Double-Stack Container Trains: Issues and Strategies for Ocean Carriers

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Double-stack container trains are studied from the perspective of an ocean carrier. Use of double-stack container trains by ocean carriers involves such considerations as the origin and destination of the trains, the choice of the party to manage the rail movement, and the size of the containers. In the final analysis, the ocean carrier must determine how these issues can be integrated into its overall corporate strategy.

Much activity related to double-stack container trains has been observed in the past year. The implications in terms of the issues and strategies related to ocean carriers are discussed.

An overall strategic issue for an ocean carrier concerns the integration of double-stack container trains into a firm's corporate strategy. The topic is approached via the following questions, which represent some of the key issues involved:

- Should the carrier use double-stack container trains?
- What ports and inland cities should be used?
- Who should manage the inland movement?
- What size containers should be used?

Although these issues are interdependent, they are first considered individually and then integrated into a comprehensive strategy.

SHOULD THE CARRIER USE DOUBLE-STACK CONTAINER TRAINS?

An ocean carrier must determine whether the use of double-stack container trains can save the firm money, improve its quality of service, or both. A cost comparison of container movements from Asia to selected U.S. destinations by an all-water route, double-stack container train from the West Coast, and unit train container-on-flatcar (COFC) from the West Coast is given in Table 1. In all cases the double-stack container train is less expensive than the COFC from the West Coast. The comparison shows that the double-stack container train appears to be (a) less expensive than the all-water alternative when the destination is the U.S. Gulf Coast, (b) more expensive to the South Atlantic ports, and (c) generally less expensive to the North Atlantic ports. Double-stack containers are significantly less expensive than the all-water alternative to New York, but slightly more expensive to Baltimore.

In reality, the economic analysis is not so straightforward. The trains will not always be full, and double-stack container trains' costs will not be identical to the price offered to the ocean carrier. The transit time for a double-stack container train should always be less than that of an all-water service; however, the ocean carrier must be able to evaluate the value of this increased quality of service as well as its reliability.

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WHAT PORTS AND INLAND CITIES SHOULD BE USED?

The obvious answer to this question appears to be that the double-stack container train chosen by the ocean carrier should operate between cities where the carrier has a large cargo. Port pairs carrying more than 50,000 long tons of marine container rail traffic in 1983 are given in Table 2. No data is included for inland cities, such as Chicago, that do not reside on the ocean.

However, the answer is not as simple as matching cities to cargoes. A carrier operating between Asia and the U.S. West Coast may have a great deal of cargo to and from Chicago. Because the carrier stops at more than one West Coast port, it will have to choose between existing ports of call (and possibly others). When choosing the inland city for cargo destined for the U.S. East Coast, it may be more economical to use a double-stack service only as far as a Midwest city, such as Chicago, if cargo volumes to specific cities do not justify a transcontinental double-stack service.

Other factors to be considered include (a) terminal facilities available at each end of the rail run, (b) terms offered by the railroad involved, and (c) inducements offered by the ports involved. Baltimore, New York, and Seattle are among the ports that have promoted double-stack container trains.

Public port authorities have the advantages of having access to tax-exempt bonds, state and local funds, and tax provisions that can be used to finance capital investments. Because of this access to public financing, public port authorities are able to finance projects that would be considered too speculative by private corporations.

WHO SHOULD MANAGE THE INLAND MOVEMENT?

If an ocean carrier uses a double-stack container train service on a particular city-pair route, more decisions must be made: (a) who should own (or long-term lease) and operate the terminal at the port and at the inland city? (b) Who should own the rail equipment? (c) Who should handle the paperwork? and (d) Who should provide a container-tracing service? In other words, the boundary of control for the ocean carrier on the intermodal movement should be determined. Each carrier must consider both its own resources and the options open to it in making these decisions.

A major consideration in managing a double-stack container train service is finding cargo for the backhaul direction. The major direction for existing double-stack services is eastbound, and westbound for the backhaul leg. In the forehaul direction marine cargo comprises most or all of the cargo. In the backhaul direction it is necessary to put domestic cargo in the marine containers in order

TABLE 1 ALL-WATER VERSUS BRIDGE AND STACK CAR OPERATING COSTS FROM ASIA TO SELECTED DESTINATIONS

Destination	All-Water to East Coast	Unit Train COFC from West Coast	Stack Car from West Coast
Savannah-Charleston	1,700	2,100	1,950
Range from various Far East ports	1,300–1,700	1,850–2,100	1,700–1,950
Baltimore	2,000	2,250	2,050
Range from various Far East Ports	1,350–2,000	1,950–2,250	1,750–2,250
Houston	2,300	2,000	1,800
Range from various Far East ports	1,800–2,300	1,700–2,000	1,550–1,800
Chicago	2,450	1,500	1,850
Range from various Far East ports	2,150–2,450	1,300–1,500	1,100–1,400
New York	2,150	1,950	1,850
Range from various Far East ports	1,800–2,150	1,700–1,950	1,600–1,850

Source: Values in the table are estimated from the bar chart in *American Shipper*, Aug. 1985, p. 12
Note: All numbers in dollars per FEU.

TABLE 2 PORT PAIRS CARRYING MORE THAN 50,000 LONG TONS OF MARINE CONTAINER RAIL TRAFFIC IN 1983

Port Pair		Thousands of Long Tons
Los Angeles 5/Long Beach 4	to New Orleans 9	211,471
Los Angeles 5/Long Beach 4	to New York/New Jersey 1	176,383
Seattle 2/Tacoma 14	to New York/New Jersey 1	172,249
Los Angeles 5/Long Beach 4	to Houston 11	143,715
Los Angeles 5/Long Beach 4	to Mobile 25	101,533
Oakland 3/San Francisco 21	to New York/New Jersey 1	96,635
Los Angeles 5/Long Beach 4	to Boston 17	61,110
Houston 11	to Los Angeles 5/Long Beach 4	59,614

Source: *U. S. Imports Via Minibridge, 1981–1983*. Maritime Administration, U. S. Department of Transportation, Sept. 1984.

Note: Succeeding numbers indicate U. S. ranking of port.

to fill the train. Ocean carriers generally have little or no experience in soliciting domestic cargo, and they may not wish to take on such a new responsibility.

WHAT SIZE CONTAINERS SHOULD BE USED?

An ocean carrier typically prefers the largest container that is economically, legally, and physically possible. The largest size of marine container that can fit below decks on a fully cellular containership is 40-ft long, 8-ft wide, and 9.5-ft high. Many 40-ft containers are 8.5-ft or 8.0-ft high. If one shipper cannot fill one container with cargo, the shipments of other shippers may be consolidated in the same container.

American President Lines (APL) is the only operator of fully cellular containerships to carry on deck larger marine containers with dimensions 45-ft long, 8-ft wide, and 9.5-ft high. The national standard on over-the-road (OTR) truck limits are 48-ft long, 8.5-ft wide, and 9.5-ft high. APL has already purchased some marine containers of this size.

There are physical restrictions involved in carrying high cube containers on a double-stack container train. Cars on these trains can typically carry containers that are longer than 40 ft only on the top row. Some double-stack container trains cannot carry 48-ft containers on some (or all) of the top row. Height restrictions may apply on a particular route in terms of the tunnels or bridges involved.

An ocean carrier may also take into account restrictions on moving high cube containers in the foreign ports that it serves. For example, Japan has restrictions on both length and height. Because of the narrow streets in Hong Kong, there are problems using containers over 40-ft long.

CORPORATE STRATEGY

Corporate strategies that integrate the foregoing issues are discussed using APL for example. APL is one of the largest containership operators in the transportation trade; its ships do not leave the Pacific basin. Consequently, APL must reach the U.S.

East Coast by rail. As part of its marine system, APL operates major port terminals, utilizes a worldwide satellite communication network and uses computers to control tens of thousands of pieces of equipment.

In using double-stack container trains, APL made a strategic decision not only to enhance its existing marine service but also to diversify into a new field, domestic transportation. APL spent approximately $60 million to acquire the following from Brae Corporation: National Piggybank Services, Inc. (reportedly the nation's largest shippers' agent); National Piggybank Specialized Commodities (which focuses on movements of perishables); and Intermodal Brokerage Services, Inc. (which specializes in movement of time-sensitive cargos, primarily for U.S. automakers). APL has purchased its own double-stack container train equipment and controls the entire movement. APL has an advantage over others in soliciting domestic cargo because it has the only high cube marine containers over 40 ft on its double-stack train. APL only needs a railroad to haul the trains.

No other ocean carrier has followed the APL strategy of purchasing domestic transportation operations. However, Sea-Land, one of the largest containership operators in the world, has also aggressively used double-stack trains. This U.S. flag carrier does not operate an all-water route from Asia to the U.S. East Coast; therefore, it also relies on double-stack container equipment it has purchased.

A third U.S. flag carrier that has more recently entered the double-stack container train scene is United States Lines (USL). It owns the world's largest containerships with a capacity of 4,456 20-ft equivalent units and serves both the U.S. East and West Coast from Asia. A double-stack container train from a West Coast port would be expected to compete with the East Coast service; however, by placing containers on a double-stack service from the West Coast to Chicago, better transit time to the Midwest than is possible through the East Coast is provided, and apparently no major diversion of cargo from the East Coast service is caused.

Foreign-flag ocean carriers did not approach double-stack container trains with the eagerness of APL or Sea-Land, but several are now involved (e.g., NYK, Mitsui OSK, and Maersk). Some foreign carriers have set up their own U.S. firms, and others have formed contractual relationships with existing U.S. companies. The introduction of the foreign carriers to the use of double-stack container trains was made easier by the aggressive promotion of this service by certain railroads such as Burlington Northern, and ports such as Seattle.

Although APL represents one extreme in terms of investment, the other extreme should be considered. A small containership operator, or a carrier that carries a relatively small number of containers as part of a combination-bulk cargo vessel service, cannot afford to spend millions of dollars on an activity not directly related to vessel operations. The firm does not have sufficient volume on a steady basis to write a long-term contract with a railroad. The company uses neither satellite communications nor computerized container-control systems. It has few, if any, sales offices in locations other than its ports of call. It does not have the financial resources to buy double-stack container railcars or the management resources to manage a separate domestic transportation division.

Such a small operator must take advantage of public services provided by railroads and ports. The Burlington Northern, the Chessie (CSX) and Conrail all provide (or did provide at one time) common carrier double-stack container train service. Seattle provides services to carriers and shippers including container tracing in some instances. The Port of New York and New Jersey served as a shippers' agent to promote Conrail double-stack service. Although not directly helping an ocean carrier, this activity helped to keep the double-stack service in operation. The Port of Baltimore has subsidized the rate charged by CSX on double-stack service provided at its port.

As carriers examine the issues involved and the extreme range of strategies possible, they must decide on the particular strategy best for them. A carrier deciding to purchase its own double-stack container rail cars must determine the capacity of this equipment in terms of 40-ft, 45-ft, and 48-ft containers. The container widths may also vary at 8 or 8.5 ft. This decision should be tied to the carrier's desire to purchase high cube containers longer than 40 ft, as well as accompanying design changes that might have to be made to its vessels. If a carrier believes that all the existing and announced double-stack container train services will result in overcapacity, its decision to purchase railcars will also be affected.

In conclusion, ocean carriers have a wide range of issues and strategies to deal with. Although the decision-making process may be difficult, double-stack container trains appear to be here to stay, therefore, ocean carriers cannot afford to ignore them.

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