

CASE STUDY

Warehouse Location Optimization

Total Hockey

■ PROBLEM / CHALLENGE

Omnichannel sporting goods retailer needed to expand its warehouse beyond the original Midwestern warehouse location where the company was founded. This scope included ecommerce order fulfillment and store inventory replenishment. In addition, the warehouse locations had to support the CEO's goal of being 1 – 2 days away from a large portion the amateur hockey player market.

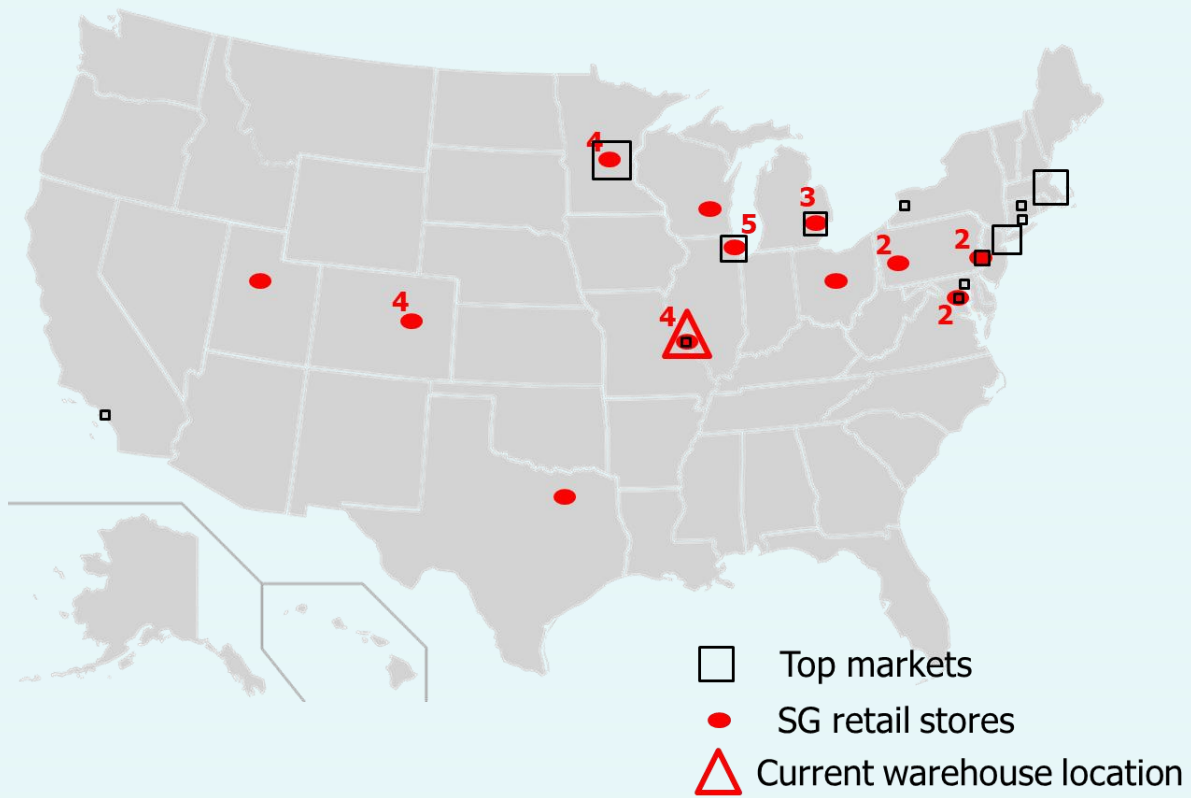
■ CUSTOM OPTIMIZATION MODEL

The needs of Total Hockey (TH) went beyond packaged network optimization software. The consideration of profit maximization and the affect on market share of being closer to major markets necessitated a custom model. This model was built in Excel Solver enabling ongoing use and adjustment by Total Hockey.

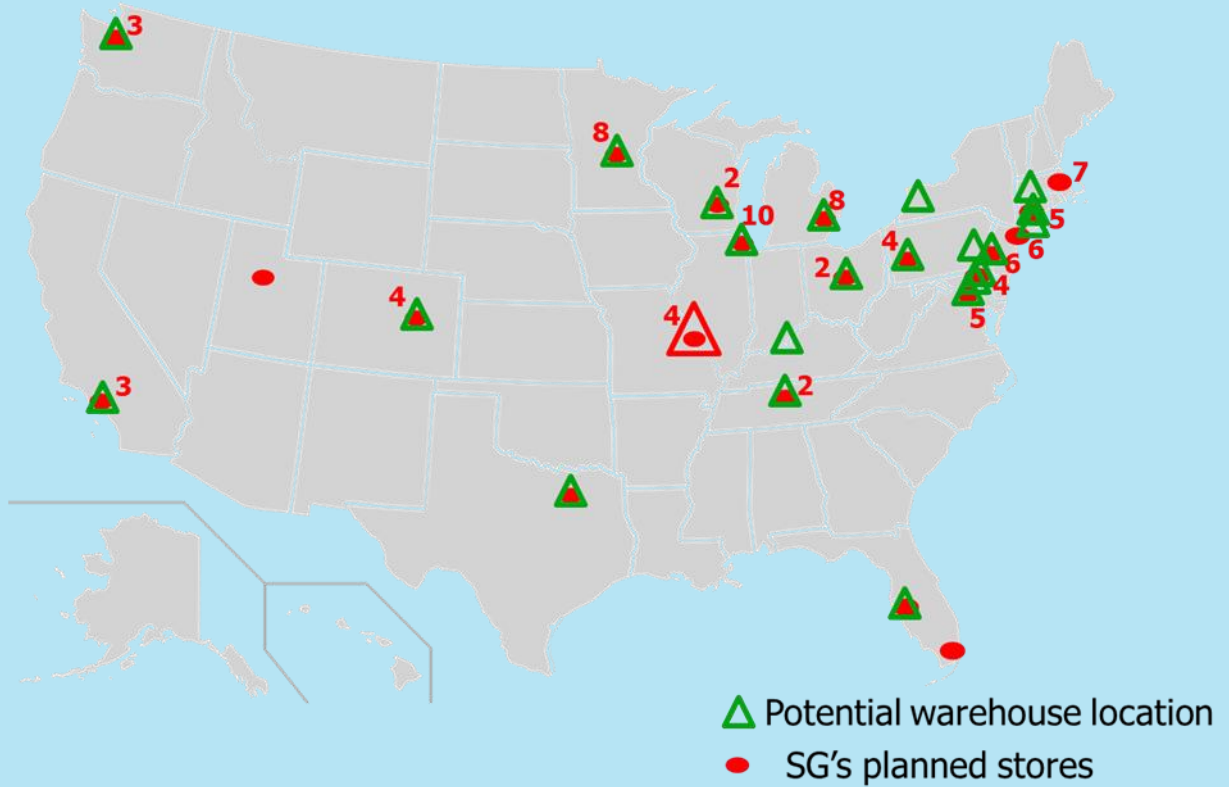
■ IMPLEMENTATION DETAILS

- **Formed Total Hockey (TH) Network Optimization Team**
 - Gathered data on market size, competitor store locations and flows of inventory to each consumer MSA and TH store.
 - Working with USA Hockey data and company loyalty program, created a market-share by delivery-time function to estimate demand by being:
 - 1, 2 and 3 days from major amateur hockey markets
- **Designed and programmed custom facility location optimization model to account for:**
 - Deliver distance based market share
 - Reverse cannibalization of ecommerce demand based on TH store locations
 - Competitor store market share
- **Ran sensitivity analyses to find robust locations**
 - Altered shipping costs, market share function and inventory costs
 - Found robust solutions that were optimal across multiple settings:
 - See top of page 3

Total Hockey - Current State Network

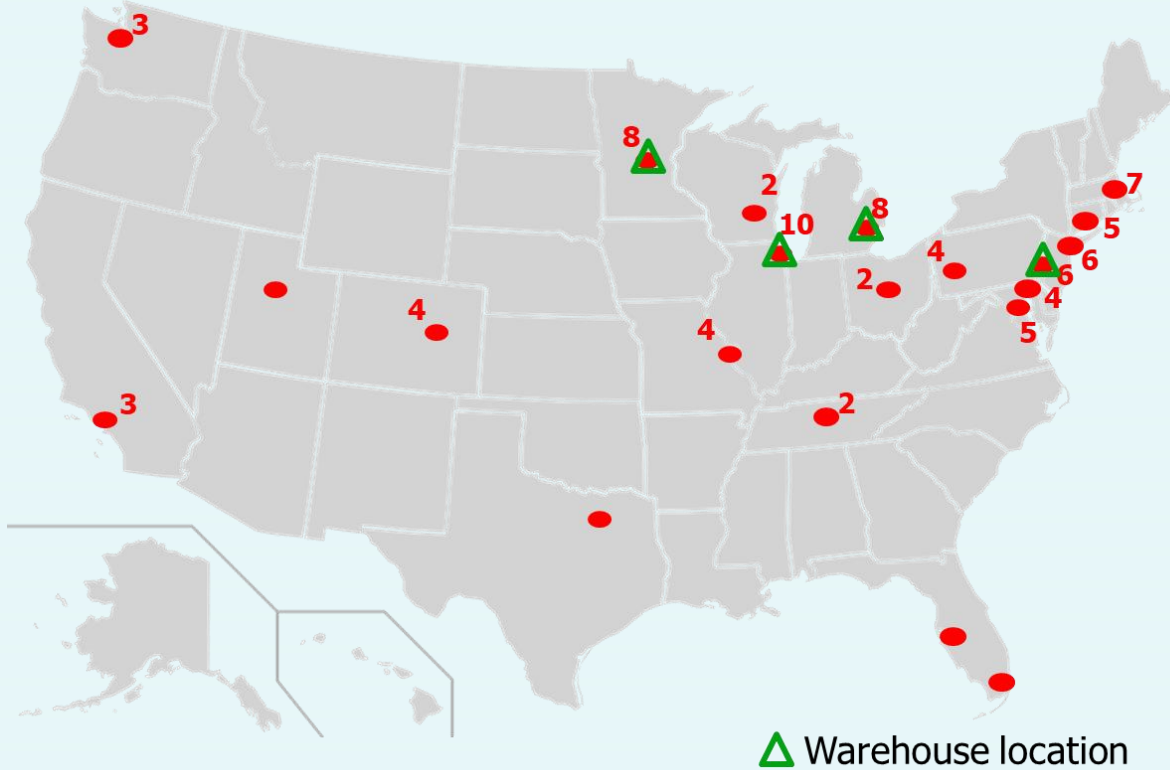


Potential Warehouse Sites



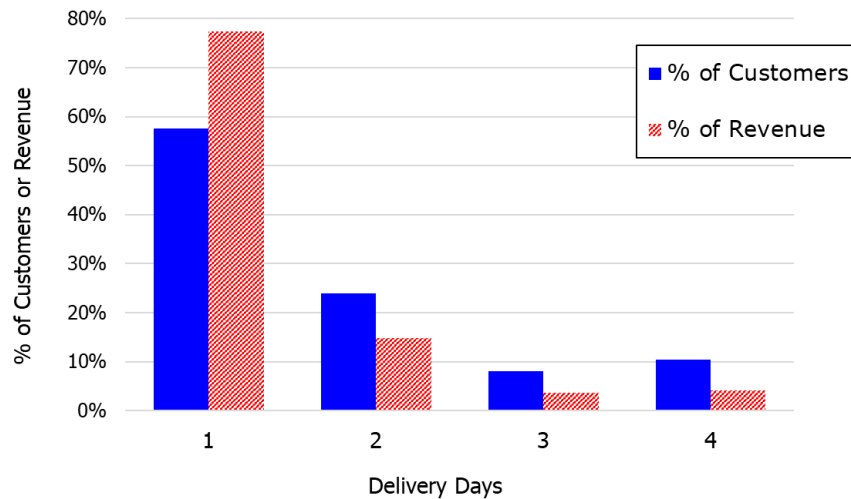
Reference: Rob Bowers, VP of Strategy
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Optimal Network Design



Strategic Impact

- Total Hockey was bought by Pure Hockey, a competitor with a large warehouse in the Northeast, eliminating the need for the new Philadelphia warehouse
- Total Hockey's Upper-Midwestern warehouse network was combined with Pure Hockey's Northeastern network
- Over 50% of hockey players are within 1 day delivery of the combined company's warehouses



Customer Testimonial

We partnered with Dr. Mitch Millstein to optimize warehouse locations that support both e-commerce and in-store inventory needs. This led to a new omni-channel warehousing and inventory plan that entirely redefined our approach to warehousing, inventory management, store distribution and fulfillment. The modeling efforts made us rethink our expansion strategy from needing a single new east-coast warehouse to a more complex distribution system with multiple warehouses as well as e-commerce fulfillment from retail stores. This work illuminated some options we had never considered, including the value of in-store inventories to support e-commerce sales. We reassigned MSAs to the new warehouses and leveraged in-store inventories to satisfy e-commerce demands. We have already seen an improvement of \$300,000 from both more efficient shipping strategies and better inventory management.

Rob Bowers, VP Strategy, Total Hockey