

What is Warehousing....

In Today's Logistics Environment & Its Impact on MN Transportation



Minnesota Freight Advisory Committee (MFAC)
“Warehousing’s Role in Transportation” Session
October 18, 2013

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Center For Transportation Studies (CTS), U of MN

American Society of Landscape Architects – MN Chapter



Why Care About Warehousing....or even.... Supply Chain Logistics / Transportation?



Why Care About Warehousing....or even.... Supply Chain Logistics / Transportation?

Touches Everything We Do
% of Economy

8.5% Logistics

\$3.80 per person in U.S.

vs.

17.3% Healthcare

\$7.89 per person in U.S.



Why Care About Warehousing....or even.... SC Logistics / Transportation?

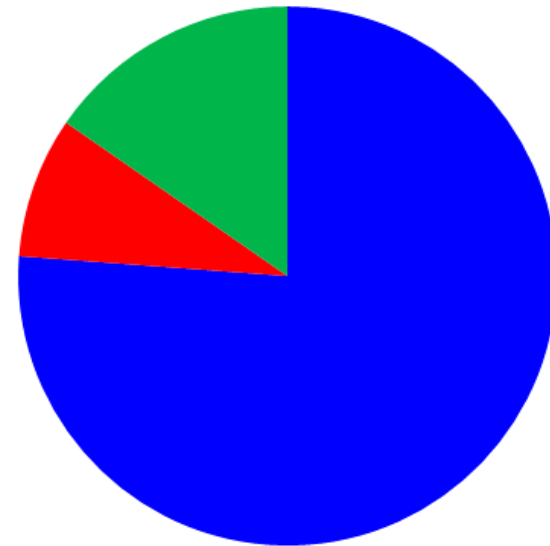
Major Components % of Total U.S. Logistics Costs in 2012

Total Logistics Cost: \$1,331B

Motor Carriers: \$647B (48.6%)

Railroads: \$72B (5.4%)

Warehousing: \$130B (9.8%)



■ Motor Carriers 48.6% ■ Railroads 5.4% ■ Warehousing 9.8%

Source: CSCMP 2013 State of Logistics Report



Logistics Leadership since 1904

Supply Chain Logistics: The Home of Warehousing

What Is It?

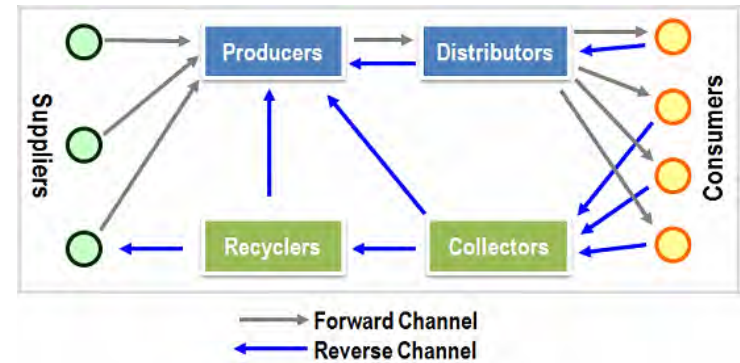
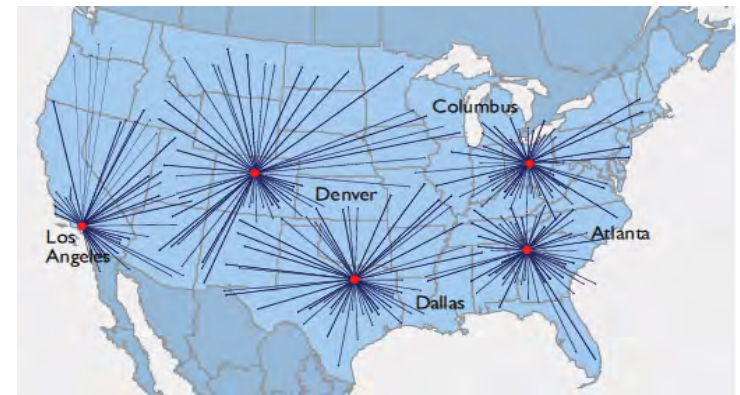
Definition

“The care and movement of product from point of origin to the end consumer”

Involves Many Facets of a Product’s Life

- ✓ Raw Material
- ✓ In-process
- ✓ Finished Good
- ✓ Recycled
- ✓ Destruction

Warehousing handles products in all phases of a products life-cycle



Warehousing in Logistics

5 Billion Sq. Ft of warehousing in U.S.

Floor area equals a 4 foot walkway from here to the Moon...!!!

The 5B only includes what's under roof. Add another 40-50% to include outdoor dock & staging areas and we get a 6 foot wide walkway.

Industry has a massive impact on the Nation's landscape



Warehousing in Logistics

Come In All Sizes

Sq. Ft. Range

As Small As: 10,000 sq. ft.

Minnesota Typical: 100,000 - 350,000 sq. ft.

Major Logistics Hubs: 500,000 – 1,000,000 sq. ft.
(Chicago, LA, Atlanta, etc.)

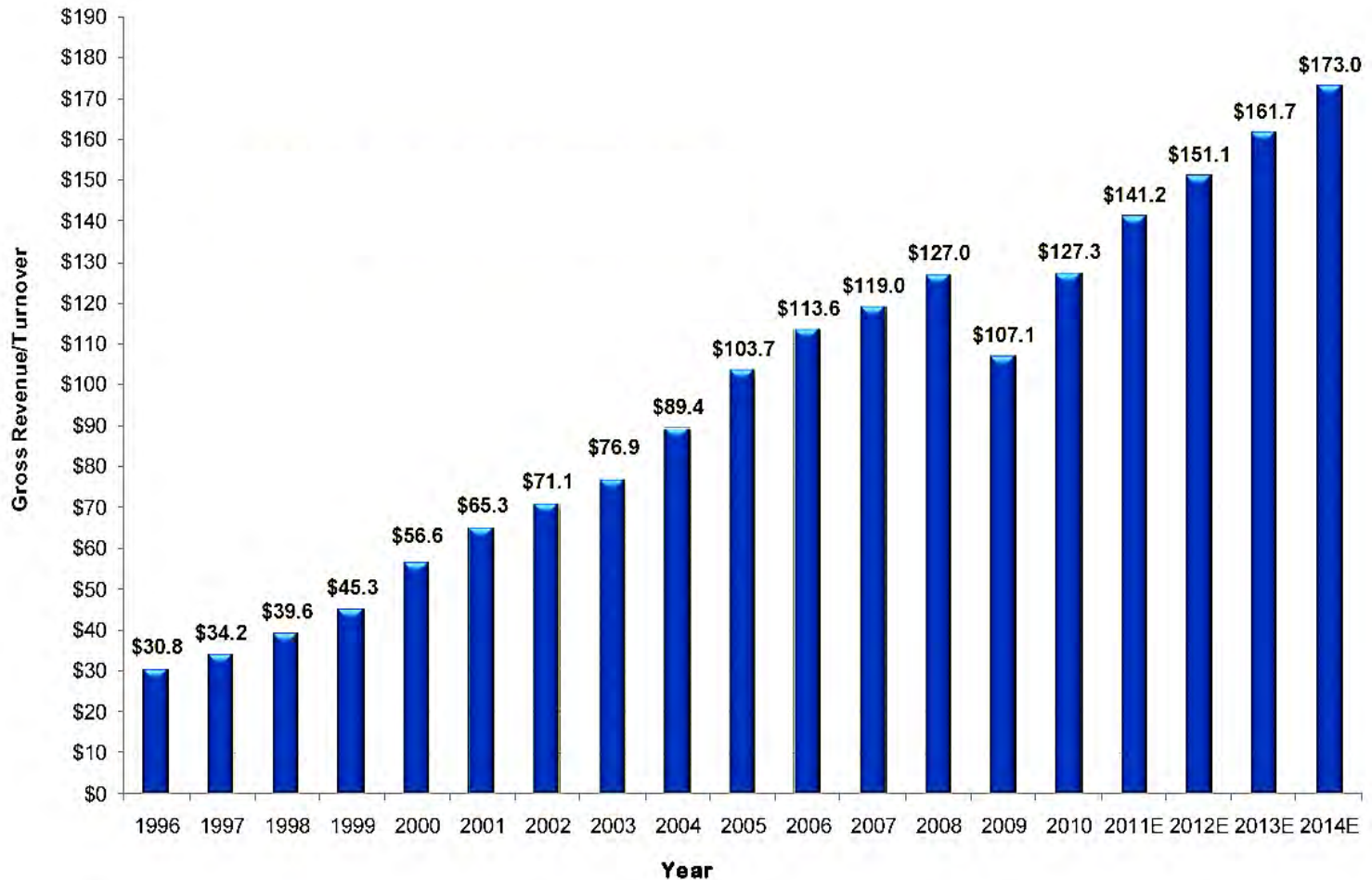
International Hubs: Multi-Story
(Shanghai, Japan, Europe, etc.)



Where Do We Come From

3PL Industry (*3rd Party Logistics Services*)

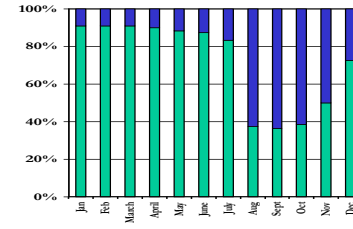
Formerly Called “*Public Warehousing*”
Fastest Growing Segment of Logistics Industry



How do firms use 3PLs i.e. Public / Contract Warehouses

15 Examples

1. Global Sourcing – Domestic Distrib
2. Domestic Sourcing – Domestic Dist
3. Vendor Consolidation Park
4. Seasonal Space Offsets
5. Domestic Manufacturing Support / Support
6. Distribution / Transportation Services
 - Regional Distribution
 - U. S. Distribution
 - Consolidation / Cross Docking
 - Rail Transload / Truck-Rail-Ocean Integration
7. Contract Logistics
8. Medical Support Logistics
9. Value Added Services
 - Parts Assembly
 - Pick and Pack operations
 - Packaging
10. Customer Returns Processing / Reverse Logistics
11. Fulfillment Services
12. Order Postponement Strategies
13. E-Commerce Support
14. Core Competency Strategies Solutions
15. Build to Suit Operations and Warehouses



Medical Support Logistics

JIT Replenishment

Surgical Kits

Custom kits for various surgery operations

- ✓ Customized for teams of Doctors at every hospital.
- ✓ Kit contains all the items needed for a surgery.
- ✓ JIT delivery to hospital.

Hospital Supplies

- ✓ IV Solutions, Needles, Dressings, etc.



Mass Merchant Retail Support

Store Backroom Logistics

Supply of 1500+ Stores with items to run stores

- ✓ Supplies, training manuals, uniforms. Sales/promo materials, bags, etc.
- ✓ Full “pick-pack” operation..



Global Sourcing – Domestic Production Multiple Concepts in Operation

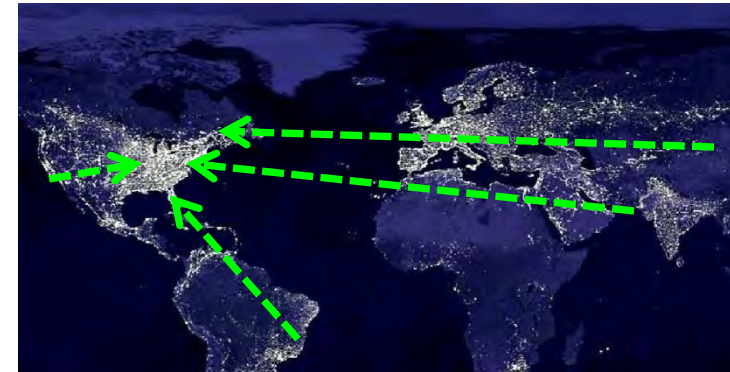
Food Products – Raw, In-Process & Finished;
Imported From Middle East & elsewhere

Vendor Park (Global Consolidation Point)

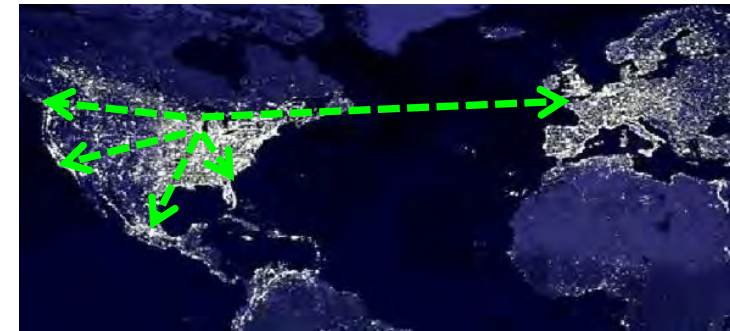
North America Distribution



Inbound Flow - Raw Materials



Outbound Flow – Finished Goods



Plant Support - Printing Industry

MN 4th Largest Printing Market

Rail & Truck Inbound & Outbound

- ✓ Rolls, Flat, Sheet & Pulp
- ✓ 4 - 12,000 lbs. weight per roll
- ✓ 24/7 Operations to meet Scheduling Changes
- ✓ Specialized Handling Equipment
- ✓ Strict RF Controls



U.S. Distribution

Recreation Industry

Canadian Company Covering
Entire U.S. from One Central DC
Operations Include:

- ✓ Item Pick / "Pick-Pack"
- ✓ Case Pick
- ✓ Pallet Pick
- ✓ Small-to-Large Order
- ✓ Custom Labeling
- ✓ Carrier Selection & Mgmt.



Customer Returns Management

“Reverse Logistics”

What happens to your clothes once they reach the final end of retail

savers.
good all around

Clothing – garments shipped overseas for fibers to be separated and reused.

- ✓ A local fashion designer has a clothing line made from recycled threads.

Shoes – rubber soles recycled; fabric used as compost.

Leather Goods – reprocessed into other leather items.



Regional Distribution

Contract Logistics - 5 State Distribution

Beer: Domestic + imports + end-of-isle displays.

- ✓ Operate at 40-55°; keg room at 36°
- ✓ Strict lot control & rotation: “Born-on Date”

Reduces Distributors’ Cash Flow Requirements

Typical Beer activity: 52 turns per year

- ✓ DC Designed for “Flow-through”



Seasonal Space Offsets

Marriage of Offsetting Space Use Periods

Also True With Seasonal Labor Needs Swings

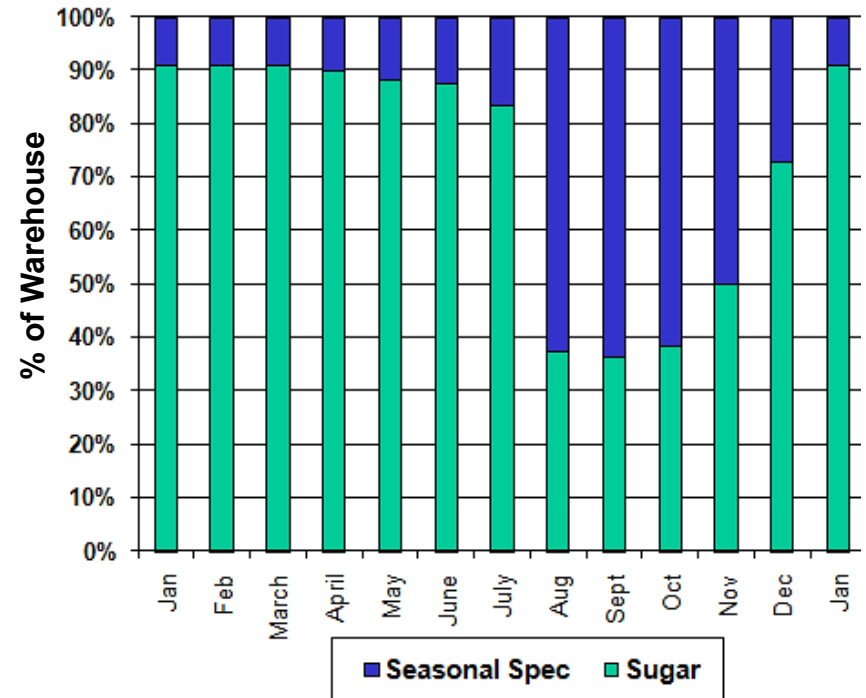
Product & Space Example (*graph*)

Sugar

- ✓ One turn per year.
- ✓ Fall inbound; spring to fall outbound.

Christmas Items

- ✓ Christmas Holiday Season only.



Consolidation & Cross Docking Financial Impacts Driven

Growing interest by “individual” shippers to:

- ✓ Consolidate multiple orders to a region.
- ✓ Hold till enough product ordered to ship full loads.
- ✓ Utilize cross-dock operations to deliver locally.

Growing interest by “groups” of shippers to:

- ✓ Consolidate orders to build full loads for direct TL shipment or to a cross-dock facility.

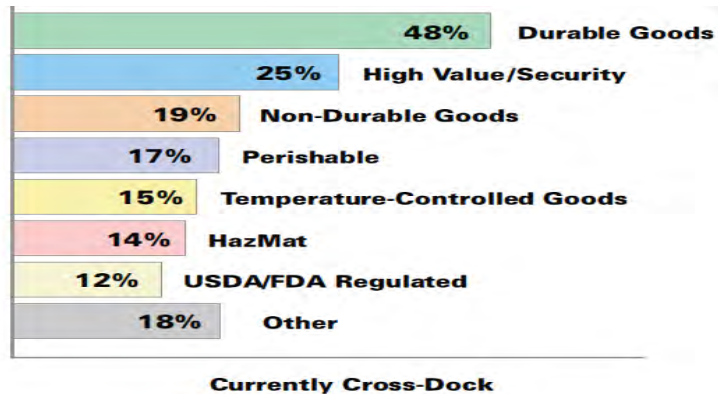
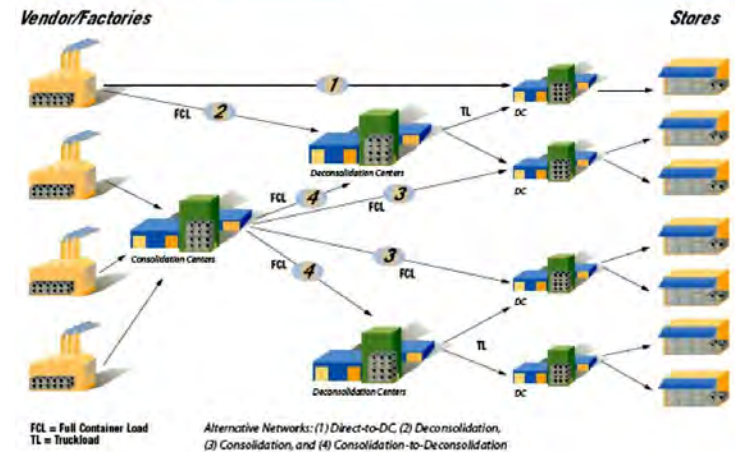


Exhibit 1: Consolidation and Deconsolidation Networks Facilitate Truckload and Full-Container Shipping



Value Added Services “Postponement”

Important Concept in Marketing

- Allows manufacturers to “*postpone*” final format of products
- Reduces total number of SKUs and inventory size
- Allows customization to customer specs at last minute
- Typical services include:
 - ✓ Brand labeling / Packaging (private label)
 - ✓ Order entry and customer service
 - ✓ Kit assembly / Make-to-order
 - ✓ Multi-pak creation
 - ✓ Shelf / end-of-isle display ready
 - ✓ Reverse logistics for store returns
 - ✓ Product repair
 - ✓ Inventory control

Multi-paks



Product Assembly & Packaging



Tray Pack



Halloween Candy Mix packs



End-of-Isle Displays



Value Added Services “Postponement”

Retail Supply Chain – Big User Increasing Important for Retail Sectors:

- ✓ Club Stores
- ✓ Mass Merchandisers
- ✓ Box Retail / Department Stores
- ✓ Auto Stores & Repair Channels
- ✓ Grocery Wholesalers & Retail Chains
- ✓ Super-sized Stores

Project Example

- ✓ Multi-vendor 4th of July promotion
- ✓ End-of-Aisle Displays
- ✓ Master invoicing & coordination

SUPERVALU.



**Cub
FOODS**

Multi Vendor Pallet (MVP) Program

Display ready pallets built at Murphy warehouse and cross-docked at SV Hopkins to the Cub stores.



Advantage
Sales & Marketing



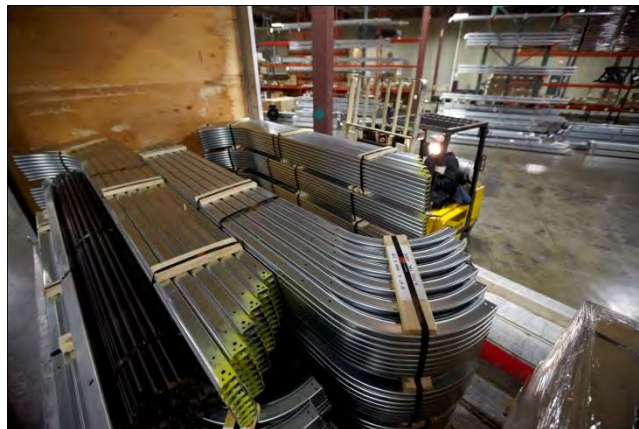
Value Added Services

Custom Fabrication

Fabrication to meet contractor conditions

Overhead Door Components

- ✓ Bending to form
- ✓ Cutting to size
- ✓ Drilling to design

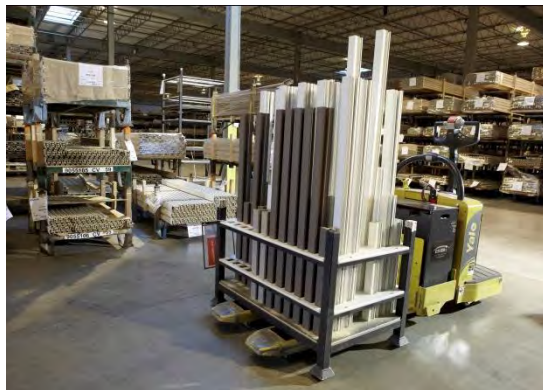
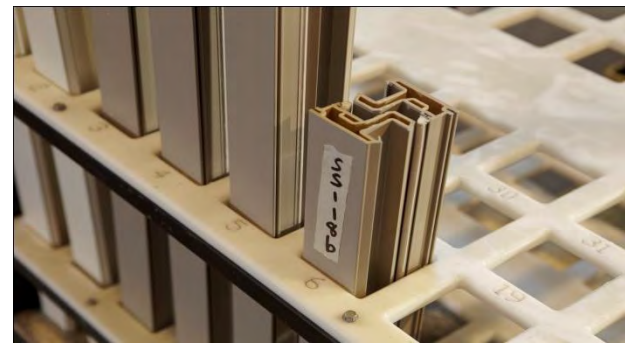


Value Added Services

Custom Fabrication + JIT Plant Support

Component Customization
Production Sequencing
JIT Delivery to Line

- ✓ Cutting to size
- ✓ Drilling to design
- ✓ Lot controls
- ✓ Sequencing



Value Added Services

Custom Product Assembly

Holiday Season Retail Kitting and Packaging

Increasingly Important for Retail Sectors



Fulfillment Services

Whole Other World of Warehousing

Types of Services

Physical Products Programs

- Promotions Processing
- Rebates
- Sweepstakes & Contests
- Coupons
- Retailer / Magazine Product Shipment

On-Line / Electronic / Phone programs

- 800# Call Service Centers
- Customer Service Person
- On-Line Order Processing
- Fraud Control
- Banking / Credit Card Interface
- Web-hosting / Social Media
- FTC Compliance



Fulfillment Services

Whole Other World of Warehousing

Scenes From Inside

- ✓ Small piece bin mgmt. – clothing sizes, business forms, drugs, components, etc.
- ✓ Conveyor sys. consolidation



Fulfillment Services

Whole Other World of Warehousing

Scenes From Inside

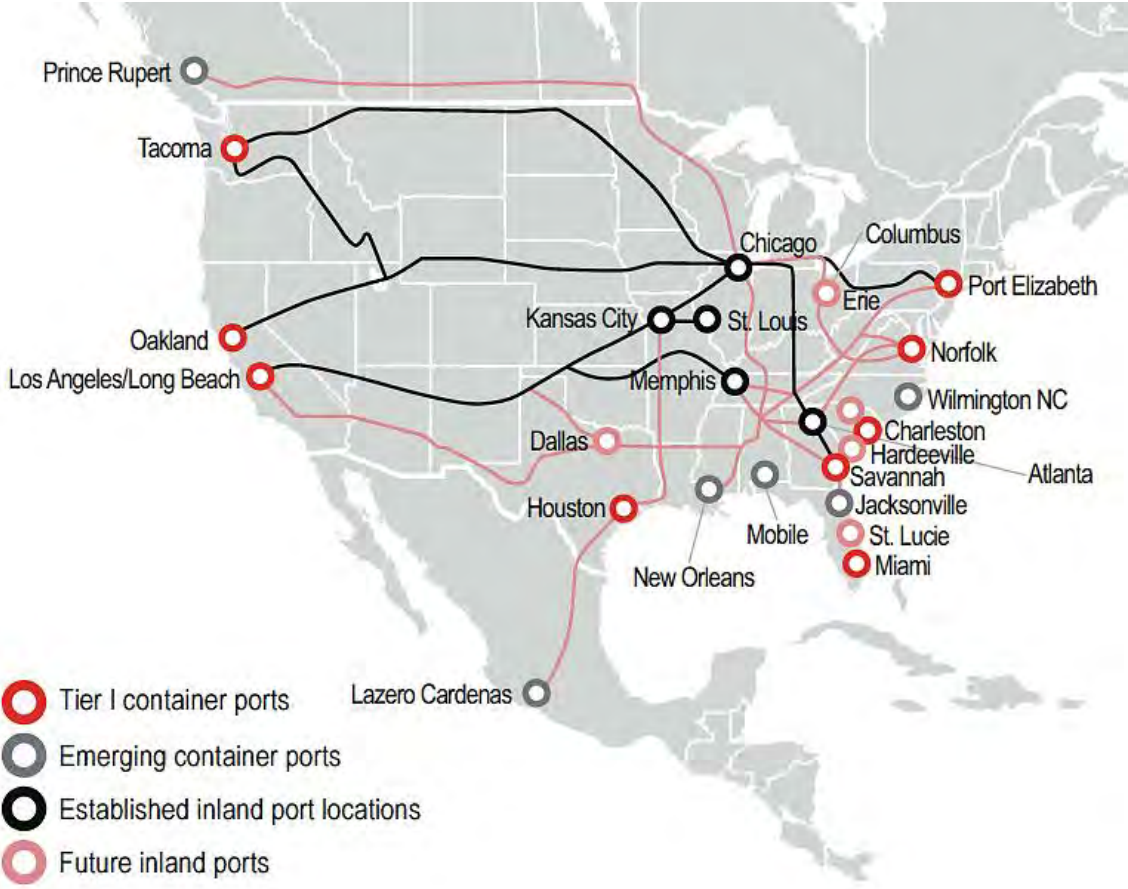
- ✓ Gift card response
- ✓ Pick-n-pack multiple items
- ✓ Pick by “Voice Commands”
- ✓ Small order via UPS / FedEx



Logistics & Real Estate

New Mantra

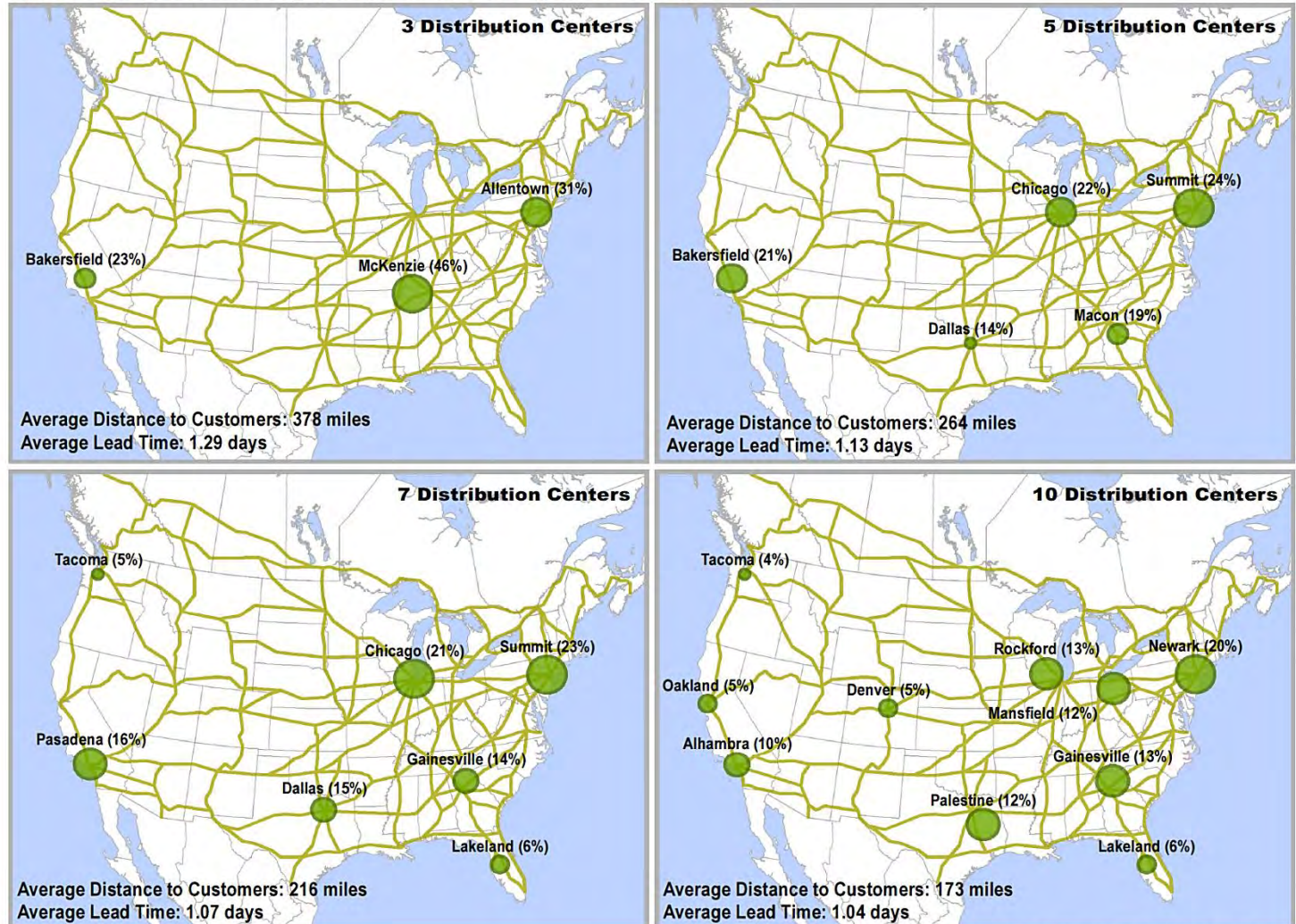
“Location, Location, Logistics”
Old mantra was “location, location, location”



Domestic Network Design

Where And How Many

Optimal Location and Throughput by Number of Freight Distribution Centers



Source: Adapted from Chicago Consulting.

Dr. Jean-Paul Rodrigue, Dept. of Global Studies & Geography, Hofstra University

North America “Mega-Regions”

Eastern Market Still Biggest Impact To Models

Eastern USA Holds 60% of U.S. Population



Domestic Network Design

Increase In Locations

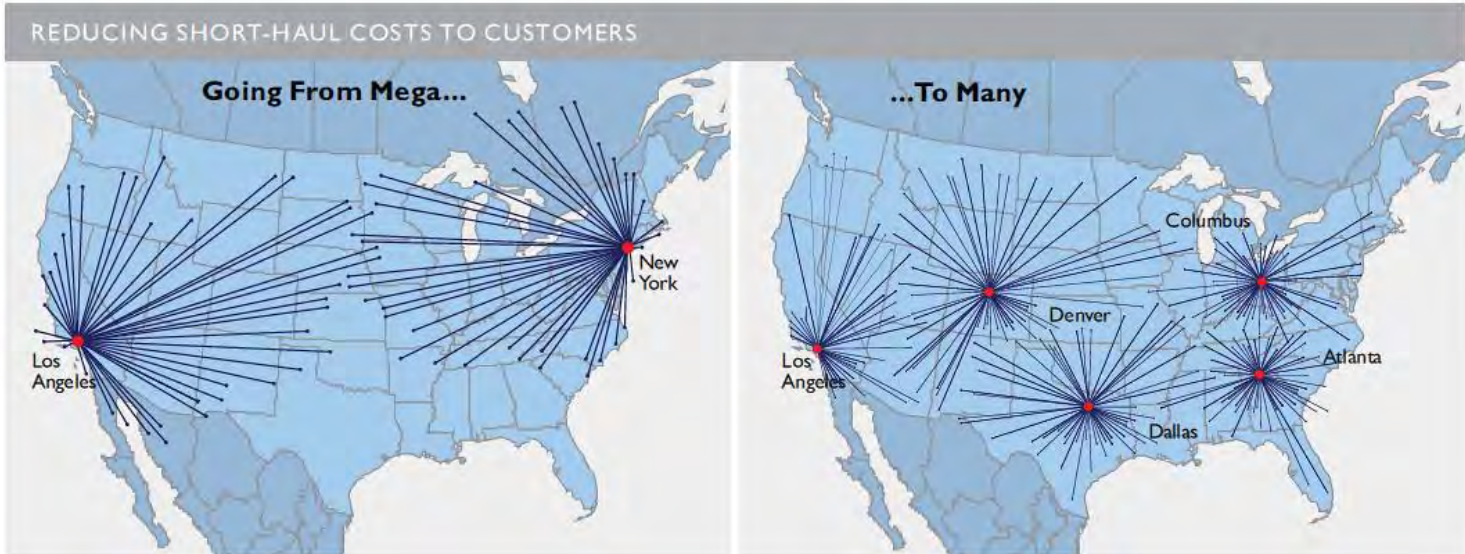
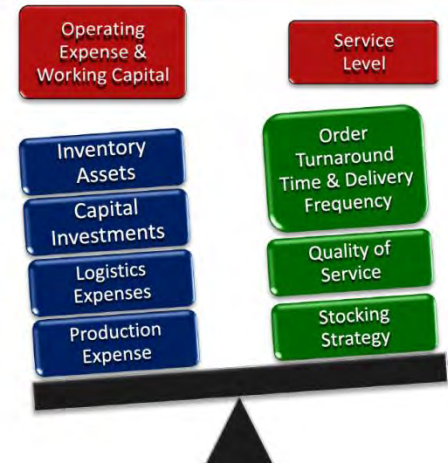
Last 20 yrs trend - fewer & bigger warehouses: 3 - 5 Total

- ✓ JIT, ERP, TQM, Lean Impacts
- ✓ Lower fuel costs helped allowed

Today, attention given to increasing number of warehouses: 6-10 Locations Network

- ✓ Impact of higher local delivery cost (vs. long haul cost) is changing networks.
- ✓ Trend also towards smaller warehouses.

Distribution Network Optimization - The Great Balancing Act



Source: New Age of Trade. Cushman & Wakefield, 2009

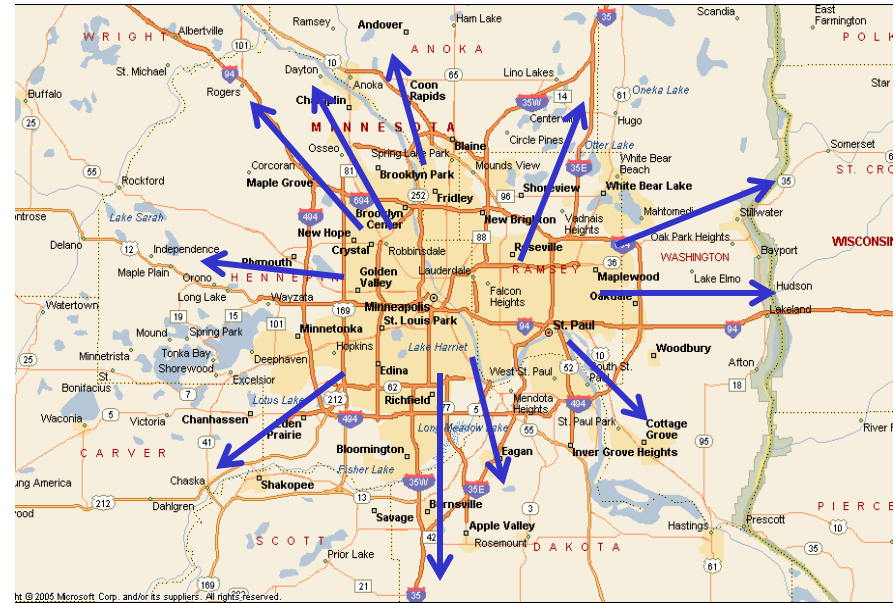


Urban Land Prices Pushing Logistics Campuses Further Out

To Suburban Edge

- ✓ Adding increased transportation time, cost & congestion
- ✓ 500% land price increases on sites near freeway rung system closer to urban center

Big campuses can't be too close to cities, but can't be too far out either



Where to Find Warehouses / DCs Today

Logistics Parks & Corridors – Freight Villages

- ✓ Regional Economic Development Drivers

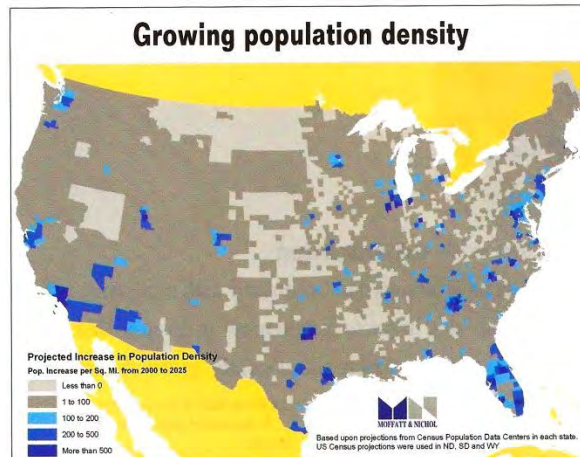



Warehousing in Logistics

Typ. Physical Requirements

Site Location Characteristics

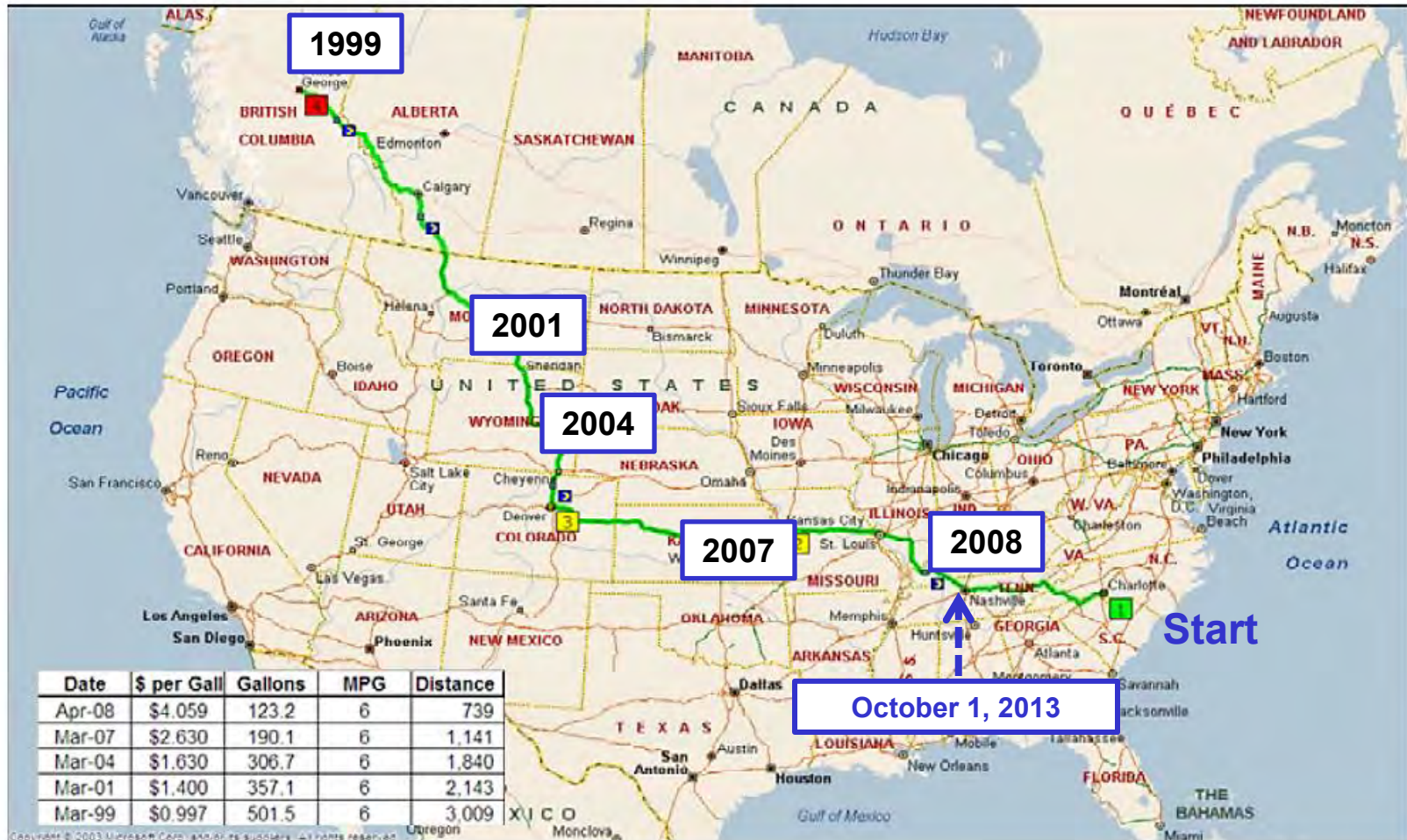
- Good Highway Access
- Near Population Centers – can't be too far away otherwise transportation cost too high
- Flat Land
- Within 10 Miles of Intermodal Yard
- Rail Siding
- 24/7 Access
- Secured Yard
- 32-40' Ceiling Hgt.



Source (for both charts): U.S. Census Bureau; Moffatt & Nichol.



IMPACT: How far a Truck travels on \$500 of Diesel Fuel



Transport Capital Partners, LLC

Source: Stifel Nicolaus – State of Trucking Industry, 2/24/09

Diesel fuel powers the supply chain sector



Logistics Leadership since 1904

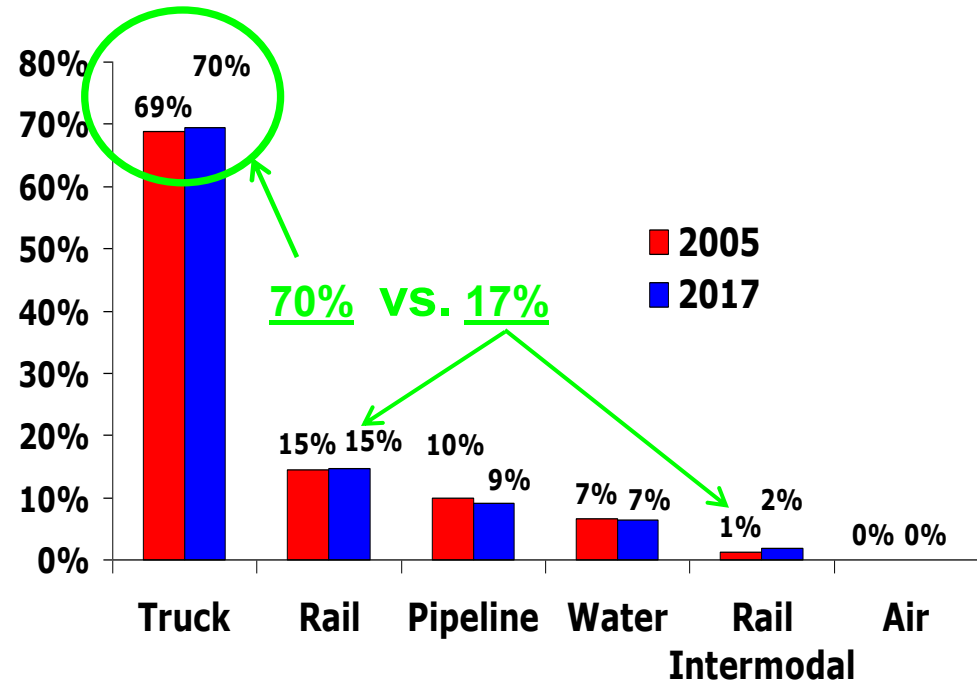
Why Do We Care About Truck Capacity, Driver Shortage and Road Congestion?

Freight Modal Shares
In domestic tonnage

Trucks Handle 70% of all Freight

Trucking capacity issue will
plaque economy for years!
Railroads cannot meet all future
demand for capacity

Will drive prices up...
& shipping delays up...!!!



Source: U.S. Freight Transportation Forecast to...2017



Rail Industry

Issues To Think About

Ugly Sister Syndrome

Passenger Rail is the Friend

Passenger Rail:

- Media loves!!!
- Kids love!!!
- Seen as neighborhood friendly
- The “*green*” alternative

Freight Rail:

- Old, dirty, big, loud, scary....
- “*Not-in-my-backyard*” stigma
- Oil & frac-sand tie therefore sustainability advantage lost in media exposure
- **Desperately needs better media attention!**



Domestic Network Design

Retail / Consumer Demands

20 Year Impact of Big-Box Retailers

Less backroom stock space

Pushed inventory up-stream

- ✓ Merely learning what the U.S. auto industry learned from the Japanese in the 1980's.
- ✓ Reducing cash flow tie-up a factor

Demanding frequent replenishment & smaller orders



However.... "amazon is Logistics"

- ✓ Amazon has impacted to the point where Target, Best Buy & Wal-Mart in 2011 announced plans to build smaller stores.
- ✓ The stores would carry prime movers and have internet order pick-up services.
- ✓ Speculation in industry that bigger, central DCs may make a come-back to serve this segment.

VS.



Domestic Network Design

amazon.com Impact

55 New DC's Over Last 4 Years!

Fulfillment Services Have Created Major Competition for all Retailers



Put Amazon's Fulfillment Technology to Work for You.

You sell it, we ship it. Amazon has created one of the most advanced fulfillment networks in the world, and your business can now benefit from our expertise. With Fulfillment by Amazon (FBA) you store your products in Amazon's fulfillment centers, and we directly pack, ship, and provide customer service for these products.

Enjoy these benefits when you use Fulfillment by Amazon.

FREE Super Saver Shipping
ON ORDERS OVER \$25.00

Eligible for FREE Super Saver Shipping and Amazon Prime

Customers love FREE Super Saver Shipping and Amazon Prime. FBA Listings on Amazon.com™ feature these delivery messages increasing awareness of product eligibility for free shipping.

*Excludes Multi-Channel Fulfillment orders from other websites and services including Amazon WebStore and Checkout by Amazon.

Competitive Pricing

Your FBA listings on Amazon.com are sorted by the item price without a shipping cost. Amazon assumes they will ship for free with FREE Super Saver Shipping or Prime, which gives you an edge when competing!

Your Customers are Amazon Customers

Trusted Customer Service and Returns

FBA listings are displayed with the "Fulfillment by Amazon" logo, so customers know that packing, delivery, customer service and returns are all handled by Amazon.

Fulfill Orders from other Channels

FBA can fulfill your orders from other sales channels from your inventory stored at an Amazon fulfillment center. You manage your inventory through a simple online user interface, and can direct us to return the inventory in our fulfillment centers at any time.



Same Day Shipping amazon.com Impact

The New Frontier

Amazon has put drop lockers in grocery stores for consumer pickup

Geared to apartment dwellers who don't trust neighborhood thieves

The New York Times | Technology | Personal Tech | Business Day



OCTOBER 26, 2012, 5:32 PM | 18 Comments

Google Is Testing Same-Day Delivery for Shoppers

By CLAIRE CAIN MILLER

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Google is now in the same-day delivery business. In San Francisco, some people affiliated with Google can buy a product, using their phones or computers, and have it delivered to their homes in a matter of hours.



November 8, 2012

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in case you missed it



Why same-sex marriage affects my marriage



Minnesota Poll: Marriage vote splits state in two

Wal-Mart will test same-day delivery in Twin Cities

Article by: JOHN EWOLDT, Star Tribune | Updated: October 9, 2012 - 9:20 PM

The Twin Cities area is one of four testing grounds for a move aimed at Amazon - and Target.

BloombergBusinessweek Technology

- Global Economics
- Companies & Industries
- Politics & Policy
- Technology
- Startups & Finance
- Innovation
- Lifestyle



Photograph by Joshua Lott/Bloomberg

E-Commerce

EBay and Amazon Eye Same-Day Delivery

When every minute counts, turn to FedEx SameDay®.

For those times when you can't afford to wait another day, FedEx SameDay is the fastest shipping option available to you. Reliable door-to-door delivery of your time-sensitive shipments within only hours.



Fast. Fast. Fast.



Shipping within your city is easy.

Same Day Shipping

The Coming Frontier

New Grocery Shopping in Korea
Smartphone Shopping at Rail Stations
Food Delivered to Home

Impact: *“More small delivery trucks”*



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