EXECUTIVE SUMMARY

The North Jersey Transportation Planning Authority (NJTPA) region is located right at the center of the largest and most advanced market for international trade in the world. This study examines the conditions under which existing brownfield sites in the NJTPA region may be transformed into value-added distribution centers to service international trade flows to and from this surrounding 17-state market. The objective is to intensify and localize the economic impact derived from this trade as it flows through the massive global gateway of freight transportation facilities located in region's midst, namely the Port of New York and New Jersey (PONYNJ), Newark Airport, and the intermodal rail terminals. The engine of this economic development is seen as the new and growing value-added distribution activities whose existence is tightly linked to the future expansion of trade flows. The study further substantiates the existence of major cost-effective land resources for precisely this purpose, namely, the brownfield sites proliferated across the NJTPA region.

In turn, the location on under-utilized land of value-added activities in immediate proximity to the gateway port facilities will strengthen their competitiveness. As these new activities provide globally involved livelihoods for the region's inhabitants, so will they, in turn, be empowered to expand capacity. In this manner, the NJTPA "Brownfields Project" fuses environmental and economic development objectives into a single win-win program.

The timing of the deepening of the PONYNJ access channels to 50 ft provides the region with a golden window of opportunity to capture a portion of the Asian container traffic that is currently transported trans-Pacific to the West Coast for performance of value-added work before shipment across the country by rail.[1] Value-added services are activities performed to increase the potential resale value of the commodities being handled, such as bar-coding, kitting, product manipulation, "pick and pack" and assembly of components and marketing materials. Peripherally associated activities such as product returns handling also exist. Development trends in the warehousing industry indicate that value-added services associated with Asian cargo can be successfully developed in the NJTPA region. To support this thesis, this study used a multi-pronged approach: examination of existing West Coast distribution centers servicing this cargo around the Ports of Long Beach and Los Angeles, study of the NJTPA region market climate, survey of successful national brownfields redevelopment, and a forecast of the potential trade market.

[1] It should be noted that while the overall benefits to the region would be maximized by the planned dredging of the PONYNJ's access channels to 50 ft, some of the advantages offered by value-added warehousing as discussed herein would still apply without the dredging program.

1. WAREHOUSING, DISTRIBUTION AND ECOMMERCE TRENDS AND DEVELOPMENTS

The warehousing industry, particularly the private and third-party logistics (3PL) sectors, has witnessed explosive growth, and is projected to continue to grow at a rate of 15-20% over the near future, according to the International Warehouse Logistics Association (IWLA). New approaches to logistics and warehousing have developed as a result of the rapidly growing eCommerce market. Optimization of the logistics process has become a requirement for business success and companies are reaping great benefits from the strategic advantages that effective distribution offers. Traditional models of distribution and warehousing are yielding to technologically sophisticated multi-functional product transformation centers bearing little resemblance to the warehouses of old.

The consumer eCommerce (B2C) market is estimated to have been $15 billion in goods and services in 1998, and is forecasted to grow to $380 billion by 2003. The B2B eCommerce market is larger and is predicted to grow dramatically. The GartnerGroup market analysts project rapid growth of the B2B eCommerce market from $144 billion in goods and services in 1999 to over $7.3 trillion in 2004.

Internet B2C retailers have typically adopted two approaches to satisfy the fulfillment needs of their online customers. Some large companies with sizable operating budgets have developed their own distribution networks. Other eCommerce retailers outsource their fulfillment operations to logistics experts and intermodal carriers (IMC) such as Federal Express and UPS, or to 3PLs that offer retailers and wholesalers the ability to store and ship goods without having to carry inventory in their own facilities. Drop-shipping, the practice of outsourcing the manipulation, picking, packing and shipping of items directly to consumers, is becoming more common, particularly as regards imports, with distributors even placing the retailers' names and logos on specialized packaging for them.

The traditional warehouse model illustrated in Figure 1 has evolved into the value-added distribution center system of Figure 2. The function of the warehouse in the new eCommerce paradigm is multi-functional and is often dictated by the particular needs of a client. Activities include unloading containers, sorting and inventory of contents, performance of value-added services, and shipment directly to retail stores, or in the case of Internet B2C order fulfillment, even the packaging of single items for delivery straight to the home of the consumer.

Figure 1: Traditional Storage Warehouse System

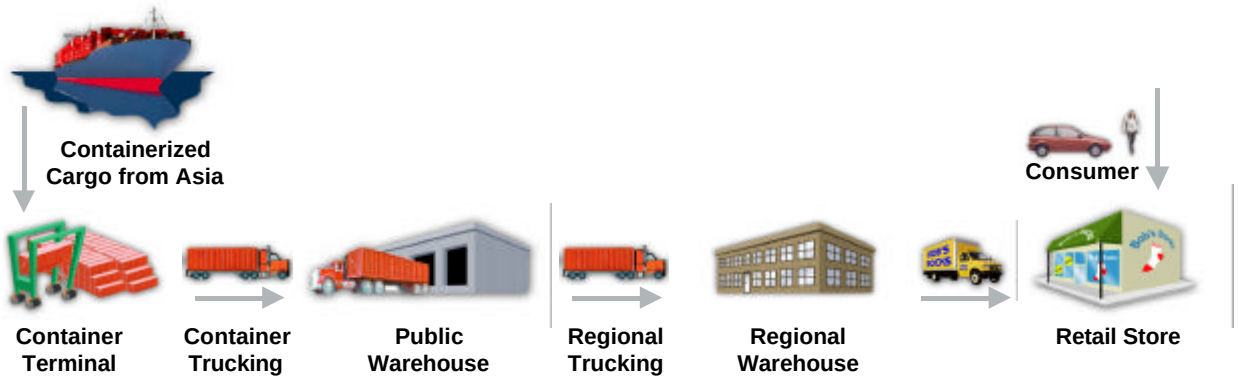
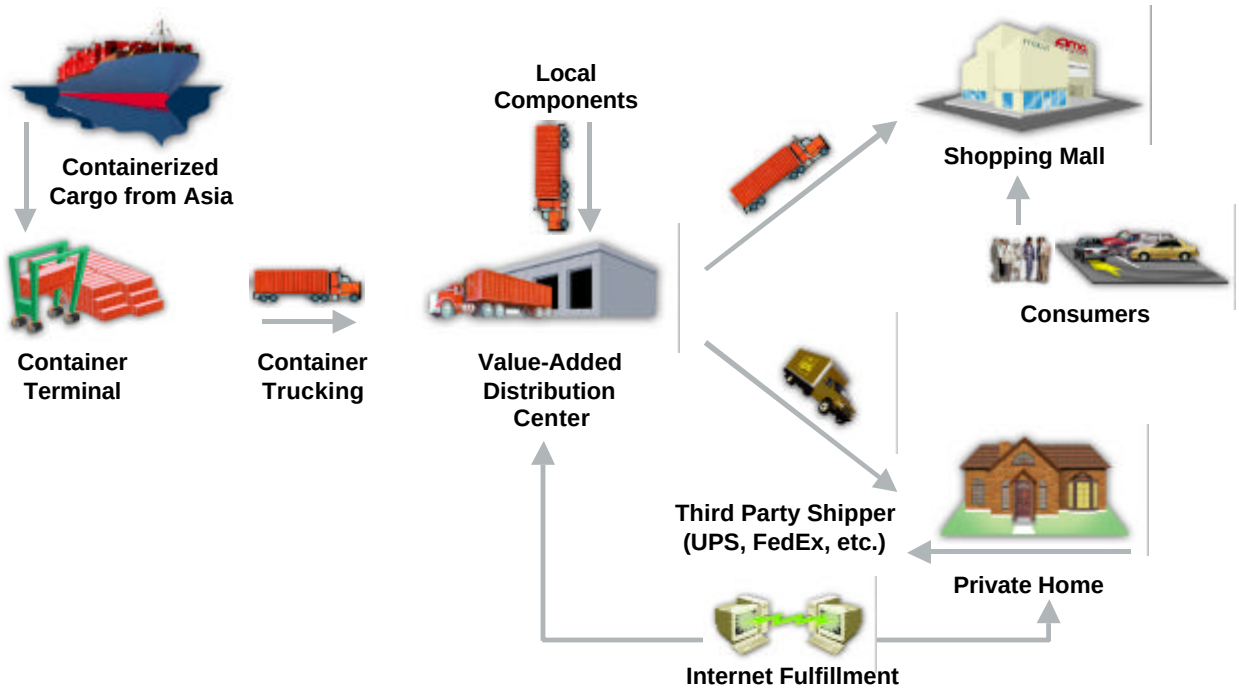


Figure 2: Value-Added Distribution Center System



Performing value-added services generally increases the number and type of employees, so the center takes on the aspect of a small assembly plant, often incorporated into a master-planned

facility with compatible tenants. With these new master-planned facilities, the physical appearance of the warehouse has undergone dramatic change as well. Newly constructed distribution centers are attractive as well as functional and often look more like office complexes than warehouses. Landscaped surroundings are the norm as owners have realized the sales advantages of using well-designed modern facilities as showcases to attract potential clients.

1. NEW JERSEY EXISTING CONDITIONS

Nearly 600,000 TEUs (twenty-foot equivalent marine container units) of imports in 1999 had some form of value-added services performed on the West Coast prior to being transported to destinations within the NJTPA market area. By 2010, when the PONYNJ channels are dredged to 50 ft, this cargo is likely to be shipped directly to the PONYNJ. Proper distribution and storage facilities will be crucial to the successful growth of logistics operations in the PONYNJ region. West Coast-style logistics operations will have to be developed in the NJTPA region.

Anyone flying into Newark Airport is familiar with the fact that the NJTPA region is already densely populated with warehouses. Traveling in and around New Jersey, one can also see massive warehousing complexes along the New Jersey Turnpike from Exit 10 (Edison) down to Exit 8A (Cranbury) in the Middlesex County area, as well as further in Pennsylvania near Philadelphia (Mechanicsburg) and in the Bethlehem (Hanover) area.

A recent public warehousing study conducted on behalf of the PANYNJ[2] revealed an industry whose members are only minimally involved in value-added services. The NY/NJ region's existing public warehousing sector is domestically oriented, highly focused on providing basic storage functions and tending to relocate increasingly further away from the port. The study also found the average physical dimensions of the warehouse and site on the rise, and consistently found Philadelphia and Baltimore warehouse locations more competitive than New Jersey sites.

While the New Jersey public warehousing sector continues to represent the older generation of logistics facilities, the private and third party sectors handling domestic cargoes are particularly dynamic and reflect the newer trends in distribution. These sectors are subject to dramatic change as developers continue to speculate by building new facilities. They are, however, primarily focused on domestic demand.

[2] Port Authority of New York and New Jersey, *Future Port Warehouse Requirements Study*, Prepared by Louis Berger & Associates, Inc., November 1999.

The recent overall trend in New Jersey industrial real estate has been toward increasingly large, state-of-the-art big-box facilities servicing a mix of national and regional 3PLs, and even some international warehousing/distribution companies and manufacturers. As mentioned, most of the material handled is of domestic origin and the cargo that is imported comes predominantly from Western Europe. The region along the New Jersey Turnpike from Exit 8A (Cranbury, Jamesburg, South Brunswick) to Exit 10 (Edison) has experienced particularly strong growth as developers in Middlesex County have taken advantage of the ready availability of land and resultant lower warehouse rents.

Demand for quality warehouse/distribution space in New Jersey has resulted in a recent vacancy rate of less than 8% in the region, one of the lowest such rates in the nation. Rents have risen accordingly, particularly in the northernmost counties, where quality space is scarce and less land is available for development. This cost differential has been a major factor in the migration of warehousing operations to the emerging Middlesex County hub. As stated by one real estate professional, "Blocks of 150,000 square feet of space remained scarce. Tenants were competing for space in the northern counties of the region with limited choices and facing much higher rents. Some tenants not dependent on PONYNJ imports, preferred moving to the central part of the region and paying lower rents."[3]

Thus, while demand for domestic freight oriented warehousing tends to gravitate away from the NJTPA area, vacant land in close proximity to the Port is essentially not available for development of international trade based distribution centers, such as those on the West Coast. For this reason brownfields sites in the region represent an extremely valuable development resource, provided they meet certain criteria. These criteria can be best described in terms of the "string of pearls concept".

2. THE STRING OF PEARLS CONCEPT

The study found the conditions for attracting port-related value-added activities – referred to hereafter in terms of their land-use equivalent: *value-added distribution center* – to be strongly related to very specific location conditions. At a minimum, sites should be:

- Within a 15-20 miles of main port terminals;
- At least 3.3 acres in size;

[3] http://www.sitarcompany.com/uli_industrial_1999.html, Sitar Company, ONCOR International, Iselin NJ.

- No more than 2 miles from major truck roadways or freight rail lines.

However, the ideal siting of value-added facilities should meet a number of additional conditions. These conditions can be summarized as follows:

- The prime location of a value-added distribution center is as close as possible to the *first maritime port of call for Asian (particularly from China)*[4] *imports*, which are generally higher value commodities such as electronics, toys and textiles;
- Once satisfying this condition, qualifying specific locations must be capable of being linked to the port's marine container terminals by *weight un-restricted and, preferably, dedicated freight-ways*;
- Sites for value-added distribution centers should have nearly *direct access to the network of interstate highways and rail terminals/lines* serving the greater region;
- Value-added distribution center sites should be situated within a *Foreign Trade Zone*;
- The value-added distribution center location should make it possible for containers to be stripped at the center and *returned immediately without dwell time to the marine terminal container yard*;
- The value-added distribution center location should be convenient for *use by package freight distributors* such as FedEx, UPS, etc. (particularly for B2C eCommerce) to service the vast New York, New Jersey, Connecticut, and Pennsylvania conurbation;
- The location should be accessible to *inbound (truck) shipments of domestic inputs*;
- Special *Customs gate clearance functions* should be allowed at the location;
- The location should be readily *accessible to a two-tiered labor pool*; and
- Sufficient land parcels should be available for the speculative development of an attractive *planned unit development (PUD)*[5].

[4] Most recent forecasts of trade indicate that, while Asian origins and destinations will continue to dominate, by 2015 Latin America will emerge as a greater trading partner than Europe. Accordingly, one can expect trade flows thus generated will also be susceptible to value-added distribution activities.

[5] The first such value-added distribution center, sized for 2010 demand, should occupy 150 acres.

Extrapolating these conditions, qualifying locations must allow the development of sizeable value-added distribution centers in close, weight un-restricted proximity to a container yard while at the same time maintaining nearly direct highway access to the region's consumers. In the case of the value-added distribution center, the container yard in question need not be that of the marine container terminal. Instead, it is best conceived of as a separate yard located inland and linked to the marine terminal by a dedicated freightway allowing the massing (truck trains or automatic guided vehicles) of box flows between terminals.

The image of inland container yards surrounded by value-added distribution centers strung like "pearls" along a dedicated freightway, or "strand", connected to the marine container terminals has given rise to the concept of the "string of pearls". An elaboration of this concept in terms of a flow diagram is given on Figure 3.

It is precisely this definition of the value-added distribution center location that links the brownfields program and the goals it represents to the Portway program and its goals.

Planning for the construction of a multimillion-dollar truck "strand" or corridor ("Portway") in Northern New Jersey is currently underway. The Portway project is intended to relieve congestion by separating truck traffic from highways, using new bridges and former railroad rights-of-way. Phase One of the project would connect marine terminals at EPAMT and Port Newark to the various rail yards in the immediate region. Besides relieving congestion, Portway is also intended to stimulate economic development to sites located along its path.

Figure 4 summarizes the scope and synergistic relationship of the two programs in terms of their shared objectives and identifies new ones made possible by the joining of the two projects.

3. BROWNFIELDS REDEVELOPMENT CONDITIONS

As defined by the United States Environmental Protection Agency (EPA), "brownfields are abandoned, idled, or under-used industrial or commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination that can make redevelopment of the property financially or logistically prohibitive."

Successful conversions of brownfield locations include sites now dedicated to a number of various uses. Freight-related facilities represent approximately half of these examples, including sites rehabilitated for manufacturing operations and industrial parks, mixed-use parks, warehousing/distribution operations, transportation facilities, and wholesalers. Figure 5 shows

the incidence (by 5-digit zip code) of known or suspected contaminated sites some of which meet the definition of brownfields.

THE FOLLOWING MAPS ARE PROVIDED IN A SEPARATE DOWNLOAD FILE

- String of Pearls Map
- Figure 4 Synergy Map
- Figure 5 brownfield map

A significant percentage of these can most likely be successfully developed to serve as *value-added distribution centers* for international containerized cargo. As previously noted, the freight-related operations associated with value-added processing of what are basically Asian imports, require close proximity to the intermodal transportation infrastructure that already exists near the ports.

This study considers that *value-added distribution centers* will develop in New Jersey as a consequence of the shift in Asian traffic directly to the PONYNJ and will mirror the conditions of the existing facilities in the San Pedro Bay area rather than following the development trends toward big box structures now exhibited in New Jersey.

5. Market Forecast

The Port of New York and New Jersey (PONYNJ) is the third largest container port in North America and the largest port complex on the East Coast. The 13-state region around the PONYNJ consumes 31% of East Asia's exports to the USA, but the Port's marine facilities currently capture only a small percentage of this traffic. Currently, most of the Asian traffic is routed via the West Coast of the North America, especially the Ports of Los Angeles and Long Beach.

By the year 2010, a significant increase in Asian containers shipped directly to PONYNJ is anticipated as the Port's deep draft channels allow increasing containership size and concomitant economy of scale, thus making the shipping of Asian trade via the Suez Canal competitive in price. Approximately 30% of Asian imports bound for the PONYNJ 17-state market region are currently warehoused in the San Pedro Bay area prior to further movement eastward as domestic freight via truck or Trailer-on-Flatcar (TOFC or "piggyback") across the nation. In order for the shift of traffic directly to the PONYNJ to occur, two basic conditions must be satisfied: the deepening of the access channels to 50 ft as currently planned, and the establishment of adequate distribution facilities in the NJTPA region to satisfy the demands of the cargo.

Over the 40-year period of the market forecast, the share of trade to which value is added in the NJTPA region is expected to increase gradually as the dredging program commences around 2004, then more rapidly as the market shift takes effect over time as a result of economies of scale related to larger vessels accessible to the PONYNJ after dredging.

Table 1: PONYNJ Market Area Trade Forecast, 2000 to 2040

	Int'l Containerized Cargo Requiring V-A Processing		NJTPA Region Forecasted Quantities				
Year	West Coast (TEUs)	NJTPA (TEUs)	Associated Domestic Cargo	Total TEUs	Facilities	Acres	Employment
1999	588,434	--	--	--	--	--	--
2005 [1]	799,215	8,770	5,847	14,616	2 to 5	7 to 16	44 to 107
2010	968,623	80,089	53,393	133,482	22 to 44	73 to 147	484 to 979
2015	1,161,675	199,351	132,901	332,252	55 to 111	182 to 365	1,210 to 2,437
2020	1,501,857	262,864	175,243	438,107	73 to 146	241 to 482	1,606 to 3,213
2030	2,525,395	439,623	293,082	732,706	122 to 244	403 to 806	2,684 to 5,373
2040	4,228,594	749,826	499,884	1,249,710	208 to 417	687 to1,375	4,576 to 9,165

Note: (1) Estimated start-up date.

While not the principle focus of this study, the role of air cargo in creating potential jobs for skilled workers should also be noted. Air cargo is typically higher priority, higher value items than ocean cargo and commonly does not require much product manipulation. However, a specialized industry does also exist to handle and service air cargo and is a complement to the value-added activities addressed herein. Future growth prospects of air cargo are far less predictable, and are frequently episodic in nature. This analysis focuses on the containerized trade that constitutes 96% of international trade by weight, rather than the relatively small international component that is delivered by air.

4. CONCLUSIONS AND RECOMMENDATIONS

This consideration of the NJTPA region market for brownfields sites, specifically regarding demand by international trade, concludes that such demand will indeed be focused and strong. In parallel with the transfer of Asian goods to direct vessel delivery to the PONYNJ, companies carrying out value-added services on imports will seek out locations in the vicinity of the port. Because these companies typically occupy facilities built on speculation, the development of value-added distribution centers in advance is needed. Taking the form of planned unit developments (PUD), these centers are seen as best located in conjunction with the development of Portway, in accordance with the previously discussed "string of pearls" concept. The first of these centers should be approximately 150 acres and should be ready for occupancy by 2005. Scattered smaller sites should also be investigated. Fulfillment of this demand is seen as a win-win condition for the strong future growth of the NJTPA economy and its gateway transportation facilities, particularly in a role as the greater region's eCommerce distributor and in association with the PONYNJ. The case of the reuse of brownfields resources for this purpose is one in

which the realization of both environmental and economic goals march hand-in-hand toward a better future for New Jersey.

Based on these conclusions, the following recommendations are made:

1. NJTPA should complete as quickly as possible Phase II of the Brownfields Project in the aim of identifying specific distribution center sites and the means for managing their acquisition, management and disposal;

2. Because the success of the program would be enhanced by its interdependent development along with the Portway project, serious consideration should be given to joining the management and funding of the two projects;

3. The Brownfields and Portway Projects should be integrated in the aim of realizing the "String of Pearls" concept;

4. The NJTPA, the State of New Jersey and the Port Authority should prepare immediately to "land bank" (450 acres) the recommended sites for the development of distribution centers, adjoining container yards and linked dedicated freight-ways;

5. The integrated economic development program should be seen as a single, revenue producing project and, like the "Alameda Corridor," should seek and receive federal funding assistance;

6. The first phase of this integrated project should be ready for use by 2005.

7. Proactive state policies should be explored to encourage freight-related brownfields redevelopment close to core regional terminals;

8. The state should investigate ways to aid communities in developing workforce training programs and in achieving workforce access to employment opportunities in newly developed brownfield areas.