

Information for Members of the
Warehousing Education and Research Council

The New Big Dig

What the Panama Canal expansion project means for U.S. logistics.

The Panama Maritime Authority is expecting that 8.4 million TEUs will pass through the canal in 2015, compared to the 6.6 million that moved through it in 2010.

It's been nearly 100 years since the Panama Canal opened and the country of Panama is going to mark that anniversary with its biggest expansion ever. The project will create a new lane of traffic along the Canal and will include the construction of two lock complexes, one for each side of the Canal. The project will also deepen the channel to 60 feet and will widen the existing navigational channels.

Expected to be completed in 2014, the new Canal will allow for the passage of mega container ships—ships that can carry up to 12,600 20-ft. equivalent unit (TEU) containers. Compare that to the current maximum of 4,400 TEUs and you can see that this is no small project.

Nor will this be a project with small impact. The Panama Maritime Authority is expecting that 8.4 million TEUs will pass through the canal in 2015, compared to the 6.6 million that moved through it in 2010.

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MSC's ship Northern Justice at the Port of Charleston's Wando Welch Terminal. The ship is among the largest to call the U.S. East Coast and can carry up to 8,440 20-foot containers on board.



Distribution Network (Re)Design... When?... Now!

Identifying and deploying network improvements can bring competitive advantage in service, costs.

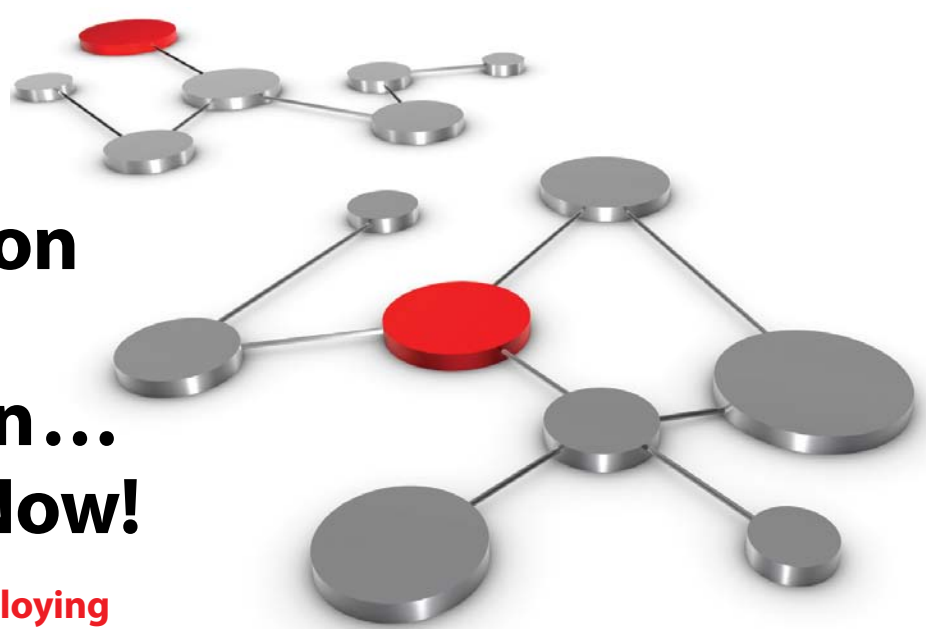
A significant number of distribution networks currently in operation have not been updated or received necessary critical investment since the beginning of the economic recession. According to the "2010 Distribution Network Trends Report," a Saddle Creek Corporation (Lakeland, Fla.) survey of logistics professionals, "Nearly one-third of respondents (30.3 percent) have made no significant changes to their supply chain distribution network in this struggling economy." While noting that many of the current networks satisfactorily meet existing requirements, "others have not changed because organizations lack viable options, financial resources, or staff resources to implement changes."

"The frequency of overall network reviews has increased over the last 10 to 20 years."

Terry Harris

"Senior management of many organizations has, understandably, been unwilling to devote scarce resources toward infrastructure additions or improvements that would take years to offset through reduced operating costs," maintains Jeff Ross, vice president of consulting, FORTE, Mason, Ohio. He also observes that the approach companies typically follow during economic downturns "tends to put them in the 'reactive' mode when the economy and their market rebound."

The real problem with a reactive approach to network design is the timeframe to execute the network changes. Ross explains: "A minimum of eight months is needed to make minor infrastructure changes and up to two to three years to fully transition to major network



changes. This means that the 'reactive' companies could be operating under severe network stress for extended periods of time," he warns.

When to re-evaluate your network

Companies typically review and redesign their distribution networks every few years; many conduct studies annually, while some may even make changes continuously. "Distribution networks, or supply chains, as they are more commonly known, keep getting more complicated," states Leonard Sahling, first vice president, ProLogis Research Group, Denver, Colo. "The optimal design for a distribution network will change in response to changes in the economic environment," he notes in a white paper (Network Reconfigurations—Springboard for Supply Chain Efficiency).

"The frequency of overall network reviews has increased over the last 10 to 20 years," says Terry Harris, managing partner, Chicago Consulting, Chicago. "These reviews are much easier and less expensive to do today. Our technology has improved and we've become much more proficient at performing network reviews and studies."

The need to re-evaluate a distribution network is driven more by events than by the calendar, according to Ross. "Changes in the business environment, customer base percent of growth and other events should provide the impetus for a review of a company's network," he explains (see sidebar). Some of the "warning signs" that a review is in order include major shifts in customer base or channel, capacity constraints in one or more DCs or other nodes in the distribution network, and sustainability initiatives within an organization.

Lease termination is also an important driver when companies evaluate their networks, says Harris. There-

fore, there is a natural limit to the frequency with which network studies are performed. "Driven by lease terms these studies are typically done every three to five years in a comprehensive way," he explains. "More moderate or focused evaluations are to be done more frequently, perhaps annually."

"Studies done very frequently, such as monthly, rarely evaluate the network structure, the number and locations of warehouses," maintains Harris. However, there are reasons to perform certain frequent evaluations, such as territory adjustments and order sourcing, deciding from which facility an order should be shipped, are examples he cites.

What elements to consider

The traditional triumvirate of factors (facilities, transportation and inventory) that have been considered during network analysis have not changed. "In most studies, the optimal network is identified through a series of scenarios developed to strike a balance between the three costs: transportation, inventory carrying cost, and variable facility handling costs," says Ross.

The top three areas of change in the Saddle Creek survey included transportation-related changes (44.1 percent); warehouse size and/or configuration (33.8 percent); and consolidation of shipments from suppliers (24.8 percent). Further, significantly more respondents highly valued a location closer to their market/customers than a location closer to the manufacturing plant, suggesting the priority placed on last mile distribution. Low operational costs and readily available inbound/outbound transportation are also rated highly when selecting a geographic location.

"The most significant change in network analysis has been the prevalence of inclusion of inventory stocking strategy," says Ross. Among the stocking strategies most commonly reviewed:

- Consolidation of slow moving items in a central DC with medium and fast items in every DC
- Consolidation of high-value, low-weight items in a central distribution point
- Stocking product families only in DCs with sufficient volume to warrant inventory investment

"Because the largest cost factor in most networks is outbound transportation, a balance of inventory carrying costs, which increase with each additional distribution center, and the outbound transportation costs, which decrease with each additional distribution center, needs to be identified through modeling of mul-

8 Reasons for Optimizing Your Distribution Network

A network optimization process can be time consuming and involved, acknowledges Jeff Ross, vice president of consulting, FORTE, Mason, Ohio. "It also can result in fundamental changes to your supply chain," he adds. So is it worth undertaking the effort?

"If you can identify with some (or all) of the following factors affecting your business today, then yes, network optimization is for you," encourages Ross.

- **Rising distribution costs.** Energy costs are on the rise, be they fuel cost spikes affecting transportation costs, or the electricity required to operate, heat and cool DCs. Labor is costly, with overtime and additional shifts adding expense. Shipping costs also continue to escalate, with more expensive expedited deliveries growing in demand. Finally, with the rise of e-commerce, more companies are struggling with a dramatic spike in reverse logistics and subsequent re-shipping, all detractors from the bottom line.
- **Outsourced manufacturing and distribution.** Moving manufacturing overseas adds miles to a supply chain, requiring additional lead time and inventory expansion to accommodate lulls and delays at customs. For some companies, it also could mean adding coastal DCs to the domestic supply chain infrastructure to more quickly bring inventory under control. Meanwhile, many companies' existing distribution networks weren't designed to integrate with foreign-based manufacturing operations, and can't efficiently handle the crunch. Third-party logistics providers (3PLs) may play a role in the network as well, but may not be appropriately leveraged.
- **Service as a key selling point.** To stand out from their competition, companies feel compelled to offer stellar service at rock-bottom pricing, but can't necessarily deliver with their current supply chain setup.
- **Leveraging current technology.** Many companies' original or current handling practices were designed for manual, less automated processes and could benefit from an upgrade. Nonetheless, they may be reluctant to invest capital in the latest technologies and equipment without hard data to justify long-term use.
- **Mergers and acquisitions.** While mergers and acquisitions are a quick way to gain market share, they're also messy—yielding more DCs that likely run on different technologies in the same general geographic regions, servicing the same customer base. This kind of growth also means more SKUs, more workers, more suppliers and more customers to contend with than ever before.
- **Change in demand.** Whether it's growth in the form of new markets, clients and products—or reductions due to closing markets, lost customers and retired products—a change in customer demand equates to added pressure on the supply chain.
- **Struggles with ongoing costs.** Are accumulating daily costs undermining your profits? Federal, state, or local taxes, charge backs for late or non-compliant order fulfillment, and offsite inventory storage can all severely impact the bottom line.
- **Potential natural disasters and security regulations.** A hurricane, tornado, earthquake, fire, or other natural (or unnatural) disaster could wipe out one of your DCs. If that happened, could your other DCs' inventories and personnel handle the need for reserve emergency stock? And, are your warehouses and inventory in compliance with the increased number of government-mandated environmental/security measures?

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multiple scenarios," Ross explains. "Inbound transportation costs and facility handling costs impact the number and location of distribution centers and other nodes, but do not impact as heavily in most initiatives."

New factors warrant a look-see

Longer and more complex supply chains bring about other issues to consider when evaluating a distribution network. For example, there's the globalization aspect. Harris cites: "How fast the Asian factory can change over to produce a new item impacts our ability to serve customers in Peoria as well as the cost it takes to do so."

Other new issues include shifts in the cost of certain supply chain resources. As an example, Harris notes the increase in fuel costs and the decrease in facilities costs and interest rates. Another factor is the "explicit evaluation of the service dimension to at least the same degree as the cost dimension, including sales and marketing functions as well as customers in supply chain design efforts."

Among the most common "new" factors are a more frequent inclusion of port-of-entry to the U.S. for imported goods and total speed-to-market. "The port-of-entry consideration has become more prevalent due to improved ocean freight transportation times to the eastern ports and the recognition by many supply chain professionals that overall inbound transportation costs can be reduced through the use of these ports," Ross explains.

"The speed-to-market factor is strongly considered during more network optimization initiatives than in prior years, especially in the retail and fashion industries," he notes. "The ability to move product quickly from the distribution centers is not sufficient. The speed from supplier to store or customer is now playing a much larger role in the network design."

"Expert" tips on re-evaluation

Because of a need to re-analyze a company's distribution network periodically, Ross recommends maintaining the original model. "As long as it is kept intact, the effort and cost associated with 'refreshing' the original with current data is much lower than a new modeling effort that entails configuring or customizing for specific needs," he explains.

"Distribution network expansion or contraction is not the right question," asserts Harris. "The right question

is, 'How can I increase service to my customers and do it at a lower cost?'" The answer will define whether to expand or contract the network.


The evaluations Harris performs quantify two dimensions: service and cost. "At a high level service components include lead-times and product availability while cost components include transportation warehousing, and inventory," he explains. The obvious key trade-off is between service and cost, but there are other more subtle trade-offs:

- Shorter lead-times from either better inventory availability or faster warehouse order processing
- Better inventory availability from concentrating it into fewer locations or dispersing it and getting it closer to customers

"Supply chains have many components and most are interdependent," Harris explains. "Not accounting for these interdependencies results in higher cost networks that provide lower service."

"The most effective approach for a distribution management professional to employ when 'selling' the distribution network optimization initiative to C-level management is to develop a thorough, fact-based summary of current network capabilities and shortcomings and to include net present value and cash flow projections associated with the transition and future operation of the redesigned network," advises Ross. The summary should include:

- Current storage and throughput capacity for each distribution center and other nodes in the network;
- Dollar value of overtime pay and expedited freight costs associated with network nodes that are bumping against or have exceeded capacities;
- Average and maximum drive distance from each DC to each customer destination. Ideally include similar data points for benchmarked companies;
- The estimated impact on delivery time that the drive distance differential causes; and
- Any documented customer comments or complaints related to inconsistent or non-competitive delivery time.

Ross encourages: "A well documented justification of the need for a network optimization initiative, along with an educational presentation of the methodology and typical results will help to sell the initiative and provide C-level management with the incentive to fund the study." 

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