Network optimization for distribution centers

Private Equity Firm

Partnered with client to assess the current distribution network of the company and optimized the network by introducing new Distribution Centers (DCs) and increasing the capacity of existing DCs, thereby reducing the shipping expenses.

Private equity company needs network optimization for distribution centers

Picture this…

You're looking to help in assess the current distribution network of company and optimize the network either by introducing new Distribution Centers (DCs) or increasing the capacity of existing DCs, thereby reducing the shipping expenses. However, the shipments were not sent out from the nearest distribution center due to lack of relevant optimization techniques, leading to higher shipping expenses.

You turn to Accordion.

We partner with your team to assess the current distribution network of the company and optimized the network by introducing new distribution centers (DCS) and increasing the capacity of existing DCS, thereby reducing the shipping expenses, including:

1) Analyzing the current network and identified that a significant share (~85%) of the packages were shipped from higher FedEx zones (higher the FedEx zone, longer the shipping distance) i.e., were not being shipped from the nearest DC due to capacity or availability constraints, highlighting an opportunity to optimize the distribution network (based only on the outbound shipments)
2) Estimating the maximum savings in shipping spend that could be achieved if packages were shipped from nearest DCs
3) Identifying the list of locations for the DCs that would result in the lowest shipping spend at a package level and consolidating these locations at a company level to optimize the overall distribution network
4) Providing two approaches to optimize the network – 1) Designing a new distribution network not limiting to the existing network and identifying network of locations. 2) Optimizing the current network to ensure the packages were shipped from the nearest available DC

Your value is enhanced.

- You have estimated that the company could achieve potentially savings of 9% to 12% in the shipping spend, translating to annual savings of $3.5M to $4.5M, if they were to optimize the current distribution network
- Based on our analysis, the company decided to introduce new DCs to the existing network based on our recommendations which would potentially result in 9% to 12% savings on the shipping spend

NETWORK OPTIMIZATION FOR DISTRIBUTION CENTERS

KEY RESULT

- Achieve potentially savings of 9% to 12%
- Annual savings of $3.5M to $4.5M
- 9% to 12% savings on the shipping spend

VALUE LEVERS PULLED

- Network optimization analysis
- Small parcel shipping spend analysis

Network optimization for an automotive accessories brand

Network optimization for distribution centers

Situation

- The automotive accessories firm partners with FedEx to ship the packages to the customers. However, the shipments were not sent out from the nearest distribution center due to lack of relevant optimization techniques, leading to higher shipping expenses.
- Partnered with the client to help assess the current distribution network of company and optimize the network either by introducing new Distribution Centers (DCs) or increasing the capacity of existing DCs, thereby reducing the shipping expenses.

Accordion Value Add

- Analyzed the current network and identified that a significant share (~85%) of the packages were shipped from higher FedEx zones (higher the FedEx zone, longer the shipping distance) i.e., were not being shipped from the nearest DC due to capacity or availability constraints, highlighting an opportunity to optimize the distribution network (based only on the outbound shipments).
- Estimated the maximum savings in shipping spend that could be achieved if packages were shipped from nearest DCs.
- Identified the list of locations for the DCs that would result in the lowest shipping spend at a package level and consolidated these locations at a company level to optimize the overall distribution network.
- Provided two approaches to optimize the network – 1) Designing a new distribution network not limiting to the existing network and identified network of locations. 2) Optimizing the current network to ensure the packages were shipped from the nearest available DC

Impact

- Estimated that the company could achieve potentially savings of 9% to 12% in the shipping spend, translating to annual savings of $3.5M to $4.5M, if they were to optimize the current distribution network.
- Based on our analysis, The company decided to introduce new DCs to the existing network based on our recommendations which would potentially result in 9% to 12% savings on the shipping spend

Approach & methodology

Identifying optimal locations

- Identified the packages that were shipped to higher FedEx zones (greater than zone 3). Higher FedEx zones translates to longer shipping distance thereby leading to higher shipping expenses.
- Built an internal FedEx zone finder tool to identify the list of origin zip codes that would convert these high zoned packages to lower FedEx zones (i.e., zones 2 &3) with destination location fixed
- Used the maximum coverage strategy to identify the minimum number of DC locations that would convert all the packages to FedEx zones 2 & 3

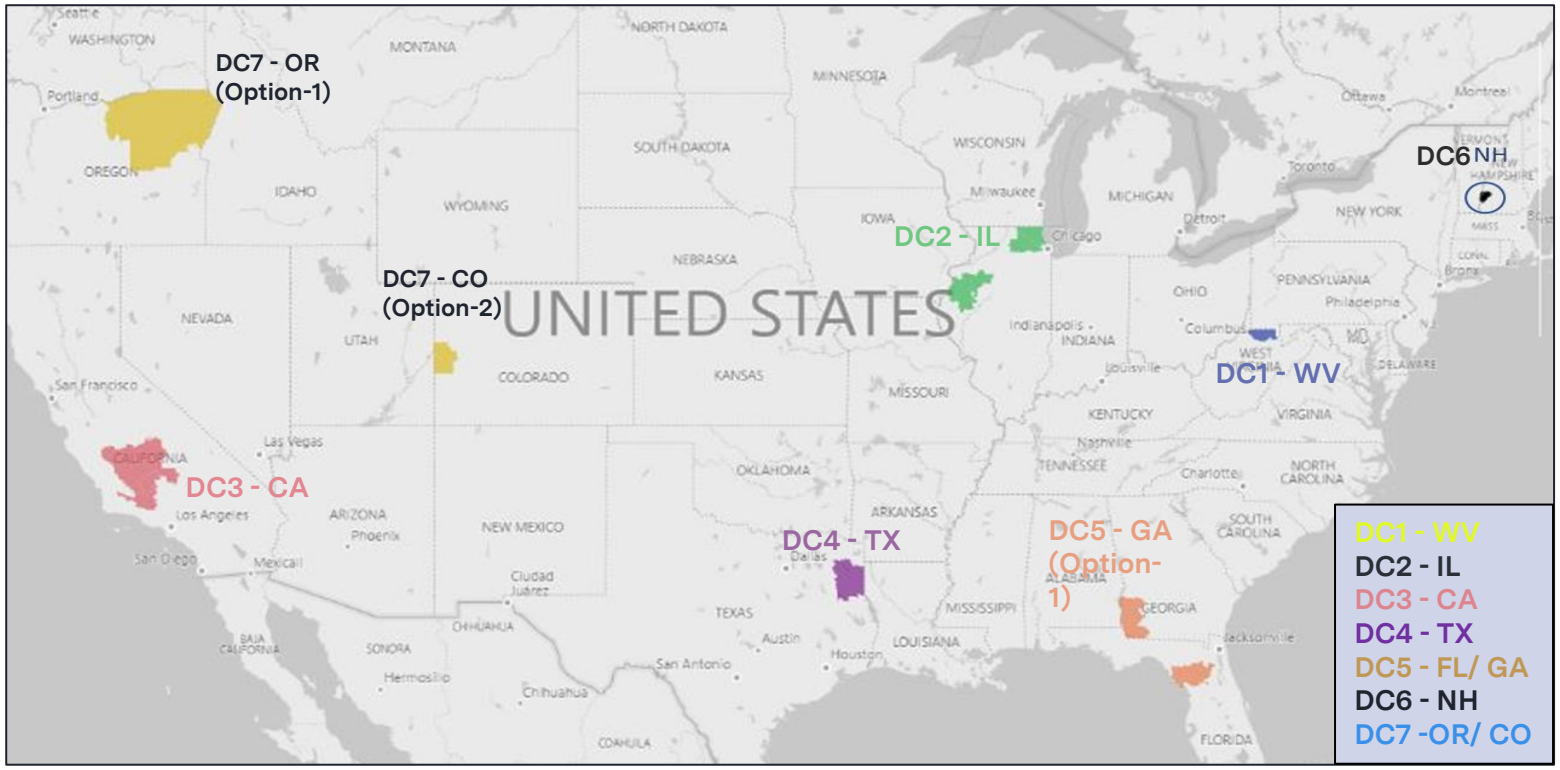
Shipping spend estimation

- Based on the results from the maximum coverage analysis, identified a list of 18 zip codes where introducing a new DC would convert all the shipments to either zone 2 or 3.
- Built a pricing model to estimate the FedEx shipping spend if the packages were to be shipped from a different origin location (different from the current DC) based on the FedEx contract.
- Estimated the FedEx shipping spend for different combinations of the 18 identified locations that would result in the lowest shipping spend.

Optimized distribution network

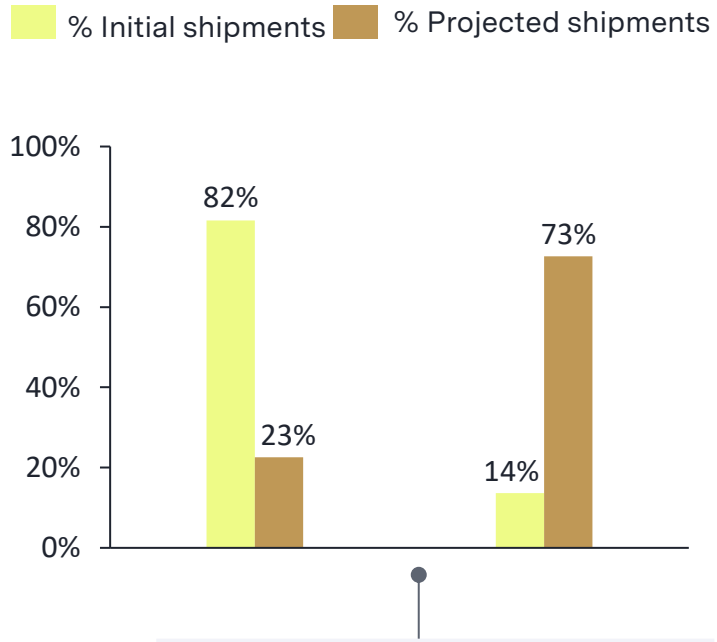
- Based on the business, provided two options to optimize the network – (a) Design a completely new network of DCs (b) Optimize leveraging the existing DC network
- Approach 1: While designing a new network without any constraints on the locations, identified the combination of locations that would result in the lowest shipping spend
- Estimated the savings by designing a new network- (a) 4 DCs network and (b) 7 DCs network
- Approach 2: In this approach, leveraged the existing DC network to optimize i.e., packages that would result in FedEx zones 2 & 3 from any of the existing DCs would ship from these DCs.
- For packages that could not be optimized with the existing DCs, aggregated the demand and identified the locations where introducing a new DC would result in savings
- Estimated the savings for optimizing (a) the existing network and (b) the existing network + 3 new DCs

Designing a new distribution network



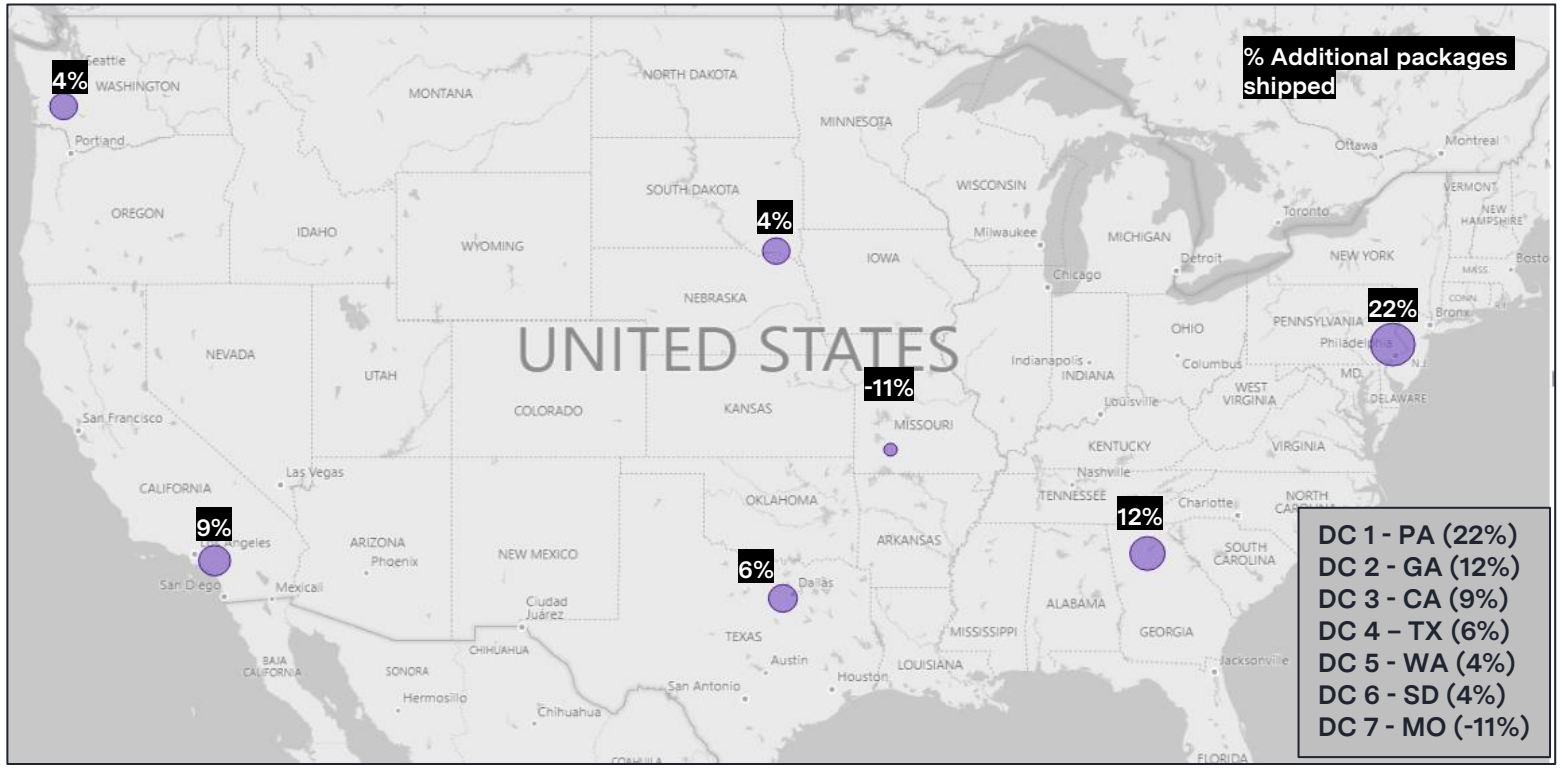
Optimized distribution network with 7 DCs

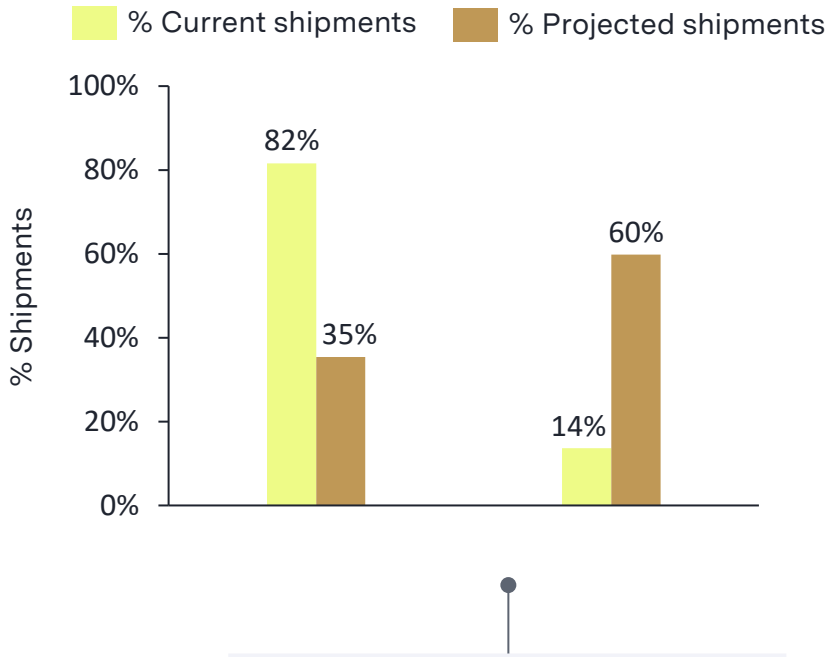
Provided alternative locations for a few DCs



Drop in the % packages shipped to higher zones with optimized network

Optimizing with existing DCs





Changes to the capacity of existing DCs to handle additional volume in the optimized network

Load from Missouri is redistributed to other locations

Drop in the % packages shipped to higher zones with optimized network