How To Support Your Supply Chain Operations with Lean Inbound Logistics

with
Brad Bossence
Vice President, LeanCor Supply Chain Group
Instructor, GT Supply Chain & Logistics Institute

Supply Chain Management Series

Lean Inbound Logistics

September 29-30, 2014 | Hyatt Regency (Savannah, GA)

www.scl.gatech.edu/lil & www.scl.gatech.edu/SCMS

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Your Presenter

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Career Focus Areas:
Entire career committed to third party logistics. Over 17 years of third party logistics experience with a specific focus in Japanese production system environments such as Toyota USA, Toyota Canada, Toyota Europe, Kubota, Yamaha, Suzuki, and Subaru.

Vice President, LeanCor Supply Chain Group:
LeanCor is a trusted supply chain partner that delivers operational improvement and measurable financial results. Unlike other 3PL providers, LeanCor offers a unique combination of training, consulting, and outsourced logistics services. “We Teach. We Consult. We Do.”

Lean Supply Chain Instructor:
Georgia Tech Supply Chain and Logistics Institute

Cross-Industry Experience:
Automotive, Consumer Goods, Industrial Manufacturing, Retail, Food and Beverage
Lean Inbound Logistics: 50,000 Foot View

Plan
- Order Visibility
- Pilot Selection
- Milk Run Design
- Packaging
- Carrier Selection
- Communication Plan

Do
- Route Management
- Pick-Up Notification
- Contingency Mgmt
- Yard Control
- Receiving Schedule

Check
- Window Compliance
- Supplier Fill Rate
- Carrier Performance
- Cube Utilization
- Time, Quality, Cost

Act
- Regular Ops PDCA
- Failure Mode Analysis
- Root Cause Analysis
- Project Management
- Pilot Expansion
- Train, Train, Train!
Inbound Logistics as Part of the Overall Supply Chain Strategy

→ Total Cost of Fulfillment: Build models and lead and make decisions based on Total Cost of Fulfillment.

→ Recognize that all decisions have unintended consequences and as leaders we must become *systems thinkers*.
Inbound Logistics & The Fulfillment Stream: Understanding the Challenges

- 80% of supply chain activities are invisible to those accountable
- Multiple suppliers, multiple customers, multiple third parties
- High variability in material behavior, transportation modes
- High variability in lead time, supply and demand
- High variability in supplier performance and capability
- The extended network is not always visible
- Data are not always abundant
Lean vs Traditional Inbound Logistics

Definition A:
- Suppliers provide visibility to shipments
- Routes are designed and tendered daily
- Rate per mile is rigorously managed
- Cost per supplier is rigorously managed
- Incorrect shipment quantities are managed at delivery

Definition B:
- Shipping days are communicated to each supplier
- Network is designed by engineers and is adjusted based on plan vs. actual
- Total landed cost is rigorously managed
- Incorrect shipment quantities are managed at pick-up

Poll Question:
Which best describes Lean Inbound Logistics?
Step 1: Make Demand Visible, Select Your Pilot

A TMS must easily integrate with our other systems

- Provide visibility to data in real-time for proactive problem solving
- Find value in your transportation
  - Opportunity to ensure **optimal routing** in terms of customer business rules and service (i.e. transportation cost)
  - Connect transportation to manufacturing and inventory strategy

Poll Question:
A: Forecast data drives our inbound material flow
B: Demand data drives our inbound material flow
Pilot Selection: Find Stability

Stable Route Plan Benefits:
- Carrier Capacity
- Purchasing Power (trans)
- Predictability & Visibility for DCs, Plants, Trucking, etc.

LTL Challenges:
- Lead Times
- Damages
- Value Added Services
- Control

Ideal for Static Truckload

Static Milk Run

Dynamic Milk Run / LTL Consolidation

Problem Solve to Maximize Visibility for Planning

Stable Route Plan Benefits:
- Carrier Capacity
- Purchasing Power (trans)
- Predictability & Visibility for DCs, Plants, Trucking, etc.

LTL Challenges:
- Lead Times
- Damages
- Value Added Services
- Control
Of These 4 Suppliers, Where Would You Start?

- **Priority # 1**: High Volume, Low Fill rate
  - Supplier A

- **Priority # 2**: Low Volume, Low Fill rate
  - Supplier B

- **Priority # 3**: High Volume, High Fill rate
  - Supplier C

- **Priority # 4**: Low Volume, High Fill rate
  - Supplier D

Poll Question: Which supplier would you pilot?
Pilot Selection: Solve Material Flow Problems

Priority # 1
High Volume
Low Fill rate

Priority # 3
High Volume
High Fill rate

Priority # 2
Low Volume
Low Fill rate

Priority # 4
Low Volume
High Fill rate

Volume

Fill rate
Step 2: Route Design & Plan For Every Part (PFEP)

- Central database of all critical information required to make business decisions relative to material flow.

- Planned Pull systems: connects consumption through replenishment.

<table>
<thead>
<tr>
<th>Part Data (Dimensions)</th>
<th>Pallet Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td><strong>Height</strong></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td><strong>Width</strong></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td><strong>Length</strong></td>
</tr>
</tbody>
</table>

**Part Data**

<table>
<thead>
<tr>
<th>Destination Plant Part #</th>
<th>Plant Name</th>
<th>Supplier #</th>
<th>Supplier Name</th>
<th>Part Description</th>
<th>Average DailyUsage [Lbs.]</th>
<th>Container Type (cardboard box, tote, bulk bin, barrel, skid, rack, etc.)</th>
<th>Container Length (in)</th>
<th>Container Width (in)</th>
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<tbody>
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<td>1255805</td>
<td>North</td>
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</table>

**Pallet Data**

53’ Dry Van Utilization:

- **Traditional Transportation Design:**
  - ✓ 26 Floor Spots (standard skids)
  - ✓ 44,000 Pounds

- **Lean Transportation Design:**
  - Liquid Cube = 52.5’x8.17’x8.67’ = 3948 Cubic Feet = 146.21 Cubic Yards
  - Design Cube = 52.5’x98”x104” = 3719 Cubic Feet = 137.73 Cubic Yards
Lean Logistics Concept 1 of 3:
Lot Size

Customer Daily Requirements = x75

Order Lot Size = 50

Day 1  Day 2  Day 3  Day 4  Day 5
100    75    100    75    100

Day 1  Day 2  Day 3  Day 4  Day 5
75     75     75     75     75

Order Lot Size = 25

Day 1  Day 2  Day 3  Day 4  Day 5
75     75     75     75     75

What Happens Here? What are the Implementation Challenges?
Lean Logistics Concept 2 of 3: Frequency

### Delivery Frequency Analysis

<table>
<thead>
<tr>
<th>1 Truck Load = 1 Week Store / Distribution Center Requirements</th>
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</thead>
<tbody>
<tr>
<td><strong>Delivery Frequency (One Part or SKU #)</strong></td>
</tr>
<tr>
<td><strong>Space Used for Inventory (SQ Feet)</strong></td>
</tr>
<tr>
<td>Monthly</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td><strong>Average Days on Hand (Days Inventory)</strong></td>
</tr>
<tr>
<td>Monthly</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td><strong>Minimum Order Lead Time</strong></td>
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<tr>
<td>Monthly</td>
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<tr>
<td>1 month</td>
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</table>

### Percent Improvement from Increased Frequency

<table>
<thead>
<tr>
<th><strong>Space Used for Inventory (SQ Feet)</strong></th>
<th>75%</th>
<th>80%</th>
<th>50%</th>
<th>50%</th>
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<tbody>
<tr>
<td><strong>Average Days on Hand (Days Inventory)</strong></td>
<td>75%</td>
<td>80%</td>
<td>50%</td>
<td>50%</td>
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<tr>
<td><strong>Minimum Order Lead Time</strong></td>
<td>75%</td>
<td>80%</td>
<td>50%</td>
<td>50%</td>
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</tbody>
</table>
Lean Logistics Concept 3 of 3: Level Flow

Where can we use this concept tomorrow?
Step 3 and Beyond: PDCA

- Disciplined Route Management
- Disciplined PO / Supplier Management through real-time communication
- Disciplined Carrier Management Program
- Total Cost Management

Do - Check - Adjust

<table>
<thead>
<tr>
<th>Part #</th>
<th>Supplier Name</th>
<th>Avg. Daily Usage</th>
<th>Parts per Container</th>
<th>Length (IN) / Container</th>
<th>Width (IN) / Container</th>
<th>Depth (IN) / Container</th>
<th>Cubic Inches used per day</th>
<th>Cubic Feet (&quot;1728&quot;)</th>
<th>Cubic Yards/Day (&quot;27&quot;)</th>
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<tr>
<td>111</td>
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<td>267.43</td>
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</table>

Route Total 267.43

Liquid Cube = 52.5 feet long x 98.5 inches wide x 110 inches high
Design Cube = 52.5 feet long x 8.2 feet wide x 9.17 feet high = 3948 Cubic Feet

Liquid Cube = 52.5 feet long x 8.2 feet wide x 9.17 feet high
Design Cube = 52.5 feet long x 8.17 feet wide x 8.67 feet high = 3719 Cubic Feet
**PDCA: Lean Logistics Measurement Systems**

**Purpose:**
- Create metrics that add value to monitoring and improving processes.

**Outcomes:**
- Identify key metrics that can be collected to monitor performance and identify gaps.
- Establish key targets for metrics that maintain, promote, or make visible instability or stability.
- Define purpose for each metric, that purpose should drive action.

**Examples:**

**On-Time Pickup and Delivery:**
*Cost impact:* prevents overtime on loading/shipping docks, increases customer satisfaction and prevents line-down scenarios, stability in this metric leads to reduced inventory

**Pickup/Delivery Frequency:**
*Cost impact:* can lead to increased logistics cost, must be paired with decreases in inventory

**Trailer Utilization:**
*Cost impact:* full trucks lead to fewer trucks, reduces transportation cost
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➔ **Learn how to:**
  - Map a current inbound logistics network
  - Appreciate the distinct nature of the inbound logistics network as a link to suppliers and manufacturing facilities and part of the overall value chain
  - Calculate total logistics costs
  - Design a future state network based on lean principles
  - Learn techniques in transportation management, supplier management, and materials planning to achieve improved material flow balances and reduced overall costs
  - Learn the keys to strategic supplier management
  - Understand how lean guiding principles serve as the strategic pathway to lean inbound logistics
  - Understand Milk-Run development and mode selection

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Thank You!

Q&A

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