



Collaborative Transportation Management: A Solution to the Current Transportation Crisis

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July, 2006

1 Introduction

The process of collaborating in the transportation area, particularly full truckload transportation, is 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, 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, 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 17th Annual State of Logistics Report®, 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 further 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.

Collaboration is more than cooperating with one another. It requires that all engaged companies work actively together toward common objectives, sharing information, knowledge, risk, and profits/benefits in an agreed-to, consistent fashion to ensure a common unity of effort. It is critical that all parties involved realize tangible benefits.

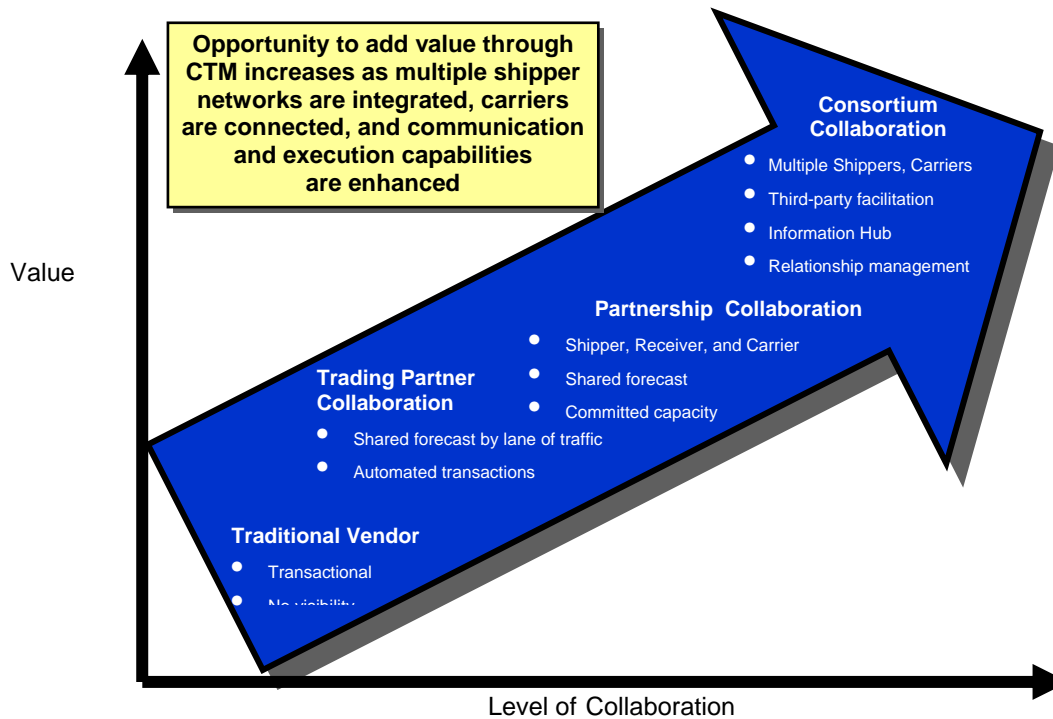
4 CTM Value-Add

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 4-1 below portrays the extension of value contribution as the collaborative network expands and information sharing increases.

4.1 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). Experience to date indicates that value increases with 2-7 days of advance notice for these operational improvements. 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 along with 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 that 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 by 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%

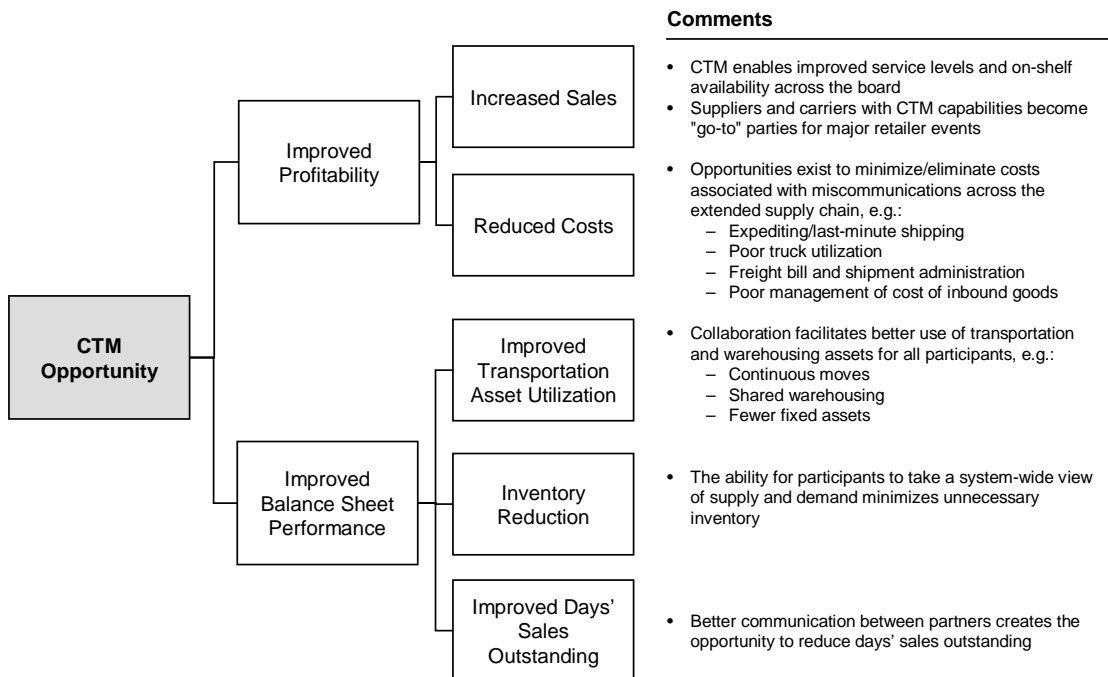
Carriers have recorded equally dramatic benefits from CTM pilot projects, including:

- 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 7.1 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.

7.1 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. In summary, the returns of CTM far outweigh the investments required.

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 (economic loads) 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) are related to the human side of CTM and are essential to CTM success:

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 are 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. **Working together and adjusting to one another** - There's no CEO of the supply chain, so the partners have to work collaboratively to figure out how to get the job done.
7. **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.
8. **Trust** - This basic human quality must be evident throughout the organization -- at every management level and functional area.
9. **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.
10. **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 data transfer and reducing transaction costs and risks.

In addition to enablers of CTM success, firms seeking to implement the CTM Model should be able to recognize and avoid debilitating roadblocks to CTM success. Many of these roadblocks stem from behaviors, attitudes, and practices associated with traditional business operations. The following list summarizes primary reasons for failure of collaborative initiatives.

1. **Doing things the old way** – The natural resistance to change that confronts any broad initiative like supply chain collaboration.
2. **Conventional accounting practices** - These practices become impediments to collaboration when they focus on the traditional accounting role of determining the value of a single firm, rather than measuring cross-company values.
3. **Tax laws** - Tax laws dictate the need for a clear "price paid" and "price sold" to determine profitability. Yet these practices can obscure the synergistic, and often indirect, cost savings that are primary drivers of supply chain collaboration.
4. **Limited view of supply chain** - The legacy of the traditional silo organizational structure in which people think only about their own functional area.
5. **Annual negotiation process** - Annual negotiations consume time and energy, plus they are usually adversarial. There are better alternatives.
6. **Time investment** - Collaboration takes time and a lot of hard work. To get people to make the necessary effort, they have to be clearly shown the expected benefits.
7. **Inadequate communication** - When communication between supply chain partners is nonexistent or inadequate, the potential for problems increases exponentially.

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 willingness to engage involves the recognition of the time and effort required to find the opportunities. Also, the willingness to share critical information with collaborative partners – information that up until now had never been shared – is a key driver of success. Having faith in the collaborative partner(s) is essential, trusting that the rewards of sharing the information outweigh the potential risk.

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, “If you don’t know where you’re going, any road will get you 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.

Table 9-1 lists 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. In other words, 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. Given an array of measures, which ones are critical to the success of CTM in the eyes of all participants in the collaboration? 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.

9.1 Logistics Metrics Affected by CTM

KPI	Measure	Definition	Example
Days’ Supply On-Hand	Inventory days	Value/units of inventory (cost of goods) divided by the value/units of average daily sales (based on past 6 months’ history or on forecast for next 6 months) of these products	Avg. value of inventory = \$5,000 Avg. Daily Sales = \$400 Inventory = 12.5 days
On-time Delivery	% Shipments on-time	Number of shipments delivered on-time divided by the total number of shipments	Shipments on-time: 80 Total shipments: 100 On-time % = 80/100 = 80%
Fill Rate	% Order in full	Number of order lines/cases/SKUs delivered in full divided by the total number of lines/cases/SKUs ordered	Ordered: Product A = 100 cases Product B = 60 cases Delivered: Product A = 100 cases Product B = 50 cases Line Fill Rate = 50% (1/2) Case Fill Rate = 93.75% (150/160)
Out-of-Stock Frequency	% Out of stock	Number of items not available divided by the number of items ordered	Out-of-stock should be measured as frequently as capabilities allow (e.g., daily, weekly, audit). The target is a systematic approach to daily measurement.
On-Shelf Availability	% On-shelf availability	Number of days/hours the product is available on the shelf divided by a defined period of time	There is a wide range of measurement methods for on-shelf availability. It is recommended to agree on the measurement among the trading partner’s, including the time of measurement.
Order Lead Time	Days/Hours	Number of days/hours it takes from order generation to order receipt	Order sent at noon. Picked and shipped at 17:00 the next day + 6 hours of transit time

			Lead time = 35 hours (1.4 days)
Capacity Planning	Days	Number of days for frozen period of capacity plan	A manufacturer plans capacity two months in advance and does not adjust it afterwards (KPI: 60 days)
Transportation Planning	Days	Number of days for frozen period of transportation plan	A supplier schedules trucks two weeks in advance and does not change the plans (KPI = 14 days)
Full Truck	% Full truck	Number of trucks with over 95% of volume full divided by the total number of trucks shipped	Number of full trucks in May = 20 Trucks with less than 95% fill = 10 % Full Truck = 66.6% (20 out of 30)
Vehicle Fill	% Vehicle fill	Average volume of vehicles used divided by the total volume of vehicle	Number of full trucks = 20 Trucks filled at 80% = 10 % Vehicle Fill = 93.3%
Empty Running	% Empty running	Number of miles driven empty divided by total miles driven	Miles driven empty = 300 Total miles driven = 6,000 % Empty Running = 5% (30/6,000)
Distribution Costs	% of Sales	Total distribution costs (e.g., transportation, warehousing, inventory) divided by sales dollars	Total distribution cost = \$750 Total sales = \$2,000 KPI: % Sales = 37.5% (750/2,000)
Invoice Accuracy	% Invoice accuracy	Number of lines with matching data (specification and price) divided by total number of lines	16 lines ordered 10 lines match 100% % Accuracy = 62.5% (10/16)

10 Summary of Lessons Learned and Best Practices

Those beginning their trek down the CTM road can take comfort in knowing that others have set out on the journey and achieved the intended success of their collaborative efforts. Prospective collaborators can also benefit from the best practices to emerge from pilots and full implementation of CTM. These include:

- **Mindset** -- The mindset of the individuals participating on the CTM team 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 the interaction among companies 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.

What's important to recognize with any collaboration is that there must be a driving motive for all parties involved in the 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 viability.