Logistics and Infrastructure: Are We Out of the Woods Yet?

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Abstract. In spite of the attention given our nation’s infrastructure of late, its condition continues to be questioned. Each year reports surface that detail the extent of the deterioration of the existing infrastructure. But what of the future, when all projections show major increases in population throughout the country, as well as the world. Infrastructure is not solely a domestic concern. As resources continue to decline, more resources will need to be transported long distances and across national borders to meet the requirements of growing populations. How important a part will infrastructure play in our continued wellbeing?

Introduction. Most experts agree that for any country to be globally competitive, it must have an efficient infrastructure. It must have the facilities necessary to accommodate modern shipping at its ports. Shoreside infrastructure must be in place to enable the efficient transport of goods to and from the port. Highway and bridge infrastructure needs to be sufficient to enable employees to serve the ports as well as to facilitate the movement of goods to their destination. Airlines must be accommodated at facilities that are efficient for both passenger traffic and the movement of freight. Inland waterways ought to be maintained to promote waterborne commerce as well as recreational boating. Pipelines distribute a myriad of products from crude oil to refined products to chemicals and coal. The electrical grid should be capable of distributing sufficient electricity for homes and industry. Additional elements of infrastructure include schools, levees, drinking water availability, mass transit, solid waste disposal and others are no less important.

Infrastructure Evaluation. To understand the condition of our nation’s infrastructure, the American Society of Civil Engineers studies all elements and reports on its evaluation. The 2005 and 2009 reports follow for comparison.
From these results, it seems apparent that the only substantive progress that has been made from 2005 to 2009 is to increase the amount needed to bring the infrastructure to a satisfactory level by $600 million. Sadly, we have even regressed in critical areas such as aviation and roads.

**Stimulus Spending.** There is, however, a ray of encouragement in the spending that has recently been committed to infrastructure repairs from stimulus funds. The following examples represent funding in four western states:

**Washington**
- 173 Million Energy
- 499 Million Highways
- 203 Million Transit
- 141 Million Clean Water Infrastructure

**Oregon**
- 133 Million Energy
- 355 Million Highways
- 85 Million Transit
- 93 Million Clean Water

**California**
- 611 Million Energy
- 2.751 Billion Highways
- 1.189 Billion Transit
While these expenditures are significant and encouraging, they represent only a small part of the overall requirement to restore and enhance our national infrastructure condition. States, as well as the Federal Government have recognized not only the need for these investments, but the advantages of spending stimulus money on these sorts of projects, as opposed to the purchase of some sorts of services or intellectual property. For example, consider the supply chain for the purchase of — say — software, as opposed to highway construction. Software costs include the developer, CDs and transcription and distribution. On the other hand, a highway project requires the purchase of steel, concrete, guardrails, posts, bolts, and an array of other materials, each of which has its own supply chain. Clearly, the multiplier effect (and thus the economic stimulus) of an infrastructure project is far greater than that of software.

In the January, 2010 issue of *Inside Supply Management*¹, we wrote of the alarming condition of our nation’s infrastructure and noted that no mode of transportation is without its difficulties. Ships, aircraft, trucks and trains are all increasing in size and capacity. With those changes come increasing demands on the infrastructure. For example, the Emma Maersk is the longest ship ever built. She is 1302 feet long, 183 feet in beam and draws more than 50 feet of water when fully loaded. Few ports in this country, or even in the world have the depth of water at pierside to accommodate ships of this size. Further, new container cranes must be acquired that have sufficient reach to lift containers off the outer tiers. Finally, once the ship is alongside and cranes are at work, there must be the shoreside infrastructure (roads and rail systems) to enable ships such as this to be efficiently unloaded and reloaded, considering the huge numbers of containers that must be handled in a short time in each direction. The Emma Maersk is not unique. More than a dozen ships of similar size are now, or soon will be in service.

Domestically, we face a daunting array of logistical needs. As ever larger carriers are built and come into service, infrastructure must expand accordingly to take full advantage of their efficiencies. Capacities were taxed across all modes of transportation in the boom time prior to the recession. In spite of recent articles suggesting that congestion has eased, it surely will only be a temporary reprieve. As the U.S. and other economies around the world return to pre-recession levels, we will revert to the multi-modal congestion of that time. Supply managers should work to develop long term, collaborative relationships with carriers as has been the norm with materials suppliers. Only through forecasting, sharing information and collaboration with carriers will logistical services be available when needed in the coming period of capacity constraints.

The cover of the February, 2010 issue of *Popular Science* has the headline, “Rebuilding America: 25 New Technologies to Transform our Crumbling Infrastructure.” The article contains discussions about highway gridlock, wastewater treatment, electrical power generation and transmission, and several other topics. It is encouraging to see that, after decades during which our infrastructure’s deterioration was ignored, it has now emerged into the popular press.

Another cause of concern is the ability of the nation’s infrastructure to accommodate projected population growth. Today, we have just over 310 million people in the U.S., making us the third most populous country in the world. The Census Bureau estimates that in twenty years there will be 373.5 million and by 2039, we will pass the 400 million mark. The real question, then, is how will our infrastructure accommodate a 1/3 increase in population. How will the system enable folks to get to work? How will trucks make store deliveries? How will our airports accommodate such a dramatic increase in travel? Will we be able to provide both individuals and businesses with all of the electricity needed? In terms of infrastructure, these are daunting considerations.

The world economy is emerging from a severe recession. As a consequence, demand for basic raw materials and fuels is increasing. Those who follow the ISM Report on Business have seen, in recent months, a significant upward trend in the Price Index. Across the board, basic materials have shown significant worldwide demand increases and consequent price hikes. A further price caution is found in the recent reports of double digit economic growth in China and rapid expansion of other Asian and even European economies. Many of these countries are investing remarkable sums in their infrastructures. The combination of these two conditions suggests that the price of infrastructure improvement will increase in the immediate future.

During economic downturns, conventional wisdom suggests that there should be excess capacity, with resultant short lead times and ease of acquisition. Further, logistical capacity should be plentiful, with similar ease of arranging for transportation requirements. It would seem that logistical services should be readily available under these circumstances; even as the world emerges from the recession. However that may not be so. As demand declined, carriers drastically adjusted capacity. Airfreight carriers parked their less fuel-efficient aircraft. Steamship lines laid up significant numbers of vessels. In May of 2009, there were said to be 735 ships in lay-up, anchored off Singapore harbor. Similarly, trucking firms parked tractors and many smaller firms and owner-operators went out of business. Estimates are that over 4,000 trucking firms went out of business during the height of the recession.

The consequence of these actions is that, while transportation service capacity may have been taxed when the economy was prosperous, as firms cut back in this recessionary environment, supply managers may find as much difficulty as before in obtaining necessary services. Carriers have been able to generate pricing leverage through deliberate capacity constraints.

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3 http://www.census.gov/population/www/projections/summarytables.html
Conclusions. Are we out of the logistical and infrastructure woods yet? Far from it. While we have, in recent months, made important investments in our infrastructure from both state and federal stimulus money, there is still a long way to go to restore and recondition our infrastructure. Until appropriate allocations are made, on a continuing basis, from both state and federal legislatures, we will continue to endure potholes, highway congestion, shortages of containers, rail congestion and the collective ills of decades of infrastructure inattention. One of the keys to persuading legislatures to commit continuing funding is for all concerned to speak with a single voice. Presently, there are representatives of each of the modes of transportation presenting mode-specific priorities to legislators. Similarly, the electrical industry, the waste management industry, the construction industry and even schools each has its representative and its separate priorities. Until all of these groups come together to generate a single voice focused on our infrastructure deficiencies, we as a nation will continue to struggle with inadequate infrastructure and supply managers will continue to cope with congestion, late shipments and increased inventories.