

The Voyage to Containerization

BY BETTY JOYCE NASH

How a North Carolina trucker freed world trade

Every seven minutes, a crane at Port Newark in New Jersey lowered a large metal container — an aluminum truck body — until it rested on the deck of an old tanker ship, christened the *Ideal-X* because it was ideal for the experiment. It was April 26, 1956.

Five days later, the *Ideal-X* arrived in Houston, where cranes hefted 58 containers onto 58 trucks that hauled the big boxes to their destinations. The voyage to containerization, and to a revolution in global trade, had begun.

The man behind the operation, Malcom McLean, cared mostly about the math. Cargo in that era typically took a week's worth of human labor to load and another week to unload, at a cost of \$5.83 a ton. But McLean's experts figured the *Ideal-X*'s loading costs at 15.8 cents a ton, according to historian and economist Marc Levinson, author of *The Box*, a history of container shipping.

McLean's big idea was to handle cargo only twice, once at the shippers' location and again at the final destination, never opening the box in transit. "That really cut out a lot of dockworkers," says Wayne Talley, a professor of maritime economics at Old Dominion University. It also cut waste, damage, and pilfering, which lowered insurance. "The moving of general cargo became less labor intensive and more capital intensive. It was a major technological advancement, this simple idea of handling cargo twice." Ultimately, this slashed shipping costs, which made it affordable to haul goods over distances unimaginable at the time.

McLean was an outsider to the maritime industry. A ship to him might as well have been a truck on water. He'd already built one freight-hauling empire on land; why not build another, at sea?

Four Lanes to Sea Lanes

McLean worked in the early 1930s at a gas station where he heard truckers got five dollars for hauling the station's oil from Fayetteville, 28 miles away. It sounded like good money, so he borrowed the station owner's rusted-out trailer to do the job. By 1940, he had 30 trucks on the road and was grossing \$230,000 a year. Five years later, his fleet had grown more than fivefold.

Trucking boomed. Long-distance truck traffic more than doubled between 1946 and 1950, according to Levinson. McLean expanded by leasing routes or buying companies. He grew his truck fleet in part by recruiting World War II veterans who could use government loans to buy their trucks, then work for him as independents. Between 1946



Malcom McLean stands at the Port Elizabeth, N.J., terminal of Sea-Land, the container shipping company he founded. A native North Carolinian, McLean's instinct for efficiency had helped him build a successful trucking firm before he entered the shipping business. His big idea was to handle cargo twice and twice only, which led to lower shipping costs.

and 1954, McLean Trucking routed goods from Atlanta to Boston.

McLean watched every expenditure. McLean Trucking installed diesel instead of gasoline engines. Operators bought only at gas stations agreeing to discount fuel. The Winston-Salem, N.C., hub automated and transferred freight between trucks by conveyor belts. The firm paired new drivers with experienced ones, who received bonuses if a trainee went accident-free the first year. This cut insurance and repair costs.

To add routes, McLean had to deal with federal regulations that controlled routes, rates, and even the types of goods hauled. The Interstate Commerce Commission (ICC) required proof that rates were neither too high nor too low. McLean mastered the art of showing that his proposed lower rates would turn a profit on a route that he wanted. For instance, he convinced the ICC that his administrative, marketing, and terminal costs were lower for cigarettes than other products; that enabled him to haul cigarettes from Durham, N.C., to Atlanta at half the rate other truck lines charged. By 1954, McLean Trucking ranked third in after-tax profits of all U.S. trucking firms, according to Levinson.

As road conditions and traffic worsened, McLean

worried about possible competition from coastal ship operators, whose low rates had been subsidized since the Merchant Marine Act of 1936. Coastal operators also could buy surplus wartime cargo ships for next to nothing, which tempted McLean. (McLean opted against subsidies when he entered shipping, says Chuck Raymond, who worked at McLean's firm, Sea-Land Service, from 1965 until its owner CSX sold it to Maersk in 1999. McLean thought people worked better and harder without the cushion. He also wanted to avoid another layer of federal interference.)

McLean acted to head off this potential competition from cargo ships. Why not haul truck trailers via ship, unloading at trucking hubs? By 1953, he'd located a terminal. Later, he took one of McLean Trucking's top salesmen, Paul Richardson, to a New Jersey pier and showed him a container-loaded ship, according to Richardson's oral history transcript. "He said to me, 'Paul, did you ever see one tractor pulling 226 trailers?' I said, 'No sir.' And he said, 'There's one right there.'" Richardson was to become Sea-Land's national sales manager and eventually its president.

McLean's instincts matched his imagination. "He had a huge ability to visualize how things could be done better," Raymond says, "and had the guts to try it."

Rocking the Boat

McLean grasped that the choke point of the transportation business was where the modes of transport come together, recalled one of Sea-Land's chief naval architects, Charles Cushing, in an oral history. Once that could be automated, then shipping costs would fall.

Cargo in that era appeared dockside either as bulk, commodities like grain, or as breakbulk, separate goods of all shapes and sizes. Everything from bananas to whiskey to fine china showed up in bags, barrels, or boxes. Longshore labor handled the goods, some of which required crates, that members of the cooper's union built. Each job required its own tradesmen.

"There were thousands of people out on these piers," Cushing remembered. "The longshoremen would come down and there would be gangs in every hold. And there were hordes of people working on these piers to move a very modest amount of cargo. And it was just horrible ... logistically, industrially, in every possible way."

And expensive. Freight costs in 1961 were 12 percent of the value of U.S. exports and 10 percent of U.S. import value, according to Levinson — in effect, a trade barrier. Most of the costs lay in transferring loads.

McLean bought his way into coastal shipping with the purchase of the Pan-Atlantic Steamship Corp. But the ICC ruled against the transaction after protests from railroad firms until McLean sold the trucking company.

Although McLean had first envisioned trucks rolling

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trailers on and off ships, he soon realized that wheels, beds, and axles would consume precious space. Trailers instead could be stacked. Using old tankers minimized risk because they could carry oil on return trips.

But in those early days, proper equipment had yet to be designed or tested. McLean hired an engineer, Keith Tantlinger, and flew him to Mobile, Ala., home of Pan-Atlantic. According to Cushing, "Tantlinger was the mechanical genius in house, devising cell guides and devices for flipping

containers down." He invented corner fittings into which a specially designed lock could slide. Containers could be stacked and locked to those underneath. Cranes latched onto the fittings to hoist the big boxes. These inventions may have hastened industry modernization because McLean relinquished the patents in the early 1960s, at Tantlinger's urging.

The aluminum container's roof, though only one thirty-second of an inch thick, would support a man jumping on it because of the way it was riveted, Tantlinger promised. On delivery day, McLean, shipyard officials, and Tantlinger scheduled breakfast together. No one showed but Tantlinger, according to Arthur Donovan and Joseph Bonney in their book *The Box that Changed the World*. (Donovan is a professor emeritus of humanities at the U.S. Merchant Marine Academy; Bonney is transportation finance and economics editor at the *Journal of Commerce*.) When Tantlinger finally headed to the shipyard, he found McLean and the others atop container roofs, jumping.

McLean Industries was not the only maritime shipping firm testing the waters of container transport at the time, but few carried container-only loads. Trailer Marine Transport used wartime surplus landing craft to carry truck trailers from Florida to Puerto Rico; Seatrain had ferried railcars to Cuba since the 1920s. Another firm, Matson Navigation, in contrast to McLean's relatively free-wheeling approach, had cautiously begun researching standardized loads by 1956, but did not convey its first fully loaded container ship between Los Angeles and Oakland, Calif., and Honolulu, until 1960.

During the fall of 1956, McLean used idle time during an East Coast dockworkers' strike to widen decks and expand hatches of surplus wartime freighters to add to his fleet. These ships would carry 226 containers, each 35 feet long, by the following year, about four times the number the *Ideal-X* had carried in 1956. No one knew how a stack of containers might sway or shift or even whether the containers could be crushed. Before the first trip, Tantlinger stuffed chunks of modeling clay into the cell corners to indicate how the loads had moved. Upon the ship's return, the clay in the corners had moved no more than five-sixteenths of an inch, demonstrating the stacks' stability.

Though container shipping seemed poised for success, many thought it impractical, a passing fad. The prospect of automation also created labor strife. Port authorities, too, were divided about whether to configure facilities to accommodate large-scale container shipping or rely on traditional “finger” piers that jutted into the water. In 1962, containers accounted for a mere 8 percent of the freight at the Port of New York and 2 percent of West Coast freight. From 1957 through 1960, slack demand hurt Sea-Land’s container business, and it lost \$8 million, according to Levinson.

McLean borrowed to buy more surplus tankers; these ships could haul 476 containers, eight times as many as the *Ideal-X* had carried on that first voyage. Richardson developed detailed cost comparisons among modes — truck, ship, and train — to show shippers annual savings.

Once shippers tried the service, they were sold on the container concept. Cushing noted, “Here is one guy taking it [cargo] off your hands with one document, and then it’s gonna show up at your consignee, by the way, faster, sooner, with less cost ...”

Sea-Land Service, as McLean’s Pan-Atlantic had been re-christened, established California routes, and so became the first carrier to haul goods on both the Pacific and Atlantic coasts. Sea-Land snapped up two ships from a bankrupt former competitor in Puerto Rico; the commonwealth was a lucrative shipping market, partly on account of tax incentives that lured labor-intensive manufacturers. Now the primary carrier, Sea-Land built two new terminals in San Juan and opened routes to two additional Puerto Rican ports.

Chuck Raymond today is a transportation consultant for private equity firms. He saw his first Sea-Land ship in Puerto Rico in 1964 during his “sea year” with the U.S. Merchant Marine Academy at Kings Point, N.Y.

“I saw this ugly, ugly ship come in with containers stacked up on deck, with wings out to each side — those were the cranes. Then the next day, I saw that ship going out,” he remembers, told in a telephone interview. He was incredulous. “I was used to a ship taking six or seven days to unload.” Right away he sought the name of the company — Sea-Land. “I wrote him [McLean] a letter and said I wanted to work for him.”

On the day of his interview, a driver pulled up to the limo stop at the Newark, N.J., airport, as arranged. “A fellow rolled down the window and said, ‘Are you Chuck Raymond from King’s Point? Hop in the car; I’m taking you over to Sea-Land.’”

The driver quizzed Raymond about his background, how and why he chose the U.S. Merchant Marine Academy, and why Sea-Land interested him. “When we pulled up in the parking lot, they waved this guy through, and then we pulled into a spot with a sign that read M. P. McLean.” The trip was on his regular route to work, McLean explained, and it would save taxi fare.

“Here was a guy who was already an icon in the industry,” Raymond says. “And he was trying to save a nickel.”

Making Money, Losing Money

Always seeking opportunities, in 1966 McLean offered a package shipping deal — containers, chassis, trucks, and terminals — at a fixed price per ton to the military in Vietnam, according to Levinson, in an effort to bring order to a supply chain that was in chaos, logistically. McLean was convinced that containerization could solve the problem. “Like everything else Malcom McLean did,” according to Levinson, “venturing into Vietnam entailed considerable risk in hopes of a large reward.”

It paid off. On each round trip from the West Coast to Cam Ranh Bay, Sea-Land made more than \$20,000 per day. McLean also wanted to make the return voyage pay — with goods from Japan. By 1968, Sea-Land had started its Yokohama-to-California run, its ships loaded with Japanese-made electronics.

But McLean was never short on dreams. Now he wanted a fleet of big, fast ships that could circumnavigate the globe in 56 days. No idle fantasy, such ships could furnish the company a competitive advantage after the Suez Canal closed during the 1967 Arab-Israeli War. Sea-Land’s biggest competitor on the North Atlantic was U.S. Lines, with ships that could carry about 1,200 containers, yet still travel at 22 knots, 50 percent faster than any in Sea-Land’s fleet.

To help pay for Sea-Land’s new SL-7s, in 1969, R.J. Reynolds Industries, of McLean Trucking’s hometown of Winston-Salem, N.C., bought Sea-Land.

The timing couldn’t have been worse for these fuel-hungry ships. “We built the SL-7s and set transatlantic speed records several times,” Raymond remembers. But oil prices started their steep climb in 1973. “It cost a quarter of a million to run those ships one way.” And in 1975, the Suez Canal reopened, unexpectedly soon, eliminating any speed advantage. Reynolds took a \$150 million loss on the SL-7s, and sold them in 1980 to the U.S. Navy.

McLean left the day-to-day management of Sea-Land in 1970, started selling his stock in 1975, and departed Reynolds’ board in 1977, “unhappy with Reynolds’ bureaucratic ways,” according to Levinson. The tobacco conglomerate had criticized Sea-Land’s operations from the start and tightened the reins. After going through the books, according to its chief naval architect at that time, John Boylston, the Sea-Land managers were brought into a meeting where the Reynolds people “chewed us out for a good hour” over sloppy accounting. “They said we’d technically been out of business two or three times in those first six or seven years and simply hadn’t known it.”

But Sea-Land’s entrepreneurial culture kept the company nimble, Boylston remembers. Decisions could be made quickly and sometimes deals were sealed with a handshake. “If you didn’t take advantage of the growth opportunities, then somebody else was going to do it very quickly.”

McLean worked up other ventures — a hog farm in North Carolina, a residential development named Diamondhead on the Mississippi Gulf Coast — but couldn’t stay out of moving freight. A year after resigning as an RJR

director, he bought U.S. Lines for \$160 million. This time McLean planned bigger but slower ships that could carry more freight in an effort to cut per-unit costs. But by 1985, crude oil prices had dropped from about \$30 a barrel to about \$10 per barrel, erasing much of the ships' advantage. Overcapacity, meanwhile, brought rate wars on some routes; U.S. Lines went bankrupt in 1986. Sea-Land, which had been acquired by CSX Corp., bought the ships. Charlotte-based Horizon Lines still operates Sea-Land's domestic routes.

McLean died in 2001. Today, ships and containers continue to super-size; ships can barely fit through the Panama Canal, which is undergoing expansion. And intermodal shipping, where freight is loaded from ships to double-stacked trains and trucks, is commonplace.

The containers killed a way of life, in which jobs often were passed from father to son. Worldwide, 70 percent of dockworkers lost cargo-handling jobs, notes Tälley. Labor-management agreements at two ports on both coasts ultimately funded early retirements, among other provisions, to mitigate painful job losses.

Efficient shipping expanded trade. Labor-intensive manufacturing is channeled to low-cost countries. Cheaper finished goods, of which shipping costs are now a negligible component, cross borders, making consumers better off. Even tiny companies can sell to global markets, easily and cheaply.

"I use the example in class of a pair of \$120 Nike tennis shoes made in China. Of that \$120, the transportation cost will be a little over \$1 — it's virtually costless," Tälley says. "Without containerization, there would not be a Wal-Mart or a Home Depot."

As for McLean, he saw how freight could be shipped better, faster, and cheaper, and grasped the simple idea that low-cost shipping could stimulate more shipping. Back then, Levinson says, people thought freight volume was more or less fixed. If more moved by water, then less would move by train. "McLean understood that was fallacious and that, in fact, people might start shipping more goods if there were more and cheaper ways to ship."

He got it right and reshaped the world's economy. **RF**

READINGS

Boylston, John, Charles Cushing, and Paul Richardson. Interviews by Arthur Donovan, 1995-1998. Containerization Oral History Project, National Museum of American History, Smithsonian Institution, Washington, D.C.

Donovan, Arthur, and Joseph Bonney. *The Box That Changed the World: Fifty Years of Container Shipping — An Illustrated History*. E. Windsor, N.J.: Commonwealth Business Media, 2006.

Levinson, Marc. *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger*. Princeton, N.J.: Princeton University Press, 2006.

Tälley, Wayne K., ed. *The Blackwell Companion to Maritime Economics*. W. Sussex, England: Wiley-Blackwell, 2012.

FEDERAL RESERVE

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"Someone said that a strong macroeconomy is the best welfare policy," Thorbecke says. Many studies have documented that, across countries and time, higher inflation is associated with more poverty and lower incomes at the bottom of the income distribution. There's not a lot the Fed could do about distribution even if it wanted to, Blinder says, unless Congress gave the Fed different kinds of tools, like tax and transfer policies. "But that's way beyond the purview of the central bank."

In other words, while there is little doubt that the Fed's policies have unintended distributional effects, that doesn't make monetary policy a suitable tool to pursue distributional goals. A host of economic research suggests that the Fed should focus on price stability and avoid unpredictable policy shifts. Those measures are favored primarily because of their long-term economic benefits, but they also tend to minimize the redistributional effects that can result from monetary policy. **RF**

READINGS

Blank, Rebecca, and Alan Blinder. "Macroeconomics, Income Distribution, and Poverty." National Bureau of Economic Research Working Paper No. 1567, February 1985.

Erosa, Andres, and Gustavo Ventura. "On Inflation as a Regressive Consumption Tax." *Journal of Monetary Economics*, May 2002, vol. 49, no. 4, pp. 761-795.

Doepke, Matthias, and Martin Schneider. "Inflation and the Redistribution of Nominal Wealth." *Journal of Political Economy*, December 2006, vol. 114, no. 6, pp. 1069-1097.

Rodgers, William. "African American and White Differences in the Impacts of Monetary Policy on the Duration of Unemployment." *American Economic Review: Papers and Proceedings*, May 2008, vol. 98, no. 2, pp. 382-386.