

An aerial photograph of a port area, likely Seattle, showing a large number of shipping containers stacked in rows, several red gantry cranes, and a city skyline in the background under a clear blue sky.

# Making Sense of Supply Chain Challenges

How Washington's Small Businesses Can Weather the Storm



Business Impact Group  
Research Program

December 2022  
Report



Business Impact Group, the University of Washington's largest consulting student organization, is dedicated to advancing small business growth. In partnership with the University's Consulting and Business Development Center, we consult women and minority-owned businesses. Our Research Program generates insights for small businesses, while training students on essential skills.

**Phillip Meng**

*President, Business Impact Group*

**Rebecca Rong**

*Director, Member Development and Program Innovation, Business Impact Group*

Research

**Clementine McLemore**

*Business Administration*

**Yunji Kim**

*Operations & Supply Chain Management*

Visualizations

**Chun Hin Matthew So**

*Data Analyst, PODUW*

Program Support

**Sree Lekha Pamudurthi**

*Program Consultant, Business Impact Group*

Learn more about the report's research team on p. 20.

With special thanks to Patrick Douglas for his insights and to the Polling and Open Data Initiative at the University of Washington (PODUW) for their support with data visualizations.

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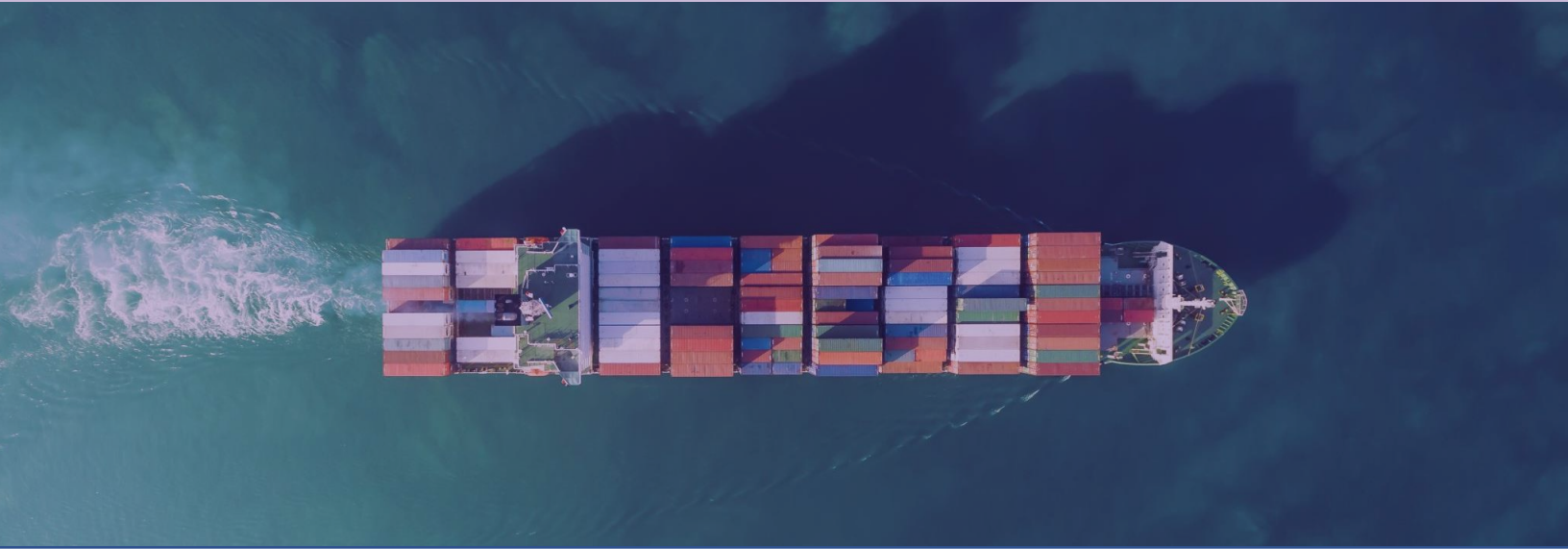
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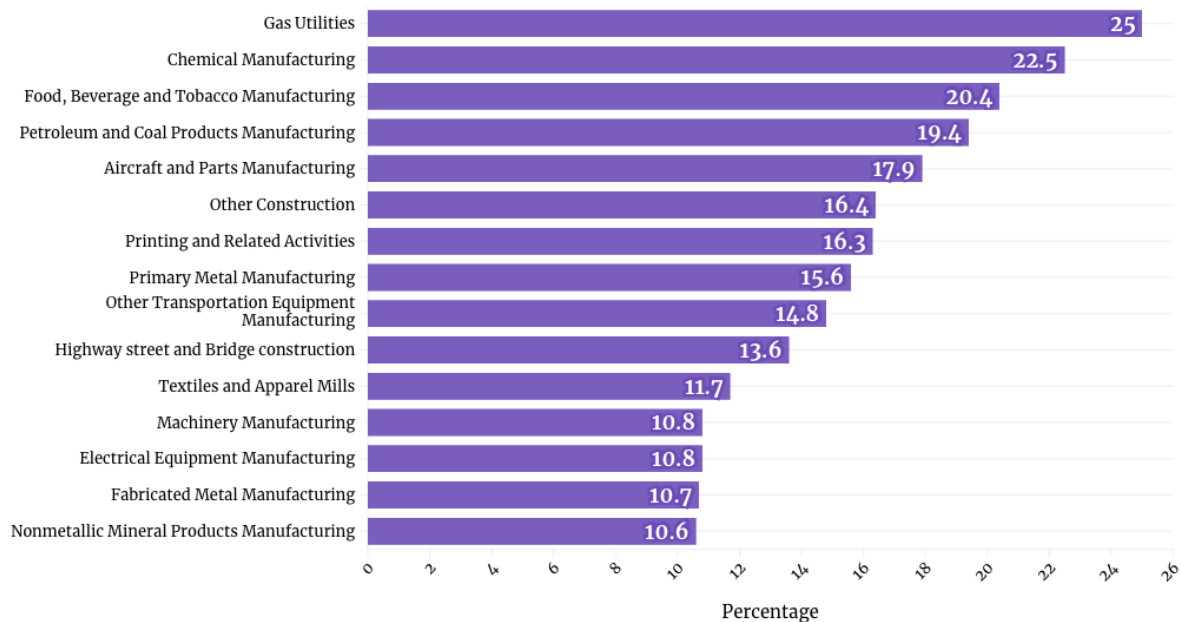
## Introduction

Globalization has linked business success with the health of supply chains across the world. In Washington, more than one in five of Washington’s jobs depend upon international trade, according to the Business Roundtable.<sup>1</sup>

There is more at stake than the success of large corporations. 90% of Washington’s exporters are small and medium-sized businesses. And imports account for much of businesses’ energy, food, and machinery demand; in 2018, 11,443 Washington companies imported goods from 187 countries around the world.<sup>2</sup>

### Imports are critical to Washington's Economy

Share of imports as share of total producer purchases, Washington State



Source: Washington State Office of Financial Management 2021

<sup>1</sup> Business Roundtable, “How Washington’s Economy Benefits from Trade & Investment,” [https://s3.amazonaws.com/brt.org/BRT\\_General\\_Trade\\_WA\\_2020.pdf](https://s3.amazonaws.com/brt.org/BRT_General_Trade_WA_2020.pdf).

<sup>2</sup> Ibid.

But since 2020, the global supply chain has reeled from effects of COVID-19, and later, the Russian invasion of Ukraine in 2022. Many of these impacts have hit close to home. Container backlogs impacted the Port of Seattle and the Port of Tacoma, which combined represent the “fourth largest container gateway in North America”.<sup>3</sup>

Through a small business focus, this brief evaluates the multiple modes of transportation that were affected and how COVID-19 and the political situation contributed to this congestion—with a focus on helping small businesses build resilience from supply chain shocks.

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<sup>3</sup> Port of Seattle, <https://www.portseattle.org/page/seaport-statistics>

# **Global supply chain disruptions were a perfect storm**

The just-in-time inventory management model created supply chain vulnerabilities that are further exacerbated by the COVID-19 pandemic and regional unrest.



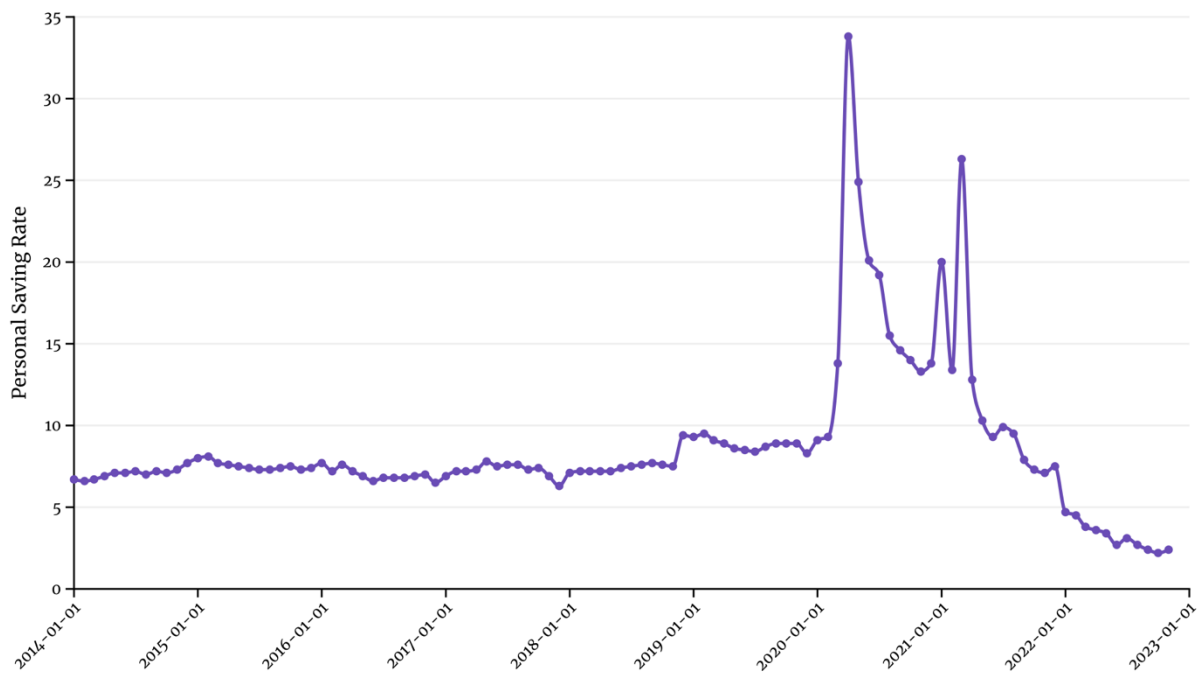
# Transformations in Global Supply Chains

## COVID-19 and Ongoing Effects

The COVID-19 pandemic made supply chain vulnerability a critical issue for small businesses. The pandemic's catastrophic impacts on inventory supplies were made possible by the propensity towards outsourcing and “**just-in-time**” supply chain management in the last few decades.<sup>4</sup>

Although some adverse effects from the COVID-19 pandemic have receded, this section outlines some key impacts.

**Personal Saving Rate from 2014 to 2022**

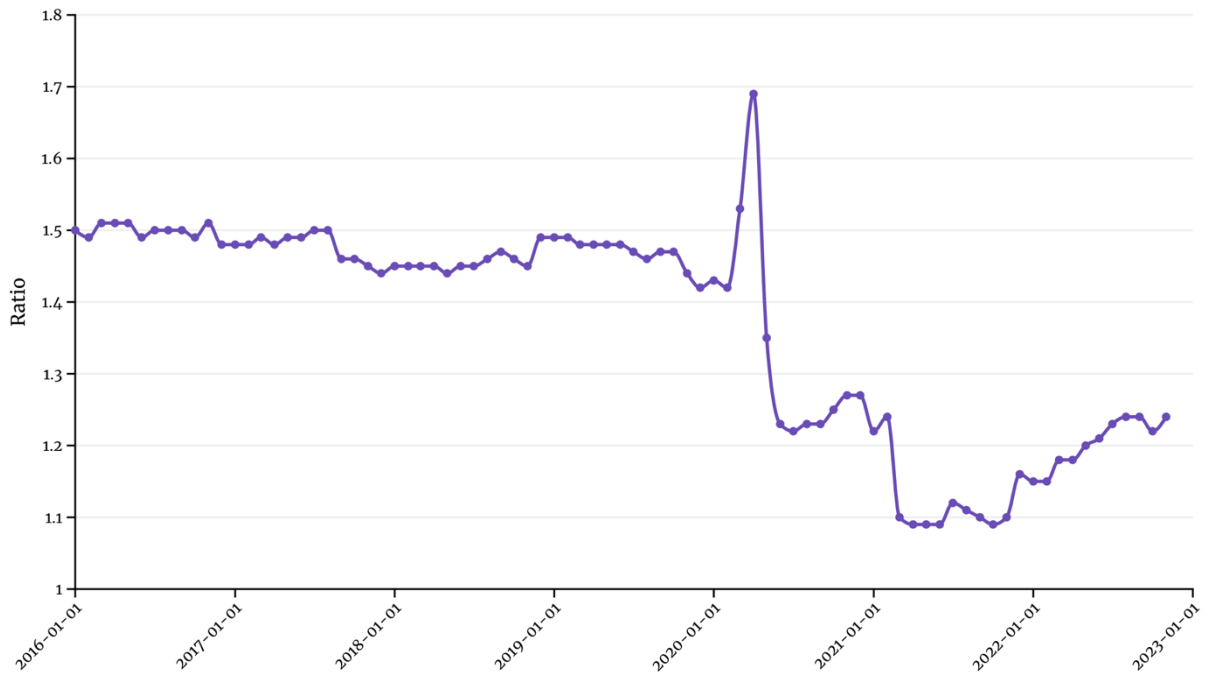


Source: Economic Research Federal Reserve Bank of St. Louis

To start, many consumers accumulated savings during the pandemic. When the pandemic's impacts began to recede, consumers spent heavily—and many businesses ran out of stock quickly as their production was vulnerable to disruption due to shortages of inputs from other businesses. **Given that long-term personal savings rates are generally constant, small businesses can look to the personal saving rate to anticipate future pent-up demand.**

<sup>4</sup> Just-in-time: retailers acquire supplies based on the current demand, as opposed to stocking supplies in the warehouse.

## Retailers: Inventories to Sales Ratio



Source: Economic Research Federal Reserve Bank of St. Louis

The sudden decrease in retail shopping, followed by sudden pent-up demand, led to a glut (and then shortage) in the average U.S. retailer's inventory-to-sales ratio fell well below pre-pandemic levels and is not yet recovered as of

*“Like a boa constrictor eating a large animal, there was an imbalance between US importers and Chinese exporters. Large volumes of goods started moving again, inciting a huge wave of cargo, and businesses couldn’t deal with the influx as a result.”*

### Patrick Douglas

VP, Fortune 500 Supply Chain Company  
(interviewed in personal capacity)

The availability of human capital has also fluctuated since the start of the pandemic. According to the Congressional Research Service, periodic surges in COVID-19 cases have caused labor shortages at times that have hobbled production. For example, the Omicron surge led to employee absences that caused new supply disruptions in the winter of 2021-2022.<sup>7</sup>

<sup>5</sup>“Why the pandemic has disrupted supply chains” The White House, <https://www.whitehouse.gov/cea/written-materials/2021/06/17/why-the-pandemic-has-disrupted-supply-chains/>

<sup>6</sup> Inventory-to-sales ratio: A ratio representing the total value of your inventories value to total sales. Lower inventory-to-sales ratio indicates an efficient company.

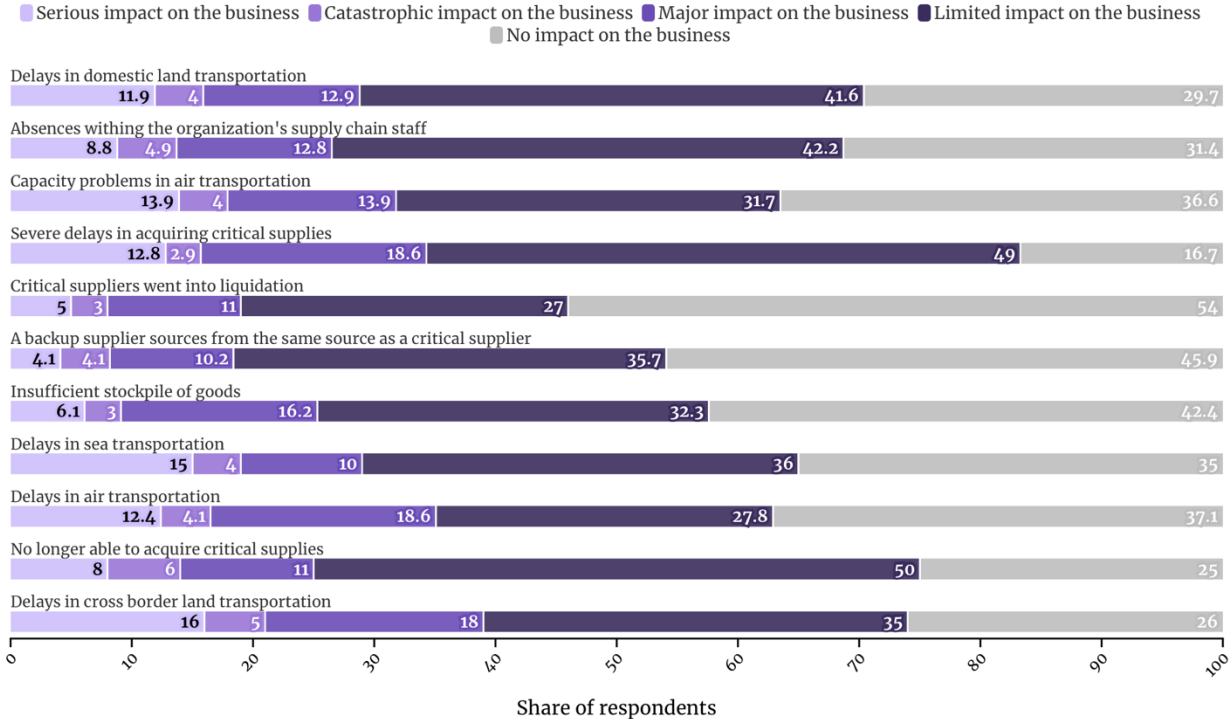
<sup>7</sup>“Supply Disruptions and the U.S. Economy.” Congressional Research Service, 13 May 2022, <https://crsreports.congress.gov/product/pdf/IN/IN11926>.



Finally, policy inconsistencies have exacerbated some challenges for small businesses, especially those dependent on imports and exports. In the United States, each country and jurisdiction created their own COVID-19 regulations. Businesses with national supply chains faced the challenge of “trying to operate in a globally consistent method”. For companies with global supply chains, the Northwest operating environment “changed dramatically since small importers were trying to find other sourcing outside of China, as seen by the change in HTS importing volumes.”<sup>8</sup>

## Impact of the coronavirus pandemic on supply chains across industries in 2022

How has COVID-19 negatively impacted your supply chain?



Source: BCI; Everstream Analytics · Details: Worldwide; BCI; Everstream Analytics; 2020; 173 respondents; business managers or leaders from various industries

<sup>8</sup> HTS: Harmonized Tariff Schedule, a classification system used in the United States to help determine customs duties to be paid on imports (UPS)

## A Crisis for Globalization

While supply chain challenges are products of a complex web of infrastructure, labor, and other issues, some factors have played an outsized impact in recent times: specifically, outsourcing vulnerability and international conflicts like Russia's invasion of Ukraine.

Before the pandemic, companies were focused on getting products delivered quickly and cheaply, relying heavily on outsourcing as a primary strategy to maximize efficiency and reduce costs. However, as the pandemic put a strain on the supply chain, the lack of direct sourcing caused a further waiting period and risk between the consumers and the suppliers. Small businesses and their suppliers relied increasingly on outsourcing, which created vulnerabilities during the pandemic.

Supply chain challenges have also been impacted by the 2022 Russian invasion of Ukraine, which impacted commodity shortages. Because Russia is a significant energy producer, and both countries are significant grain producers, the conflict has significantly increased the world prices of energy and certain foodstuffs, metals, and other commodities and disrupting trade patterns. Small businesses like Merlino Foods, a local bakery, have felt the increase in flour prices cutting into profit margins: flour prices jumped by 30% since 2019 since 30% of global wheat export come from Russia and Ukraine.<sup>9</sup>

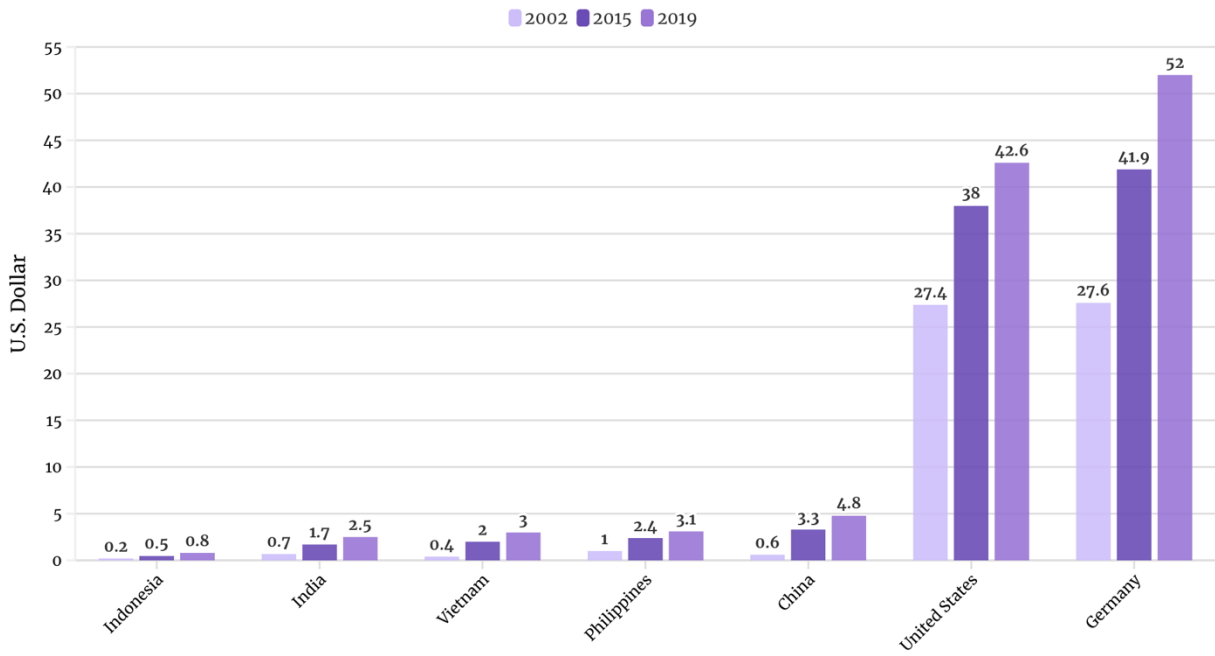
**Increasing volatility in the political environment** is likely to accelerate calls to reduce global dependence. This could well be an inflection point for globalization, given that some convergence in labor costs is already beginning. For instance, in China (the world's largest exporter), wages have more than tripled in the last ten years, eroding what was once a significant competitive advantage.<sup>10</sup>

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Paul Roberts, "For Many Washington State Businesses, the War in Ukraine Means Tough Choices," *Seattle Times*, <https://www.seattletimes.com/business/for-many-washington-state-businesses-the-war-in-ukraine-means-tough-choices/>

<sup>10</sup> Michelle Cheng, "As China's wages rise, Mexico beckons manufacturers," *Quartz*, <https://qz.com/as-chinas-wages-rise-mexico-beckons-manufacturers-1849705904>.

# Manufacturing labor costs per hour for select countries from 2002 to 2019



Source: Kearney; Economist Intelligence Unit

## U.S. Domestic Policy Response

The combination of supply chain and trade challenges have contributed to high inflation throughout 2021 and thus far in 2022.<sup>11</sup> Consequently, resolving supply chain challenges has been a top priority.

*“Higher inflation today reflects a restricted goods supply at the same time there’s strong demand for many of those same goods”*

**Tom Hainlin**

U.S. Bank National Investment Strategist

## The Biden Administration’s Response to Supply Chain Challenges

### Supply Chain Task Force

On June 8, 2021, President Biden announced the creation of a Supply Chain Disruption Task Force, a whole-of-government approach focused on relieving near-term supply and demand mismatches, specifically in the homebuilding and construction, semiconductor, transportation, and agriculture and food industries. It is also directed towards increasing data sharing among agencies.

### Freight Logistics Optimization Works (FLOW)

On March 15, 2022, the Biden Administration announced a new initiative, FLOW, to improve supply chain data flow. FLOW is “an information sharing initiative to pilot key freight information exchange between parts of the goods movements supply chain.” Participants include private businesses, warehousing, logistics companies, and ports, among others. FLOW is intended to speed up delivery times and reduce costs.

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<sup>11</sup> Congressional Research Service 2022



An aerial photograph of Seattle, Washington, showing the city skyline, the waterfront, and surrounding areas. The image is overlaid with a semi-transparent purple filter. The text is positioned in the upper left quadrant.

# Infrastructure challenges in Washington deepened the crisis

In addition to global factors, Washington businesses have been impacted by infrastructure developments and a severe trucking bottleneck.



## Local Supply Chain Challenges and Impacts on Businesses

In addition to national factors, Washington's supply chain shortages are impacted by infrastructure challenges.

### Expansion of the U.S. Coast Guard Base in Seattle

In October 2022, the U.S. Department of Homeland and Security announced an "expansion and modernization of base Seattle."<sup>12</sup> According to the Seattle Times, one of the alternatives that would displace containerized cargo capacity on the waterfront would take much of the Port of Seattle's existing terminal capacity offline by consuming up to 54 acres of Terminal 46. The article also mentions that "and two others would occupy enough capacity on both T46 and/or T30 to make cargo operations there extremely inefficient.

The problem is that Terminal 46 has better access to I-90 and I-5 than any other marine port of entry in the Northwest Seaport Alliance network. The two freight berths at T46 represent 25% of the Port of Seattle's ship-berthing capacity. "Cargo container ships will start calling at T46 early in 2023, representing the best use of that marine industrial land not just for International Longshore and Warehouse Union 19 workers, but for many Washingtonians who rely on the terminal to facilitate a variety of import and export activities."<sup>13</sup>

T46 is currently used as a United States Department of Agriculture storage yard by farmers in Eastern Washington and for overflow containers from other terminals. Changes to these terminals, especially T46, could put our state's agricultural producers in a hard situation.

### The West Seattle Bridge Closure and Impacts on Infrastructure

In March 2020, the West Seattle High Bridge (WSHB), the main bridge connecting WS to the rest of the city, was closed to traffic. While the bridge's primary closure has

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<sup>12</sup> "Expand Seattle Coast Guard base without impacting working waterfront." *The Seattle Times*

<sup>13</sup> Ibid.

ended, the low bridge is still closed to most vehicles weekdays from 5 AM to 9 PM and weekends 8 AM to 9 PM.

The Supply Chain Transportation & Logistics Center at University of Washington studied the impacts of the West Seattle Bridge Closure from September 2020 to March 2022. According to the study report, “the unexpected closure of WSHB disrupted freight mobility to/from WS, increasing travel times and generating bottlenecks on the remaining bridges.” Even as the bridge closure has concluded, it **underscores the enormous impact of infrastructure closures**. As Western Washington contends with seismic risk and expansion, small businesses should pay close attention to locations that are highly dependent on certain arterial infrastructure.

## Trucking Challenges

Even before the pandemic, Washington experienced significant truck congestion. The American Transportation Research Institute placed seven Washington locations on its top 100 truck bottleneck list in 2022.<sup>14</sup> Bottlenecks worsened due to extreme changes in the amounts of goods that were being transported. During our interview, Patrick Douglas stated that when the economy started to reopen, “large volumes of goods started moving again, inciting a huge wage of cargo that businesses could not deal with.”

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American Transportation Research Institute, “Top 100 Truck Bottlenecks,” <https://truckingresearch.org/2022/02/08/top-100-truck-bottlenecks-2022/>.



## Strategize, Analyze, Localize, Digitize: A Four-Step Approach for Building Resilience

Statistically, 72% of enterprises reported a negative effect from the pandemic, while only 2% of organizations were prepared for the disruption. Most businesses struggled balancing demand and supply during the pandemic with supply disruptions, inventory imbalances, strained manufacturing capacity and financial uncertainty.

How can small businesses buck the trend? We recommend a four-step approach.

### Strategize

Small businesses can think ahead on consumer patterns (like savings rates), global trends, and potential disruptions to anticipate supply chain challenges.

### Analyze

Installing digital data analytical systems to track increasing demand for goods will allow customer satisfaction to be optimized and businesses to prevent a lack of inventory.

### Localize

Localizing inventory suppliers instead of outsourcing will allow for a minimized wait time for stock to be updated.

### Digitize

Specifically for Washington state small businesses, digital presence is an important factor in growing a firm's consumer base and creating a returning customer base.

## Strategize: An Expert Perspective

To learn more about how think strategically about supply chain disruptions, the Business Impact Research Program interviewed **Patrick Douglas**, Vice President, Security, Health, and Safety, Expeditors.

*All answers are the interviewee's own views and do not represent any company. This interview has been lightly edited for clarity.*

### **1. Looking at recent tensions between the United States and China and the profound impact of COVID-19, what would you consider the biggest challenge regarding supply chain disruptions?**

A lack of transparency from the Chinese authorities in terms of the localized impact. We have very little idea on the impact of COVID in China. In 2020, we had some level of visibility because they shut down factories and increased lock down mechanisms and restrictions in the US, causing an imbalance in the supply chain.

Like a boa constrictor eating a large animal, there was an imbalance between US importers and Chinese exporters. Large volumes of goods started moving again, inciting a huge wave of cargo, and businesses couldn't deal with the influx as a result (staffing shortages).

### **2. Specifically in Seattle, was there a particular issue you found to be more significant than in other areas, in the region or across the United States?**

The Pacific Northwest is a very rule-following part of the country, so we created many COVID restrictions, and it became very restrictive. Look at how Texas responded to COVID vs. how Seattle responded to COVID: different leadership approaches. And most companies were not familiar with the health department policies.

### **3. What policies have been the most successful for companies in addressing these disruptions?**

Shifting or moving capabilities to work remotely has been successful. There is a lot of in office work, so companies created flexibility to maintain logistic processes.

**4. What local infrastructure problems are leading towards supply chain problems?**

From a health and safety perspective, Seattle is understaffed and the ability to respond to a major outbreak is probably not strong enough. Great research, but cost of living is high, individuals who support those researches do not have high wages, so there is probably a better standard of living elsewhere. Competition between Tacoma and Seattle has been minimized.

**5. Do you see vast differences between national and local supply chain disruptions?**

Each country and jurisdiction created their own COVID rules, creating differences in how companies had to operate. Operating is very challenging, in trying to be globally consistent. The Northwest operating environment changed dramatically. Small importers are trying to find other sourcing other than China, so HTS importing volumes might start leaving China and going to low cost countries.

**6. How would you advise small businesses who are just starting on how to build their supply chain in regards to resilience and other stabilizing factors?**

Having a diversified supplier base. It is important to develop relationships with multiple sourcing partners, to have a similar product in different countries, establish partnerships to develop joint strategies, and rely on relationships more. The supply chain is not linear, it's more of an ecosystem, so there are ripple effects.

## Analyze

Small businesses can build better resilience from supply chain shocks with analytical tools. We will explore these in more detail in a future report.



## Localize

Experts from EY stress the importance of long-term relationships with suppliers at all tiers, “addressing risks and building capabilities within supplier operations integrating ESG performance factors”.<sup>15</sup> Sustainable relationships with suppliers could reduce the damage of extreme supply chain shock, and these relationships are easier to develop locally.

Indeed, according to a survey from McKinsey and Company, companies are increasing inventory along the supply chain, sourcing from two or more suppliers, and sourcing from more regional suppliers during the span of 2021 to 2022.<sup>16</sup>

*“[Emerging businesses should] develop relationships with multiple sourcing partners, have a similar product in multiple countries, and establish partnerships in order to develop joint strategies.”*

**Patrick Douglas**

VP of Security, Health, and Safety at Expeditors

## Digitize

Many resources exist for digitizing supply chain operations. In Seattle, there is a coalition called “Internet for Growth” where small businesses are banding together to educate one another on how internet presence can be beneficial in the long run through online payment systems, user friendly websites, email lists, social media, and online advertising. For many emerging small businesses, coalitions like these can help formulate partnerships and knowledge on how to build the resiliency of your business from facets like social media presence and automated inventory management.

## Resilience for the Future

The COVID-19 pandemic and other recent impacts are a wakeup call for small businesses. More than ever, it is important to build resilience across supply chains. Businesses that strategize, analyze, localize, and digitize their supply chains will be readier when the next challenge comes along.

<sup>15</sup> EY-Procurement Alliance

<sup>16</sup> McKinsey & Company, “Taking the pulse of shifting supply chains,” <https://www.mckinsey.com/capabilities/operations/our-insights/taking-the-pulse-of-shifting-supply-chains>

## Meet the Research Team



### **Clementine McLemore**

Clementine McLemore is a Business Administration major at the Foster School of Business. She has previous experience with non-profit volunteer work and Model UN projects.



### **Yunji Kim**

Yunji is an Operations and Supply Chain Management major. Outside of Business Impact Group, Yunji is an intern at the UW Athletic Marketing Department, working behind the scenes of sports games and in the office to assist the directors.

