The Need to Consider Multi-Modal Mega RDCs

by: Andy Piper
Supply Chain Designer, Modalgistics

11/03/2006

Introduction

Since 2004, transportation costs have been steadily rising due primarily to the increased cost of fuel. During this time the trucking industry has been plagued by driver shortages; the enforcement of stricter emission standards in 2007 mean trucking companies have to recover more costs in order to comply with these newer EPA standards; most U.S. railroads have been operating at near-peak capacities; deficient supply of specific railcars are not uncommon; and inventory-carrying costs have soared. Multi-modal mega RDCs (M^3RDCs) may just be the answer to help the shipper and transporters alike.

Problem Statement

Regional distribution centers (RDCs) are nothing new in the logistics arena and have been used effectively to take advantage of better economies of scale in order to reduce cost; but is there merit for multi-modal mega RDCs?

Common RDC Selection

The site selection process for an RDC differs greatly among shippers. The standard RDC tends to be one where both inbound and outbound movements are performed by truck. In some cases, proximity to rail or other transportation methods are not considered during the site selection process.

The appropriate number of distribution facilities also differs. Some shippers opt for many smaller facilities so as to be closer to their customer, while others prefer fewer sites with more substantial footprints. Costs associated with inbound and outbound transportation as well as inventories are affected based on the approach chosen.

With significant increases in distribution costs in recent years, companies may need to reevaluate their approach and see if it is still a valid one going forward.

Current Distribution Climate

The cost of transporting goods has increased dramatically since 2004. Many factors account for this – the increased cost of labor, rising inventory-carrying costs, and rail capacity shortages are just a handful. However, there's no denying that rising diesel fuel costs is a leading contributor.

In September of 2003 diesel fuel was at a national average of $1.50/gallon; by September 2004, the same gallon of diesel was $2; and in the wake of Hurricane Katrina last year, the cost of diesel fuel spiked above $3 per gallon.[1] This increased cost is typically passed onto shippers in the form of a fuel surcharge. The surcharge encountered varies depending on contract vs. spot rate, but is usually a carrier-set percentage based on either the total distance or the established rate for the move.

Gary Girotti, Chainalytics VP of Transportation Practice, indicates that their research "has shown that the average price of a 750-mile load dry TL in North America has increased 33% from January 2004 through July 2006, fully 55% for this increase is due to fuel surcharges."[2]

According to the Council of Supply Chain Management Professionals' (CSCMP) *State of Logistics Report,* Rosalyn Wilson indicates that the rise in overall logistics cost in 2005 was the highest one-year increase in the 17-year history of the report. "Soaring fuel prices, a driver shortage, and diminished competition have all come together to raise rates across all modes, and for trucking in particular."[3]

Ms. Wilson's report also stated that driver shortages in 2005 reached record levels "because so few workers are taking up trucking as an occupation."[3] In June 2005, the American Trucking Associations (ATA) reported that first quarter increases in driver pay (as much as 8-10%) "helped with retention but not necessarily with recruitment."[4] And even this year, JB Hunt executives indicate that a shortage of long-haul TL drivers of 20,000 existed in 2004, with an expected shortfall of 111,000 by 2014.[5]

Next year, more stringent EPA emission standards go into effect for all 2007 and later model year heavy-duty highway engines. According to DieselNet, an online information service on clean diesel engines and diesel emissions, "The EPA estimates the cost of reducing the sulfur content of diesel fuel will result in a fuel price increase of approximately 4.5 to 5 cents per gallon. The EPA also estimates that the new emission standards will cause an increase in vehicle costs between $1,200 to $1,900."[6]

JB Hunt sees this cost being higher. At the 2006 CSCMP in San Antonio, JB Hunt President John Roberts and Richie Henderson, Vice President Marketing Strategy, reported that the purchase cost of Freightliners has increased by over $8,000, and they expect a reduction in MPG resulting in additional fuel costs. They also foresee increased costs to maintain and service the newer engines.[5]

Transportation issues have not been limited to just the trucking sector. With the increase in rail traffic, railcar and labor shortages have been noticed over the past three years.

In her *State of Logistics Report*, Ms. Wilson indicated that rail costs rose by 14% in 2005 due to increased demand. She anticipates that the railroads will need "to hire 80,000 new workers by 2012."[3]

In September 2004, L.I. Prillaman, CMO, and S.C. Tobias, COO, of Norfolk Southern (NS) spoke at the AAR at its Briefing on Fall Service Plans in Kansas City informing participants that "with increasing demand, spot car shortages will continue to be an issue in several areas; particularly flats, gondolas, covered coil cars for steel, and boxcars for seasonal peak paper volumes." To counter the rise in demand, NS took steps to add more cars to their fleet through repairing and leasing efforts, anticipated delivery of over 200 new locomotives by year end, and planned to hire 1,600 conductor trainees (1597 were hired in 2003).[7]

Norfolk Southern has done much to plan for the current and future growth of rail traffic. According to the Norfolk Southern 2005 Annual Report, NS has hired over 2400 employees in the service and mechanical departments alone, and purchased 222 new high efficiency locomotives for delivery in 2005 and 2006.[8]

These programs to increase railcar availability as well as employ new personnel have added more to the cost of shipping goods via rail.

After transportation costs, inventory-carrying costs represent a significant portion of the total cost of distribution.

A common business practice has been to reduce delivery times to the customer by increasing the number of distribution facilities. One must keep in mind that the more warehouses a company utilizes, the more inventory that must be carried.

In 2004, Lisa Harrington of Inbound Logistics, in an interview with Kristian Bjorson of The Staubach Company, wrote "Generally, the more facilities you add, the lower your outbound transportation costs. Your inbound transportation costs often increase, however, because your load size decreases (from truckload to less-than-truckload quantities) and your shipments are more frequent."[9]

Modalgistics Solution

Studies by Modalgistics suggest that shippers do need to consider multi-modal mega RDCs in their strategic distribution planning. In an M^{3}RDC model, rail is used as the primary inbound mover; goods are stored in a shared-resource facility; and outbound shipments are handled predominantly by FTL and LTL carriers.

As shown earlier, fuel costs have been a major factor in rising transportation costs and many believe the price of diesel won't go back down below $2/gallon. The Federal Highway Administration of the DOT estimates that on one gallon of fuel, a truck can haul a ton of freight 59 miles compared to a train which can haul that same ton 202 miles.[10] With this in mind, fuel efficiency is a key factor in reducing costs.

Rail also offers more capacity per railcar than truck – typically seen as a 3-to-1 tonnage ratio. Therefore, opportunities for greater aggregation exist on rail thus reducing overall transportation costs.

Given more fuel efficiencies and the ability to flow more tonnage in a railcar than in a truck, long-haul movements are better suited for rail travel.

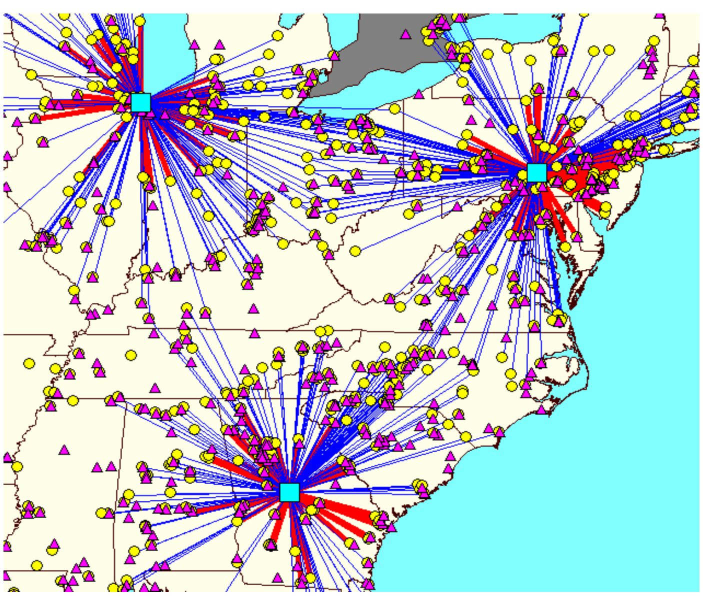
JB Hunt offered some keys to attracting and retaining drivers at the 2006 CSCMP. Two of their points were efforts in "improving the driver's quality of life by regionalizing or regularizing freight networks" and allowing "more frequent, predictable home time."[5]

Whether outbound shipping is done via LTL or TL, the M³RDC approach is a benefit for the trucking industry. Usage of truck for short haul outbound moves encourages the creation of consistent multi-stop routes. By guaranteeing work to haulers, shippers enable the trucking company a better opportunity to retain its employees, thus warding off the threat of trucking labor shortages. Consistently heavy traffic volumes also allow for better negotiations when dealing with carriers and warehouse providers.

By having the ability to unload and reload across multiple modes of transportation at the same facility, both trucks and railcars have the opportunity to arrive and depart with full loads. This benefits the shipper by not having to pay for deadhead miles as well as being able to avoid head-haul rates over both road and rail.

Investing in a multi-modal mega RDC significantly reduces costs in ways other than inbound and outbound transportation. The M³RDC model promotes the sharing of resources across multiple shippers, thus minimizing costs due to collective purse-strings. Examples of such shared resources include forklifts, warehouse personnel, and a common railhead.

In studies by Modalgistics on Norfolk Southern traffic over the 2005 calendar year, data indicates that greater than 75% of rail-served customer sites averaged less than 1 rail car per week; with many less than twice a month.[11] If these customers were served by an M³RDC facility, inefficiencies can be reduced in a number of ways.



From a railroad standpoint, efficiencies are gained by:

- Turning cars quicker
- Reducing empty miles
- Reducing service times by relying less on time-intensive local, short-line, and interchange movements
- Having the potential to unload and reload at the same facility
- Encouraging an increase in capacity on high-volume lanes

From a customer standpoint, efficiencies are gained by:

- Reducing time to receive goods
- Creating capacity through increased velocity
- Having the potential to unload and reload at same facility
- Creating a captive network with dedicated capacity
- Consolidating inventories to one or more larger facilities, thus reducing inventory-carrying costs

Michael Miller, General Manager of Modalgistics, sees M³RDCs as a way for the rail to "consolidate, simplify, and improve velocity." Benefits will include significant reductions in "capital expense requirements for infrastructure, locomotives, and railcars; reduction in car hire costs; the number of re-crews and taxiing expenses; as well as improving the quality of life for all T&E employees."

Michael F. Gorman of MFG Consulting at the Council of Logistics Management in 2003 indicated that "inventories are 'insurance' against the unknown, unpredictable, and uncontrollable" as well as "buffer processes from stockouts and costly production swings."[12] Combine this need for keeping sufficient inventory levels with the need of many shippers to reduce inventory-carrying costs, and you realize that multiple smaller distribution warehouses may not be appropriate for every shipper.

An M³RDC may help reduce your inventory-carrying costs by:

- Decreasing the number of facilities that carry inventory (for those shippers that operate multiple smaller facilities within a common region)
- Reducing fixed and variable costs at the distribution facility through resource sharing
- Reducing inbound and outbound transit costs

Looking Forward

The best location for a M³RDC will either be in or near a current logistics park with easy access to highways and rail mainline track. Doing so will provide the shipper with multi-modal shipping opportunities as well as increased access to higher distribution competencies.

Summary

In summary, the M³RDC is a win-win-win for shippers, railroads, and the trucking industry alike.

An M³RDC offers substantial benefits to both the rail and trucking industries by increasing asset utilization, having more consistent routing opportunities which help retain employees, and reducing inefficiencies in the respective networks.

More importantly, the shipper wins by not only being able to draw on the strengths of multi-modal transporters at a single regional distribution facility, but also by taking advantage of increased economies of scale and shared facility resources.

M³RDC = Win-Win-Win.

Sources

(1) **Energy Information Administration** (2006). *"Diesel Fuel Prices: What Consumers Should Know."* *http://www.eia.doe.gov/bookshelf/brochures/diesel/dieselprices2006.html*.

(2) Gary Girotti (2006). *"Transportation Master Planned"* – presentation at the October 2006 CSCMP meeting in San Antonio, TX. **Chainalytics, LLC.**

(3) James A. Cooke (2006). *"Logistics costs under pressure."* **Logistics Management**. http://www.logisticsmgmt.com/article/CA6352889.html.

(4) **American Trucking Associations** (2005). "Driver Turnover Drops from Record Levels but Remains High." http://www.truckline.com/NR/exeres/58826678-C6E6-49D1-A61A-CF1B61A51B0B.htm.

(5) John Roberts & Richie Henderson (2006). *"Truckload Transportation and Capacity Strategies: The Next Five Years"* - presentation at the October 2006 CSCMP meeting in San Antonio, TX. **J.B. Hunt.**

(6) **DieselNet** (2006). *"Heavy-Duty Truck and Bus Engines".* http://www.dieselnet.com/standards/us/hd.html.

(7) **Norfolk Southern Corporation** (2004). "AAR Briefing on Fall Service Plans; Kansas City – Sept. 9, 2004." http://www.nscorp.com/nscorphtml/speech04/lip0909.htm.

(8) **Norfolk Southern Corporation** (2006). "Norfolk Southern Corporation Annual Report 2005". http://www.nscorp.com/nscorphtml/ar05/pdf/AR05.pdf.

(9) Lisa Harringon (2004). *"Economic Development: The Science of Site Selection."* **Inbound Logistics**. http://www.inboundlogistics.com/articles/features/0504_feature02.shtml.

(10) **FHWA** (2001). *"Conference Proceedings"* - presentation at the FHWA National Freight Planning and Programming Conference in Memphis, TN. http://ops.fhwa.dot.gov/freight/Memphis/Proceedings.htm.

(11) Alan Brown & Andy Piper (2006). *"Mega RDC Concept Study".* **Modalgistics.**

(12) Michael F. Gorman (2003). *"Inventory-Driven Mode Optimization"* - presentation at the Council of Logistics Management meeting. **MFG Consulting.**

MODALGISTICS
SUPPLY CHAIN SOLUTIONS

For more information regarding multi-modal mega regional distribution centers (M³RDCs), please contact Andy Piper or Alan Brown with Modalgistics Supply Chain Solutions.

Andy Piper can be reached at: 404.962.5550.
Alan Brown can be reached at: 404.897.3061.