MARINE HIGHWAYS' NEW DIRECTION

■ *By Asaf Ashar*

WHILE ATTENDING A recent two-day marine highways workshop at George Mason University, I realized the concept has been studied exhaustively for more than 20 years, with no tangible results. On the contrary, just recently we have seen the termination of the last two coastal services, by Colombia Coastal and SeaBridge Freight. Moreover, SeaBridge terminated its cross-Gulf service despite an offer for a generous federal grant. Perhaps it's time to pause, take stock of the situation, challenge some conventions and point to new directions.

The marine highway consists of two principal shipping systems: inland waterways and coastal, the subject of this article. Coastal shipping encompasses many shipping systems, categorized by the type of freight (containers, trailers, passengers, cars, domestic/international), ship configuration (tug and barge; lift-on, lift-off; roll-on, roll-off; roll-on, lift-off; and roll-on, roll-off, passenger), ship size, speed and port system — most of which have been studied. The shipping systems that technically seem suitable to the U.S. environment can be grouped into three categories:

- **FEEDERING.** *200 to 500 miles with small lo-lo vessels with capacities of 400 to 800 40-foot equivalent units operating at 15 to 18 knots.*
- **SHORT RANGE.** *200 to 500 miles with 80- to 100-FEU compact ro-ro vessels operating at 18 to 20 knots.*
- **LONG RANGE.** *500 to 1,000 miles with 200- to 300-FEU midsize ro-ro vessels operating at 22 to 24 knots.*

The small lo-lo is for feedering international containers between hub and regional ports. The ro-ros are for trailers and domestic/international containers on chassis; the compact ro-ro is geared for bypassing short stretches of congested highway and/or high-toll bridges/tunnels, such as New York-Boston or Miami-Jacksonville; and the midsize ro-ro is geared for longer routes such as Miami-New York, Tampa-Houston or Los Angeles-Oakland.

The cost structure of any coastal shipping system consists of three main components: ship, including capital (construction) and operating (running) costs; port, including loading/unloading the ship and, if needed, capital (construction) cost; and drayage, trucking to/from the port. The drayage is added to the water service because it competes with door-to-door truck services.

The lo-lo has the lowest ship cost. Recent publications by American Feeder Line indicate a 650-FEU ship built in the U.S. would cost about $70 million, or $110,000 per FEU. Because most of the feedering traffic is generated and terminated at ports, there is no drayage. However, the high port cost ($100 to $150 per lift, or $200 to $300 per trip) offsets these cost advantages. Moreover, in addition to trucks, a U.S. shipping service will face competition from foreign services employing ships with about one-third of their slot cost, based on low-cost, foreign hub ports. It seems, then, that the prospects of the U.S.-based coastal lo-lo aren't promising.

The ro-ros may fare better than the lo-los, although ro-ro ships are more expensive than lo-lo ships because of the additional decks for supporting trailers and the additional weight of chassis. According to Intermodal Marine Lines, a midsize ro-ro with 220-FEUs (3,675 lane-meters) would cost about $180 million, or $800,000 per FEU. The compact ro-ro is even more expensive; according to Coastal-Connect, an 85-FEU ro-ro would cost about $95 million, or $1.1 million per FEU.

Despite their high slot costs, the production cost of these ships, measured in dollars per FEU-mile, is much lower than that of trucks. Likewise, their port cost ($50 to $75 per lift) is relatively small. The midsize ro-ro, however, might have difficulties generating sufficient traffic for a long-range, three-times-a-week service. Moreover, because the midsize ro-ro needs a wide catchment area, the drayage cost would be quite high ($100 to $300 per trip). The compact ro-ro isn't expected to have difficulties attracting sufficient traffic for a daily and even twice-daily service, because its route is along highly congested highways. Likewise, the drayage cost for such a service is relatively small.

The resulting, total trip cost for both ro-ro ships, including ship, port and drayage costs, is similar or perhaps somewhat lower than that of trucks. However, the water service has longer transit times and lower frequency than trucks. In addition, the water service mandates a huge, initial capital investment that, for the three-times-a-week, long-range service — requiring three midsize ro-ro ships and two port terminals — may reach $600 million. Further, rail also may be competing with water services, a factor many studies conveniently ignore.

Hence, although the prospects of a coastal ro-ro system seem better than those of the lo-lo, it seems unlikely private investors will develop it, and that the system will survive competition from truck (and rail) services. An unavoidable conclusion is that for the marine highway to succeed, it requires massive federal support.

The highly touted rationale for federal support has been the reduction in highway congestion and air pollution resulting from substituting truck by ship transport. Unfortunately, the impact of fully implemented marine highway services on road traffic would be negligible. The average daily traffic on Interstate 95 is 72,000 vehicles, including 10,000 trucks; a three-times-a-week service by the

200-FEU ro-ro would only eliminate about 200 trucks a day. Obviously, the marine highway can't solve the congestion problem on I-95. Moreover, because of its negligible impact on road traffic, the marine highway can't justify the required federal support.

The justification for such support could stem from the Navy need for modern ro-ro ships as spelled out in its "dual-use" program. Still, even with the federal government covering some of the capital cost, I doubt a coastal marine highway service would be competitive with trucks and rail.

An elegant solution yet to be explored sufficiently is applying the Navy "dual-use" program to offshore (non-coastal) traffic, between the mainland, Alaska, Hawaii and, especially, Puerto Rico — where there is no truck competition. In Puerto Rico's case, a combination of old and slow barges, and old and very expensive ships (mostly ro-ro) handle most of the traffic. The older fleet could be replaced by modern, fast and fuel-efficient ro-ros, similar to the midsize ro-ro mentioned earlier, except their design is adapted to the Navy requirements.

The savings for the Navy may justify covering some of the capital and operating costs as well, applying a similar program to that used to support U.S.-flag ships competing against foreign-flag ships in international trades.

The use of fast, economical ro-ro ships also could broaden the scope of the offshore shipping services by including extended coastal legs. For example, a Houston trailer destined for Puerto Rico currently must be trucked along the entire I-10, to reach Jacksonville, the main port of departure of existing Puerto Rico ro-ro services. A fast ro-ro service, following a triangular rotation with direct calls at Houston, Mobile, Miami and San Juan, could eliminate the I-10 highway leg.

Moreover, once the ro-ro service is established, building on the offshore traffic as its core, it also could provide cost-competitive transportation services for non-Puerto Rico, mainland coastal traffic, such as that linking Houston, Mobile and Miami. A similar triangular rotation could connect New York, Norfolk, Jacksonville, Miami and Puerto Rico, resulting in a similar impact on I-95 traffic. Then, using Miami as a relay port, the two water services could connect the U.S. East and Gulf Coast ports, providing a service between New York and Houston.

The compact ro-ros could provide both regional services and feedering services for the midsize ro-ros. For example, a Boston-San Juan trip could begin with a Boston-New York leg by a compact ro-ro, and then continue on a New York-San Juan leg by a midsize ro-ro. Altogether, using a combination of compact and midsize ro-ros, the entire range of coastal ports could be covered. JOC

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