systems. Pilot programs are underway using AEI. One of the most successful is Matson Lines in Hawaii, which has completely automated its tractors and chasses in an intermodal gate that is as advanced as any. The economics has not been outlined in any public forum yet.

* Do the economic benefits accrue to the individual users of AEI or extend to the system?

Both. At American President Company, we are evaluating both the external and internal economies. There are dramatic cost-cuttings and simplifications from this process that justify moving ahead with it. We also feel that there are some external economics pertinent to providing the customer a much better logistical product. There is a pilot program underway with my company, the railroads, and others to establish this more fully, probably 9 months away.

* What is the effect of innovative hardware on labor opportunities?

On the West Coast, the shippers' organization has made some presentations to organized labor, the International Longshoremen's and Warehousemen's Union (ILWU), on the concept of using technologies that will simplify the marine terminal operations to the point where manning reductions will be seen. There is an awareness and a forum to dialogue these issues. We are confident that over a short time logical and reasonable implementations can be made to automate the functions on the west coast. I don't know about rail labor or other areas, but the approach is to work with the ILWU.

We tend to find solutions and breakthroughs when there is a necessity. The forces that are acting on us today do not explain what we can do to break through our hardware issues. I believe we will see mutations but I also believe that the forces behind our industry to make change and force innovation are not in the area of marine propulsion or areas where we can take physical advantage in the physical movement and operation of the freight. This is why I feel comfortable that we are not going to see any major changes in the technology relative to the hardware.

* Federal Express Company is one of the best examples of seamless movement. They pick up the package, input the computer one time, and it moves through the system.

Basically, they get a high degree of efficiency as a result of that. Are we going to move to such a system for container movements? This change would mean an integrated organization, a CSX type of approach. Is this the future?

We do need to look at so-called "one-stop shipping." We do need to integrate the way that we process a shipment. We would love to find out how their procedures work and imitate Federal Express. We have essentially glued our documentation together, leading all the way to billing the customer from bulk rates, adding the rail and the trucker's portion on top of that. Benchmarking Federal Express makes our operation seem outmoded.

STRATEGIC ISSUES FOR PORTS

Sid Robinson, Director of Planning and Research
Port of Los Angeles
San Pedro, California

Ports mean different things to different people and may be viewed in terms of:

- Cargo trans-shipment point.
- Public access point to the waterfront.
- Recreational and/or commercial and/or retail development site.
- Industrial development site.

My presentation addresses ports as cargo trans-shipment points.

Increasing Commodity Flows

Figure 1 shows that the ports of the world handled 4.1 billion metric tons of cargo in 1989. That's big business and the business is growing. While commodity flows will be increasing in the future, the increase will be handled by fewer ports. In other words, this is a strategic opportunity for ports who gain market share and a strategic threat for ports who lose market share.

Increasing commodity flows are important from a port perspective because they have strategic implications in the following areas:

- Type of vessel calls,
- Facility requirements,
- Landside transportation requirements,
- Environmental concerns, and
- Community impacts.

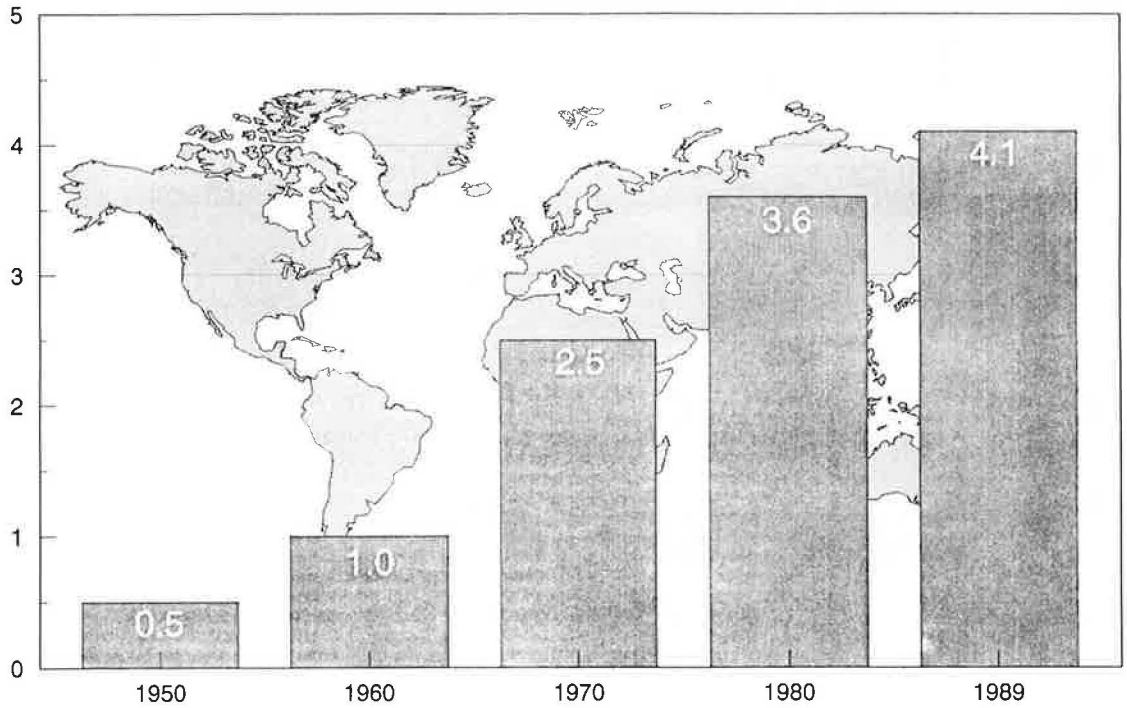

FIGURE 1 Worldwide maritime trade (in billions of metric tons).

Growth of Ship Size

The size, capacity, and speed of vessels handling waterborne trade has significantly increased during the last 20 years. Figure 2, for example, shows the growth in containerships. First generation vessels which were in use toward the end of the 1960s and early 1970s, carried 500 containers and required 25 to 27 feet of water depth. Today's sixth generation vessels carry over 4,000 TEUs and require 40 feet of water. One of the primary reasons for this growth is the economies of scale of using larger vessels.

Increasing ship size/capacity/speed, (i.e., changing ship technology) is a strategic issue because it has required ports to deepen channels and berthing areas, build longer and stronger wharves, provide more backland adjacent to the wharves, and invest in new cargo handling equipment. In other words, as ships get larger, carry more cargo, and become faster, more pressure will be placed on ports to increase efficiency.

Rationalization of Shipping Operations

Rationalization refers to shipping lines sharing space on each other's ships and/or port facilities. This is a strategic issue from the ports' perspective because it reduces the market for port facilities. Rationalization of shipping operations encourages the formation of load center ports and larger terminals, resulting in a need for fewer ports of call. The load center ports that emerge will be required to make substantial investments in larger terminals and infrastructure improvements.

Inadequate Landside Transportation Systems

The nation's highway and railroad systems are inadequate to efficiently handle maritime and domestic traffic. The ports access to the nation's transportation infrastructure, in many instances, is also inadequate. There is a need for major investments to improve deficient roads, bridges, and interchanges connecting ports with highway and rail corridors.

This can be accomplished by, among other things, constructing grade separations and implementing dedicated highway and rail transportation corridors such as the Alameda Transportation Corridor. This transportation project is designed to move cargo in and out of the ports of Los Angeles and Long Beach and provide access to the major highway and rail systems serving the two ports.

The construction, maintenance, and development of port access to highway and rail corridors with sufficient capacity to move the nation's commerce is arguably the most important strategic issue facing the port industry today.

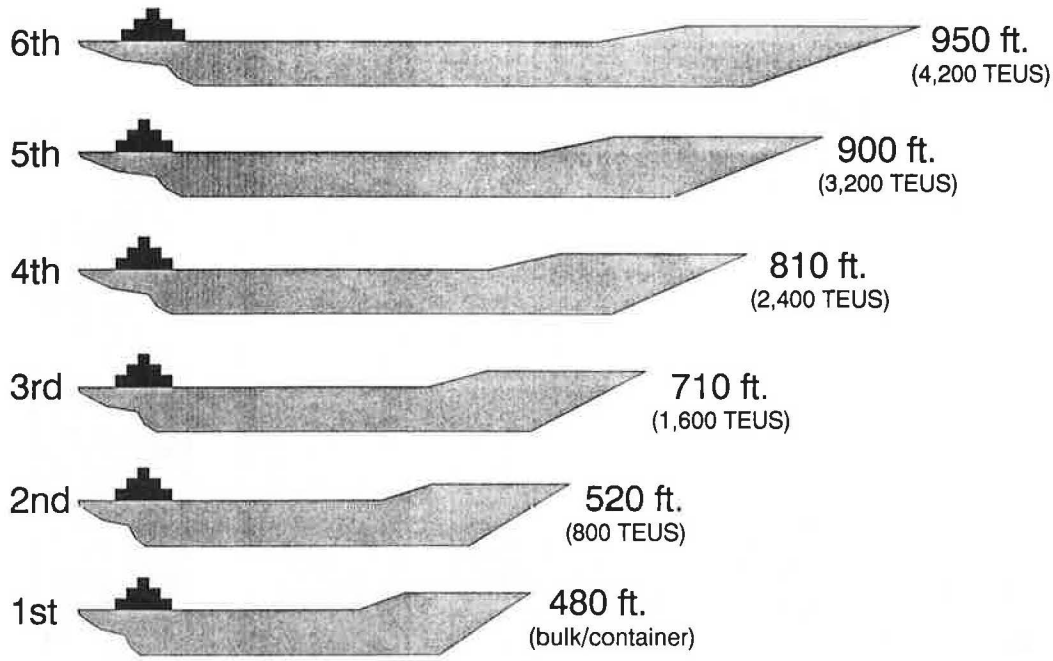

FIGURE 2 Growth of containership size (in generations).

Increasing Land Use Conflicts

It has been said that by the year 2000, 75 percent of the nation's population will be located within 100 miles of the waterfront (assuming that the Great Lakes are considered part of the waterfront). These people will place tremendous demand on ports and other waterfront areas for access.

The desire for public access to the waterfront has created what one port manager called the quiche versus cargo conflicts—where you have public facilities (quiche) being developed adjacent to traditional port facilities (cargo). Consequently, a key strategic issue facing many ports today is the need to respond to community pressure for public access and at the same time maintain existing and develop new port facilities.

Decreasing Environmental Quality

Air quality, water pollution, and soil contamination are examples of another strategic issue facing ports. That issue is the degradation of the environment and its impact on the port's ability to operate and construct needed facilities.

Decreasing environmental quality entails the following issues (among others):

- Dredging channels and disposal of dredged material,
- Restrictive regulations,
- Soil and groundwater contamination, and
- Hazardous waste disposal.

The viability of many ports will depend on their ability to effectively respond to the environmental quality issue.

Limited Financial Capability

The cost of responding to strategic issues is increasing at a high rate as illustrated in Figure 3. A one-berth, 50-acre container terminal costs almost $1 million an acre today as contrasted with less than $200,000 an acre in 1968. This is only half the picture. Not only has the cost to respond to strategic issues substantially increased over the years but the financial capability to fund these costs has decreased at the same time.

Summary

The key strategic issues faced by the port industry are summarized in Figure 4. In essence, there is going to be more cargo handled at fewer ports. The cargo is going to be carried in larger ships operated by fewer shipping

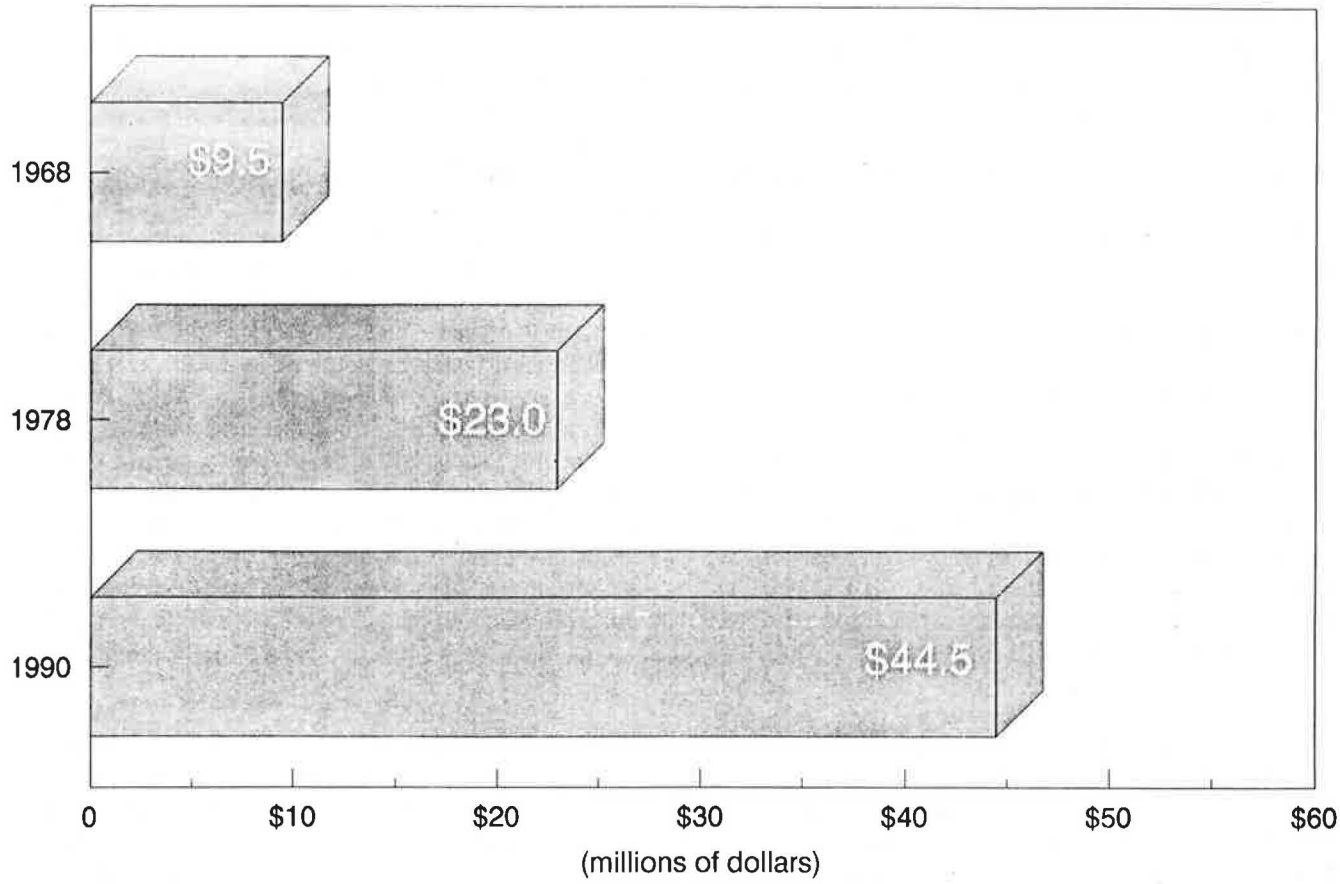

FIGURE 3 Container terminal cost (50 acres).

- Increasing Commodity Flows
- Growth in Ship Size
- Rationalization of Shipping Operations
- Inadequate Landside Transportation Systems
- Increasing Land Use Conflicts
- Decreasing Environmental Quality
- Limited Financial Capability

FIGURE 4 Summary of key strategic issues.

lines requiring larger terminal facilities. The landside transportation systems available to handle the increased movement are inadequate and need to be expanded to provide port access at strategic locations. Finally, ports will have to deal with the inherent land use conflicts between public access facilities and traditional port facilities in a deteriorating environment with limited financial resources.

Questions & Answers

* How can ports project cargo volumes?

Some of the cargo is discretionary. When you have a population base like Los Angeles and Long Beach of 16 million people within an 80-mile radius of the port, cargo is going to go there. It is not going to be shipped through Vancouver and trucked down to Los Angeles. Of our cargo, 40 to 50 percent is discretionary. The other 50 percent could go to either Long Beach or Los Angeles, but it will come to the Southern California area. Even some of the discretionary cargo is not so discretionary in that if you are coming to Los Angeles anyway, you are going to bring some of that discretionary cargo there. A big segment of the business is discretionary; we compete with Seattle, Tacoma, and to some extent, Oakland and San Francisco. The real major competitor to the Port of Los Angeles is our neighbor, Long Beach.

* What about the truck weight issue and how ports deal with that?

It should be a national issue with a national solution rather than a port issue.

LOGISTICS SERVICE: PROVIDERS' PERSPECTIVE

John Saylor, Director of Government Affairs
Fritz Companies, Inc.
Washington, D.C.

I will explain what we do in third-party logistics and give you a case study of what is going on in Kuwait as far as the need for strategic planning and the mess that anyone doing business in that part of the world is facing.

Fritz Companies, based in San Francisco, is the largest U.S. freight forwarder custom house broker. We have 65 offices in the United States and over 150 locations worldwide. We look at third-party logistics. We can offer services to our clients on a worldwide basis. Providing third-party logistics is a seamless operation. We provide service from purchase order all the way through delivery.

Sears is one of the largest companies that we deal with so I will use it as an example. We are the transportation department for Sears. We work with Sears to provide a complete system to meet all its transportation goals. We examined its operation, made recommendations, and came up with a cost savings. The objective is to save money for our clients. We worked with their purchasing department. We don't buy goods for them but we could. We could do everything, the full range, or any individual segments of the process. From the time the Sears buyers issue their purchase orders from their foreign factories, we take it all the way until we deliver the products into their distribution centers and their stores. We have Fritz employees in their overseas buying offices. Once the order is issued, we work with the suppliers, checking on the required shipping dates, as well as the delivery dates required by Sears.

All this information is loaded into our computers. The key to the whole operation is our systems. Without them, the operation couldn't work. What we are providing to our customers is access to this information. They don't have the staff to do it. We have the staff both overseas and in the United States. There are a number of different departments within Sears that are looking for certain kinds of information. The transportation group is trying to make sure that the goods are delivered when they are supposed to be. They are looking at their cost. Purchasing is looking at making sure they are going to get their goods when they are supposed to and in the quantities that are supposed to be delivered.

Then there is finance—keeping tabs on what they paid for. This is like a Nintendo game going from one screen to another. This is basically what our computer program does for Sears. Depending on who the intended users are, their information is coded in. We can break down every single item that they have purchased—how much it will cost them in their distribution center. The system also has flexibility, so even if the goods are in transit changes can still be made. If they come to us and say that they have too much sitting out in Seattle and they want to move it to Phoenix—but it is in transit—we will take care of it as soon as it enters the port.

The idea is that once we load the system we put the data into the computer on a daily basis. It comes in from all over the world. Sears in Chicago has access to that information. They can pull it up whenever they like. They can make changes, recommendations, or comments that get back to us. Not to say we don't have problems. Of course, we have problems whether there is a shortage