CASE STUDY

EXPEDITORS CUSTOMS

# Optimizing a North America Forward Stocking Network

One of the world's largest oil and energy companies engaged the Expeditors Network Solutions team to help evaluate their North America distribution and logistics network. This engagement was prompted by the dramatic downturn in oil prices which had greatly compressed the company's profitability. The company's supply chain organization was identified as the target for cost reductions by the company's executive team with a goal of driving out cost by identifying efficiencies to be gained within their existing distribution footprint, logistics flows and inventory management processes.

The company had historically operated in a decentralized model where the seven individual business segments had designed, operated and made strategic decisions based solely on the strategies, materials and flows within their own segment. The network under scope was significant, accounting for 13 regional replenishments DCs, 75 forward stocking sites, 330 core suppliers and a material count encompassing more than 22,000 unique parts.

## OPPORTUNITY

The company's supply chain executives recognized that there were likely significant opportunities to improve their cost of goods sold by developing a comprehensive plan for the different business segments to be able to share facilities, supplier flows and materials across a few core areas. The purpose of this analysis was to identify if a more holistic approach would bring net gains to the company.

With these objectives in mind, the key business segment leaders sought to re-design their supply chain to not only improve the current operating costs but also, and perhaps more importantly, be better prepared to support and capitalize on future growth opportunities once oil prices returned to a more profitable level.

After initial discussions and evaluations, the project team identified some core improvement areas that would serve as the backbone for this transformation:

- Reduce enterprise transportation costs by combining logistics flows across sites and/or segments.
- Reduce enterprise overhead costs (facility leases and labor costs) by rationalizing current DC network by combining segments into shared facilities where geographically appropriate.
- Improve inventory and working capital through leveraging shared pools of inventory for materials that were shared either across segments or by pooling inventory within a segment to more central stocking points.
- Understand inventory safety stock levels against historical demand to identify future improvements that can be made for future planning efforts under the new model.
- Develop a replenishment program for downstream stocking locations that balances transportation cost and inventory investment against part level availability requirements.
- Improve business processes for the distribution and planning teams by developing a replenishment process aligned to the adjusted network and inventory strategy.

## OUR SOLUTION

After the initial scoping of the project, the team collected the data sets that would be needed to evaluate the network and quantify the opportunity across each improvement area. These data sets captured the end-to-end logistics flows, a summary of the costs for their network of facilities and current inventory policies.

Once all data elements were received, an initial baseline view was developed that summarized the current network from a physical footprint, logistics flow and inventory standpoint. This first review served as a "feasibility check" to make sure the network was properly represented before moving forward with the more laborious task of constructing a costed network model.

To support this review, the team developed a variety of analytics through an interactive visualization dashboard that provided a summary of the major flows to/from key entities, demand consumption patterns, potential cross segment synergies available and a summary of logistics flows from a mode and service level standpoint. Following this initial review, a collaborative workshop was developed where all key cross-functional stakeholders attended to discuss and refine the core business objectives and constraints by evaluating and testing against the existing network. This interactive session explored not only the as-is state but also the trade-offs and weighting of priorities that could be expected across different network configurations. Ultimately, the workshop allowed the project team to synthesize the discussion down to a core list of alternate scenarios to be modeled and evaluated for the next phase.

Following the workshop session a fully costed logistics model was constructed and subsequently validated with the customer to represent the existing network from a cost and lead time standpoint. The agreed list of alternate scenarios was then developed and reviewed during another interactive workshop where decisions were made regarding their future operating model and the current gaps that needed to be bridged to achieve this vision.

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## RESULTS

Through the analysis, the customer recognized that they would need to make significant changes to their existing DC network and operating model in order to realize the efficiency gains identified. By transforming their network design and operating model, the company was able to achieve the following:

- DC Rationalization - The customer was able to rationalize their DC network from thirteen to seven replenishment DCs that would handle the majority of the distribution operations and would be able to replenish their downstream operations on a consistent and predictable schedule based on the part service level requirements. While most of the small forward stocking hubs were maintained for the operations, the footprint of parts at each of these hubs was significantly reduced allowing for a massive reduction in operating costs. Figure 1 shows the modified network of seven replenishment DC's serving the forward stocking network.


- By combining and centralizing more of the DC operations, they were able to drive more efficiencies and ultimately were able to re-deploy previous labor resources to other areas of their business.
- The inventory optimization did not prove out to show as much savings as expected when pooling across business segments. Only a 2% reduction in safety stock was available through developing multi-business segment inventory pools for shared SKUs. This low savings was mostly due to the fact that many of the shared SKUs were high running, low value parts.Larger inventory savings, however, were available (as a percentage of total inventory value) within several individual segments by collapsing stocking locations and aggregating SKUs that were unique to a specific business segment. On average, the business units realized working capital reductions of 13%.
- Inventory optimization showed that $2.3 million in savings could be achieved by adjusting stocking levels to meet the targeted service levels. However, the optimization analysis also showed that there were certain areas where additional investments in inventory were needed to achieve the desired service levels that the business had identified.
- Ultimately, as a result of our engagement, their executive team was able to (1) better understand the inner working of their complex network and (2) develop strategies to improve it. More importantly, they were able to (3) develop a play book to align the business segments leaders to collectively achieve the critical objectives of the company's transformation that would prepare them for the future.

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