Warehouse Slotting Optimization: How Storage Type Analysis Improved Pick Efficiency and Saved Up to $450K

1 Introduction

A global medical technology manufacturer operating a high-volume distribution facility was experiencing growing pressure to improve warehouse productivity and space utilization as order volumes increased. The facility handled a complex SKU mix that included both batch-controlled and serial-controlled inventory, creating operational challenges within the picking process.

As growth continued, leadership recognized that the existing slotting strategy and storage configuration were no longer optimized for efficiency.

The organization partnered with Alpine Supply Chain Solutions to conduct a Storage Type Analysis (STA) and slotting optimization project to improve rack utilization, streamline picking workflows, and reduce labor costs associated with inefficient travel throughout the warehouse.

2 Challenges

The warehouse was experiencing several operational inefficiencies related to storage utilization and picking workflows. Many batch-controlled SKUs were slotted throughout the building without a consistent structure, allowing them to be stored at any level within a rack bay. Because pickers often had to locate specific batches for an order, this approach sometimes required traveling across large portions of the warehouse to complete a single pick sequence.

Additionally, some batch-controlled SKUs had dedicated forward pick locations while many others did not, leading to inconsistent replenishment practices and inefficient labor usage. Serial-controlled items were also required to be stored in pick locations, adding further complexity to slotting decisions. As product demand and order volumes increased, the organization needed a new slotting strategy that could improve pick efficiency, reduce travel distance, and better utilize rack locations across the facility.

3 Solutions

Alpine began the engagement by conducting a Storage Type Analysis to determine the ideal mix of rack types and storage configurations required to support the facility's inventory profile. Based on this analysis, Alpine then partnered with the client team to develop a structured slotting strategy designed to improve pick efficiency while supporting both batch-controlled and serial-controlled SKUs. The optimized slotting strategy introduced several key operational rules.

Each pick location would contain only one batch per SKU, ensuring pickers could work through inventory sequentially. Up to 10 serial units of the same SKU could be stored within a single location, while all serial-controlled SKUs were assigned dedicated forward pick locations. For batch-controlled items, two forward pick locations per SKU were established, allowing pickers to continue picking from one location while the other location was replenished.

4 Implementation

To determine the most effective approach, Alpine modeled six different slotting scenarios and conducted a cost-benefit analysis for each. The final strategy organized inventory based on heavy-to-light product characteristics, branch plant groupings, and fastest-moving to slowest-moving SKUs, while maintaining operational constraints such as keeping long items in designated long-goods areas and prioritizing the lower rack levels before utilizing upper levels within the very narrow aisle environment.

Using the results from the Storage Type Analysis, the client adjusted rack elevations across 10 warehouse aisles to improve overall storage utilization. The warehouse team then executed the slotting changes during third-shift operations to minimize disruption to daily fulfillment activities.

The implementation followed a structured approach. First, existing SKUs and location labels were removed aisle by aisle and temporarily relocated to available storage areas. Next, the warehouse team relabeled rack locations based on the optimized slotting plan provided by Alpine. Once locations were established, SKUs were moved into their new dedicated pick locations according to the slotting strategy. Finally, the warehouse management system was updated to reflect the new configuration, including location numbering, location dimensions, pick path sequencing, SKU-slot assignments, and updated minimum and maximum quantities—all of which were developed and provided by Alpine.

5 Results

The optimized slotting strategy is expected to significantly improve picking efficiency by reducing unnecessary travel and creating a more structured picking workflow. Based on projected improvements in picker productivity, the client expects to save between $300,000 and $600,000 annually in picking labor costs.

Although the new slotting strategy will require an estimated $150,000 in additional replenishment labor, the net impact is projected to generate annual savings between $150,000 and $450,000. By combining Storage Type Analysis with a structured slotting strategy, the organization now has a scalable warehouse layout and operational workflow capable of supporting continued growth while improving overall warehouse productivity.