WHERE IS MY SHIPMENT AND WHY CAN’T I GET IT?

Over $30 Bn in goods

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WHY IS FREIGHT TRANSPORT IMPORTANT?
MAYHEM AT THE PORT GATE

Impacts
- Environmental
- Financial
- Operational

Source: Bloomberg
SOURCE OF THE PROBLEM

Anticipatory Orders
IT’S NOT JUST ONE ISSUE AND IT’S NOT NEW!

2018-2019 U.S.-China Trade Tensions
Tariffs & Retaliatory Tariffs

Manufacturer Migration to Southeast Asia
= Cargo Routing to U.S. East Coast

Cargo Owners Pull Inventories Forward in Advance of Scheduled Tariff Increases

Tariff Wars Exacerbate Trade Deficit Imbalances

Record-Setting 2018 Volume

2020-2021 COVID-19 Disruptions
Distressed Supply Chain

Economies Shutter
China Manufacturing Halts
Global and Regional Workforce Shortages
Consumer-Driven Cargo Surge
E-Commerce Boom
Global Supply Chain Disruptions
Container Shortages
Shipping Price Hikes
POLA Exports Down 31 out of 35 months thru Sept. (biggest declines since 2002)

Record-Setting 2021 Volume
SHIPS AT ANCHOR – NOT IN PORT

Container ships off LA/LB on Friday (15Oct2021) morning. Map: MarineTraffic
SUPPLY CHAIN METRICS

Avg. Value of Goods / TEU $40,000
SUPPLY CHAIN METRICS

China - US Ocean Shipment Transit Time - Freightos Marketplace Shipments

Average Days End-to-End

40 41 43 45 46 48 49 50 51 52 53 56 58 60 61 62 63 64 65 66 67 68 70 71 73 76 78 80


Bad to Worse
### SUPPLY CHAIN METRICS

<table>
<thead>
<tr>
<th>Container</th>
<th>Terminal Dwell</th>
<th>Street Dwell</th>
<th>Total Dwell</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEU</td>
<td>8.4</td>
<td>10.5</td>
<td>18.9</td>
</tr>
<tr>
<td>FEU</td>
<td>4.0</td>
<td>9.7</td>
<td>13.7</td>
</tr>
</tbody>
</table>

- Chassis used to store containers NOT moving containers
- Distribution centers / warehouses at or above capacity
- Not enough truck drivers (est. at 80,000 -100,000 deficit)
- Drivers being poached by other trucking lines

Examples of real-world on-port dwell times:
- LA/LB – 45 days
- Balt. – 14 days
SUPPLY CHAIN METRICS - FINANCIAL

Additional Interest paid by customers for cargo value due to berthing delay

- TEUs at Anchor vs. Additional Interest ( Millions $ )

- Additional Interest Trends:

FAU-FMRI / FEBRUARY 9, 2022
**SUPPLY CHAIN METRICS**

<table>
<thead>
<tr>
<th>Railroad</th>
<th>Range of daily demurrage fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNSF</td>
<td>$150 to $500, depending on container dwell time and facility</td>
</tr>
<tr>
<td>CN</td>
<td>$100 to $450, depending on container dwell time and facility</td>
</tr>
<tr>
<td>CP</td>
<td>$75 to $350, depending on container dwell time, facility and who owns the equipment</td>
</tr>
<tr>
<td>CSX</td>
<td>$100 to $500, depending on container dwell time, facility and whether the equipment is for domestic or international use</td>
</tr>
<tr>
<td>KCS</td>
<td>$100 per day after free time expires, in all cases</td>
</tr>
<tr>
<td>NS</td>
<td>$100 to $300, depending on container dwell time and facility</td>
</tr>
<tr>
<td>UP</td>
<td>$100 to $225, depending on container dwell time, facility and whether the equipment is for domestic or international use</td>
</tr>
</tbody>
</table>

**SOURCE:** Letters in response to the STB, as linked. Union Pacific did not disclose its specific fees in the letter, but its rates are available online.

- Velocity is the key to profitability
- Using a stick (demurrage) can have negative effects
Ocean Freight Costs vs. Value of Products

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Typical Nbr. Of Items per 40 foot container</th>
<th>Estimated Retail Value (USD)</th>
<th>China - US West Coast Freight Rate per Retail Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Clothing (low-value)</td>
<td>90,000</td>
<td>130,000</td>
<td>$225,000</td>
</tr>
<tr>
<td>Clothing (mid-range)</td>
<td>25,000</td>
<td>60,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>Sports shoes</td>
<td>18,000</td>
<td>28,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Bicycles</td>
<td>1,200</td>
<td>1,600</td>
<td>$240,000</td>
</tr>
<tr>
<td>Toys (low-quality)</td>
<td>20,000</td>
<td>60,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Consumer electronics (small)</td>
<td>2,800</td>
<td>3,800</td>
<td>$170,000</td>
</tr>
<tr>
<td>Consumer electronics (large)</td>
<td>240</td>
<td>480</td>
<td>$70,000</td>
</tr>
<tr>
<td>Appliances (small)</td>
<td>600</td>
<td>1,200</td>
<td>$45,000</td>
</tr>
<tr>
<td>Appliances (large)</td>
<td>100</td>
<td>130</td>
<td>$30,000</td>
</tr>
<tr>
<td>Furniture (assembled)</td>
<td>250</td>
<td>600</td>
<td>$20,000</td>
</tr>
<tr>
<td>Furniture (flat-packed)</td>
<td>1,000</td>
<td>3,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Automobile parts</td>
<td>600</td>
<td>15,000</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

FEU rate China - North America west coast: $16,883

Sources:
Freightos Index, October 25, 2021 - FEU rate.

- Ocean transport costs are unsustainable
- Prices of products will have to rise significantly
- Price-elasticity of demand will affect flow of imports
OTHER ISSUES - IMPACTS

• Anticipatory Orders
  • E-commerce clicks generate trends ➔ Supplier ordering

• Truck Repair Parts
  • Delayed from 2 weeks to 3 months ➔ Drivers leaving who can’t earn

• Precision Scheduling Railroading
  • Focused on Wall Street NOT consumers ➔ Insufficient capacity

• Environmental Impacts
  • Container ships + trucks + trains idling ➔ Increased concentrated emissions
E-COMMERCE IMPACT ON LOCAL COMMUNITIES?

- More trucks on the road
- Higher costs
- More congestion

<table>
<thead>
<tr>
<th>Estimated Truck Operations Per Year in U.S.</th>
<th>UPS</th>
<th>FedEx</th>
<th>USPS</th>
<th>Amazon</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of packages per truck/day</td>
<td>125</td>
<td>125</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>No. of trucks per day / 2020</td>
<td>106,168</td>
<td>70,779</td>
<td>210,125</td>
<td>38,707</td>
</tr>
<tr>
<td>No. of trucks per day / 2026</td>
<td>186,740</td>
<td>124,493</td>
<td>369,589</td>
<td>68,082</td>
</tr>
</tbody>
</table>

Ocean costs have increased from 1.5% to 15% of value of goods
WHAT TO DO?

- Manage expectations
- Purchase what is needed – reduce returns
- Re- and near-shore – make local buy local
- Focus on consumer needs NOT just investor expectations
- Improved / coordinated infrastructure planning and investment
- Expanded TDL/SCM training
- Digital investment
NEEDED RESEARCH

• Analyze existing ‘freight’ data bases and select ‘best’ ones
• Digitalization / cargo community systems – US applications in marine industry
• Benefit-cost analysis of significant expansion of Critical Urban and Critical Rural Freight Corridors program
• Benefits of EV on noise, particulate, and other emissions in communities surrounding ports
• Integrate / coordinate state TIMS and port / company TMS systems
• Use of AI to improve ocean-domestic container processing and handling
QUESTIONS AND GENERAL DISCUSSION