Create Efficient Multi-Stop Vehicle Routes and Maximize Asset Utilization

LLamasoft® Transportation Guru® enables analysts to model entire supply chain networks, incorporating alternate transportation options and key variables such as cost, time, capacity and delivery parameters.

Use Transportation Guru to:
• Challenge legacy transportation networks
• Determine lowest overall landed cost
• Identify optimal mode mix
• Measure all constraints for most efficient routings
• Identify efficient multi-stop vehicle routes while optimizing fleet size
• Create multi-stop routes that include pickups and deliveries interleaved throughout route to minimize costs
• Identify efficient schedules while balancing shipments across time periods

Transportation Guru includes four new route optimization algorithms, each created to meet a unique market requirement.

1. Continuous Moves Interleaved Shipments

Transportation Guru’s continuous moves interleaved shipments algorithm enables planners to schedule interleaved pick-ups and drop-offs within cohesive routes, while considering right-sizing the fleet and mode selection. Therefore, Transportation Guru now has the ability to identify if a shipment should be fulfilled via multi-stop route or via direct shipment (LTL, Parcel, etc.) with the Mode Selection technology, and if the shipment will be fulfilled via multi-stop routing, the algorithm will determine which asset it should ship with. This reduces the overall transportation system cost by right-sizing the fleet, determining optimal interleaved multi-stop routes, and considering direct shipment costs.

How can continuous moves interleaved shipments be used?
• Retailers can create routes that move product between stores
• Warehouses can transition inventory to other facilities with inter-facility routes
• New product and returns can be considered on one route
• 3PLs can consider delivery and pickup requests during a single route

“Not only does Transportation Guru integrate network optimization and vehicle route optimization, but it will also simplify our data input and output analysis, enabling us to quickly identify opportunities for freight savings in our supply chain.”
- David Raymond, Vice President of Operations Transformation, Wayfair
2. Fleet Optimization

In Transportation Guru’s fleet optimization algorithm, asset costs are considered in the objective function in order to create multi-stop routes with the right fleet mix. This balances optimizing fleet size while identifying efficient multi-stop vehicle routes, maximizing utilization. Because costs are part of the objective function, the fleet optimization algorithm has the ability to determine the fleet mix by identifying which shipments should be fulfilled by which asset.

How can fleet optimization be used?

- Determine optimal private fleet size
- Utilize optimization parameter to identify how many assets are needed to run optimal routes
- Minimize private fleet and 3PL carrier assets
- Consider which carriers to use in addition to private fleet
- Identify optimal asset mix within fleet

3. Continuous Moves Backhaul Optimization

The backhaul technology in Transportation Guru identifies the most efficient inbound pick-ups based on the last stop of the outbound route in order to minimize the overall route cost by minimizing the time and distance trucks are driven empty. The technology utilizes deliveries and pick-ups input into the software to minimize overall route cost by optimizing both outbound and inbound routes. This is done by opportunistically identifying inbound routes which take full advantage of pick-ups on the return trip to the DC.
How can backhaul optimization be used?

- 3PL or carriers can make deliveries and then fulfill pick-up requests on the way back
- Direct store delivery (DSD) trucks can pick up empties or expired goods following store deliveries
- Retailers can pick-up returns from stores following deliveries and bring them back to the DC
- Following deliveries to retail stores, trucks can pick up materials from suppliers and bring to warehouse

4. Periodic Shipment Balancing and Scheduling

The periodic VRP (PVRP) creates routes using daily shipment data to balance and schedule deliveries/pickups across a time period. This enables planners to determine the frequency and schedule for multi-stop vehicle routes to minimize costs while adhering to scheduling requirements.

How can periodic VRP be used?

- Identify frequency of deliveries or pick-ups balancing contract requirements and transportation costs
- Determine delivery or pickup schedule for all locations while considering transportation system constraints
- Balance shipment schedule throughout the week

"With LLamasoft Transportation Guru’s continuous moves technology, we are able to leverage backhaul optimization to gain exceptional insight into how to take advantage of route return trips to reduce overall distance, time and number of routes necessary. We can now demonstrate to clients how optimizing both outbound and in-bound routes can result in significant overall route cost reduction."

– Edward Sands, Global Practice Leader – Logistics, Procurian