

## Customer Challenges

- Fleet size required for on-time deliveries
- International shipping network capabilities
- Equipment requirements
- Inventory buffers

## PROJECT SUMMARY

This study identified the fleet sizes of trailers necessary to achieve 100% on-time delivery service of door panels and seats in the sphere of an International shipping network. From this study, a major automotive manufacturer was able to show the productivity gain of providing a "Switcher" cab at the plants and was able to influence its purchase.

## SYSTEM DESCRIPTION

The shipping network consists of a substrate manufacturing plant (USA), a trim plant (MEX), an assembly plant (CAN), three trailer truck queuing points (USA) and four border crossing points. A combination of trucking and railroad transportation is used to haul two fleets of trailers (1 fleet for seats and 1 fleet for door panels), totaling more than 300 trailers, and 20,000 dedicated shipping containers. This network utilized a combined push system & JIT pull system for flow control.

System requirements were determined for the 1991 calendar year, taking into consideration statutory holidays and production shutdown periods for the USA, CAN and MEX. These system parameters were also considered:

- Operating hours of each plant, customs and the railroad
- Resource constraints such as tractors, trailers and shipping/receiving dock.
- Operating procedures including a combination of pull and push shipping flow logic.
- Unscheduled interruptions including effects of damaged trailers and containers, delays at the borders, variability in the railroad schedules, etc.

## OPPORTUNITY

The client wanted to identify equipment requirements, size of inventory buffers for staging trailers. They also wanted to evaluate delivery service capabilities of the new shipping system prior to launch. An accurate determination of trailer fleet size for transporting seats was especially critical as these are custom built and very expensive.

## APPROACH

The objectives of the project were:

- Determine the fleet size of trailers and shipping containers
- Evaluate inventory buffer sizes for staging trailers at each of the plants and rail yards.
- Determine the productivity gain by providing "Switcher" cabs

## Case Study: Material Flow Analysis of Fleet Size for Deliveries

### SOLUTION

The study showed that original estimate of trailer fleet size used for shipping door panels was inadequate to achieve 100% shipping volumes. Trailer fleet size should be increased by 25% to avoid shutting down an assembly plant and the Trim plant. The analysis identified an 18% reduction in container fleet size. The simulation showed that providing a "Switcher" cab at one plant could increase productivity. The study also established the yard space necessary to accommodate trailers temporarily staged at each of the plants and their respective queuing points.

### BENEFIT

As a result of these two studies, a major automotive company found that they could reduce their container fleet size by 18% without compromising their delivery service or handling needs. The client identified an \$800,000 capital cost avoidance in the Door Panel Shipping System and \$1,200,000 capital cost avoidance at the Seat Shipping System. The overall simulation costs were \$22,000 and \$12,250 respectively.

