



# Learning from the Past to Prepare for the Future

## Adapting Freight and Supply Chains to Resilience Factors

Photo: Wilnora, Flickr

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*Above:* The effects of 9/11 on the freight system were vast and, in some cases, prolonged: From late 2001 to 2011, commercial traffic was prohibited in the Holland Tunnel between New York and New Jersey.

September 11, 2001 (9/11), started as a beautiful day with a picture-perfect blue sky and ended in a tragedy that shook the world. The emotions remain, but in the 20 years since this horrific event, assessments of 9/11's impacts on supply chains have informed responses and transformed the movement of goods. This article summarizes some of the key changes and effective practices that have emerged, along with the ways in which this tragic event has influenced planning and responses to major disruptions.

### Tragic Legacy

Published in 2012, *National Cooperative Highway Research Program (NCHRP) Report 732: Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System* analyzed the local impacts of the terrorist attacks of 9/11 on the New York–New Jersey region (1). The report notes that the immediate impacts on freight movement involved closures of borders, airports, seaports, and area

roadways, as well as a slowing of rail service. For example, the Port of New York and New Jersey was closed as a precaution; it resumed operations on September 14. The bridges and tunnels between New York and New Jersey were similarly affected, particularly the Holland Tunnel, which



For more information on *NCHRP Report 732: Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System*, visit <https://dx.doi.org/10.17226/22702>.

was closest to Ground Zero. Many food companies, smaller delivery trucks, and trucks bound to John F. Kennedy International Airport (JFK) could no longer use the Holland Tunnel, which was closed to truck traffic from 9/11 until January 2011.

Despite the extensive destruction in lower Manhattan and the significant transportation infrastructure operations affected, no one in the region went hungry, and the supplies needed by the population and businesses continued to flow. The can-do spirit of private-sector supply chain professionals and the efforts of the public sector were evident.

Some immediate impacts and actions had longer-term consequences, however. Among these changes were business losses and shifts, enhanced and redefined security measures, new supply chain practices and efficiencies, and expanded collaborations.

### **BUSINESS LOSSES AND SHIFTS**

All airports were closed and U.S. airspace shut down immediately after the attacks. Although air service was largely restored a week later, international air cargo still had to be off-loaded at the first U.S. airport at which it landed; it then was moved to its final destination by surface transportation modes. JFK airport, which had also been affected by road closures, saw a longer-term negative impact on its air cargo business.

As noted in the NCHRP report: “By being forced to try alternative gateways and finding these alternatives better for serving certain markets, shippers and forwarders changed their long-held practices. JFK, the New York–New Jersey region’s predominant international airport, lost business and is working hard to regain market share” (1).

New supply chain vulnerabilities and risks became evident, particularly with the emergence of longer global supply chains that relied on seamless multinational movements. The border closures immediately following 9/11 affected manufacturing operations in North America. Production lines had become global in nature and many companies had reduced inventory levels to quantities needed “just in time.” This method had relied on the



Photo: Matt Hints, Flickr

An Airborne Express cargo plane waits at JFK in New York in 2003. The events of 9/11 negatively affected JFK’s cargo business for several years.

predictable and unimpeded flow of goods among countries. Multiple auto assembly lines in Canada and the United States halted operations. Companies revisited their use of just-in-time inventory levels.

### **ENHANCED AND REDEFINED SECURITY MEASURES**

Although pre-9/11 acts of terrorism had led to increased screening and security, supply chain security measures more often focused on reducing cargo theft. The events of 9/11 turned transportation equipment into weapons and underlined the potential for cargo to be used for nefarious purposes.

On November 27, 2001, U.S. Customs Commissioner Robert C. Bonner summarized the objective of the new enhanced national security measures in a statement to the National

Commission on Terrorist Attacks upon the United States: “We must reaffirm the importance of knowing your customer, and consider the overall ‘air-tightness’ of your supply chain, from factory floor, to loading dock, to transportation to our border. Every single link in that chain must be made more secure against the terrorist threat.”

Trade security measures were implemented, including the Customs-Trade Partnership against Terrorism, the Container Security Initiative, the Known Shipper Management System, and the Safe Ports Act of 2006. These measures tightened security, required substantially more data exchange, and created new relationships and requirements within the supply chain and between the public and private sectors.

An x-ray scanner waits for containerized cargo traveling into the Port of Lisbon, Portugal, one of the many international ports that participates in the Container Security Initiative.



Photo: Nuno Morão

## NEW SUPPLY CHAIN PRACTICES AND EFFICIENCIES

The increased scrutiny and data needed for security had additional benefits: The measures created tighter understandings of each element and organization involved in supply chains and generated new data and tools that enhanced the visibility and expedited the movement of shipments. In an article published on September 11, 2017, Jon Slangerup, CEO of American Global Logistics, commented:

With increased preshipping data requirements due to post-9/11 security concerns, the supply chain was forced to create efficiencies in the hand-offs, where money and time are often wasted. As a result, the cost to move goods is a smaller proportion of the sale price to the end user than it was 10 years ago (2).

In some respects, the new security requirements accelerated the development of the information and management systems that have become as important as the physical elements needed to move goods in efficient supply chains.

## EXPANDED COLLABORATIONS

More and better collaboration and closer working relationships emerged as new security requirements were implemented.

Individual government agencies coordinated more effectively to secure transportation systems and supply chains. The new data required from each element of the supply chain also necessitated greater organization and interaction among all the companies involved in the movement of goods, including sources, transportation providers, and customers.

As Slangerup noted: “What we encountered since 9/11 was an understanding of how silo-driven the management of those supply chains were, and to some extent still are. The various agencies involved in protecting people and assets pulled together very quickly” (2).

## Evolution of Supply Chains and Freight Movement

Unfortunately, disruptive events continue, whether caused by nature or humans. Although in many cases effective practices and lessons learned from previous events have already been applied, substantial and expensive changes in supply chains and freight resilience may only occur after repeated incidents.

In 2011—just 10 years after 9/11—many natural catastrophic events occurred in the span of a single year (Figure 1, page 40). Some had profound effects, similar to those of 9/11, on globally interconnected supply chains and on companies’ continued focus on maintaining

low inventory levels. As noted in logistics company DHL’s 2016 white paper: “Supply chain risk has been a major unintended consequence of two significant trends in recent decades: globalization and lean production” (3).

Affected again by disruptions in one part of the world that affected production operations elsewhere in the world, companies needed to address the risk. It was clear that supply chains would remain global. But relying on a single location or supplier—particularly after the 2011 earthquake and tsunami in Fukushima, Japan—was no longer prudent. As a result, organizations pursued diversification of production locations and suppliers.

Working together has become more important with every disruptive event, and the positive impacts of this change extend beyond disruptive events. Collaboration, cooperation, and communication are the three critical Cs in disruption preparedness and response.

The Council on Port Performance (CPP), formed by the shipping community of the Port of New York and New Jersey in 2014, largely was an outcome of the collaboration, cooperation, and communication that enabled public- and private-sector partners to restart port operations just days after the significant damage caused by Superstorm Sandy in 2012.

# 9/11 REFLECTIONS

## ANNE STRAUSS-WIEDER

**Role on 9/11:** Principal and Founder, A. Strauss-Wieder, Inc., with nearly 18 years prior experience at the Port Authority of New York and New Jersey at the World Trade Center. She was present during the 1993 bombing and worked on one of the recovery teams.

“During those early weeks after 9/11—and with deep sorrow and mourning for colleagues lost and injured—we focused on helping (where possible) to get the agency and others back on their feet and to keep the goods flowing. Everyone helped where they could. The collaborations, teamwork, and can-do spirit would continue to serve the region well as it faced major disruptions and challenges in the years that followed.”

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The CPP's members represent all facets of waterborne movement, including governmental agencies, ocean carriers, terminal operators, labor unions, shippers, trucking companies, railroads, and third-party logistics organizations. The council has worked to address and resolve issues proactively. When the COVID-19 pandemic struck, the CPP moved to more frequent meetings to tackle the new challenges.

## COVID-19 and Supply Chain Resilience

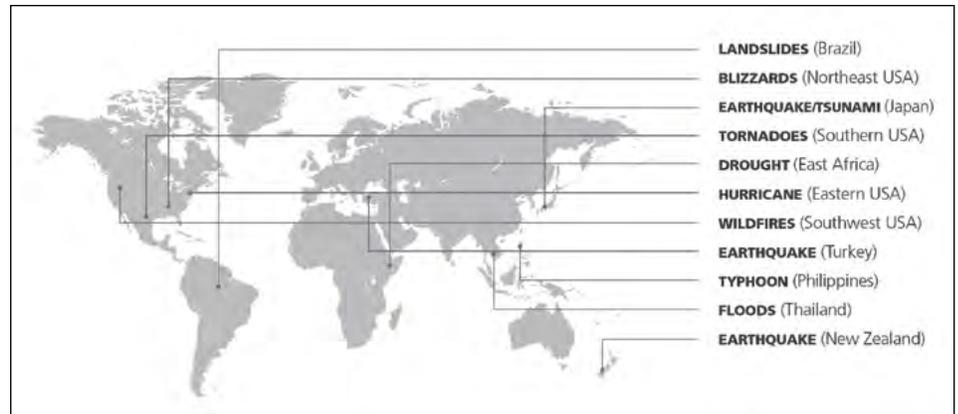
Every disruption is unique. Although we learn and adapt from previous disruptions, new catastrophic events continue to pose challenges.

The pandemic has been the latest challenging disruption. It is global but has not physically affected infrastructure. However, the pandemic abruptly changed the demand for certain products, and some production facilities went offline. It became even more critical to protect the health of essential workers. Each country had to consider its own needs.

Without the robust information systems created and maintained since 9/11, the situation would have been quite different for businesses and consumers. Without the development of collaboration, cooperation, and communication skills, it would have been far tougher to respond.

Pre-pandemic supply chain trends accelerated, including the use of e-commerce, diversification of production locations, augmentation of domestic production capacities, and the expansion of information and automation technologies.

As supply chains are rebooted and reshaped, the effective practices and lessons learned will continue to prepare us for the future.



**FIGURE 1** Natural disasters worldwide in 2011. (Source: DHL.)



Photo: NOAA National Ocean Service

The National Oceanic and Atmospheric Administration (NOAA) ship *Thomas Jefferson* launches a high-tech survey boat to check the waterways in the Port of New York and New Jersey a few days after Superstorm Sandy made landfall in fall 2012. NOAA was among the agencies working together to restart port operations.

## REFERENCES

1. Georgia Tech Research Corporation. *National Cooperative Highway Research Program (NCHRP) Report 732: Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System*. Transportation Research Board of the National Academies, Washington, D.C., 2013. <https://dx.doi.org/10.17226/22702>.
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