
final report

Hunts Point Waterborne Freight Assessment

Opportunities to Meet the Community's Freight Transportation Needs Through Waterborne Strategies



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Executive Summary

The Hunts Point Food Distribution Center, occupying 329 acres in the Bronx adjoining the East River, is the nation's largest wholesale food distribution center. It is active in the receipt, processing, distribution, and sale of produce, meat, and specialty food products, and will soon be home to the relocated Fulton Fish Market. The Hunts Point Food Distribution Center provides over 3,000 jobs and \$3 billion in sales annually. Nearly 80 percent of the New York metropolitan area's produce and 40 percent of the region's meat is shipped through the Hunts Point Market. It is a huge economic success story for the Bronx and for the region as a whole.

Market activities generate a substantial amount of vehicle traffic over the area's already-burdened transportation system. Domestically produced goods are shipped to the market by truck and by rail. International goods arrive at the region's airports or seaports and are trucked to the market. Buyers come to the market from all over the region, picking up goods by truck and by car. Employees travel to work by car, public transit, and on foot.

The safe, reliable, and cost-effective movement of goods and people to and from the Market is essential for it to function effectively, maintain and grow its business, and generate employment and other economic benefits for the community. However, direct rail service into the market is limited and market-bound trucks and cars must navigate the region's congested highway system. A number of regional transportation studies (recently completed or still underway) address Market access needs within a larger regional transportation context, focusing on highway and rail system improvements.

The New York/New Jersey region is one of the world's leading centers of marine transportation and seaport activity. Hunts Point is directly accessible by a major navigable waterway, but currently is not served by either freight or passenger vessels. The question has been asked: could we do more with waterborne services to meet the current and future transportation needs of Market businesses and employees? In response, the New York Metropolitan Transportation Council (NYMTC) and a variety of public and private sector partners initiated the *Hunts Point Waterborne Freight Assessment*.

Truck access is a major regional and local transportation issue, and *Hunts Point Waterborne Freight Assessment* focused on waterborne strategies to help offset some of the local and regional impacts of trucking to and from the Hunts Point area. The study also asked whether goods movement strategies also could meet related passenger transportation demand for Market employees and customers.

After identifying multiple possibilities, the following potential waterborne services were selected for evaluation:

- Hunts Point to LaGuardia, Newark, and JFK Airports;
- Hunts Point to the East End of Long Island;
- Hunts Point to Port Authority of New York and New Jersey (PANYNJ) marine terminals and the Connecticut Coast; and
- Hunts Point to New Jersey markets and west of Hudson markets.

Potential ferry operations were evaluated based on several criteria:

- First, the operation must meet an identifiable demand. There has to be a minimum base level of potential traffic to support the service.
- Second, the operation must be physically and operationally feasible. There has to be a suitable location for an appropriately sized terminal, with adequate navigation channels, providing effective connections to ferry users and the regional transportation network.
- Third, the operation must provide an attractive level of performance, in terms of its speed, price, frequency, reliability, and security. It has to be competitive with other available transportation choices to capture a fair share of market demand. Interviews with a limited sample of Market representatives suggested that what they want is what they already have – fast, on-demand, reliable, door-to-door trucking service, along with the availability of rail service for long-distance shipments. They are not interested in doing things any differently in order to use a waterborne transportation option. A service that seems consistent with the Market’s needs would use the water as a “floating highway” to move trucks, truck trailers, and/or containers, with marine transportation substituting for part of the highway trip.
- Finally, the operation must provide economic, transportation, and environmental benefit at a reasonable cost, with a high likelihood of being stable and sustainable as a business proposition. Many ferry services require public subsidies – which may be warranted if significant, sustainable public benefits are generated.

The following waterborne services appear to have limited benefit or feasibility, and are not recommended for further consideration:

- **Hunts Point to LaGuardia Airport freight ferry.** No freight demand was identified and there is no suitable location for a freight ferry at LaGuardia.
- **Hunts Point to Newark Airport freight ferry or freight/passenger ferry.** Very limited freight demand for Hunts Point commodities was identified; there is no direct access to water at Newark Airport and no identifiable terminal location; ferry service time would not be competitive with trucking; and ferry operations would have to be heavily subsidized to offer a price competitive with trucking.
- **Hunts Point to JFK Airport freight or freight/passenger ferry.** Although freight demand for Hunts Point is identifiable, there are significant constraints for vessel

operation in Jamaica Bay, including shallow berthing areas, low bridges, and sensitive wetlands requiring low-speed/low-impact operations; ferry service time would not be competitive with trucking; and ferry operations would have to be heavily subsidized to offer a price competitive with trucking.

- **Hunts Point to East End of Long Island freight ferry or freight/passenger ferry.** Very limited freight demand for Hunts Point commodities was identified; no suitable terminal location could be identified; there is a high likelihood of local opposition by East End communities; ferry service time would not be competitive with trucking; and ferry operations would have to be heavily subsidized to offer a price competitive with trucking.

The following waterborne services appear to have potential benefit and are recommended for further feasibility analyses:

- **Hunts Point to Port of New York and New Jersey container barge.** This would be an additional stop for a planned port-to-port container roll-on/roll-off barge service being implemented between the Port of New York and New Jersey (PONYNJ) and Bridgeport, Connecticut. It could provide a potentially viable alternative for moving international containers locally (between PONYNJ and the Bronx) and for moving domestic and international containers regionally (between New England and the Bronx). Key questions include the level of anticipated demand (which may be limited), the potential effect on community streets, whether the PONYNJ-Bridgeport service and its users would be negatively impacted by adding another stop, and the potential need for public subsidy.
- **Hunts Point to New Jersey and West of Hudson markets.** This could be a drive-on/drive-off truck ferry service, providing a “floating highway” link between Hunts Point and the west of Hudson regional and national transportation system. The west of Hudson market includes a mix of long-haul traffic (from the Midwest, South and West) as well as regional traffic from New Jersey railyards, international gateways, and producers/consumers. Sketch planning assessments indicate that under certain conditions, ferry services could offer reasonably competitive performance in terms of time and cost versus trucking. Further analysis will be needed to identify the specific origins and destinations of west of Hudson traffic, the range of vessel types and characteristics that might be used, the specific west of Hudson areas and sites that might be available, the incentives and improvements necessary for host communities to support a terminal, and the potential need for public subsidy. Strategies to limit the amount of “through” traffic between North Jersey and areas other than Hunts Point also should be explored, so that Hunts Point is not burdened with additional non-local truck traffic. Options could include limiting the service to Hunts Point origins and destinations, or creating a multi-tiered pricing system to discourage through traffic, or to continue the service further east to a point on the Connecticut coast to accommodate North Jersey-New England traffic.

The cases for a container barge stop at Hunts Point, or for a truck ferry between Hunts Point and New Jersey, are by no means proven at this point. These are envisioned as local services to enhance truck access to/from the immediate Hunts Point community, and do

not substitute or reduce the need for other major highway, rail, and marine transportation improvements being planned to serve the New York/New Jersey region as a whole. However, the fact that there are scenarios in which freight ferries serving Hunts Point could be competitive with over-the-road trucking suggests that the opportunity merits further consideration, as a limited capacity highway substitute for Hunts Point traffic that cannot be handled by rail or other alternative modes of freight transportation.

If freight services justify an investment in developing a ferry terminal at the Market, then passenger-only services could be added at relatively low-capital cost. Although this study did not quantify passenger opportunities, two concepts did emerge.

- **Hunts Point to LaGuardia passenger ferry service.** The freight analysis suggested that ferry service to/from LaGuardia would be highly competitive with auto and transit services. The PANYNJ is investing to reestablish a Manhattan to LaGuardia service, and is providing the necessary terminal facilities (at the former Delta Water Shuttle site). Key questions include the total demand from Hunts Point, and the impact of increasing demand (by creating linkages to the New York City public transportation system) on Market activities.
- **Regional passenger ferry network connectivity.** A variety of passenger ferry services currently operate in the East River. New York Water Taxi currently runs between Manhattan and Hunters Point, Fulton Landing, Red Hook, and Brooklyn Army Terminal, generally between 6:30 a.m. and 8:30 p.m. There is an even more extensive system of ferry routes between New Jersey and Manhattan. These service networks could potentially be extended to Hunts Point in the future. Because market businesses operate extensively in the overnight and off-peak periods, the availability of after-hours ferry service would be a key issue.

An initial limited engineering feasibility assessment suggests that development of a four-acre marine terminal could be developed adjoining the Fish Market site, on property owned (but not currently used) by the New York City Department of Sanitation. The terminal would have sufficient water depth and land area to accept container barges (with a limited amount of on-site storage), truck ferries, and/or passenger ferries. The development cost is estimated at around \$6.4 million based on currently available information. The terminal would be compatible with adjoining land uses, would not require major marine improvements (dredging or pier construction/demolition), and is not expected to require roadway improvements.

Overall benefits associated with these waterborne service opportunities would include:

- Improved transportation services for Market businesses;
- Regional transportation system benefits (from reductions in over-the-road mileage by trucks) and local benefits (from management of local truck patterns);
- Regional air quality benefits; and
- Improved regional accessibility for employees, customers, and area residents.

As a next step in this process, it is recommended that the study sponsors and interested stakeholders work closely with the Market business community, with the larger Hunts Point community, and with responsible agencies (transportation, planning, environmental, and economic development) at the Borough, City, regional, and state levels to:

- Determine which, if any, of these opportunities to pursue further.
- Initiate discussions with potential service partners and regional stakeholders.
- Perform follow-on estimates of travel patterns, market demand, and engineering feasibility where needed, for the Hunts Point-New Jersey and PANYNJ-Hunts Point-Bridgeport container barge options.
- Perform further studies of shipper-specific distribution patterns. Available data did not allow for the examination of individual Market businesses and customers, but there may be significant unit moves by shippers or receivers that offer additional opportunities.
- Initiate discussions with potential developers, operators, and regional partners, as warranted.

1.0 About the Hunts Point Waterborne Freight Assessment

■ 1.1 Origin and Purpose

The *Long Island Sound Waterborne Transportation Plan* (LISWTP) is a planning initiative which is exploring the potential for expanding the use of the Long Island Sound and its tributaries for waterborne passenger and freight transportation. Development of the *Plan* was launched in February 2002. The issue of the feasibility of waterborne freight transportation to/from the Hunts Point Peninsula area has emerged from extensive community involvement undertaken as part of the *LISWTP*.

The peninsula is home to the Hunts Point Market, the nation's largest regional food distribution facility, which generates significant traffic activity. The anticipated opening of the relocated Fulton Fish Market on the Hunts Point Peninsula in the South Bronx by the end of 2004 has further increased the concerns of community residents in and around the peninsula about the impacts of increased truck traffic on their community.

In response to these concerns, the Bronx Borough President's office and The Point Community Development Corporation reached out to the New York Metropolitan Transportation Council (NYMTC) to coordinate discussions between its members and community representatives on waterborne alternatives for moving freight to the peninsula to support the operations of both the current Hunts Point Market and the planned Fish Market. Since the peninsula serves as a key regional distribution point for these commodities, any waterborne alternatives which help the local community also might help the larger region. In terms of reducing truck travel and its impacts, NYMTC's members have responded to these concerns by including the *Hunts Point Waterborne Freight Assessment* in the current NYMTC Unified Planning Work Program, as a supplement to the LISWTP

The *Hunts Point Waterborne Freight Assessment* is first and foremost a freight study, but it also explores the possibility for combined freight/passenger services. It is primarily intended to: define baseline conditions in the Hunts Point area; identify potential opportunities for freight and freight/passenger waterborne services; evaluate alternatives in terms of business, transportation, and economic performance factors; evaluate the feasibility of implementing the most promising alternatives; assess the benefit and cost of potential waterborne services; and identify recommended next steps.

■ 1.2 Study Participants

The *Hunts Point Waterborne Freight Assessment* was performed under contract to the New York Metropolitan Transportation Council (NYMTC). NYMTC is the designated Metropolitan Planning Organization (MPO) for the five Boroughs of New York and the counties of Nassau, Suffolk, Westchester, Putnam and Rockland. NYMTC is governed by a Board of voting members consisting of:

- New York State Department of Transportation (NYSDOT);
- New York City Department of Transportation (NYCDOT);
- New York City Department of City Planning (NYCDCP);
- County executives of Nassau, Suffolk, Westchester, Putnam and Rockland; and
- Metropolitan Transportation Authority (MTA).

The study was directed by a Steering Committee consisting of representatives of:

- New York State DOT;
- New York City DOT, DCP, and Economic Development Corporation;
- Bronx Borough President's Office;
- Queens Borough President's Office;
- City Council District #17;
- Waterfront Committee of City Council;
- Community Board #2;
- Bronx Overall Economic Development Corporation;
- Hunts Point Economic Development Corporation;
- The Point Community Development Corporation;
- Sustainable South Bronx;
- Hunts Point Produce Market;
- Vista Food Exchange; and
- Port Authority of New York and New Jersey.

■ 1.3 Related Planning Efforts

The *Hunts Point Waterborne Freight Assessment* was closely coordinated with the *Long Island Sound Waterborne Transportation Plan*, and utilized data and tools developed under that

effort where applicable to the specific issues and opportunities at Hunts Point. In addition, the study made use of information from the following studies (ongoing and completed) and data sources:

- NYMTC Regional Freight Plan and Freight Facilities Inventory;
- Port Inland Distribution Network, Bridgeport Container Barge, and New Haven Feeder Barge studies;
- New York Customs District Air Cargo data;
- PANYNJ JFK Air Cargo Access Study;
- Comprehensive Port Improvement Plan;
- NJDOT Portway Extensions Study;
- NYCEDC Cross-Harbor Freight Movement MIS and EIS;
- NYCEDC East of Hudson Rail Freight Program;
- Fulton Fish Market Draft and Final EIS;
- NYC Arterial Goods Movement Study;
- NYSDOT Hunts Point Truck Study (Draft);
- NYSDOT Bruckner-Sheridan Interchange Reconstruction EIS;
- NYSDOT Bronx Arterial Needs Assessment Study;
- NYMTC Sustainable East End Development Strategies; and
- U.S. Army Corps of Engineers and Coast Guard Navigation Data.

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2.0 Conditions in the Hunts Point Area

■ 2.1 Geography and Land Use

Hunts Point is a peninsula located in the southeast portion of the Bronx, adjoining the East River at the mouth of the Bronx River (see Figure 1 below). Water forms two main boundaries of this generally triangular district; the third main boundary is a major transportation corridor consisting of the Bruckner Expressway and the Metro North Railroad's New Haven Line. The waterfront adjoining the East River comprises three historic "points" – Oak Point, Barretto Point, and Hunts Point (the easternmost of the three).

Figure 1. General Location of Hunts Point

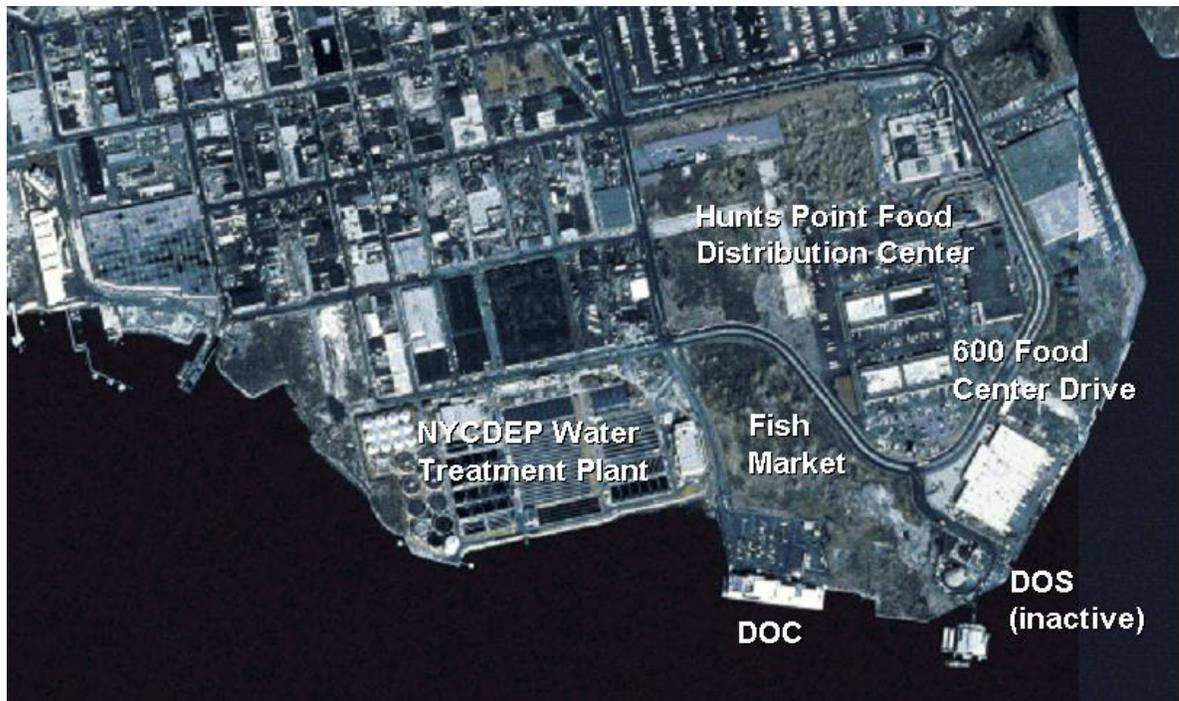


The *Final EIS for the Fulton Fish Market at Hunts Point* observes that:

- Hunts Point can be broadly classified into three land use districts:
 - The Hunts Point Food Distribution Center, located on the far southeast portion of the area, bounded by the Bronx River to the north and east, the East River to the south, and Halleck Street to the west;

- The industrial sector, located on the southwest quarter of the peninsula; and
- The residential sector, located on the northwest quarter of the peninsula.
- The Hunts Point Food Distribution Center consists of 329 acres, and is home to:
 - The Hunts Point Terminal Produce Market (995,000 square feet);
 - The A.L. Bazzini (175,000 square feet), Krasdale (335,000 square feet), Shopwell (A&P) (115,000 square feet) and National Foods (200,000 square feet) distribution facilities;
 - The Hunts Point Cooperative Market (the Meat Market) (680,000 square feet); and
 - The future Fulton Fish Market (451,000 square feet planned on 30 acres).
- The Hunts Point Food Distribution Center also includes a variety of non-food-related uses, including a New York City Department of Environmental Protection (NYCDEP) Water Treatment Plant, a floating (and active) New York City Department of Corrections (DOC) facility, and an inactive New York City Department of Sanitation (DOS) Marine Transfer Station.

Figure 2. Land Use at the Hunts Point Food Distribution Center



■ 2.2 Market Operations

There are over 800 businesses in Hunts Point, with nearly 9,000 employees (source: U.S. Census Journey to Work Data). Hunts Point industries are a tremendous economic success story for the Bronx. The Hunts Point Food Distribution Center is the largest food distribution center in the nation and a vital component of the local and regional economy, providing 3,000 jobs and \$3 billion in sales annually. Estimates quoted by Con Edison state that “nearly 80 percent of the New York metropolitan area’s produce and 40 percent of the region’s meat is shipped through the Hunts Point Market.” Its key components – the Produce, Meat, and Fish markets – are discussed below.

Figure 3. The Produce Market



Produce Market

The New York City (Hunts Point) Terminal Produce Market was opened in 1967. Today, it generates gross revenues of more than \$1.5 billion dollars annually – more than any

other terminal market in the world – and its more than 50 merchants serve a market area of more than 15 million people. Available studies and interviews indicate:

- The produce market handles a wide variety of fruits, vegetables, nuts, berries, and herbs, grown throughout the United States (including Long Island) or imported from the tropics, Central and South America, Asia, and the Mediterranean. These commodities are for the most part highly perishable, and therefore require fast, reliable, on-demand transportation.
- Around 95 percent of produce shipments arriving at the market are received by truck, which is seen by merchants as offering excellent service. Market representatives estimate that around 100,000 truck trailers are received annually; around 25 percent of these consist of “piggy-back” service, where standard over-the-road trailers are moved on rail flatcars to North Jersey, then transferred to truck (at the CSX North Bergen and Little Ferry yards) and driven to Hunts Point. The other five percent of produce shipments are received by rail, on sidings within the Market.
- An undetermined percentage of truck service is related to imports arriving via air or water. Many produce market imports actually enter the United States through gateways outside the region – for example, from December to May, between 30 and 100 trailers per day bring Chilean fruit to the market from the Port of Philadelphia.
- The largest market (in terms of truck arrivals and departures) is New York City, which accounts for around half of all trips; other important markets include New York State, New Jersey, and more distant markets (South, West, and other regions).
- The Produce Market is busiest in the morning hours. The peak period for truck arrivals is midnight to 8:00 a.m., and the peak period for truck departures is 4:00 a.m. to 1:00 p.m. There is 24-hour activity, but few trips between 5:00 p.m. and midnight.

Meat Market

The Hunts Point Cooperative Market, handling primarily meat and related products, was opened in 1974, and is home to 47 independent wholesale food businesses. An additional 100,000 square feet of refrigerated storage is planned. Available studies and interviews suggest:

- The market handles a wide range of meat products – beef and veal, lamb, poultry, sausage, delicatessen meats, and some fish and dairy products as well. The market handles brand-name and specialty domestic meats as well as imported meats, Latino market products, and kosher products. Customers include other distributors as well as hotels, restaurants, supermarkets, butchers, and institutions.
- Around 99 percent of meat market deliveries are by truck – less than one percent (mostly poultry) is by rail. Beef comes from the Midwest, poultry from the South, and pork from the Midwest and Canada. Around 90 percent of arriving product is

domestic, and around 10 percent is imported. Imports typically arrive through west coast seaports or the Port of Philadelphia, and move by rail or truck to the market; very little arrives through local air or marine gateways.

- The largest market (in terms of truck arrivals and departures) is New York City, representing around 43 percent of all trips; other important markets include New York State, New Jersey, and more distant markets (Midwest and other regions). Some of the meat market businesses have related operations in other states, and operate locally as part of a national network.
- The Meat Market is busiest in the early morning hours – somewhat later than the Fish Market, but earlier than the Produce Market. The peak period for truck arrivals is 2:00 a.m. to 10:00 a.m., and the peak period for truck departures is 6:00 a.m. to 11:00 a.m. There is 24-hour activity, but few trips between 5:00 p.m. and 1:00 a.m.

Figure 4. The Fulton Fish Market



Fish Market

The Fulton Fish Market is planned for relocation to Hunts Point, where it will accommodate 55 businesses and 500 employees initially (with up to 1,000 employees planned), adding to the current economic activity at Hunts Point.

The *Final EIS for the Fulton Fish Market at Hunts Point* characterizes current Fish Market operations as follows:

- The fish market operates five days a week and is closed Saturday and Sunday. Operations occur mostly during the evening and early morning hours.
- Deliveries from fish suppliers are received starting generally around 10:00 p.m. Approximately 70 different trucking companies representing hundreds of suppliers serve the fish market; on a typical night, around 80 trucks and 500,000 pounds of fish are received. Crews of four to six unloaders (employees of Laro, the City's unloading contractor) generally work until 3:00 a.m. or 4:00 a.m.; each vehicle may take anywhere from a few minutes (for small vans) to a half-hour or more (for larger trucks) to unload. Suppliers bring fish by truck from New England, Canada, Long Island (the Montauk fleet), Florida, Louisiana and Texas. An estimated 25 percent to 40 percent of the market's fish is imported via the region's airports, predominantly JFK.
- After receipt of shipments, fish is held in cold storage at 68 business stalls. The market opens for selling at 3:00 a.m. and the peak period for customers to arrive and purchase fish is 4:00 a.m. to 7:00 a.m.; most selling is completed by 9:00 a.m. and floor activity ceases by 11:00 a.m. The majority of the market's 500 employees arrive between 2:30 and 3:30 a.m. On an average night, around 600 buyers shop at the market; most visit several stalls and the average length of stay on-site is around three hours. Customers may arrive by car, van, or truck. Journeymen deliver fish from the stalls to the customers' vehicles, and packers actually load the vehicles. About 50 percent of the customers are from Manhattan; the remainder are mostly from the other Boroughs, Long Island, and New Jersey, although some customers may come from Westchester and Connecticut.

Interviews with air cargo representatives determined that at JFK, fish arrive on 35 different airlines throughout the day, and are held in cold storage - in air cargo containers or on pallets - by the individual airlines, awaiting truck delivery to the market in the evening when it opens for receipt of shipments. For example, Iceland Air brings fish in at 2:00 p.m., and holds it in a refrigerated trailer until 10:00 p.m. when it is trucked to the market. Fish and other Hunts Point Market commodities arriving at Newark Airport (estimated to be a small amount) are typically trucked to JFK, where they clear customs.

■ 2.3 Regional and Local Freight Movement

Hunts Point Market activities generate a substantial amount of freight-related traffic. Freight data is available at both the regional (areawide) and local (site-specific) levels from various sources. For purposes of the *Hunts Point Waterborne Freight Assessment*, the local data is most important, but the regional-level data provides a useful context.

Regional Freight Movement

The region's goods movement infrastructure consists of highways, railroads, marine sea-ports, and intermodal terminals (where cargo is transferred between rail and truck or between rail and water). Warehouse and distribution centers – such as the Hunts Point Food Distribution Center – are also a critical element in the regional goods movement infrastructure, as they help determine the “trip ends” for truck and rail trips.

The Bronx receives and ships goods by truck, by rail, and by water (through privately owned terminals). Quantitative estimates of these movements are available from a source known as TRANSEARCH. TRANSEARCH is a commercial product offered by Reebie Associates of Stamford, CT, which uses a combination of public and proprietary data sets and model assignments. It provides information on the number of tons moving between different regions (generally, at the county or state level), by commodity type (using Standard Industrial Codes or Standard Transportation Commodity Codes), and by mode of transportation (truck, rail, water, air). It includes domestic tonnage only, and does not include international air or water shipments. TRANSEARCH data was obtained as part of NYMTC's *Regional Freight Plan* and NYCEDC's *Cross Harbor Freight Movement Major Investment Study*. Permission was granted by Reebie Associates to use that data in the *Long Island Sound Waterborne Transportation Plan* and the *Hunts Point Waterborne Freight Assessment*.

Table 1. Bronx Commodity Flows by Type, 2000

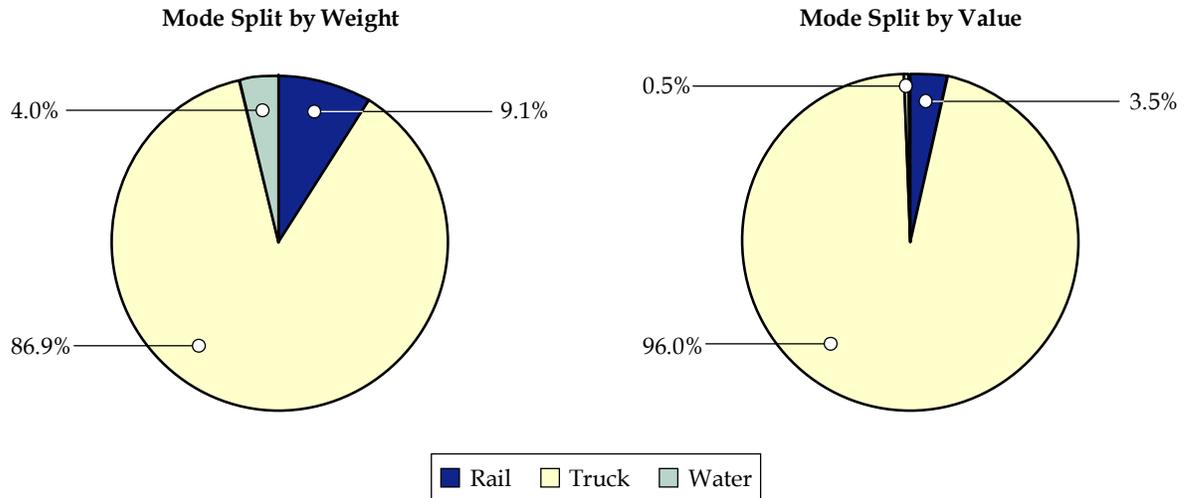
Direction	Tons	Share	Dollar Value	Share
Inbound to Bronx	9,383,410	63%	\$16,534,384,405	60%
Outbound from Bronx	5,347,626	37%	\$10,822,151,675	40%
Total	14,731,036	100%	\$27,356,536,080	100%

Source: Reebie Associates TRANSEARCH Database.

Looking at inbound and outbound freight flows (excluding internal traffic within the Bronx and through traffic between non-Bronx origins and destinations), the Bronx annually received and shipped around 14.7 million tons of freight worth an estimated \$27.4 billion dollars in year 2000.

In addition, several major truck corridors – most notably I-95 and I-87 – traverse the Bronx. Bronx highways accommodated around 9.4 million tons of through truck traffic in year 2000. Through trucking represented nearly 40 percent of Bronx truck traffic (excluding local traffic entirely within the Bronx), and consumed a substantial share of the area's limited transportation resources.

Figure 5. Bronx Commodity Mode Splits by Weight and Value
2000



Source: Reebie Associates TRANSEARCH Database.

For inbound and outbound Bronx commodities, trucks are the dominant mode of freight transportation. In year 2000, trucks handled almost 87 percent of freight traffic by weight and over 96 percent of freight traffic by value. Rail handled less than 10 percent by weight and less than four percent by value; water handled less than four percent by weight and less than one percent by value. Air cargo is not flown directly into or out of the Bronx, so it does not show up in the commodity data. It is important to note that cargo which is trucked into the Bronx from airports, rail terminals, or seaports outside the Bronx shows up in the data as a truck trip, so some of these truck trips (the exact number cannot be determined from the data) are part of a larger multimodal “trip chain.”

Looking at Bronx commodity types, the importance of food and food products to the local economy is immediately obvious. The commodity category “food and kindred products” is the Bronx’s second-leading commodity class by weight (representing 22 percent of tonnage) and its leading commodity class by value (representing 18 percent of value). The category “farm products” ranks fourth in tonnage (seven percent) and fifth in value (five percent). Overall, food and kindred products plus farm products accounted for over 4.3 million tons and over \$6.4 billion dollars in value for the Bronx in year 2000.

Table 2. Leading Bronx Commodity Types by Weight, 2000

Bronx Commodity (Inbound Plus Outbound)	Weight (Tons)	Share
Clay, concrete, glass or stone products	3,721,076	25%
Food or kindred products	3,266,382	22%
Warehouse and distribution center traffic	2,276,644	15%
Farm products	1,083,910	7%
Petroleum or coal products	879,951	6%
Waste or scrap materials	796,633	5%
Lumber or wood products, excluding furniture	537,749	4%
Pulp, paper, or allied products	432,653	3%
Fabricated metal products	326,934	2%
Chemicals or allied products	316,291	2%

Source: Reebie Associates TRANSEARCH Database.

Table 3. Leading Bronx Commodity Types by Value, 2000

Bronx Commodity (Inbound Plus Outbound)	Value (Millions of Dollars)	Share
Food or kindred products	\$5,049	18%
Warehouse and distribution center traffic	\$4,012	15%
Apparel or other finished textile products	\$3,770	14%
Lumber or wood products, excluding furniture	\$1,395	5%
Farm products	\$1,364	5%
Transportation equipment	\$1,334	5%
Fabricated metal products	\$1,271	5%
Electrical machinery, equipment, or supplies	\$1,092	4%
Instruments, photographic and optical equipment, etc.	\$983	4%
Machinery, excluding electrical	\$855	3%

Source: Reebie Associates TRANSEARCH Database.

For food or kindred products, inbound moves are around twice as high as outbound moves on a tonnage basis (the same is true for value), suggesting that about half of what comes into the Bronx remains in the Bronx, while the other half is shipped back out of the Bronx. (The data does not capture freight moves in small vans or private automobiles, so small shipments out of and within the Bronx are underrepresented in the dataset.) For farm products, outbound tonnage and value does not show up on the list of leading commodities, indicating that it remains in the Bronx, or is processed into a ‘product’ form.

Table 4. Detail of Food or Kindred Products and Farm Products, 2000

Bronx Commodity	Tons	Percentage			
		Truck	Rail	Water	Air
Food or kindred – Inbound	2,154,105	89.8%	10.2%	0.0%	0.0%
Food or kindred – Outbound	1,112,277	99.7%	0.3%	0.0%	0.0%
Farm products – Inbound	1,082,657	87.2%	12.8%	0.0%	0.0%

Source: Reebie Associates TRANSEARCH Database.

For inbound food or kindred products, almost 90 percent of tonnage is moving by truck, 10 percent by rail, and none by water or air. (Again, if commodities are coming through railyards or seaports or airports outside the Bronx and are subsequently trucked to the Bronx, they count only as a truck trip.) For outbound food or kindred products, virtually all is moving by truck. For inbound farm products, about 87 percent of tonnage is moving by truck, 13 percent by rail, and none by water or air. This is generally consistent with the information provided by Market representatives.

Local Freight Movement

Recent studies – the *Bruckner-Sheridan Interchange Reconstruction EIS*, the *Hunts Point Truck Study*, and the *Final EIS for the Fulton Fish Market at Hunts Point* provide useful information that helps relate the regional-level data to local conditions at the market.

The Fulton Fish Market is entirely dependent on trucks, and the Produce and Meat markets are heavily dependent on trucks. The Final Public Scoping Document for the *Bruckner-Sheridan Interchange Reconstruction EIS* (prepared by URS Corporation for NYSDOT) notes:

“The Hunts Point peninsula, which is entirely contained within the project’s primary study area, is one of the most dynamic and growing sections in New York City. This area is both residential and commercial and is bordered by several major transportation corridors: the Bruckner Expressway (Interstate 278), the Sheridan Expressway (Interstate 895), the #6 subway line, and railroad lines. More than 150,000 vehicles use these highways every day. Commercial and residential interests

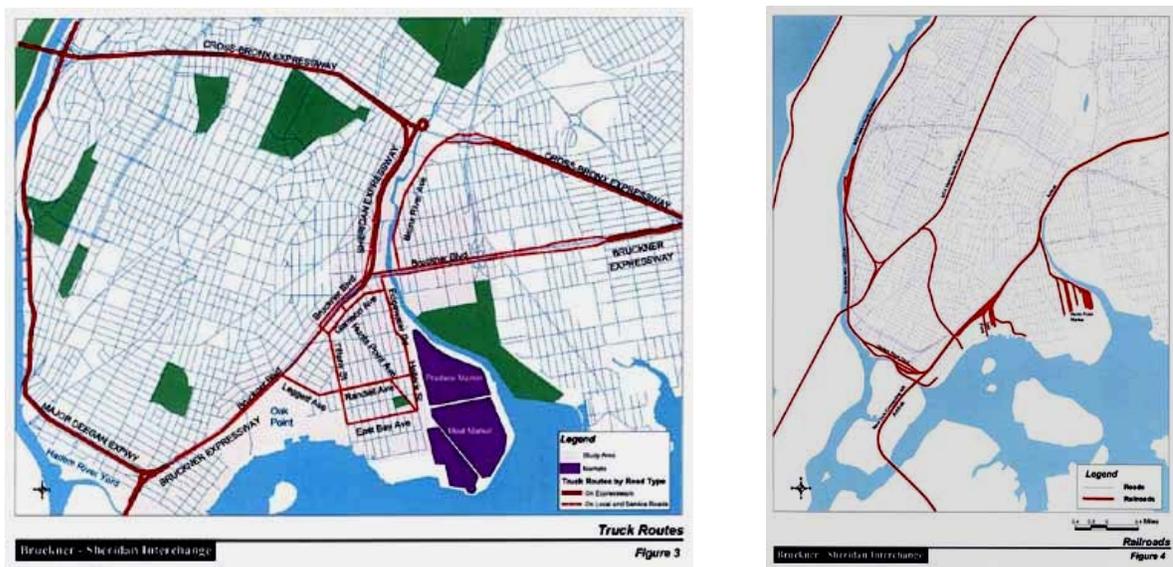
have fueled much debate as both seek to coexist in the same vicinity. The Hunts Point area is a major economic focal point of not only the Bronx, but of the New York City region. The Hunts Point Peninsula alone generates over 77,000 vehicles per day, including over 15,000 trucks.”

“The Hunts Point Food Distribution Center (HPFDC), with over 10,000 truck trips per day, is one of the largest truck traffic generators in Hunts Point. Traffic flow is constant, occurring 24 hours per day, especially during the very early morning hours. Signage to guide trucks between the regional highways and the HPFDC is scarce.”

“Hunts Point Markets are heavily dependent on the movement of goods by truck. Only six percent of Hunts Point Market freight was delivered by rail cars (in terms of truckload equivalents). Another 13 percent was carried by trailers-on-flatcars (TOFC), which still need to be hauled on highways and Hunts Point streets to reach the market. It is anticipated that these percentages will increase in the future because New York State is undertaking improvements to expand the rail system and facilities-removing height, weight, and operational restrictions on the Hudson Line from Selkirk to the New York Metropolitan region.”

As part of NYSDOT’s Hunts Point Truck Study, URS conducted traffic counts to determine the amount of traffic on key streets providing access to/egress from the Hunts Point peninsula. For a 24-hour period, they counted 6,242 inbound trucks (3,669 with two-axles/six-tires and 2,573 with more than three-axles) and 6,613 outbound trucks (3,826 with two-axles/six-tires and 2,787 with more than three-axles). These truck moves – a total of 12,855 over a 24-hour period – included all trip purposes, and reflected both Market and non-Market activity.

Figure 6. Bruckner-Sheridan EIS Depictions of Highway and Rail Access to Hunts Point



Source: Bruckner-Sheridan Reconstruction EIS, NYSDOT and URS Corporation.

Produce and Meat Market Vehicle Traffic

The *Hunts Point Truck Study* collected data on the number of trucks arriving and departing the Produce and Meat markets over a 24-hour period. The key findings were:

- **Produce Market** - 1,921 inbound truck moves (1,304 with two-axles/six-tires, 617 with more than three-axles);
- **Meat Market** - 715 inbound truck moves; and
- **Combined** - 2,636 inbound truck moves. Assuming each inbound move has a corresponding outbound move, the Produce and Meat markets generate 5,272 truck moves per day - around 41 percent of total truck moves for the Hunts Point peninsula.

The *Hunts Point Truck Study* also performed time-of-day and origin-destination surveys for a sample of Produce and Meat market truck traffic. As shown in Table 5 below, both markets show distinctive time-of-day patterns for truck traffic:

- For the Produce Market, most trucks arrive between 12 midnight and 8:00 a.m.; most trucks depart between 4:00 a.m. and 1:00 p.m.
- For the Meat Market, arrival and departure patterns show a similar reliance on over-night trucking, with even less midday and evening travel. Most trucks arrive between 2:00 a.m. and 10:00 a.m.; most trucks depart between 6:00 a.m. and 11:00 a.m.
- Overall, this produces a pattern of trucking activity that is highest between 4:00 a.m. and 10:00 a.m., peaking between 5:00 a.m. and 9:00 a.m.

Table 5. Truck Arrivals and Departures Per Hour for Produce and Meat Markets, Surveyed Trucks Only

Period	Produce Market Sample			Meat Market Sample			Combined Percent
	Arrivals	Departures	Percent	Arrivals	Departures	Percent	
12:00 M - 1:00 a.m.	23	7	4%	3	0	1%	3%
1:00 a.m. - 2:00 a.m.	28	3	4%	2	1	1%	3%
2:00 a.m. - 3:00 a.m.	28	4	5%	14	3	4%	4%
3:00 a.m. - 4:00 a.m.	29	10	6%	17	1	5%	5%
4:00 a.m. - 5:00 a.m.	38	13	7%	26	4	8%	7%
5:00 a.m. - 6:00 a.m.	42	23	9%	47	5	14%	11%
6:00 a.m. - 7:00 a.m.	31	26	8%	33	29	16%	11%
7:00 a.m. - 8:00 a.m.	27	22	7%	16	21	10%	8%
8:00 a.m. - 9:00 a.m.	15	44	8%	12	32	12%	9%
9:00 a.m. - 10:00 a.m.	14	33	7%	10	28	10%	8%
10:00 a.m. - 11:00 a.m.	8	35	6%	3	15	5%	6%
11:00 a.m. - 12:00 N	5	26	4%	2	4	2%	3%

Table 5. Truck Arrivals and Departures Per Hour for Produce and Meat Markets, Surveyed Trucks Only (continued)

Period	Produce Market Sample			Meat Market Sample			Combined Percent
	Arrivals	Departures	Percent	Arrivals	Departures	Percent	
12:00 N - 1:00 p.m.	9	12	3%	8	6	4%	3%
1:00 p.m. - 2:00 p.m.	3	7	1%	1	3	1%	1%
2:00 p.m. - 3:00 p.m.	6	16	3%	4	5	2%	3%
3:00 p.m. - 4:00 p.m.	10	14	3%	2	4	2%	3%
4:00 p.m. - 5:00 p.m.	7	11	3%	0	3	1%	2%
5:00 p.m. - 6:00 p.m.	3	6	1%	2	1	1%	1%
6:00 p.m. - 7:00 p.m.	4	4	1%	1	0	0%	1%
7:00 p.m. - 8:00 p.m.	5	3	1%	0	2	1%	1%
8:00 p.m. - 9:00 p.m.	7	2	1%	1	3	1%	1%
9:00 p.m. - 10:00 p.m.	7	0	1%	1	0	0%	1%
10:00 p.m. - 11:00 p.m.	15	1	2%	4	2	2%	2%
11:00 p.m. - 12:00 M	19	3	3%	1	0	0%	2%
Totals	383	325	100%	210	172	100%	100%

Source: *Hunts Point Truck Study*, URS Corporation.

The origin and destination data is equally interesting. As one might expect, New York City accounts for the highest share of trip origins and destinations. What may be surprising is the degree of New Jersey origin-destination traffic and long-haul truck trips (Midwest, South, Far West) which require a bridge or tunnel crossing of the Hudson River. It is likely that supplier trucks exhibit different characteristics from distribution trucks, but the data does not allow for these two trip purposes to be analyzed separately.

Table 6. Origins and Destinations of Produce and Meat Trucks, Surveyed Trucks Only

Origin or Destination	Produce Truck		Meat Truck	
	Arrivals From	Departures To	Arrivals From	Departures To
New York City	45.1%	46.7%	38.9%	45.6%
New York State	10.7%	13.7%	17.2%	23.9%
New Jersey	12.8%	22.8%	13.3%	17.2%
Midwest	0.5%	0.5%	10.3%	0.6%
South	12.6%	4.7%	3.4%	0.6%
Far West	9.3%	4.4%	6.9%	2.8%
Other	9.4%	7.1%	9.9%	9.4%

Source: *Hunts Point Truck Study*, URS Corporation.

Both markets are served by a combination of large tractor-trailers and light trucks (vans, pickup trucks, etc.), with a limited number of single-unit trucks (smaller trucks with the cab physically attached to the cargo unit).

Table 7. Classes of Produce and Meat Trucks, Surveyed Trucks Only

Class of Truck	Produce	Meat
Light Truck	48%	54%
Single-Unit	6%	5%
Tractor-Trailer	46%	41%

Source: *Hunts Point Truck Study*, URS Corporation.

The truck surveys performed for the *Hunts Point Truck Study* covered around 1,090 truck trips. As noted previously, there are an estimated 12,855 truck trips per day to and from the Hunts Point peninsula, and an estimated 5,272 of these trips are associated with the Produce and Meat markets. It is reasonable to expand the time-of-day and origin-destination pattern findings from the survey sample to the total population of 5,272 Produce and Meat market trucks. However, it is not considered valid to apply the survey findings to other Hunts Point peninsula truck trips, which represent different trip purposes not reflected in the survey sample. This becomes an important point in trying to “size the market” for potential ferry operations, as discussed in Section 4.0 of this study.

Fish Market Traffic

Both the *Final EIS for the Fulton Fish Market at Hunts Point* and the *Hunts Point Truck Study* provide data on current Fish Market traffic operations. For purposes of this study we are relying on the *Truck Study* figures.

Table 8 provides estimates of truck arrivals and departures from the Business Integrity Commission (BIC), along with the results of a limited survey and classification of 20 truck arrivals. (The BIC data is on the half-hour, while the survey data is on the hour, and it is not known whether the data is from the same day.) Overall, the data suggests that supplier arrivals start around 9:30 p.m. and end by 5:30 a.m., with the most activity between 12:30 and 3:30 a.m. Around 60 percent of supplier trips involved tractor-trailers; the other 40 percent were single-unit, light truck, or commercial two-axle trucks. Table 9 on the following page presents survey results for supplier truck departures between 1:00 a.m. and 5:00 a.m.

Table 8. Fish Market Supplier Truck Arrival Times

Period Beginning	Supplier Truck Arrivals (BIC)	Surveyed Trucks Only				Total
		Tractor-Trailer	Single-Unit	Light Truck	Commercial Two-Axle	
12:00/12:30 a.m.	19	1				1
1:00/1:30 a.m.	6	2				2
2:00/2:30 a.m.	12			1	1	2
3:00/3:30 a.m.	5	3	2			5
4:00/4:30 a.m.	2					
5:00/5:30 a.m.	1					
6:00/6:30 a.m. to 8:00/8:30 p.m.						
8:00/8:30 p.m.	0					
9:00/9:30 p.m.	4					
10:00/10:30 p.m.	8			1		1
11:00/11:30 p.m.	16	2				2
Unknown		6		1		7
TOTAL	73	14	2	3	1	20

Source: *Hunts Point Truck Study*, URS Corporation.

Table 9. Fish Market Supplier Truck Departure Times

Period Beginning	Supplier Truck Departures	Surveyed Trucks Only				Total
		Tractor-Trailer	Single-Unit	Light Truck	Commercial Two-Axle	
12:00 a.m.	Not available; 73 assumed based on number of arrivals					
1:00 a.m.		1				1
2:00 a.m.		1		1	1	3
3:00 a.m.		1				1
4:00 a.m.		3	1			4
5:00 a.m.		1		1		2
6:00 a.m.						
7:00 a.m.			1			1
Unknown		7		1		8
TOTAL		14	2	3	1	20

Source: *Hunts Point Truck Study*, URS Corporation.

The total population of retailer trips does not appear to have been conclusively established beyond two facts: retailers arrive after the suppliers (mostly between 2:00 a.m. and 5:00 a.m.), and retailers use smaller vehicles (no tractor-trailers and just two percent single-unit trucks, 34 percent light trucks, 47 percent commercial two-axle, six percent van, and 11 percent passenger auto).

Table 10. Fish Market Retailer Vehicle Arrival Times

Period Beginning	Retailer Vehicle Arrivals	Surveyed Vehicles Only					Total
		Single-Unit	Light Truck	Commercial Two-Axle	Van	Car	
12:00 a.m.	Not available						
1:00 a.m.		1	1				2
2:00 a.m.			4	7	3		14
3:00 a.m.			5	4			9
4:00 a.m.			4	6		2	12
5:00 a.m.			2	3		1	6
6:00 a.m.				2		2	4
7:00 a.m.							
TOTAL		1	16	22	3	5	47

Source: *Hunts Point Truck Study*, URS Corporation.

Table 11. Fish Market Retailer Vehicle Departure Times

Period Beginning	Retailer Vehicle Departures	Surveyed Vehicles Only					Total
		Single-Unit	Light Truck	Commercial Two-Axle	Van	Car	
12:00 a.m.	Not available						
1:00 a.m.							
2:00 a.m.		1					1
3:00 a.m.			1	3	1		5
4:00 a.m.			3				3
5:00 a.m.			5	1	1		7
6:00 a.m.			5	2			7

Table 11. Fish Market Retailer Vehicle Departure Times (continued)

Period Beginning	Retailer Vehicle Departures	Surveyed Vehicles Only					Total
		Single- Unit	Light Truck	Commercial Two-Axle	Van	Car	
7:00 a.m.	Not available	1	1	4		2	7
8:00 a.m.			1	8		2	11
9:00 a.m.							
10:00 a.m.				1	1		2
11:00 a.m.							
12:00 p.m.				1			1
TOTAL		1	16	20	3	4	44

Source: *Hunts Point Truck Study*, URS Corporation.

We can make an order of magnitude estimates of the total population of retailer trips using data from the *Final EIS for the Fulton Fish Market at Hunts Point*. The *EIS* counted 3,100 total vehicle moves for the market area per night, or around 1,550 each way. The *EIS* states that employees at the relocated market will need 500 parking spaces, so for present purposes we assume each employee represents a car trip each way. That leaves 2,100 vehicle trips for non-employee traffic (1,050 inbound and 1,050 outbound). Assigning 73 of these trips to supplier trucks leaves a maximum of 977 trips inbound and 977 trips outbound for retailers. Dividing 500,000 pounds by 977 outbound retailer trips yields a load factor of a bit more than 500 pounds per trip, which is not implausible.

Looking at origin and destination patterns (see Table 12 on the following page), more than 90 percent of supplier arrivals are from outside New York City – from New England, Florida, Maryland New Jersey (maritime regions and/or gateway states). Retailers, on the other hand, come almost exclusively from the local region – 49 percent from New York City, 21 percent from New Jersey, 15 percent from Long Island, and 11 percent from the remainder of New York State.

Table 12. Origins and Destinations of Fish Market Suppliers and Retailers, Surveyed Vehicles Only

Origin or Destination	Supplier Truck		Retail Vehicle	
	Arrivals From	Departures To	Arrivals From	Departures To
Bronx	10% (all NYC)	28% (all NYC)	6%	10%
Queens			29%	21%
Brooklyn			4%	17%
Manhattan			6%	15%
Staten Island			4%	0%
Long Island	5%	6%	15%	10%
Other New York State	0%	6%	11%	10%
New Jersey	14%	22%	21%	15%
Pennsylvania		6%		
Delaware		6%		
Maryland	14%			
Florida	19%			
New England	38%	28%	2%	2%

Source: *Hunts Point Truck Study*, URS Corporation.

3.0 Opportunities for Waterborne Transportation

■ 3.1 Potential Services

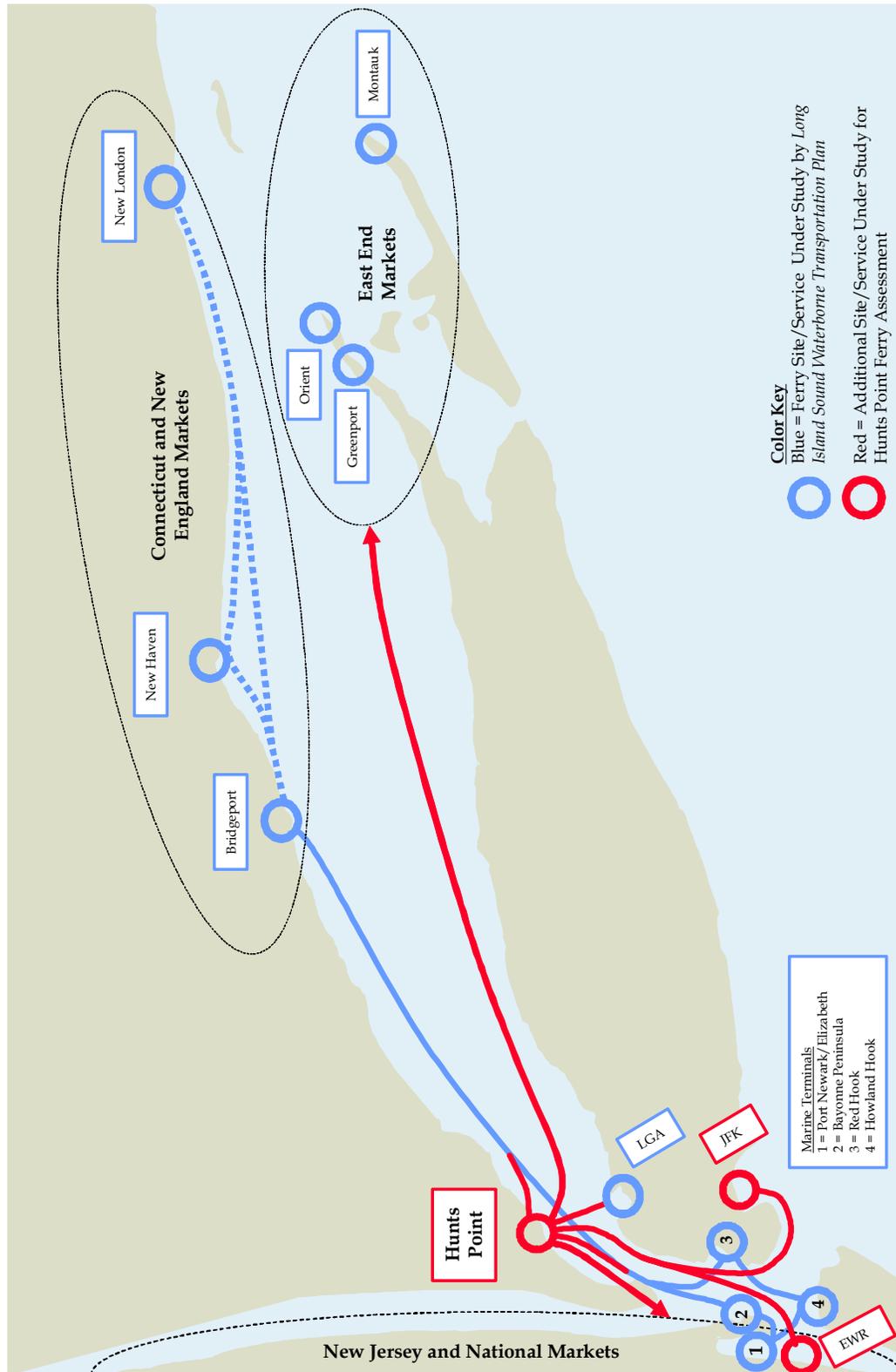
Potential waterborne freight and passenger services for Hunts Point were identified from a variety of sources, including:

- Steering Committee member input.
- A Community Planning Workshop held in the Bronx as part of the *Long Island Sound Waterborne Transportation Plan*.
- Consultant team interviews with public agencies and Hunts Point stakeholders.
- Review of other studies and available information.

Overall, these potential services tended to cluster around some key possibilities:

- **Waterborne connections between Hunts Point and the region's airports** (JFK, Newark, and LaGuardia) to facilitate the movement of air cargo commodities.
- **Waterborne connections between Hunts Point and the region's marine terminals** to facilitate the movement of port-handled commodities. (A container barge service currently is being developed to link the region's marine terminals with the Connecticut coast; the *Long Island Sound Waterborne Transportation Plan* looks at possibly extending this service to New Haven and/or New London.)
- **Waterborne freight connections between Hunts Point and key activity clusters and transportation nodes.** This includes: the East End of Long Island; the Connecticut coast (connecting with New England); and New Jersey (connecting with the Mid-Atlantic, Midwest, South, and West). The *Long Island Sound Waterborne Transportation Plan* identifies Bridgeport, New Haven, New London, Greenport, Orient Point, and Montauk as existing or potential future sites for ferry services.
- **The possibility of providing passenger service** along the same routes, primarily to facilitate workforce access to Hunts Point, but also to improve customer access and the overall mobility of the Hunts Point community.

Figure 7. Potential Waterborne Service Opportunities for Hunts Point



■ 3.2 Performance Criteria

To be successful in improving freight transportation for Hunts Point, we believe a ferry operation must meet a number of performance criteria.

- **The operation must meet an identifiable demand.** There has to be a minimum base level of potential traffic to support the service. Preferably, this demand is based on current travel patterns and volumes, although some services may be warranted based on their ability to create (and serve) new travel demand patterns that were not previously feasible.
- **The operation must be physically and operationally feasible.** There has to be a suitable location for an appropriately sized terminal, with adequate navigation channels, providing effective connections to ferry users and the regional transportation network.
- **The operation must provide an attractive level of performance.** In terms of its reliability, speed, service frequency, price, visibility and security, it has to be competitive with other available transportation choices, to allow it to capture its “fair share” of market demand. Different customers place different emphasis on these factors. For example, coal shippers care more about cost than speed, and prefer cheaper, slower barge and rail services to trucking. Conversely, express package services such as FedEx and UPS sell speed and reliability, and require faster air and truck services to deliver on their promises – although UPS now utilizes a premium, guaranteed-on-time intermodal rail service for some of its traffic. In the case of Hunts Point, we heard several clear messages:
 - Interviews with a limited sample of Market representatives suggested that what they need is what they already have – fast, on-demand, reliable, door-to-door trucking service for time-sensitive shipments, and the availability of rail for cost-sensitive shipments. Market businesses do not want to be involved in consolidating loads for shipment, or loading or unloading barges. They certainly are not interested in spending more for slower, less frequent, less reliable, more logistically complex services. One interviewee may have said it best: “This is a hard enough business already! Don’t make us less competitive, we’ll have to move to Jersey!”
 - This argues against a service that has to consolidate cargo from various points, load a ferry, unload a ferry, and then distribute the cargo to multiple points at the other end. The process takes time, and there is a certain amount of risk. Who is responsible for the goods at any given time? Who guarantees overall performance? What happens to your shipment if there is a problem with someone else’s shipment? The idea of losing control of the cargo trip seems to be one of the primary concerns.

- A service that seems more consistent with the Market’s needs would basically use the water as a “floating highway,” with marine transportation substituting for part of the highway trip. The “floating highway” operation could move trucks (drive-on/ drive-off), trailers or containers (roll-on/roll-off). Market business operators would see is what they always see – the back of a truck, a container, or a trailer. There would be no need to consolidate or redistribute loads, and no need to surrender control over the cargo to a third party. When asked, Market representatives seemed very responsive to this model – provided it offers good service at the right cost.
- As part of the Bruckner-Sheridan Interchange Reconstruction EIS, surveys were distributed to area businesses. One set of questions asked whether businesses would use ferry services, and under what conditions. Only three facility operators responded to the ferry questions; two said they would consider a ferry if it was a drive-on/drive-off truck ferry; the other would consider a ferry if it was a roll-on/roll-off trailer ferry. None of the three would accept the service if it was slower or more expensive than trucking, or if sailings were more than 30 minutes apart during main delivery hours. This is obviously a very limited sample, but it is consistent with the positions expressed in the interviews.
- One of the more interesting aspects of a “floating highway” operation is that the client for this service is actually the trucking community. We started this process trying to find ways to serve Market businesses better, but it turns out they basically want to be left alone. The idea of the “floating highway” is to give truckers a better way to serve Market businesses. The questions then become: what makes it in a trucker’s interest to utilize a “floating highway” option versus an all-highway option? What is the public benefit in providing a “floating highway” option to the trucker?
- **The operation must provide economic, transportation, and environmental benefit at a reasonable cost, with a high likelihood of being stable and sustainable as a business proposition.** Many ferry services require public subsidies, especially in the form of start-up capital assistance. Such investments may be warranted – provided the investment generates clear public benefits in return, and that the operation remains in place to ensure that the public continues to receive these benefits over the long term.

■ 3.3 Potential Vessel Types

Waterborne vessels come in a dizzying variety of shapes, sizes, functions, and performance characteristics. Start-up services sometimes use existing vessels or “off the shelf” designs for new vessels, but many start-up services will custom-design and purpose-build a vessel for that specific service. Some key variables include:

- **What the vessel carries.** Is the cargo in intermodal shipping containers, in air cargo containers, on pallets, or loose in the vessel hold? Does it carry trucks? If so, does it carry the whole truck (including tractors and drivers), or just the trailer? Does it carry passenger autos or walk-ons along with freight?

- **How the vessel is loaded.** Is cargo loaded with cranes or forklifts (lifted)? Are trucks driven on? Are trailers “rolled on” using terminal equipment? Or is it walk-on only? This impacts how the terminal and berth are designed.
- **Dimensions and draft** (water depth required) of the vessel. Small passenger ferries can draw as little as five feet; cargo barges generally require nine to 19 feet; and container ships draw up to 50 feet. Vessels also have “air draft” (height above the waterline), and can be restricted by low bridges.
- **Propulsion system.** Is the vessel self-powered, or pulled or pushed by a tugboat? Is it a slow-speed service (around nine knots) or high-speed (35 to 45 knots or more)? Is it a conventional diesel or gas turbine, a waterjet, or a hovercraft? How much noise and air emissions does it produce?
- **Current and wave-handling ability.** Does it have enough power to deal with currents, waves and inclement weather, and other navigational impediments? This is particularly important for operations in the East River, as currents through Hell Gate (between Hunts Point and New York Harbor) are extremely strong.
- **Hull design.** Is it a monohull or a catamaran? Does it rely on “surface effects” (lifting itself out of the water to reduce drag)? How much wake does it produce?
- **Safety and security.** Does the vessel meet all applicable standards?
- **Cost and cost recoverability.** Does the vessel have high-capital acquisition and/or operating costs? Does it require a specialized, expensive terminal or operating system? Will it need a public subsidy to cover capital and/or operating costs?

Figure 8 on the following page illustrates a representative range of potential vessel types currently operating in the United States or Europe – including several that are actually operating in New York Harbor or Long Island Sound – along with data on speed, capacity, and capital/operating costs. This information is based on published specifications, interviews with vessel operators, and industry data provided by Seaworthy Systems, the consultant team’s marine architects.

Some of these vessel types are good candidates for use in Hunts Point services, while others are considered unsuitable for various reasons. The pros and cons are discussed in Section 4.0 of this report.

Figure 8. Examples of Different Vessel Types and Characteristics



a) Detroit-Windsor Truck Ferry
9 knots, 8 to 30 trucks
\$3 to \$4 million, plus \$8,000/day



b) Shelter Island Ferry
9 knots, 12-15 cars
\$2.5 million plus \$2,400/day



c) Ferry Cat 120 (European Services)
22 knots, 400 passengers, 112 cars or 30+ trucks
\$29 million, plus \$14,000/day



d) Columbia Coastal Container Barge
8 knots, 45 trailers or 225 boxes
\$3.5 million, plus \$8,000/day



e) New York Water Taxi
25 knots, 50-75 passengers
\$1.5 million, plus \$3,200/day



f) Bridgeport-Port Jefferson Ferry
12 knots, 1000 passengers, 100 autos
\$14 million, plus \$11,000/day



g) Passenger-only Hovercraft
35 knots, 25 passengers
\$3 million plus \$6,500/day



h) Rochester-Toronto Fast Ferry
50 knots, 220 cars plus 10 trucks
\$46.5 million, plus \$40,000/day

4.0 Market and Performance Evaluation of Opportunities

■ 4.1 Definition of Services, Vessel Types, and Operational Assumptions

Services

The general opportunities identified in Section 3.0 were refined into a short list of potential services for further evaluation. These included the following:

- **Hunts Point to LaGuardia Airport freight ferry or freight/passenger ferry.** Consistent with the “floating highway” approach, which minimizes the need for consolidating and distributing loads at both terminals, the concept would be a drive-on/drive-off truck ferry (self-powered) or barge (tug-assisted). Passengers also could be handled on the truck ferry if desired.
- **Hunts Point to Newark Airport freight ferry or freight/passenger ferry.** As with LaGuardia, the concept for a freight ferry would be a drive-on/drive-off truck ferry or truck barge, and passengers could be handled on the truck ferry if desired. Because Newark is further from Hunts Point than LaGuardia, higher speeds on the water would be desirable to be more competitive with trucking.
- **Hunts Point to JFK Airport freight or freight/passenger ferry.** As with LaGuardia and Newark Airport, the concept for a freight ferry would be a drive-on/drive-off truck ferry or truck barge, and passengers could be handled on the truck ferry if desired. Because JFK is even further from Hunts Point (by water) than Newark, service speed is even more significant. The central idea of the “floating highway” – avoiding the need to consolidate and distribute cargo at either end – is especially important for JFK, since there are more than 35 separate air cargo facilities.
- **Hunts Point to Long Island East End freight ferry or freight/passenger ferry.** The east end of Long Island generates traffic for the Market from the Montauk fishing fleet and from Suffolk County agriculture and food processing operations. Three potential sites on the East End have been identified. For a freight ferry operating from Greenport or Orient Point, the concept would be a drive-on/drive-off truck ferry (self-powered) or barge (tug-assisted). For a freight ferry operating from Montauk – which has an ordinance prohibiting vehicle ferries, ferries faster than 20 knots, and ferries with more than 2,000 hp – the concept would be a small self-powered vessel carrying cargo only – not trucks.

- **Hunts Point to Connecticut and Port of New York and New Jersey (PONYNJ) Marine Terminals.** The concept here is to take advantage of a service that already is in the advanced planning stages. The Port Authority of New York and New Jersey (PANYNJ) and Port of Bridgeport, Connecticut are planning to start (in year 2004) a container barge service between the two ports. Containers on trailers will be rolled-on and rolled-off a specially fitted oceangoing barge, powered by a large tug. The operation is fully consistent with the “floating highway” model of using water to substitute for some portion of a highway move, but has one huge advantage over a truck ferry – it does not involve moving the truck driver or the cab. That means that speed is less important, because the driver and his cab are not sitting idle on the barge during the trip. The vessel also is less expensive, because it does not require the life-safety features of a person-carrying vessel. The barge might add Hunts Point to its itinerary, moving containerized goods between PONYJ and the Market, and between Connecticut/New England and the Market.
- **Hunts Point to New Jersey and West of Hudson markets.** New Jersey and its “hinterland” (Mid-Atlantic, Midwest, South, and West) accounts for a large share of the Market’s truck traffic. The concept is to intercept eastbound trucks at a convenient point and shift them to the water, bypassing congested Hudson River crossings and Bronx highways, and bring them directly into Hunts Point by water. This would be a drive-on/drive or roll-on/roll-off service using a self-powered vessel or barge. It is viewed as a high-volume, dedicated freight service, but also could carry passengers.
- **Hunts Point to LaGuardia passenger ferry service.** Small packages might be delivered on passenger ferries, possibly by foot couriers. The PANYNJ is investing to reestablish a Manhattan to LaGuardia service, and Hunts Point might be able utilize that terminal for a potential passenger-oriented service.
- **Regional passenger ferry network connectivity.** A variety of passenger ferry services currently operate in the East River. New York Water Taxi currently runs between Manhattan and Hunters Point, Fulton Landing, Red Hook, and Brooklyn Army Terminal, generally between 6:30 a.m. and 8:30 p.m. This service network could potentially be extended to Hunts Point in the future, based on subsequent study. Additionally, there are extensive ferry services between New Jersey and Manhattan, and Hunts Point might be tied into these systems as well, either directly or via transfer at Manhattan ferry terminals. Market businesses operate in the overnight and off-peak periods, so the availability of after-hours ferry service would be a key issue for their employees, although this would be less of an issue for area residents and non-Market employees as a whole.

Vessel Types

Each of the potential services must be matched with appropriate vessel types. Looking at the vessel types illustrated in Figure 8 on page 28, several appear to be good candidates for Hunts Point freight services:

- **Truck Barge.** An operation similar to the Detroit-Windsor Truck Ferry depicted in Figure 8 – trucks on barges moved by tugs – could provide a simple, low-speed, low-cost truck connection on water for Hunts Point. Terminal costs would be fairly modest, and vessel capital and infrastructure costs are low. For purposes of this study, we are assuming the use of a 4,000-hp tug joined to a 400' by 80' (approximate dimensions) barge with a draft of 15 to 24 feet. The 4,000-hp tug would be capable of moving the barge through all local waters, including Hell Gate against the tide, with an average service speed of nine knots. The barge, which would be fitted with onboard loading ramps at each end, could accommodate a minimum of 30 tractor-trailers, or a larger number of smaller trucks. There is no passenger handling capability. Vessel capital cost is estimated at \$4.0 million for the barge; the tug would be leased at a cost of \$4,800 per day (for more than 12 hours), with an additional fuel consumption cost of \$350 per hour. The tug also could be leased by the hour at \$400 per hour, for a minimum period of four hours.
- **Container Barge.** Container tug-barges currently are operating on several different U.S. routes in the Atlantic, Pacific, and Gulf coasts. A container barge service was recently started between the Port of New York and New Jersey (PONYNJ) and the Port of Albany, and another service is planned to start between PONYNJ and the Port of Bridgeport, Connecticut. The PONYNJ-Bridgeport service will operate at approximately eight knots. Vessel capital cost is estimated at \$3.5 million for the barge; the tug would be leased at a cost of \$4,800 per day (for more than 12 hours), with an additional fuel consumption cost of \$350 per hour.
- **Medium-Speed Truck Ferry.** This would be a variation on the Ferry Cat 120 design shown in Figure 8. For purposes of this study, we are assuming the use of a 5,100-hp vessel of approximately 350' by 70', capable of loading and unloading at both ends, with a draft of 10 feet. The vessel would be capable of moving through all local waters, including Hell Gate against the tide, with an average service speed of 15 knots. The vessel could accommodate a minimum of 30 tractor-trailers, or a larger number of smaller trucks. It also can accommodate passengers, if desired. Vessel capital cost is estimated at \$18.0 million, with an average operating cost of around \$11,000 per day, including fuel. This represents non-fuel operating costs of around \$7,000 per day (for more than 14 hours), with an additional fuel consumption cost of \$300 per hour. (The fuel cost assumes a more efficient engine design than a tug.)
- **High-Speed Truck Ferry.** This also would be a variation on the Ferry Cat 120 design shown in Figure 8, but with more horsepower and a higher service speed. For purposes of this study, we are assuming the use of a 25,000-hp vessel of approximately 350' by 70', capable of loading and unloading at both ends, with a draft of 10 feet. The vessel would be capable of moving through all local waters, including Hell Gate against the tide. In open water, it would allow for an average service speed of 35 knots; on the East River, the combination of limited channel width, other vessel traffic, and vessel wake would in all likelihood restrict actual operating speeds to around 15 knots. The vessel could accommodate a minimum of 30 tractor-trailers, or a larger number of smaller trucks; it also could accommodate passengers if desired. Vessel capital cost is estimated at \$40.0 million, with an average operating cost of around

\$28,000 per day, including fuel. This represents non-fuel operating costs of around \$7,000 per day (for more than 14 hours, same as the medium-speed vessel), with an additional fuel consumption cost of \$1,500 per hour. Compared to the medium-speed truck ferry, the high-speed truck ferry costs more than twice as much, and requires nearly five times the horsepower and fuel.

The other vessel types depicted in Figure 8 are not considered good candidates for Hunts Point freight services, for various reasons:

- **Water Taxi (similar to New York Water Taxi).** This is a passenger-only vessel and does not carry vehicles, so its freight potential is limited to small package and walk-on traffic. However, it represents a service that currently is operating on several routes in the East River, and might potentially be extended to Hunts Point should it prove desirable. This possibility is discussed in Section 4.3 of this report.
- **Small Conventional Ferry (similar to Shelter Island Ferry).** This is an inexpensive, proven design, but with a capacity of 12 to 15 cars, it would only be capable of handling a few trucks per trip. Fitted as a double-ended dedicated truck ferry, it would probably carry only six trucks. To move 30 trucks at nine knots, you would need five of these vessels, at a capital cost of \$12.5 million and an operating cost of \$12,000 per day; you could move the same number of trucks at the same speed using a truck barge, at a capital cost of \$4.0 million and an operating cost of \$8,000 per day.
- **Large Conventional Ferry (similar to Bridgeport-Port Jefferson Ferry).** This is another well-proven design that has been highly successful operating in Long Island Sound. However, for Hunts Point, our medium-speed truck ferry provides comparable truck capacity with an optimal deck configuration and a faster service speed, for a generally comparable cost.
- **Super-Fast Passenger and Vehicle Ferry (similar to Rochester-Toronto Ferry).** This is an extremely expensive, very fast (50 knot) vessel design that has been recently put into service between Rochester and Toronto. Unlike the New York Water Taxi, Shelter Island Ferries, and Bridgeport-Port Jefferson Ferry, a substantial public subsidy was required to establish this service. A Hunts Point version of this service would not require the passenger handling capability of this type of vessel, but an adapted version of this design could be considered. Given that its capital and operating costs are substantially higher than our 35-knot high-speed truck ferry, is the additional cost for the additional speed justified? Over shorter distances, and for operations in the East River where effective speeds will be limited to 15 knots, the extra speed is useless. Over longer distances, such as Montauk to Hunts Point, it might make a difference, but ferry vessels of this size (more than 2,000 hp) are prohibited in the Town of East Hampton.
- **Hovercraft.** The hovercraft vessel depicted in Figure 8 is a small passenger-only service, and a much larger and more expensive vessel would be needed to accommodate a load of more than 30 trucks. Historically, hovercraft have posed several problems, including high levels of noise (although recent designs are claimed to be quieter) and

high operating costs. For comparison, the hovercraft design depicted in Figure 8 carries only one-third to one-half the number of passengers as a New York Water Taxi vessel, yet its capital and operating costs are twice as high.

Operational Assumptions

Potential freight ferry services were evaluated based on demand, physical and operational feasibility, performance and service characteristics relative to trucking, and overall prospects for benefit and sustainability. In making these assessments, the team relied on multiple sources of data.

- **Demand estimates** were based on available Hunts Point transportation demand and operations data, as summarized in Section 2.0 of this study.
- **Nautical distances and operating speeds.** Nautical distances were measured using the Street Atlas USA software package. For large vessels carrying more than 30 trucks, operating speeds were assumed to be limited to 15 knots in the East River and Kill van Kull and nine knots in Jamaica Bay due to conflicting traffic, wake generation, and other factors.
- **Vessel operating characteristics and costs** were defined using the profiles of four vessel types – truck barge, container barge, medium-speed truck ferry, and high-speed truck ferry – as summarized in the preceding section. As previously noted, these were based on published specifications, interviews with vessel operators, and input from Seaworthy Systems, the consultant team’s marine architect.
- **Vessel “turn time.”** The container barge takes approximately two hours to complete an offload-reload cycle (based on studies for the PANYNJ-Bridgeport container barge service). The truck barge, medium-speed truck ferry, and high-speed truck ferry would have a 30-minute offload-reload time (15 minutes to offload and 15 to reload).
- **Highway distances, routes, and unconstrained truck travel times** were calculated using the Street Atlas USA software package. Street Atlas USA calculates time-optimized routes based on speed limits. The unconstrained travel times require further manual adjustment to represent periods of congestion.
- **Truck operating costs per mile** were estimated from the Federal Highway Administration’s Office of Freight Management and Operations report entitled *Expense Measures for the For-Hire Motor Carrier Industry: 1976 through 1999*, which provided comprehensive historic and current estimates of per-unit truck operating costs. Costs were disaggregated to isolate the factors – fuel, oil, tires, and related per-mile maintenance – that would be affected by a trucker’s decision to use a ferry instead of an all-highway routing. (Costs such as equipment depreciation and amortization, insurance, taxes and licenses, purchased equipment or services, and wages – which would not be affected by a trucker’s decision to use a ferry – were excluded). The year 1999 estimate was \$0.22 per mile, with fuel representing around

\$0.10 of this per-mile cost. Since diesel costs have roughly tripled since 1999 (from \$0.58 to a recent high of \$1.80), we have tripled the fuel component of this cost, yielding an average rate of \$0.42 per mile. This is a “best case” competitive scenario for a ferry. On any given day, a trucker’s actual per-mile costs may be higher or lower.

- **Truck toll** information was obtained from rate schedules posted on the NJ Turnpike Authority, MTA, and PANYNJ web sites.
- **Value of trucker time.** For tractor-trailers, the ferry could carry the cab and driver, or just the trailer unit itself (which could be drayed between the ferry landing and Hunts Point businesses by a contract trucker, possibly using electric vehicles). If the ferry carries just the trailer, a trucking firm does not have to pay the driver to sit on the vessel, and the driver can be engaged in serving other customers. This represents a net savings to a trucking firm, which can be applied to the cost of the ferry and the drayage at Hunts Point. In 1999, the value of salary, labor, and fringe for all truck services was \$0.90 per mile (source: FHWA, *Expense Measures for the For-Hire Motor Carrier Industry: 1976 through 1999*). However, for owner-operators, and for smaller single-unit and panel trucks, leaving the driver behind may not be an option. We assume that contract drayage could be made available at Hunts Point for a flat rate of \$20 per trip.
- **Truck “dead time.”** This includes time spent in the loading and unloading process. For the truck barge, medium-speed truck ferry, and high-speed truck ferry, the total load time is 15 minutes and the total unload time is 15 minutes. On average, a truck will spend 7.5 minutes in the loading cycle and 7.5 minutes in the offloading cycle. Additionally, a truck will generally arrive at a ferry terminal some time before the ferry loads; this time can vary considerably depending on highway conditions and ferry service frequency, but for purposes of this study we assume that the average truck spends no more than 15 minutes in queue. The total “dead time” for an average truck is therefore 30 minutes (15 in queue, 7.5 to load, and 7.5 to unload).
- **Ferry terminal access time.** At Hunts Point, the idea is to provide a ferry in very close proximity to market businesses. This may not be true at the other end of the trip – a trucker may have to deviate from the most direct highway route to reach the ferry. This extra “access time” (which varies) must be reflected in the ferry service time.

■ 4.2 Freight Services

Hunts Point to LaGuardia Airport

Demand

LaGuardia Airport (LGA) specializes in domestic passenger operations. Cargo is handled in the baggage hold of passenger aircraft (this is known as “belly cargo”). LGA has not hosted an all-cargo airline flight since 1999. While many airlines use belly cargo to boost their

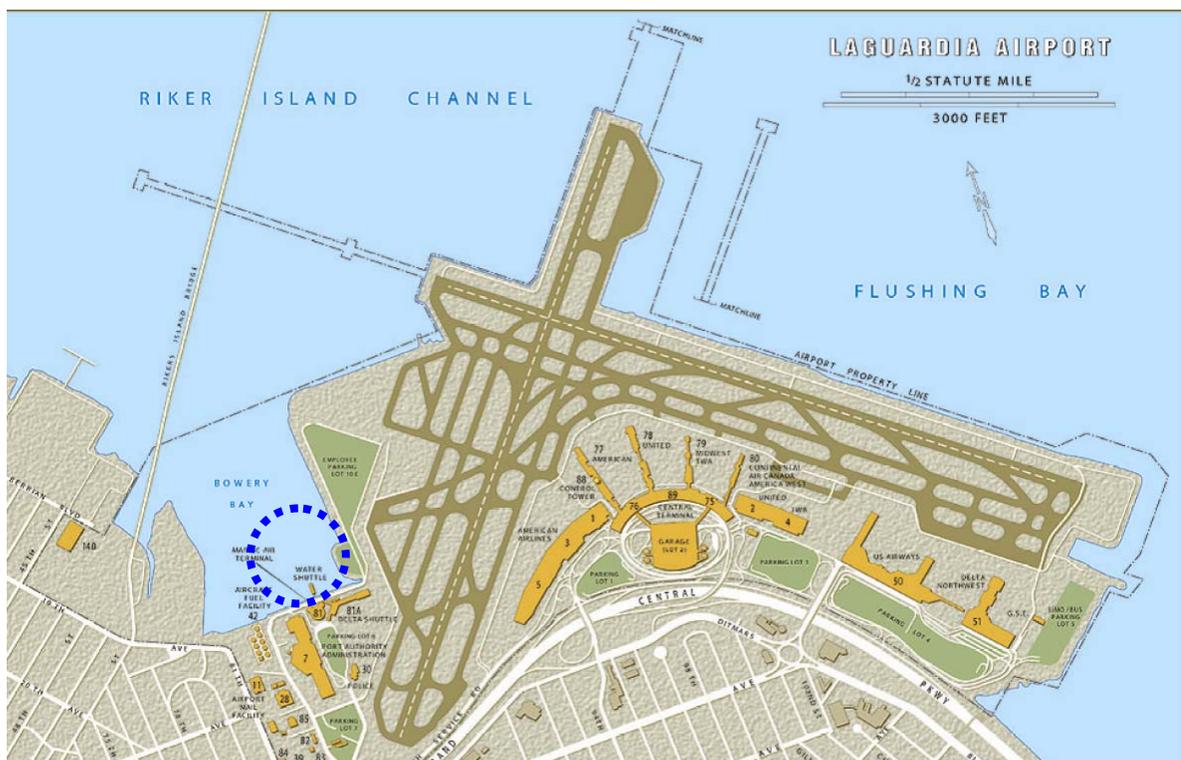
operating revenues, the airlines at LGA are carrying very little of it. In 2002, they moved just 11,709 tons of freight (source: PANYNJ). This is the equivalent of 40 tons per day, or two fully loaded tractor-trailers, and represents less than one percent of JFK tonnage.

The commodities making up this tonnage are not known – statistics on domestic air cargo commodities are not collected – nor is its ultimate origin or destination. The majority is assumed to be consumer package goods and express traffic, rather than food products that would be handled at the Market. LGA handles somewhat more mail than cargo – a total of 23,818 tons in 2002. Mail goes directly to off-site Postal Service facilities for processing. Overall, there is no identifiable demand for a substantial freight service between LGA and Hunts Point.

Physical and Operational Feasibility

Interviews with PANYNJ staff indicate that there is only one feasible location for a ferry operation serving LGA – the Marine Air Terminal site, where the former Delta Shuttle ferry to Manhattan operated. The ferry terminal is designed for passenger movement only, and has virtually no landside support in the form of vehicle waiting or cargo staging areas. The PANYNJ plans to reinstate ferry service from Manhattan to LGA using this terminal, so it will once more be used for active passenger service, precluding the possibility of dedicated freight operations using a truck ferry or barge.

Figure 9. LaGuardia Airport and the Water Shuttle Site



Source: PANYNJ.

Performance and Service Characteristics

The distance from LGA to Hunts Point is only 2.5 nautical miles. At an average vessel speed of nine knots, the distance can be covered in less than **17 minutes**, and at 15 knots it can be covered in **10 minutes**. By highway, the distance is 9.4 miles, and the unconstrained off-peak travel time is **18 minutes**. However, constrained travel time can easily be twice as long, if not longer.

Although there is no identifiable demand for a freight service, a passenger service might offer attractive service times compared to auto, taxi, and transit options. This would depend on service frequency, wait time, terminal access time, and other factors. Such a service could accommodate small packages and/or foot couriers, although the potential level of demand is likely to be small. Passenger service opportunities for LGA are discussed in Section 4.3.

Benefit and Sustainability

There is no identifiable demand for a freight service, and infrastructure limitations at LGA would preclude a dedicated freight service in any case.

Overall Freight Service Assessment

Given these findings, further consideration of a freight ferry between Hunts Point and LGA is not recommended.

Hunts Point to Newark Airport

Demand

In 2002, Newark Airport (EWR) was the ninth leading cargo airport in the United States. Air cargo operations generate hundreds of truck trips per day. None of the Hunts Point traffic studies indicate how many of these trips are bound to or from the Market. Available information does indicate the following:

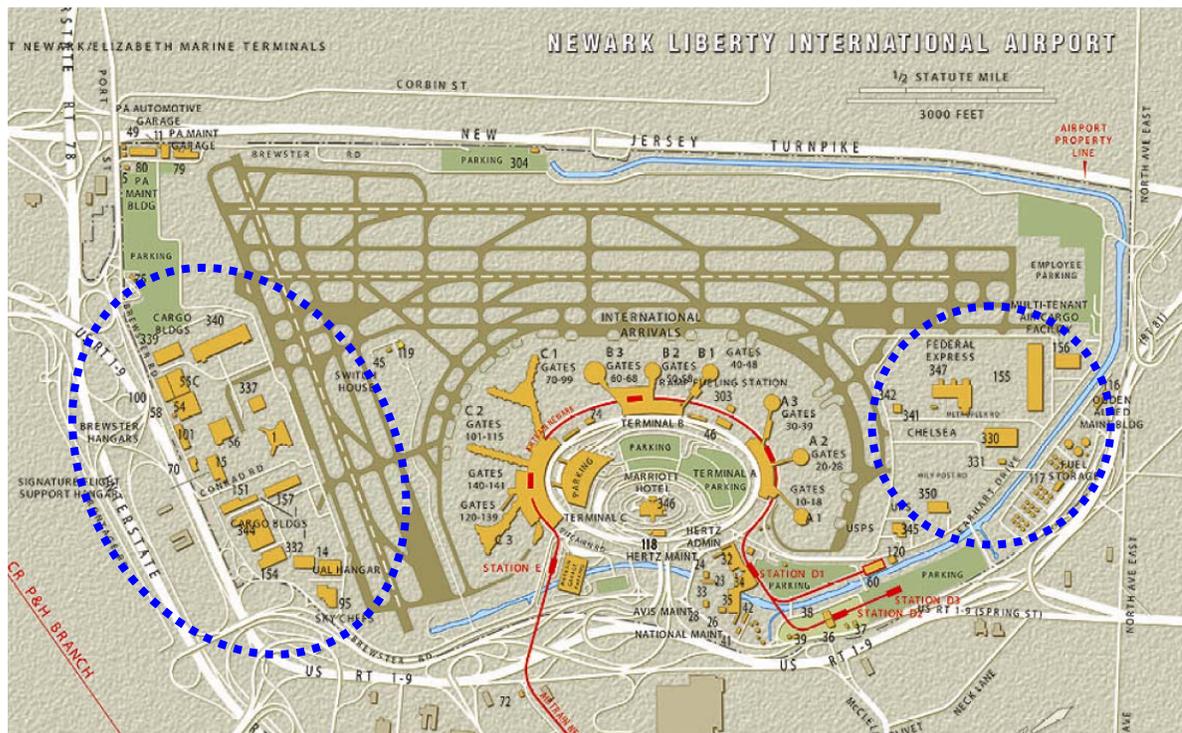
- EWR is the region's primary gateway for domestic cargo. It handled 727,766 tons of domestic cargo in 2002 – close to twice the amount handled at JFK (source: PANYNJ). It hosts major Federal Express facilities, as well as accommodating other all-cargo airlines and belly cargo operations. There is no information on the commodity types or origins and destinations of EWR domestic cargo. However, from interviews and studies, we understand that Market businesses do not utilize domestic air cargo to any identifiable degree.
- EWR is a secondary regional gateway for international air cargo, handling 170,448 tons in 2002 – around one-seventh the volume of JFK. According to interviews with air cargo experts, much of EWR's international cargo is actually trucked to JFK, where it clears customs. (Several years ago, a company known as Empire Waterlink proposed a ferry between EWR to JFK to eliminate these customs-related truck moves.)

It would require further traffic studies to quantify the number of truck trips between EWR and Hunts Point. But based on the fact that Hunts Point is not a substantial user of domestic air cargo services, and the fact that a large portion of EWR’s international traffic is trucked to JFK before moving to its ultimate destination, there appears to be little demand for a direct freight ferry connection between EWR and Hunts Point.

Physical and Operational Feasibility

EWR’s cargo buildings are located west of the New Jersey Turnpike. There are two main cargo areas, one north and one south of the passenger terminals. The airport complex does not have direct access to navigable water, so cargo would have to be trucked to the waterfront to access a ferry. The nearest navigable water is only a short distance away – just on the other side of the Turnpike is the Port Newark/Elizabeth complex, one of the world’s leading container ports, located on the western shore of Newark Bay. This would be the closest point to establish a freight ferry for EWR. However, the PANYNJ is a “landlord” port – it leases its property to private terminal operators – and PANYNJ staff indicates that it would be difficult to accommodate this use on Port property.

Figure 10. Newark Airport and Air Cargo Areas



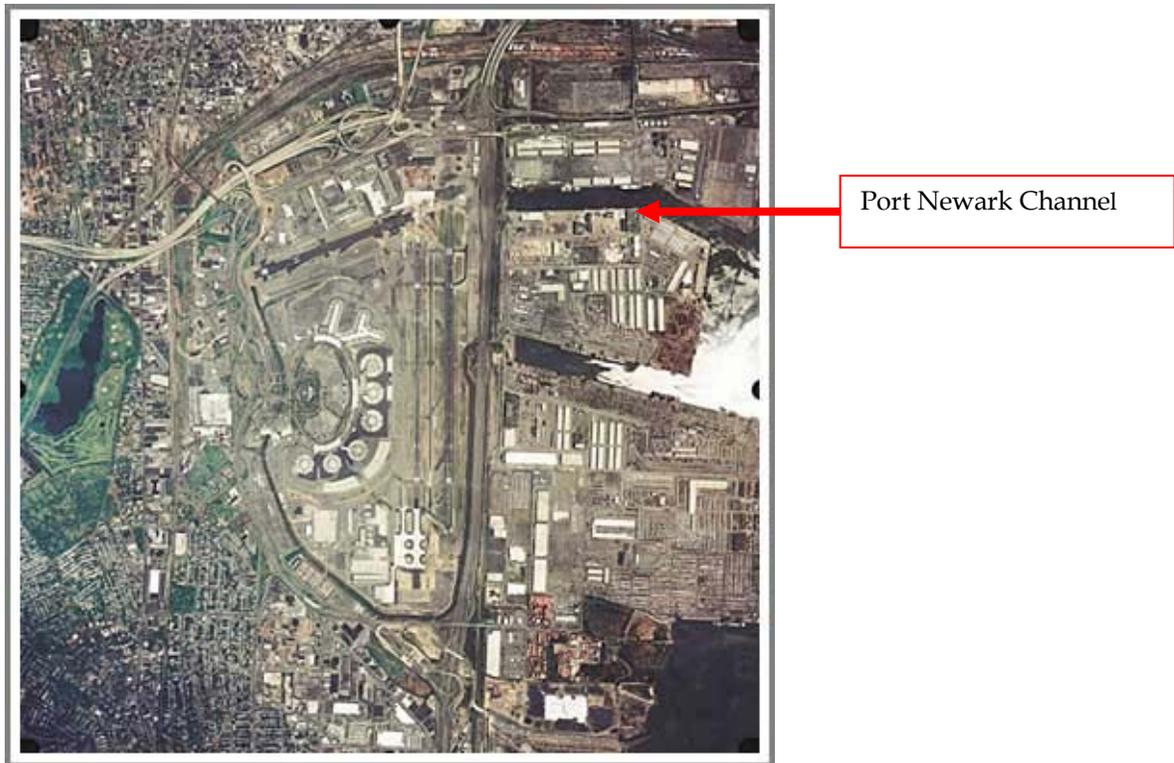
Source: PANYNJ.

Figure 11. Newark Airport Cargo Operations



Source: PANYNJ.

Figure 12. Relationship of Newark Airport and Port Newark/Elizabeth



Source: PANYNJ.

There is substantial private waterfront to the north and south along the western shore of Newark Bay, and at other reasonably proximate locations adjoining New York Harbor. We believe that a suitable site could be identified somewhere in the region, although some amount of over-the-road driving might be required to reach it. For analysis purposes, however, we assume a best-case scenario, where a ferry landing could be provided at the nearest navigable water to EWR, at the end of the Port Newark Channel.

Performance and Service Characteristics

The distance from the Port Newark Channel to Hunts Point is 21 nautical miles. At a low-end truck barge speed of nine knots, the trip would take two hours and 20 minutes. With a faster 15-knot medium-speed truck ferry service, the trip would take one hour and 24 minutes. A 35-knot service would not be possible, given operating constraints in the East River and Kill van Kull. To these times, we add 30 minutes of truck “dead time” and 10 additional minutes to go from EWR cargo terminals to the ferry. The total service times are therefore **three hours** for the truck barge, and **two hours and four minutes** for the medium-speed truck ferry.

By highway, the distance is 28.4 miles and unconstrained off-peak travel time is **35 minutes** via the Turnpike and George Washington Bridge. Since the Fish Market is the dominant user of air cargo and it takes the vast majority of its deliveries at night, peak-hour highway conditions are not an issue.

The ferry is clearly not competitive on time, and it does not offer any cost benefit that would offset this disadvantage.

- If we assume (optimistically) that 10 percent of EWR’s international cargo would use the ferry, it would generate around 20 tractor-trailer loads per day (170,000 tons times 10 percent divided by 3.4 tons per truck divided by 260 days per year). (The factor of 3.4 tons per truck comes from the Fulton Fish Market, which receives 250 tons per evening from an estimated 73 supplier trucks; 250 divided by 73 is 3.4. The 260 days per year also comes from the Fish Market, which operates five days per week).
- For a six-axle truck, Turnpike tolls from EWR (Exit 14) to the George Washington Bridge (Exit 18) would be \$6.55, and GWB tolls would be \$21.00 (weeknight EZPass) to \$36.00 (cash), for an average total of around \$35. Add an operating cost of \$0.42 per mile for the 29-mile trip (around \$12), and the trucker’s total cost is around \$47.00 going to Hunts Point. On the return trip to EWR there is no GWB toll, so the trucker’s cost is around \$18.50.
- On the “headhaul” to Hunts Point, 20 trucks paying \$47 each to use a ferry would generate daily revenues of \$940; if we also captured them on the “backhaul” to EWR, 20 trucks paying \$18.50 each to use a ferry would generate daily revenues of \$370. Total daily revenues for the ferry would be \$1,310. If we carried only the trailers, we might charge an additional \$0.90 per highway mile (the value of the time saved by not carrying the trucker). This would generate an additional \$26 per trip, of which \$20 would cover drayage at Hunts Point and \$6 would represent additional ferry

revenues; 40 trips times \$6 equals \$240 in additional revenues. In the best case scenario, ferry revenues might then reach \$1,550 per day.

- Ferry revenues of **\$1,550 per day** would not come close to covering vessel operating costs, let alone contributing to capital costs. Using vessels with a capacity of more than 30 trucks, we would need two trips per day, one in each direction. The truck barge requires two hours and 20 minutes of transit time, with 30 minutes to unload and load at each stop. We would therefore need a tug for around six hours; at \$400 per hour to lease the tug plus \$350 per hour for fuel, the cost would be **\$4,500**. The medium-speed truck ferry requires one hour and 24 minutes of transit time, with 30 minutes to unload and load at each stop. We would therefore need this ferry for around four hours. If there was another use for the ferry elsewhere in the region and we could lease it by the hour, it would cost around \$800/hr, or **\$3,200** total; in practice, it is more likely that the service would have to cover the entire daily operating cost of \$7,000 per day plus four hours of fuel at \$300 per hour, for a total cost of **\$8,200**.

Benefit and Sustainability

The EWR-Hunts Point market is uncertain and there is no clear location for a ferry terminal. Ferry service would be substantially slower than trucking, and if priced competitively with trucking would not come close to covering its operating costs, let alone capital costs. Overall, this suggests that a Newark Airport to Hunts Point service would provide limited public benefit and have questionable prospects for long-term success. The public sector could, at its option, fill the capital and operating cost gap with subsidies, but the value of subsidizing a ferry service to remove 40 off-peak truck moves from the region's highway system seems marginal.

Overall Freight Service Assessment

Given these findings, further consideration of a freight ferry between EWR and Hunts Point is not recommended.

Hunts Point to JFK International Airport

Demand

In 2002, JFK was the sixth leading cargo airport in the United States. JFK is a secondary regional gateway for domestic air cargo, handling 432,117 tons in 2002. Our assumption, as with EWR, is that very little domestic cargo is bound for the Market. However, the Market does receive international air cargo, and JFK is one of the nation's most important international gateways, handling 1,236,252 tons in 2002 (source: PANYNJ). According to U.S. Customs data for the period January-September 2003, the New York District (JFK and EWR) imported almost 23,000 metric tons of vegetables and over 20,000 metric tons of fish, along with other edible goods – much of which was bound for the Hunts Point Market.

Table 13. Selected Air Cargo Imports, New York Customs District

Commodity	Metric Tons, January-September 2003	Tons per Year (Estimated)	Tons per Day (260 Days)
Vegetables	22,678	33,331	128
Fish	20,693	30,413	117
Fruits and Nuts	2,844	4,180	16
Seed, Fruit, Grain	868	1,276	5
Miscellaneous Foods	816	1,199	5
Prepared Meat and Fish	484	712	3
Preserved Food	318	467	2
Meat	230	338	1

Source: PANYNJ, U.S. Customs.

Starting with fish, we noted in Section 2.0 that the Fulton Fish Market handles an estimated 500,000 pounds of fish (250 tons) per night, and that an estimated 25 percent to 40 percent (60 to 100 tons) is air cargo imported through JFK. This is generally consistent with the tons per day of fish reported in Table 13. If we attribute 40 percent of Fish Market supplier trips to JFK, then we get an estimated 29 truckloads per evening (40 percent times 73 truck arrivals, from Table 9).

Moving to vegetables, if we use the same load factor as for Fish (3.4 tons per truck, a very light loading), 128 tons of vegetables per day works out to around 38 truckloads per day that might be bound for Hunts Point. Considering the Hunts Point Food Distribution Center as a whole generates 5,272 truck trips per day, the observation by a Produce Market representative that “air represents about one percent of our traffic” seems reasonable. The observation by a Meat Market representative that they receive very little air cargo also seems borne out by the data (just three tons of prepared meat/fish and one ton of meat per day coming into the New York Customs District).

There may be other commodity types moving from JFK to Hunts Point that are not represented in Table 13. For planning purposes, if we assign all the tonnage in Table 13 to Hunts Point, we end up with 277 tons per day; at 3.4 tons per truck, this translates into a maximum of around 80 truckloads per evening bound for Hunts Point. This is a very optimistic estimate, and actual traffic is in all likelihood somewhat lower, but it gives us a target demand for evaluating the potential for waterborne services.

Physical and Operational Feasibility

JFK is located on Jamaica Bay, and there is an existing Federal navigation channel accessing the airport property at Bergen Basin, off Lefferts Boulevard. The navigation channel currently is not used for freight, but is intended to allow fuel barges to access the airport in the event of a problem with the airport’s fuel pipelines. Trash-skimming boats

currently moor there. According to air cargo industry representatives, there are around 35 airlines that import commodities that may be trucked to Hunts Point Market. Air cargo buildings are widely scattered over the airport property, as shown in Figure 13 below.

Figure 13. JFK Airport and Bergen Basin



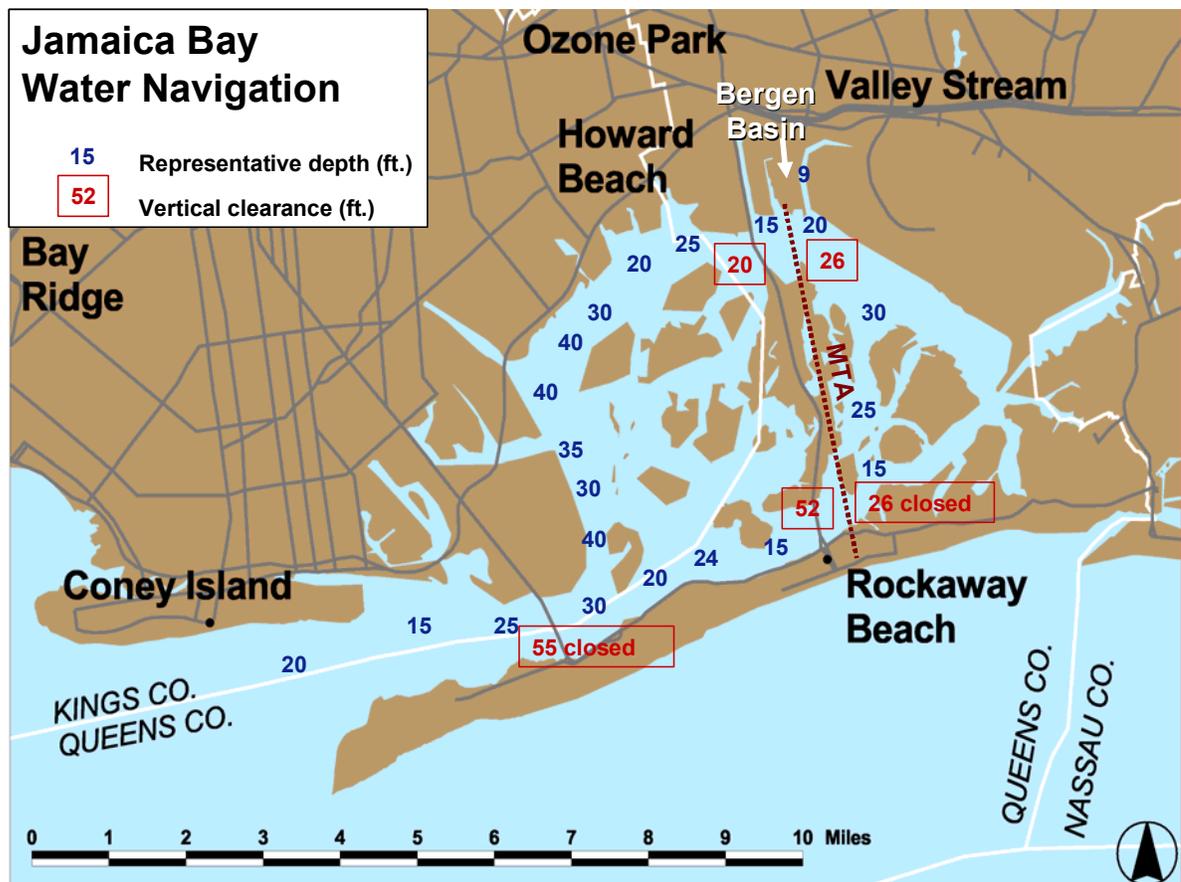
Source: PANYNJ.

PANYNJ staff indicated that a freight ferry could potentially be sited on the west side of Bergen Basin (circled in Figure 13). Bergen Basin has a nine-foot depth, and is served by a channel with a minimum depth of 15 feet. There are, however, significant navigational constraints for vessel operations:

- First, at nine feet, Bergen Basin does not offer optimal depths to accommodate a truck barge (15 to 24 feet) or a medium- or high-speed truck ferry (10 feet). Maintenance dredging would be needed, or a modified vessel design providing a shallower draft would be needed.
- Second, the two channels that access Bergen Basin are crossed by low bridges on the MTA line to Rockaway. The “air draft” is limited to 26 feet. You would either have to use the southernmost channel (adjacent to Rockaway) and open the MTA bridge on every trip, or you would have to utilize very low profile vessel designs that could fit under the bridges. Vessel width under bridges also may be an issue.
- Third, Jamaica Bay is the largest national wildlife refuge in the country, and is part of the Gateway National Recreation Area. The Bay is environmentally sensitive and

vessel operations will be correspondingly restricted with respect to speed, wake, noise, and emissions. Careful environmental reviews and extensive public/institutional outreach would undoubtedly be required. Maximum allowable speeds would probably not be in excess of nine knots, and might even be as low as five knots.

Figure 14. Navigation Constraints in Jamaica Bay



Performance and Service Characteristics

The service to JFK could be a truck barge or a truck ferry. The alternative of a cargo-only ferry - involving picking up cargo from 35 widely separated buildings, consolidating it at Bergen Basin, loading a ferry, unloading the ferry at Hunts Point, and managing the subsequent distribution of this cargo to 55 Fish Market businesses and an undetermined number of Produce Market businesses - is not considered a viable or attractive option, and was specifically rejected by the Market representatives and air cargo industry experts contacted as part of this study.

From Bergen Basin, the distance from JFK to Hunts Point is 36 nautical miles. Operations at speeds faster than nine knots through Jamaica Bay and 15 knots through the East River are not considered feasible, so the high-speed truck ferry is clearly not an option. Using a

truck barge at nine knots, the trip would take four hours. Using a medium-speed truck ferry at 15 knots (reduced to nine knots through Jamaica Bay), the trip would take around three hours. To these times, we add 30 minutes of truck “dead time” and 10 additional minutes to go from JFK cargo terminals to the ferry. The total service times are **four hours and 40 minutes** for the truck barge, and **three hours and 40 minutes** for the medium-speed truck ferry.

By highway, the distance is 18.1 miles and unconstrained off-peak travel time is just **27 minutes** via the Van Wyck Expressway and the Bronx-Whitestone Bridge. Since the Fish Market is the dominant user of air cargo and it takes its deliveries at night, peak-hour highway conditions are not an issue.

The ferry is not competitive on time, and it does not offer any cost benefit that would offset this disadvantage.

- We assume a maximum of 80 truckloads per evening from JFK to Hunts Point. This represents all of the trucks we believe could be Hunts Point traffic, and as previously noted is a highly optimistic best-case scenario.
- For a six-axle truck, Bronx-Whitestone Bridge tolls would be \$20.80 (EZPass) or \$26.00 (cash). Add a fuel/operating cost of \$0.42 per mile for the 18-mile trip, and the trucker’s out-of-pocket cost is around \$31. Tolls apply in both directions.
- On the “headhaul” to Hunts Point, 80 trucks paying \$31 each to use a ferry would generate daily revenues of around \$2,500; if we also captured them on the “backhaul” to JFK, it would generate another \$2,500. Total daily revenues for the ferry would be \$5,000. If we carried only the trailers, we might charge an additional \$0.90 per highway mile, which would generate an additional \$19 per trip; but this would not cover the estimated \$20 drayage charge at Hunts Point, and would not generate any additional ferry revenues. In the best case, ferry revenues would reach \$5,000 per day.
- Ferry revenues of **\$5,000 per day** would not come close to covering vessel operating costs, let alone contributing to capital costs. Using vessels with a capacity of more than 30 trucks, we would need six trips – three each way – to handle 80 outbound truck moves and 80 return moves. The truck barge requires four hours of transit time, with 30 minutes to unload and load at each stop. We would actually need the barge for around 27 hours to make six trips, so we need two barges operating for around 13.5 hours each. At \$4,800 per day per barge plus \$350 per hour for fuel per barge, the cost would be around **\$19,100** per day. Alternatively, if we used a single tug-barge combination around the clock, the cost might be reduced to **\$13,200**. The medium-speed truck ferry requires three hours of transit time, with 30 minutes to unload and load at each stop. We would need the ferry for around 21 hours. At \$7,000 per day per ferry plus \$300 per hour for fuel, the cost would be around **\$13,300** per day.

Benefit and Sustainability

While there is clearly demand for truck movements from JFK and Hunts Point, there are significant challenges – navigation channel depths, bridge clearances, and environmental

sensitivity – to establishing a ferry service. Ferry service would be substantially slower than trucking, and if priced competitively with trucking would not come close to covering operating costs, let alone capital costs. Overall, this suggests that a JFK to Hunts Point service would provide limited public benefit and have questionable prospects for long-term success. The public sector could, at its option, fill the capital and operating cost gap with subsidies, but the value of subsidizing a ferry service to remove an uncertain number of after-midnight truck moves from the region’s highway system seems marginal.

Overall Freight Service Assessment

Given these findings, further consideration of a freight ferry between JFK and Hunts Point is not recommended.

Hunts Point to East End of Long Island

Demand

Demand for Produce and Meat Market moves from the East End of Long Island to Hunts Point cannot be estimated from available data. The *Hunts Point Truck Study* does not show Long Island as an origin or destination separate from New York State.

However, demand for Fish Market moves can be estimated from available data. The *Hunts Point Truck Study* reports that, based on its limited survey, around 5.0 percent of Fish Market supplier trips are coming from Long Island (with the catch from the Montauk fishing fleet). With an estimated 73 supplier trucks arriving per night, 5.0 percent of 73 is a total of four truckloads per night.

Physical and Operational Feasibility

Many different sites on the east end of Long Island were assessed for feasibility as part of the *Long Island Sound Waterborne Transportation Plan*. Of these, the only two sites deemed suitable for vehicle activities (cars or trucks) were Greenport and Orient Point. Both sites currently host vehicle ferry operations. Orient Point offers service to New London, Connecticut, while Greenport is the northern terminus of the Shelter Island North Ferry. Neither of these sites is considered suitable for a ferry to move fish from the Montauk fleet to Hunts Point. The unrestricted off-peak drive time from Montauk to Hunts Point is two hours 24 minutes; the unrestricted drive time from Montauk to Greenport is one hour 30 minutes, and from Montauk to Orient Point is one hour 45 minutes. Traveling at night, when the Fish Market receives shipments, a Montauk truck could be more than halfway to the Bronx in the amount of time needed to reach Greenport or Orient Point.

Montauk is an active maritime center and hosts a seasonal passenger-only ferry service to New London, Block Island and Martha’s Vineyard. The Town of East Hampton, within which Montauk is located, prohibits vehicle ferries, ferries capable of exceeding 20 knots, and ferries with engines larger than 2,000 hp. A freight operation from Montauk would therefore have to move cargo, and not vehicles. The vessel would have to be substantially

smaller than we have envisioned, because 2,000 hp is not sufficient to power our truck barge, our medium-speed truck ferry, or our high-speed truck ferry. Moreover, there are no obvious sites to accommodate such an operation in Montauk. Local residents and local government expressed strong opposition to the potential establishment of new or expanded passenger ferry services for Montauk, and they are not likely to embrace a freight ferry.

For purposes of this analysis, we are assuming the use of a small offshore supply boat, configured to allow cargo to be rolled on and off a loading deck. The boat would provide 15-knot service in open water using less than 2,000 hp of power, at an estimated capital cost of \$2 million and an estimated operating cost of \$4,000 per day for 16-hour operation.

Performance and Service Characteristics

From Montauk Harbor, the distance to Hunts Point is 94 nautical miles. At 15 knots, the trip would take six hours and 16 minutes. Allowing 45 minutes to load and 45 minutes to unload, the total service time would be **seven hours and 46 minutes**.

By highway, the distance is 113 miles and unconstrained off-peak travel time is **two hours and 24 minutes**. Since the Fish Market is the dominant user of air cargo and it takes the vast majority of its deliveries at night, peak-hour highway conditions are not an issue.

The ferry is clearly not competitive on time, and it does not offer any cost benefit that would offset this disadvantage.

- We assume the equivalent of four truckloads of cargo arriving at Hunts Point each evening (there may be a backhaul market, but the data does not support any conclusions as to its size). We further assume that if trucked, this would involve four truck moves to Hunts Point and four truck trips returning to Montauk.
- For all trucking types, average revenues are approximately \$2 per mile (source: FHWA, *Expense Measures for the For-Hire Motor Carrier Industry: 1976 through 1999*). For the 226-mile round trip, the over-the-road trucking cost would be around \$450. If we factor in the Bronx-Whitestone Bridge tolls of \$20.80 (EZPass) or \$26.00 (cash), the total round-trip charge might climb to around \$500.
- Four truckload equivalents paying this same \$500 each to use a ferry would generate daily revenues of \$2,000 in the loaded direction. This is a one-way trip – the fish does not return to Montauk.
- Ferry revenues of **\$2,000 per day** would not come close to covering vessel operating costs, let alone contributing to capital costs. We would need one trip each way per day, requiring almost 16 hours of vessel utilization at an estimated cost of **\$4,000 per day**.

The economics could be improved – possibly to a break-even operating point – if there was an identifiable backhaul for the barge on its return trip from Hunts Point to the East End, but the available data does not indicate any other markets that might help the vessel “pay its way.” The economics also could be improved might also be improved if the

service accommodated commodities other than fish. We know there is extensive agricultural activity throughout Suffolk County, and that some of these goods find their way to Hunts Point. It seems unlikely that many Suffolk County shippers would send their cargo to the easternmost end of the South Fork just to catch a more than six-hour ferry, when they could simply truck their cargo to Hunts Point in around two hours (unconstrained) to around four hours (worst case scenario). Also, we would not expect the East End communities be pleased about hosting any additional trucks.

Benefit and Sustainability

While the idea of an East End service is appealing in concept, the identifiable market is quite small, there are significant limitations on the types of vessels that can be operated, and there is no reason to believe that an acceptable site could be found. Ferry service would be substantially slower than trucking, and if priced competitively with trucking would not come close to covering operating costs, let alone capital costs. There may – or may not – be other markets that could help reduce this cost gap. However, given the practical difficulty of establishing any form of service regardless of demand, it does not seem worth the effort of additional market research. Additionally, this service would require extra cargo handling at Hunts Point – exactly what the Market representatives are trying to avoid.

Overall, this suggests that an East End to Hunts Point service would provide limited public benefit and have questionable prospects for long-term success. The public sector could, at its option, fill the capital and operating cost gap with subsidies, but the value of subsidizing a ferry service to remove a few truck moves from the region’s highway system at night seems marginal.

Overall Freight Service Assessment

Given these findings, further consideration of a freight ferry between the East End of Long Island and Hunts Point is not recommended.

Hunts Point to Port of New York and New Jersey and Connecticut Coast

Demand

Demand for truck moves between the Bronx and New England can be partially estimated from available data as follows:

- The *Hunts Point Truck Study* reports that, based on its limited survey, around 38 percent of Fish Market supplier trips are coming from New England. With an estimated 73 supplier trucks arriving per night, 38 percent of 73 is about 28 truckloads per night. Produce and Meat Market trips cannot be estimated from available data.
- The TRANSEARCH database indicates that only around three percent of Bronx inbound commodities in the Food and Kindred products category comes from New England. The *Hunts Point Truck Study* found that 3.9 percent of inbound trucks and 5.0

percent of outbound trucks used the New England Thruway. If we assume that New England food product trucks might constitute around four percent of total trucks for the Hunts Point Food Distribution Center, it would represent around 100 truckloads in and 100 out per day.

Demand for container moves (not trucks) between PONYNJ and Hunts Point can be estimated using data generated by the PANYNJ and Moffatt and Nichol Engineers the “Port Inland Distribution Network” (PIDN) initiative. PIDN estimated the origins and destinations (at the zip code level) for containers moving through PONYNJ in year 1999.

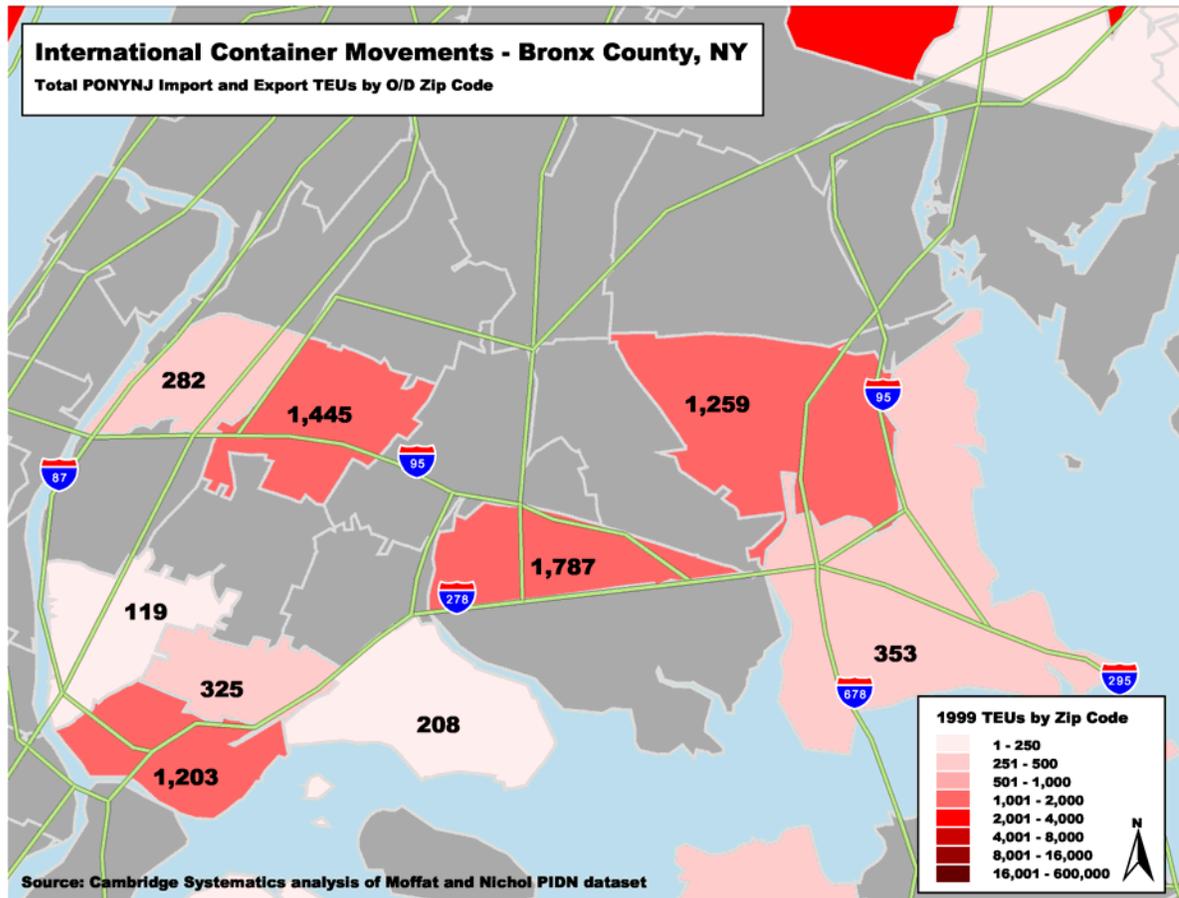
- Looking at Figure 15 below, the estimate of 208 TEUs (20-foot equivalent units, the equivalent of around 122 containers) moving between PONYNJ and Hunts Point seems low, and most likely reflects limitations in the original source data. A better estimate can be derived by adding the totals for all Bronx zip codes, producing an areawide total of 6,981 TEUs. Next, we need to multiply this estimate by 1.6, reflecting growth in PONYNJ container traffic between 1999 (2.5 million TEUs) and 2003 (four million TEUs), resulting in an estimate of 11,169 TEUs. Then, we convert to containers per day (using 1.7 TEUs per container and 312 days per year), giving a result of 21 containers per day.
- We know that import containers outnumber export containers by a 2:1 margin, so we assume this figure of 21 containers consists of 14 import containers and seven export containers, plus seven outbound empties – for a total of 14 containers each way per day.

Physical and Operational Feasibility

The PANYNJ and Port of Bridgeport, Connecticut are planning to start (in year 2004) a container barge service between the two ports. Containers on trailers will be rolled-on and rolled-off a specially fitted oceangoing barge, powered by a large tug. A similar container barge service (using lift-on/lift-off rather than roll-on/roll-off) already is operating between PONYNJ and the Port of Albany.

The operation is planned to remove 33,000 TEUs (20-foot equivalent units) from I-95 over the next two years. The overnight service will operate six days per week; initially, around 50 to 80 containers will be loaded in New York Harbor and delivered to Bridgeport by around 7:00 a.m., with the return trip beginning around 10:00 a.m. Once established, the service might use a higher-capacity barge.

Figure 15. Estimates of PONYNJ Container Moves, 1999



This service could potentially add Hunts Point as a stop within New York Harbor, if demand warrants. The service might work as follows:

- At the region's marine terminals, Bronx-bound containers would be loaded.
- Arriving at Hunts Point, these containers would be offloaded, and Bronx traffic bound for New England would be loaded. This would be mostly domestic containers, rather than international containers.
- Arriving at Bridgeport, containers would be offloaded and distributed both locally and throughout New England. Containers moving from New England to the Bronx would be loaded onto the barge.
- Arriving back at Hunts Point, containers from New England would be offloaded, and Bronx containers bound for the region's marine terminals would be loaded.
- Finally, back at the region's marine terminals, these containers would be offloaded, and the cycle would start again.

The potential truck market between Hunts Point and New England is estimated at **78 truck moves per day in each direction**. Out of this total, the number that might be suitable for handling on a roll-on/roll-off container barge is unknown. The number of domestic containers that move between New England and the rest of the Bronx is unknown, but could add to the total demand for a roll-on/roll-off barge service.

The container market between PONYNJ and the Bronx - **14 containers per day each way** - is small. On the other hand, recognizing that the start-up barge only holds 50 to 80 containers, even a few boxes helps build and support the service. Also, as noted above, the PIDN data analysis may have underrepresented Bronx traffic.

Performance and Service Characteristics

Comparisons of distance and transit time for the proposed service are shown in Table 14 shown below. For estimating purposes, we assume that Hunts Point is the origin or destination for all truck and barge moves, so additional distance and time associating with trucking containers between Hunts Point and other Bronx origins-destinations is not reflected in the figures. Barge loading/unloading time (two to three hours per stop) also is excluded. We understand that the service is planned to operate at eight knots on average.

Table 14. Comparison of Truck and Container Barge Performance

Origin-Destination	Truck Move		Barge Move	
	Miles	Transit Time (Off Peak)	Nautical Miles	Transit Time (Eight-Knot Service)
Port Newark-Elizabeth (via Turnpike and GWB)	28.4	35 minutes	21.0	2 hours 38 minutes
Howland Hook (via Turnpike and GWB)	33.5	40 minutes	19.2	2 hours 24 minutes
Bridgeport, CT (via I-95)	50.9	58 minutes	40.8	5 hours 6 minutes

Because the service would be overnight and the trucker’s time would not be tied up, the transit time differential is not seen as a significant negative factor. The key issue is whether the service provides a cost benefit compared to trucking. The PANYNJ’s analysis of a representative move (PONYNJ to Hartford, Connecticut) suggests the barge would save \$50 per trip versus trucking - including all loading, unloading, and local pick-up and delivery costs - based on an assumed trucking cost of \$550.

Would container barge movements to and from Hunts Point enjoy the same type of savings? This is a critical question. Given that Hunts Point is somewhere between PONYNJ and Hartford, we might expect the trucking price to either destination to be less than the \$550 cost to move between them. We have not conducted an analysis of

comparative trucking costs as part of this study, but anecdotal evidence suggests that some truckers are in fact charging as much as \$550 for a round trip into the City during the day. Also, the cost to New England would be influenced by the specific origins and destinations, which cannot be determined based on available data. Further study of comparative costs therefore seems warranted.

Another question concerns the number of stops the service can make. At two to three hours per stop, each stop adds significantly to the total end-to-end transit time for the barge. Rather than stopping at multiple terminals every day, it may be more practical to stop at fewer terminals each day. Instead of being served every day, a terminal might be served two or three times a week. This would reduce the operating demands on the barge and allow for a “critical mass” of Hunts Point container traffic to accumulate. The disadvantages would be the loss of service frequency and the need for more on-terminal container storage. As service frequency declines, the attractiveness for time-sensitive loaded containers declines; this would not be an issue for empty containers.

Benefit and Sustainability

As proposed by the PANYNJ and Port of Bridgeport, the container barge offers a credible alternative to regional trucking between PONYNJ and the Port of Bridgeport. Adding Hunts Point to the itinerary has the potential to offer a similar benefit.

Overall Freight Service Assessment

Given these findings, a container barge stop at Hunts Point is considered a candidate for improving freight service to Hunts Point. Further study will be needed to generate:

- Better estimates of container volumes, origin-destination patterns, and comparative trucking costs, for both the PONYNJ and New England markets.
- Analyses of the traffic impacts of distributing Bronx containers from the Hunts Point waterfront. Moving Hunts Point containers by water instead of truck is a clear benefit for Hunts Point; moving someone else’s containers may not.
- Analyses of the operational impacts of adding another loading/unloading stop to the barge service, and the optimum number of days per week for a service to Hunts Point.

Hunts Point to New Jersey and West of Hudson Markets

Demand

The *Hunts Point Truck Study* estimated that between 20 percent and 35 percent of Produce and Meat market trucks are associated with New Jersey and other markets west of the Hudson River, depending on trip purpose. On average, around 30 percent of Produce and Meat market trucks are associated with west of Hudson origins and destinations, as shown in Table 15 on the following page.

The *Hunts Point Truck Study* also estimated that the Produce and Meat markets generate 5,272 truck moves per day; the west of Hudson share (30 percent) of 5,272 truck moves represents around **1,600 truck moves per day** (800 inbound and 800 outbound). This is a substantial number of truck moves, and is significantly larger than any other market opportunity studied in this report.

Furthermore, around **50 percent** of these trips occur between the hours of **7:00 a.m. and 7:00 p.m.** (as shown previously in Table 5 on page 16), when they are subject to periods of highly congested travel.

Table 15. Produce and Meat Trucks from West of Hudson Markets

Origin or Destination	Produce Truck		Meat Truck	
	Arrivals From	Departures To	Arrivals From	Departures To
New Jersey	12.8%	22.8%	13.3%	17.2%
Midwest	0.5%	0.5%	10.3%	0.6%
South	12.6%	4.7%	3.4%	0.6%
Far West	9.3%	4.4%	6.9%	2.8%
Total	35.2%	32.4%	33.9%	21.2%

Source: Hunts Point Truck Study.

These 1,600 truck moves per day include:

- Drayage associated with New Jersey origins and destinations. Arrivals may be related to imports through PONYNJ and EWR, to rail cargo that terminates its trip at North Jersey railyards, and to local production. More cargo departs for New Jersey than arrives from it, highlighting New Jersey’s importance as a consuming region for Hunts Point businesses.
- Drayage associated with non-local or “hinterland” markets (Midwest, South, Far West). We see a higher percentage of produce coming from warm-weather growing regions (West and South), and a higher percentage of meat coming from meat producing regions (Midwest and West). Some of this traffic also may be related to imports through out-of-region airports and seaports.

In addition, around 47 percent of Fish Market supplier truck arrivals, 34 percent of supplier truck departures, 25 percent of retail vehicle arrivals, and 15 percent of retail vehicle departures are associated with west of Hudson origins and destinations. This could represent an additional 30 supplier truck moves each way (mostly between 9:00 p.m. and 5:00 a.m.), and as many as 400 retailer vehicle moves (trucks and autos) each way per day (mostly between midnight and 8:00 a.m.).

Physical and Operational Feasibility

Today, large trucks get between from hinterland markets to the Bronx by going through New Jersey and using the George Washington Bridge (primarily) and the Verrazano Narrows Bridge (secondarily, via the Goethals or Outerbridge); or by going through New York State and crossing the Hudson over Tappan Zee or the I-84 bridge at Newburg.

The opportunity here would be to create a truck drive-on/drive-off ferry, strategically located to intercept Hunts Point trucks before they accessed the most congested parts of the region's highway system, and deposit them on the Hunts Point shoreline - and vice versa. Since most of the trucks we are interested in capturing already will be on the major interstate approaches to these crossings, it makes sense to consider potential locations where the interstates are close to the water.

To make a general assessment of this approach, we examined three general areas for terminal locations west of the Hudson: the Bayonne Peninsula (off New York Harbor), Perth Amboy (off the Arthur Kill), and Port Ivory on Staten Island (off the Kill van Kull). We would emphasize that these are not site or location recommendations, and they imply no intent to advance them as proposals. Our only intent was to try and determine if the ferry might be an idea worth considering.

Performance and Service Characteristics

Table 16 below presents an overall comparison of mileage and service times from each of these areas by truck, compared to a truck barge and medium-speed truck ferry. (Our high-speed truck ferry would have to operate at 15 knots for most of these routes, and would offer little or no speed benefit). These comparisons include unconstrained truck travel time, plus estimates of highly congested travel time (double the unconstrained time); they also include 30 minutes of truck "dead time" and 10 minutes of terminal access time for the ferry.

Table 16. Illustrative Service Comparisons, West of Hudson Truck Ferry

Hunts Point to Vicinity of:	All- Highway		Ferry		
	Miles	Travel Time (unconstrained, congested)	Nautical Miles	Transit Time and Service Time (9 knots)	Transit Time and Service Time (15 knots)
Bayonne Peninsula (via GWB)	28.9	39 minutes 1 hour 18 minutes	13.6	1 hour 31 minutes 2 hours 11 minutes	54 minutes 1 hour 34 minutes
Port Ivory (via GWB)	34.0	52 min 1 hour 44 minutes	19.2	2 hours 8 minutes 2 hours 48 minutes	1 hour 17 minutes 1 hour 57 minutes
Perth Amboy (via GWB)	38.4	56 min 1 hour 52 minutes	25.6	2 hours 51 minutes 3 hours 31 minutes	1 hour 43 minutes 2 hours 23 minutes

For each of these routings, highway travel is faster than ferry service assuming unconstrained travel conditions. If we assume congested travel conditions, highway travel is still faster than the ferry for all routings, but the differences – particularly for the medium-speed truck ferry from Bayonne or Port Ivory – become fairly small. Under these conditions, ferry service is reasonably competitive with trucking based on time.

However, these distance/time comparisons are highly dependent on the specific origins and destinations being tested. For example:

- Assume that a trucker is coming out of Newark Airport and has the choice of heading north on the turnpike to the GWB or heading east to the Bayonne waterfront to catch a 15-knot ferry. His/her over-the-road distance is 28.4 miles with an off-peak time of 35 minutes and a congested time (in this example) of 70 minutes. His/her travel time to the Bayonne waterfront is 28 minutes (congested time), plus 30 minutes dead time, plus 57 minutes transit time, for a total of 115 minutes. For this trucker, the ferry is somewhat less attractive than the comparisons shown in Table 16.
- Produce Market truckers estimate that they bring around 40 trailers per day of “piggy-back” traffic from the CSX North Bergen and Little Ferry yards to the market, and return 40 trailers as backhaul. These railyards are located very close to the GWB crossing, and it would make little sense to dray these trailers a longer distance to the waterfront to catch a ferry, even during periods of high congestion. (If a ferry terminal is built at a rail-served waterfront location, it would be physically possible to deliver these piggy-back trailers to the waterfront by rail; however, the additional rail handling would in all likelihood result in prohibitive time delays and cost increases, compared with simply draying from North Bergen or Little Ferry.) Overall, piggy-back traffic is viewed as a poor candidate for a truck ferry. The same logic holds true for other traffic using I-80 (which offers a straight shot into the GWB) and other Hudson crossings further north – this traffic is unlikely to be divertible to ferry.
- However, for trucks using I-78, I-280, I-287, and crossings south of the GWB – which do not offer a straight shot by highway into the Bronx – the ferry option is likely to be more competitive, and these trucks could be divertible.

This illustrates the need to examine specific travel corridors and ferry locations at a greater level of detail, to determine which types of moves would find a meaningful time advantage in using a ferry, and under what operating assumptions. For present purposes, it is sufficient to note that **some** west of Hudson truck moves should find a ferry service to be time-competitive during periods of highway congestion.

Furthermore, it also appears that under certain circumstances, the ferry could actually be slightly less expensive than the truck:

- We assume a peak-period (7:00 a.m. to 7:00 p.m.) volume of up to **200** Produce and Meat market truck moves – 100 each way. This represents the original estimate of 1,600 truck moves, times 50 percent (the share within the 7:00 a.m. to 7:00 p.m. period), times 50 percent (a gross estimate of the share that might be using travel corridors

where a ferry could be competitive), times 50 percent (a gross best-case estimate of how much “potentially divertible” traffic might actually be captured by a ferry).

- For purposes of this analysis, we assume that a trucker reaches a “decision point” on the NJ Turnpike at Newark Airport, from which he/she could take the all-highway route over the GWB, or drive to a ferry on the Bayonne waterfront. Between this decision point and Hunts Point, Turnpike tolls for a six-axle truck would be \$6.55, and GWB tolls would be \$21.00 (weeknight EZPass) to \$36.00 (cash), for an average total of around \$35. Add an operating cost of \$0.42 per mile for the 29-mile trip (around \$12), and the trucker’s total cost is around \$47.00 going to Hunts Point. On the return trip to EWR there is no GWB toll, so the trucker’s cost is around \$18.50. 100 trucks per day paying \$47 each to use a ferry on the headhaul to Hunts Point would generate daily revenues of around \$4,700; 100 trucks per day paying \$18.50 each to use a ferry on the backhaul to New Jersey would generate \$1,850 per day, for a total of **\$6,550 per day**.
- Using vessels with a capacity of more than 30 trucks, we would need eight trips (four each way) to handle 100 outbound truck moves and 100 return moves. The truck barge requires one hour and 31 minutes of transit time, with 30 minutes to unload and load at each stop, for a total of 16 hours. If we limit the operation to just 12 hours (7:00 a.m. to 7:00 p.m.) by making only six trips, then at \$4,800 per day per barge plus \$350 per hour for fuel per barge, the cost would be around **\$9,000 per day**. The medium-speed truck ferry requires 54 minutes of transit time, with 30 minutes to unload and load at each stop, and could complete eight trips in 12 hours. At \$7,000 per day per ferry plus \$300 per hour for fuel, the cost would be around **\$10,600 per day**.
- Revenues of \$6,550 per day would not cover the operating costs of either the truck barge or the medium-speed ferry. However, if we assume that we carry only trailers, and can capture some of the value of driver time savings in the form of ferry revenue, the economics improve substantially. For the 29-mile trip under unconstrained conditions, we value the driver’s time at \$0.90 per mile; under congested conditions, with travel speeds cut in half, we could double this value. (The actual 1999 value for less-than-truckload trips, which occur mostly in congested urban areas, was \$1.98 per mile.) At \$1.90 per mile, the value of saving a 29-mile trip is \$55; subtracting \$20 for the cost of contract drayage at Hunts Point leaves \$35 per trip available as potential ferry revenue. In the best case, this would add \$7,000 per day (200 trips times \$35) to ferry revenues, boosting them to **\$13,550 per day**. (For a barge making six trips per day instead of eight, we would use an estimate of around **\$10,150 per day** – 75 percent of \$13,550.) In this scenario – which is optimistic but not implausible – ferry revenues would cover operating costs for either the barge or the medium-speed truck ferry, without subsidy.

The economics of this operation are enormously sensitive to the specific costs and performance characteristics of the vessel, to changing highway conditions throughout the day, to the time-sensitivity versus cost-sensitivity of the driver, to the different choices available to drivers based on their specific routings, to the probable load factors of each ferry trip, and to the assumed ferry revenues. At this point, the good news is that we can envision scenarios where a truck barge or ferry might potentially offer attractive services at competitive prices. Further study would clearly be needed to address:

- **Demand, comparative service characteristics, and diversion potential** by route and corridor.
- **Revenue streams associated with realistic mixes of vehicle types.** We have based our estimates on just two types of traffic – tractor-trailers with drivers, and trailers without drivers. In practice, the vessels might carry a mix of different kinds of traffic – six-axle tractor trailers with drivers, trailers without drivers, single-unit and panel trucks, etc. We would probably charge smaller vehicles less, but we also could carry more of them.
- **Other Hunts Point traffic that might be served.** The Hunts Point peninsula generates over 12,000 truck trips per day – far more than the 5,272 associated with the Produce and Meat markets. Many of these trips are internal to the Bronx, but some of them are external and west of Hudson-related, and could potentially be served by a ferry.
- **Through traffic.** Truckers are intelligent consumers of transportation capacity. If you provide a better way to get from the west of Hudson to the east of Hudson, they will use it. This includes through traffic trying to get between the west of Hudson and markets in Connecticut and New England. If you open the service up to through traffic, you dramatically expand the potential market for the ferry, and could probably improve its economics significantly. But you also concentrate through trucks on the Hunts Point peninsula. One of the Market representatives explained that: “we want to depressurize the peninsula by removing trucks ... not pressurize it by adding them.” To avoid this effect, a west of Hudson truck ferry would somehow have to be controlled to exclude or at least minimize through traffic – possibly through differential pricing, or by restrictions and preferences.
- **The effects at a west of Hudson ferry terminal.** There has to be an incentive – a positive transportation and/or economic outcome – that would interest a west of Hudson community in hosting such a service. A successful service must be a regional partnership in which all stakeholders share in the benefits.
- **The need for subsidy.** Our calculations have not suggested any scenarios in which ferry revenues could make a significant contribution to capital costs for vessel acquisition or terminal infrastructure. While it could happen, it is probably more likely that a public subsidy would be needed to cover these capital costs.
- **Potential for a high-speed truck ferry.** Truck ferry routes through the East River and Jamaica Bay do not allow for operations at 35 knots. However, a service between Hunts Point and the Connecticut coast – perhaps to Bridgeport and/or New Haven – could potentially operate at 35 knots. This suggests the possibility of a using a 35-knot vessel on a New Jersey-Hunts Point-Connecticut service; the vessel would operate at 15 knots between New Jersey and Hunts Point, then at 35 knots between Hunts Point and Connecticut. This might be a way to capture revenues from through traffic markets, without “dumping” that traffic at Hunts Point.

Benefit and Sustainability

There is a substantial amount of truck traffic between the west of Hudson and Hunts Point, and shifting a meaningful share of this traffic to a truck ferry operation may be possible under certain conditions.

Overall Freight Service Assessment

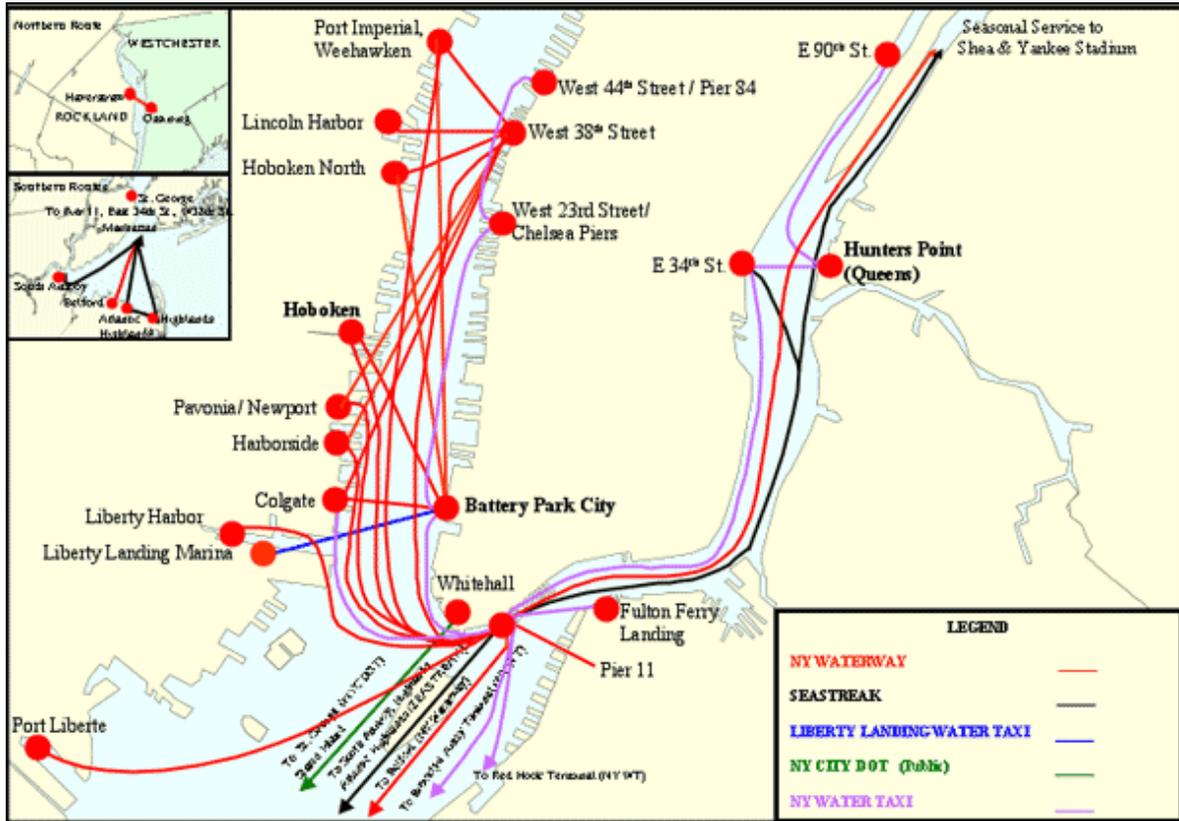
Given these findings, a west of Hudson truck ferry is considered a candidate for improving freight service to Hunts Point, and is recommended for further feasibility assessment.

■ 4.3 Passenger Demand

If freight services justify an investment in developing a ferry terminal at the Market, then passenger-only services could be added at relatively low-capital cost. Although this study did not quantify passenger opportunities, two concepts did emerge.

- **Hunts Point to LaGuardia passenger ferry service.** The freight analysis suggested that ferry service to/from LaGuardia would be highly competitive with auto and transit services. The PANYNJ is investing to reestablish a Manhattan to LaGuardia service, and is providing the necessary terminal facilities (at the former Delta Water Shuttle site). The key questions are: how much demand there is from Hunts Point? Would you increase that demand (and the potential viability of the service) by connecting the waterfront to the City transit system (perhaps using shuttle buses)? What would be the impact of concentrating ferry passengers in a freight-oriented district? And to what extent would a passenger terminal increase vehicular traffic in Hunts Point, thereby offsetting the benefits of ferry service?
- **Regional passenger ferry network connectivity.** A variety of passenger ferry services currently operate in the East River. New York Water Taxi currently runs between Manhattan and Hunters Point, Fulton Landing, Red Hook, and Brooklyn Army Terminal, generally between 6:30 a.m. and 8:30 p.m. There is an even more extensive system of ferry routes between New Jersey and Manhattan. These service networks could potentially be extended to Hunts Point in the future. Because market businesses operate extensively in the overnight and off-peak periods, the availability of after-hours ferry service would be a key issue.

Figure 16. Regional Passenger Ferry Routes



Source: PANYNJ.

5.0 Service Development and Next Steps

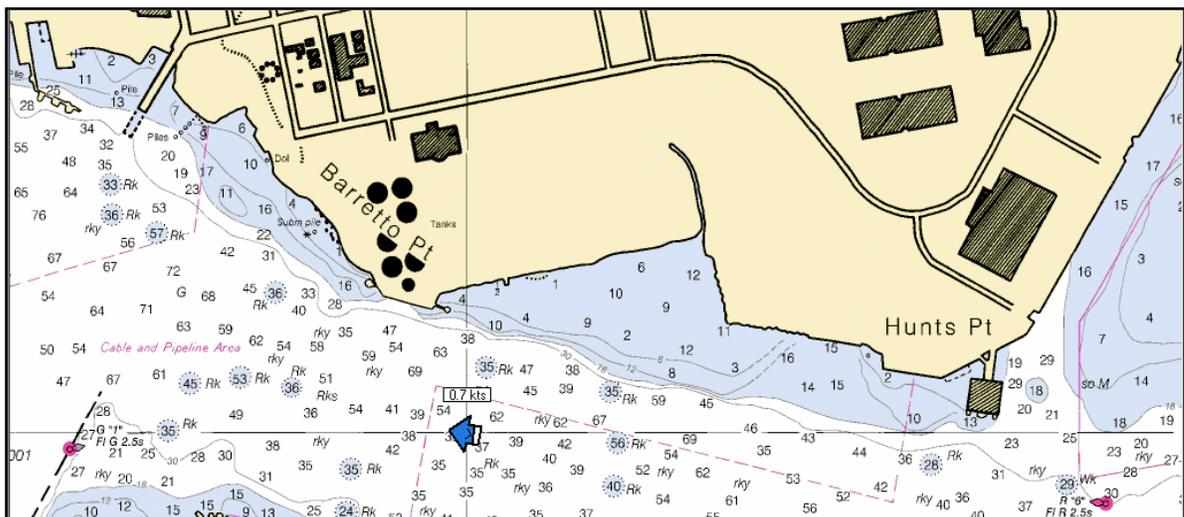
■ 5.1 Site Development at Hunts Point

Having identified major opportunities and evaluated potential services, the next question is: can these services be accommodated at Hunts Point? A limited engineering feasibility assessment determined that Hunts Point offers appropriate marine conditions, landside resources, and transportation system connections to support both a container barge and a truck ferry service.

Marine Conditions

Marine channel depths of 10 feet or more would be necessary for a truck ferry, and 15 to 18 feet would be necessary for a container barge. At Hunts Point, sufficient depths are available in three places – the pier at the foot of Tiffany Street, Barretto Point, and the waste transfer pier adjoining the Department of Sanitation site. Depths adjoining the Department of Corrections site (14 feet) are not considered adequate, and a pier would be needed to reach deeper water.

Figure 17. Water Depths at Hunts Point



Source: Navtech.

Land Resources and Transportation Access

To accommodate a ferry terminal and/or container storage yard, around three to five acres would be a desirable minimum. Looking at sites adjoining deep water, the best opportunity is at the Department of Sanitation (DOS) site.

- The DOS site offers four acres, already paved, with a bulkhead in place. A minimum amount of demolition (the removal of the existing Salt and Sand dome) and new construction would be needed to make the site ready for the receipt and shipment of marine cargo.
- The DOS site is accessible by an existing road (Farragut Street), and is centrally located to serve the Fish, Produce, and Meat markets. The operation would not need to route trucks through other residential or commercial areas of the Hunts Point community in order to reach Market businesses.
- Development of the DOS site would return this property to active use, without impinging on current Hunts Point businesses. However, the potential availability of this property has not been discussed with DOS as part of this study.

Figure 18. The Department of Sanitation Site



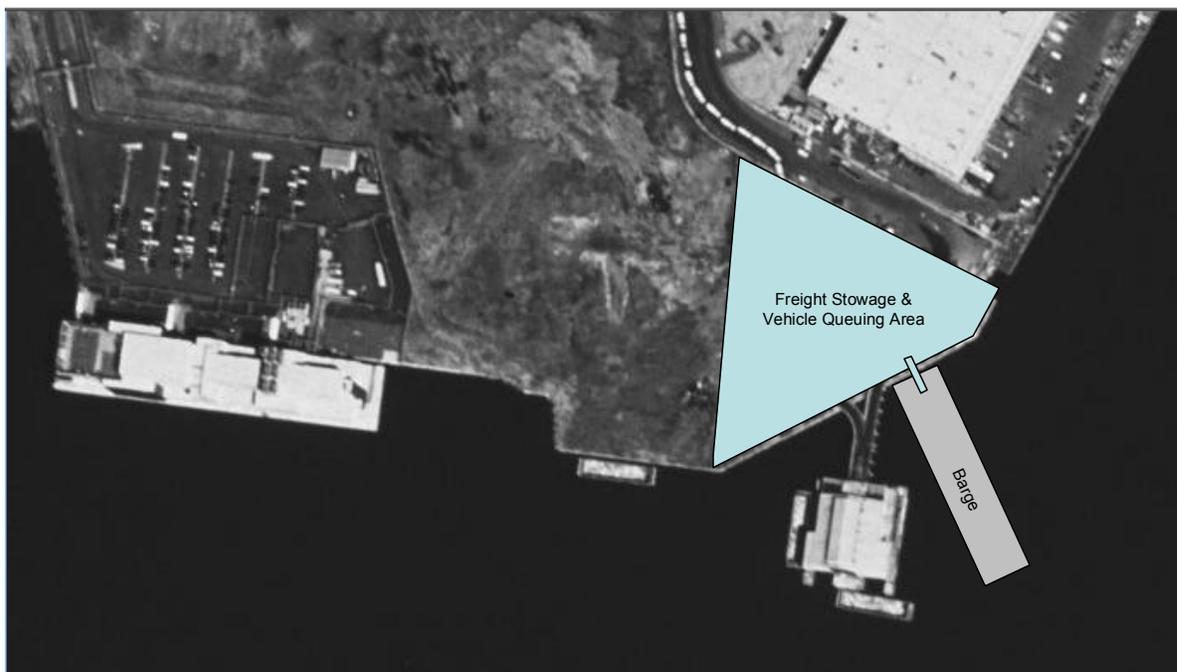
Development Cost and Concept Layout

The required site improvements have been estimated to cost \$6.5 million, and consist of:

- \$2.8 million for bulkhead repair and replacement;
- \$1.0 million for repaving, construction of a gate complex, and perimeter fencing and security;
- \$1.2 million for demolition of the Salt and Sand dome; and
- \$1.5 million (30 percent) for contingency.

This \$6.5 million would provide a 3.85-acre terminal accommodating a roll-off/roll-on container barge (as shown in Figure 19 below) and a truck ferry (which could be accommodated at the same location, or at a separate point along the short edge of the terminal's water frontage). Both vessel types could be accommodated without removing the existing DOS transfer pier. Construction of a new pier is not required – both a container barge and a truck ferry will berth with their bow or stern sides facing the bulkhead, and containers or trucks will be driven across a ramp between the vessel and the terminal. Cranes and other types of expensive cargo-handling machinery are not required.

Figure 19. Site Development Concept



■ 5.2 Service Costs and Benefits

Vessel Acquisition and Operating Costs

In addition to terminal development costs, a freight ferry or container barge would incur vessel acquisition and operating costs. Ideally, all three cost components could be recovered directly and fully from revenues generated by the operation. In practice, however, the public sector may be responsible for some or all of these costs.

For marine terminals throughout the United States, the most common financing model is for the public sector to provide the terminal, and recover some (though not necessarily) all of its investment by leasing the terminal to an operator, or by controlling related concessions such as parking. The operator is usually responsible for providing the vessel and covering operating costs from revenues.

However, in the case of very expensive operations, the public sector may contribute significantly towards vessel acquisition and initial start-up period operating costs (until a suitable base level of revenue traffic is achieved).

For the potential Hunts Point freight services, the need for public support of vessel acquisition and operating costs is at this point undetermined. However, there are likely to be differences in the costs of participating in the container barge service, versus a west of Hudson truck ferry.

- Funding for the container barge is in place, and most (hopefully all) of its operating costs will ultimately be covered by revenue traffic between PONYNJ and Bridgeport. Costs associated with adding a stop at Hunts Point would be limited to actually building the terminal at Hunts Point, plus a possible subsidy (if required and desired) to provide a competitive price with trucking.
- There is no planning or funding in place for a west of Hudson truck ferry. Terminals would need to be constructed on both sides, and a vessel (or vessels) will need to be acquired. As noted in Section 4.0, the ability of such a service to cover all its operating costs or meet capital outlays and debt service will require substantial further assessment.

Potential Benefits of Waterborne Freight Services to Hunts Point

Public investment in waterborne freight services may be justified by the realization of public benefits. Such benefits cannot be quantified at this point, but are likely to include:

- Improved transportation service and/or reduced transportation cost for Hunts Point businesses.
- Reduced truck traffic (compared to without project conditions) outside of the immediate Market area, benefiting local Hunts Point streets as well as major regional access corridors and the City's overall transportation system.

- Reduced air emissions (compared to without project conditions).
- A general increase in mobility and accessibility for Hunts Point businesses, customers, and residents, reinforcing its position as the region's preeminent food distribution center.

■ 5.3 Recommendations and Next Steps

As a next step in this process, it is recommended that the study sponsors and interested stakeholders work closely with the Market business community, with the larger Hunts Point community, and with responsible agencies (transportation, planning, environmental, and economic development) at the Borough, City, regional, and state levels to:

- Determine which, if any, of these opportunities to pursue further.
- Initiate discussions with potential service partners and regional stakeholders.
- Perform follow-on estimates of travel patterns, market demand, and engineering feasibility where needed, for the Hunts Point-New Jersey and PANYNJ-Hunts Point-Bridgeport container barge options.
- Perform further studies of shipper-specific distribution patterns. Available data did not allow for the examination of individual Market businesses and customers, but there may be significant unit moves by shippers or receivers that offer additional opportunities.
- Initiate discussions with potential developers, operators, and regional partners, as warranted.