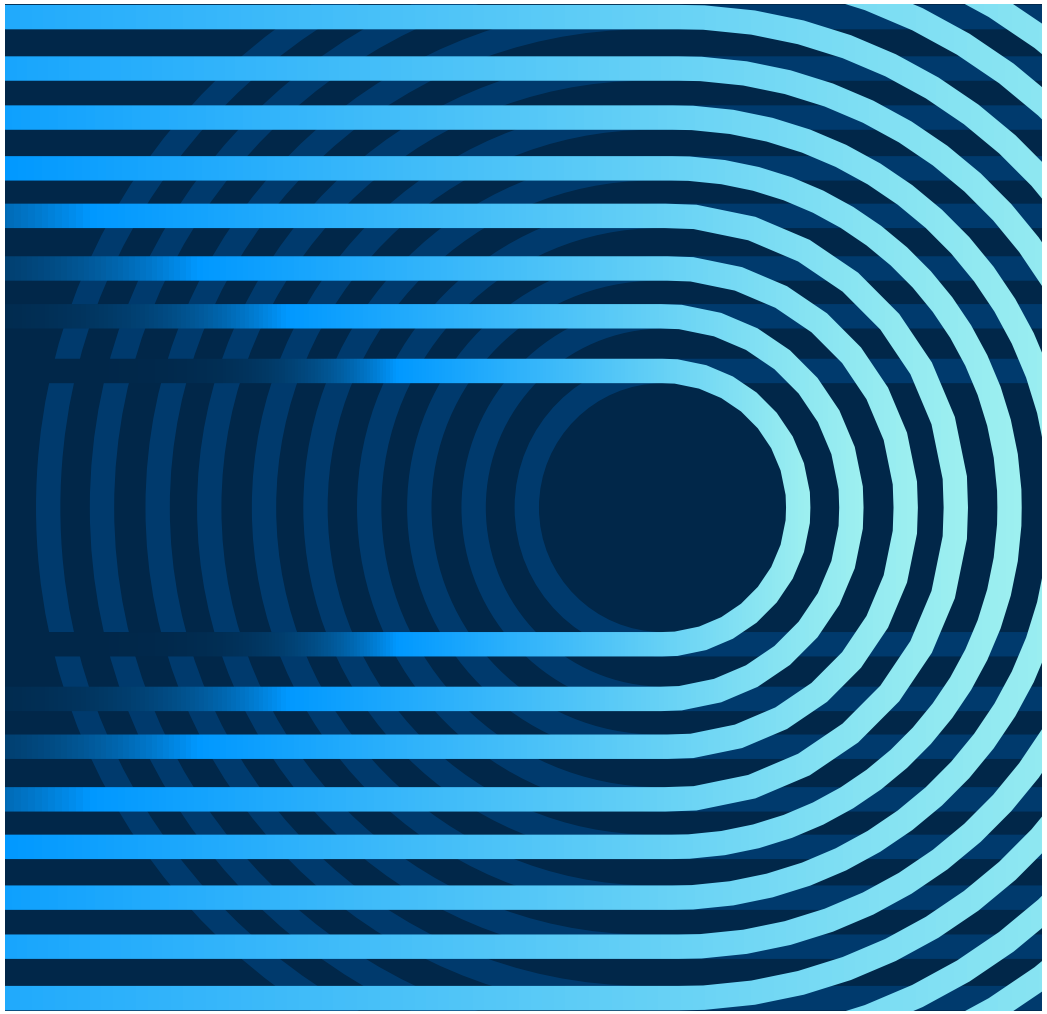
Preparing governments for future shocks

Collaborating to build resilient supply chains



In collaboration with

National Academy of Public Administration

IBM Center for The Business of Government

AmCham The Netherlands

Introduction

During the last three years, a perfect storm of natural and geopolitical events has disrupted worldwide supply chains in ways that few governments could have anticipated. Even as nations, businesses, and consumers strive to normalize, new interruptions have created bottlenecks in an enormously complicated and interconnected system of purchasing, operation, distribution, integration, and consumption.

38%

of global CEOs reported that supply chain disruption is one of their greatest challenges.

In a 2022 survey, 38% of global CEOs reported that supply chain disruption is one of their greatest challenges.[1] And now, the impact of supply chain disruptions on national economies and social systems is driving government leaders to also put a top priority on building supply chain resiliency.

What is the role of governments in preparing for supply chain disruptions that impact government services, national defense, and national economies? How can governments foresee potential challenges, plan responses ahead of time, and be ready to minimize the impacts?

Recently, the IBM Center for The Business of Government, the IBM Institute for Business Value, the National Academy of Public Administration, and the American Chamber of Commerce (AmCham) in the Netherlands jointly sponsored roundtable discussions on "Preparing for Future Shocks: Modernizing Supply Chains." These events, held in Washington, DC, and Rotterdam, brought together leaders and experts from government, business, academia, and the nonprofit sector to share learnings and develop practical and actionable recommendations for governments.

During the roundtables, the participants discussed the need for governments to establish a shared service center of excellence to develop protection against supply chain disruptions. After establishing these supply chain risk management organizations, governments should have the centralized resources to diagnose threats, design responses, sustain supply chains, and mitigate disruptions by building supply chain immunity.[2]

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Step #1

Create a shared service approach to build supply chain resiliency

Many disruptive scenarios envisioned by roundtable participants required different responses from multiple government entities.

This led to a clear conclusion: to garner multiagency support and cross-sector collaboration for quick response, a shared service strategy can be a key form of engagement to build supply chain resiliency.

A shared service approach for supply chains would also incorporate a “center of excellence” (COE) model. A COE would consist of multiple agencies, and could include a data center with key information, predictive modeling capabilities, and an effective vendor-managed inventory. Participants envisioned a multiagency shared service, with full-time subject matter experts contributing unique expertise and perspectives on supply chain disruption events. This team could also build out diagnostic data and organize more predictive models as foundations for “future-state” planning scenarios.

However, managing a shared service is no easy task. Overseeing such an enterprise requires managing experts from multiple government agencies. A COE of this composition should also include leaders from the private sector to help ensure that the right channels are used for driving policies and implementation.

Key takeaway

By taking advantage of synergies between agencies and industry partners, a government-led shared service center of excellence can foster public-private collaboration to diagnose, design, and sustain supply chains to build resiliency.

Research that informed the roundtable shows that the most critical components for building supply chain resiliency include:

- Real-time access to data on disruption effects
- Supply market intelligence with insights into mitigative actions
- Access to skilled experts who know what to do with this information.

To strengthen the effectiveness and security of supply chains, agencies need to quickly execute decisions that drive actions, with a direct line to the right actors in each link of the supply chain. Developing these capabilities requires a combination of appropriate skills, supply risk technology, and communication channels that enable agile responses. Effective preparation cannot be taken for granted; supply chain readiness requires a defined process and a governance framework to analyze and respond, often based on limited options.

For these reasons, participants found that a government-led, industry-involved shared service entity represents the most effective instrument for delivering capabilities to manage supply chain resilience. This report, based on the experience and expertise contributed by the roundtable, lays out the playbook for this and other key actions.

Step #2

Diagnose the acquisition ecosystem

Governments should begin by diagnosing the entire acquisition ecosystem and identifying key vulnerabilities, critical supply risks, and suppliers impacted by these risks.

This effort takes considerable time and effort, given the difficulties involved with managing diagnostic work among multiple agencies and numerous businesses, trade associations, and international partners.

Vulnerability and risk may be further complicated by context. For example, a life sciences manufacturer described how chip shortages and the low availability of reagents impacted the provision of COVID-19 tests. In terms of national security, vulnerability means understanding the nature of component shortages. One defense industry expert explained, "The Tier 1 supplier was not the problem. The issue was a Tier 4 and a Tier 5 connector that was not available. The lack of one inexpensive part prevented more than a dozen aircraft from being deployed."

Key takeaway

Governments need to determine the areas of highest vulnerability to supply chain risks, and map their supply chain networks to recognize and build key supplier relationships that can address those risks.

A June 2021 report[3] issued by the US White House identifies four major supply chains as especially vulnerable:

- Semiconductor manufacturing and advanced packaging
- Large capacity batteries for electric vehicles
- Critical minerals and materials
- Pharmaceuticals and active pharmaceutical ingredients.

After identifying vulnerable categories, governments must develop a set of critical risks to monitor these products and services. For example, critical risks impacting semiconductor manufacturing include:

- Fragile supply chains
- Malicious supply chain disruptions
- Obsolete semiconductors, and related challenges to profitability
- Customer concentration and geopolitical factors
- Erosion of the US microelectronics ecosystem
- Skilled worker shortages
- Intellectual property theft
- Capturing innovation benefits
- Aligning public-private interests.

For governments, information sharing requires visibility into critical events, especially when national defense is involved. However, suppliers may hesitate to provide visibility to governments when warning about sustainment shortages for critical military systems. This inhibits the development of trusted customers and suppliers.

In addition, mergers and acquisitions may mean that prime vendors do not know who is in their supply network, leading to sudden disruptions when a component is no longer supported. In one case noted by a participant, a US firm was acquired by a Chinese company, which meant that the acquired US firm could no longer sell products to the US government.

Another lesson learned was the importance of mapping supply chain networks to build effective supplier relationships. Several participants contended that machine-generated supply network maps are often inaccurate without validation. For this reason, network mapping needs organic verification based on source-level data.

Data is essential to reducing risks associated with supply chain disruption. However, data relevant to supply chains does not reside in most government systems. Commercial partners will need to be heavily involved in collecting key information.

Step #3

Apply design thinking to develop key supply chain components

Design thinking can help governments build supply chain resiliency by developing statements of work, specifications, and sourcing networks with resiliency in mind. Effective networks must be designed at the outset of a program.

As governments build supply chain immunity, they need to establish inventory stockpile requirements. Stockpiles apply not only to pandemic-related goods, but also to inventories of critical commodities such as energy, pharmaceuticals, semiconductors, aerospace components and other national security products. Many government agencies can manage one-time disasters, but struggle with broader crises that shock supply chains on a daily basis.

Several participants agreed with the statement: "You will never stockpile your way out of disruption issues." Creating cost-efficient, agile domestic production capabilities will require further development of advanced manufacturing capabilities. Participants also discussed the value of increased agility through reduced lead times, as cited in the 2022 Economic Report of the President.[4] However, stockpiling efforts could run counter to national mandates, such as US procurement practices that minimize cost at the expense of quality.

Stakeholder education will also be an important factor in network design. Typically, government program managers focus on cost, assessment, and scheduling. Adding supply chain resilience to these criteria would require a major shift in sourcing strategy.

Key takeaway

To design effective networks, governments need to establish inventory stockpile requirements, educate stakeholders to drive change, and develop technology for supply chain visibility and planning.

This may include establishing pre-award intelligence requirements that require vendors to make business continuity plans transparent and provide location details about where materials are sourced. This change was described as "democratization of data"—anyone working on a program can see the data and understand where disruptions may occur.

To build supply chain immunity and resiliency, governments need to implement robust shared technology platforms for supply chain visibility and planning. These platforms need to include AI tools, data analytics, intelligent workflows, and supply chain mapping information to inform decision-making and resource deployment.

Supply chain visibility also enables decision-makers to pivot from a reactive to a predictive stance and mitigate problems before they occur. Participants discussed real-time analytics and predictive modeling for future-state planning. To develop this capacity, governments need to define a problem set and then identify the data needed to address that challenge. Supply chain visibility should occur in real time and provide transparency into the status of critical components and materials. To make sure users have total supply chain visibility, the private sector will also need to collect and share relevant data.

Step #4

Sustain supply chains through risk mitigation and private-sector partnerships

After establishing a visibility network and data collection protocols, a government-led supply chain shared service strategy can shift to a "sustain" mode. This includes the development of predictive models, mitigation strategies, and partnerships with private-sector organizations to innovate and expand capabilities.

Key takeaway

To sustain a resilient supply chain, and better understand the potential impact of disruptions, governments should run war games, use predictive analytics, and improve acquisition strategies and private-sector partnerships.

Wargaming is a useful risk mitigation tool. These exercises bring together stakeholders from different functions to explore various scenarios and examine how future shocks to supply chains could impact government assets, leading to improved procurement approaches and local sourcing alternatives.

Supply chain wargaming also supports stockpile management. Participants discussed the evolving concept of a "virtual stockpile," which enables distributors and manufacturers to hold materials within their own operations, but also provides data visibility to make these materials rapidly available to governments in a crisis.

With the growing sophistication of predictive analytical tools, governments can build on insights gained from wargaming to develop more accurate "what if" scenarios and contingency plans. Technologies such as AI and digital twins—the Port of Rotterdam uses digital twinning to visualize and make decisions quickly and effectively[5]—could also be used to find out where supply chains can break down under stress conditions.

To sustain supply chains, investments are required in resilience capabilities. However, many agencies lack the financial resources and authority to make these investments. Contract officers perennially weigh cost, schedule, and performance, often leading to trade-offs between operations and longer-term sustainment capability. Indeed, government procurement often drives other purposes and objectives, resulting in multiple goals and measures of success. Improving the resilience of government critical supply chains should be considered as a key requirement in procurement decisions, alongside product cost, life cycle costs, and environmental impacts.

Procurement also has a responsibility to act as an organized entity on the demand side. Clear demand signals create economic incentives to invest in strategic industries. These signals also increase the willingness to share data and share the development of more comprehensive business continuity plans.

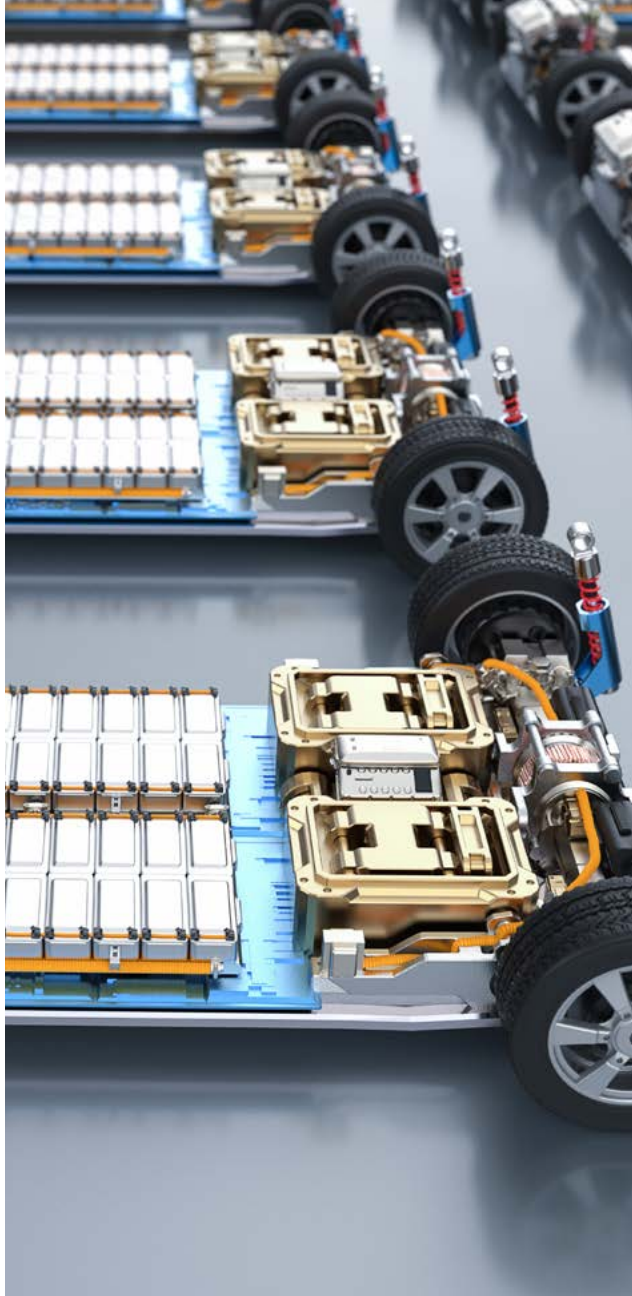
To help address global challenges that impact supply chains, participants cited the new Market Shaping Accelerator at the University of Chicago.[6] This initiative is designed to accelerate response by leveraging the power of incentives, competition, and private sector innovation.

Designating vulnerable industries as essential to a national economy may lead to additional challenges, such as steering investment into critical areas. This requires recognition of structural difficulties within domestic supply chains to meet economic and security objectives. If at-risk essential sectors cannot be sourced without higher costs, then governments need to invest in domestic industries that support national security, such as electric batteries, semiconductors, and pharmaceuticals.

To improve supply chain resiliency, governments must foster strong partnerships with the private sector.

By sharing information and developing mutual trust, governments and businesses can help each other adjust to different situations that might arise in an unpredictable, disaster-prone world. The US National Emergency Business Operations Center—part of the Federal Emergency Management Agency—has established a precedent for developing such partnerships.[7]

Measuring costs and return on investment also supports supply chain resilience. Participants noted that governments do not currently track these costs, nor costs related to expediting fees, emergency alternative sourcing, and overtime. And since financing often occurs through progress payments, costs are simply passed on to the government after being incurred—increasing overall costs in subsequent years.



Roundtable in Rotterdam, the Netherlands

For an international perspective on developing supply chain resiliency for governments, a roundtable event was held at the Port of Rotterdam in the Netherlands, where European experts added context to the action items introduced in Washington.

The event was co-sponsored by the American Chamber of Commerce in the Netherlands.

The Port of Rotterdam—a very large government-owned entity, the largest seaport in Europe, and a key European supply chain hub—is embarking on a data-driven modernization strategy that can provide a model for recommendations coming from both roundtables.

In the Dutch discussion, cooperation between governments and private industry emerged as essential in bringing the shared services concept to fruition. For example, the shipping industry has difficulty in obtaining and sharing data. Ports, supply chains, and transport networks each have their own API systems. In addition, governmental rules and regulations often prohibit the sharing of information between port operators and logistics providers. The ability of governments and commercial entities to exchange data on a timely basis needs to be a high priority task when building systems that support resilient supply chains.

Key takeaway

The Rotterdam roundtable provided insights into the benefits—and potential risks—that advanced technologies such as AI, automation and quantum computing, will have in transforming supply chain operations.

Given the interest in recent advances in generative AI, the Rotterdam roundtable provided insights into the role that AI and other advanced technologies—such as automation and quantum computing—will play in supply chain resilience. Algorithms using these technologies have potential to optimize the operation of container-lifting cranes, direct vehicles, and help pilots bring ships safely into ports as busy as Rotterdam, which handled 467.7 million tons of goods in 2022.

However, these new technologies also represent potential risk. When discussing supply chain vulnerabilities, participants shared concerns about the security of supply chain networks. In the hands of hackers and absent strong cybersecurity protections, AI and quantum computing could disrupt logistics, customs operations, and border protection.

Participants agreed with the criticality of building security into the design of emerging technology systems to drive resiliency, rather than bolting on security only after a risk or threat arises.

Conclusion

Modernize supply chains to build resilience

Building supply chain resiliency solutions starts with a strategy involving a government-led, industry-involved shared service and center of excellence.

Given the central role of a shared approach to building supply chain resiliency, how can governments set up these collaborative organizations that meet their specific requirements? Although the following recommendations were developed in a US government context, this framework could also be applied to other democratic governments with similar agency structures.

In the US, a shared service for supply chain resilience could include multiple agencies that share a common objective. The European Union already has a similar framework that shares data and information among countries.[8]

A shared service could span several domestic agencies with direct insights into various types of civilian and national security supply chain disruptions. These could include the Departments of Homeland Security, Commerce, Health and Human Services, Energy, Transportation, State, and Defense, as well as the Intelligence Community. Other nations may choose to house a shared services capability in ministries or bureaus with similar responsibilities.

A shared service capability needs to exist as a core responsibility, and the government should own it, lead it, and drive cross-border collaboration with other countries. Our experts also recommended establishing agency mission-support leadership roles for supply chain management. These mission-support leaders would address cross-departmental and interagency component tasks.

Assembling the multiple components of a supply chain resiliency solution will need more than government participation. The private sector will also need to be involved when developing this capability. For this reason, private-sector advisors to agencies should include business leaders and subject matter experts from different nodes in the supply chain. These experts could come from equipment manufacturers, distributors, logistics providers, hospitals, retail pharmacy chains, and drug manufacturers.

Governments are responsible to broad constituencies for building supply chain immunity, and a shared services center of excellence provides a practical structure to manage this responsibility. Such a strategy would integrate the expertise of government agencies with private-sector business acumen. It also provides the flexibility to anticipate and respond to continuously changing supply chain disruptions. Recommendations put forth at these roundtables provide a useful playbook to this approach and can bring insights to governments around the world as they prepare for the supply chain shocks of the future.

Afterword

Pandemics, armed conflict, civil unrest, droughts, floods, earthquakes, critical supply disruptions, and other events demonstrate that future shocks are happening now, with far-reaching and long-term impacts.

To help government leaders build capabilities and resilience to prepare for future shocks, IBM has launched an initiative through the IBM Center for The Business of Government and the IBM Institute for Business Value, in partnership with the National Academy for Public Administration. This initiative includes six international roundtable discussions with global leaders and experts from public, private, academic, and other sectors.

In 2022, the first roundtable event in this series was held in Washington, DC, focusing on emergency preparedness and response. A research brief, "Partnering for Resilience: A practical approach to emergency preparedness" was published and includes pragmatic and actionable steps to lead in an era where managing unexpected events is now part of the portfolio.

Key takeaway

The six domains of the future shocks initiative include emergency preparedness, cybersecurity, supply chain risk management, sustainability, workforce skills, and international cooperation.

For the second topic in the series—cybersecurity—roundtable events were held in Washington, DC, and Rome, Italy. A second research brief was published, "Preparing governments for future shocks: An action plan to build cyber resilience in a world of uncertainty." It includes steps to help governments emerge stronger from current and future cyber-shocks.

Supply chain risk management, the domain area of this brief, was the focus of the third series of roundtable events held in Washington, DC, and Rotterdam, the Netherlands. In 2023, three more roundtable events will discuss additional domain areas including sustainability, workforce skills, and international cooperation.

In each domain area, insights from the roundtables will be used to identify strategies and solutions to help governments anticipate and address the challenges that lie ahead. This knowledge will enable the identification of practical and specific recommendations for near-term implementation and long-term readiness.

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Established in 1961 and now in its sixth decade of service to the US business community, the American Chamber of Commerce (AmCham) in the Netherlands seeks to further the development of commerce between the US and the Netherlands. AmCham encourages and facilitates the transaction of business between both countries and promotes the interests of its members in matters of trade and investment. AmCham is a nonprofit, nongovernmental, nonpolitical, voluntary organization of companies and individuals who invest in and trade between the US and the Netherlands, one of the most important destinations for US direct investment in Europe and a major hub of American professionals living and working abroad. Learn more about AmCham and its work at https://www.amcham.nl

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