Supply Chain Packaging Optimization
Leveraging Packaging for Cost Savings Strategies

Tom Blanck, CPP  |  Walmart Sustainability Expo  |  May 8, 2012
Introduction

- Packaging improvements can generate a chain reaction in the supply chain
- Cumulative benefits available in the supply chain
  - Planning, handling, loading, containerization, transportation, logistics, etc.
- Packaging tactics to drive the supply chain strategy
  - Focal points for improvement
- What’s this got to do with sustainability?
Session Agenda

- Packaging’s Impact on the Supply Chain
- Packaging Tactics for Supply Chain Savings
- Sustainability AND Savings
- Examples & Summary
Session Agenda

Packaging’s Impact on the Supply Chain

Packaging Tactics for Supply Chain Savings

Sustainability AND Savings

Practical Cost Reduction Opportunities
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

Supplier → Manufacturing → Storage Warehouse → Distribution Center

Retail Store → Customer

Supplier → Manufacturing → Storage Warehouse → Distribution Center

Retail Store → Customer

Supplier → Manufacturing → Storage Warehouse

Retail Store → Customer

LTL → Small Parcel
Packaging’s Impact on the Supply Chain

Inbound Materials Opportunities

- Inbound Transportation Cost Reductions
- Reduce Packaging Storage Requirements
- Reduce or Eliminate Waste, Disposal Issues
- Reuse Packaging (Multi-Tiered Suppliers)
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

- Supplier
- Manufacturing
- Storage Warehouse
- Distribution Center
- Retail Store
- Customer
- LTL
- Small Parcel
Finished Goods Opportunities

- Pallet Optimization
- Slip Sheets, Clamp Handling
- Trailer or Container Loading
- Minimized Handling, Increased Throughput
- Packaging Automation
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

Storage + Warehouse Opportunities

- Reduced Storage Costs (Frozen, Refrigerated)
- Stacking, Floor Space, Footprint
- Reduced Handling, Forklifting
- Reduced Safety Stock
- Labor Reallocation
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain
Customer’s Systems Opportunities

- Damage Avoidance
- Breakout for Mixed Loads (Store Deliveries)
- Reduced Waste, Disposal Issues
- Handling Efficiencies
- Increased Stocking Levels, Shelf Counts
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

- Material Costs
- Handling Costs
- Warehousing Costs
- Labor Costs
- Freight Costs
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

Less-than-Truckload Opportunities

- Weight Reductions
- Increased Product Density
- Freight Class Improvements
- Damage Reduction
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain
Packaging’s Impact on the Supply Chain

Small Parcel Opportunities

- Dimensional Weight Charge Avoidance
- Damage Prevention, Product Protection
- Packaging Selection, Envelopes
- Expediting Charges, Overnighting
Packaging’s Impact on the Supply Chain
Session Agenda

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- Packaging Tactics for Supply Chain Savings
- Sustainability AND Savings
- Examples & Summary
Packaging Tactics for Supply Chain Savings

- Focal Points for Packaging Improvement Opportunities:
  - Packaging Materials
  - Packaging Volume
  - Packaging or Shipping-Related Damage
Packaging Tactics for Supply Chain Savings

Reduce Material

- Reduced Expenses
- Less Material in Waste Stream
- Fewer Disposal Challenges
- Reduced Weight
- Cube Utilization

Examples
- Right-weighting Packaging Materials
- Shared Load Packaging Strategies
- Minimize Internal Packaging
- Proper Amounts of Cushioning
SITUATION

- Ready-to-Eat Food Manufacturer
- Original Package – Maximum Billboard
- Looking to Preserve Margin

Current Configuration
486 in²

New Configuration
245 in²
Packaging Tactics for Supply Chain Savings

**SOLUTION**

- Reoriented Product Arrangement
- Reduced Packaging Blank Size by 241 in\(^2\)
- Nearly 50% Material Reduction per Unit
Packaging Tactics for Supply Chain Savings

Reduce Volume

- Decreased Freight Costs
- Decreased Small Parcel Ship Costs
- Increased Throughput
- Storage, Warehouse Savings
- Handling, Labor Savings

Examples
- Eliminate Headspace and Voids
- Minimize Case Dimensions
- Pallet Unit Load Optimization
- Primary Packaging Size
Packaging Tactics for Supply Chain Savings

**SITUATION**

- Global Consumer Products Company
- Manufacturing Sites in Mexico and US
- Varied Retail Product Mix (Light Weight)
- Removing 3/8” from the Carton Height = $15K in Material Savings on Cartons and Cases

![Diagram showing carton height reduction and material savings](image)
SOLUTION

- Logistics Savings ~ $89,000 Annually
- UL Increase from 21 → 28 Cases ~ 33% Improvement
- 24% Trailer Reduction from 62 → 47 Truckloads
- Freight Class Change from 100 to 92.5 for LTL Shipments
Packaging Tactics for Supply Chain Savings

- **Real Life Shipments**
  - The Problem with “Let’s Try It”
    - Singular Event? Smooth or Rough Journey?
- **Importance of Packaging Testing**
  - Testing Replicates a Harsh Environment
    - Controlled, Predictable
- **Implementation**
  - Find Out if it Works - Before your Customer Does
  - Trials, Pilot Shipments
    - Roll-out Plan

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**The Real Cost of Product Damage**

- Loss of Product
- Spoilage to Other Packaging
- Return Shipment Cost and Time
- Field Service Cost
- Disposal
- Manufacturing Time Lost
- Customer Experience and Satisfaction
Packaging Tactics for Supply Chain Savings

- Product Damage vs. Package Damage (Unsaleables)
  - Justifiable Amounts of Damage
  - “Sweet Spot” Costs in Line with Cost of Damage
• Package Testing Standards
  - ISTA (International Safe Transit Association)
  - ASTM (American Society for Testing and Materials)
  - ISO (International Organization for Standardization)
  - Custom Protocols

• Walmart Packaging Guidelines
Session Agenda

Packaging’s Impact on the Supply Chain

Packaging Tactics for Supply Chain Savings

Sustainability AND Savings

Examples & Summary
Sustainability AND Savings

Natural Resource Consumption

Greenhouse Gas Emission
• Reduce Material Consumption (Fiber):
  ✷ Reduce or Eliminate Materials
  ✷ Substitute Packaging Materials

• Reduce Greenhouse Gases (Diesel, Energy):
  ✷ Reduce Weight
  ✷ Increase Shipping Densities

• Reduce shipping-related damage
  ✷ Understand the Real Cost of Damage
Sustainability

- Many Companies Want to Improve Sustainability
- Common Perception of Packaging Sustainability:
  - Recyclable
  - Reusable
  - Biodegradable
- Broader View of Packaging Sustainability:
  - Reduce Supply Chain Costs
  - Reduce Environmental Impact

Savings

- Many Companies Have Cost Reduction Goals
  - Conflict with sustainability?
  - Align with sustainability

THE BOTTOM LINE

Packaging Sustainability Provides Savings

- Reduced Transportation and Distribution Costs
- Minimized Packaging Waste, Energy Consumption
• Packaging Improvements Extend into Distribution and Supply Chain
  - Measure the Business Results
  - Measure the Sustainability Improvement

• Calculating Sustainability
  - Reference Formulas from Websites
    - www.climatecrisis.net/takeaction/carboncalculator/howitwascalculated.html
    - www.replanttrees.org/biz%20calc/BusForm.htm
    - www.papercalculator.org
    - www.design-compass.org/
    - www.epa.gov/sustainability
    - www.nrel.gov (National Renewable Energy Lab)
Packaging Improvements Extend into Distribution and Supply Chain

- Measure the Business Results
- Measure the Sustainability Improvement

Calculating Sustainability

- Reference Formulas from Websites
  - Diesel Weight ~ 7 lbs/gal
  - CO₂ per Combusted Gallon of Diesel = 22.2 lbs/gal
  - Tons of Diesel Consumed during 14-day Ocean Vessel Trip = 3,052
  - Max. Load of 40’ Containers per Ship = 3,875
  - Average MPG for Diesel Truck and Trailers = 7.5
  - 101lbs of Corrugated Material = 1 Tree

Sustainability AND Savings
Calculating Sustainability

**PROJECT RESULTS**

**BUSINESS RESULTS**

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Material Savings</td>
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<tr>
<td>Freight Savings</td>
<td></td>
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<tr>
<td>Labor Savings</td>
<td></td>
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<tr>
<td>Warehouse Savings</td>
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**SUSTAINABILITY RESULTS**

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<tbody>
<tr>
<td>Paper Reduction</td>
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<tr>
<td>Pallets Eliminated</td>
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<tr>
<td>Diesel Reduction</td>
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**THE BOTTOM LINE**

- **$** Costs Saved
- **Tons** Fiber Reduced
- **Tons** CO₂ Eliminated
Session Agenda

Packaging’s Impact on the Supply Chain

Packaging Tactics for Supply Chain Savings

Sustainability AND Savings

Examples & Summary
**OBJECTIVE**

- Consumer Electronics Company with Manufacturing in Asia
- Short Product Lifecycles, Airfreight
- Interest in Reducing Logistics Costs
**Solution**

- Redesigned and Tested Secondary Packaging
- Reduced Dimensions and Partitions
- New Unit Load Configurations
Supply Chain Sustainability Example

**SOLUTION**

**OLD CONFIGURATION**

Number of Cartons = 80
Area Efficiency = 94%

**NEW CONFIGURATION**

Number of Cartons = 140
Area Efficiency = 95%
## Supply Chain Sustainability Example

### RESULTS (SINGLE PRODUCT)

<table>
<thead>
<tr>
<th>BUSINESS RESULTS</th>
<th>SUSTAINABILITY RESULTS</th>
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<tbody>
<tr>
<td>Material Savings</td>
<td>$3,000</td>
</tr>
<tr>
<td>Inbound Freight Savings</td>
<td>&gt; $366,000</td>
</tr>
<tr>
<td>Corrugated Reduction</td>
<td></td>
</tr>
<tr>
<td>Pallet Reduction</td>
<td></td>
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</tbody>
</table>

**THE BOTTOM LINE**

- **$366,000+** Costs Saved
- **Tons** Fiber Reduced
- **Tons** CO$_2$ Eliminated
Supply Chain Sustainability Example

RESULTS (across 3 products)

<table>
<thead>
<tr>
<th>BUSINESS RESULTS</th>
<th>SUSTAINABILITY RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Savings</td>
<td>Corrugated Reduction</td>
</tr>
<tr>
<td>$4,500</td>
<td>1,632,000 ft²</td>
</tr>
<tr>
<td>Inbound Freight Savings</td>
<td>CO₂ Reduction</td>
</tr>
<tr>
<td>&gt; $1,136,000</td>
<td>3.5 tons/pallet</td>
</tr>
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</table>

The Bottom Line

$1,100,000+ Costs Saved

85 Tons Fiber Reduced

142 Tons CO₂ Eliminated
**OBJECTIVE**

- Optimize Product Dimensions to Reduce Material Consumption
- Realize Supply Chain Savings
- Visual Indifference
Supply Chain Sustainability Example

**Solution**

- Space Saving Carton Reduction ~ 16%
- Core Size Reduction ~ 23%
- Corrugated Reduction ~ 18%
- New Unit Load Configurations ~ 30%

| 1.625” | 1.25” |
Supply Chain Sustainability Example

SOLUTION

PRODUCT 1 (30)

PRODUCT 2 (39)

30% More Cartons per Pallet
18% Corrugated Reduction
Supply Chain Sustainability Example

**RESULTS (FOR EACH 10 MILLION UNITS)**

<table>
<thead>
<tr>
<th><strong>BUSINESS RESULTS</strong></th>
<th><strong>SUSTAINABILITY RESULTS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Savings</td>
<td>Paper Reduction</td>
</tr>
<tr>
<td>$300,000</td>
<td>2,559,524 ft²</td>
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<tr>
<td>Freight Savings</td>
<td>Pallet Reduction</td>
</tr>
<tr>
<td>$75,000</td>
<td>2,200</td>
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<tr>
<td>Labor, Warehouse, &amp;</td>
<td></td>
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<tr>
<td>Handling Savings</td>
<td></td>
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<tr>
<td>$40,000</td>
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**THE BOTTOM LINE**

- **$415,000** Costs Saved
- **33 Tons** Fiber Reduced
- **1,400 Tons** CO₂ Eliminated
• What should you look for in your system?
  - Pallet Overhang or Underhang
  - Headspace or Voids in Cartons, Cases, Totes
  - Trailers or Containers Utilization
  - Floor Space, Racking Challenges in Warehouse
  - Direct Ship, Small Parcel - DIM Charges or Penalties

• Understand your Customer Distribution System
  - Packaging Performance Outside of your System
  - Zero Damage may Indicate Over-Packaging
• **Savings AND Sustainability**
  - Most Supply Chain Cost Improvements are Sustainability Significant
  - Measure the Sustainability Impact

• **Supply Chain Costs > Packaging Material Costs**
  - Leverage Package Design

• If you can’t get to this yourself, get help!
Tom Blanck, CPP
tom.blanck@chainalytics.com
(612) 812-3372