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# Collaborative Transportation Management: A Solution to the Current Transportation Crisis

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## 1 Introduction

In May, 2006, Lehigh University's Center for Value Chain Research held its annual Spring Symposium on Supply Chain Adaptability. The symposium attendees included shippers, carriers, third-party providers, consultants, and supply chain technology companies. A main area of discussion was supply chain collaboration with a focus on transportation. It was clear that while there remain serious concerns over such issues as control, trust, and the potential risks of entering into collaborative relationships, the potential benefits were too compelling to ignore.

The process of collaborating in the transportation area, particularly full truckload transportation, is called Collaborative Transportation Management (CTM). CTM is a process that brings

shippers, receivers, and transportation service providers together for the sake of “win-win-win” outcomes among all parties. While CTM has been around since the mid-90’s, it’s been like the weather: Everyone talks about it, but no one does anything about it. That is, until recently. With tight carrier capacity, rising fuel costs, port congestion, driver shortages, increased security concerns, hours-of-service constraints, and increasing lead-time variability, more trading partners are taking real steps towards serious collaborative transportation relationships.

This paper describes what collaborative transportation is and what the benefits are, and provides a compelling business case for taking action.

## **2 Defining Collaborative Transportation Management**

Collaborative Transportation Management (CTM) is a holistic process that brings together supply chain partners and service providers to drive inefficiencies out of the transport planning and execution process. The objective of CTM is to improve the operating performance of all parties involved in the relationship by eliminating inefficiencies in the transportation component of the supply chain through collaboration.

CTM focuses on enhancing the interaction between three principle parties -- a shipper, a carrier, and a receiver, as well as secondary participants such as third-party logistics (3PL) service providers. Participants collaborate by sharing information about demand and supply (e.g., forecasts, event plans, and expected capacity), ideas and capabilities to improve the performance of the overall transport planning and execution process, and assets, where feasible (e.g., trucks). The process begins with an order/shipment forecast, and includes capacity planning and scheduling, order generation, load tender, delivery execution, and carrier payment.

## **3 Why Collaborate on Transportation?**

The 17<sup>th</sup> Annual State of Logistics Report<sup>®</sup>, sponsored by the Council of Supply Chain Management Professionals, showed that transportation costs consumed 6.0% of the U.S. gross domestic product in 2005. This percentage has remained in the 6% area for much of the last two decades. While many efficiency improvements have been made, there still remain significant opportunities for improvement. Trucks still run empty approximately 20% of the time, wait times to load and unload shipments are still excessive, driver turnover ratios reached an all-time high in 2005 of 130%, and revised hours-of-service (HOS) regulations that went into effect in October of 2005 are impacting the hours available for operation and how drivers will use their on-duty time. Also, given the mandate for heightened security provisions throughout the supply chain, shippers and carriers must work closely to ensure the safe transit of goods while keeping the costs of enhanced security within reason.

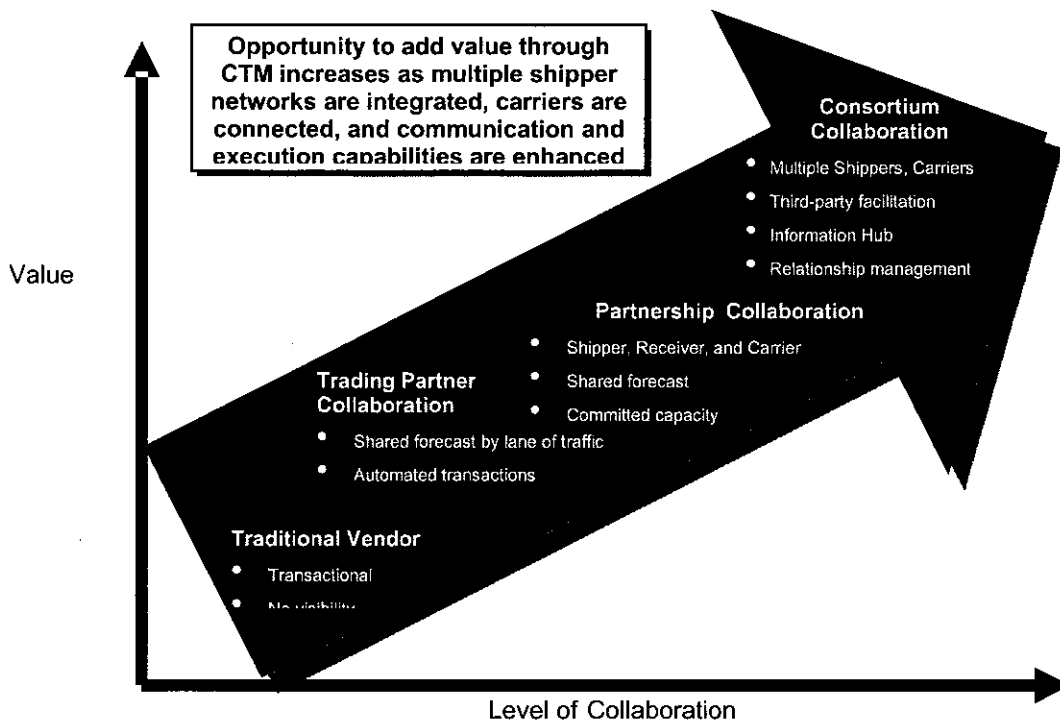
Given these concerns, it is important for companies to work together to eliminate inefficiencies, reduce cost, and ensure reliability in the movement of goods. In most instances, there is only so much that a single member of the supply chain can do to resolve the problems noted above. This is why collaboration among partners in a supply chain has become a topic of great interest for many and an essential element of company strategy for others.

## **4 CTM Value-Add**

CTM adds value by eliminating transportation inefficiencies inherent in most order fulfillment processes. First, it reduces the amount of dwell time carriers experience waiting to load or

unload shipments. Second, it optimizes the weight and/or volume utilization of transportation assets. Third, it reduces deadhead miles by better sequencing and routing transportation assets within a transportation network. Fourth, it reduces process errors which can lead to inefficiency. Finally, it reduces billing errors and inaccurate communications.

The opportunities to add value increase as multiple shipper networks are integrated, connecting a broader sphere of shippers, receivers and carriers and enabling enhanced opportunities for communication and improved execution. Central to the effort to connect a network of collaborating parties is the development of a common information hub. In general, the level of information sharing increases with the level of collaboration. Figure 1 below portrays the extension of value contribution as the collaborative network expands and information sharing increases.



**Figure 11. CTM Value Continuum**

CTM benefits can be found with short- or long-range planning horizons. For example, if the focus of CTM is on the operational picture expressed days in advance, improvements are recognized in shipment and carrier management (improving asset utilization) and fleet routing and scheduling (improving cycle times and increasing carrier revenue miles). As the time horizon extends to months or quarters, collaboration efforts can improve efficiencies in transportation procurement and contracting. Finally, with a planning horizon of up to one year, strategic issues such as supply chain network design, market growth, fixed asset planning, and transportation planning and modeling can be addressed in the collaborative network. Annual forecasts can also prove valuable in contract negotiations. The potential benefits to Return on Assets and Investment are greatly impacted by such long-range strategic initiatives.

## 5 Key Transaction Areas

There are three transaction areas that represent key opportunities for CTM. These are: 1) capacity procurement, 2) inbound management, and 3) integrated movements. Each area is described below, along with its potential benefits.

### **Capacity Procurement**

Capacity procurement represents the interaction between the shipper and carrier to arrange transportation capacity. Even when transportation capacity is negotiated under contractual arrangements, the carrier must often anticipate the needs of the shipper and make quick, and often imperfect, decisions when a load is ultimately tendered. Through collaborative planning, the carrier can anticipate demand much better than if left to guess where and when demands for service will surface. Providing the carrier with load tendering plans is also beneficial for shippers. Through improved planning, the shipper can seize load consolidation opportunities not otherwise available. The load tendering process is simplified and administrative costs are reduced. The shipper can also reduce the carrier base and better leverage its carrier base nationwide, reducing the shipper's total freight cost. In return, carriers benefit from increased volume commitment, guaranteed lane assignments, process simplification, and reduced administrative costs.

### **Inbound Management**

Inbound management refers to the proactive control of inbound goods flow and management of transportation by the receiver of the freight. By exhibiting better control of inbound freight, the receiver can reduce transportation cost through inbound consolidation and vendor allowance. Compliance issues should be more precisely defined and enforced. Overall lead time and lead time dependability can improve, resulting in better sales with reduced levels of inventory. Carriers benefit from increased volume commitment, guaranteed lane assignments, and advanced scheduling predictability. Collaboration of inbound management involves not only the carrier and receiver but also the shipper. As a result of transferring freight management responsibility to the receiver (i.e., converting freight payment terms from prepaid to collect), the shipper reduces its own administrative expense and diminishes its risk of shipment refusal. With dependable lead times, inventories can be reduced and, quite possibly, sales will increase.

### **Integrated Movements**

Integrated movements, or continuous moves, involve aggregated volumes for multiple locations within a company, across divisions or even across companies. Shippers and receivers benefit from reduced freight costs, an increased amount of dedicated usage, and improved service. Receivers that enjoy greater control of their inbound freight movements can realize opportunities for coordinated and consolidated inbound-outbound movements. Carriers can improve asset utilization while reducing empty miles, labor cost, and sales and administrative expense. By developing scheduled tours, the carrier enjoys greater familiarity with customers, which leads to better service. Scheduled tours may also include closed-loop, milk run service to accommodate returnable container usage or any other reverse logistics flow.

## 6 Reported Performance Benefits

CTM pilot initiatives have been implemented in various companies and settings in the U.S. starting in 1999. These pilot projects have demonstrated that the benefits of CTM are very real and substantial. Shippers and receivers have documented gains such as:

- On-time service improvements of 35%
- Lead-time reductions of more than 75%
- Inventory reductions of 50%
- Sales improvements of 23% (through improved service to customers)
- Premium freight cost reductions of greater than 20%
- Administrative cost reductions of 20%

Carriers have recorded equally dramatic benefits from CTM pilot projects, including:

- Deadhead mile reductions of 15%
- Dwell time reductions of 15%
- Fleet utilization improvements of 33%
- Driver turnover reductions of 15%

## 7 Translating Benefits into Financial Return

No one can deny that improved on-time performance, reduced lead times, inventory reductions, sales improvements, and cost reductions are desirable outcomes. These benefits in and of themselves, however, typically will not justify the investment of time and effort required of collaboration. The business case for CTM must be stated in financial terms that spell out the real costs and benefits. Figure 2 represents the business case for CTM, showing how some of the benefits reported in CTM pilots have translated into improved profitability and balance sheet performance. The increased sales potential and reduced costs result in improved profitability. Better utilization of transportation assets, inventory reductions, and the potential for reduced days' sales outstanding (DSO) yield improved balance sheet performance. The improvements are found among all parties -- shippers, receivers and carriers involved in collaborative effort.

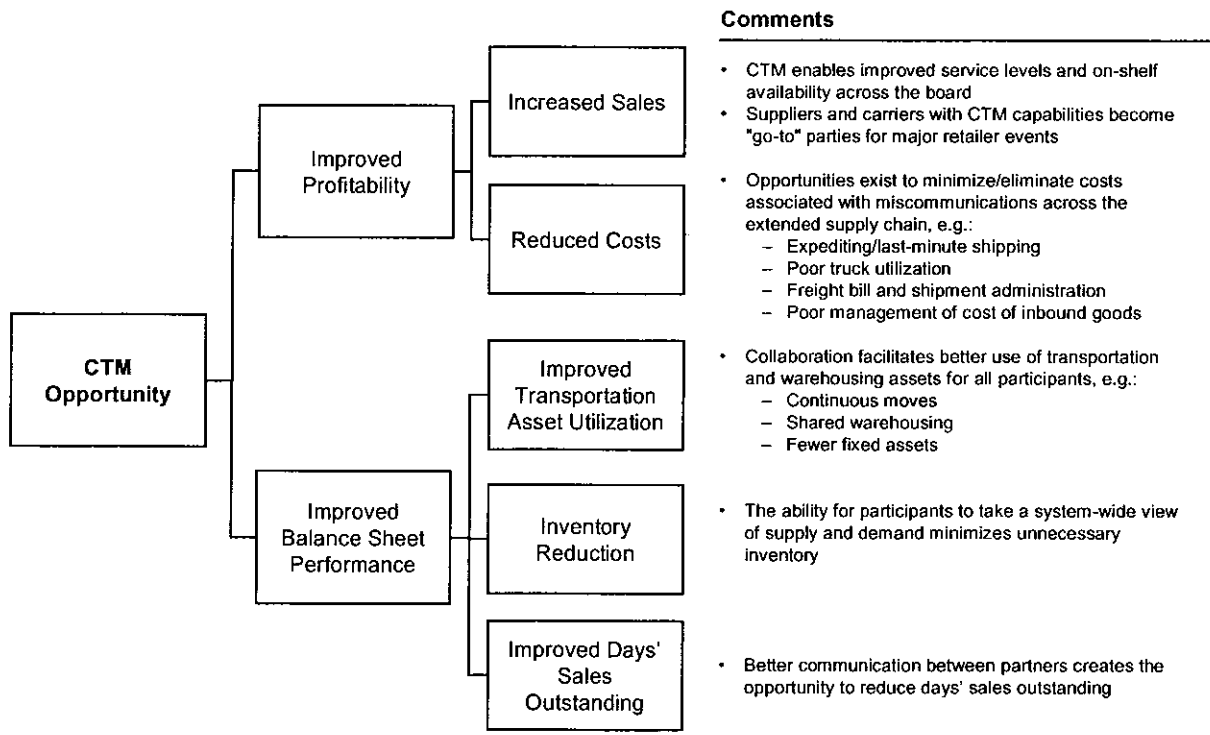


Figure 22. Possible CTM Benefits

Surprisingly, very little capital investment is required for Collaborative Transportation Management. While a sufficient level of information system capability is required to capture and process needed information, physical assets are generally not required to bring about the results of CTM. Rather, the primary forms of investment involve people and time.

## 8 Key Enablers and Roadblocks to Collaboration

In order for collaborative initiatives to succeed, key enablers must be in place. These enablers support best practices in critical activity areas and help overcome the roadblocks to success that inevitably surround collaboration.

One critical enabler of CTM success is establishment and mastery of transportation best practices. Such practices are separate from CTM but create the needed foundation for success. The following list summarizes transportation best practices that facilitate CTM success:

- Increase operational control and centralize transportation management
- Establish a core carrier program; rationalization and reduction of carrier base
- Institute proper contract terms and conditions
- Optimize daily transportation plan: Consolidation and selecting lowest cost carrier
- Implement electronic tendering
- Implement shipment status reporting and visibility for orders, shipments, and inventory
- In-source freight payment; implement self-billing
- Eliminate freight bills for contract carriers; pay on agreed milestone/timeframe
- Establish concise KPIs and metrics; ensure compliance
- Implement trading partner report cards and quality reviews
- Establish Continuous Improvement programs
- Implement accurate freight cost allocation and cost/unit reporting
- Implement transportation financial analysis

While developing best practice transportation is central to CTM success, other key enablers are equally important. Successful collaboration is a function of how well people work together both internally and with collaboration partners. The following enablers (*Supply Chain Management Review*, September/October, 2000, pages 52-58) are related to the human side of CTM:

1. **Common interest** - All parties need to have a stake in the collaboration's outcome to ensure their ongoing commitment.
2. **Openness** - For a relationship to work, the partners must openly discuss their practices and processes. Sometimes this means sharing information traditionally considered proprietary (though adherence to anti-trust guidelines remains prerequisite).
3. **Recognizing who and what is important** - Not all prospective collaborators and supply chain activities are created equal. Choose those that will deliver the greatest benefits.
4. **Clear expectations** - All parties need to understand what is expected of them and others in the relationship.
5. **Leadership** - Without a champion to move collaboration forward, nothing significant will ever be accomplished.
6. **Cooperation, not punishment** - When things go wrong in a relationship, punitive actions seldom make them better. The right approach is to solve the problem jointly.
7. **Trust** - This basic human quality must be evident throughout the organization -- at every management level and functional area.

8. **Benefit sharing** - In a true relationship, the partners need to share both the pain and the gain - use of a shared modular supply chain scorecard can help.
9. **Advanced information technology (IT)** – IT is essential to enabling collaborative relations across the supply chain. Communication and process automation achieved through IT enables CTM by facilitating real-time, accurate, data transfer.

In addition to enablers, firms seeking to implement CTM should recognize and avoid roadblocks to CTM success. Many of these roadblocks stem from behaviors, attitudes, and practices associated with traditional business operations. The following list summarizes potential roadblocks to successful collaboration as identified at Lehigh University's Center for Value Chain Research Symposium in May, 2006.

1. **Control and trust** - How is knowledge shared in such relationships? Who owns and controls the intellectual property gained in such relationships and how is this shared?
2. **Sharing of proprietary information** – How is information protected from getting into the hands of competitors?
3. **Ethical issues** - The very nature of collaborative relationships has not yet been clearly ironed out.
4. **Integration of systems and technology** – When sharing information and integrating systems, each company within the relationship must have accurate data to share.
5. **Going global** – Due to the size and scope of many businesses today, the complexity of global collaboration is something that has not yet been demonstrated.
6. **Measuring and documenting benefits** – While there are a number of different metrics in use today, there is no easy way to document total CTM benefits.
7. **Structure** - Establishing effective and implementable “standards” will be needed before such relationships can be successful and sustainable.

Collaboration is not meant for every situation. That is, collaborative effort must result in gains for everyone involved. If outcomes involve only one party gaining, and the winner's gains are not shared to offset the losses of others, the collaboration should not be pursued. Therefore, no single party can only consider what it stands to gain from the effort. The initiative must represent a collective win.

The final requirement is ability. Having good opportunities and good intentions will only get you so far. The partners must individually and collectively have the skills and information capabilities to seize the opportunities. Management and analytical skills are necessary for finding the value and selling the prospects with internal and external parties. As noted previously, information technology represents a critical enabler of CTM. With the exception of transportation marketplaces, however, CTM is not a “technology solution.”

While outside parties such as third-party logistics providers are not required of CTM, they can serve as facilitators of communication or execution. This is particularly true when potential for gains are found among trading partners but capabilities are lacking. The presence of an unbiased, capable intermediary can sometimes make collaboration possible when it might not exist otherwise.

## 9 Measuring Results

As Yogi Berra said, "You got to be careful if you don't know where you're going, because you might not get there." Clearly, for CTM to work, a detailed roadmap to success is required. In other words, measuring performance is essential in guiding the collaborative relationships. The measures themselves must be agreed upon, defined, understood, prioritized, gathered consistently, and shared with collaborative partners.

There are a number of key performance indicators (KPIs) of logistics management that are likely to be affected by CTM. To understand the relationship between operational activities and strategic imperatives, the measures should be related to the business case for CTM. For example, if inventory reduction is a significant driver of CTM, inventory levels and measures of service reliability should serve as focal points of assessment. Improvements in these measures should correlate very closely with the desired outcome, reduced inventory levels. It's in this regard that prioritizing measures is important. Which measurements are critical to the success of CTM in the eyes of all participants? Not all measures are equally important, nor is there a single set of measures that should serve as the focus for any given CTM initiative.

## 10 Summary of Lessons Learned and Best Practices

Those considering implementing CTM can take comfort in knowing that others have achieved the intended success of their collaborative efforts. Prospective collaborators can also benefit from the best practices to emerge from pilots and implementation of CTM. These include:

- **Mindset** -- The mindset has to be one of collaboration. A willingness to share information and jointly manage the process is critical to success.
- **Unbiased Guidance** -- In order to keep the process focused, and to enable CTM in the process development stages, third-party unbiased guidance is recommended.
- **CTM Readiness** -- Once there is commitment to the concept of CTM, it can be used by each individual partner as a tool to build relationships with other business partners, where the existing relationships may not be as strong.
- **Face-to-Face Meetings** -- The value of face-to-face meetings seems crucial to maintaining the momentum of the project, and to ensuring the quality of the CTM process that is developed.
- **Values of Interaction** -- As a result of face-to-face, telephone, and e-mail communications, companies tend to encounter unanticipated opportunities along the way, even if there is not 100% follow-through on some initiatives.
- **Scheduling** -- To ensure participation in face-to-face meetings, scheduling the sessions a month in advance compels participants to make them a priority.
- **Commitment to Supply Chain Improvement** -- While CTM is focused on "transportation" management, its impact is spread throughout the supply chain.

It's important to recognize that there must be a driving motive for all parties in the collaborative relationship to work together to achieve something greater than any individual company acting in isolation could achieve on its own. To that end, participants become a committee of "equals" – there is no room for "lesser members". While the magnitude of each partner's "win" will vary, everyone must find value in the collaboration to ensure its long-term success.

This article was written in part based on research conducted by Joel L. Sutherland and excerpts from the CTM white paper created by Joel L. Sutherland and his sub-committee for the Voluntary Interindustry Commerce Standards Association, April, 2004.