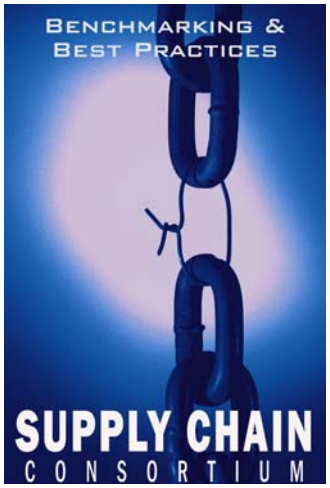
Supply Chain Benchmarking and Best Practices Consortium

Supply-Chain World

North America 2006

March 27, 2006



Supply Chain Consortium Model

Vision:

To become the premier destination for supply chain benchmarking and best practices knowledge.

Mission:

Provide companies the forum and tools to document and extract knowledge on their supply chain performance and opportunities for improvement to achieve world-class status.

Requirements of Success:

- Strong Industry Leadership
- World-Class Tools
- Right Participants
- Member Centric
- Excellence in Networking

Leadership and Content

Strong Leadership:

Broad Content:

- Profile
- Inbound Orders
- Truck Transportation
- DC Operations
- International
- Ocean Transportation
- Dedicated Fleet
- Supply Chain Technology
- Air Freight and Parcel
- Order Fulfillment – Internet/Catalog
- Demand Planning
- Supply, Distribution and Transportation Planning
- Supply Chain Network Design

Building Momentum

Question Refinement:

- 2004 – 2,900
- 2005 – 7,600
- 2006 – 9,000

Right Participants:

- 2004 – 50 Retailers
- 2005 – 80 Retailers and Industry leaders
- 2006 – Goal is 200

World-Class Tools:

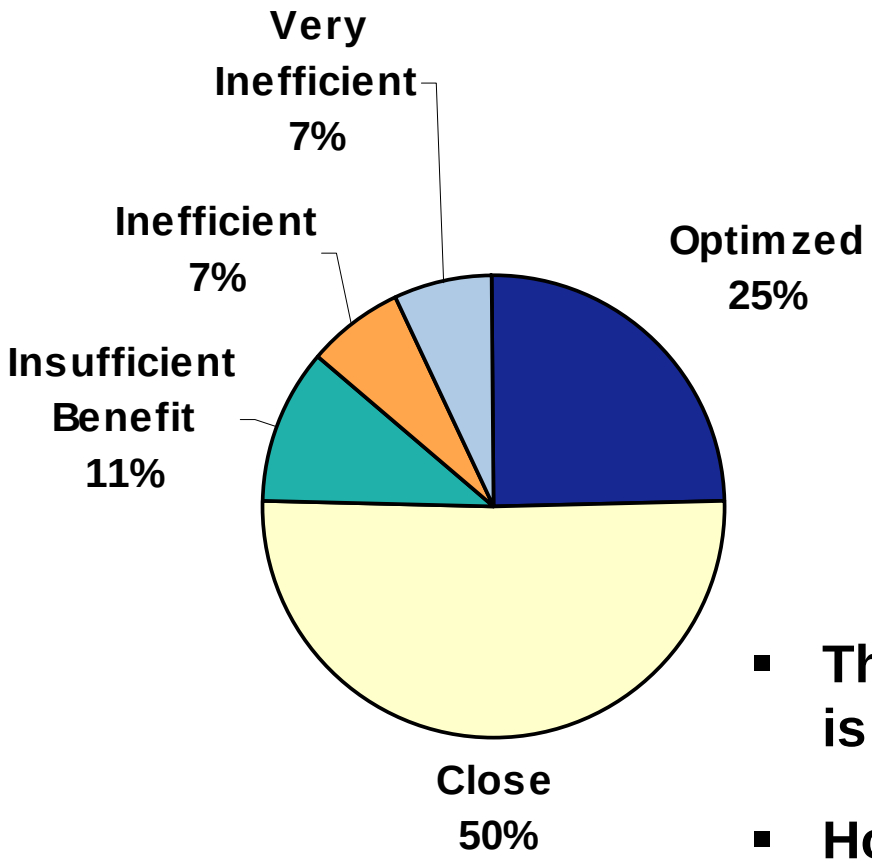
- Web Interview Process
- Search
- Online Queries
- Peer Networking

Highlighting a Few Points in a Few Areas Today

- **Overall Supply Chain**
- **Distribution Center Practices and Trends**
- **Vendor Collaboration**
- **High Velocity Inbound Orders**
- **International Trends**
- **Ocean Ports**

Overall Supply Chain

Overall Supply Chain - Network Design



- **The focus on network optimization is improving.**
- **However, 24% of members indicate that their network design has not been reviewed in over 3 years.**

Overall Supply Chain – Performance Metrics

Supply Chain Performance Metrics

Operational Metric	------ Performance ------ Current	Target	Targeted Improvement
Transportation costs*	2.97 %	2.79 %	6%
DC operations costs*	2.98 %	2.81 %	6%
Inventory turns	6.0 turns	6.7 turns	12%
Supply chain overhead costs*	1.34 %	1.27 %	5%
Days purchases outstanding	44.6 days	45.0 days	1%

* As a % of COGS or Revenue

- **Significant cost reductions possible.**

Overall Supply Chain - Transportation Mode Shifts

As supply chain networks become more efficient, the trend is toward more efficient transportation modes.

Trends in Domestic Transportation Mode Usage

Domestic Shipping Mode	More	Avg % Change	Less	Avg % Change	No Change
Truckload -- excluding TOFC	69%	11%	19%	13%	13%
Rail Intermodal (TOFC and non-ocean COFC)	70%	9%	2%	45%	28%
Inbound consolidation (Pool)	58%	17%	17%	4%	25%
Rail (Boxcar)	21%	6%	8%	8%	71%
Parcel	22%	13%	26%	12%	52%
Air Freight	10%	9%	27%	6%	63%
Less Than Truckload	26%	16%	57%	11%	17%

Overall Supply Chain – Learnings

- ***Network design*** is a significant lever, but may not be optimized. The key is to have the right facility types, right number and right location.
- ***Higher fuel prices*** are changing the balance between transportation and distribution center costs in designing optimal networks.
- ***SKU rationalization*** is also key – the right quantities, inventoried at the right locations, and flowing through the correct parts of the network.
- Accurate ***demand planning*** and forecasting is key to using the network optimally.
- As companies take greater control of their inbound networks, ***transportation modes*** will shift. The burden of finding adequate capacity shifts from the vendor to the buyer.

Distribution Center Practices and Trends

DC Operations – Size

To put this topic in context, note that the majority of DC's are in the 201K to 500K square foot size categories.

DC Size

DC Size in Square Feet	% of Total DCs
0 to 10K	0%
11K to 50K	0%
51K to 100K	7%
101K to 200K	2%
201k to 300K	22%
301K to 400K	20%
401K to 500K	17%
501K to 600K	6%
601K to 700K	3%
701K to 800K	7%
801K to 900K	6%
901K to 1M	1%
1M to 1.5M	9%
Over 1.5M	0%

DC Operations - Trends

What trends have you seen in the last 3 years? What trends do you anticipate in the next 3 years?

Trends in DC Operations

Trend	Last 3 Years		Next 3 Years	
	Increase	Decrease	Increase	Decrease
Inbound order size (weight, cube, cases or pieces)	76%	18%	88%	12%
Outbound order size (weight, cube, cases or pieces)	56%	39%	61%	33%
Number of SKU's carried	89%	6%	61%	33%
Imports as a percent of inbound shipments	83%	11%	89%	6%
Exports as a percent of outbound shipments	83%	9%	73%	9%
Crossdock volume as a percent of total inbound volume	77%	15%	77%	15%
Flow through volume as a percent of total inbound volume	82%	9%	82%	9%
Direct to consumer sales (catalog or Internet) as a percent of total volume	71%	14%	100%	0%
Degree of automation (material handling equipment)	83%	6%	89%	0%
Operating hours	29%	2%	77%	20%
Live unloads for truckload deliveries (vs. drop trailer)	13%	16%	40%	65%

DC Operations - Layout Wish List

If you could make changes, what changes would you make to your current DC layouts?

Wish List of DC Layout Changes

Change	Anticipated Improvements: Capacity/ Throughput	Labor Productivity	Order Fill Accuracy	Safety
Fewer dock doors	0%	0%	0%	0%
More dock doors	68%	36%	0%	32%
Narrower building (less width)	0%	0%	0%	0%
Wider building (greater width)	14%	14%	0%	0%
Shorter building (less length)	0%	0%	0%	0%
Longer building (greater length)	14%	10%	0%	0%
Lower ceilings	0%	0%	0%	0%
Heigher ceilings	43%	20%	0%	0%
Different storage racks	50%	43%	15%	14%
More automated material handling	73%	83%	62%	38%
Less automated material handling	0%	0%	0%	0%

DC Operations - Slotting Methodologies

Best practice can yield exceptional results. Product slotting in DC's is one example of a potential opportunity.

Slotting Methodologies

Slotting Methodology	% of Companies
a. Fixed assignment of SKU's to storage slots based on physical characteristics (i.e. pallets, cases, loose pieces)	9%
b. Manual assignment of SKU's to slots based on physical characteristics and best efforts to minimize labor requirements	45%
c. Same as manual process in b., but assisted by internally developed spreadsheets or database tools	27%
d. Sophisticated slotting software that optimizes the trade offs between storage utilization, labor productivity and safety	18%

DC Operations - Slotting Opportunities

The benefits of automated slotting can be significant, but not all DC's have taken advantage of the technology.

Efficiency of Slotting Plan

Efficiency	% of Companies
Near optimal	5%
Efficient, but small improvements are possible	15%
Acceptable, but improvements are possible	70%
Inefficient, significant improvements are possible	10%

Benefits of Automated Slotting

Benefit	% Improvement
Labor productivity	14%
Pick accuracy	25%

DC Operations – Learnings

- Automated ***material handling equipment*** tops the wish list of DC facility upgrades.
- There are several key opportunities to upgrade receiving operations including expanded use of ***ASN's*** for unload planning and automated product receipts.
- Automated ***slot management*** tools can result in significant productivity improvements, but they are not used in many DC's.
- Expanded use of ***crossdock and flow through*** operations is the ultimate key to improved performance.
- Current ***WMS*** applications have left significant room for improvement.

Vendor Collaboration

Vendors - Where is Performance Today?

Vendor Performance Metrics

Metrics	---- Performance ---- Current	Goal	Targeted Improvement
Operational Metrics			
On-time availability at shipment origin	84.5 %	97.4 %	15%
On-time delivery (prepaid)	86.0 %	95.7 %	11%
In stock at stores	94.7 %	97.3 %	3%
Lead time (in days)	13.7 days	11.2 days	18%
Fill rate on closed orders	91.8 %	97.7 %	6%
Perfect Orders	92.3 %	99.4 %	8%
Status/EDI Metrics			
Timely and accurate PO Acknowledgements	91.3 %	98.9 %	8%
Timely and accurate Advance Shipment Notifications	75.6 %	90.3 %	19%
Timely and accurate Ready to Ship notices	77.6 %	93.4 %	20%

… significant opportunities for improvement.

Vendors - Expediting and Ordering Behaviors

Reasons Shipments Must Be Expedited

Reason	Importance (1 - 5)
Vendor is not ready to ship on time	4.2
Last minute changes in products, quantities or dates (promotions or "ads")	3.9
Last minute changes in products, quantities or dates (on routine orders)	3.3
Insufficient lead time when order was placed	3.3
Carrier delay in transit	2.4
Improper routing	2.0
Lack of adequate documentation	2.0
Delay at consolidation points	1.9

… three of the top four reasons are controlled by the retailer.

Vendors - Joint Initiatives

The most significant improvements can result from joint initiatives undertaken with vendors.

Joint Improvement Initiatives with Vendors

Initiative	% Of Companies
Sharing of inventory status	62%
Shipment size, frequency and timing optimization	54%
Reductions in order lead times and lead time variability	54%
Pallet or shipment build improvements	54%
Sharing of demand forecasts	54%
Packaging improvements	54%
Order fill accuracy improvements	46%
Shipment mode and carrier use guidelines	46%
Shipment damage reduction	38%
On-time availability at origin improvements	31%
Store ready initiatives	31%
On-time delivery improvements (freight prepaid shipments)	31%
Security of in-transit product	31%
Sharing of customer or store sales data	31%
Accurate and timely status reporting from order acknowledgement to delivery	23%
Initiatives to increase cross docking opportunities in distribution centers	23%
Inventory reduction initiatives beyond those listed above	23%

Penalties and Rewards

Vendor Penalties and Rewards

Penalties and Rewards	Part of Program Yes	Part of Program No	Used in Last 12 Months Yes	Used in Last 12 Months No
Poor performance				
Financial penalties	65%	35%	89%	11%
Reduced order volumes	53%	47%	67%	33%
Performance that meets or exceeds goals				
Financial bonuses	0%	100%	na	na
Vendor recognition awards	26%	74%	Avg Awards = 5	

- Penalties are a key part of many programs
- Positive incentives are less pervasive
- Intent – corrective action versus revenue line item
- Monitoring programs are not always “transparent”

Vendor Collaboration – Learnings

- Implement a timely, accurate and transparent ***measurement process***. ***Communicate*** results. Measurement can be two-way, but the retailer creates and maintains the process.

- ***Penalties*** can be effective, but they need to be reasonable (reflect the cost of non-performance), applied consistently and motivated by a desire to fix problems.

- **Ordering** behaviors need to support performance goals.

- Information ***sharing*** is essential – sales forecasts and future plans.

High Velocity Inbound Orders

Inbound Orders - Transit Time Variability

Transit time experiences can vary significantly.

Average Actual Transit Times

Shipment Origin	Transit Times (days) Low	Average	High
To West Coast			
China/Hong Kong	11	22	45
Pacific Rim (Other)	12	27	45
Western Europe	9	22	50
Eastern Europe	9	24	45
Other (Middle East, Africa, etc.)	21	35	52
To East Coast			
China/Hong Kong	22	31	42
Pacific Rim (Other)	27	35	55
Western Europe	7	22	65
Eastern Europe	10	17	22
Other (Middle East, Africa, etc.)	21	28	35

Inbound Orders - Product “Touches”

Costs, transit times and damage increase the more times a product is handled in moving from vendors to stores or customers.

Product "Touches" from Vendor to Store or Customer

Step in the Inbound Flow	Product Touches	% of Inbound Freight Flow
Vendor loading	1.0	100%
In-transit to distribution center via truckload carrier	2.5	60%
In-transit to distribution center via less-than-truckload (LTL) carrier	4.0	25%
In-transit to distribution center via inbound pool consolidation	3.5	15%
Flow through at distribution center	3.0	5%
Cross dock at distribution center	2.0	28%
Pick from stock at distribution center	5.3	67%
Delivery to store via truckload or dedicated carrier	1.5	96%
Delivery to store via LTL carrier	4.5	1%
Delivery to store via pool distribution carrier	n/a	n/a
Delivery to store via parcel carrier	7.0	1%
Delivery to consumer via parcel or small package carrier	4.0	0%
Delivery to consumer via furniture/white glove carrier	8.0	2%
Weighted average product touches for all products	10.0	

Inbound Orders - Gate-to-Gate Times

The mix of crossdocked, flow-through and stored product can significantly impact average gate-to-gate times through distribution centers.

Distribution Center Gate-To-Gate Time

Step in the Flow	Actual Time (hours) Low	Average	High	% of Product
Check-in and Unloading				
Arrival at gate to beginning of unloading at dock – live unload	0.4	1.0	2.9	47%
Arrival at gate to beginning of unloading at dock – drop trailer	0.7	11.3	33.9	63%
Unloading and available on receiving dock	0.6	1.6	3.9	100%
Waiting time on receiving dock prior to receipt processing	0.4	1.3	4.7	100%
Receipt Processing, Picking and Packing				
Receipt processing and move to storage location (putaway)	0.7	2.2	13.1	67%
Receipt processing and crossdock to shipment staging (for crossdock product)	0.4	1.0	8.8	28%
Receipt processing and flow through to shipment staging (for flow through product)	1.2	1.7	3.3	5%
Time in storage (all storage types, including reserve storage and picking locations)	21	503	2019	67%
Pick from stock to completion of packing and move to shipping	1.0	2.8	10.6	67%
Loading and Departure				
Waiting to load at outbound shipment staging	0.6	10.5	24.4	53%
End of wait at shipment staging to loaded and ready for departure	1.3	2.7	6.3	100%
Departure from shipping dock to gate check out (loads not staged prior to departure)	0.4	0.7	1.4	33%
Departure from shipping dock to outbound staging yard (staged outbound loads)	0.9	2.7	4.2	67%
Wait in outbound staging yard (staged outbound loads)	0.9	3.1	5.9	67%
Pickup in outbound staging yard to gate check out (staged outbound loads)	0.4	0.5	0.8	67%
Total gate-to-gate time (weighted average in hours)	20	364	1429	
Total gate-to-gate time (weighted average in days)	0.8	15.2	59.6	

Inbound Orders - Volume Flow

While crossdock and flow through are the most significant opportunities to reduce inbound order cost and transit times, they are a relatively small percent of the order flow.

Shipment Flow through DCs

Flow	Best DC	All DC Average
Crossdock	15%	16%
Flow through	8%	9%
Pick-from-stock	77%	75%
Total	100%	100%

Inbound Orders – Learnings

- Shippers experience wide ***variations in transit times*** using the same transportation mode. However, transit times can be managed and improved.
- An emphasis on ***crossdock and flow-through*** operations can significantly reduce gate-to-gate times at distribution centers.
- Accurate ***measurement*** of lead time components can point to recurring, systemic problems that are the most deserving of attention.
- The ability of vendors to provide ***short, consistent produce times*** (order acknowledgement to ready-to-ship) is the single most important factor in order lead times.

International Trends

International - Inbound Shipment Origins

As background for today's discussion, international inbound orders are coming primarily from China/Hong Kong and the Pacific Rim.

Vendors by Origin Region

Shipped From Region	Average Vendors	% of Total Purchases
North America (US)	1,388	74%
North America (non-US)	13	2%
China/Hong Kong	121	14%
Pacific Rim (other)	106	5%
Western Europe	30	2%
Eastern Europe	20	1%
South/Central America	12	1%
Other (Middle East, Africa, etc.)	31	1%
Total		100%

Vendors by Origin Region – Trend

Shipped From Region	Number of Vendors		Purchases	
	Increase	Decrease	Increase	Decrease
North America (US)	33%	67%	42%	58%
North America (non-US)	90%	10%	89%	11%
China/Hong Kong	100%	0%	100%	0%
Pacific Rim (other)	100%	0%	100%	0%
Western Europe	63%	38%	57%	43%
Eastern Europe	60%	40%	60%	40%
South/Central America	50%	50%	50%	50%
Other (Middle East, Africa, etc.)	80%	20%	80%	20%

With the trend moving to increased use of vendors outside of North America.

International - Serving Customers and Stores In …

Sales by Region

Region	% of Total Sales
North America (US)	92.4%
North America (non-US)	2.0%
China/Hong Kong	0.4%
Pacific Rim (other)	1.5%
Western Europe	2.6%
Eastern Europe	0.3%
South/Central America	0.4%
Other (Middle East, Africa, etc.)	0.6%
Total	100%

International inbound orders are primarily serving customers and stores in North America.

With the trend moving to more customers and stores in North America.

Customers/Stores by Region – Trend

Region	Number of Customers		Number of Stores		Sales	
	Increase	Decrease	Increase	Decrease	Increase	Decrease
North America (US)	10	2	12	2	17	1
North America (non-US)	4	0	2	0	5	0
China/Hong Kong	2	0	0	0	3	0
Pacific Rim (other)	2	1	1	1	2	1
Western Europe	3	1	0	2	3	2
Eastern Europe	1	0	0	0	2	0
South/Central America	1	0	1	0	2	0
Other (Middle East, Africa, etc.)	1	0	0	0	2	0

International - Third Party Logistics Providers

Global 3PL's play a significant role in managing shipments from every international region and their role is increasing.

Use of 3PL's in Managing Inbound Shipments

Origin Region	Companies Using	Average Use	Trend		
			Increasing	Decreasing	No Change
China / Hong Kong	28	86%	10	3	15
Pacific Rim (Other)	23	72%	6	4	13
Western Europe	15	71%	5	2	8
Eastern Europe	13	73%	5	1	7
North America (Non-US)	9	70%	5	0	4
South/Central America	18	71%	4	1	13
Other (Middle East, Africa, etc.)	17	64%	4	2	11

International - 3PL Satisfaction Ratings

Providers have low ratings (satisfactory = 2.0) in several areas.

Average Rating – All Providers

Factor	Average Rating (0 - 3)
Rates	1.6
On time performance	2.0
Transit times/reliability	2.2
Capacity availability	2.3
Status tracking/visibility	1.7
Proactive alerts	1.8
Breadth of lanes offered	2.3
Claims experience	1.8
Field operations responsiveness	2.0
Additional services offered	2.0
Billing accuracy	2.2

International – Learnings

- ***Performance measurement*** and ***aggressive goals*** can create a competitive advantage.

- The ***role of 3PL's*** will continue to grow but will begin to shift away from managing carriers and move towards value added services. Companies will need to become more skilled in sourcing and managing carriers.

- ***Overseas sourcing offices*** will play an increasingly important role in managing the import process. ***Vendor*** roles will not increase.

- Large carriers and large logistics service providers do not always turn in the ***best performances***.

- The role of ***air freight*** in the international supply chain is small and decreasing. This trend will place a greater burden on companies to manage the factors that impact inventory.

Ocean Ports

Ocean Ports - Volumes by Origin Region

While not a surprise, ocean volumes inbound to North America originate predominately in China/Hong Kong and the Pacific Rim.

Ocean Shipment Volumes

Shipment Origin	% of Total FEU's	Cum % of Total FEU's
China / Hong Kong	69.8%	69.8%
Pacific Rim (Other)	18.9%	88.7%
Western Europe	4.1%	92.9%
North America (non US)	2.8%	95.7%
Other (Middle East, Africa, etc.)	2.1%	97.8%
South / Central America	1.9%	99.7%
Eastern Europe	0.3%	100.0%

Ocean Ports - Leading Origins and Destinations

Ocean volume tends to be concentrated in a few ports.

Top Origin Ports

Product Origin	Port	Companies Using
China/Hong Kong	Hong Kong	21
	Yantain	16
	Shanghai	11
	Qingdao	2
Pacific Rim (Other)	Bangkok	7
	Kaohsiung	7
	Keelung	6
	Manila	5
	Busan	3
	Jakarta	3
	Singapore	3
	Ho Chi Minh	2

Top U.S. Destination Ports

Destination Ports	Annual FEU %
L.A./Long Beach/San Pedro	48%
Seattle, WA	18%
Norfolk, VA	14%
New York/New Jersey	6%
Savannah, GA	5%
Oakland, CA	2%
Boston, MA	1%
Miami, FL	1%

Ocean Ports - Causes of Congestion

Causes Of Congestion at North American Ports

Cause	Weighted Ranking
Lack of rail equipment and capacity serving ports	4.3
Limited hours of operation for gates, terminals and local truck operations	4.0
Inefficient port operating practices that limit trucking productivity and create driver shortages	3.8
Lack of adequate port and terminal operations metrics to pinpoint problems and identify where available capacity might exist	3.5
Vessel arrivals concentrated on certain days of the week (e.g. Thursdays, Fridays and Saturdays)	3.4
Road congestion entering and leaving ports	3.2

Ocean Ports - Contingency Planning

In the past, the concern was labor unrest at West Coast ports. The current focus is on Katrina. What contingency planning is appropriate to protect supply chain operations?

Contigency Actions for Import Routes	Weighted Average
Diversifying the ocean carrier base.	3.7
For routine shipments, moving more inbound ocean shipments from Asia through East Coast ports.	3.6
Developing documented contingency plans.	3.5
For routine shipments, diversifying the number and location of ocean ports being used in North America.	3.4
Placing orders earlier than usual when it appears likely there will be a disruption (e.g. work stoppage at ports).	3.4
In the event of a disruption, air freight will be used as an important alternative for shipments that would typically move on ocean carriers.	3.4
Increasing normal inventory levels in recognition of the risks in international supply chains.	2.2
If increasing inventory levels, how many additional days of product, raw material or component inventory are you adding? >>> 22	
Using smaller, more frequent shipments to lessen the impact of a single disruption.	2.2

Ocean Ports - Shifts in Domestic Port Usage

Recent disruptions at ports are encouraging shippers to diversify their port usage.

Planned Shifts in Port Usage

Ports (Top five in each Group)	% of Companies	% of North American Volume Current	% of North American Volume In 3 to 5 Years
With the Largest Gains			
New York, NY	23%	9%	14%
Norfolk, VA	17%	6%	31%
Savannah, GA	10%	10%	18%
Seattle, WA	10%	4%	10%
Baltimore, MD	7%	17%	25%
With the Largest Losses			
Long Beach, CA	40%	34%	24%
Los Angeles, CA	27%	33%	24%
Montreal, PQ, Canada	13%	9%	4%
Charleston, SC	7%	50%	6%
Savannah, GA	7%	4%	0%

Ocean Ports – Learnings

- There continues to be a significant ***concentration*** of freight flowing through a ***few ports*** but shippers are planning to diversify port usage.
- Despite the risk of disruptions, shipper ***focus*** on port issues is ***limited***.
- While ***ocean carriers*** are not performing well, they tend to receive higher ***ratings*** than other modes. It may be that expectations are not as high as they should be.
- Service level experiences for individual shippers can vary significantly from average performances or best practice. There may be a limited understanding of ***what goals are reasonable and achievable***.
- ***Contingency planning*** is becoming more important in international supply chains.

Questions?