

California Supply Chain **SUCCESS** Initiative

A DISCUSSION GUIDE

September 2021

Introduction

This paper serves to guide the development of the California Supply Chain Success Initiative. The California Supply Chain Initiative is a joint effort of the California Governor's Office of Business and Economic Development (GO-Biz), the California State Transportation Agency (CalSTA), the Port of Long Beach, and the California State University, Long Beach Center for International Trade and Transportation (CITT). It seeks to engage the diverse spectrum of stakeholders along the supply chain to identify both short-term and long-term solutions to the key challenges facing us all in moving freight throughout the State and beyond. The Initiative is a series of solution-based dialogues among and between the set of system-wide stakeholders along the supply chain.

This paper will also serve to inform discussions surrounding the Initiative's September 2021 Virtual Workshop as well as a gathering of key supply chain decision makers to follow. The Workshop will provide a forum for industry, community, and policy makers to refine and prioritize the solutions that will be critical in igniting collaborative discussion and problem-solving.

The California Supply Chain Success Initiative is driven by a series of key questions:

1. What can we as supply chain stakeholders do better in order to add value to the supply chain?
2. What does supply chain success look like?
3. What obstacles are preventing us from getting there?
4. What are the risks of doing nothing?
5. What is the appropriate role for government?

Stakeholders across the global supply chain have faced unprecedented challenges throughout the COVID-19 global pandemic. So much so that "supply chain" is now a household term. Supply chain shocks, starting with runs on toilet paper and other taken-for-granted household goods, have continued to educate mainstream America about what was until very recently considered the invisible mode of transportation: the freight systems that move essential goods throughout the world. Most industry stakeholders would agree that the invisible mode has suddenly become hyper visible.

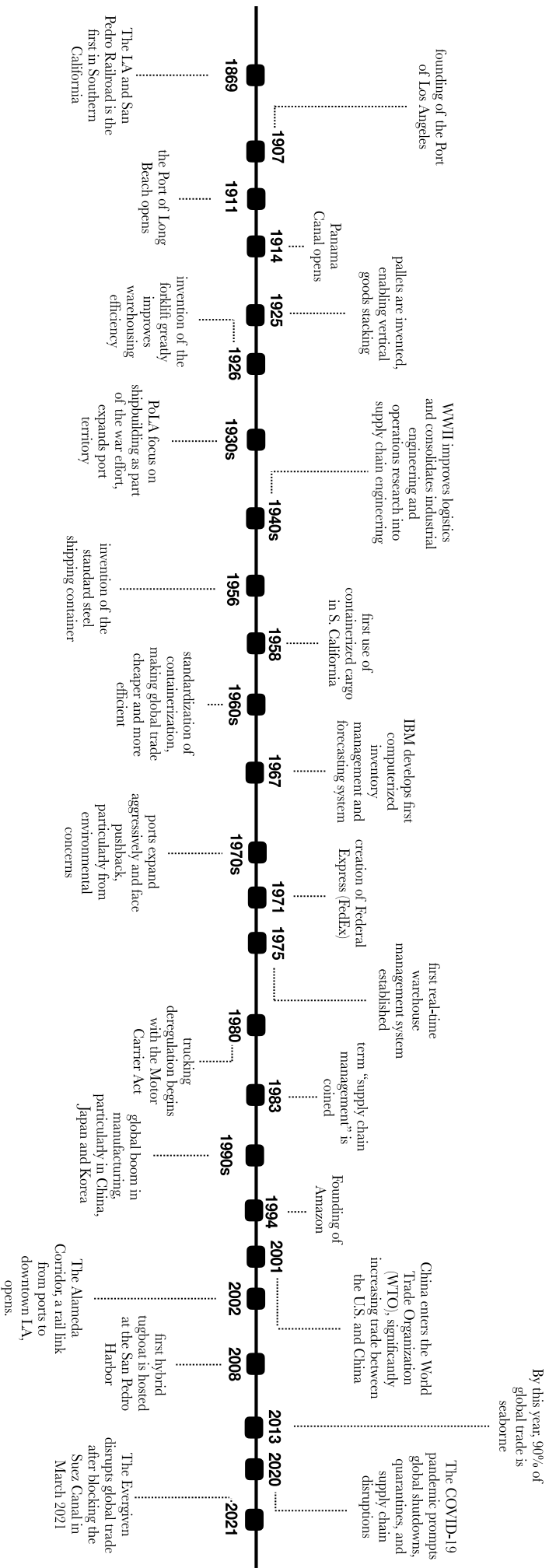
But the pandemic is not the sole reason that supply chains are under duress. It merely accelerated and exacerbated trends well underway, some of which have their origins not in the past decade but in the past century. The story of global trade is one of innovation, such as the development and widespread use of the ocean shipping container; process improvements, including the evolution toward an integrated supply chain way of thinking; and increased economic integration between trading nations. California has consistently played a leading role as the Figure 1 timeline indicates.

Key trends include increasingly larger vessels delivering more goods on road and rail infrastructure that has not kept pace with demand, and rapid increases in demand for e-commerce-driven fulfillment centers. The visibility of the supply chain has also made us all more aware of some of the negative impacts of moving freight globally as well as through local communities. These include congestion and, in some cases, poorer air quality. As local, state and national governments seek policy solutions to mitigate these impacts, the supply chain itself is seeking to balance its responsibility to the environment with increasing consumer demand.

Supply chain and logistics challenges are particularly acute in California. The Golden State, with a population of 39.56 million, represents the fifth largest economy in

the world and is an important supply-chain player on a global scale as the California and Global Trade Facts and Figures sheets below attests. Given this prominence, California is a bellwether for technological, environmental, and socioeconomic trends that may start here but that will almost certainly impact the rest of the supply chain.

The ports in Oakland, Los Angeles, and Long Beach serve as crucial gateways connecting markets in East Asia to the U.S. and beyond. California is home to the top two container ports in the nation in terms of annual throughput (Los Angeles and Long Beach), as well as extensive rail and highway infrastructure that connects those ports to distribution facilities and retailers across the U.S. California is also home to the nation's fourth largest air cargo facility—Los Angeles International Airport, which is also among the world's Top 20 facilities in terms of total cargo handled and total international freight. Finally, the State is home to the world's busiest border crossing at San Ysidro. The southern border serves as a gateway for not only passenger traffic but also cargo. But maintaining that leadership role means responding to, if not leading, global trade trends as well as paying attention to shifts in trade patterns, including consumer demand, that could impact where and how trade occurs.



Sources: GlobalTranz Enterprise, Blume Global, Estrada (KCET), Port of Los Angeles, Port of Long Beach, California State Transportation Agency, Federal Highway Administration

California & Global Trade



Between 2015 and 2019, the combined import-export share of the Ports of Long Beach and Los Angeles dropped from 26.5% to 22.9%*, as part of a growing trend shifting away from West Coast ports. The four-year decline was recently relieved in 2020 by a slight uptick in shares. For instance, the volume of inbound cargo rose 3.4% (Port of Los Angeles) and 7.4% (Port of Long Beach) since 2019, in comparison to the 1% average growth of other ports.

*of containerized trade in North America

Nationally the Port of Los Angeles ranks first in containerized trade, followed by the Port of Long Beach at second. Internationally, they rank 18th and 20th.



290 Miles of Waterway and 10 Major California Ports

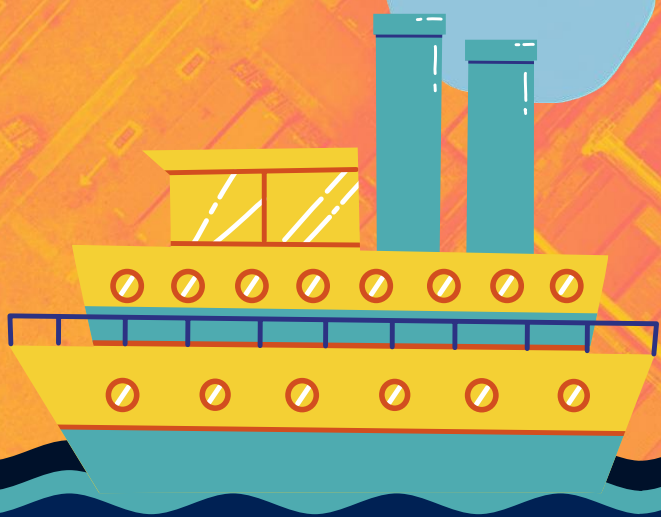
annual container trade in TEUs a 2000-2020 comparison

Port of Los Angeles	Port of Long Beach
9, 213, 395.95 TEU (2020)	8,113,315 TEU (2020)
4,879,428.60 TEU (2000)	4,600,652 TEU (2000)

Since 2000, the average size of global vessels has increased; container ships have quadrupled, cargo ships have tripled, and bulk carriers have doubled in size.

17.5% OF WEST COAST PORTS HANDLE 10K-15K TEU VESSELS - IN 2010, THIS PERCENTAGE WAS 1.1%

IN COMPARISON TO THE EAST COAST, WHICH HANDLES ON AVERAGE 2.5K-4K CONTAINER MOVES FOR EACH VESSEL, THE SAN PEDRO BAY PORTS HANDLE 8K-12K.



252

State Highways

175,589

Miles of Public Road

4,828

Miles of Freight Railroad

2.8 TRILLION

TONS OF FREIGHT FLOW VALUE

735.9 BILLION

TON-MILES OF FREIGHT FLOW



*2018 figures



Out of the 30 major state airports, LAX has handled the most cargo, over 21 millions tons since 2010, or around 2 million tons each year.

Air Cargo by Tons

3,479,304
(2020)

3,198,484
(2000)

*BUR, LAX, LGB, ONT, PSP, & SNA



~\$287,987 MILLION

VALUE OF BORDER TRADE TO CANADA SINCE 2015



~\$479,147 MILLION

VALUE OF BORDER TRADE TO MEXICO SINCE 2015

Sources: Bureau of Transportation Statistics, "California Transportation by the Numbers"; "Transborder Freight Data"
Journal of Commerce (JOC), "JOC Rankings: COVID-19 halts four years of growth for global ports"; "Increasing vessel sizes a red flag for US ports"; "Largest North American Ports Gained Market Share in 2020"
California Department of Transportation, "Caltrans Facts"
Port of Los Angeles, "Container Statistics"
Port of Long Beach, "Port Statistics"
the United Nations Conference on Trade and Development, "Review of Maritime Transport"
Southern California Association of Governments, "SCAG Region Commercial Airports"

California is critically important to the nation’s economy and especially to the freight transportation sector that supports and maintains economic activity throughout the U.S. As such, it is uniquely positioned to assume a leadership role among the 50 states in tackling the complex freight transportation challenges that the nation faces today. These include a combination of infrastructure development needs, operational challenges, both the intended and unintended consequences of policy decisions and regulatory measures, broader global trends with localized impact and changing consumer demand (Table 1).

Table 1: Some Supply Chain Pressure Points

Infrastructure	Operations	Global Trends
<p><u>Storage - Warehousing & Distribution Centers</u> Limited capacity is increasing reliance on chassis & empty containers for storage space, which fuels container shortages.</p> <p><u>Structural Restrictions</u> Ports are limited by a lack of modernized facilities & structural improvements and are being increasingly strained by larger ships and a higher volume of cargo traffic.</p> <p>Transportation is also increasingly delayed due to traffic and congestion on highways, particularly in urban mega-regions, as well as outdated and overstressed infrastructure on a state & national level.</p> <p>Fragmented connectivity between freight corridors and rural communities complicates last-mile delivery.</p>	<p><u>Carriers & Shippers</u> Rail fees and rates are increasing in California, at the same time that shippers are experiencing limited rail capacity.</p> <p>Trucking faces complications due to the planned-for-transition to a zero emissions future, impact of hours-of-service regulations, as well as both a labor and equipment (specifically of trucks) shortage.</p> <p>COVID-19 creates demand for supply chain services but the frontline workforce risks exposure.</p> <p>Lack of clear communication between carriers and exporters, leading to inaccurate estimates of arrival/departure times, missed windows, and fees.</p> <p>Pandemic-induced port and terminal closures create bottlenecks at supply chain partners.</p>	<p><u>International Policy</u> A recent determination by the International Trade Commission (ITC) concluded that the import of chassis materially injures US businesses. To “beat” future restrictions, equipment has been shipped in advance (front-loaded) without plans for immediate use, exacerbating limited storage capacity.</p> <p>Withdrawal from the TPP and complications with other Free Trade Agreements threaten California’s trade system, as more than 40% of the state’s exports are credited to FTAs (Free Trade Agreements).</p>
Consumer Trends	Regulation	<p><i>Sources: Pacific Maritime Association (2021), CITT Future Ports, Hawkins (2021), California State Transportation Agency (“Goods Movement Issues”, 2021), CITT (“Evolving Good Movement Solutions”, 2006; “The Decade Ahead”, 2009; “The Pandemic and the Supply Chain”, 2020), Howard (2021).</i></p>
<p><u>Consumer Behavior</u> Unpredictable consumer behavior during the COVID-19 pandemic, notably panic buying and changes in employment location and tenure, led to extreme swings in demand, increasing dwell times & turn-around times. The pandemic also encouraged online shopping, heightening the demand for fast & efficient last-mile delivery.</p> <p>Growing cargo traffic and increasing consumer demand for goods will continue to pressure already stressed systems.</p>	<p><u>Environmental Regulation</u> California’s zero emissions mandates have the potential to increase the cost of supply chain operations within the State. High cost of business affects the state’s market share.</p> <p>Communities are concerned by the serious environmental and public health impacts caused by port and supply chain congestion, like air pollution.</p> <p><u>Lack of centralization</u> California currently lacks a central authority advocating for the interests of supply chain stakeholders, such as the ports, and a proliferation of plans and policies.</p>	

Clearly, California faces a host of challenges that could pose threats to the state's freight supply chain efficiency, competitiveness, and resilience. Although these problems, including the unique impact of the COVID-19 pandemic, are national and global in nature, California – Southern California in particular – provides their most visible manifestation. So as others look to the Golden State for solutions, the key question becomes who responds and how?

WHO RESPONDS AND HOW?

Finding answers to these challenges is not easy. The global supply chain--with its myriad challenges from origin to destination, across national and state borders, and amid an era of unprecedented technological and social change--meets every criteria for what Horst Rittel famously defined as a Wicked Problem (Potter et al., 2010), a “class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing” (Maani, 2016). The supply chain fits this definition where no single solution exists because:

- The problems are difficult to define and identify because of changing requirements that are challenging to recognize;
- The stakeholders involved present a wide range of differing opinions and related self-interests; and;
- One problem is interconnected with other problems.

In fact, the supply chain by its very nature is vastly complex, has continually changing dynamics, and a broad spectrum of stakeholders involved. Furthermore, not all of these stakeholders are able to influence the supply chain in the same way. Understanding this is often the first step in identifying solutions to challenging problems and more important, who should take the lead in resolving them as outlined in Table 2 (O'Brien & Sanchez, 2020).

- **Consumers**, the stakeholders that create demand for freight and the communities, including environmental justice communities, through which freight passes.
- **Infrastructure Managers**, the stakeholders responsible for the construction, operation, and maintenance of physical infrastructure and public assets utilized by consumers and distributors who transport goods. This includes labor at terminals and other facilities who make freight movement possible.
- **Distributors**, the stakeholders responsible for operating the freight systems that move goods through urban, suburban, and rural jurisdictions using public infrastructure.
- **Planners and Regulators**, the stakeholders involved with developing goods movement policies and regulations related to planning concerns and transport externalities.

Table 2: Stakeholder Categories

Consumers	Infrastructure Managers	Planners and Regulators	Distributors
<ul style="list-style-type: none"> • Manufacturers • Construction • Wholsalers • Retail Store • Restaurants • Offices • Homes • Schools 	<ul style="list-style-type: none"> • State HWY systems • Local roads • Railroads • Ports • Airports • Intermodal • Pipelines • Border crossings • Power infrastructure • Waste Management • Infrastructure Managers • Parking Authorities • City Planners • Private Developers 	<ul style="list-style-type: none"> • Local • State • Federal (CBP, USCG, FTC, FAA, FMC, FRA, police powers) 	<ul style="list-style-type: none"> • Freight consolidators • 3PLs • Parcel deliveries • Postal service • Freight forwarders • Drayage Trucking • Common Carrier • Private Carrier • Reciever • Shipper

Each of these groups – and segments within them - has its own set of mission-critical priorities as well as knowledge and resources to contribute to goods movement success. Experienced industry leaders understand all too well that even the seemingly simple task of problem identification within the global supply chain requires thoughtful and on-going conversation and analysis. In identifying stakeholder interests and how they influence the supply chain, we are able to better understand both how more siloed interests can have broader (and sometimes negative) supply chain impacts AND what the stakeholder can do to add value to it. This includes both government and freight distributors (Tables 3-4, O’Brien & Sanchez, 2020, adapted from DeLangen, 2006) as well as labor and the communities surrounding trade-related facilities (Table 5, DeLangen, 2006).

Table 3: Planner and Governance Stakeholder Relationships, Interests and Different Sources of Influence

Stakeholder	Interests	Sources of Influence	Indicators of Stakeholder Influence
Local	Contribution to regional economy and contribution to regional tax income	Regional planning and public investments	Public land ownership; Ownership and governance structure port authority
State	Delegate funding for state highway, intercity rail, and transit improvements	Public investments and creation of laws and enforcement	Infrastructure planning and development and financing
Federal	Low generalized (trans) port costs for residents and firms; cost recover of infrastructure	National investment, creation of laws and enforcement	National role of infrastructure planning

Table 4: Distributer Stakeholder Relationships, Interests and Different Sources of Influence

Stakeholder	Interests	Sources of Influence	Indicators of Stakeholder Influence
Receiver	Safe and on-time delivery of products at a minimum cost	In aggregate control demand for products and externalities associated to freight shipping	Influences demand of products being transported
Shipper	Generate movement of goods and ensure receiver satisfaction	Shipping times influence when goods are ordered to ensure adequate delivery time	Mitigate demand that is able to be supplied
Carrier	Meet receiver expectations while minimizing the cost of a delivery	Determine the vehicles, staff and equipment required to complete good movements, routes traveled, and the organization of delivery tours	Vast asset inventory, Contributes most equipment in transport of goods process
Beneficial Cargo Owner (BCO)	Safe transport of cargo from point of entry	Takes physical ownership of cargo and utilizes their own logistics assets	Vast asset inventory, ownership of cargo
Drayage	Exchange merchandise between seaports and dispatching docks (Fleet, 2016); Generate multiple trips, minimize impact of regulation	Movement of containers depend on usage of drayage trucking	Drayage administrations
Parcel (Ex: FedEx, UPS)	Generate parcel shipments and deliver products in timely manner while maximizing profits and minimizing costs	Price setters due to low competition; Determine when shipments can be dropped off and made; dedicated pick up and drop off locations	Worldwide operations and network
Postal (United States Postal Service)	Deliver letters and packages of small sizes	Numerous locations throughout the United States and designated drop off zones	Backed by the government
3PL	Timely deliveries by connecting businesses, logistics and carriers	Provide businesses a competitive advantage through fast and accurate shipping process	Involvement in various business operations throughout supply chain
Freight Consolidators	Divide and regroup consolidated cargo	Provide businesses a competitive advantage	Provides competitive

Table 5: Other Supply Chain Stakeholders, Interests, and Different Sources of Influence

Stakeholder	Interests	Sources of Influence	Indicators of Stakeholder Influence
Local Environmental Groups	Regulations that mitigate environmental harm to locals, like air pollution	Political pressure and utilization of procedures to limit and postpone port expansion	Presence of local groups, with influence coming from ability to threaten court action
Local Residents	Healthy local market with jobs being created, low traffic congestion, and no port-related reduction of 'quality of life'	Political pressure	Presence of residential groups
Port Labor	High paying, secure jobs	Strikes; can influence the image of seaports Essential workers ensuring the flow of goods	Wages, presence of port labor agreements

Source: DeLangen (2006). Additional tables and graphs visualizing stakeholder relationships may be found [here](#).

But the diverse set of perspectives also means more opportunity for common ground. The diverse system of actors, each with their own roles, interests, and management styles, constantly interact with one another. And when one link in the supply chain is broken, the entire chain becomes less effective (Black & Glaser-Segura, 2021). Limited port capacity to accommodate greater cargo volumes can translate into a need for operators to keep loads on trucks or in empty containers, worsens both equipment shortages and container shortages, which then create significant delays in transporting freight from warehousing, distribution and fulfillment centers. The longer a container is used as temporary storage for excess goods, the greater time lost utilizing it to carry more cargo. For all of the parties involved, congestion is a common enemy, and the question becomes, what can we do better that improves the situation?

For planners and regulators, the question is often how best to encourage changes that are beneficial to society but that don't create unintended consequences including shifts in trade patterns that could negatively influence goals related to economic growth. At the federal level, this can include plans for infrastructure investments like the recent Port Infrastructure Development Program. In California, recent years have seen significant efforts to mitigate the real and negative environmental impacts of global trade. These have taken the form of legislative efforts incentivizing operational changes such as the adoption of appointment systems. The most recent efforts have established mandates for the transition to zero emissions vehicles in the freight sector including Executive Order (N-79-20). It should also be noted that key industry stakeholders, led by the San Pedro Bay Ports, have adopted their own environmental standards in the form of the Clean Air Action Plans (CAAP), first adopted in 2006 and then updated in 2010 and 2017. The CAAP program has established a model for an industry-led approach to problem solving across jurisdictional boundaries in concert with government. Although California leads the way in this approach, what happens in California doesn't necessarily stay in California. For example, the state has the unique authority to set its own emission standards while requesting a waiver from the US Environmental Protection Agency (EPA). Other states can choose to adopt California's low emission and zero emission vehicle standards under Section 177 of the Clean Air Act. 13 states have done so. This means that California's efforts are likely to have an impact on the broader supply chain.

Environmental rules and regulations add more complexity to goods movement in California. One of the first environmental efforts can be traced back to 2001 when SB 1 intended to establish Southern California Freight Management Agency and authorize container facility surcharge. No further action has been taken to bring this effort to life. AB 2041 tried to establish a port management congestion district back in 2004 but also without any success. Later minimum penalty for diesel-fueled commercial vehicles (AB 233), truck regulations (Clean Truck Program), Freight Action Plan (EO B-32-15), zero-emission truck sales (Advanced Clean Truck Program) and more regulations were successfully introduced. There has been a tremendous evolution of goods movements policy over the last 20 years, both nationally and globally. Along with the added complexity, these efforts demonstrate the potential for the industry to work with policymakers and elected officials to work together to meet established goals.

Separate from the sheer number of actors engaging with each other and the compilation of disruptions, a variety of factors internationally complicate the supply chain scheme. The Ever Given blocking the flow of cargo traffic in the Suez Canal, as well as the COVID-19 pandemic, are indicators that unpredictable and unforeseen events can test the limits of already strained systems. Political conditions, manifested in conflicts like the US-China trade war, represent

another range of difficult socio-political challenges. Tariffs, imposed on a series of countries including China and major trade partners, shift demand as prices fall or rise to accommodate, and as costs for importers increase, changing where companies may decide to manufacture and source, as well as the level of cargo traffic coming in and out of American ports. Similarly, natural disasters may temporarily shut down trade hubs, displace workers, or disrupt existing cargo routes.

At first glance, these problems cannot be resolved with a single solution. While issues occur at every level and are often shared between the different layers of the supply chain, some may only be resolved exclusively by a specific set of actors. For instance, a heavier burden lies on the federal government to focus on issues related to fragmentation in national policy and the need to harmonize trade, commerce, labor and investment policies. Operationally, terminal operators and labor must work together to ensure a smooth flow of goods. As competition from the East Coast, Mexico, Latin America, and other West Coast ports like Seattle, increases, California must continue to balance sometimes competing demands for efficiency, competitiveness and sustainability to maintain its position as a leading trade gateway and center for value-added supply chain activity.

Previous studies examining the relationships between stakeholders have found that more value is added to the entirety of the supply chain system when actors form integrated links, rather than acting in isolation; in fact, these collaborative improvements may also spill over to other areas and add value to the next ‘link’ of the chain. Specifically, value relies not only on the capacity and competence of a single actor, but also the capacity and competence of the actors integrated within their extended system. In addition, inter-port cooperation is also a key necessity, as studies measuring port efficiency have found that efficiency is generally reduced by competition, but increased by cooperation (Visounis and Pallis, 2012).

What we are working toward

That brings us back to our key questions:

1. What can we as supply chain stakeholders do better in order to add value to the supply chain?
2. What does supply chain success look like?
3. What obstacles are preventing us from getting there?
4. What are the risks of doing nothing?
5. What is the appropriate role for government?

Although breakdowns may occur at many points throughout the supply chain system, each actor within the connected network is able to contribute to the identification of solutions. As a result, the California Supply Chain Success Initiative offers different ways to contribute your ideas and thoughts including via social media and in a virtual workshop. These ideas will be shared with key decision makers who are in a position to identify short term and longer-term strategies, including possible pilots that make wicked problems more manageable. Your comments will also help us develop an agenda for future research by answering the question “What don’t we know?”

The Initiative seeks to build credibility by identifying and implementing some near-term solutions, and by creating space for ongoing dialogue and efforts to continually improve the system. But, having a framework for discussion and dialogue, one that serves to build consensus, helps everyone see themselves as part of the #systemofsystems. That is the goal. Just in time.

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