TRANSPORTATION OPTIMIZATION

Transportation optimization helps shippers, 3PLs, and transportation consultants analyze shipments, rates, and constraints to produce realistic load plans that reduce overall freight spend.
The number of logistics operations using TMS is steadily increasing, with the magazine’s most recent reader survey finding that nearly 40% of shippers are using the system as part of their overall supply chain management strategies.

And while many firms are familiar with the benefits of TMS, transportation optimization—or, the ability to analyze shipments, rates, and constraints to produce freight plans that minimize costs—remains an elusive goal for many. In fact, many users remain unclear on exactly how to justify the business case of transportation optimization—or, they assume optimization is too complicated or expensive.

On the logistics side, everything from the last mile to next-day/same-day delivery to carrier capacity issues are pushing shippers, third party logistics providers (3PLs), and transportation consultants to work smarter, better and faster within their respective positions along the supply chain.

“Companies are being asked to deliver more frequently and in smaller batches,” says Adrian Gonzalez, a long-time supply chain analyst and current president of Adelante SCM in Boston. “This represents a significant shift from the way things ‘used to be,’ when companies would fill a single truckload to ship every Tuesday.”

According to Logistics Management Research

Nearly 40% of shippers are using TMS

Those users achieve an average cost savings of 7.5%

The new realities of the logistics environment have made transportation optimization more important than ever. Logistics Management has covered the development and evolution of transportation management systems (TMS) for more than 15 years, and its reporting shows that TMS users achieve an average cost savings of 7.5% when they use preferred carriers, better procurement negotiations, and put low-cost mode selections to work.

Making the Case for Transportation Optimization

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Today, the same customer that waited a week for that truck to reach capacity might want three shipments of smaller quantities. Or, it may want one truck to deliver the goods to one location, and then two others to go to two additional company locations.

Regardless of the specific complexity, or the level of that complexity, the bottom line is that shippers, 3PLs, and consultants are now drawing clearer lines between inventory and transportation. As part of that process, many are using transportation optimization to produce realistic load plans, reduce overall freight spend, and effectively meet their customers’ evolving wants and needs.

In this report, we’ll take steps to dispel the myths around transportation optimization, gain awareness of technology supporting optimization technology, and better understand the return on investment (ROI) for shippers, third-party logistics firms (3PLs), and transportation consultants.

THE BUSINESS CASE

Cost Savings

- Procurement (leverage spend, more intelligent bids)
- Consolidation (e.g., LTL to TL consolidation)
- Mode conversion (e.g., rail is cheaper than truck)
- More efficient routes (minimize miles, reduce fuel costs)
- Minimize/eliminate accessorial fees
- Less overhead (process automation, fewer drivers)

Cost savings of 5-25%+ are possible — depends on how inefficient your processes are before you implement

We’ll show you how firms have gone beyond using rate bid sites to get spot quotes for single loads, and instead increasingly are taking a holistic view of the complete supply chain. This, in turn, allows shippers to make the strategic decisions necessary to optimize the entire end-to-end transportation process. ➤
What is Transportation Optimization?

**TRANSPORTATION OPTIMIZATION** is the process of analyzing shipments, rates and constraints to produce realistic load plans that reduce overall freight spend and gain efficiencies across entire transportation networks.

The process can be used for orders from anywhere in the world—and from multiple customers, locations or vendors—and can be combined into multi-pick/drop movements, continuous move shipments, backhauls, and pooling scenarios. From consolidating loads to finding better routes to choosing more capable carriers, transportation optimization helps companies save both time and money.

For example, with Mojo Transportation Optimization, MercuryGate’s optimization solution, users can:

- Identify optimal mode, carrier, rate, and route.
- Leverage strategies including freight consolidation, mode shifting, zone skipping, cross docking, pooling, continuous moves, multi-pick and multi-drop shipments
- Simultaneously optimize inbound/outbound, including backhauls and reduce empty miles or loads
- Optimize a combination of private fleet and common carriers

**TRANSPORTATION OPTIMIZATION A WIDE SPECTRUM OF USE CASES**

**Sourcing**
- Evaluate and analyze carrier bids with simulation of actual shipment data, lanes and volumes

**Planning**
- Capacity Planning - Assess future needs of carriers
- Evaluate mode shifting
- Analyze impact of pool points and cross docks on transportation costs

**Execution**
- Generate optimized load plans across inbound/outbound, private fleet/common carriers and consolidate across customers

**Sales**
- Demonstrate ability to minimize cost with customers
- Evaluate new customer additions on existing route models
“The main drivers include the high level of TMS adoption among companies and the fact that people are moving away from Excel spreadsheets and over to more sophisticated systems. Given that they already have some degree of execution in place, this sets the stage for companies to begin looking at optimization as an option.”

—Vikram Balasubramanian, MercuryGate

- Increase asset utilization of private fleet
- Enable detailed modeling of private fleet including vehicles, domiciles, drivers, and driver schedules
- Specify custom heuristics and influence optimization output using Mojo Script
- Perform transformation and validation of input and output data and customization of the system’s user interface
- Consolidate loads across business units and customers
- Leverage as a sales tool to demonstrate optimization capability and win new business
- Conduct “what if” analysis to model transportation network
- Create multiple alternative execution plans for evaluation
- Evaluate carrier bids with actual shipment data
- Model forecast information to determine capacity requirements
- Identify network pool points and cross dock opportunities
- Determine carbon footprint and savings

Continuous Moves: Stringing loads together so that the carrier can better utilize a particular truck or asset.

Backhauls: Reduce empty miles and increase asset utilization; incorporate reverse logistics in scope as well;

Holistic Viewpoint: Taking a holistic view of both inbound and outbound freight spend and movement, such as:

- Taking shipments from multiple sources and consolidating them into the lowest possible number of vehicles/shipments.
- Taking a holistic view of both inbound and outbound freight spend and movement.
- Pairing freight options for continuous truck utilization (versus having just one “inbound” carrier and one “outbound” carrier).
- Handling reverse logistics (i.e., minimizing the number of “empty” trucks on the road).

These and other functionalities make transportation optimization attractive to small firms, large shippers, 3PLs, transportation consultants, and other entities that would benefit from a more streamlined, optimized approach to transportation.

Those companies that rely heavily on human intuition (i.e., those that say, “Joe is really good at looking at loads and just knowing how to intuitively put everything together”) are particularly well positioned to benefit from transportation optimization.

“It doesn’t take that much complexity for humans to understand what an optimization solution can do,” adds Gonzalez.
There are No Barriers to Good Optimization

The demands of omni-channel distribution have made it universally applicable.

TRANSPORTATION OPTIMIZATION may have once been the domain of larger companies that had complex transportation requirements; however, the demands of today’s omni-channel distribution and e-commerce channels have made it universally applicable.

“I’d say that there’s a relatively small percentage of firms that actually don’t need optimization at this point,” says Gonzalez. “In fact, most companies would benefit from it—even those that are still using spreadsheets and human intuition to handle their transportation logistics. With each shipment, the company that’s not optimizing its transportation is leaving money on the table.”

While optimization and mathematical models have been used in the supply chain industry for years (i.e., inventory planning and strategic sourcing), the adoption of transportation optimization has been relatively low. The key barriers have included the time necessary to get the execution piece right before introducing optimization into the picture.

Historically, companies have had to invest in execution systems that automate processes before figuring out how to optimize. That has made the latter a “second leg” or afterthought on the journey to holistic transportation management. As a result, transportation has been left out of the mix.

Also, many shippers have been reluctant to invest in optimization, having been discouraged by the cost of doing so, and thereby believing that they can do it by themselves manually. And while it’s true that with traditional, on-premise, monolithic software the upfront investment can be high, newer software delivery options have broken down that barrier.

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Finally, some companies feel that they’re not “big enough” to need optimization. However, once a company expands its analysis to both inbound and outbound freight (and, in the case of a retailer, returns), the complications associated with transportation management multiply fairly quickly.

When combined, these historical barriers to transportation optimization come down quickly and pave the way for shippers and 3PLs of all sizes to be able to take advantage of its power.

“We’re definitely seeing increasing interest in optimization, and not just execution among the customers and prospects that we speak with,” says Vikram Balasubramanian, MercuryGate’s senior vice president of product strategy. “The main drivers include the high level of TMS adoption among companies and the fact that people are moving away from Excel spreadsheets and over to more sophisticated systems. Given that they already have some degree of execution in place, this sets the stage for companies to be looking at optimization as an option.”
**LynnCo: Putting Optimization to Work**

At LynnCo Supply Chain Solutions, Inc., helping clients improve their own supply chain performance is an ongoing mission. Based in Tulsa, Okla., the 3PL serves a diverse customer base that’s focused on gaining operational efficiency and reducing costs. To assist clients in achieving these and other business objectives, LynnCo leverages MercuryGate TMS and Mojo, a key technology capable of reducing transportation costs through route optimization and freight consolidation.

“We have found MercuryGate’s TMS and Mojo to be real-world tools that can be applied; not just something to measure potential savings in a theoretical sense,” says Scott Anderson, director of engineering and technology at LynnCo. MercuryGate’s configurability has also proven to be an advantage for LynnCo, facilitating the on-boarding of new customers and allowing the 3PL to quickly adapt to their specifications and work flow.

LynnCo has traditionally secured outbound capacity for customers using both less-than-truckload (LTL) and truckload (TL) carriers. The company now takes this process one step farther, using Mojo to determine opportunities to consolidate LTL shipments onto existing truckloads.

These changes result in lower overall transportation costs and streamline customer operations by having fewer carriers at their docks to pick up freight. “Mojo consistently enables us to save between 10% and 15% in transportation costs,” says Anderson.

All shipment orders arrive from customers electronically into MercuryGate TMS. Pending shipments are fed automatically into the Mojo optimization tool, which is pre-configured for each customer. When the optimization is complete, new shipments are sent back to the MercuryGate TMS for tendering to third party carriers.

Mojo also enables LynnCo to easily identify and report cost savings, a major benefit for customers and a competitive differentiator for LynnCo in the 3PL market. “We’ve fully automated the process and have shipments being created automatically within MercuryGate TMS using system integration,” adds Anderson. “Customers love that efficiency. They send the shipments to us and they all get optimized with no touch.”

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With companies like MercuryGate providing next-generation, cloud-based optimization solutions, the cost-related barriers to entry are fading. By leveraging cloud-based logistics networks to reduce onboarding and integration with transportation partners, for example, companies see the ROI from transportation much faster—and with much lower upfront investment and risk.

By allowing carriers, suppliers, freight forwarders and 3PLs to collaborate in a multi-enterprise, connected process, cloud-based platforms support a well-orchestrated, integrated optimization process. “That makes the value proposition for optimization very attractive,” says Balasubramanian.

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MAKING THE CASE
FOR TRANSPORTATION OPTIMIZATION

According to Gonzalez, optimization can be deployed in a wide range of scenarios. It can be used during the procurement process to make sourcing decisions, during the actual planning process when you’re identifying capacity requirements, and during the execution process when you’re building actual loads. Last but not least, it can also be used in strategic network design when making decisions like adding pooling points to reduce network costs.

A shipper, for instance, can use optimization tools to simulate transportation spend using carrier quotes and rate information to evaluate carrier bids. The typical contract is fairly complex, so simulation using a model will help companies arrive at true costs by lane. “Purely eyeballing contract proposals to determine pricing can be complex,” says Balasubramanian.

From a planning perspective, optimization can be used to identify future capacity requirements—similar to material requirements planning (MRP) in an unconstrained environment—and run “what if” simulations for fuel costs, changes in the transposition environment, and possible shifts in allocation between private fleets and common carriers.

“When shipments are ready to be fulfilled and executed,” Balasubramanian explains, “optimization can be used to generate/build loads that are optimized based on similar principles and constraints deployed during the planning and sourcing stage.”

As one of the largest providers of integrated cold storage, transportation, and logistics solutions, Voorhees, N.J.-based United States Cold Storage (USCS) integrated Mojo Transportation Optimization with its proprietary TMS to improve the load-planning process and give users total control and visibility.

The company consolidates shipments, primarily frozen food items, from multiple vendors to create truckloads going to common destinations and consignees. Approximately half of its 34 warehouses serve as regional distribution centers for a nationwide multi-vendor consolidation (MVC) program, a fundamental element of USCS’s integrated operations and value proposition.

THE ULTIMATE GOAL of any transportation optimization system is to take the empty miles out of the supply chain. It’s about gaining efficiency, making sure routes are optimal, reducing carbon footprints, and saving money. When more trucks are going down the road filled and en route to the right locations and at the right time, everyone wins.

As transportation models continue to mature—and as companies learn to grapple with the demands of omni-channel, e-commerce, and whatever may be coming around the next corner—transportation optimization will continue to play a critical role in the smooth, streamlined orchestration of the supply chain.

“Right now, all signs point to a transportation landscape that’s only going to become more complex in the years ahead,” says Gonzalez. “Consumers are raising the bar, cost pressures are growing, and—in answer to these demands—companies are moving from traditional, rules-based transportation to using transportation networks that are truly optimized.”

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WITH TRANSPORTATION OPTIMIZATION, Everyone Wins

USCS puts Mojo to work to optimize the consolidation and transportation of hundreds of temperature-sensitive shipments each day.

USCS delivers more than 50,000 loads a year through its nationwide multi-vendor consolidation (MVC) program.

Mojo provides optimized consolidation of shipments that fall within the company’s 72-hour planning period.

The platform is able to optimize, and re-optimize, between 400 and 500 orders at a time in less than one minute.

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Aggregating multiple shipments potentially across clients: example LTL to TL

Build multi stop route with multi pick/multi drop

Consolidate individual packages to TL/LTL and send to distribution/sorting facility closer to destination

Optimal selection of warehouse/cross docks to leverage consolidation and deconsolidation

Stringing loads together, so that the carrier can better utilize a particular truck or asset

Reduce empty miles and increase asset utilization

WHAT STRATEGIES MAKES SENSE FOR YOUR SHIPMENTS TO BE OPTIMIZED

Smarter | Stronger | Faster | Better

- **Consolidation**

- **Multi-point optimization**

- **Zone skipping**

- **Pooling**

- **Continuous moves**

- **Backhauls**

With a need to reduce carrier expense as a percentage of revenue as well as the number of trucks needed for daily operations, USCS selected Mojo to optimize the consolidation and transportation of hundreds of temperature-sensitive shipments each day. Shipment and rating data is transmitted to Mojo, which creates consolidated loads, sending data back to the USCS TMS.

USCS users still maintain complete control of the process by reviewing the plan output and making minor modifications as required. Loads are then tendered to carriers based on the consolidated solution developed by Mojo and reviewed by USCS.

For outbound freight consolidation, USCS uses Mojo to consolidate LTL freight into high cube shipments at cost effective rates. The company is also able to coordinate order movement through utilization of well-defined sailing schedules as well as leveraging a “cluster” arrangement of facilities in strategic geographic areas for freight consolidation.

USCS delivers more than 50,000 loads a year through its MVC program. Each day, Mojo provides optimized consolidation of shipments that fall within the company’s 72-hour planning period. The platform is able to optimize, and re-optimize, between 400 and 500 orders at a time in less than one minute, according to Andrew Pavlicin, continuous improvement analyst at USCS. “Mojo is remarkably fast,” he says.

Pavlicin exports data from Mojo to a spreadsheet for further analysis to proactively address any missing information on the front end, such as consignee address, delivery windows, or other shipping requirements. This extra step is made easy by Mojo, and has enabled USCS to improve overall performance by preventing service issues before they occur. “It separates the data into everything you need to manipulate however you want,” Pavlicin said.

The tool also provides valuable information to support the bid procurement process, and compares motor carrier rates to determine which carriers are the best for each lane. With six active users, USCS also realizes significant cost savings because Mojo does not require individual user license fees for its software as a service model. In addition to cost savings, USCS also saves time by using Mojo and having an automated planning process. “The software clearly makes users more efficient,” adds Pavlicin.
WHEN ASSESSING THE BUSINESS CASE for transportation optimization, Gonzalez says companies can start with the associated cost savings, which is usually at the top of the list. In most cases, the cost savings can be achieved by consolidating disparate, less-than-truckload (LTL) shipments into truckload (TL) shipments.

However, optimization goes much farther than that by playing a role in the broader transportation lifecycle. Before bids are even sent to preferred carriers, for example, a transportation optimization system is working to better understand the network itself, by running different scenarios, and—once the bids come back—effectively analyzing those bids.

Knowing that most shippers, 3PLs and consultants are already being pushed to “do more with less” across all of their responsibilities, MercuryGate has developed a transportation optimization solution that is literally for the masses. Inputting data, for example, requires a skillset that any high school graduate already has. No advanced degrees needed, and no exceptional math or analytical skills required.

So even though optimization uses complex algorithms and mathematical programming to analyze large batches of shipments—and then create multiple truckloads that represent best possible cost scenarios—that doesn’t mean users have to be mathematicians to be able to leverage these systems.

“The platform’s wizard prompts you with all of the key transportation constraints—weight, cube, quantity, temperature requirements and loading priority—that everyone encounters when they’ve moving freight,” says John Martin, MercuryGate’s Director of Sales Engineering for MercuryGate International. “All you have to do is pick fields from a drop-down dialogue based on the spreadsheets you’ve already loaded onto the platform.”

BENEFITS FOR SHIPPERS:

THE COMPANY THAT SHIPS a truckload a week to the one that manages dozens—or more—every day can both benefit from transportation optimization. By analyzing shipments, rates, and constraints to produce realistic load plans, transportation optimization helps to reduce a shipper’s overall freight spend while helping the company achieve other efficiencies and savings.

Using optimization, shippers can look at their freight movement from a holistic perspective. This, in turn, enables cost cutting and improved decision making. In general, companies are saving anywhere from 1% to 30% in transportation costs thanks to optimization, but the actual number really depends on how their businesses are set up.

Along with optimization comes efficiency, the opportunity to implement automated processes, and even reduce the amount of human resources needed to orchestrate the transportation process. These individuals can be allocated to more important, value added activities. Optimization can also be used to aid in decision support for procurement cycles (i.e., what-if simulations can be leveraged to simulate carrier proposals with historical shipments to provide least-cost carrier selection across the distribution network).
BENEFITS FOR 3PLS:
TODAY’S 3PL has to be everything to everyone, but very few have the resources and discipline to be able to meet this extremely high and growing demand. Because they can’t feasibly focus on one specific capability or business area, 3PLs need powerful tools to be able to efficiently and effectively serve their broad customer bases.

Using transportation optimization, 3PLs can focus on their core businesses and let their software platforms optimize loads across business units, locations, and customers globally, and determine the best carrier and mode (ground, parcel, air, ocean, rail, or intermodal). Third-party providers can also simultaneously optimize inbound and outbound loads while looking for backhauls, optimize transportation equipment based upon schedules (i.e. ocean moves), and create multiple alternative transportation plans using real-world parameters.

By optimizing freight across their networks, 3PLs can more efficiently coordinate activities across multiple customers via cross-client consolidation), save money for both the 3PL and for its customer, increase revenues, and distribute resources and expenses more evenly across their various client bases. Third-party logistics firms can also use optimization as a sales tool to differentiate themselves in the marketplace with cost saving opportunities. Finally, optimization can also help in providing decision support during procurement bids.

BENEFITS FOR ASSET-BASED COMPANIES:
OPTIMIZATION SOFTWARE provides decision support regarding when to use your own fleet versus common carriers. With a private fleet, your objective is capacity utilization and minimizing total distance, taking into account fuel costs and other variables. With carriers, the goal is to utilize the lowest rate by lane—and taking into account all cost categories.

New solutions like Mojo take into consideration private fleet and common carriers, and then optimize based on objectives of meeting delivery commitments—and at the same time minimizing cost. “If you look at the current trends like driver shortages and possible capacity constraints,” says Balasubramanian, “it’s easy to see how leveraging technology to identify lane assignments and determining when to use your own fleet versus common carriers can produce valuable and immediate benefits.”

Knowing that most shippers, 3PLs and consultants are already being pushed to “do more with less” across all of their responsibilities, MercuryGate has developed a transportation optimization solution that is literally for the masses.

BENEFITS FOR TRANSPORTATION CONSULTANTS:
TASKED WITH PLANNING, directing, and/or coordinating the transportation operations either within an organization, for another organization, or via a third-party provider arrangement, transportation consultants have a lot on their plates right now.

Focused on finding solutions to their client’s most pressing transportation issues, consultants are increasingly turning to transportation optimization as a way to gain greater value through supply chain management, streamline operations, and save money. By running a variety of scenarios through an optimization solution, for example, they can make the best possible recommendations without having to do all of the math and analytics manually.

Like shippers and 3PLs, consultants rely on transportation optimization tools to help them take a more holistic view of the transportation component of the supply chain. This, in turn, helps them minimize freight spend, achieve ROI, gain efficiencies, implement automation, reallocate human resources (to more important tasks), and improve customer service.
MAKING THE CASE
FOR TRANSPORTATION OPTIMIZATION

The Case for Transportation Optimization: Closing Arguments

FOR SHIPPERS

FOR SHIPPERS, a transportation optimization system enables a holistic view of the transportation network and minimizes freight spend. The estimated return on investment (ROI) for a transportation optimization implementation is typically 4% to 8% of total freight cost. This ROI increases to 6% to 12% of total freight cost when users across divisions (or companies) combine shipments, thereby developing routes that are mutually beneficial.

In addition, ROI comes in the form of improved efficiency, fewer human resources, and fewer resources directly allocated to the transportation planning process. With transportation optimization, shippers can consolidate shipments and create multi-stop truckload moves as well as construct and utilize transportation pools and mode skipping.

Shipment consolidation from single origins (or to single destinations) provides ROI, but when this is combined with the ability to optimize routes, that ROI can be substantially higher. Ultimately, it’s the combined ability to route freight to and from multiple facilities—and also incorporate the use of pooling and cross docking—that helps shippers develop a truly cost effective supply chain.

FOR 3PLS

FOR 3PLS, the true ROI in transportation optimization lies in the ability to consolidate across multiple customers using strategies like cross-client consolidation. If, for example, a 3PL is handling multi-stop shipments via two different LTL orders—and if it can combine them into one TL shipment—then it can improve profits without impacting service.

FOR TRANSPORTATION CONSULTANTS

FOR TRANSPORTATION CONSULTANTS called upon to help streamline the supply chain and make it more efficient, using transportation optimization means being able to run numerous scenarios and determine the best possible approaches for their clients. From there, consultants can help their clients take a more holistic view of the transportation component of their businesses, minimize freight spend, achieve ROI, gain efficiencies, implement automation, reallocate human resources (to more important tasks), and improve customer service.

Q&A WITH MERCURYGATE’S MONICA WOODEN

Q: Why should shippers, 3PLs, and transportation consultants be thinking about transportation optimization?
A: The more trucks that are going down the road full, the more filled containers that you’re moving, or the more full private or contracted fleets that are moving, the better. These filled vehicles or containers represent the best possible cost scenarios and are also very good for the environment. These are the principles that transportation optimization focuses on, and they solve some very important issues for today’s shippers.

Q: Has transportation optimization become more critical in recent years?
A: As the use of optimization has grown, we’ve seen more companies upping the models of their transportation systems. Other firms are using transportation planning, but not really maximizing the execution side of the equation. They put together nice plans, but those plans never come full circle and truly execute in a way that optimizes transportation.

Q: What changes do companies have to make when they’re moving to an optimized transportation scenario?
A: For optimization to be most effective, you have to be able to change your processes a bit and “go up” a layer to gain more access to information. For example, if you have two business units with multiple locations that are servicing the same customers, you have to be able to plan effectively across those locations. Achieving this goal requires centralization, a good view across both business units, and probably some change management.

Q: What benefits do companies see when they optimize transportation?
A: There are many different benefits that come from transportation optimization, including ROI that ranges from 1% to 30%, depending on the firm’s current setup. A company that uses a combination of partial-truckload and less-than-truckload with few distribution points/manufacturing plans, for example, will see very big wins from their optimization efforts.