Supply Chain Logistics – Post Recovery Landscape

Freight and Logistics Symposium
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Perspective…

Presentation Flow – Trends & Implications….

• Logistics Perspective
• Transportation
  • Trucking, Rail, Ocean, River, Fuel
• Global Sourcing & U.S. Logistics
  • Land Bridges, Inland ports, Import Warehouses, Plant Locations
• Domestic Logistics
  • Retail / Consumer Demands, Geographic “Mega Regions,” Land Prices Impacts, Freight Security / Theft, Network Design Changes
• Green Logistics
  • Green measures, Certifications, Urban Heat Island, Stormwater, Energy Management & Production

Logistics Cost – In Perspective….

• $680B is the cost of trucking in U.S. (ATA)

✓ Equates to $2,267.00 per person in the USA!!!
Logistics Cost – In Perspective….

- $122B is the cost of warehousing in U.S. (CSCMP)
- Equates to $407.00 per person in the USA!!!

U.S. Logistics System Cost….

<table>
<thead>
<tr>
<th>Category</th>
<th>$ Billions</th>
<th>$ per U.S. Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying Costs</td>
<td>472</td>
<td>150</td>
</tr>
<tr>
<td>Transportation Costs</td>
<td>122 407</td>
<td>407</td>
</tr>
<tr>
<td>Logistics Administration</td>
<td>52 173</td>
<td>173</td>
</tr>
<tr>
<td>Total Logistics Cost</td>
<td>1345 4483</td>
<td>4483</td>
</tr>
</tbody>
</table>

Transportation - Trends & Implications….

- Truck
- Rail
- Ocean
- River Barge
- Fuel Prices

U.S. Economy…..

...During Current Recession

All transportation modes dropping capacity FAST!!!

This will come back to haunt the economy upon recovery!!!

Transportation...

U.S. Logistics System Cost…..

......$4,483 / person

Note: The statistics provided may differ from the actual figures due to various factors such as inflation, market conditions, and data collection methods.
Trucking Industry：

**Demand decrease in loads....**

![Graph showing Truck Demand Indicator]

**Carriers – bankruptcies growing**

![Graph showing Carrier Bankruptcies growth]

**Equipment Sell-off**: Trucking companies sell-off of tractor equipment overseas growing

![Bar graph showing Equipment Sell-off by region]

**Fleet Age & Future Replacement Impact on Pricing**

![Graph showing Fleet Age vs. Public TL Pricing]

Trucking capacity under/over-utilization impacting supply/demand imbalances, seeing usage for the Freight Trading Exchange. Over the past few years, the freight market has shifted from a tight capacity-driven market to a more demand-driven one, with capacity now at historically low levels. This shift is driven by a combination of factors, including reduced demand due to a downturn in the economy and the proliferation of new technologies that have increased efficiency. As a result, carriers are now able to offer more capacity at lower rates, which has impacted pricing. The chart below illustrates the inverse relationship between freight rates and fleet age.
Trucking Industry: Capacity Reductions

Truck driver shortage - still a major factor; current recession merely a lull in the storm

Historical Tonnage by Mode:

Freight Transportation Modal Shares

Trucking Capacity Issue Will Plague the Economy for Years!

Rail Industry: Trucking is not Alone.

Container & Rail Car Traffic Down.
Rail Industry....
....Trucking is not Alone....

Container & Rail Car Traffic Down....20-25%

Source: Wall St Jour Oct 10, 2009

BNSF Railroad

Rail Industry....
....Trucking is not Alone....

Equipment Parking -- Railroads parking equipment on every available siding -- nearly 30% of capacity!

Housing market severely impacted total rail industry
Rail Rebirth…

...Key Realities

- More Energy Efficient
- Lower Emissions
- Lower Cost
- Longer Timelines
- At Max Capacity
- Intermodal Growth High
- Doesn’t Provide Local P&D

Trends Influencing U.S. Logistics

Intermodal
- Growing to offset rising diesel prices and congested seaports.
- “Intermodal is a core growth opportunity for the railroads...but they must adapt to the expectations of typical truckload customers”
  - Steve Weiby, VP, CH Robinson.

- Running into “NIMBY”
- Community opposition and “not-in-my-back-yard”
- Pushing transload yards far out from city.
  - Chicago: 56 miles out
  - Dallas/Fort Worth: 42 miles out
Rail Box Car Influences
- 1 Box-car handles 3-4 truck loads!
- Since the 1970s most new warehouses have not been built with rail siding!
  ✓ Select 3PL / Contract Warehouse Companies are now one of the few places to get rail access.

Trends Influencing U.S. Logistics
Rail Transload Centers
- Major Railroads establishing "Rail Transload Partners" across the country with:
  ✓ Indoor warehouse unloading / loading
  ✓ Food and Paper Industry
  ✓ Outdoor rail yards for unloading / loading
  ✓ Lumber / Forest Products Industry

Trends Influencing U.S. Logistics
Rail Congestion
- Growing Volume
- Rail congestion impact – Slower Trains

Revenue ton-miles (billions)

Rail Influences
- Growing Volume
- Rail congestion impact – Slower Trains

Railroad Average line-haul speed (mph)
Two Issues Impacting...

1. Drop in business has carriers parking equipment throughout the world waiting for resurgence. 11.3% of capacity parked as of 3/30/09 (485 ships). (Journal of Commerce Online 3-31-09)

2. Carriers ordered many new and much larger capacity ships over the past few years. These new ships are due on-line starting in 2009 (79 just since 1/1/09) adding to current over-capacity problem – some say by +20%.

Rates have plummeted in response.

New ships are huge....!!!! Photos show the “Emma Maersk”

Largest today: Emma Maersk (14,956 TEU, 2006) Panama Canal limit today: 4,500 TEU
Need to keep in mind the inland waterways as a transportation option.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Short-Term Reduction</th>
<th>Long-Term Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTL</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Rail</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td>Barge</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>Parcel</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Express</td>
<td>12%</td>
<td>3%</td>
</tr>
<tr>
<td>Air</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Ocean</td>
<td>11%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Fuel Prices Impacting Logistics....

We all know what recently happened...

Fuel Prices Impacting Logistics....

Economic Comparison....

All Transportation Modes....

The Truckload Segment has Witnessed the Greatest Reduction in Capacity: How Much More Capacity Will Leave the Market?

<table>
<thead>
<tr>
<th>Equivalent Units</th>
<th>1 Barge</th>
<th>15 Railcars</th>
<th>80 Truck Trailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost per mile (cents)</td>
<td>0.97p</td>
<td>0.34p</td>
<td>0.04p</td>
</tr>
<tr>
<td>Time per gallon of fuel</td>
<td>0.14</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Clearing – Carbon Monoxide</td>
<td>5.0</td>
<td>6.6</td>
<td>14</td>
</tr>
<tr>
<td>Defect – Injury rate</td>
<td>0.00</td>
<td>21.77</td>
<td>N/A</td>
</tr>
<tr>
<td>Avail. Capacity</td>
<td>99 - 98%</td>
<td>93 - 92%</td>
<td>90 - 88%</td>
</tr>
<tr>
<td>Reliability</td>
<td>94 - 93%</td>
<td>91 - 90%</td>
<td>88 - 87%</td>
</tr>
</tbody>
</table>

Source: Department of Energy
Currently near $80.00 per barrel

Note accelerated rate of price climb...

February 14, 2009 – Price: $47.40 per barrel
December 2, 2009 – Price: $77.50 per barrel
Result: 64% increase...!!!

U.S. has been on steady rise for years...

Some say we are running out...
No one seems to agree when Peak will occur...

**Timing is the only question for most.**

<table>
<thead>
<tr>
<th>Peak Now to 2012</th>
<th>Peak 2011 to 2021</th>
<th>Peak after 2021</th>
<th><em>Peak Oil is garbage</em></th>
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<tbody>
<tr>
<td>EIA</td>
<td>2011</td>
<td>2011</td>
<td>2011</td>
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<tr>
<td>BP</td>
<td>2012</td>
<td>2012</td>
<td>2012</td>
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<tr>
<td>Mises</td>
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<td>Vail</td>
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<td>Vail</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
</tr>
<tr>
<td>Vail</td>
<td>2021</td>
<td>2021</td>
<td>2021</td>
</tr>
</tbody>
</table>

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

Fuel Prices Impacting Logistics....

U.S. Energy Information Administration’s View...

Note how price projection jumped from 2008 to 2009 report...!!!

Another crude oil price projection....$200 by 2013

Source: The Oil Drum
Fuel Prices Impacting Logistics....

Why do I say fuel prices will rise again...we have been below these countries oil price thresholds....

Fuel Prices Impacting Logistics....

Oil is subject to serious geographic "choke points".... which if closed will drastically raise prices....

Transportation - Implications....

Trucking
- Trucks will remain a major player.
  - Trucks are expected to continue to handle 60-70% of all freight.
  - Most freight involving rail/ocean/river is handled by trucks at beginning and end of movements.
  - Severe shortage of capacity.
  - Equipment will not be replaced as fast as economic recovery.
  - Prices will rise faster than economic recovery - carriers have to make up cash from last few years losses to survive.
  - Driver shortage will reappear.
Rail
- Railroads are making a comeback – and will play a greater role in the future.
- Rail carriers already raising prices as if no recession...!!!
- Environmental efficiency, esp. from carbon footprint, will help push growth.
- Rails will once again feel capacity constraints – equipment & manpower - when activity levels reach pre-recession volumes, pushing prices higher.
- Intermodal operations must meet trucking service expectation levels to compete, unless fuel prices reach astronomical levels and force traffic to intermode, despite the rails service postures.
- Box car use will grow.

Freight & high speed passenger rail will have to work together....

Greater integration of service between railroads will progress....

Mode integration will increase....
Ocean Carriers…
- Severe over capacity will linger for years…!!! - prices will continue to stay low as a result.
- New, bigger ships will add operational efficiencies – cost savings will not be readily realized till smaller, older ships retired.
- Fuel price increases will put pressure to raise rates, but over capacity and resultant competition will keep downward pressure.
- If global sourcing reduces significantly as fuel prices rise, carriers will be left with huge ships with no freight to move – smaller, older ships may be sorely missed.

River Barges…
- May see a rebirth, especially within 300 miles of coast.
- Fuel efficiency per ton moved very good - compared to land transportation modes.

Transportation - Implications....

Fuel Prices....
- Will go up…!!!
- Increase will impact logistics…!!!
- Smart supply chain, logistics & transportations folks already considering changes to offset increases.

Mode shifting to occur more frequently....
Shippers Moving Down Rungs of Mode Ladder to Save Money and Reduce Carbon Footprint
- Air → Ground
- Air → Ocean
- Intermodal → Boxcar
- Truckload → Intermodal
- Less-Than-Truckload → Truckload
- Rail → Barge

Global Sourcing & U.S. Logistics....
Trends & Implications...
- Land Bridge Impacts
- Inland Ports
- Import Warehouses
- Plant Locations
  - Near Sourcing
  - Made in the USA
Global Supply Chains...Impacts on U.S.

If only the world was so close....

Global Supply Chains...Impacts on U.S.

If only international sourcing was so easy....

Global Supply Chains...Impacts on U.S.

....and then there's Pirates....

Source: The Tioga Group

Implications of offshore sourcing / manufacturing:

- Less manufacturing space needed in USA
- More DC / warehouse space needed in USA
- Distance adds time and more safety stock requirements

Resulting in changing distribution patterns in US.

Historic Domestic Oriented Networks... vs. New Import Oriented Networks

- Internal source of product flows evolved over past 20 years to today’s import focused product flows.
- Large shippers like Wal-Mart are also beginning to affect warehouse locations in order to feed their huge complexes.

Import Transportation...

- Changing economics!!!

<table>
<thead>
<tr>
<th>Year</th>
<th>Asia to USA (7000 miles by ocean)</th>
<th>LA Port to Chicago (1750 miles by rail/11000 miles by ocean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$9,800</td>
<td>$2,000</td>
</tr>
<tr>
<td>2008</td>
<td>$9,500</td>
<td>$2,200</td>
</tr>
<tr>
<td>2009</td>
<td>$9,000</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

- Land portion most expensive part of trip - $1.14 vs. $0.14 / mile!
- May 11th, 2009 – Drewry: Reported the spot price for a 40’ container from Hong Kong to LA was $884... marked a 4.7% decline from week before and 50% below a year ago.
- F. Damas, Div Dir at Drewry – started in 1985 and have never seen rates below $1,000!

Definition: MLB – “Mini Land Bridge”
Panama Canal

- Land cost portion is pushing many to consider ocean voyages through the Panama Canal for better access to east coast and gulf ports.
- In 2008, 25% of U.S. imports flowed through the Panama Canal.
- Starting in 2014 with expansion of Panama Canal, finished domestic intermodal will face steep competition as all-water routes will be cheaper, esp. as fuel prices rise.

Asia to East Coast

- All-water route (via Panama Canal): $1800
- Mini-landbridge (via train from LA): $2800
- This advantage to the all-water is new.

Global Supply Chains...Impacts on U.S.

- Growing congestion and new clean air mandates for LA ports are forcing many to look at alternative ports and inland routes: Prince Rupert in Canada & Mexican Ports

Global Supply Chains...Impacts on U.S.

- "Northwest Passage"...
  - People are starting to talk about the feasibility of the "Northwest Passage" being open for container ships.
  - Already happening...
  - A cable-laying ship sailed through in 2008 from Hong Kong to a project in the North Atlantic.
  - Coast Guard figures show there were 114 commercial marine vessels traveling through the Northwest Passage in 2008.
  - Will create a potentially shorter route to east coast and St. Laurence Seaway ports from Asia.
"Northwest Passage"…

"Northeast Passage" for Europe?


Global Supply Chains….Impacts on U.S.

Port Congestion and High Fuel Price Impacts…. 

Creation of Inland Ports

Rail / truck / ocean…. 

Integration hubs

Examples include:

- Chicago
- Columbus
- DFW / Texas
- Kansas City
- Memphis
- Atlanta

Locations: Up to 100 miles from ocean ports with services generally provided by 3PL’s.

- Resulting from:
  - Land shortages near seaports
  - Transportation efficiencies delivered by maturing intermodal and rail industries
  - Activities include transloading, repack and labeling.
  - Example: 6 - 40’ containers = 4 - 53’ trailers

Import Containers…. “Maersk Effect”

- No longer want their containers inland
- Pricing reflects penalty for not transloading near port
- 1st ocean carrier to implement these rules
- Others analyzing due to box and handling costs – will lead to growth in transload service industry
Major Concern with East Coast Port, Auto, Truck & Rail Traffic Congestion….Looking for Solutions….

“Short-Sea” Shipping - To handle increasing port, rail and highway congestion “Short-Sea” Shipping is growing along the east coast and gulf. A practice common in other parts of the world.

Global Supply Chain Complexity…
- 73% experienced Logistics disruptions past 5 years
  - 58% of these reported disruptions affected profitability & customer expectations.

Source: WSJ May 18, 2009 P. Dvorak article
Can long supply chains still be cost effective?

Factors influencing re-evaluation of offshore manufacturing:
- Energy costs — e.g., in logistics/transportation
- Complexity of supply chains and visibility issues
- Long lead times
- Excess inventory required
- Larger carbon footprints — “Green” movement impact
- Product Quality Controls
- Available labor pools in select countries
- Impact in China from growing internal consumer market (vs. export market)

Port Capacity Available

Focus changing from labor cost per hour to... greater focus on total landed cost...

<table>
<thead>
<tr>
<th>Costs increase between 2003 &amp; 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Costs</td>
</tr>
<tr>
<td>US</td>
</tr>
<tr>
<td>Mexico</td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td>Transportation Costs</td>
</tr>
<tr>
<td>Ocean Freight</td>
</tr>
<tr>
<td>TL/Rail</td>
</tr>
</tbody>
</table>
Global network evaluation becoming more important….

**Global Supply Chains…Impacts on U.S.**

Global network evaluation – Case Study….

**Global Supply Chains…Impacts on U.S.**

*Made in America…..Once Again*

- Corporations are abandoning their myopic focus on hourly wages for "Total Landed Cost".
- Quality control a growing issue in select overseas markets.
- Future fuel prices worrying executives.
- Receiving serious Board Room and Supply Chain Management discussion today.
- Some European companies have already started to set-up manufacturing operations in the USA because it offers:
  - Skilled labor force
  - Automated manufacturing technology
  - Strong transportation infrastructure
  - Proximity to world’s largest market
  - Political stability
- Question to ask however…..Are there any Stress Points in bringing manufacturing back to USA….
Return of American Manufacturing to US...

- Stress Points in bringing manufacturing back to USA...
  - Industrial space – NO PROBLEM.
  - Workforce – SOME ISSUES w RE-TRAINING and RE-LOCATING GEOGRAPHICALLY
  - Regulations, esp. environmental - SOLVABLE
  - Transportation – SERIOUS CAPACITY PROBLEMS....!!!

Global Supply Chains....Impacts on U.S.

- Ocean Freight Lanes....
  - More traffic through the Panama Canal – esp. after major lock expansion completed in 2014.
  - More cargo will arrive at gulf & east coast ports
  - Land bridge cost from west coast ports will continue to rise relative to all water route forcing more Asian containers to east and gulf coast ports.
  - Northwest passage may open - and allow container ships to more economically reach upper east coast and St. Laurence Seaway ports.

- Inland Ports & Import Warehouses....
  - Will continue to grow - these two trends are creating large Logistics Centers in key inland markets

- Plant Locations....
  - Total landed cost will be the driver! – not just labor cost per hour; especially as fuel prices rise.
  - “Near sourcing” will grow!! – Mexico, Central America & South America.
  - “Made in USA” will see more movement.

Domestic Logistics - Trends & Implications....

- Retail / Consumer Demands
- Geographic “Mega Regions”
- Land Prices & Urban Closeness
- Freight Security / Theft
- Network Design Changes – “More is Less”
  - Fuel Price Impact
  - Carbon Footprint Impact

Freight Transportation Modal Shares

REMEMBER....

Trucking & Rail - Lack of Capacity will Plague the Resurging Economy for Years!

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

Global Sourcing & U.S. Logistics.... Implications....
Growing impact of “big-box” retailers

• Less backroom stock space.
• Pushing inventory up-stream to suppliers.
• Reducing the cash flow tie-up a key factor.
• Demanding frequent replenishment and smaller orders.

Trends Influencing U.S. Logistics


What’s Happened to the Order Profile...???

"Old 80:20 Rule"

<table>
<thead>
<tr>
<th></th>
<th>THEN</th>
<th>NOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% of Sales</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>20% of Sales</td>
<td>??</td>
<td>??</td>
</tr>
</tbody>
</table>

What’s Happened to the Order Profile...???

‘Design for Logistics’ In Action

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>35% gross profit margin</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
</tr>
<tr>
<td>33% gross profit margin</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
</tr>
<tr>
<td>31% gross profit margin</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
<td>25%+</td>
</tr>
</tbody>
</table>

Source: Supply Chain Insights and Research
What's Happened to the Demand Cycle...???

...and then throw in internet purchasing.... and catalogues...

Trends Influencing U.S. Logistics

Consumer demands at work....

- "...we want it now!...."
- SKU Proliferation...

North America "Mega-Regions"

Network analysis further impacted by these growing regions
Continued Impact of Eastern U.S.

- Eastern U.S. region holds 09% of the U.S. population.
- Approximately 75% of U.S. consumption takes place in the East.

Highway System...

...Congestion Impacts

Today

2035

Urban Land Prices....

...Pushing Out Logistics

- 500% increase in 10 years!
- These are the sites typically found in the suburban industrial parks.

Impact – Pushing Logistics centers out further, thus increasing transportation costs and congestion.

Where To Find

Warehouses Today...

- Growth of Large Logistics Parks & Corridors – Freight Villages
- Regional Economic Development Drivers.
- Big Co. Campuses can’t be close to hip hubs, but they also can’t be too far out...

“Raising the Roof”

Conversion of low ceiling height warehouses to tall structures.

18’ up to 38’

Chicago Project
“Back to the Future”

- Due to ocean port freight congestion and land availability, people are looking to build “Multi-Storey” warehouses with:
  - Tall ceilings (20’)
  - Floors stacked 2-3 high, even 10+ high
  - Experience in China, Japan, and Europe.

- ProLogis Park, Tokyo – 10 stories w 20’ ceilings
- ProLogis Parc Yokohama
- ProLogis Parc Tokyo II

Security – Logistics Theft

- Cargo theft: $15-50B/yr in U.S. (FBI)
- Warehouses and carriers handling electronics and high value products have seen an increase in “out-side” theft.
- Average loss per incident by employee theft:
  - Accounting/Finance People: $69,903
  - Purchasing People: $349,750
  - Shipping/Receiving People: $200,000

Cargo Theft Incidents, Past 12 Months

Cargo Theft Risk: Mexico

- Map showing cargo theft risk areas in Mexico
Hope none of us have unhappy employees like this...

Why Logistics theft is growing...

• Value of products increasing + Counterfeiting
   Electronics, Meat, Fish, Cigarettes, Metals.
• Easily sold domestically (& internationally)
   Orders go out for products from organized gangs/dcrime.
   Cuban criminals been hard at work stealing Cigarettes.
• Low risk of being caught
   Since 911 FBI’s Cargo Theft Teams assigned to domestic security.
• Inadequate criminal justice system
   Drug arrest yields 20 years in prison - $2M Cigarette heist yields 10 year max, usually less...!!!
   Result, drug criminals have shifted to Logistics theft.
     “Crime doesn’t pay” no longer applies!

“More is Less”

Trends Influencing U.S. Logistics

Last 15 yrs trend has been fewer & bigger warehouses. 3-5 Total.
• TQM, ERP, JIT / Lean Manufacturing & lower fuel cost driven!
Serious consideration being given to increasing number of warehouse points.
   Where 3-5 network of warehouses was cost effective.....today many are looking at becoming a 6-10 network of warehouses.
   Impact of higher local delivery cost (vs. long haul cost)......changing networks.

Fuel Impacts, etc. Influence....

Local Delivery – Higher Cost....
• Congestion
   Less efficient time & fuel utilization
   Dock time: waiting & unloading / loading
   Hourly Cost (vs. fixed per mile)
   More safety incidents
   Ability to use consolidation to offset above cost factors

Long Haul – Less Expensive in Comparison...
• Less Congestion is flight
   Engines running at peak efficiency
   No dock wasted time
   Fixed per mile cost (vs. variable hourly)
   Less safety situations on open road
   Lane Selection - Trucking companies have become very selective in what lanes they will accept freight to reduce “deadhead” miles driven and keep equipment moving....thus industry efficiency up & capacity reduced
Network Modeling…. becoming even more important.

Trends Influencing U.S. Logistics

Network Cost + Carbon Footprint Reduction…. Trade-off Curve between number of DCs, costs, service and carbon footprint.

Source: MIT 10-2008

Trends Influencing U.S. Logistics

Oil price vs. inventory carrying and facility costs

Moving from $120/bbl to $150/bbl changes the optimal number of DCs from 6 to 7. In particular, you can think of Las Vegas being replaced by Los Angeles, Albuquerque, and Portland.

Trends Influencing U.S. Logistics

Network Cost + Carbon Footprint Reduction…. From Baseline to better costs, service and carbon footprint.
Near Sourcing example….

Trends Influencing U.S. Logistics

Location Impacts….

“Where is the best balance of costs today?”

Rural Manufacturing Plants

- Traditionally cheaper land and availability of labor force was a plus.
- 2006-2008 – Tough access to trucks...!!! Will happen again after economy recovers...!!!
  Picking up in the city where they unloaded vs. driving 100+ miles for a load is the issue.
  Forcing some plants to forward position finished goods to nearby major city where more trucks reside.
  Access to rail spurs also an issue.

Retail / Consumer Demands….

- Retailers & consumers demands are playing havoc with inventory management, cycles, & production planning.
- Regionally concentrating freight delivery areas.
- Local delivery costs rising – congestion, fuel, labor, etc.

Land Prices & Urban Closeness

- Continued pressure pushing DC’s/warehouses further out, thus adding to local delivery costs and time.
- Economics of “raising the roof” to modernize older facilities gaining momentum – will pick up steam once industrial vacancy rates lower which may take 3 years.
- Multi-story warehouses may see a renaissance – currently popular in select Asian cities where crowded land use & land prices dictate going up.
Freight Security / Theft:
- Growing during the recession.
- Increasing values of cargo and lenient justice system insure theft will continue escalating – logistics industry fighting back with technology and better law enforcement coordination.
- Not just unique to USA.

Network Design Changes – “More is Less”:
- Fuel price increases forcing changes to Supply Chain Networks – domestically and globally.
- Growing interest in more DC and Crossdock locations.
- Likely to see 6-10 DC/Warehouse networks (vs. 3-5 which was common since the late 1980’s).
- Carbon footprint will grow as a factor in network design – in some cases, this leads to more locations.
- Rural plants will see tough access to trucks return like in 2006-2007 – rail access already tough.

Domestic Logistics - Implications:
- Fuel price increases forcing changes to Supply Chain Networks – domestically and globally.
- Growing interest in more DC and Crossdock locations.
- Likely to see 6-10 DC/Warehouse networks (vs. 3-5 which was common since the late 1980’s).
- Carbon footprint will grow as a factor in network design – in some cases, this leads to more locations.
- Rural plants will see tough access to trucks return like in 2006-2007 – rail access already tough.

Green Logistics - Trends & Implications:
- Green Measures
- LEED Certification
- Urban Heat Island
- Stormwater Management
- Energy Management & Production

Today's Bottom Line:
- “Eco…”
  - Eco-nomics
  - Eco-logy

Many investors see “green” practices as a reflection of good management practices.

Green Trends Influencing U.S. Logistics

Logistics Leadership since 1994

Major corporations - “Green” Initiatives
- Logistics Performance Measure:
  - 100% Order Accuracy

- Traditional Focus: Customer satisfaction.
- Green Focus: to avoid redelivery and thus reduce carbon emissions.
Major corporations - “Green” Initiatives

- Logistics Performance Measure:
  - Zero Customer Order Complaints

- Traditional Focus: ...do whatever it takes to make customer happy!...order minimums are no problem...delivery ASAP!

- Green Focus: ...increasing order minimums to reduce delivery frequency, and longer order lead times to facilitate transportation consolidation.

Consolidation and Cross Docking

Growing interest by “individual” shipper’s to:
- Consolidate multiple orders to a region.
- Wait till enough product ordered to ship full loads.
- Utilize cross-dock operations to deliver locally.

Growing interest by “groups” of shippers:
- Consolidate orders together to build full loads for direct TL shipment or to a cross-dock facility.

LEED / Green Certifications.....

- “Leadership in Energy and Environmental Design” (LEED) – a green building rating system.
- More companies will be asking their outsourced providers for LEED certification over the next 3-5 years to meet “green initiatives.”
- Other green certifications growing in importance also - Smartway, EnergyStar, ISO 14001, etc.

Urban “Heat Island” Impacts and Green Roofs....

- Chicago City Hall – In 2000 the City of Chicago roofed its half of a building in a green roof with striking results as noted....
  - 90°F – Roof Temp.  
    City of Chicago side (green roof)
  - 170°F – Roof Temp.  
    Cook County side (normal built-up roof)
Green Roofs:

- Cooling aspects – for building and urban area
  - Even a 40 foot ring around air intake vents proving beneficial!
- Roofs become water retention basins
  - Delayed runoff the result
  - Runoff rate from storm surge into stormwater system delayed
  - Reduces size and cost of site infrastructure
  - Eligible for stormwater fee credits
- Green roofs still 5x cost of traditional roofing – costs are lowering with innovative products; will see more on non-public buildings starting in 10 years or so.

Facility Design – Stormwater Regulation Impacts:

- Few realize growing impact!!!
- EPA mandating cities control their stormwater – quantity & quality
- Stormwater fees growing – 1000+ cities to date nationwide.
  - Minneapolis - $3,400 per acre. Most DC/warehouses use 20+ acres, costs $68,000+/yr.
- Native plant material growing in popularity – sometimes requires a new aesthetic; much cheaper to maintain than lawn.

Energy Creation Measures

- Wind power units – rooftop units (individual fans, horizontal row of blades, & stand alone tower units)
- Horizontal wind power units – research in Chicago on roof top units mounted in a horizontal row of blades at roof edge to capture air flow rising up and over building.

Solar Power Stations

- Large available flat areas – "just sit there" – Solar panels not a great load factor
- Commercial solutions include:
  - "Solar Energy Service Provider" who provides 100% responsibility to design, build, own and operate the asset - including all upfront purchase and installation costs.
  - To solutions where building owner owns the solar assets.
Green Logistics –
Implications….

Green Logistics….
• Green Logistics is in..!!!
• “Green” seen as a reflection of good management by Wall Street and public.
• Could lead to less service & options for shippers – to increase consolidation opportunities, etc.
  • “Consolidation / Pool Distribution” will likely come back in popularity amongst shippers.
• Likely see a “slow-down of logistics velocity” – as transportation modes slow down to maximize fuel efficiency & consolidation
• LEED & other environment certifications will grow in importance
• Facility design changes – including green roofs, stormwater management, & other planting concepts.
• Energy production on logistics facilities roofs – wind & solar.

The Next Logistics Frontier….
….MIT already working on….