

The Port Authority of New York and New Jersey: Global Changes, Regional Gains and Local Challenges in Port Development

Jean-Paul Rodrigue

Department of Economics & Geography, Hofstra University, Hempstead, New York 11549, USA

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Abstract

The interplay between globalization and maritime transportation has been the focus of much attention. Under such a context, the port authority is often perceived as an entity increasingly under the pressure to cope with the demands of global maritime shippers and with local constraints pertaining to port development (e.g. better terminals, efficient inland distribution and environmental protection). This article investigates the relationships between global changes and the local challenges of the Port Authority of New York and New Jersey, one of the most diversified port authorities in the world. A wide array of facilities including office space, bridges and tunnels, industrial development zones, waterfront developments, airports, transit systems and, finally, port terminals are under its jurisdiction. It is argued that even if port activities represent a small share of the port authority's assets, it has an enduring commitment to port development. From traditional responses such as terminal improvements and dredging, the port authority is developing new strategies aimed at port regionalization such as terminal access and inland distribution systems.

Keywords: Globalization, Port Development, Maritime Terminals, Port Authorities, New York and New Jersey.

1.0 Introduction

Maritime shipping and port development have been shaped by many forces over the last half century. Geographically, the global economy has become tri-polar with North America, Western Europe and Pacific Asia as its dominant poles handling the majority of the commercial, financial and distribution functions. The latter is obviously assumed in large part by maritime transportation which accounted for about 71% of all the tons-km shipped globally. Substantial changes have concomitantly occurred in the maritime sector, notably:

- A growing demand for energy and raw materials and their related long distance maritime flows.
- A commodification of the economy implying rising consumption and distribution.
- The emergence of global commodity chains with fragmented functions of production, distribution and consumption.

- Technical changes in maritime operations, linked with containerization and intermodal transportation.

Ports, from gateways to feeders, have been influenced by increased competitive pressures, by their integration with inland freight distribution systems and by technical and technological changes in maritime and land transportation alike. The governance structure of ports, commonly the port authority, is also being challenged. Under such circumstances, a paradigm shift is occurring changing the role of port authorities within supply chains (Robinson, 2002; Notteboon and Winkelmann, 2001). The port authority, in order to remain successful as a provider of services (to ship-owners and merchandises), must demonstrate a capacity to cope with endogenous and exogenous changes and articulate proper responses.

As one of the largest port authorities in the world, the Port Authority of New York and New Jersey (PANYNJ) is facing many port development challenges and represents a highly relevant case study to investigate the relationships between port authorities and contemporary economic and technical changes. From a regional perspective, the port authority has resulted in substantial economic gains for New York in its more than 80 years of existence, with the development of large assets involving several transportation modes. Many local challenges, such as containerization, need to be addressed for the port to continue to service the metropolitan area and the Eastern Seaboard of the United States early into the 21st century. This article thus investigates these challenges and changes in a context where the port authority has much more vested interests in other modes, particularly air and road transportation, than on maritime transportation. In spite of these apparent conflicts of interest, the port authority has responded to traditional port development problems, namely by upgrading and expanding its facilities and by dredging new access channels. The port authority is also addressing new challenges in port development that are more regional in scope such as improving terminal access and developing an inland distribution network.

2.0 The Port of New York and Global Changes

2.1 The American Maritime Context

With 22% of the global GDP the American economy represents a huge national market that has been impacted by changes in the nature, volume and direction of its international trade. Trade agreements such as NAFTA¹ and the explosion of the trans-Pacific trade have also played a significant role in the changing geography of commodity flows. The key expression of these changes is the negative goods trade balance that has endured since the 1970s with the growth of national consumption, an appreciation of the value of the US dollar making foreign products cheaper, and a shift of labor-intensive manufacturing activities outside the United States. Many segments of the American economy have been “exported” to lower cost locations, impacting on its balance of payments, notably for goods (Figure 1).

¹ North American Free Trade Agreement

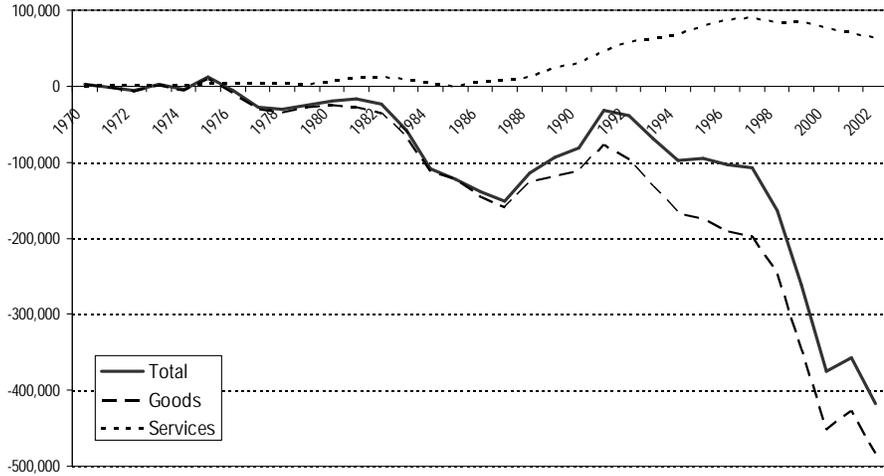


Figure 1 U.S. Trade in Goods and Services - Balance of Payments, 1970-2002 (millions of \$US)
Source: US Census Bureau.

Such a negative trade balance is reflected on port operations, which have seen a sizeable growth in traffic, but a shift in its direction, on par with the trade deficit. The majority of American ports now have a negative balance in the traffic they handle (Figure 2). This balance is further exacerbated by a growing level of energy dependency as more than 65% of all the oil consumed in the United States is imported.

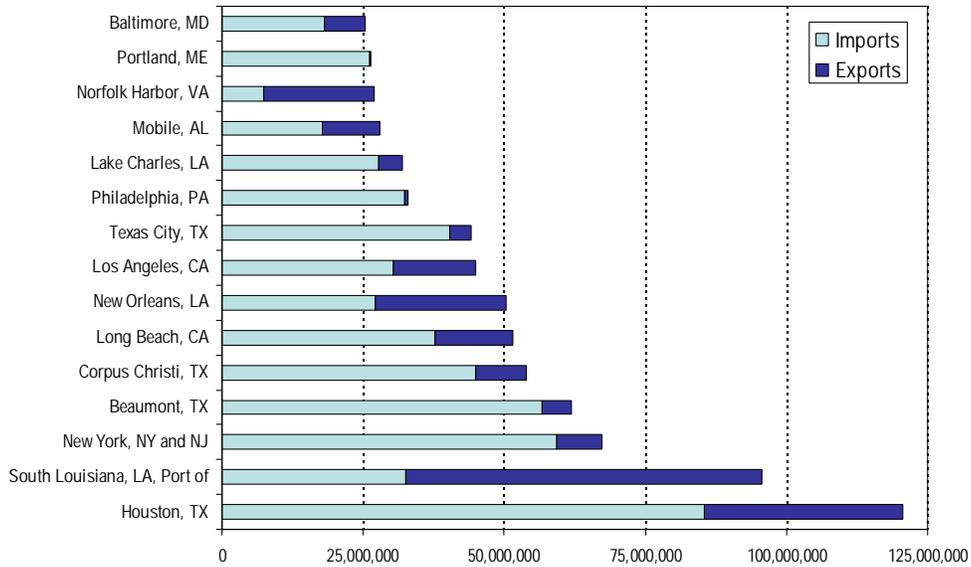


Figure 2 Tonnage of Foreign Cargo Handled by the Top 15 American Ports, 2001
Source: US Corps of Engineers, Navigation Data Center.

The geography of American ports is being affected in a different manner by this global trade structure, which underlines varied regional adjustments. Ports have developed different functions and market areas linked with the endowments of their regions and the size of their markets. In the first part of the 20th century, trade was dominantly concerning Western Europe as East Coast ports grew in accordance and developed a rail transport network to supply continental markets. After World War II, trade relationships shifted with the growth of Pacific Asia economies (notably Japan and China), and more recently NAFTA also impacted on trade flows within the United States with the consolidation of north-south trade corridors.

2.2 The Port of New York

The Port of New York² reflects well the changing commercial geography of the United States with a shift in the direction of its transshipment, as 75% of the value and 90% of the tonnage of its trade is import/inbound-related. It serves a huge regional market as it handles 11% of all oceanborne general cargo imported into the United States and 25% of all containers handled on the Eastern Seaboard. 40% of the Midwest bound cargo transshipped by North Atlantic ports comes through the Port of New York (PANYNJ, 2001). It handled more than 5,000 cargo ships in 2001. As such, New York is the busiest container port of the East Coast and the third largest port³ of the United States. Port activities support directly and indirectly more than 220,000 jobs and contributes \$14.6 billion to the regional economy (NYNJPA, 2003). The metropolitan region it services includes more than 20 million persons representing one of the most extensive accumulations of economic activities in the world. About 700 million tons of freight is being moved annually within the metropolitan area.

The governance of the port of New York is assumed by the Port Authority of New York & New Jersey (PANYNJ), one of the largest public agencies in the United States. The PANYNJ administers a region of about 1,500 square miles (3,880 sq km) centered around the New York Harbor (see Map 1). Under this jurisdiction, it benefits from a very broad governance mandate where it can undertake any project concerning any transport mode as long as it would promote commerce, trade and public good. To finance its activities the PANYNJ can issue bonds, charge user fees and collect rent (Mysak, 1997; Warf, 1988). Concerning its mandate and the governance structure it has established, the PANYNJ cannot be considered solely from a port and maritime transportation perspective, as it has vested interests over a wide array of non-maritime activities.

As such, the PANYNJ differs significantly from the traditional port authority governance model that tends to be focused on public control, often involving ownership of terminals, and the management of port land use and traffic regulation, such as safety. The PANYNJ is responsible for a variety of infrastructures ranging from office space⁴, to bridges and tunnels, industrial development zones, waterfront developments, airports, transit systems and port terminals. No other port authority around the world manages such a diversified

² The term Port of New York refers to the regional port system, which includes New Jersey where the great majority of port activities take place.

³ Both in tonnage and in TEU.

⁴ New York's premier financial center, the World Trade Center, which belonged to the PANYNJ, was destroyed on September 11 2001 by a terrorist attack.

portfolio of activities, infrastructures and terminals within a conterminous geographical and administrative entity.

Within the maritime industry, processes of horizontal and vertical integration are taking place (Slack and Wang, 2002). For instance, the Port Authority of Singapore (PSA), likely the world's second largest port authority, is integrating horizontally by building and contracting the management of container terminals around the world⁵. In 2000, the PSA handled about 25% of the world's container transshipment throughput. On the other hand, many maritime shippers, and other transport operators as well, are integrating vertically along the supply chain in order to control a wider range of value added transport functions. These cases of integration challenge the traditional perspectives on port authorities and their new role for regional and local development in the age of globalization. However, the PANYNJ is either a vertically or horizontally integrated entity as it does not operate outside its jurisdiction and as its assets are not highly, if at all, integrated. It thus represents a "diagonally" integrated entity managing transport assets for the purpose of public good.

2.0 New York and its Port Authority: Regional Gains

2.1 Regional Setting

The role of New York as one of the world's true global cities and the main gateway of the Eastern Seaboard of North America emerged at the beginning of the 19th century (Abu-Lughod, 1999; Sassen, 1991). The history of New York and its port authority is well documented (Doig, 2001). Initially, the hinterland of the port of New York was substantially expanded with the opening of the Erie Canal that opened between 1821 and 1825 to include the resource-rich regions of America's heartland. The canal linked New York to Albany to Buffalo and initiated a new era of growth for inland freight transportation. At that time, New York was only the fifth largest American seaport, behind Boston, Baltimore, Philadelphia and New Orleans. By 1850, New York evolved to become the most active port in the United States, as well as its primate city handling a maritime traffic greater than Boston, Baltimore and New Orleans combined (New York State Canal Corporation, 2001). The later part of the 19th century focused on rail infrastructure developments, undermining the importance of the canal system, but confirming the function of New York as a hub of the national transport system. The growth of port activities went on par with the consolidation of foreign trade, wholesaling, financial, shipbuilding and industrial activities as well as making New York the immigration gateway of North America. Since the New York harbor and the lower Hudson River are the boundary between the states of New York and New Jersey, port development occurred under different jurisdictions.

This process led to conflicts between the two states concerning the usage and jurisdiction of harbor facilities along the Hudson River, which by the early 20th century have become increasingly difficult to manage. In 1917, as the United States entered the First World War, an interstate conflict arose over the issue of rail freight rates. Most of the rail lanes coming from the west ended on the New Jersey side of the harbor while most ocean

⁵ With a focus on China, the Middle East and Western Europe.

shipping was calling from Manhattan and Brooklyn. Freight had to be transferred on barges across the Hudson, exacerbating delays and congestion in the harbor. New Jersey petitioned the Interstate Commerce Commission to lower rail freight rates on its side of the Hudson in order to attract more port calls, but was overruled on the ground that the whole region was one functioning harbor, not two. This was the stepping stone that led to the creation of the port authority, modeled after London's. The Port of New York Authority was founded in 1921 to settle these disputes, which makes it a unique governance case as it spans two powerful states.

Until the 1960s, port activities expanded as New York and the eastern seaboard became of one the world's major industrial regions. This dominance has however changed and New York has intensively de-industrialized since then, implying that its export function has decreased. After a period of relative stagnation, which roughly lasted from the 1970s to the late 1980s, the metropolitan area undertook an unprecedented phase of economic growth in the mid 1990s, with growing local consumption (Warf, 2000). About 80% of the new employment is service-related. New York spurred a new wave of development increasingly leaning on activities global in scale, such as finance and banking, international investments, information technologies, and marketing and media activities (Lakshmanan and Chatterjee, 2000). This situation has incited inbound cargo demands for port activities, notably containerized cargo (Warf and Cox, 1989).

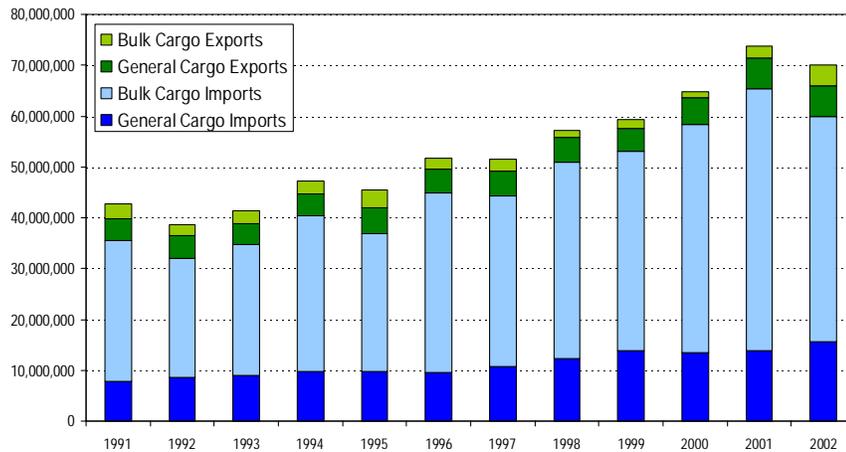


Figure 3 Cargo Handled by the Port of New York, 1991-2002 (metric tons)

The growth of the traffic handled by the port in the 1990s is solely attributed to cargo imports (Figure 3). While cargo exports increased only by 12.3% in tonnage in a decade (1991 to 2001), cargo imports boomed by 84.2%. This evolution well reflects the de-industrialization of the Eastern Seaboard in general and of New York's metropolitan area in particular and the synchronism it imposes on port activities.

2.2 Port Evolution and Infrastructure Developments

To service the needs of the regional economy, the PANYNJ has undertaken since its inception the development of many projects, each linked with the perceived priority of the

time. The most noteworthy achievements of the port authority in its early years (1920s - 1930s) were not the development of port terminals, but the construction or the take over of a succession of bridges and tunnels linking the two states, an urgent need on which both sides of the Hudson agreed. Goethals Bridge and Outerbridge Crossing were the firsts constructed (1928), followed by George Washington and Bayonne bridges (1931). The PANYNJ also received the jurisdiction of the Holland tunnel in 1930 (completed in 1927) and opened the Lincoln tunnel in 1937, both of which were directly servicing high density Manhattan midtown and downtown areas (map 1; PANYNJ, 2001). The issue of connectivity between New York and New Jersey was thus addressed, by road if not by rail⁶.

The post World War II era marked tremendous technological and spatial changes for transport activities in New York, mainly with the development of air transport terminals, which jurisdiction the PANYNJ inherited. By 1948, the PANYNJ was responsible for New York's three major airports, Newark, La Guardia and John F. Kennedy⁷. A major shift was also in the making for maritime transportation. Most port terminals were relocated from the general cargo wharves of Manhattan, Brooklyn, Hoboken and Jersey City to specialized and more spacious terminals at Port Elizabeth, Newark, Red Hook and Howland Hook. By the early 1980s, virtually all maritime cargo transshipment activities in Manhattan ceased and maritime traffic shifted to New Jersey and Staten Island, a complete reversal in the port's geography of freight. Most, if not all, port activities were thus disconnected from the traditional urban core and relocated towards peripheral settings having higher accessibility to rail and interstate road infrastructures. The first dedicated container terminal in the world, the Elizabeth-Port Authority Marine Terminal, opened in 1962.

The 1950s and 1960s saw a commitment to public transit with the opening of the Port Authority Bus Terminal (1950), the Port Authority Trans Hudson railway (PATH, 1962) and the George Washington Bridge Bus Terminal (1963). As New York, like all American cities, was suburbanizing, a growing demand for passenger movements between both sides of the Hudson was being felt. The PANYNJ deemed it had the responsibility to help accommodate this increase in interstate interactions. This focus also reflected a shift in priority in American land transportation development with the funding of regional and national highway systems, which accelerated in the 1950s with the construction of the Interstate system. In the 1970s and 1980s, as New York's economy was compromised by de-industrialization and the flight of head offices of major corporations, the PANYNJ became more specifically involved in regional economic development with the construction of the World Trade Center (1970), the reconversion of maritime terminals into parks and residential areas, the setting of industrial and telecommunication parks and of a power plant (1990).

The early 21st century indicates a phase of focus on improving the efficiency of regional distribution. For instance, the PANYNJ has addressed the problem of connectivity between its two main airports and Manhattan, which could only be reached by road transportation. AirTrain services connecting the Newark airport with regional rail transit opened in late 2001 and another service between JFK and rail accesses to Manhattan opened in 2003.

⁶ The problem of rail connectivity will emerge as a major issue in the 1990s.

⁷ Known at that time as New York International.

Another important regional strategy is the development of a Port Inland Distribution Network where the port authority is seeking to develop inland container distribution centers, namely through barge ports and rail terminals.

| Period | Focus | Projects |
|-------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1920s-1930s | Interstate road connectivity | Geothals and Outerbridge Crossing (1928), George Washington and Bayonne bridges (1931), Holland (1927) and Lincoln (1937) tunnels |
| 1940s | Air transportation | Inherited Newark, LaGuardia and New York International / JFK (1948) |
| 1950s-1960s | Public Transit (suburbanization) | Port Authority Bus Terminal (1950), PATH railway (1962) and George Washington Bridge Bus Terminal (1963) |
| 1970s-1980s | Regional development | World Trade Center (1970), industrial and telecommunication parks, waterfront development and a power plant (1990) |
| 1990s-2000s | Regional distribution | ExpressRail (1991, 2003), E-Zpass ⁸ (1997), port redevelopment (1999), AirTrain (2001, 2003), Port Inland Distribution Network (2003) |

Table 1: Major Development Phases of the PANYNJ

Since its inception, the PANYNJ continuously expanded its assets (Table 1). Doing so, it provided New York with an extensive array of terminals handling freight and passengers. New York could not have become a global city without the transshipment and distribution capabilities provided by these projects. The PANYNJ has grown along considerably and exercises a sizeable influence over the city’s transport system with 7,200 employees, an annual budget of \$4.6 billion and a cumulative infrastructure investment of \$35 billion (PANYNJ, 2001).

⁸ A toll system using electronic tags which are valid in all major tolls in the states of New York, New Jersey, Pennsylvania, Delaware, Massachusetts and Maryland. It is probably the most extensive electronic toll system in the world.



Map 1: Facilities of the New York and New Jersey Port Authority, 2003. Source: PANYNJ, 2001; Bureau of Transportation Statistics, Transportation Atlas of the United States.

Map 1 provides an overview of the facilities and terminals under the jurisdiction of the port authority as of 2003. They fall under four major sectors of activity (Table 1).

| Sector | Key Infrastructures |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Port terminals | Five container terminals that handled 3.7 million TEU in 2002. |
| Bridges and Tunnels | All river crossings between New York and New Jersey with more than 250 million vehicular crossings per year. Four bridges and 2 tunnels. Electronic toll system. |
| Airports | Three major airports; Newark, John F Kennedy and La Guardia. Combined traffic of 81.1 million passengers in 2002. World's largest overseer of air traffic. 2.5 million tons of air freight. |
| Public Transit | Heavy rail system linking New Jersey and New York; 73.3 million passengers in 2000. Two bus terminals handling about 62 million passengers in 2001. Two light rail systems linking Newark and John F Kennedy airports to metropolitan public transit. |
| Regional Development | Industrial parks, Commercial developments, Waterfront urban developments and a power plant. |

Table 2: Sectors of Activity of the PANYNJ

3.0 The Port Authority and Port Development: Local Challenges

3.1 The Challenge of Containerization

Containerization has been a dominant paradigm shift of maritime transportation over the last 30 years (Slack, 1998) and has triggered a phase of port restructuring (Rodrigue et al., 1997). Over this issue, the PANYNJ has a tradition of innovation and adaptation, since the first containership called from New York in 1956 and the first specialized container terminal was constructed at Port Elizabeth, New Jersey in 1962. By the 1970s, New York was the largest container port in the world, handling just under 1 million TEUs in 1975, 1.9 million in 1980 and 2.3 million in 1985. From this peak, a period of stagnation and relative decline endured as New York was handling roughly the same amount of containerized traffic in the early 1990s (1.8 million TEUs) as it did in the early 1980s. While the decline of the port of New York during that period can be attributed to international trade changes, which are exogenous factors outside local control, endogenous factors such as inadequate intermodal rail access and high labor costs, played significantly in its demise (Warf and Kley, 1989).

Meanwhile, Pacific Asian container ports, such as Hong Kong, Singapore, Kaohsiung and Pusan, as well as Pacific Coast ports such as Los Angeles and Long Beach, boomed and

topped New York. Even if containerization resulted in significant productivity gains in maritime transportation, these gains were not uniformly achieved and newer container handling facilities had an advantage in terms of the quality of their infrastructures as well as room for development. It is worth noting that most of these ports, especially Hong Kong and Singapore, are transshipment ports deriving the bulk of their activities from their intermediate functions. While intermediate ports are more linked to business cycles of the global economy, which means their foreland, a port such as New York is more linked to the cycles of its regional economy. It represents a significantly different dynamics linked to its hinterland.

The New York metropolitan area houses 20 million people, with an extra 80 million can be reached within 24 hours, making the direct hinterland of the port of New York the largest in North America and one of the most extensive in the world. Under such circumstances, the late 1990s saw a spectacular growth of container traffic for New York, and the port was able to maintain its rank among the 15 largest container ports in the world with a traffic over 3.7 million TEUs. Its national share has also improved in the last 5 years as the Port of New York / New Jersey accounted for 13.5% of all containers handled by American ports in 2002 (PANYNJ, 2003).

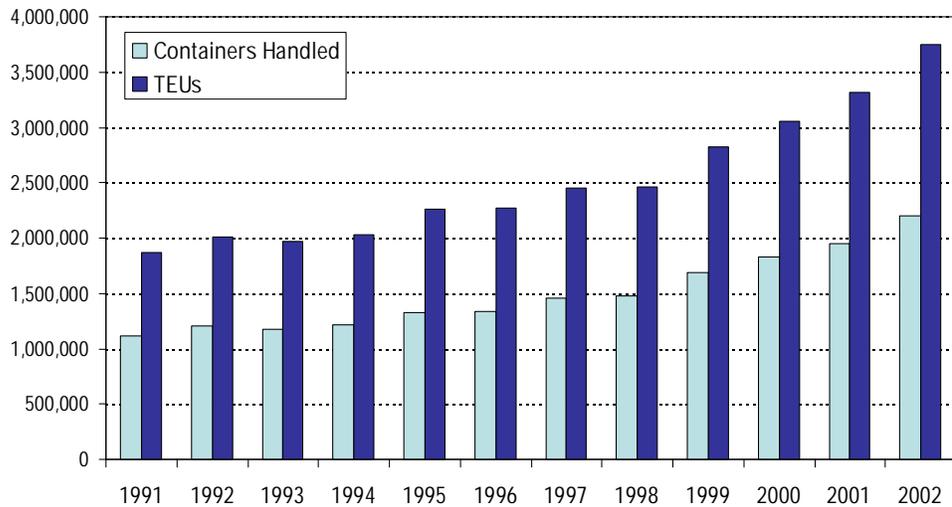


Figure 4 Container Traffic Handled by the Port of New York, 1991-2002

Source: Port Authority of New York and New Jersey.

Container traffic also underlines the issue of regional development, since 75% of all container traffic handled by the PANYNJ is bound for or coming from locations within a 400 km radius. The significant growth of containers handled by the port of New York in the late 1990s is thus the result of regional freight demand (Figure 4). Although during the 1980s and early 1990s the hubbing role of New York was challenged by traditional rivals such as Baltimore, Philadelphia and Montreal and by new rivals such as Halifax and Hampton Roads. The beginning of the 21st century leaves New York the undisputable maritime container hub of the North Atlantic Coast. It handled about 70% of all the maritime container traffic of the North Atlantic façade. The traditional perception of New York as an

expensive port has changed and the port is now competitive with other Atlantic ports for handling containerized freight. This status was confirmed in 1999 when Maersk-Sealand, the world's largest container shipper, decided to keep New York as their East Coast hub. The growth of containerized traffic between 1995 and 2002 for the PANYNJ topped the combined growth of all its competing ports of the North Atlantic range. New York's hubbing role is one of the most pronounced in the United States, since it received the largest number of containership calls, even if it is the 3rd largest container port. Comparatively, West Coast ports are more inland gateways than hubs.

3.2 The Challenge of Governance

The unique governance structure of the port authority has obviously several benefits but also implies challenges. Scales, both geographic and economic, strongly play in favor for the PANYNJ as its jurisdiction includes the bulk of New York's metropolitan area. This implies that regional transportation problems can be addressed regionally and that funding can be drawn from the already massive and diversified assets of the port authority (see figure 3). Further, several large agencies regulating freight transportation which, such as the Metropolitan Transportation Authority (MTA) and the New York State Department of Transportation, offer collaborative opportunities that however tend to be complex to achieve (Holguin-Veras and Paaswell, 2000).

The financial profile of the PANYNJ reveals that operating revenues were more than \$2.7 billion in 2002, of which 57% were derived from air terminal operations, 30% from interstate transportation (bridge tolls and transit fares) and only 5% from port activities. This is the result of a long process of diversification over several transport modes servicing the metropolitan area and port infrastructures account for only 11% of the PANYNJ's assets. At the beginning of the 21st century, the PANYNJ is considering several transport infrastructure solutions to keep the port competitive and tuned to the global function of New York. The nature of the PANYNJ's governance is consequently a factor in port activity development.

Although the PANYNJ was created to avoid rivalry between the states of New York and New Jersey, notably over rail access, the development of infrastructures is not devoid of turf wars which have endured since its inception, such as which state has the jurisdiction of Ellis Island. Different goals are competing within the agency, which is caught in the difficult game of trying to allocate funds equitably and for the benefit of the whole metropolitan area. Each new project reflects a rivalry, which is expressed internally within a board of 12 commissioners equally appointed by the governors of New York and New Jersey (Doig, 2001; NY Department of City Planning, 1995; Moss, 1988; Warf, 1988). Under such circumstances, the bi-state governance structure imposes an extra conflict layer to the traditional port authority model, which dominantly leans on conflicts between the port and the city. Considering the diversified involvements of the port authority, as indicated by its assets, there are numerous alternatives to mitigate conflicts in investment allocation. For instance, investment in maritime activities, dominantly in New Jersey, can have some proportionate equivalent in the state of New York, but for a project involving a different mode.

4.0 Conventional Responses to Port Development Challenges

Even if the major changes affecting port operations are global and regional in scope, it is at the local level that these changes force adjustments, namely for port terminal facilities (Slack, 1994; McCalla, 1999). The local transport geography offers several challenges for the development of port activities in the New York metropolitan area, to which the PANYNJ has provided solutions which are increasingly complex to implement and expensive to fund. The major challenge is to upgrade the facilities to face the needs of port operations in the early 21st century. To do so, the PANYNJ has committed in 2000 a \$1.8 billion port redevelopment five-year plan to which local private operators committed another \$500 million in marine terminal investments. These mainly include added terminal capacity and dredging, a conventional response of many port authorities to development problems.

4.1 Added Terminal Capacity and Efficiency

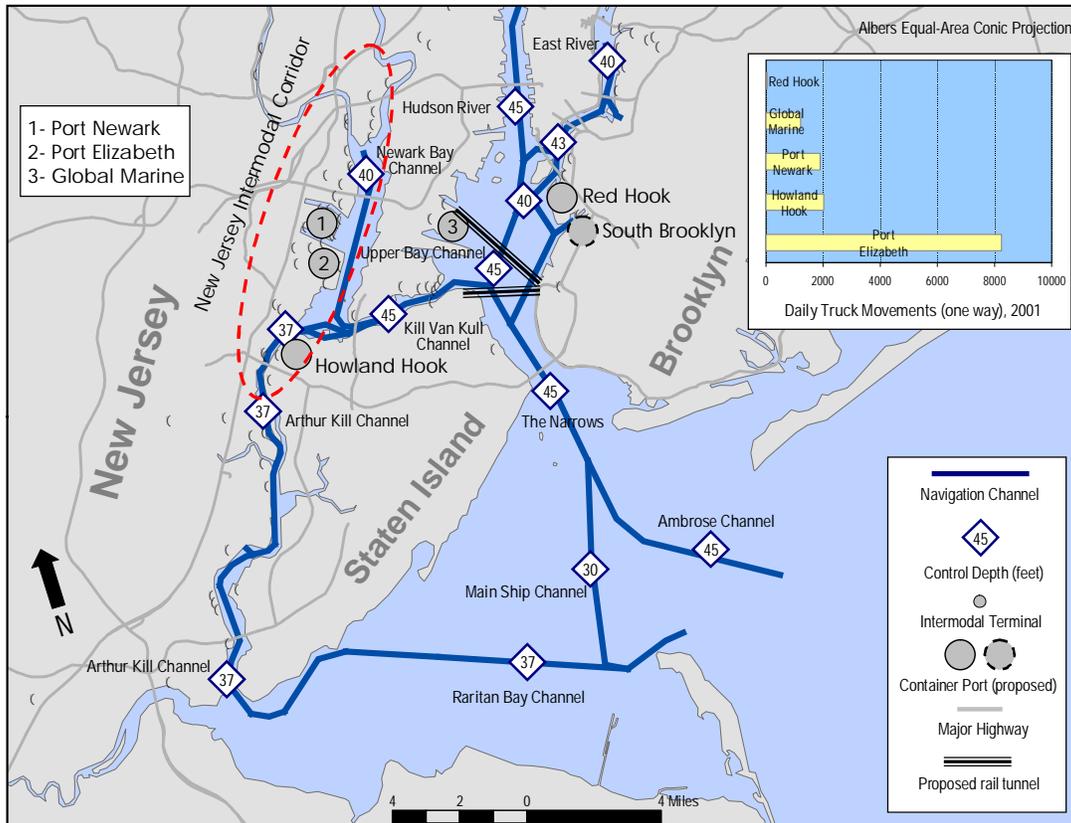
The port of New York handled just over 3.7 million TEU in 2002, with a total capacity of about 4 million TEU, which means that the port roughly operates around 90% of its potential capacity. This capacity is however insufficient to accommodate future container traffic growth, which is expected to double to 6 million TEU by 2015. This would require substantial infrastructure improvements, such as expanding and developing terminals, increasing container storage capacity and accelerating container movements (O'Neil and Moss, 1998). Among the major alternatives for terminal productivity improvements are (Map 2):

- **Howland Hook.** A container terminal reopened in 1996 and expanded to accommodate on-dock rail services. By 2006, its capacity will have been doubled to 1 million TEU per year, or about 25% of all the projected growth in container traffic.
- **Port Elizabeth.** The main container terminal handling about 60% of the containerized traffic. To be extended with on-dock express rail facility in 2004. This terminal offers the only double-stack rail link within the PANYNJ, and is thus a high-priority investment.
- **South Brooklyn Marine Terminal.** The PANYNJ is considering reactivating this terminal, which is currently used for storage and to handle some bulk cargo, to provide additional container traffic capacities. However, this site is seriously impeded by lack of space and accessibility to the highly congested local road network. Direct rail access to New Jersey is currently provided by a float barge system.

4.2 Channel Deepening

Planned channel deepening reflects the world-wide driver that, as the global container fleet is upgraded with larger ships, major ports face the challenge of accommodating deeper vessel drafts (Slack, 1994). From a port authority perspective, this is a typical challenge of finding and justifying funds. While a typical Panamax containership could be accommodated by a 35-foot (10 m) channel, the new generation of post-Panamax containerships handling between 4,000 and 6,000 TEUS requires a channel depth between 42 and 52 feet (13 – 16

m). The current channel depth of 40 feet for its container terminals makes New York uncompetitive in view of several North American ports, where most of them have better channel depths. Channel deepening is thus an important issue for the port to keep and enhance its containerized traffic and to meet the demands of international shipping in the 21st century. The current major bottleneck for the expansion of maritime access to container facilities is the Kill Van Kull channel (Map 2), over which the PANYNJ has been under strong pressures to deepen.



Map 2: Intermodal Facilities and Navigation Channels of the Port of New York, 2002.
Source: Bureau of Transportation Statistics, Transportation Atlas of the United States.

Channel deepening is being undertaken in two major phases. The Army Corps of Engineers⁹ started the first phase of dredging work in 1999 and by 2003 a 45 feet channel was ready at a cost of over \$700 million. In 2001, the PANYNJ accelerated and expanded the dredging project to a proposed depth of 50 feet encompassing the whole harbor access channel, which is expected to be completed by 2009. Dredging costs are estimated to be around \$1.8 billion, of which about 50% would be provided by the port authority (PANYNJ, 2002). However, environmental and technical problems arise as a 50 feet deep channel

⁹ The sole agency authorized to undertake dredging projects in the United States.

would involve cutting through the bedrock at several points. This project also includes the deepening of the Arthur Kill channel, which links the Howland Hook container terminal to the Kill Van Kull channel, to 41-45 feet, from its current depth of 37 feet. It would be required for Howland Hook to accommodate expected growth in container traffic and larger containerships.

5.0 Port Regionalization: A New Challenge to Port Development

Although many solutions brought forward by the port authority can be labeled as conventional, a new set of strategies have been advanced to improve the efficiency of the port. They have in common that the port must look outside its immediate jurisdiction as a focus of its future development. Such strategies fall within a perspective of port regionalization where a port seeks a closer integration with the supply chains of its hinterland.

5.1 Local Accessibility to Maritime Terminals

New York's densely populated region has strong impacts on the port hinterland, since 87% of containers bound for the port are carried by 15,000 trucks travels each day¹⁰. Alone, Port Elizabeth generates more than 8,000 trucks travels per day (Map 2). Local accessibility to maritime terminals is thus of strategic importance for regional freight distribution. This problem is further exacerbated by congestion and very high local transportation costs, which are on average 30% higher than other American metropolises. Freight movements across the harbor are limited to two bridges, George Washington and Verrazano, handling crossings of more than 30,000 trucks per day. Road congestion is expected to increase by 50% by 2020 (NYCEDC, 2000). Recognizing this drawback in inland accessibility, the PANYNJ is developing two strategies:

- **Rail / ship connectivity.** The PANYNJ is trying to promote better intermodal rail connectivity at Port Elizabeth, Howland Hook and Port Newark. Built in 1991, an ExpressRail terminal offers direct ship-to-rail and rail-to-ship transshipment capabilities and enables freight traffic to shift away from roads as an entry/exit point to port facilities. It handled 228,551 containers in 2002. A new terminal having better truck and rail access is scheduled to open in 2004 (PANYNJ, 2003). It is expected that by 2010, intermodal rail share would climb to 25-30% of transshipped containers, resulting in improved economic and environmental benefits for the locality (NYMTC, 2001). Inland rail terminals could consequently act as satellite terminals and permit freight circulation to avoid the congested road system of the metropolitan area, especially near port terminal facilities.
- **Cross-harbor tunnel.** Another major problem is related to cross harbor rail accessibility between Brooklyn and New Jersey port terminals, where cross harbor rail traffic must either take a 140 miles north detour through Albany or be floated by rail barges. A cross-harbor rail tunnel was proposed by the New York City

¹⁰ The national average is 44%.

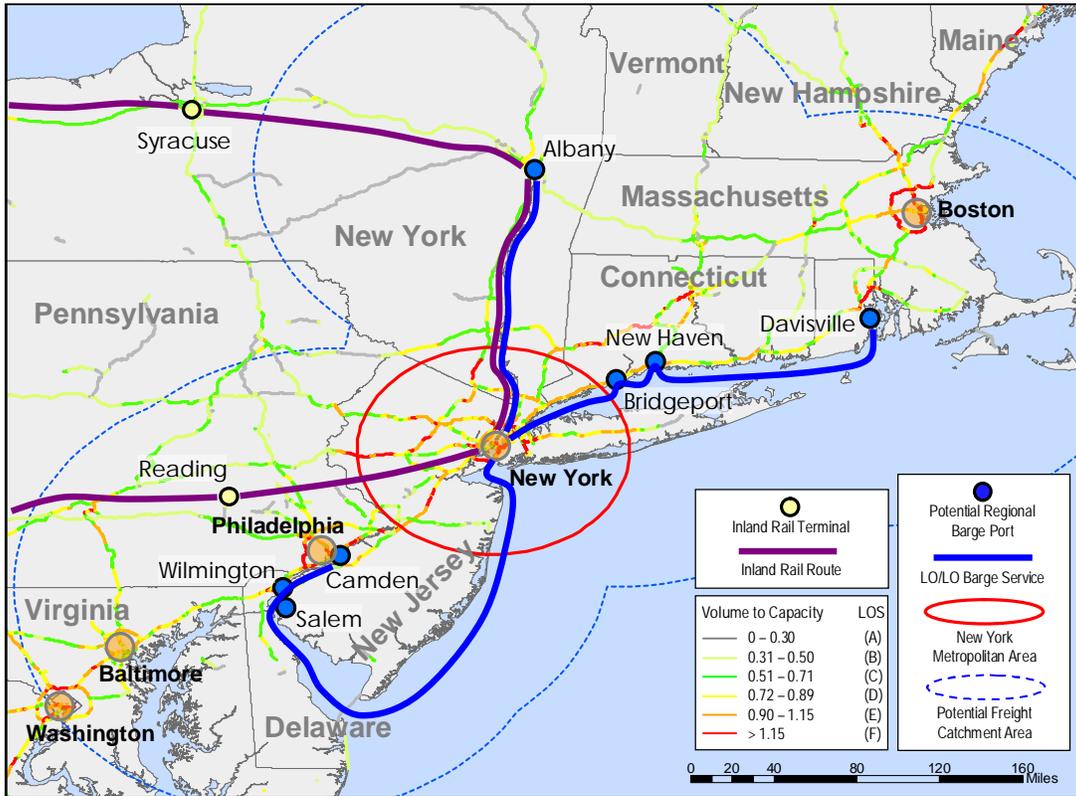
Economic Development Council as a solution to this problem¹¹, either from Greenville Yard in New Jersey or from Staten Island (Map 2; NYCEDC, 2000). Brooklyn harbor has good maritime, but weak inland access and such an alternative would support the construction of a major container terminal in South Brooklyn. Through modal diversion, a rail tunnel would alleviate freight movements between New Jersey and Long Island by an estimated reduction of 6% of all trucking trips. This project is controversial namely because of very high construction costs, ranging anywhere between \$1.3 and \$2.4 billion, and poor terminal accessibility in Brooklyn. As an alternative, further expansions of rail float barge services, including Red Hook, have been initiated (NYMTC, 2001). However, the question remains as if these services would be adequate to satisfy the requirements of a modern container terminal on the Brooklyn side of the harbor, where rail access is primordial.

5.2 Regional sub-harborization

A Port Inland Distribution Network (PIDN) has been proposed in 2002 by the port authority to relieve road congestion in the metropolitan area, to reduce distribution costs, to expand port throughput, to increase the efficiency of inland freight distribution and favor inland development by using a set of inland rail and port terminals to handle containers (PANYNJ, 2003; Map 3). It will use a mix of barge ports and inland rail freight terminals. About 82% of the regional container market is located within 50 miles of the proposed terminals. Barges will increasingly be used to ship containers to regional terminals, such as Albany (NY), Davisville (RI), Bridgeport (CT), New Haven (CT), Camden (NJ), Salem (NJ) and Wilmington (DL), where the cargo will be unloaded to trucks for its final destination (Map 3). Through a modal shift, this would create a freight diversion effect preventing trucks to enter the metropolitan area and the capture of a wider market area.

An agreement with the Port of Albany has been signed under which it will be used as the first regional freight distribution centre. Since the channel depth on the Hudson between New York and Albany is a least 32 feet and available year-round, a high capacity LO/LO (Lift On / Lift Off) container barge system that could increase the port's market area in southeastern Canada (Ontario and Quebec) can be established. Oceangoing containerships arriving in the New York harbor could directly be unloaded on barges and then shipped to regional barge ports. Once in place, this distribution network would create a regional port having a radius of about 250 km around New York. However, the constraints of the Jones Act, restricting cabotage to American carriers, may impede the development of a regional port system.

¹¹ The construction of a rail freight tunnel has been considered by the PANYNJ and other agencies since 1936.



Map 3: Port Inland Distribution Network and Regional Sub-Harborization of Container Terminals by the Port of New York, 2003. Source: PANYNJ (2003) and US DOT-FHWA Office of Freight Management (2003).

5.0 Conclusion

The regional dynamics and the function of the port of New York have changed substantially during the 20th century. One of the main reasons why the port of New York has stagnated in the 1970s and 1980s is linked with uncompetitive transshipment costs, local road congestion, limited capacity (both for transshipment and berth for post-Panamax ships) and above all a shift of world trade towards the Pacific Rim. However, regional economic growth has spurred new port and freight distribution opportunities. The port of New York is linked to the trade characteristics of the American economy, with a recurrent trade deficit that is reflected in systematic imbalances in traffic with greater quantities of inbound cargo. This structural problem cannot be addressed at the local and regional levels and represents a condition that American ports, including New York, must adapt to.

One of the main challenges of the early 21st century is thus for New York to reaffirm and strengthen its prominence as the gateway of the North American eastern seaboard. The responses to these challenges go beyond the traditional perspectives centered on the port itself. Port regionalization thus represents the next stage in port development where

efficiency is derived with higher levels of integration with inland freight distribution systems. This expands the concept of port hinterland, but also port forelands. For instance, the Port Authority is looking east to reach Asia through the Suez Canal route and thus improve its share of the transpacific trade (Parker, 2000). This trade, notably the China trade, accounted for most of the growth of the cargo traffic handled by the port. By shifting some cargo from transpacific to transatlantic routes (via Suez), it is expected to the amount of cargo handled by New York would grow by 2.5 million TEUs by 2020. Alliances with Mediterranean ports, such as Suez and Genoa, are sought to achieve this goal, but the fundamentals would remain shipping time and costs. For instance, while the Singapore – Panama Canal – New York route is cheaper than the Singapore – Seattle – New York route (using rail across the United States), with about \$750 per TEU compared with about \$1,300 per TEU, it is almost as twice as long (36 days compared to 19 days). As far as rates are concerned, the Chicago – St. Louis axis represents the equal cost line between transpacific and Suez routes, and the PANYNJ is well aware of the clear advantages of West Coast ports for the inland distribution of cargo bound from Pacific Asia. However, trade with South Asia represents a significant potential for traffic growth, as the region falls within New York's foreland. Any improvement in the Suez segment compounded with more efficient inland access would in theory help New York consolidate its continental hinterland. It thus appears that the battle over port forelands will be decided over the hinterland, a segment of the distribution chain over which port authorities could play a more significant role.

The intermodal and hubbing future of the port lies in the Staten Island / New Jersey corridor (Map 2) where land is available for infrastructure development and inland accessibility is optimal to both road and rail transport systems. In view of larger containerships, physical infrastructure developments are primordial and mainly include channel deepening, adequate berths and cranes, enough terminal space to handle transshipment and its logistics and rail and highway connections (O'Neil and Moss, 1998). Although the Brooklyn section of the harbor offers some development possibilities for container operations, notably if a cross-harbor tunnel is built, investments on the Staten Island / New Jersey corridor would provide more benefits as it is better linked with the Boston – Washington corridor. The maritime industry and terminal operators have already made this commitment on the west side of the harbor. The challenge lies on how the traditional New York / New Jersey rivalry may skew those port development strategies necessary to insure that New York remains the maritime gateway of the Eastern Seaboard of North America in the 21st century.

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