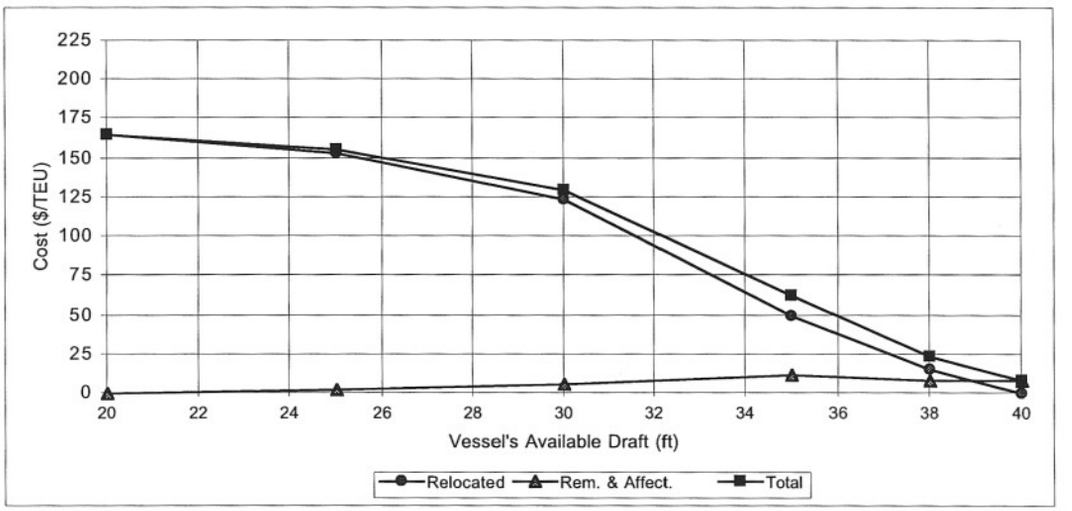
Exhibit 7
Added Freight Cost as a Function of Available Vessel's Draft - 1995

Available Draft (ft)	Relocated	Remained		Added Cost ($/TEU)		
		Affected	Unaffected	Relocated	Remained and Affected	Total
40	0.0%	20.1%	79.9%	0.00	8.29	**8.29**
38	9.3%	21.0%	69.7%	15.40	8.66	**24.06**
35	30.3%	28.7%	41.0%	50.04	11.82	**61.87**
30	75.1%	14.6%	10.4%	123.89	6.01	**129.89**
25	93.0%	4.6%	2.4%	153.38	1.90	**155.28**
20	100.0%	0.0%	0.0%	165.00	0.00	**165.00**



Response to Channel Restrictions—Future Fleet

Analysis of the general trends in containerships predicts the introduction of two "generations" of post-Panamax ships. The post I, with about 5,000 TEUs and typical dimensions of 950 x 130 x 43 feet (length x beam x draft), is already being deployed. The post II, with about 6,000 to 8,000 TEUs and typical dimensions of 1,050 x 130 - 150 x 43 feet, is forecasted to dominate the next decade. The key question is what service patterns calling New York may employ post-Panamax ships, if any.

Fleet Forecast Methodology

The methodology for forecasting the year 2015 fleet is based on the premise that lines always attempt to deploy the largest and most cost-effective vessels that can be supported by trade density and length of route. In addition, lines

need to consider en route constraints which, for New York services, are:

- Panama Canal, assuming that its basic dimensions of 965 x 106 x 39.5 remain unchanged, limiting vessels to about 4,000 TEUs; and
- South American ports, assuming their access channels are dredged only to about 40 feet, limiting vessels to 3,500 TEUs.

Altogether, the forecasting methodology involves two stages: (1) an unconstrained vessel size is assigned to each route according to its trade density and length; (2) the size is adjusted to comply with en route constraints.

Present and Future Services and Vessels

The forecast assumes that the present service patterns of New York will remain essentially unchanged. This is simply because most of the conceivable patterns are already available. Some additional services, mainly to emerging trade regions such as Africa and East Europe, may be introduced in the future. However, their relative share of New York's market is not expected to be significant in the next 20 years. The forecast thus relates to the same ten services as defined above, with each analyzed according to its length (long, medium, short), future density (high, medium, low) and en route constraints (Panama Canal, non-New York ports).

The 2015 forecast indicates that 6,000-TEU, post II containerships will only be deployed by the Suez-Express services (currently with 2,800 TEU). It estimates 4,000-TEU Panamax vessels will be deployed by the Panama-crossing Pendulums (same as presently used). The Transatlantic and Americas services will employ vessels ranging between 3,000 and 3,500 TEUs (slightly larger than currently deployed). The smallest and shortest service, the Puerto Rico service, is expected to operate with 2,500-TEU ships (presently with 1,200 TEU).

Exhibit 8 presents the fleet forecast

Exhibit 8
Unconstrained Vessel Forecast for New York Main Services

		Present Vessels		Relevant Factors: Trade Density	Route Length	Navigation Constraints	Future Vessels	
East-West Services		TEUs	Draft				TEUs	Design Draft
1	Transatlantic	2,900	35	High	Medium	—	3,500	41
2	Pendulum North	4,000	40	High	Long	Panama	4,000	42
3	Pendulum South	3,300	38	High	Long	Panama	4,000	42
4	Panama Express	2,800	36	Medium	Long	Panama	3,500	41
5	Suez Express	2,800	36	High	Long	—	6,000	44
6	Mediterranean/Middle East	2,000	32	Low	Medium	—	3,000	39
7	Round-the-World	3,500	39	Low	Long	—	4,000	42
North-South Services								
8	East Coast South America	1,500	28	High	Short	Foreign Ports	3,500	41
9	West Coast South America	1,000	26	Low	Medium	Foreign Ports	2,500	37
10	Puerto Rico	1,200	26	Medium	Short	Foreign Ports	2,500	37

for New York main services, assuming the channel is dredged to 45 feet.

Market Share of Services

Projecting the future market shares of each of the ten service patterns is the most difficult task in the fleet forecast. It involves predictions of growth (decline) rates by trade route and cargo allocation according to the multiple connection options. Especially difficult is the allocation of cargo between services that call and do not call New York. This relates to New York's Asian trade, with about two-thirds of it handled by services that do not call New York, using the MLB through West Coast ports. Recently, this trend is being reversed with the introduction of express services through the Panama and Suez Canals.

The basic assumption underlying the forecast is that the express services, especially through the Suez, will make large inroads into the MLB, shifting large amounts of cargo back to the port of New York. This assumption relies on three factors: (1) increasing trade with Southeast Asia (South China, Thailand, Indonesia, India) for which the through-Suez route is shorter; (2) growing rail congestion resulting in devoting more capacity to the higher paying domestic cargo; and (3) reduction in ocean freight following the scale economies of post-Panamax ships operated by alliances of lines. Another trend assumed in the forecast is a substantial growth in trade with the Americas following the creation of regional free trade blocks.

Model Results for All New York Services– Cargo Loss and Added Transport Costs

The draft response model is applied for New York's future fleet. As before, the model generates a desertion chart and transport costs. The model results in terms of cargo losses are: 21% for 38 feet (9% in 1995), 44% for 35 feet (30% in 1995) and 100% for 30 feet (78% in 1995). In terms of sailings: 11% for 38 (6% in 1995), 34% for 35 (22% in 1995) and 100% for 30 feet (63% in 1995).

The added transport costs per TEU range from $9 at an available draft of 40 feet ($9 in 1995), up to $165 (cost of drayage from relocation port) at 30 feet ($133 in 1995).

Model Sensitivities

The results of the model are sensitive to two key input assumptions:

- Service Pattern Composition—especially the relative share of services expected to employ post-Panamax vessels such as the Suez Express; and
- Hinterland Cargo Composition—especially the relative share of New York local cargo.

A higher share of large vessels increases the impact (cargo loss) of channel restrictions since large vessels are hurt more by partial loading. A higher share of New York cargo reduces the impact since local cargo is more costly to divert to regional ports because of its higher feedering costs. The cargo loss, assuming current channel depth and most unfavorable conditions, high share of Suez Express and low share of local cargo, is 30% versus 21% at the base case.

Conclusions

The model's results can be interpreted in two ways:

- The good news is that New York's traditional trades and service patterns, including those with Europe, Americas and Puerto Rico and all-water, through-Panama Far East, are not expected to be affected by the current 40-foot channel.

- The bad news is that New York's growth potential beyond its traditional trades, especially the Suez Express, may be critically affected by the 40-foot channel.

While New York's traditional trades are expected to grow at a sluggish pace, emerging trade with Southeast Asia, to be served mainly by the Suez Express, is rapidly expanding.

Disregarded Factors

The model has disregarded several factors that might impair its predictive capacity.

Obstacles for Terminal Relocation. The first lines that are assumed to relocate are those operating larger and deeper ships. Yet, these lines are also those that operate large dedicated terminals, which are the most difficult to relocate. Developing such terminals in competing ports would be an expensive and prolonged process, which may take at least five years. The lines may also face substantial costs for relocating the equipment and facilities owned by them (e.g., gantry cranes). Finally, New York's lines have long-term agreements with port authorities and unionized labor that include substantial penalties in case of leaving the area.

Service and Vessel Adjustments. Lines are assumed to keep their service patterns unchanged. However, lines may elect to modify their regional rotations in response to draft limitations (e.g., call New York as MID instead of as FI). There is also a possibility that lines may develop special New York services based on shallow-draft ships.

Lines' Control of Cargo. Relocated lines are assumed to take "their" cargo with them. Shippers, especially those with local patriotism, may choose to keep their cargo at their current port and switch to lines remaining in the port.

Snow-Balling Effect. Lines forced to relocate one restricted service may decide to relocate all their services and, perhaps, the services of their global partners that share ships and terminals with them.

Long-Term Policy Analysis Tool

Any model that attempts to predict the behavior of shipping lines for a 20-year horizon is bound to be conceptual and simplistic. The model and its underlying methodology are aimed at analyzing and formulating a long-term, national policy for ports' access channels. The focus is thus on the fundamental market forces that govern liner shipping and port competition in the modern intermodal era. The intent is therefore to identify and evaluate the net, long-term impact of channel restrictions, disregarding regional variations and short-term friction.

National Dredging Policy—Who Pays?

From a national point of view, relocation of cargo among U.S. ports is not a concern. New York's loss is Philadelphia's gain—both are bona fide U.S. ports.[17] However, by definition, any relocation and reallocation resulting from a restriction involves costs. In the new intermodal era, these costs are borne by *all* U.S. shippers, including those in remote areas. Therefore, investing federal funds in any port channel should be assessed in the broader, national-level context. Put differently, there is a clear case here for a national-level study that encompasses all U.S. ports. However, unlike this study, a national study should also address the parallel subject of financing channel dredging, currently done through locally collected harbor fees. In this case, New York, being a large generator of these fees, may have a large claim on the use of them. After all, no taxation without representation is a time-honored American tenet.

References

1. These terminals are actually located in New Jersey. The local port authority, the Port Authority of New York and New Jersey, is a bi-state agency which also manages airports, bridges, etc.

2. The formula was established in the Water Resource Development Act of 1980, which created the Harbor Trust Fund based on an add valorem tax, called Harbor Fee. This tax is collected through U.S. Customs. The current rate is 12.5¢ per $100 of cargo. Because of the large volume of its maritime trade, New York is a major source for the fund's revenues.

3. In despair, New York has even considered upland disposal at a cost of $118 per cubic yard, about 20 times the cost of a typical water disposal.

4. See, for example: "Dredging Hurts NY/NJ," Terminal Update, *Containerization International*, June 1995, p. 39.

5. This article is mainly based on the author's work in a recent study conducted for the Port Authority of New York and New Jersey. (See Louis Berger & Associates, *New York Harbor Dredging Scenario Study: Regional Economic Impacts of Not Performing Maintenance or Deepening the Port*, November 1995.) This article is the sole responsibility of the author and does *not* represent in any way or fashion the views and/or positions of Louis Berger & Associates or the New York/New Jersey Port Authority. A related study that was also consulted is: Paul F. Richardson Associates, Inc., *The Port Authority of New York and New Jersey Dredging Impact Study*, Draft, December 1994.

6. For example, a New York-destined container shipped from Japan that traditionally was handled in the Port of New York can be discharged in Philadelphia, PA; Baltimore, MD; Norfolk, VA; Seattle, WA; Los Angeles, CA, or, in the future even in Freeport, Bahamas. The question is taken from A. Ashar, "Ports Strategic Planning, The New Role of Shipping Lines" *WWS/Worldwide Shipping*, pp. 71–74, 1986.

7. Several cases of port relocation due to the draft restriction were recorded. For example, SeaLand quit direct calls in New Orleans with its European service in response to draft restriction in the Mississippi River Gulf Outlet (MRGO) channel that leads to its terminal in France Road. Currently, the cargo is handled at the Port of Houston and feedered from Houston to New Orleans via barge.

8. The results of the draft response model are fed into a second model, which calculates the economic impact of ship and cargo diversion, including the loss of regional jobs, outputs, and taxes. A third model conducts a cost/benefit analysis of the KVK deepening project. The second and third models are not discussed in this article.

9. The Pendulum relates to an itinerary where ships follow the same rotation back and forth.

10. This practice is more common in the South Atlantic. For example, the Global Alliance (APL/OOCL/Hapag/NYK) Panama Express service double-calls at Charleston, South Carolina.

11. The design draft is not the maximum draft that the vessel structure can withstand, defined as the scantling draft.

12. Some vessels lighten their KVK draft by pumping out ballast. This procedure reduces stability (metacentric height) and thus not considered as "standard".

13. The Beta is a continuous distribution function, which is bounded on two sides and easily manipulable to reflect skewness.

14. The actual relocation port assumed in the model is a combination of Philadelphia and Baltimore.

15. The feedering cost is reduced for Philadelphia cargo that was previously feedered from New York. There are also other costs/savings due to realignment of the non-New York cargo that was previously feedered through New York (e.g., Boston, Midwest).

16. The vessel may also be carrying South American cargo that will be discharged in Miami, Jamaica or Panama and relayed.

17. This is not the case if the diversion is to a Canadian port (e.g., Halifax on the East Coast and Vancouver on the West Coast).

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