DRIVING SAVINGS VIA INBOUND LOGISTICS NETWORK DESIGN

GERALDINE FELICIO
DEEPIKA SHARMA
SERGIO CABALLERO – ADVISER
AGENDA

- Project Background
  - Objective
  - Context
  - Approach
- 3 Designs (Overview, Methodology, Key Results)
  - Consolidated Inbound and Outbound Shipments
  - Supplier Village
  - Reallocate Nearby-Site Flow and Storage
- Key Takeaways
There is an estimated 10% savings opportunity by consolidating inbound and outbound logistics.

Supplier Village could yield further savings, analyzed from a total supply chain standpoint.

Reallocating RM/PM with FG can be a decent saving opportunity, under certain constraints.
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PROJECT BACKGROUND

- **OBJECTIVE:** Find ways for the company to reduce inbound logistics costs

- **CONTEXT:**
  - The company is constantly evolving its supply chain
  - Primary focus had been on outbound logistics
  - Key opportunity to improve visibility and processes for inbound logistics
APPROACH

- **HYPOTHESES:**
  - The company can get savings by
    - Leveraging better economies of scale than their suppliers
    - Leveraging existing supply network design
- **ACTION PLAN:**
  - Identify 3 project sites
  - Identify existing opportunities to streamline inbound logistics for these sites
  - Create general models for evaluating these savings opportunities
  - Test general models on the test sites
## CURRENT HYPOTHESES

<table>
<thead>
<tr>
<th>NETWORK DESIGN</th>
<th>SITE 1</th>
<th>SITE 2</th>
<th>SITE 3</th>
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<tbody>
<tr>
<td>Consolidated inbound and outbound shipments</td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td>Supplier Village</td>
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Opportunity to reduce empty miles for carriers

Results in opportunity to translate truckers’ savings into discounts for the company
CONSOLIDATED INBOUND AND OUTBOUND SHIPMENTS

SUPPLIER WAREHOUSE (A) INBOUND DELIVERY → CPG PLANT AND DISTRIBUTION CENTER (DC)...

EMPTY MILES (B)

PREVIOUS DELIVERY LOCATION

EMPTY MILES (C)

OUTBOUND DELIVERY

SUPPLIER WAREHOUSE (D) OUTBOUND DELIVERY → RETAILER DISTRIBUTION CENTER (DC)
CONSOLIDATED INBOUND AND OUTBOUND SHIPMENTS

A. SUPPLIER WAREHOUSE INBOUND DELIVERY

CPG PLANT AND DISTRIBUTION CENTER (DC)

D. OUTBOUND DELIVERY RETAILER DISTRIBUTION CENTER (DC)
CONSOLIDATED INBOUND AND OUTBOUND SHIPMENTS

- Savings estimated to be within the range of 3 - 20%
  - 10% used as benchmark for the project
  - Savings are likely to be reflected in carrier’s bid
  - Exact savings will still be dependent on multiple factors that go into carrier’s bid; actual bidding and negotiation needed to refine savings value
CONSOLIDATED INBOUND AND OUTBOUND SHIPMENTS

- Simulation created to project savings value for the test site
  - Distribution of inbound trucks
  - Distribution of outbound trucks
  - Probability of sharing the truck
  - Potential % Savings
- Potential savings opportunity at $800k annually
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A method of streamlining the supply chain

- Supplier and the company share one inventory pool
- Inventory pool is placed near the company
- Quantities are shipped from the Supplier Village (SV) warehouse to the company
  - Just-in-time for production
  - Right-sized for production
SUPPLIER VILLAGE

SUPPLIER WAREHOUSE → SUPPLIER'S CONTRACT WAREHOUSE

<15 minutes

days

SUPPLIER'S CONTRACT WAREHOUSE → CPG PLANT AND DISTRIBUTION CENTER (DC)
Calculate NPV of the project from a total supply chain standpoint

Built a model to calculate total inventory at each stage for both the scenarios

Model then calculates other associated costs:
- Holding Cost
- Handling Cost
- Storage Cost
- Transportation Cost

Model used to find operating ranges
### SUPPLY CHAIN COST COMPONENT

<table>
<thead>
<tr>
<th>Component</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory Holding Cost</td>
<td>21% reduction</td>
</tr>
<tr>
<td>Storage Cost</td>
<td>21% reduction</td>
</tr>
<tr>
<td><strong>TOTAL SAVINGS</strong></td>
<td><strong>8% reduction</strong></td>
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As holding cost increases, savings from SV model become significantly higher.
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REALLOCATE NEARBY-SITE FLOW AND STORAGE

- Raw materials were consuming so much space in the plant
- Overflow warehouses required to store finished goods
- Limited space for direct delivery from warehouse
FG transferred to DC for storage
FG shuttled from overflow warehouses to DC as needed for customer deliveries
Excess FG moved to overflow contract warehouse
REALLOCATE NEARBY-SITE FLOW AND STORAGE

OPPORTUNITY: Switch locations of RM/PM with FG to

1) generate savings via reduced touches
2) free up space in plant for direct shipment
REALLOCATE NEARBY-SITE FLOW AND STORAGE

- Mapped out RM, PM and FG flow for current scenario and proposed scenario
- Built a model to calculate the savings:
  - Shuttling Cost
  - Handling Cost
  - Plant-Direct Shipment Savings / Steady flow of deliveries
REALLOCATE NEARBY-SITE FLOW AND STORAGE

Plant Direct Shipment:

1) generate savings via less inventory
2) transportation savings via better contract prices

- Potential savings of ~ 8 % with Plant Direct Shipment
- Potential savings of ~ 5.6 % without Plant Direct Shipment
REALLOCATE NEARBY-SITE FLOW AND STORAGE

Key Drivers: Savings with plant-direct-shipment

- No of O/B trucks/day
- Percent of Transportation Savings
- No of I/B trucks/day
- % of O/B trucks from Plant to Ship-to-point (Proposed)
- Handling cost/pallet ($)
- Percent of plant direct shipment
- Cost/shuttle ($)
- Pallets/Shuttle
- Cost/truck ($)
- % of O/B trucks from Plant to Ship-to-point (Current)
- DOH savings
- % of Cross Dock savings

High base | Low Base | Negative Savings

Table values and percentages are shown for each key driver, indicating savings in millions.
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