

# Simulation Reveals False Conclusions of Distribution Center Program for Home Improvement Retailer

National Home Improvement store

Success Story

Retail

ProModel



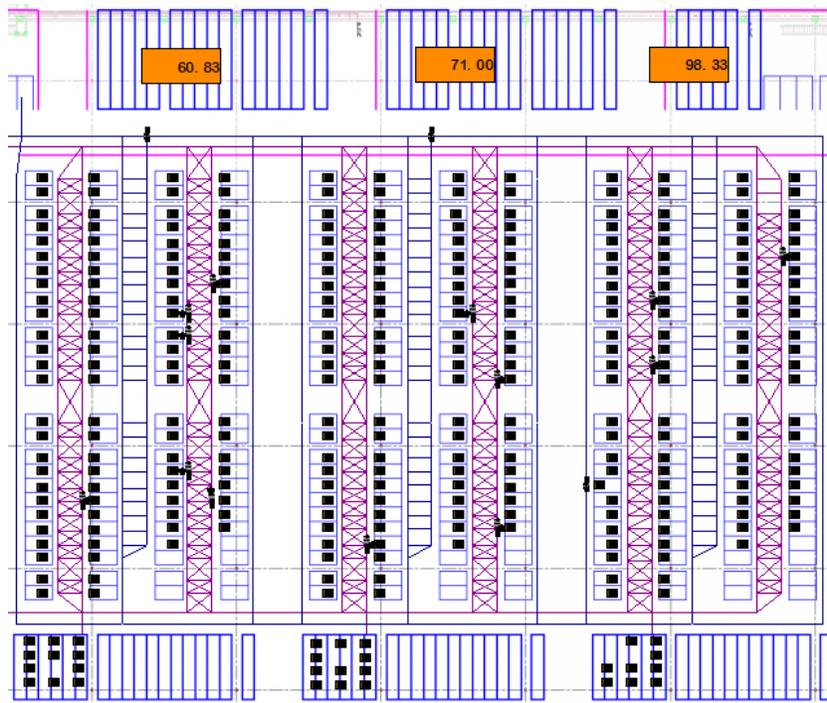
## CHALLENGES

A large national home improvement retailer was experiencing rapid growth and investing in the development of its own supply chain system of distribution centers. In order to increase efficiency and control costs, the retailer was constantly seeking ways to improve its distribution center operations.

Studies completed by the retailer had already shown that the put-to-store area (PTS) was a critical bottleneck in their distribution centers. To remedy this, a proposed PTS layout was being piloted at one of its distribution center locations. However, before finalizing the decision to incorporate this new layout in all 26 worldwide distribution centers, the retailer enlisted ProModel to build a model of the pilot program and validate its performance.

## OBJECTIVES

The primary goal of this project was to validate the implications of the pilot put-to-store program.

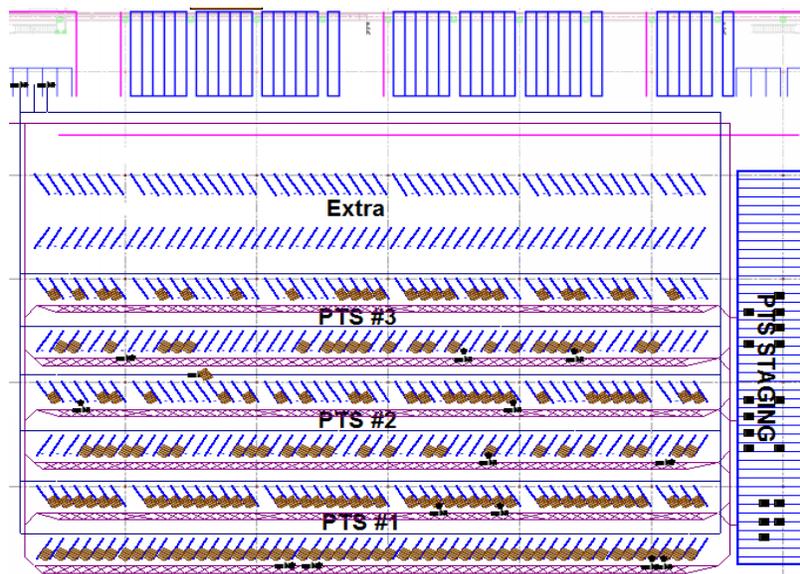


Original Layout

## SOLUTION

At the put-to-store (PTS) area, where pallets of non-conveyable product are sorted by the store they will ship to, cartons are retrieved by forklift from the staging area and taken to multiple store drop-off points. Forklift operators remove the cartons for a particular store and load them onto an outbound pallet. When full, they signal for it to be picked up by forklift and taken to shipping. The area is divided into multiple zones with up to six forklifts dedicated to each zone. Performance is measured by the rate of cartons per hour per driver or CPH. Congestion and safety are a concern because multiple forklifts unload cartons going to the same store and pallets are staged on both sides of each aisle. Maneuvering forklifts is a challenge.

One DC was selected to try the new layout. They created aisles where outbound pallets were positioned on only one side, allowing for a passing lane on the opposite side. Each single aisle became twice the length of the aisles in the original layout. The pallets were also angled to conserve aisle space and to make them easier to pick up and take away to the outbound queue. The proposed layout reduced the floor space of the PTS area by roughly 25%. Preliminary results were promising and CPH jumped by 17%.



**Proposed Layout**

Since this proposed layout would cost over \$1 million, ProModel was tasked to develop a model to test the merits of the new layout. Several simulation experiments were conducted and as a result they discovered that instead of improving CPH by 17%, the proposed layout would reduce CPH by 3.4%. Key consequences of reduced throughput were an increase in labor expenses for the same volume, and an increase in cycle time. The Hawthorne effect was largely responsible for the difference in results. In the pilot system, workers were conscious of being under the microscope and therefore either deliberately or unconsciously improved their performance. Management and engineering teams were similarly under pressure to achieve positive results. However, the simulation was completely unbiased and used the same assumptions regarding forklift travel speeds, put and pick times, and operator work methods across both scenarios.

## VALUE PROVIDED

In the end, the existing system proved to be more efficient because the frequency and duration of forklift blockages were far less substantial than the increased travel distances required by the pilot layout that was developed to reduce forklift congestion.

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