia enjoys an advantage due to lower tolls and the logistical difficulties that attend leaving the Ports of NY & NJ.²⁶ Demand is beginning to drive further south, toward the cheaper land near Exit 7a.²⁷ The southward expansion of the warehousing sector along the NJ Turnpike increases Philadelphia’s potential competitive advantage.

The Potential of Southport

There are competing visions for the development of Southport. Some would like to see the entirety of Southport’s acreage devoted to containers; others want it to serve primarily or even exclusively as an energy export facility; still others would like to see a hybrid facility, part devoted to containers, part to energy export, and part to automobiles or logistics. Currently there are three types of cargo that are most commonly cited as potential anchors for the Southport parcels. Each of these visions for the port correlates with growing industrial sectors in Philadelphia.

The potential economic impact of Southport is a function of how it will be developed. Which type of port will maximize Philadelphia’s potential additional capacity while bringing the greatest return in terms of employment and tax revenue? If Southport attempts to accommodate all three types of cargo, there is a real danger that it will lose the economy of scale and optimal density necessary to make an investment in a modern container terminal feasible. Economic impact must be measured based on a number of port-specific factors, such as the type of cargo and level of capital investment or the Minimum Efficient Scale (MES). The MES of a container terminal can be defined as the smallest scale at which output can be produced at minimum average long run cost. Scale can be associated with the size of the terminal or the size of the terminal-operating firm.

²³ “New Class of Shipping Vessel calls Port of Philadelphia” American Journal of Transportation; October 22,2014

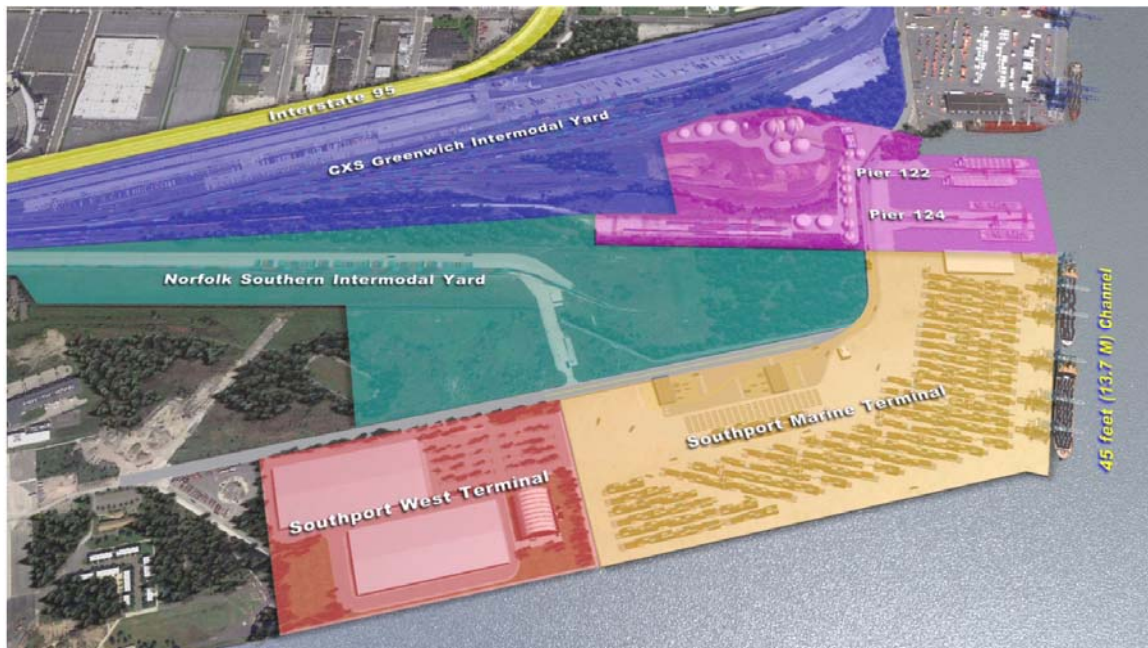
²⁴ Linda Loyd, “16 Companies vie for Vacant Navy Yard Site.”

²⁵ Pennsylvania Department of General Services, “Southport Marine Terminal Development Project,” May 20, 2010

²⁶ “New Jersey Industrial Market,” Transwestern, Fourth Quarter 2014 ; “A New Dawn For Philadelphia Logistics” Special advertising section Journal of Commerce, October 15, 2007.

²⁷ PlanSmart NJ & New Jersey Chamber of Commerce, “What will it Take to Support New Jersey’s Industry Clusters?”April 2013

Image 1: The parcels of land that make up Southport²⁸



1. Southport as a Modern Container Terminal

After the passage of Act 38 in 2010, the Commonwealth reached an agreement with Delaware Stevedores to develop the entire Southport acreage into a container terminal. It was estimated at the time that devoting just 120 acres to containers the Southport Terminal would add an additional 750,000 TEU of capacity and create 6,000 new jobs at the Port of Philadelphia – or one new job for every 125 additional TEU.²⁹ This estimate seems conservative in comparison to other recently modernized ports. For example, the Port of Jacksonville saw an increase of 128,000 TEU and 1,634 jobs from 2008 to 2013, or one job for every 78 TEU.³⁰ The Maryland Port Administration reported a smaller ratio of jobs to TEU: in 2010, 387,000 containers came through the Port of Baltimore, directly supporting 3,515 jobs, one job for every 110 TEU. In 2012, the Packer Avenue Marine Terminal supported nearly 2,000 jobs with 273,190 TEU, which equates to 136 TEU per job.³¹ Extrapolating, this would mean nearly 8,100 jobs supported by 1.1 million TEU. Container ports create jobs not only for longshoremen, but in trucking, warehousing, and customs houses as well.³² Applying the range of metrics from these other ports, if Philadelphia were to garner 1.1 million additional TEU, between 8,100 -14,000 direct new jobs could be generated.

²⁸ Image taken for PRPA promotional video

²⁹ Peter Leach, "Third Try for Philadelphia in Developing Southport Terminal," JOC.com, October 29, 2014; Ryan Briggs, "Dredging Promise: Restoring Hope to the Port of Philadelphia," Next City, November 5, 2012

³⁰ Martin Associates, "2013 Economic Impact of the of Port of Jacksonville," August 7, 2014

³¹ Briggs, "Dredging Promise"; PRPA, "Port of Philadelphia's 2013 Cargo Statistics Show 15% Increase in Cargo Handled and Fourth Consultative year of Growth," February 27, 2014

³² Martin Associates, "The Economic Impacts of the Port of Baltimore 2010," December 16, 2011

In order to achieve 1.1 million TEU annually as initially planned,³³ the Southport Terminal must be more technologically advanced than the current Packer Avenue Marine Terminal. The throughput of a container terminal is a function of two variables. First is crane capacity: how many containers can a crane lift per hour and how many cranes serve the terminal? Second is the capacity of the container yard: How many containers can be stored? This is in turn delimited by the type of stacking and storage equipment the terminal deploys. A cargo yard that is low density, that is, has ample acreage so that containers do not have to be stacked very high, carries lower costs; because fewer containers are stacked, the surface does not need to be as durable and the equipment needed to handle the containers is cheaper.³⁴

For the purposes of comparison, consider the Port of Everglades and the Port of Tacoma. The former handles just under 1 million TEU annually, the latter just over 1.1 million. The Port of Everglades has seven New Panamax cranes, while Tacoma has 26 cranes that can handle between 14-18 columns of containers.³⁵ According to a 2012 report by Tioga Associates, 7 cranes working at 80% capacity can move nearly 1 million TEU a year.³⁶ The Port of Everglades supports 6,359 direct jobs, while the Port of Tacoma supports 8,080 direct jobs.³⁷ The Port of Tacoma has 494 acres for containers, Port of Everglades has 324 acres; the entire Southport site is 239 acres.

It is possible to make up the yields in a smaller yard by increasing the intensity of use, mainly by stacking containers higher and limiting the space allowed for vehicles; however, this requires greater capital investment. A wheeled side-picker, the cargo-yard equivalent of a fork-lift, can handle only 3 levels of containers. To handle 1.1 million TEU, a 120-acre cargo yard would need to handle at least 130 TEU per acre, while an 80-acre cargo yard would require 200 TEU per acre. Either of these alternatives would require an intermediate level of port sophistication with very expensive equipment outlays and would leave the port with little room for growth.³⁸ Further, the greater the density of the yard, the greater the financial risks; the capital investment required to make it work is a function of the operator's MES and how much container traffic a terminal developer believes it can plausibly attract. The smaller and more dense the yard, the greater the capital investment required to handle large amounts of cargo. The optimal level of capital investment is a function of the container yard or the smallest scale which output can be produced at the minimum average long-run cost.³⁹ In sum, the fewer acres devoted to containers, the more dense the yard, the more expensive the start-up costs, the more risky the investment.

³³ PRPA, "Southport Marine Terminal Development Project," May 20, 2010

³⁴ Tioga Associates, "Container Port Capacity and Utilization Metrics," June 27, 2012.

³⁵ <http://www.porteverglades.net/cargo/cranes-and-services/> (accessed April 2, 2015); <http://portoftacoma.com/shipping/facilities> (accessed April 2, 2015).

³⁶ Tioga Associates, "Container Port Capacity"

³⁷ <http://www.porteverglades.net/our-community-role/economic-impact/> (accessed April 2, 2015); Martin Associates, "The 2013 Economic Impact of the Port of Tacoma," September 23, 2014.

³⁸ Tioga Associates, "Container Port Capacity"

³⁹ Evangelia N Kaselimi, Theo E Notteboom, Athanasios A Pallis, and Sheila Farrell, "Minimum Efficient Scale and Preferred Scale of Container Terminals," Research in Transportation Economics, August 17, 2011

2. *Southport as an Auto Facility*

In 2010, Hyundai and Kia began importing autos and storing them in the Pier 98 Annex, nestled against the southern edge of Columbus Blvd and Walt Whitman Bridge.⁴⁰ This created 270 jobs on the 90-acre facility, which can store 150,000 autos annually. One oft-discussed component of a potential Southport proposal would add an additional 75 acres of auto storage. With the additional acres, Southport's auto storage capacity would increase by 125,000 autos a year, creating about 240 new jobs. Extrapolating from a 2010 report, an auto facility Southport would create between 225 and 525 new jobs, depending upon the number of total acres employed. The Port of Tacoma moves about 250,000 tons of autos annually, supporting 277 jobs in Tacoma, roughly similar to Philadelphia.⁴¹ In Tacoma, as well as in Philadelphia, one job is created for every 555 autos. However, in Baltimore one job is created for every 433 autos. This may be a function of the fact that Baltimore is the largest importer of autos on the east coast, handling nearly three times the number of autos as Philadelphia; thus, there is probably greater throughput. If Philadelphia matched Baltimore's intensity, as many as 675 jobs could be created at a Southport auto facility.⁴² No current proposals envision converting the entirety of Southport into an auto import facility; however, the more land devoted to autos, the less that is available for a container terminal; the cost of developing a container terminal increases with increased density.

Hyundai currently ships autos to Philadelphia and stores them on the Pier 98 Annex until they are either purchased or are relocated to a dealership. The number of autos stored at the facility is a function of demand; there are times when the number of autos arriving at the facility exceeds the number leaving.⁴³ When this happens, the autos overflow the facility and line the streets of South Philadelphia. The 90-acre lot has a static capacity of 7,200 autos.⁴⁴ To be able to move 150,000 autos in a year through a facility, an average 17 days must lapse between when it is offloaded and when it leaves the facility.

As part of the deal with Hyundai, the Commonwealth of PA agreed to make some upgrades to the facility; PRPA invested \$1 million to prepare Pier 98 Annex for autos. PRPA now receives per-car rent from Holt, the operator of the terminal, and Philly Ro-Ro, the company that coordinates the labor.⁴⁵ The Hyundai deal was struck right before the massive earthquake and tsunami that struck Japan in 2011, which brought the Japanese auto industry to a virtual standstill; Korean autos made major inroads into the US market. As the Japanese auto industry has recovered and as the US auto market has generally improved, overall demand for Korean autos has leveled off.⁴⁶

⁴⁰ Linda Loyd, "Hyundai, Kia to Import Cars Here," Philadelphia Inquirer, April 21, 2010

⁴¹ Martin Associates, "The 2013 Economic Impact of the Port of Tacoma," September 23, 2014

⁴² Martin Associates, "The Economic Impacts of the Port of Baltimore 2010," December 2011

⁴³ Discussion with Philadelphia Regional Port Authority staff, March 30, 2015.

⁴⁴ "RoRo" is very low density 80 units per acre. Tioga Associates, "Container Port Capacity."

⁴⁵ Loyd, "Hyundai, Kia to Import Cars Here."

⁴⁶ "How the Japanese tsunami changed the auto industry," CBS MoneyWatch, March 9, 2012; "A year after quake, Japan's auto industry recovers," USA Today, March 11, 2012; "S.Korea's car exports hit record high on demand for high-priced models," Global Times, January 14, 2014.

3. *Southport as an Energy Terminal*

There are also discussions of using the finger pier at the North Berth to load chemicals or petroleum products. Energy has long been a mainstay of Philadelphia's port business and economy. With the exploitation of the Marcellus Shale fields, there has been increasing discussion of a potential natural gas pipeline into Philadelphia and of the potential for energy-related businesses as well as the revival of manufacturing from access to cheap energy. An energy terminal would create about 3,000 construction jobs and about 120 permanent jobs.⁴⁷

It is also possible to imagine that Southport could accommodate both a modern container terminal as well as an energy port, since the latter requires little if any water frontage. Of course, the devil is in the details. The feasibility of combining an energy port with a container terminal depends heavily on the footprint required for the former. By way of comparison, PGW's Port Richmond Facility is 30 acres, enough space to be a world-class facility.⁴⁸ If the energy port could be contained to 25% or less of the Southport acreage, it would not impinge on the requisite 190-200 acres need to achieve economic feasibility for the container terminal. Based on conversations with experienced energy executives, the space requirements for an energy facility seem to be more flexible than those for an auto facility, making it easier to imagine co-existence with a container terminal.⁴⁹

Though several REIs were reportedly submitted by energy companies, regulatory and other restrictions limit Southport's potential to become a major energy port. First, the US Department of Energy would need to approve the site. Second, public safety and national security concerns arise from the proximity of huge ships hauling extremely flammable materials to shore; bridges would also have to be shut down as the ships sail underneath. A third concern revolves around the 40-meter limit to the air drafts on the Delaware River; almost all long-haul LNG ships are taller than 40 meters when loaded.⁵⁰ Yet the energy port idea has a few built-in advantages: a massive and well-capitalized refinery nearby, seeking to expand, creating instant demand. At the same time, while there is existing petroleum business, many of the real value-added natural gas-related businesses such as urea and ammonium nitrate require the creation of a pipeline connecting Philadelphia to Marcellus Shale. To date there has yet to be a viable proposal floated to build such a pipeline.

The images below were created from PRPA's promotional video, altered to show the differences in employment structure by port function. In sum, they demonstrate graphically that a container terminal is by far the most job-intensive use of Southport's acreage.⁵¹

⁴⁷ Susan Phillips, "Idea for Philadelphia LNG Export Terminal Floated at Council Hearing," State Impact Pennsylvania, February 28, 2013.

⁴⁸ Concentric Energy Advisors, "Philadelphia Gas Works: Highest and Best Use Study," October 2014

⁴⁹ Conversation with Philadelphia Energy Solutions CEO, Phil Rinaldi, May 5, 2015.

⁵⁰ "Mariner's Advisory Committee" The Delaware River and Bay; Update 2007

http://www.bape.gouv.qc.ca/sections/mandats/rabaska/documents/DA3_Ch2.pdf, accessed April 6, 2015.

⁵¹ See Appendix; Based on 4 jobs per acre for an auto facility and 34.5 jobs per acre for a container terminal based on the projections of jobs create of 8,100 for a container terminal in a 235 acre terminal verse 5,815 jobs created when the parcels are separated and 90 acres are used for an auto facility creating 300 jobs and 160 acres used for container terminal creating 5,515 jobs.

Image 2: Jobs created utilizing entire acreage as a Container Terminal



The greater the proportion of the Southport land used for a container terminal, the greater the return on investment; as the container terminal acreage falls below 195 acres, the capital investment required to handle the higher density cargo yard increases dramatically. There would be significant diminishing returns in terms of jobs from devoting 30% or more of the land to an automobile facility. Dedicating at least 80% of the acreage to containers will produce at least 8,100 jobs, while splitting the acreage with an auto facility will create 5,815 jobs.

Image 3: Jobs created by splitting into Container Terminal and Auto Facility



Image 4: Jobs created by splitting into Container Terminal and Energy Port



Economic Impact

It is quite expensive to develop a modern marine terminal; the original 2010 estimate for Southport was \$300 million, but there are reasons to believe this could be an underestimate.⁵² Port expansion in Los Angeles recently doubled in cost from \$250 million to \$500 million. In Philadelphia's case, the vast bulk of the costs are to be borne by the private operator of the marine terminal not by the public sector. The Philadelphia Regional Port Authority owns the land and would lease it to an operator to develop the port, forming a Public-Private Partnership.

Terminals are complex systems that facilitate the transfer of goods from one mode of transportation to another. The terminal's economic impact on the surrounding area is limited because it is primarily a conduit for intermodal cargo handling, rather than a development which creates spinoffs and business clusters. Nevertheless, there is undoubtedly a huge employment impact that will accrue major economic benefits for the City as a whole. According to Bureau of Labor statistics, the median income for a terminal worker is \$41,500. This median figure obscures wide variations in job classifications, employment numbers, and levels of pay; different types of cargo also create dramatically different impacts on Philadelphia's economy and tax base. The creation of 8,100 new jobs at a modern marine terminal would generate \$336 million in wages and \$13.4 million in wage tax revenue annually. Using only 160 acres for a container terminal and the 75 acre parcel of the lot to store cars would create 5,815 new jobs, \$241.3 million in new wages and \$9.6 million in additional wage tax revenue.

⁵² Peter Van Allen, "Ready for our Ships to come in," Philadelphia Business Journal, May 12, 2014

Some worry that splitting the acreage between an auto facility and a container terminal would make the massive capital investment for the terminal unjustifiable, given the Port of Philadelphia’s competitive position. Yet for now the cars are a ‘sure thing’ and the cost of expanding the auto facility is far lower than building a modern container terminal. It should be noted, however, that projections are based on median wages, which conflate wages for workers who offload containers and those who offload cars. According to officials of the International Longshoremens Association, workers who work containers earn roughly \$9 an hour more than those who work other cargo. This significant differential makes the impact of a modern container port even greater.

Data suggests that the direct economic impact of an energy port is smaller than that of an auto facility without the support and additional jobs created by the container terminal. A Petroleum Pump System operator earns \$70,300 annually. An energy hub at Southport that employed 120 workers would generate only about \$8.5 million in additional wages and \$340,000 in additional wage tax revenue annually. If the energy port did not require a footprint any larger than 40 acres it could be combined with a container terminal creating 6,841 jobs and \$11.5 million in wage tax revenue. At the same time, though, an energy terminal could have larger ramifications for the region than either a container terminal or an auto facility; an energy port would be supported by development and processing of petrochemicals which would, in turn, support additional Philadelphia jobs in a wide variety of fields. It is very difficult if not impossible to estimate these induced effects, since even the most stalwart energy hub proponents admit they are speculative.

In sum, it is safe to say that a modern container terminal on 85% of the Southport land, operating at 1.1 million TEU a year, would generate by an order of magnitude the most jobs and revenue for the City of Philadelphia and would have the greatest economic impact. Devoting the remainder of the land to the creation of an energy port would help Philadelphia take the next step toward becoming an energy hub – without sacrificing the employment potential offered by a modernized container terminal.

The table below summarizes the impact:

Table 1: Permanent Jobs at Southport

Use	Direct Jobs	Indirect Jobs	Wages	Indirect impact	Wage Tax Rev
Container	8,100	12,150	\$336.0 mil	\$504.2 mil	\$13.4 mil
Container + Auto	5,815	8,722	\$241.3 mil	\$362.0 mil	\$9.6 mil
Container + Energy	6,841	10,262	\$287.4 mil	\$431.0 mil	\$11.4 mil

Conclusion

The development of Southport offers Philadelphia an opportunity to expand its port capabilities corresponding to the growth areas of the City's industrial economy as well as the future of the shipping industry. In recent years the Port of Philadelphia has seen increases in activity as events outside of its control have shifted conditions in its favor. The expansion of the Panama Canal will open up the East Coast to larger ships and direct connections to East Asia. The coast's ports are making investments to compete for the largest of these ships; Philadelphia's best opportunity seems to be to capture those ships that are pushed out of the larger ports. Warehouse capacity is moving further south in New Jersey, closer to Philadelphia, to take advantage of cheaper real estate.

Specific development opportunities would position the Port of Philadelphia to take advantage of the changes. First among these is creating a larger, state of the art container terminal, which would ensure that Philadelphia is well-positioned as a port for years to come. Second, more cargo is coming to the port each year, and increasingly, it is arriving in containers; even Philadelphia's traditional niche strongholds in food products and other break bulk goods are increasingly containerized. Finally, investing in a modern container terminal would create an order of magnitude more jobs and revenue than any other type of facility. The more land dedicated to containers, the less investment needed in infrastructure to handle density of large stacks of containers. This will help keep overall costs down while ensuring the acreage necessary to create the most jobs.

In sum, the greatest economic impact will accrue from developing the bulk of Southport's acreage into a modern container terminal. Limiting the acreage of the container terminal in order to provide more space for storing automobiles would have a detrimental impact in two ways – fewer direct jobs flow from autos and, more important, fewer acres for containers means higher density and large increases in capital costs. The development of an energy facility holds great potential for the city as a whole; however it too must be developed in such a way as not to sacrifice the minimum required acreage for a modern container terminal, so that direct employment opportunities will be maximized. If it is the PRPA's goal to create a port with long-term viability and maximum economic impact for the region, in line with changes in the shipping industry, it is imperative that Southport become a state of the art container terminal that accommodates an energy port.

Appendix A – Methodology for Estimating Jobs

The number of jobs created at an auto facility and container terminal is computed very differently. Employment at a container terminal is dependent on the number and size of cranes used to hoist the cargo off of the vessels, the size of the cargo yard and technology used to move the cargo around the yard. The number of jobs created by an auto facility is depended on the number of cars that needs to be off loaded from the ships and loaded onto trucks. This it is a fundamental question of acreage: How many cars an auto facility can hold and the number of people required to complete the job.

To compare the number of jobs created by either type of port use a common unit of measure had to be established. The most basic is units per acre. To gain the number of jobs per acre in a container yard first the total amount of jobs created was established assuming a given size, 1.1 million TEU. This was then divided by the number of TEU per job which was calculated from previous Southport estimates, Packer Avenue Marine Terminal, and other ports. This was used to determine a range resulting in 8,100-14,000 new direct jobs. The low-end TEU per job range was used and was divided by total acres equaling 34.5 jobs per acre.

To calculate the number jobs created by an auto facility, the Pier 98 Annex was used as a template. 275 jobs were created on 95 acres supported by 150,000 autos. Extrapolating, this means roughly 300 new jobs would be created on a 75-acre parcel supported by 125,000 autos – or about 3-4 jobs per acre.

To estimate the number of jobs created if the parcels of Southport became a multi-use facility, it was assumed that 120 acres would be devoted to a container terminal, yielding 5,515 jobs, and 75 acres to autos, yielding 300 jobs – for a sum total of 5,815 jobs. These numbers can only be approximations, since they assume a constant return to scale; there are reasons to assume that the number of jobs created per acre decreases as the acreage decreases, but there are insufficient data available to create a Cobb-Douglas function to estimate increasing, decreasing or non symmetric growth rates with constant returns to scale. In sum, an assumed linear relationship is a reasonable approximation.

A similar process was used to estimate the number of jobs created in a hybrid container terminal and energy port. It was assumed that 195 acres would be devoted to containers, with the remaining 40 acres dedicated to the energy facility. At 34.5 jobs per acre, a 195 acre container facility would create 6,721 direct jobs. Calculating the number of direct permanent jobs generated by an energy facility is a different process; it is a low number because energy is extremely capital intensive. Less than 10% of the port jobs in Philadelphia are energy related despite being the largest port sector in both value and tonnage by several orders of magnitude. During recent City Council hearings on the creation of an energy port at Southport, energy company officials suggested that 120 new direct jobs would be created. Thus, an energy port plus a modern container terminal would yield, conservatively, 6,841 total direct jobs.

Acknowledgments

City Controller's Office Contact	Bill Rubin, First Deputy City Controller Tel: (215) 686-6696 Email: bill.rubin@phila.gov
Staff Acknowledgements	Jeff Hornstein, Ph.D., Director of Financial and Policy Analysis was the project manager for this report. Policy Analyst Lief Erickson did the data analysis.
Additional Acknowledgements	The Controller's Office wishes to thank staff at the Philadelphia Regional Port Authority and officials at the Local 1291 of the International Longshoremen's Association for gracious cooperation with this study.
City Controller's Office Mission Statement	The City Controller's Office is the independent watchdog agency of the City of Philadelphia that strives to promote honest, efficient, effective, and fully accountable city government. We address this mission by: providing timely and objective analysis on the availability of funds for all city contracts; preventing inappropriate spending of public funds; and providing objective, timely, and relevant information to city officials, the public, and other interested parties about financial operations of the city, and on ways to improve city operations and the use of public resources.
Obtaining Copies of City Controller's Office Reports	The fastest and easiest way to obtain copies of the City Controller's Office reports is through the City Controller's Web site at (www.philadelphiacontroller.org).
To Report Fraud, Waste, and Mismanagement of Your City Tax Dollars	Contact information Website: http://www.philadelphiacontroller.org/report-city-fraud-waste-corruption.asp Telephone: (215) 686-8888 or (215) 686-3804 (automated line) Download the Free Fraud Reporting app for iPhone, iPad, iPod Touch and Android devices