The Great Balancing Act – Optimizing the Distribution Network

IF YOU SUPPLY THE SUPPLY CHAIN, YOU BELONG AT MODEX.

The greatest supply chain show on earth.

Presented by:
Wayne Lewis
Senior Director, Global Consulting & Engineering

© 2016 MHI® Copyright claimed for audiovisual works and sound recordings of seminar sessions. All rights reserved.
Agenda

• Presenter Background
• Introduction – The Great Balancing Act
• What is Distribution Network Optimization?
• Why perform Distribution Network Optimization?
• What questions does Distribution Network Modeling answer?
• How do you build a Network Optimization Model?
  o Process
  o Inputs
  o Outputs
Presenter Background

Wayne Lewis

• Senior Director, Global Consulting & Engineering
• Education:
  o BSIM, Georgia Institute of Technology
• Experience
  o 16 years Consulting & Engineering
  o 13 years Operations Management
• Expertise:
  o Network modeling and design
  o Data analysis and profiling
  o Methods and process improvement
  o Labor modeling
  o Picking strategies
  o Storage planning
  o Conceptual design
  o Evaluation of alternatives

Peach State

• Supply Chain Consulting & Engineering
• Material Handling Systems Engineering and Integration
• Founded 1975
• Subsidiary of Associated
Introduction

• SC Senior Executive’s Goals
  o Reduce the “cost to serve”
  o Achieve balance of desired service level at optimal cost
  o Deliver bottom line results
  o Increase shareholder’s value
  o Beat the competition
The Great Balancing Act…

The optimal distribution network, that minimizes costs and provides the necessary service levels, can be identified through robust distribution network modeling.
What is Distribution Network Optimization?

Network optimization is focused on evaluating the trade-offs of various logistics costs to meet service level expectations. Typically, modeling software is used to solve for the lowest total cost solution within a set of constraints.
Why perform Distribution Network Modeling?

• Identify supply chain inefficiencies
• Reduce overall supply chain costs
• Understand cost implications of increasing customer service requirements
• Assess impact of changing supply chain conditions
• Evaluate potential impact of servicing new business
• Analyze what-if scenarios to better understand the impact of adding or removing network nodes
• Plan for the future
What questions does Distribution Network Modeling answer?

• Optimum number and location of distribution centers
• Role, capacity and size of each facility in the network to provide the best service at the lowest cost
• How an alternative network performs in terms of logistics cost and delivery performance as compared to the current state
• Changes that need to be made in the supply chain to support anticipated growth
• Perspective on how the recommended network should be implemented
How do you build a Network Optimization Model? The Process…

**INPUTS**

- Current network structure, locations, flows and policies
- All relevant costs
  - Inbound freight ($)
  - Outbound freight ($)
  - DC fixed & variable ($)
  - Inventory ($)
- Customer demand (by product group)
- Growth rates

**OPTIMIZATION SOFTWARE MODEL**

- Alternative Scenarios
- Optimal network
  - Number of facilities
  - Location of facilities
  - Customer assignments
  - Product volumes & flow
  - Service territories
- Key Performance Indicators (KPIs)
  - Network costs
  - Service levels
- Recommendation Plan

**OUTPUTS**

**Review Current State**
**Analyze Data**
**Build Baseline Model**
**Build Modified Baseline**
**Analyze Scenarios**
**Recommend Network Plan**
How do you build a Network Optimization Model? The Inputs…

- **Cost Data**
  - Transportation
  - Warehousing (people, equipment, space and operating expense)
  - Inventory carrying charges

- **Supply & Demand Data**
  - Supplier locations
  - Customer locations
  - Products
  - Inventory

- **Growth Forecasts**
How do you build a Network Optimization Model? The Outputs…

- Optimal Network Design
- Comparison of Current State to Alternatives
  - Cost
  - Service
- Plan for Implementation

<table>
<thead>
<tr>
<th>DC Location</th>
<th>Expanded</th>
<th>Total Network Cost</th>
<th>Savings</th>
<th>% Savings</th>
<th>Customer Units</th>
<th>Units Delivered within 1k Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td>$16,940,376</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADC Enterprise, AL</td>
<td>No</td>
<td>$2,806,701</td>
<td></td>
<td></td>
<td>40,107,350</td>
<td>92.4%</td>
</tr>
<tr>
<td>CDC Hebron, KY</td>
<td>No</td>
<td>$5,297,599</td>
<td></td>
<td></td>
<td>59,896,307</td>
<td></td>
</tr>
<tr>
<td>KDC Savannah, GA</td>
<td>No</td>
<td>$1,490,716</td>
<td></td>
<td></td>
<td>6,226,339</td>
<td></td>
</tr>
<tr>
<td>NDC Las Vegas, NV</td>
<td>No</td>
<td>$692,362</td>
<td></td>
<td></td>
<td>7,263,335</td>
<td></td>
</tr>
<tr>
<td>SPA Augusta, GA</td>
<td>No</td>
<td>$1,416,430</td>
<td></td>
<td></td>
<td>4,378,742</td>
<td></td>
</tr>
<tr>
<td>SPT Thomaston, GA</td>
<td>No</td>
<td>$2,635,154</td>
<td></td>
<td></td>
<td>13,068,763</td>
<td></td>
</tr>
<tr>
<td>WDC Chino, CA</td>
<td>No</td>
<td>$2,601,415</td>
<td></td>
<td></td>
<td>21,321,525</td>
<td></td>
</tr>
</tbody>
</table>

| Baseline Optimized 6 Dcs |          | $14,598,224        | -$2,342,152 | -13.8% | 152,262,361 | 91.7% |
| ADC Enterprise, AL     | No       | $4,241,731         |             |       | 61,916,721  |       |
| CDC Hebron, KY         | No       | $4,812,038         |             |       | 48,454,142  |       |
| KDC Savannah, GA       | No       | $464,651           |             |       | 894,391      |       |
| NDC Las Vegas, NV      | No       | $1,141,621         |             |       | 9,116,202    |       |
| SPT Thomaston, GA      | No       | $1,984,052         |             |       | 13,068,763  |       |
| WDC Chino, CA          | No       | $1,954,393         |             |       | 18,817,254  |       |

| Baseline Optimized 5 Dcs |          | $14,393,408        | -$2,546,968 | -15.0% | 152,262,361 | 91.7% |
| ADC Enterprise, AL     | No       | $4,379,743         |             |       | 61,916,721  |       |
| CDC Hebron, KY         | No       | $4,872,236         |             |       | 49,343,421  |       |
| NDC Las Vegas, NV      | No       | $1,141,744         |             |       | 13,068,763  |       |
| SPT Thomaston, GA      | No       | $2,045,292         |             |       | 18,817,254  |       |

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3PL</td>
<td>ST Opportunities</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>WCC Pilot</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>WCC Pilot</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>WCC Pilot</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>WCC Pilot</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>WCC Pilot</td>
<td>WMS Selection &amp; Implementation</td>
<td>WCC Pilot</td>
<td>WCC Self Run</td>
<td>Design/Implement WCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3PL Investment: $4MM to $6MM
WCC Investment: $1MM to $2MM
WMS Investment: $1MM to $2MM
What are the benefits?

**Retailer Network Case Study**

**Project Scope & Deliverables**

- Understand and assess current logistics operations capabilities and shortfalls.
- Capture strategic directions and key drivers of merchandise flow.
- Build a baseline model of the current logistics operations and an adjusted baseline for 2019 volumes and strategy.
- Model the optimum supply chain network and compare to current.
- Develop a strategic roadmap to execute the recommended network.
- Determine additional capabilities to support the future network.

**Project Results**

- Cost Avoidance / CPU Reduction: Decreases distribution cost per unit by $0.18, driven by $28.7M annual reduction in transportation cost in 2019.
- Improved Service: Recommended (3) DC network reduces distances to stores by 49% and to domestic vendors by 57%.
- ROI: Favorable return on $13 – 15MM incremental capital Investment; NPV > $20MM.
- Streamlined DC operations: Recommended layout consolidates (6) buildings across 2-3 mile radius, improves efficiency and accommodates five year growth plan with minimal increase over current square footage occupied.
What are the benefits?

Retailer Network Case Study

Project Scope & Deliverables

• Define the role, capacity and size of each facility in the network to provide the best service at the lowest cost.
• Develop a baseline model of the current logistics operations.
• Develop 5-year modified baseline models for zero sales growth as well as projected sales growth.
• Evaluate the new network options in terms of logistics cost and delivery performance. Compare to the current network.
• Cost/Benefit analysis of consolidated import structure.
• Develop a strategic roadmap to execute the recommended network.

Project Results

• Reduced Supply Chain Costs: savings potential of $1.084M per year by transitioning from a 17 site network to an 18 site network (and redistributing customer volume to optimal DC).
• Customer Service Metrics: recommended network changes increased % Demand w/in 250 miles from 79.7% to 81.3%.
• ROI: Expected ROI is < 2 years by modifying the network in conjunction with facility lease expirations.
• Flexible and Functional Operations: the recommended network design relieves capacity issues and allows more operational flexibility to grow the business. By leveraging resources for both fulfillment as well as service functions, the network is capable of performing more efficiently and cost effectively.
What are the benefits?

Project Scope & Deliverables

• Build a baseline model of the current logistics operations and an adjusted baseline for 2021 volumes and strategy.
• Model the optimum supply chain network and compare to current.
• Determine the impact of various service level and network strategies.
• Quantify the potential inclusion of additional business units added to network.
• Develop a strategic roadmap to execute the recommended network.

Project Results

• Improved Service: Recommended (6) DC network provides 2-day ground service to 95% of dealers. Current network provided 2-day ground service to 36% of dealers.
• Cost Avoidance: Other business units with similar transportation channels could not independently justify regional distribution centers. By sharing the fixed costs of regional DCs, business units were able to improve service levels at cost justifiable level.
• ROI: 2.9 year return on a $7.2M investment.
The Great Balancing Act…

Distribution network modeling can help achieve your goals by:

- Reducing the “cost to serve”
- Achieving balance of desired service level at optimal cost
- Delivering bottom line results
- Increasing shareholder’s value
- Beating the competition
For More Information:

Speaker email: wlewis@peachstate.com
Website: www.peachstate.com
Or visit MODEX 2015 Booth 5055