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# Inbound Transportation and Receiving: Making Material Flow Starts at the Source

*Optimizing the flow of incoming materials requires a value chain approach that evaluates the tradeoffs between truckload vs. less-than-truckload and multiple deliveries vs. consolidated milk runs.*

> BY KEN KOENEMANN

Nov. 10, 2008 -- Historically high fuel prices have forced Americans to completely rethink their driving habits, from the type of vehicles they drive to how they go about their daily errands. Likewise in the business world where managers have developed a newfound awareness of transportation and logistics expenses.

With so many variables and cost drivers, getting a handle on such costs requires a value chain perspective that includes an end-to-end look at transportation. This article focuses on some of the opportunities for improvement and potential savings on the inbound side of the logistics equation. This includes redefining milk runs, cross docking, scheduling deliveries and the intelligent use of technology.

## A New Vision for Receiving

Mapping all of the transportation legs between the point of origin and your facility can make it easy to see where and when problems are likely to arise. Most company's inbound shipments look like a child's drawing of the sun with an array of spokes coming together at a single point: your receiving dock at 8:15 a.m. on a Thursday morning.

By definition the receiving function does not create value. The goal is therefore to minimize the time and touches required to move material from the dock to the assembly line or work cells. Accomplishing this starts at the points of use in the plant, focusing specifically on high dollar value and high frequency items. Looking at the actual rate of consumption, or takt time, will reveal the optimum rate of incoming parts and subassemblies. Such analysis typically yields an ideal material flow that is characterized by smaller quantities and more frequent deliveries. Such a tactic would logically translate into higher transportation costs unless incoming shipments can be consolidated.

For example, a manufacturer of large industrial equipment that we worked with was receiving nine different shipments per week from one of its major suppliers. Each of these less-than-truckload (LTL) shipments included a sufficient quantity of each SKU (engines and transmissions in this case) to last several weeks or more. This manufacturer builds and ships its product at an average rate of one unit per week. Somewhat paradoxically, by consolidating the nine smaller shipments from this supplier into a single weekly truckload shipment, and lowering the individual part volumes to be more in line with actual consumption, they have been able to increase the delivery frequency for each part, reduce raw material inventory, and cut overall transportation costs.

Another way to consolidate shipments into truckload quantities is to establish some form of transportation loop, known as a milk run. The truck becomes the consolidation device, picking up shipments from suppliers within a particular geographic area on a daily or weekly basis, and delivering them to the factory on a regular schedule. The cost of a truck traveling a regular route on a regular schedule will typically be less than LTL or parcel even if the trailer is only 80% to 85% full on average.

## Managing Variability

Getting such an approach to work requires an ability to minimize and manage variability. Milk run truckloads will typically include a broad variety of products. Some pallets will be stackable and some will not. Building each load requires a solid understanding of each product's dimensions, weight and volume, and how they tend to be banded and packed.

Managing variability in volume presents some special challenges as well. The size of the truck offers some opportunity for aligning the incoming flow with normal consumption patterns. Any overflow, during seasonal sales spikes for example, should be handled via alternative transportation modes. If shipment volumes for a SKU tend to have huge swings in volume-perhaps because a particular raw material is produced in large batches at irregular intervals-they should not be considered for milk run delivery. Similarly, if a particular supplier is providing unreliable delivery or quality performance, or is likely to be replaced as part of a rationalization effort, it shouldn't be included in the design of the milk run. With sufficient oversight

day-to-day execution of the route can be cost effectively managed by a third-party logistics provider. However it is managed, the mix and volume of the incoming parts flow should be re-evaluated at least every quarter.

Having milk runs offers some additional benefits. For one they make it easier to manage returnable packaging and part carriers. Such an approach can save a lot of money by eliminating excess cardboard and other dunnage, and reduce in-transit product damage. Calculating the benefits of such investments should include both the hard cost of waste disposal and the labor costs of managing the waste streams. After doing such an analysis, one of our clients, which had 10 mechanics working in a particular area of its assembly line, found that the equivalent of one full-time employee-10% of their labor costs-was spent handling packaging and removing trash.

## The Many Faces, and Benefits, of Cross Docking

Another strategy for consolidating shipments is cross docking. A cross dock receives a variety of products and sorts and consolidates them for shipment without anything ever being put into long-term storage. These facilities, which may look similar to a normal warehouse with more staging areas and fewer storage racks, or feature miles of conveyor and highly automated sorting equipment, allow large quantities of product to be received from one channel and a mixed load to be built on the outbound side. The multi-million-sq.-ft. postal, UPS and FedEx sorting facilities are huge cross-dock operations that receive a mass of disorganized incoming material every night and sort it into the appropriate channel for next-day delivery. The concept can be just as effective on much smaller scale.

The industrial equipment manufacturer that we worked with set up an internal cross dock to handle incoming truckload shipments. Their worksite stretches over a mile and includes seven different buildings. By receiving consolidated, full truckload shipments at a single receiving dock they are able to avoid drop charges that their carriers would impose for stopping at each plant. Following a regular route and schedule, they deliver the materials from the central receiving area throughout the facility, further smoothing the material flow.

## Fire Fighting Should Not Be a Core Competency

No matter the approach, effectively managing the inbound material flow offers a huge advantage when it comes to scheduling. Most receiving docks are overwhelmed with deliveries at certain times of the day. The peak time might be first thing in the morning, late in the afternoon or happen at completely unpredictable intervals. The receiving area descends into chaos with material piling up in staging areas and lift trucks dashing to and fro. During other hours there may be little for people to do but sweep the floors.

Scheduling and segmenting some portion of the inbound material flow will smooth the flow of goods through receiving. More predictable deliveries allow managers to do a better job of allocating resources, including labor, floor space and material-handling equipment. Over time this level loading of the inbound flow will dramatically shorten the lead time between when incoming material hits the receiving dock and when it's available for manufacturing. Improved predictability also improves productivity and limits overtime requirements. Because there's no longer a mountain of pallets that has to be processed all at once, the square footage dedicated to the receiving area can be re-sized. More predictable work patterns also allow for the establishment of standardized work.

Standardized work in the receiving area looks the same as it does in other areas of a factory. Yellow painted boundaries on the floor, which can now be sized appropriately because material flow has been leveled, indicate pallet status ("waiting for inspection," "ready to be put away.") Standard packaging and labeling further simplifies material flow and reduces errors. Standard processes make it possible to effectively deploy technology, such as 2D or 3D bar codes or RFID, which can further minimize the number of transactions and touches required to receive a product.

These are some of the basic tactics for streamlining the flow of incoming materials. Operations managers need to stay on top of such activity as global transportation rates rise, and foreign subsidies and raw material cost advantages disappear. The price of shipping stuff halfway around the world is already beginning to negate labor cost savings, which only account for 5% to 10% of total product cost to begin with. Whatever the point of origin, it all comes down to a value chain mindset that continually seeks new ways to better align inbound material flow with actual customer demand.

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