



## Consultants in Material Handling Logistics

Operations Design for Warehousing, Manufacturing and Distribution

### **SIMULATION MODEL - FOOTWEAR AND ACCESSORIES RETAILER/DISTRIBUTOR**

#### **CLIENT:**

A national retailer of footwear and accessories needed to service 4,700 retail locations. About 75% of the inbound volume was cross docked with the balance placed into storage for store replenishment. One third of the outbound volume was re-packed cases.

#### **DESCRIPTION OF OPERATION:**

The client needed to expand the capacity of its largest DC to satisfy a requirement to receive and ship a combined total of about 100,000 cases per shift through a highly mechanized receiving and shipping sortation system.

#### **OBJECTIVE:**

The client needed to know if their selected vendor's design to upgrade the existing mechanized system and integrate it with a new system going into a very large building addition would consistently meet the projected design volume and order profile requirements. Gross & Associates was commissioned to develop a simulation model of the vendor proposed operations design to identify any design flaws or system bottlenecks. Included in the objective was to determine how to best schedule/sequence both inbound and outbound to maximize throughput and productivity.

#### **CONSULTING SCOPE OF WORK:**

The simulation model had to include the entire handling system: movement of containers into the inbound doors, automated carton identification label application via print and apply machines, putaway of the portion of the receipts destined for inventory, full case induction, mechanized piece pick and packing, palletizing and loading (both cases and pallets), and movement of trailers away from the outbound doors. Additionally, the model had to account for: downtime allowances for various components of the mechanized system, balancing between the original and new building systems, variations in the mix of full case vs. repack, and seasonal changes in the percentages of inbound going to reserve storage. The model was designed to test how long critical components of the system could be down before the throughput for various downstream functions and then for entire system stopped.

#### **RESULTS:**

The client built the facility addition bringing the facility size up to about 530,000 sq. ft. with the original portion of the building being 42 ft, high and the addition being 52 ft. high. The handling system satisfied or exceeded the design parameters determined by the simulation.