



MARKET DRIVERS OF CHANGE

SASHTO
AUGUST 2014

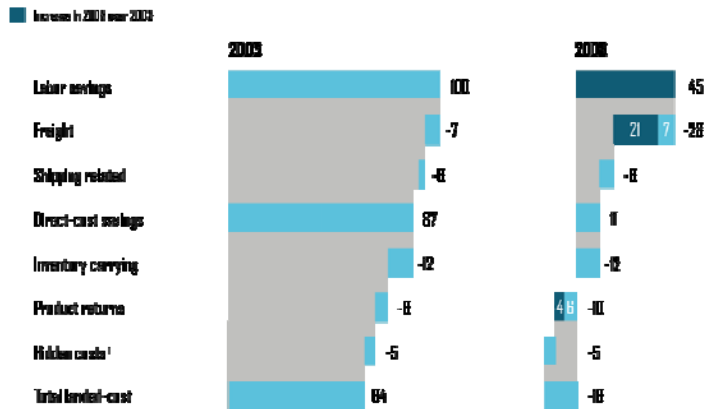
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Freight Market Game Changers

- International Drivers
 - Near shoring to Mexico gains momentum
 - In sourcing to US driven by robotics, time to market
 - Panama Canal expansion stays on track
- Energy Drivers
 - Energy exploration drives growth in fracking states
 - Energy self-sufficiency lowers US manufacturing costs
 - Truck fuel begins to shift from diesel to natural gas
- Customer Drivers
 - E-commerce service standards continue aggressive evolution
 - Continuous supply chain optimization a permanent dynamic
 - 3-D printing further develops as production technology
- Carrier Drivers
 - Rail intermodal gains share, reduces competitive distances
 - Regulations & demographics tighten freight labor & capacity
 - Dedicated & private fleets used to lock in capacity

Supply Chain Location Shifts

Total landed-cost savings or losses for producing midrange server in Asia instead of United States; Index: labor savings in 2003 = \$100



¹ Include costs for reworking errors, incremental financing, and exchange-rate risk.

Potential Re-Shore Industries (BCG)

Computers & Electronics	Machinery
Transportation Goods	Fabricated Metal Products
Appliances & Electrical Equip.	Furniture
Plastics & Rubber Products	

- Asian wage differentials narrowing while transport costs rise
 - Plus: intellectual property risks, carbon footprints, materials cost
 - Supply chains rethinking design
 - Decision factors: time to market, delivered cost, labor content, automation, risk
 - Affects production (sourcing) & distribution (staging) location
 - Near-shoring & Re-shoring
 - 1/3 of US manufacturers considering re-shoring (MIT 2012)
- ➔ New places and new development

Revolution in Retail

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- Omni-channel strategies
 - In-store/mobile web
 - Select local inventory backed by huge supply
- Same day delivery
 - Amazon vs. stores as DCs
- Robotic DCs
 - Enables small footprint, high cube design
- ➔ More and closer-in locations

Revolution in Manufacturing & Distribution

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- Manufacturers reviewing product *content* for *portions* suited to 3D printing
- Replacement parts among the candidates
- Parts production at local UPS truck terminal could supplant air hub DCs
 - ➔ Materially different production and distribution system



DC Trends: Next 3 Years

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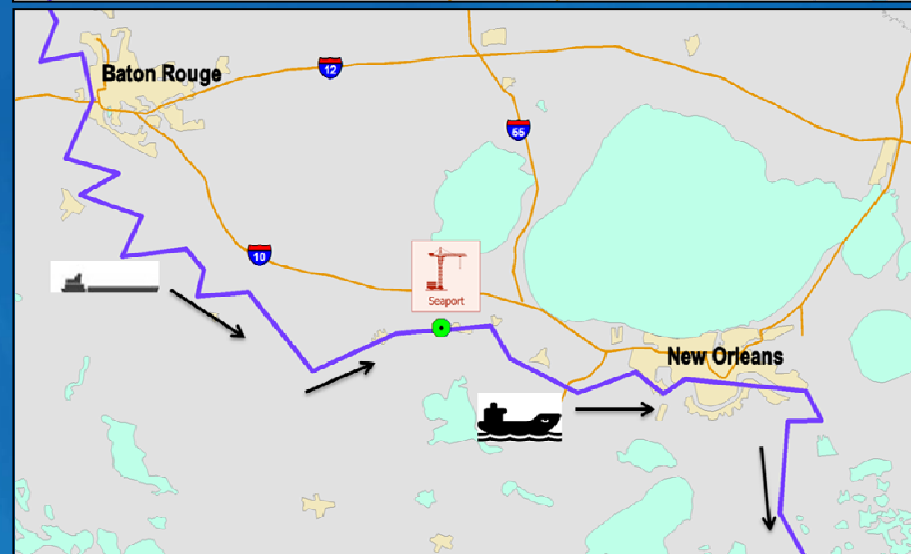
Trend	Increasing	Decreasing	No Change
Direct to consumer sales	100%	0%	0%
Degree of Automation	88%	0%	12%
Outbound order size	88%	12%	0%
Exports as a % of outbound shipments	80%	0%	20%
Number of SKU's carried	75%	13%	12%
Operating hours	57%	29%	14%
Cross dock volume as a % of total inbound volume	50%	17%	33%
Inbound order size	44%	33%	22%
Live unloads for trucks	33%	50%	14%
Imports as a % of inbound shipments	29%	43%	29%

Source: Tompkins International
Supply Chain Consortium /
MEDC

MAP-21 Freight Planning

- All plans are performance driven: State and MPO
 - All agencies encouraged to involve private sector
 - Performance is the private sector focus
 - Outcomes are a public-private product
- Performance in freight is end-to-end
 - Across the changing supply chain
 - As Freight Advisory Councils will stress
- Depends on sub-state and multimodal networks to deliver the freight
 - Different degree of institutional coordination

End-to-End Supply Chain: Export Agriculture (Soybeans)



End-to-End Performance Measurement

DOC ♦ FHWA ♦ I-95 Pilot

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Links and Nodes	Transit Time/Dwell Time (Days, hours)	Reliability (95% travel time)
<i>Farm in vicinity of El Paso, IL</i>		
Truck move	0.8 hours	1.7 hours*
<i>ADM/Growmark Peoria Terminal Wharf Port Facility</i>		
Barge move	8.2 days	14.5 days*
<i>Cargil Loading Facility, Reserve, LA</i>		
Totals	9.0 days	14.6 days

* Estimated using U.S. Army Corps of Engineers data for the period June 2012 through January 2014; TTI Mobility Report 2012 for 95% index for small urban areas.

Analysis by Cambridge Systematics

Thank You!

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**Parsons Brinckerhoff
Freight & Logistics**
• BryanJG@pbworld.com