Collaborative Logistics in a Market-Driven Environment

A Discussion on Moving the PI Forward in the United States

Participants

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- Adrian Grigg, FLEXE
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- CELDi Research Team
  - Chase Rainwater, U of Arkansas
  - Kimberly Ellis, VA Tech
  - Phil Kaminsky, Berkeley
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Preliminary thoughts

- We might need to be careful with our words
  - Collaboration and shared
- Has the idea of the PI changed?
  - Open, connected network used widely
  - Individual companies form the “PI?”
- Different perspectives must be addressed
  - Including logistics, technology, and business
- Role of government and free markets

Logisticians Perspective

Logistics is very important

- US (2012)
  - 48M tons of freight valued at $46M is moved *every day*
  - 71.5% by truck (145B miles, 28.7B gallons of diesel fuel, $114B at $4/gal)
  - Transportation section about 10% of GDP
- EU-28 (2013)
  - 6,027M tonne-km moved *every day*
  - 74.9% by road, 18.2% by rail, 6.9% by inland waterways
  - 4.6% of GDP (+1.7% if manufacturing of transport equipment is included)

It is a significant economic driver

- US
  - Impacts 7.5 million businesses and 300 million consumers
  - Employs over 6 million people
    - 2nd largest employment sector
  - 270,000 new jobs annually through at least 2018
- EU-28
  - Employs over 10 million
    - 4.5% of total EU employment (+1.5% for manufacturers of transport equipment)

Focusing on the US …

… we have a problem

- Logistics systems are currently underutilized
  - Between 15 & 25% of U.S. trucks on the road are empty
  - Non-empty trailers are 36% underutilized
- Over $25B a year spent on diesel fuel alone repositioning assets
  - And associated carbon emissions
- Similar underutilization statistics for storage

Evidence suggests collaboration will have significant impact

- Manufacturers can cut 35% off logistics distribution costs
- Retailers can cut costs as much as 45% through more collaboration for retail product distribution
- There are success stories and promising research

So isn’t the solution obvious?

Maybe, but it hasn't worked very well in the US

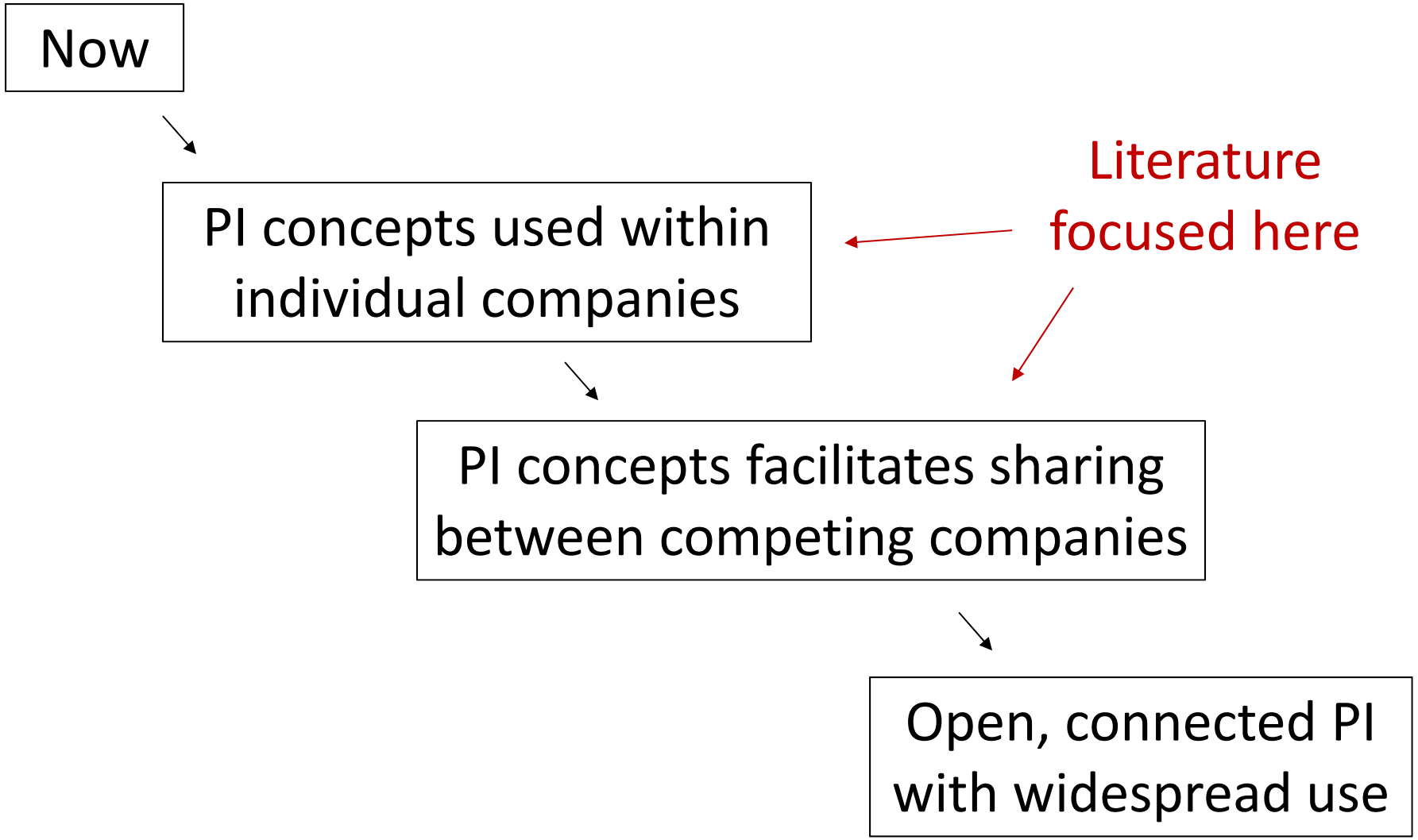
- Survey a few years back indicated success rate for collaborative efforts in the US is only 20%
- Collaboration efforts are "more likely to fail than to succeed"
- Several studies that suggest many collaboration efforts fail to meet the expectations of the participants

But sharing and collaborating are different.

Maybe.

But maybe the underlying reasons for lack of successful collaborations will prohibit successful sharing as well and doom the PI along with anything like it.

A possible path to the PI



There is/are lots of

- Success stories
  - One-off examples
  - Some quantitative assessment
- "Best case" benefits analysis
- Qualitative discussion on why collaborative logistics should be a good idea
- Failures

There is little discussion of

- "Definitive" identification of the key questions that must be addressed to move towards a more efficient logistics system.

- Roles that academia versus industry versus government should be playing in this effort.

There are some challenges - especially in the US

- Customer expectations are increasing especially in terms of delivery time and frequency
- Innovation has historically been driven by free market forces
- The PI can be viewed as a direct competitor of third-party providers
  - Make money off of their ability to deliver goods more efficiently than their competitor
  - Not in their best strategic interest to be early adopters

All Hope Lost?

Europe is Moving Forward

- Modulushca

- Alliance for Logistics Innovation through Collaboration in Europe (ALICE)

Concepts with Collaborative Implications in the US

- Trucking
  - Uber trucking
- Warehousing
  - FLEXE
- Mixing Centers
  - Ryder and ES3
- The current United States efforts in collaboration are
  - Evolving from the bottom-up
  - Driven by new customer requirements
- There is much to learn from these industry leaders

Logisticians Perspective

Future

Business Perspective

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Real-world Experiences

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Bill Loftis

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POV: The CPG industry needs shared networks

	Merchant Better Service	Logistician Lower Cost	Sustainability More Sustainable
Current State: *Dedicated* Networks			
Proposed Future State: *Shared* Networks			

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Kurt Salmon

Toward a Physical Internet: Meeting the Global Logistics Sustainability Challenge

Selections from a Case Study

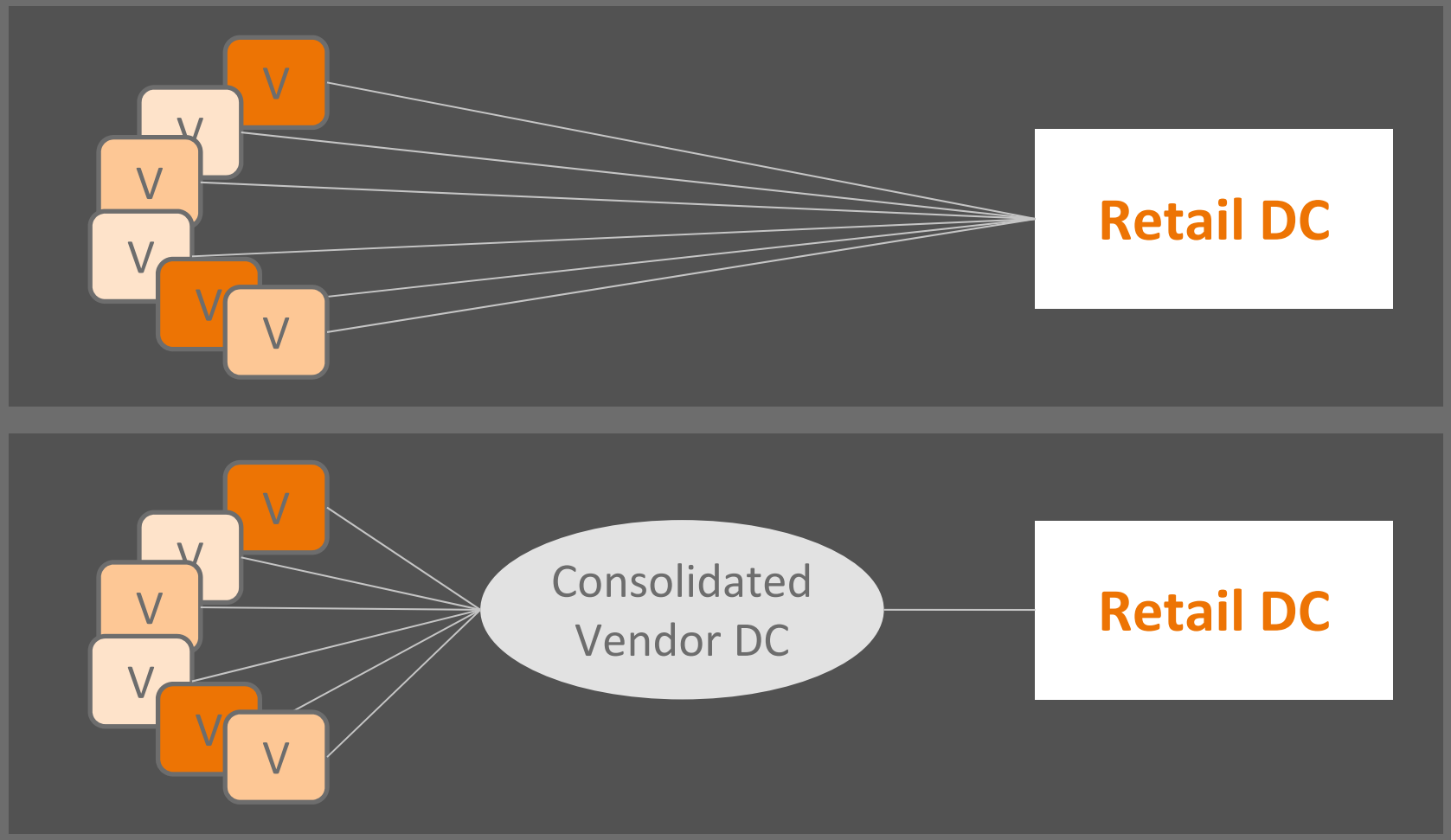
Agenda for Discussion

01 Dedicated vs. Shared Resources

02 Case Study Example

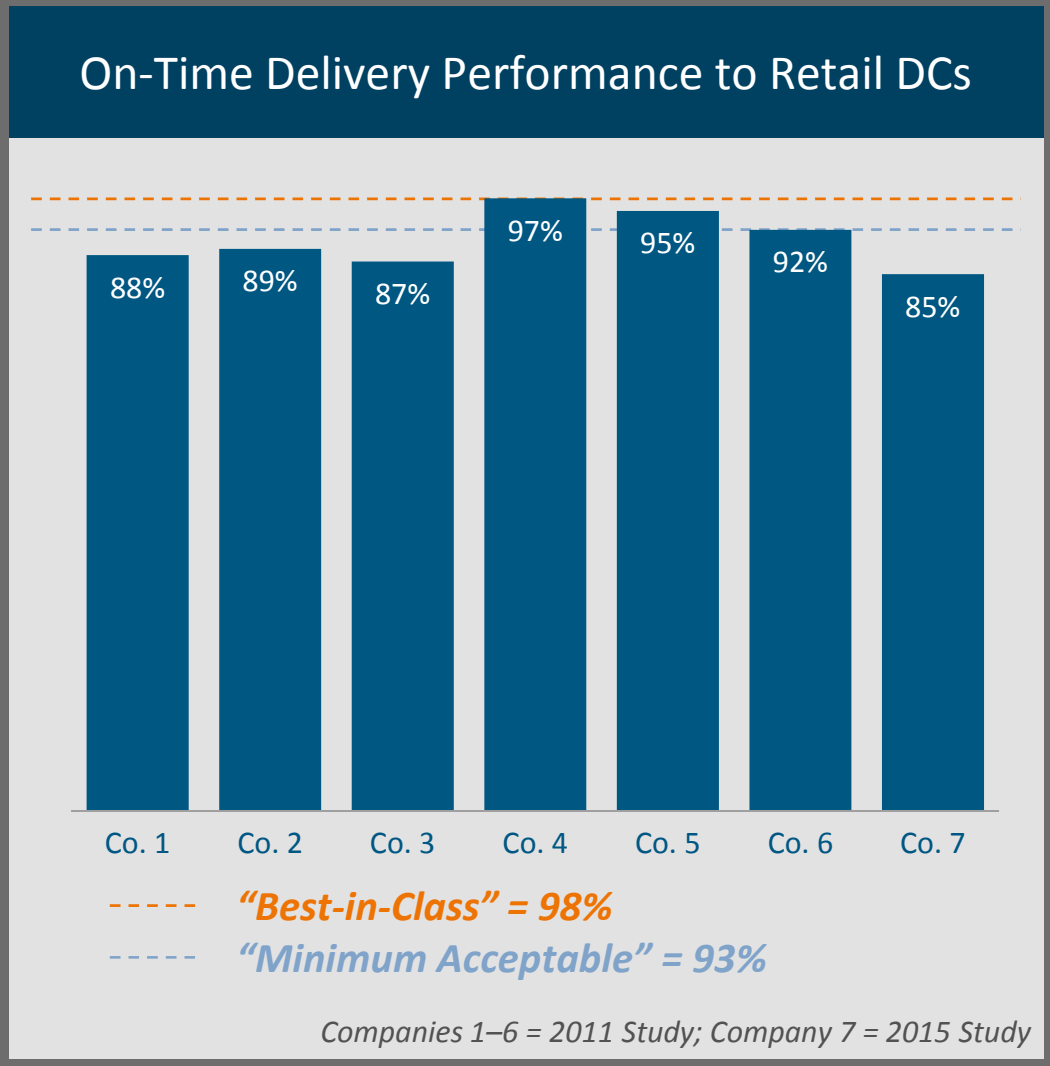
03 A Path Forward

Dedicated vs. Shared Networks



Dedicated Networks Struggle with Service

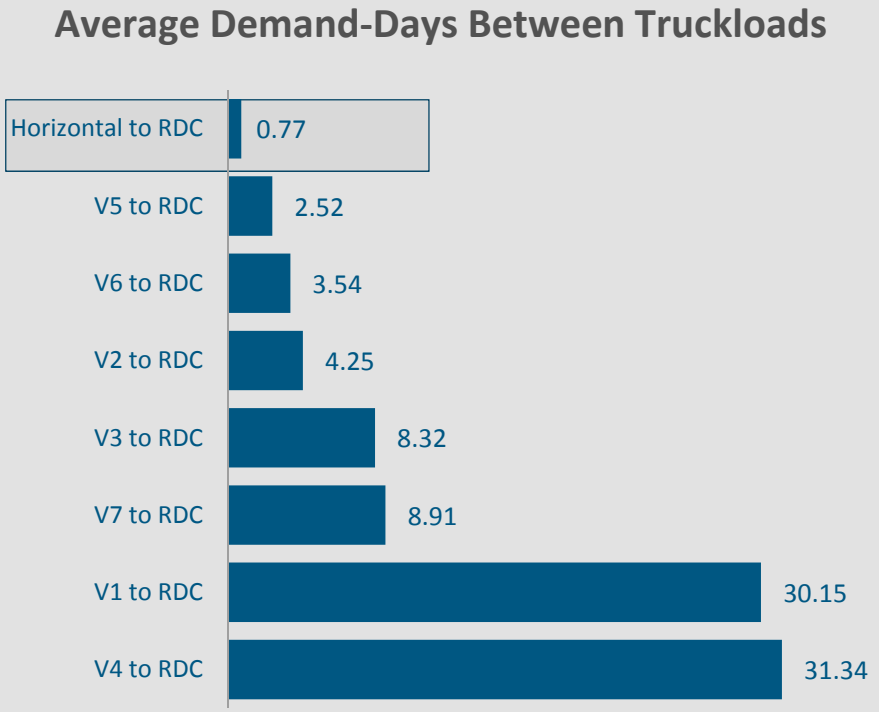
- Dedicated long-haul networks are service challenged
- A 2011 customer service study found that:
  - 4 of 6 major CPG companies could not meet minimum accepted performance standards
  - None met "best-in-class" performance
- Recent performance is no better and arguably will get worse



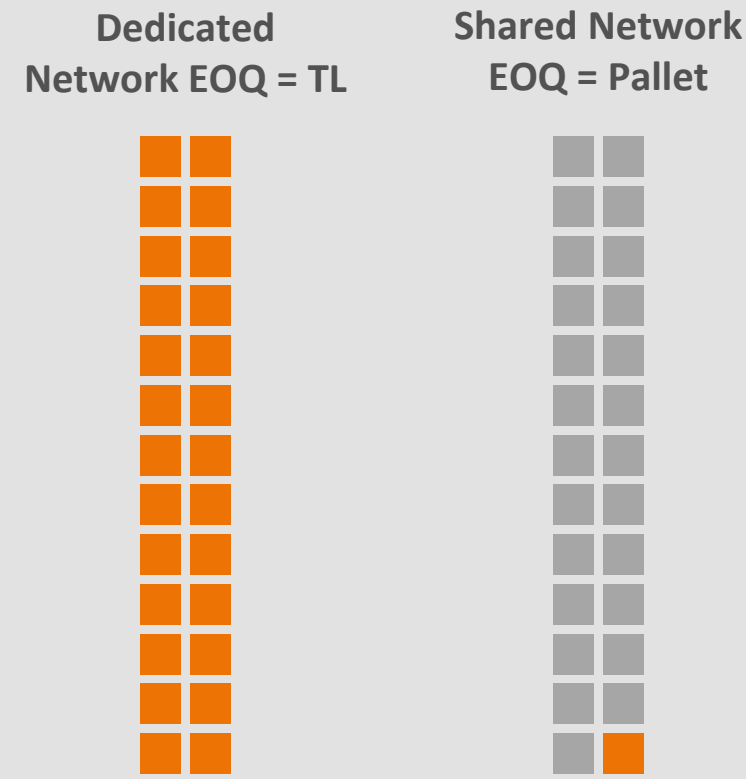
Notes:
2011 Benchmarking study by author; shipper performance ranged from 87% to 97% OT same day
2015 Example CPG data point

Shared Networks Allow More Frequent Orders in Smaller Quantities …

Density reduces order frequency to less than 1 TL per day



Shared trucks enable changing the EOQ from a TL to a pallet (or layer)



Source: Analysis of 7 major CPG vendors into regional grocery network

…Profoundly Changing Capabilities and Business Results

A shared network has the capability to deliver:

Small quantities	On any day
Over short distances	At no extra cost

Retailer Results

- Increased sales (higher on-shelf availability)
- Reduced inventory requirements

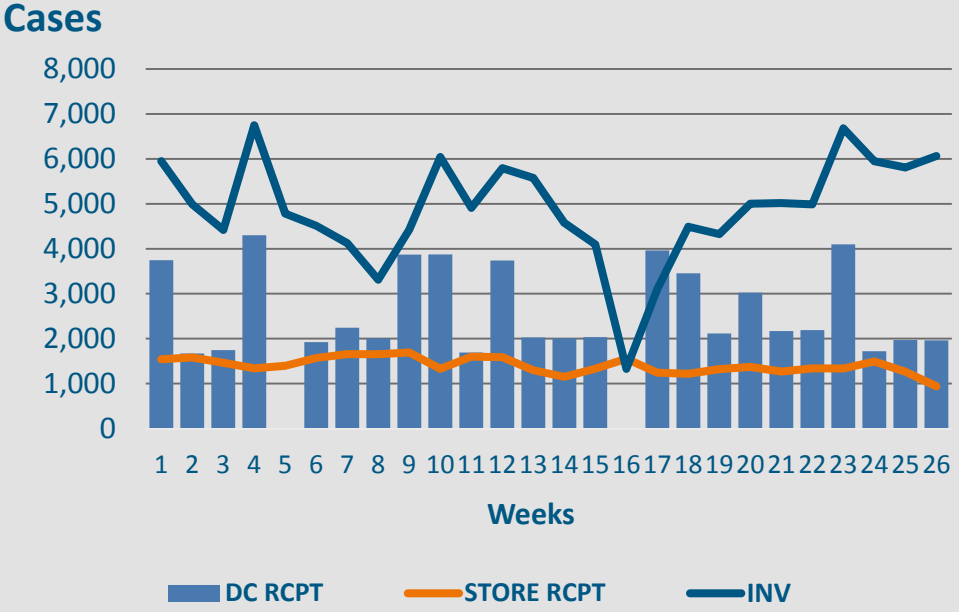
Vendor Results

- Increased sales (higher on-shelf availability)
- Enhanced strategic relationship

Inventory Variability Is A Common Problem

On-Time Delivery Performance to Retail DCs

Example: V1–DC 1



Variability Drivers:

Ordering Issues

- Deals
- Poor data maintenance
- Inconsistent buying practices
- Lack of vendor-specific data
- Influence of pricing brackets

Logistics Issues

- Inbound variability (2–3 days)
- Vendor fill rate
- DC congestion
- Weekend arrivals

Regardless of consistent demand, dedicated networks often create inventory variability

Source: Kurt Salmon client analysis; DC_RCPT, RCPT and DC_INVT Data, 10/5/2013– 4/26/2014

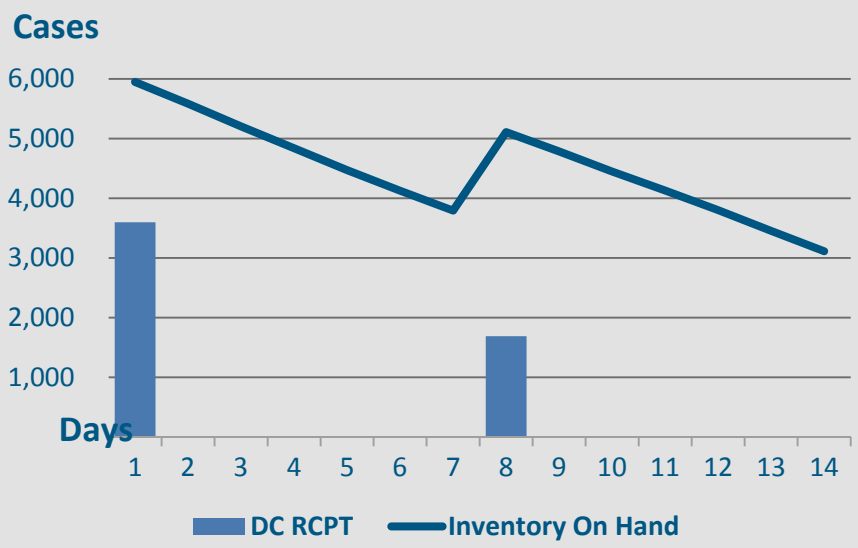
Modeling Assumptions for Shared Network (SN)

	Current State Regional*	Shared Network	SN Reasoning
Source Locations	Current Origins	York, PA/ Atlanta, GA	Proximity to RDCs; available 3PLs
Order Frequency	5 to 50 days	1 day	Daily mixed truckload deliveries
Minimum Order Quantity	Layer	Layer	Consistent SKU level MOQ
Lead Time	4 to 11 days	3 days	Normalized lead time for all vendors
Lead Time Variability	+/- 3 to 15 days	+/- 2.5 days	More consistent and reliable lead time
Service Level	92%–97%	99%	Shorter, scheduled deliveries

*Current-state regional assumptions are unique for each vendor. Ranges reflect observations from selected SN vendor set.

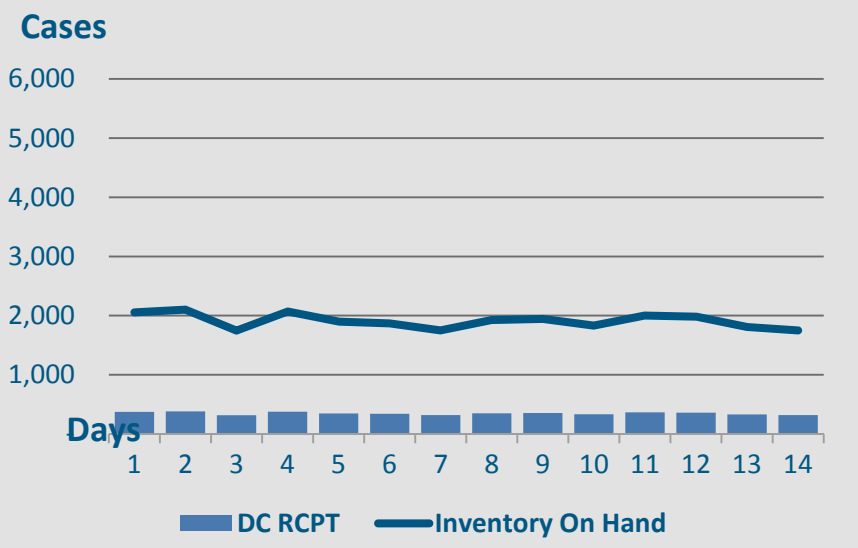
Inventory Modeling Results

Current-State Product Flow
Example: V1–DC



1.4x/week DC receipts
11.8 DOS, avg. inventory on hand—4,130 cases

Shared Network Product Flow
Example: V1–DC



Shared Network Product Flow

Modeled inventory requirements reduced 56% on average by vendor (ranged from 38% to 75%)

Order lead time—7 days (current) vs. 3 days (horizontal)
Lead time variability—4.9 days (current) vs. 2.5 days (horizontal)
Service level—97% (current) vs. 99% (horizontal)

We Are Currently Researching Vendor Benefits

Hypothesis:	The most interested vendors are:
• Increase sales via greater on-shelf availability • Satisfy any item service need with no transportation penalty • Increased sales by virtue of favored partner status	• Service and sales focused • Sustainability focused • Desirous to proactively control transportation capacity

A Path Forward

> We piloted the concept and discovered that almost all the benefits went to the retailer. If the retailer had changed any policies, for example, if they allowed an additional 3 or 4 promotions per year, it would have been sustainable and a big win.

- Director Supply Chain Strategy, Large CPG Manufacturer

Key Steps:

- Show retailers the benefits and ask them to lead
- Engage category managers and business people along with logisticians
- Ask retailers to provide favorable policies to incent selected vendors to participate
- Design a pilot project with an interested 3PL to measure a proof of concept

For a greater cause…thank you!

Better Service

Lower Cost

More Sustainable

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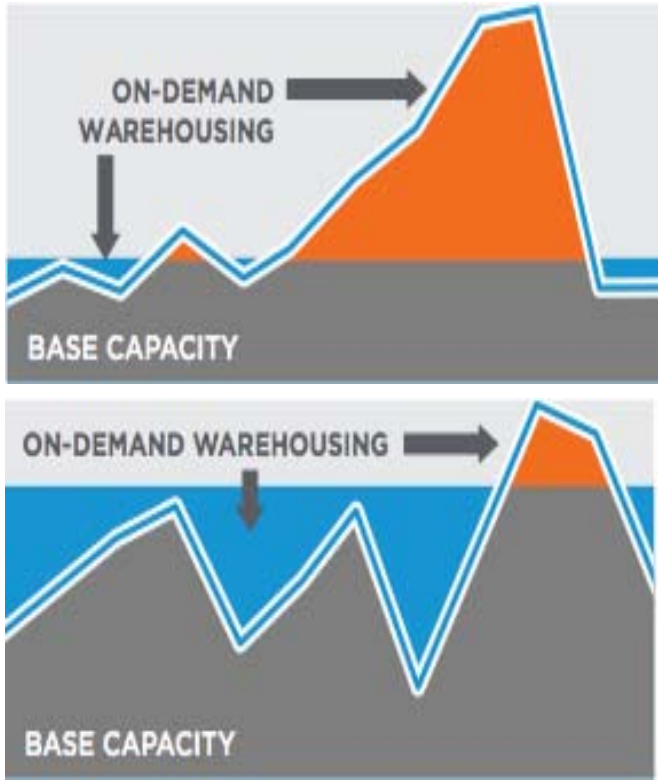
FLEXE – Dynamic & Hyper-Connected Warehousing

IPIC – June 29, 2016

The Fundamental Problem About Warehousing:
It's Underutilized, or Overflowing



- **Warehousing capacity comes in static chunks:**
  - Fixed footprints
  - Long-term leases
- **But, space needs are dynamic:**
  - Business seasonality
  - Advantageous buying scenarios
  - Unforeseen product demands
  - Shifting sales channels – i.e. eCommerce
- How has the industry traditionally solved this issue?
- The Case for: ***On-Demand & Collaborative Warehousing***

FLEXE: A Connected Network of “On-Demand” Warehouses

Access to large + flexible warehouse footprint drives supply chain flexibility

Warehouse Operator

Have capacity

- ✓Empty space coverage
- ✓No cost / low risk
- ✓Low commitment
- ✓Easy
- ✓Scalable

Lists space/services →

← Buys space/services

Goods Owner

Need capacity

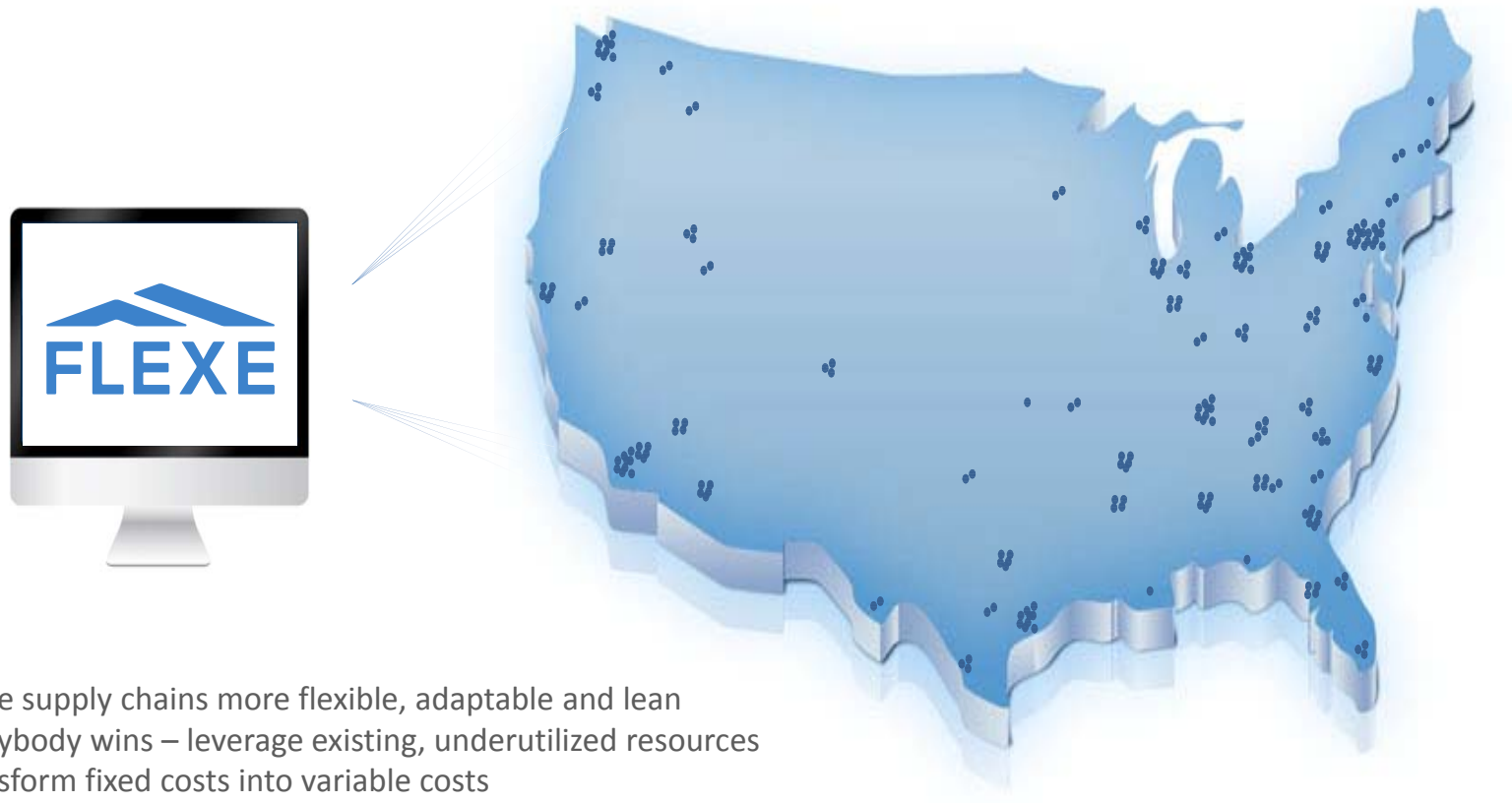
- ✓On-demand network access
- ✓No fixed costs
- ✓Low commitment
- ✓Easy
- ✓Scalable

↓

- Reduces friction
- Enables control
- Drives efficiency

Vision: A Connected Network of 1,000's of Warehouses

A Global "Spot Market" for Warehousing

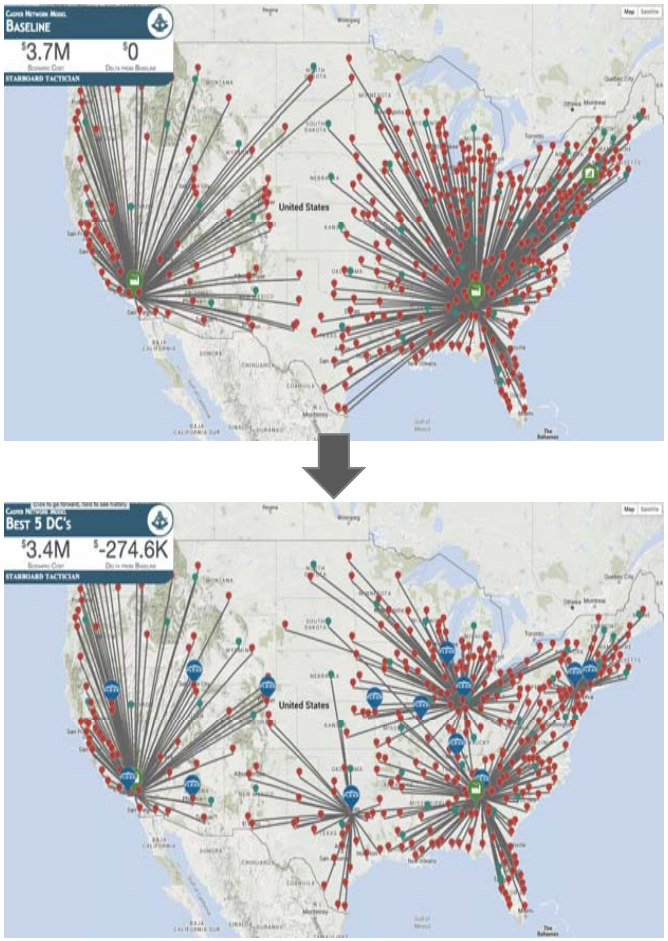


- ✓ Make supply chains more flexible, adaptable and lean
- ✓ Everybody wins – leverage existing, underutilized resources
- ✓ Transform fixed costs into variable costs
- ✓ Increase supply chain speed and responsiveness

RM1

Pop-Up Distribution – Dynamic Warehouse Footprints

- **The Changing Face of Retail: The New Normal**:
  - eCommerce consumer expectations
  - Minimized (or free) shipping costs
  - Solving for 10X+ peak volume swings
- *True Network Optimization* is not a constant formula
- The Challenge: Minimizing fixed costs and long term commitments
- Tech & The Sharing Economy: Unlock & leverage existing capacity.



Slide 41

RM1 maybe future flexibility for demand changes is a good point to mention here? i.e. your customers may change, products may change, etc.

Ryan Morel, 2/25/2016

Collaboration Meets Warehousing – The Shared Economy

What's holding us back?

- PI - Standardization & infrastructure may be a ways away.
- Technology and some simple guiding operating principles.

What are the benefits? It's a win-win for all:

- Shippers ("Clients"):
  - Get closer to the customer: Improved service, reduced cost
  - Solve your space constraints
  - Capitalize on advantageous buying scenarios

- Service Providers (3PL or 1PL):
  - Added revenue streams, or cost coverage
  - Maintain continuity of permanent labor
  - Gain numerous different economies of scale

Matt Rzucidlo

CUSTOMER
1ST
SUPPLY
NETWORK

PI Conference - June 30, 2016

ES3

Customer First Supply Network

CUSTOMER 1ST SUPPLY NETWORK

Plant | Mixing Center | Retail DC | Transportation | Store | Customer

Traditional Supply Chain

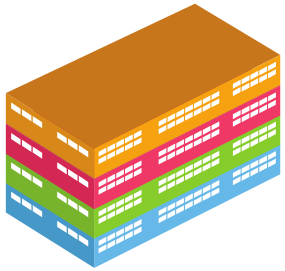
Customer First Supply Network

Current Delivery Options

CUSTOMER 1ST SUPPLY NETWORK

The customer wants

CHOICES!



PERSONAL

Instacart

POSTMATES

Google Shopping Express

HOME

amazon fresh

freshdirect

SAFEWAY

Peapod

relayfoods.com

CLICK N' COLLECT

hannaford to go

Rosie

Harris Teeter

Walmart

ToGo

curbside

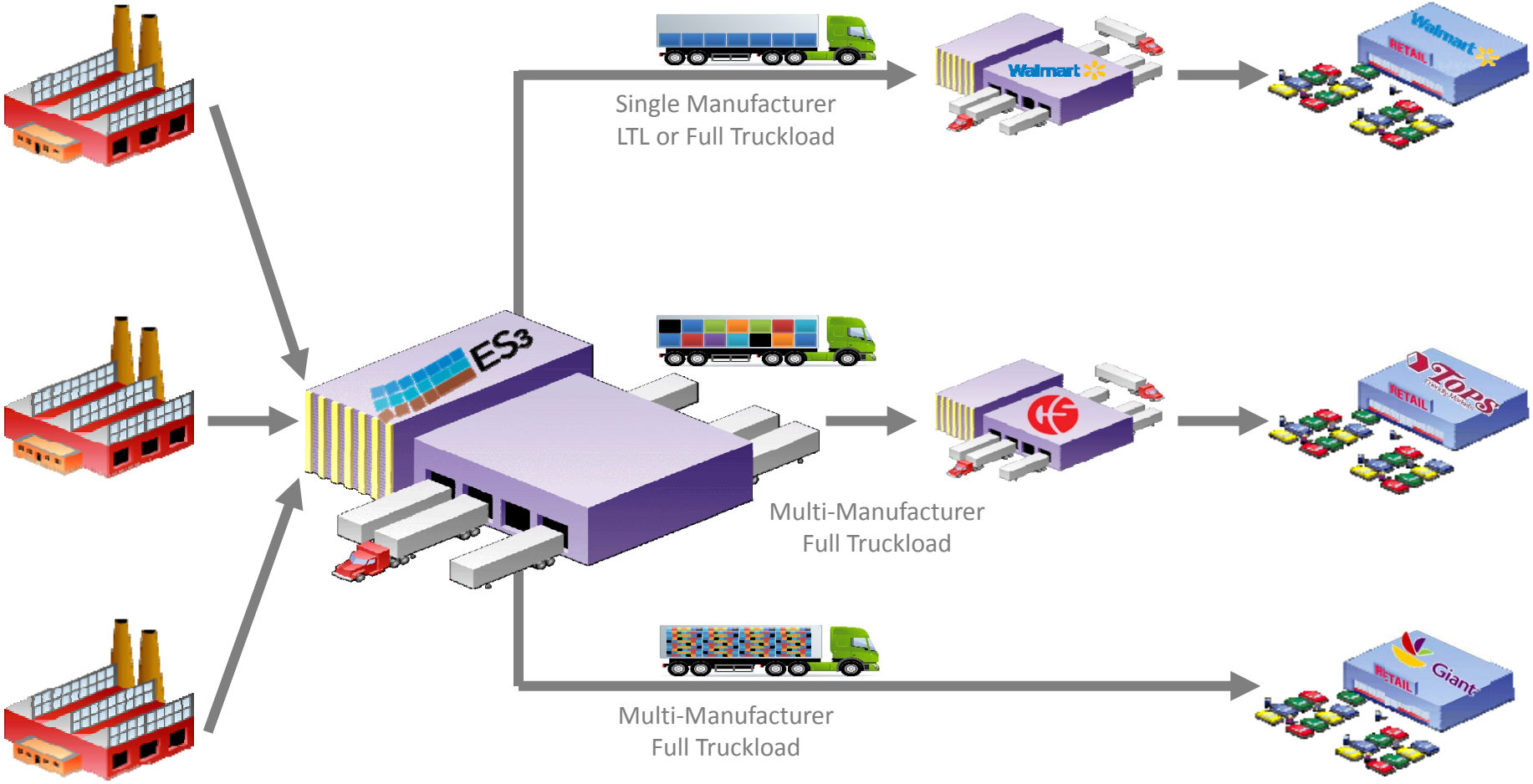
TRADITIONAL

MWG MYWEBGROCER

Winn-Dixie

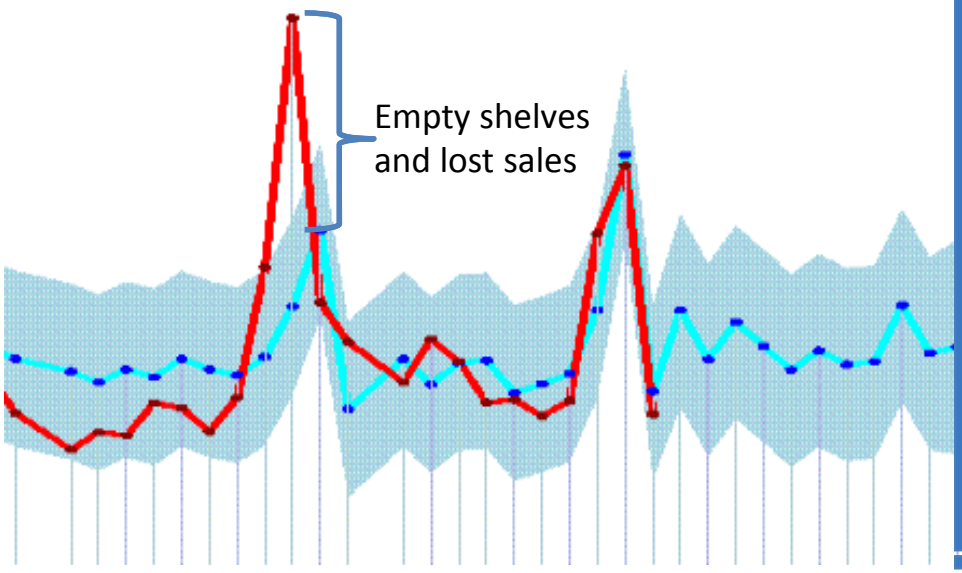
BI-LO

CUSTOMER 1ST SUPPLY NETWORK



Speed

The solution to forecasting errors is not empty shelves



Order to Delivery Speed

It is
faster delivery cycles

D2S
<18 hours

Consolidated
<24 hours

Regular Truckload
<48 hours

Savings: Transportation

CUSTOMER 1ST SUPPLY NETWORK

- Manufacturers' full truckloads average 38,000 CAW
- ES3 guarantees 42,000 CAW on collaborative shipments
- That's a 10% transportation savings on all collaborative shipments

Savings: Transportation

- Typical Northeast retailer unloading accessorial is $160 per truckload
- ES3 caps accessorials at $75 per load and manufacturers pay their share of that based on their share of the truck
- That's a 53% savings in accessorials

No additional unloading or lumping fees
No fines for bill of lading compliance
No fines for label compliance
No fees for pallet quality

Open Discussion

- Collaborative logistics must be initiated by the retailer
  - Type of incentives
  - How do you reach a critical mass?
- Government intervention is necessary for widespread adoption
  - What are the minimum requirements that gov't need to impose?
- What businesses can be created to support a widespread collaborative logistics network and what would be their basic business model?