Mitigating Supply Chain Risk: Planning Around Port Disruptions

To reduce the business impact of U.S. port shutdowns, retailers need a framework to help them assess their global supply chain capabilities and make decisions that ensure a consistent supply of imported goods.

Executive Summary
As supply chains increasingly globalize, and retailers spread their sourcing arms across the world, the role of international trade and commerce is growing geometrically. Retailers already rely heavily on imports (both directly sourced and via third-party vendors) to fulfill their inventory. Hence, disruptions to port operations can have a devastating effect on their business operations.

This white paper looks at the impact of port disruption on retailers’ supply chain operations and offers ways to mitigate any and all consequences. We also present an overview of options available to importers to manage risks associated with import operations in the event of a port shutdown.

U.S. Imports: A Brief History
The U.S. is the world's second largest importer, after the EU, with a net value of imports nearing $2.73 trillion in 2013. More than 80% of U.S. imports are goods ($2.268 trillion) as opposed to services, and the consumer goods category constitutes close to one-quarter of this figure, at $533B (see Figure 1).

Source: http://useconomy.about.com/od/tradepolicy/p/Imports-Exports-Components.htm
A large portion of these imports flow into the country as containerized traffic via major U.S. ports. The U.S. imported 22.5 million TEUs (twenty feet equivalent) in 2013, and retailers corner a major share of these containerized exports.

**Rising Retailer Imports**

According to the *Journal of Commerce*’s 2013 top importer list, 33% of the top 100 importers were retailers. Five of the top six importers are retailers, and the top 10 list each year is dominated by giants such as Walmart, Target and Lowe’s (see Figure 2). Collectively, these retailers constitute almost 70% of the traffic, measured in TEUs. Given the proximity to China’s ports and connectivity via major shipping lanes, the bulk of these imports arrive at West Coast ports. The ports of Los Angeles and Long Beach together handle about 40% of U.S. imports from Asia. Together, West Coast ports handle about 70% of the market share of U.S. imports from Asia, earning it the title of “Gateway of Choice” for goods sent to and from Asia. However, the collective share of the East Coast and Gulf Coast ports have steadily increased over West Coast ports in the last few years, as these ports are increasingly perceived as viable alternatives by importers (see Figure 3).

Given the high volume of imports, any disruption to port operations arising from natural or man-made causes has a critical impact on retailers’ business operations and profit margins.

**Understanding the Impact of Port Disruptions**

A typical import lifecycle for a retailer occurs over a four- to six-month period, and involves many departments, from merchandising through supply chain and logistics (see Figure 4, next page).

The complexity is further increased due to various regulations and governmental bodies, such as the U.S. Customs and Border Patrol, involved in the import process. Disruptions to port operations also have a crippling impact on the overall economy. In addition to natural calamities, labor issues have disrupted port operations in the past, such as the recent negotiations between the International Longshore and Warehouse Union and Pacific Maritime Association.

**Share of U.S. Containerized Cargo (Imports)**

![Share of U.S. Containerized Cargo (Imports)](source: USA Trade Online/Martin & Associates. Figure 3)
The Monetary Impact of Long-term Supply Chain Operational Disruptions

According to academic estimates, the 11-day lockout at West Coast ports in 2002 incurred billions of dollars in losses. The shutdown was nothing short of an operational nightmare for retailers. Buyers had to expend time and effort to prioritize shipments to be flown in or re-routed to the East Coast. Stores, meanwhile, started to experience out-of-stocks, and holiday orders were delayed beyond the season and had to be canceled in some cases, thus impacting the financial health of offshore suppliers and factories, as well.

Even when the strike ended after 10 days, shipments were so backed up that retailers ended up receiving some goods after Christmas and had to sell the products at marked-down prices just to clear inventory. Merchandising was hit hard by first the scarcity of inventory and then an out-of-season oversupply scenario.

The prolonged labor contract negotiations in 2014 slowed down port operations yet again, and retailers’ margins were impacted. Lululemon Athletica stated that its fiscal-year fourth-quarter revenue would be hit by as much as $10M due to the shipment backup.

Clothing retailer Ann, Inc. took the initiative to receive shipments via air-freight for the holiday season, which significantly impacted margins. The risk is more pronounced for specialty retailers due to the time sensitivity of their products.

Supply Chain Challenges

A large-scale disruption to port operations typically results in shifting import timelines and the need to move goods to alternate ports, thereby leading to spikes in traffic and difficulty securing resources for transportation.

From a logistics point of view, reserving a container (20 ft., 40 ft. etc.) for the preferred lane (origin to destination port) can get difficult, especially for specialized equipment. In some cases, the resources could even be allotted in a round-robin approach in spite of million-dollar deals between the retailer and the shipping lines.

This scarcity is not just limited to reserving equipment; it also includes planning for a trailer to move goods inland. For cases of IPI, the multi-modal operator or railroad carriers might run at full capacity or be overbooked.

In 2014, retailers made contingency plans to meet the fallout. Between April 2014 and June 2014, there was an unprecedented increase in port traffic compared with the same period in fiscal year 2013. Having learned from their past experiences, retailers advanced their import cycles to ship goods early to mitigate the repercussions of a feared shutdown.

Importers also shifted cargo to East Coast ports, which reduced West Coast port activity from 62% of all U.S. retail container cargo handled in January 2014 to 59% in May 2014. Some companies even split volumes to send some goods to other ports on the East and Gulf Coasts.
Mitigating Risks, Impact on Downstream Operations

To meet fallout due to port disruptions, we suggest that retailers adopt diversified strategies to prepare for all contingencies. This approach considers the following factors:

- Sourcing decisions.
- Inventory management.
- Alternate routing strategy.

Sourcing Decisions

To rationalize sourcing, retailers must investigate advancing the sourcing cycle, seasonal vs. staple merchandise sourcing, and category of goods (i.e., low vs. high value and commodity attributes, such as perishable, hazardous, etc.).

Inventory Management

From a supply chain perspective, the decision of lost sales vs. high inventory holding costs (buffer stock) vs. contingency logistics costs is a strategic one. During the West Coast shutdown in 2002, Dell implemented a “just-in-case” strategy to build up additional inventory in anticipation of a port shutdown. While its competitors attempted to address their logistical nightmare, Dell managed to capitalize on the situation by building inventory beforehand.¹⁰

<table>
<thead>
<tr>
<th>Inventory Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefits</strong></td>
</tr>
<tr>
<td>- The possibility of inventory unavailability can be eradicated.</td>
</tr>
<tr>
<td>- Strategic decisions can be made, and consensus can be built on higher inventory holding cost.</td>
</tr>
<tr>
<td>- Profits can be better managed, with known product margins.</td>
</tr>
<tr>
<td><strong>Constraints</strong></td>
</tr>
<tr>
<td>- Distribution center storage capacity is needed to support overflow.</td>
</tr>
<tr>
<td>- Capital is blocked for a significant period.</td>
</tr>
</tbody>
</table>

Alternate Routing Strategy

When it is too late to revise a sourcing decision, and the business is not comfortable with building up inventory, the only option available is to analyze the risk and seek alternate routing options.

By Sea

All the sea-based alternate routes are well-thought-of, and are completely water-based vs. intermodal or trans-shipment (see Figures 5 and 6).

U.S. Sea Gateways

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¹⁰ Other carriers, such as Mediterranean Shipping Co., CMA CGM, Hanjin Shipping and Maersk Line, have also levied CSUs on West Coast shipments.⁹

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Figure 5
**U.S. Port Gateways**

**Alternate routing for the West Coast:** The Canadian Gateway or East/Gulf Coast ports are the preferred routes over West Coast ports for contingency planning.

- Vancouver, Prince Rupert: Inter/multimodal for inland via rail.
- Prince Rupert has the best connections to the Midwest and Gulf Coast through the Canadian National Railway Co. (CN).
- Port of Lazaro Cardenas also has rail corridor connections to the U.S. South Central region. Lazaro Cardenas’ target market in the U.S. is Texas and the Gulf Coast.

**Alternate routing for the East Coast:** West Coast and Gulf Coast ports are the preferred alternates for the East Coast. The Canadian and Mexican intermodal connectivity to Eastern and South Central America are equally competitive.

- Canadian and U.S. West Coast ports all serve Chicago and the Midwest.
- Pacific Northwest ports have a comparative advantage in reaching more northerly inland markets (Minneapolis).
- Prince Rupert specializes in intermodal moves to Chicago and Memphis via the Canadian National Railway.

- Port of Lazaro Cardenas is a good alternative to the West Coast, as well.

**Trans-shipment hubs:** The “Caribbean trans-shipment triangle,” encompassing Colon, Freeport and Port of Spain, is called on by larger vessels carrying cargo from the Far East, Asia and America (north, south and central). These preferred hubs are called by feeder vessels that can distribute the offloaded containers to destinations throughout the Americas.

- Panama East (Atlantic/Caribbean Coast): Manzanillo International Terminal (MIT), Cristobal, Colon Container Terminal (CCT).
- Panama West (Pacific Coast: Balboa, Panama International Terminal).
- Caribbean Hubs/Freeport Container Port (Bahamas), Kingston (Jamaica), Caucedo (Dominican Republic), Cartagena.

Post-Panamax, these ports will have an impact on all-water cargo movements from “rest of world” to the U.S. Gulf Coast and East Coast and vice-versa.
By Air
This should be the preferred option for high-value and/or high-customer-impact commodities, in which a stock-out is simply not an option. This is a typical “hand-to-mouth” strategy: Compute the right quantity of inventory required to meet demand until port downtime, and airlift this limited stock (precious) to locations closer to the distribution center or stores.

### Alternate Routing Strategy (By Air)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Constraints</th>
</tr>
</thead>
</table>
| • Viable option for delayed planning, which may occur for various reasons, such as production delays, high-value commodity, unexpected disruptions, etc.  
• Lead times are shorter across the supply network, from importing through the last mile to the distribution center or stores. | • Premium freight costs will significantly impact margins.  
• Does not qualify for all types of commodities.  
• Space needs to be secured in case of last-minute planning challenges.  
• Service vs. cost is a paramount decision. |
### Diversified Strategy Mix

<table>
<thead>
<tr>
<th>Decision Type</th>
<th>Sourcing</th>
<th>Inventory</th>
<th>Routing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Strategic</td>
<td>Tactical</td>
<td>Operational and executional</td>
</tr>
</tbody>
</table>
| **Supply Chain Stage** | • Early in the supply chain cycle.  
• Prerequisite for the purchase order to be cut. | • Latest by midway through the supply chain cycle. | • Anytime before the shipment is onboard the carrier equipment. |
| **Suggested Actions** | • Advancing the sourcing cycle.  
• Domestic partnership/vendor.  
• Near-shoring. | • Staple vs. seasonal.  
• Substitute items.  
• Build up inventory/safety stock. | • Alternate ports/trans-shipment hubs.  
• IPI/multi-modal.  
• Air freight/ocean. |
| **Key Factors** | • Availability of vendors, both domestic and near-shore.  
• Capability of existing vendors to support advanced order cycle.  
• Capability of existing vendors to support additional volumes. | • Lost sales vs. inventory holding cost.  
• COGS, retail prices, profit margins.  
• Inventory aging.  
• DC storage capacity. | • Logistics partners: Carriers, shipping lines, freight-forwarders, etc.  
• Expertise of logistics partners to support contingency.  
• Geographical spread of logistics partners.  
• Securing resources during peak/congestion.  
• Shortest to longest lead times.  
• Total logistics cost.  
• Trade barriers, compliance, duty.  
• Financial implications: International commercial terms (INCOTERMS), letter of credit, etc.  
• Cost vs. time trade-off. |

*Figure 7*

### Import Supply Chain Risk Assessment

Figure 7 defines the trade-offs among the three strategies and the key factors within each. Our assessment framework helps retailers understand the current business capabilities with respect to import supply chain operations. The framework identifies the current import landscape and determines the agility of the importer’s supply chain. With a pre-defined set of assessment questions, key decision parameters can be collected to deploy the most suitable import-related risk mitigation strategy.

Figures 8 and 9 (next page) offer a snapshot of key business entities and their capabilities, as well as key factors to consider across the different entities and their impact on every possible strategy. These can be assessed to determine their current state and ability to adapt to a risk mitigation strategy.
### Assessing the Business and its Capabilities for Mitigating Supply Chain Risk

![Risk Mitigation Diagram]

**Figure 8**

### Factoring Degrees of Influence

A quick checklist of imperatives for making an appropriate supply chain decision.

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Factors</th>
<th>Degree of influencing the decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sourcing</td>
</tr>
<tr>
<td>Accessorial Charges -</td>
<td>Port Congestion Charges (CON)</td>
<td>Low</td>
</tr>
<tr>
<td>Surcharge</td>
<td>Peak Season Surcharge (PSS)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Panama Canal Surcharge</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Suez Canal Surcharge</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Intermodal Charges (Rail / Road)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Intermodal Fuel Surcharge (IFS)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>U.S Rail Fuel Surcharges</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Broker Charges</td>
<td>Low</td>
</tr>
<tr>
<td>Alternate Routing -</td>
<td>Characteristics of the Commodity</td>
<td>High</td>
</tr>
<tr>
<td>Operational Readiness</td>
<td>Special Handling Requirement</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Lead Times</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Vessel Schedule</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Routing Options</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Inland Trucking/Rail Capacity</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Bill of Lading (BL)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Cross-border Compliance</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Customs Documentation</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>De-consolidator Process</td>
<td>Low</td>
</tr>
<tr>
<td>Global Trade Aspects</td>
<td>Letter of Credit (validity, terms, etc.)</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>INCO Terms on PO – FOB, CIF, etc.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Insurance Terms – Specific to Port/Country</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Importer and Exporter Consensus</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Figure 9**
Looking Forward
To prepare for periodic shutdowns or possible disruptions due to contract negotiations and natural disasters, it is essential for business and supply chain professionals to build contingency planning into their systems.

Importers need to begin developing alternate ports of entry to diversify their import traffic around the country. Over-reliance on either East or West Coast ports can greatly hamper operations in the case of man-made or natural disruptions. Further, importers also need to shore up their domestic supply chains by creating import warehouses, distribution centers and a transportation landscape to meet these challenges.

The strength of the supply chain is measured by its ability to be responsive and agile in an emergency. Importers should thus look at building risk mitigation planning and execution as a competency within their global supply chain processes and systems. To contend with unplanned port closures, they need the ability to decide on cost vs. service tradeoffs, as and when required.

Footnotes
3 Ibid.
References


About the Authors

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