

Looming Issues in Logistics

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Abstract. A series of conditions are causing concern for supply professionals, as infrastructure constraints, long lead times, skyrocketing fuel and transportation costs, labor shortages and environmental concerns all combine to increase complexity, drive up inventories and restrict organizations' abilities to react swiftly to changes in customer requirements. Logistics plays an increasing part in the planning and execution of supply agreements, as supply chains stretch from outsourcing and global sourcing activities. We must address these concerns.

Introduction. For decades the infrastructure in this country has been underfunded, at both state and federal levels. The bill is now coming due. We are experiencing congestion, delays and increased costs across all modes of transportation. Furthermore, personnel shortages exist in rail, trucking and for diesel mechanics. Gas prices have risen from an average of \$1.71 in February of 2003 to \$3.25 in the same month this year.¹ Even more difficult from a business logistics perspective is the cost of diesel fuel, as it rose from \$2.62 per gallon last year to today's price of \$3.60, a record.² In short, we are in the midst of a logistical perfect storm.

Not long ago, a Traffic Manager for a firm that ships frequent loads both by rail and truck freely admitted that logistics was not very high on the list of priorities of senior management, because it was always there. Whenever he needed either rail cars or trailers, sufficient capacity existed in the logistical system that he could get either on short notice. Today, he rarely receives his requested number of cars or trailers on the day he required. Today, his title is Vice President of Logistics, reflecting the now very high priority of the function. His story is not unique. All across the country, organizations are experiencing similar logistical constraints.

State of Our Nation's Infrastructure. In 2005, the American Society of Civil Engineers issued a report card for the nation's infrastructure. In it, they detailed the condition of roads, bridges, airways, ports and rail infrastructure. They also examined less commonly considered infrastructure components such as the nationwide electrical intertie, dams, drinking water, security and how we manage hazardous waste. While security received a grade of 'Incomplete,' the others received marks that, if they were on our kids' report cards, would cause them to be grounded for an extended period.

¹ *Oregonian*, 2-27-2008, p. 1.

² *Ibid.*

Aviation:	D+
Bridges	C
Dams	D
Energy	D
Rail	C-
Roads	D
Waterways	D-

With these grades, it is not surprising that organizations find difficulty getting shipments on time, without damage, and at a reasonable cost. The condition of our infrastructure also contributes significantly to the problem of congestion. If roads are full of potholes, traffic velocity is significantly reduced. Other causes of congestion include port container handling capacity that is less than peak traffic, shoreside infrastructure – highway and rail – that may not be sufficient to efficiently move containers or bulk cargo to or from the port.

Other Logistical Concerns. Setting aside infrastructure capacity issues, there is a labor shortfall, as well. There has been a chronic shortage of long-haul truck drivers, estimated by the Council of Supply Chain Management Professionals (formerly the Council of Logistics Management) in its 2006 State of Logistics Report to exceed 80,000, nationwide. The railroads have a shortage of train operating crews that stretches back many years. In a recent survey of maritime executives that included not only deep-sea carriers, but also river operators and the like, the number two concern, after fuel costs, was the shortage of qualified personnel. To compound the labor shortage across all of these transportation modes is a persistent shortage of diesel mechanics to keep all of the equipment running.

New Equipment. Some see partial relief of capacity constraints and congestion from the introduction of new, high capacity equipment. Not long ago, Maersk, the largest shipping company in the world, launched the *Emma Maersk*, at 1302 feet, the longest ship ever built. She is 183 feet in beam and draws at least 50 feet of water when fully loaded. While estimates vary, she probably has capacity for nearly 15,000 twenty-foot equivalent (TEU) containers. Maersk recently launched the fourth sister ship. These are the largest container ships afloat, and approach twice the capacity of the large ships commonly seen in service today. There are many other new vessels now under construction and soon to enter service with similar capacities. While these new ships will relieve most of the present container carrying capacity constraints, they also create new problems.

Since they are so wide, (the *Emma Maersk* carries twenty-two tiers of containers across her deck) container cranes at many ports are not long enough to reach the outer tiers. New cranes cost \$7.5 million or more and have very long lead times. Often manufactured in China, they then must be transported in special ships to the destination port. Very few ports in the U. S. are deep enough to accommodate these new vessels. Several ports are dredging deeper channels, but the size of these ships will limit them to relatively few of the nation's ports.

Other modes of transportation are receiving similar new equipment. Railroads have new higher power locomotives. While the freighter version of the Airbus A-380 has been cancelled, the passenger version holds 550 passengers in standard configuration and requires reinforced runways and re-engineered jetways. While trailer sizes may be limited to 53 feet in length by regulation, at least one shipping line has introduced 53-foot containers to enable direct transfer

of maximum-sized equipment from ship to truck. This 53-foot size may result in re-engineering of container ships and cranes that were designed for standard 40-foot containers.

Environmental Issues. Environmental concerns are spawning interesting solutions. Ships alongside docks typically keep their auxiliary engines running to maintain power to the vessel, but the exhaust contributes significantly to deteriorating air quality in port areas, as do idling engines of tugboats and other forms of marine equipment. To address these problems, ports such as Los Angeles/Long Beach have installed shoreside electrical hook-ups enabling vessels to connect to shore power. At least one tug company is building a hybrid vessel that will operate on electrical power except when maximum thrust is demanded, at which time the diesel engines will be started.

Trucking and rail firms have addressed environmental concerns in several ways. New locomotive designs use dynamic braking systems to also recharge batteries that will help power the engine on upslopes. Hybrid trucks have been introduced by at least one truck manufacturer. Even aircraft manufacturers are developing new materials and methods to produce planes that use significantly less fuel. All of these designs address the need to accomplish the same tasks with less environmental impact.

Impacts. This nation has experienced a compulsion to outsource. This is true not just of consumer products, but equally from the industrial outsourcing of parts and products. As a consequence, we have outstripped the capacity of our infrastructure in many areas. Firms now contend with much longer lead times, and conditions such as lack of eastbound container space and port capacity constraints that cause extended and erratic lead times. Countermeasures include safety lead time (ordering earlier than necessary) and inventory increases, as safety stocks must be expanded. Extended lead times also mean less flexibility and often unacceptable response times as customer demand changes. We are now seeing a reverse outsourcing trend beginning, as some firms move sourcing back to Mexico. While prices may be higher than China prices, logistical costs are lower, especially as fuel costs escalate. Lead times are much reduced and are more consistent, and inventories may decline toward a lean model without reduced fill rates. Reactions to changes in customer demand are facilitated. In short, organizations are rethinking sourcing strategies as logistical concerns and costs increase.

Security. Prior to 9/11, the major supply chain concern was leakage. Organizations and carriers worked to prevent cargo from leaking out of shipments while in transit. Today, the opposite is our worry. The government, carriers, shippers and consignees are all collaborating to prevent contraband from being inserted into the supply chain. New regulations require advance notice of manifests before loading cargo onto ships. Inspections are increasing toward the goal of X-raying all inbound containers. The magnitude of that undertaking is almost overwhelming. As containers arrive, they will be moved to inspection stations, inspected and then released for transfer to their destinations. The process is estimated to add two or three days to transit times and up to \$300 in additional costs. Goals for air cargo are similar. The intent is to inspect all air cargo, especially that shipped as belly freight in passenger planes. Cross border trucking is becoming increasingly challenging, as inspection times have increased to the point that some truckers will no longer take these loads. Excessive border delays make it economically impractical for some. Overall, security activities will add cost and time to shipments that will necessitate increased inventories.

Legislative Notice. In 2005, a Transportation bill was passed in congress that appropriated \$286 billion for transportation causes. Unfortunately, the bill also contained over 6300 earmarks – funds set aside by legislators for pet projects. The net result is that far less than the total sum is actually available for infrastructure repairs and improvements. That bill expires in 2009. We need funding at least at that level for the foreseeable future to address the concerns identified in the Civil Engineers study. Congress must be convinced that continued funding is essential to national competitiveness.

At long last, some legislators, at both state and federal levels have begun to appreciate the magnitude of the infrastructure problem and have set about establishing infrastructure as a funding priority. One of the persistent contributors to infrastructure inattention has been the fragmented lobbying efforts by those involved with all facets of logistics. Railroads have their own lobby – as do trucking, airlines, marine transportation, transportation equipment manufacturers, and the various logistics-related labor organizations. Each pursues its own special interests with the result that there is no common front, no single voice from which legislators hear of overall infrastructure concerns.

Conclusion. Of late, we have seen a lessening of some of the constraints and concerns noted above. The hope is that the combination of a weak dollar and a slowing economy will not lull everyone into complacency. While there may be a temporary respite, it is surely only momentary. These conditions will, without doubt, reassert themselves with even greater impact when the economy recovers unless remedial action is taken. It is truly up to all of us.