CONSUMER BRANDS ASSOCIATION

U.S. Supply Chain Policy Priorities

The Case for a Federal Office of Supply Chain

The Consumer Brands Association,
Council of Supply Chain Management Professionals and Iowa State University

Powering every day.

THE AUTHORS

Chris Adderton

Vice President, Council of Supply Chain Management Professionals

Dr. Michael R. Crum

Professor and Ruan Chair of Supply Chain Management, Ivy College of Business, Iowa State University

Tom Madrecki

Vice President, Supply Chain and Logistics, Consumer Brands Association

The COVID-19 crisis has drawn considerable public attention to supply chain management, particularly for materials critical to the health, safety and well-being of the nation. The pandemic exposed supply chain vulnerabilities as the nation suffered from shortages or delays in the availability of essential products, such as food, cleaning and medical supplies, and revealed our heavy reliance upon foreign production of critical products and components, such as pharmaceuticals and rare earth minerals. Additionally, the media has been covering the supply chain challenges of manufacturing and distributing a vaccine. Because of these conditions, the general public has become much more aware of the importance, complexity and global nature of supply chains. Public policy makers are showing greater interest and urgency in developing policies and legislation to increase supply chain security, transparency and resilience and bring the production of critical products back to the United States.

The pandemic has impacted consumer behavior, some of which is likely to persist once the pandemic concludes. For instance, online shopping for a wider array of consumer products and direct-to-consumer distribution accelerated as more shoppers sought limited contact buying methods. As consumers grow accustomed to the efficiency and convenience of online shopping, expectations for speed of delivery, consistent product quality and safety and the efficient handling of returns, they will continue to place greater pressure on supply chains. Companies are responding with innovative management practices and the development and application of state-of-the-art technologies to anticipate and satisfy these growing demands. Public policy affecting transportation operations and infrastructure, technology development, urban logistics and a host of other factors will also impact the ability of supply chains to meet these rising consumer expectations.

A prominent lesson gleaned from the aforementioned impacts of the pandemic is the need for a stronger public-private partnership in the realm of supply chain capabilities. This theme was mentioned often in discussions with supply chain thought leaders conducted for this report.

National security, the economy and overall quality of life for Americans will benefit when the private and public sectors work in concert to effect positive change related to industry supply chains.

The purpose of this study is to identify key supply chain challenges, issues and opportunities for the consumer packaged goods (CPG) industry that are directly impacted by public policy and to delineate potential solutions and approaches for consideration by policy makers. The study's recommendations were informed by interviews with Consumer Brands Association members conducted by Accenture and Coyote Logistics, input from non-Consumer Brands supply chain professionals, academic research and a review of practitioner literature and government and NGO documents.

The report is organized in the following manner: Section 1 provides a general overview of the role of government and the benefits of a stronger public-private partnership for supply chain public policy; Section 2 summarizes the highest priority current and future supply chain challenges and opportunities and recommendations for government action; Section 3 identifies key current public-private sector plans and initiatives related to the topics in Section 2; and Section 4 suggests next steps for initiating needed change in the public policy arena.

CONSUMER BRANDS ASSOCIATION

SECTION 1:

The Role of Government in Fostering Safe, Efficient, Resilient and Innovative Supply Chains

1

Prior to the supply chain disruptions wrought by the pandemic, the government's impact on industry supply chain performance was mostly perceived by the general public to be its role in providing the physical logistics infrastructure, most notably transportation infrastructure. Policy makers, however, had already been devoting more attention to other aspects of supply chains as they relate to a number of economic and social issues. For example, there are several government initiatives and programs related to food supply chain security and supply chain transparency/visibility requirements, including to combat human trafficking and child labor, enhance cybersecurity for critical supply chains for national security and apply supply chain risk management to government purchasing and humanitarian relief efforts. Indeed, the adoption of supply chain risk management planning and principles for government acquisitions and operations are becoming more apparent across multiple agencies and may provide the basis for a government-wide approach to analyzing, assessing and addressing key private sector supply chain issues.

Yet, as noted earlier, the pandemic has revealed that much more needs to be done to create an economic and regulatory environment that leads to safe, efficient, resilient and innovative supply chains.

A major role of government should be to establish policies that are facilitative and enabling of private sector supply chains' development and adoption of new technologies and managerial practices that lead to improved performance. A corollary of enabling policies is the elimination or reduction of unnecessary and restrictive regulations that hinder operational efficiency and inhibit innovation.

A 2013 report by the World Economic Forum (WEF) titled *Enabling Trade: Valuing Growth Opportunities* identifies what governments can do to reduce supply chain barriers and touts the economic impact of doing so. According to the WEF, governments globally have under-managed supply chain barriers. It estimates that reducing these barriers could increase world GDP over six times more than removing all tariffs. It further suggests that if every country improved just two key supply chain barriers — border administration and transport and communications infrastructure — global GDP would increase by nearly 5% (pp. 13-15).

Though the context of the WEF report is global trade and prosperity, the findings and recommendations are informative for public

policy at the individual country level. The WEF articulated the following recommendations to improve national supply chain performance (pp. 25-28):

- Create a national mechanism to set policy priorities for improving supply chain efficiency based on objective performance data and feedback loops between government and firms.
- Create a focal point within government with a mandate to coordinate and oversee all regulation that directly affects supply chain efficiency.
- Ensure that small- and medium-sized enterprises (SME) interests are represented in the policy prioritization process and that solutions are designed to address specific constraints that impact SMEs disproportionately.
- Launch a global effort to pursue conversion of manual and paper-based documentation to electronic systems, using globally agreed data formats.

The WEF stresses the need for a holistic approach focusing on all major aspects of the supply chain and organizes supply chain barriers into four major categories that provide further insight on how governments impact supply chain performance:

- Market Access: Domestic and foreign market access.
- Border Administration: Efficiency of customs administration and efficiency of import-export procedures.
- Telecom and Transport Infrastructure: Availability and quality of transport infrastructure, availability and quality of transport services and availability and use of information and communication technologies.
- Business Environment: Regulatory environment and physical security.

The WEF also emphasizes the importance of a strong public-private partnership or collaboration, essential to the implementation of the recommendations delineated above. The significance of strategic relationships, i.e., partnerships, among supply chain members in the private sector has been fully understood and widely embraced for several decades. The sharing of data and information, joint planning, operational integration and a collaborative focus on meeting the consumers' needs has resulted in mutually beneficial and substantial improvements in cost and service performance throughout the supply chain. Though federal and state agencies and legislatures usually seek input from the private sector while crafting new policies, programs and regulations, a true partnership in the vein of what one can observe in the private sector does not exist or is very rare at best.

True partnerships between the public and private sectors would enable a deeper understanding of the capabilities and constraints each faces, a greater likelihood of achieving the desired outcomes of each and strategic leveraging of the knowledge and vision each brings to the table for mutual benefit. More often than not, public and private sector interests align with one another and government tries to implement social and economic policy and regulations that are not harmful to business. More active private sector engagement in the development of public policy makes it more likely that both national and business goals can be attained without the unintended adverse consequences that often occur. It is also essential to government efforts to bring targeted off-shore industries and manufacturing back to the U.S.

It is critical in the U.S. that the public sector be able to demonstrate to its many and diverse stakeholders how social objectives (not just economic strength) are furthered by working more closely and collaboratively with business. Public-private partnerships are viewed suspiciously and disparagingly by many (i.e., they think government is too "cozy"

with business). The private sector should be prepared to provide data-based evidence to support its positions and inform policy makers to help government ascertain the impact of legislation and regulation on its national goals.

There are several countries across the globe that serve as good role models for how such partnerships work and for the benefits they produce. For example, the Scandinavian nations, Singapore and the U.K. all scored consistently well across four recent rankings of business friendliness or business supportiveness by U.S. News & World Report, CEO World, Heritage Foundation and Trading Economics. A number of countries also stand out for the strong global companies and industries that they have helped to flourish, such as South Korea, Japan, Germany and, again, Scandinavian nations. Strengthening supply chain performance at the national level is essential to a country's global competitiveness and its ability to attract and retain industry. A recent ranking of the top 10 countries for supply chain resilience by FM Global includes many of these same countries, as well as the U.S. Though there are clearly many other factors that contribute to the economic success of these countries, an analysis of how their governments work closely with business would be insightful and provide a basis for benchmarking U.S. efforts in forging stronger public-private partnerships. It is important to benchmark those countries that are known to have a good business environment and be leaders in environmental protection, education, quality of life, labor relations and other areas that make up the social fabric of a nation.

Finally, the WEF recognizes that most governments are not organized optimally for developing effective supply chain policies. As it notes, "Logistics as such is not the focus of any one government department or entity, but rather the purview of a number of different agencies. An approach centered on all the policies that significantly affect supply chain efficiency will improve a country's competitiveness and may substantially enhance the commercial relevance of trade agreements." (p. 25) The importance of organizational structure cannot be overstated. Supply chain performance in the U.S. improved dramatically after companies transformed from a siloed organizational structure to internal integration of the various logistics and supply chain functions by placing them together into one organizational unit and managing them as an integrated system. It is also worth noting that the next major transformation in supply chain performance occurred when companies implemented external integration — integrating their internal supply chain operations with those of its supply chain partners, both upstream and downstream. One might reasonably view the suggestion for tighter collaboration between business and government as an extension of this expanded integration approach since government plays such a prominent role in the performance of all supply chains.

Additionally, breaking down the federal agency siloes should help the U.S. develop a more comprehensive, integrated and coherent national supply chain and economic growth strategies in a more expeditious manner. Failure to do this not only leads to suboptimal public policy, but it threatens our ability to compete with our major economic rivals, most notably China. The consolidation of power and centralized decision-making in China's authoritarian regime allows it to move decisively and quickly in developing and implementing its industrial strategy, a key component of which is a massive investment in its national supply chain infrastructure. There is no more compelling argument for the establishment of a focal supply chain entity within the U.S. federal government and a further strengthening of public-private partnerships.

CONSUMER BRANDS ASSOCIATION

SECTION 2:

Key Public Policy Issues and Recommendations Identified by Supply Chain Thought Leaders

2

The supply chain thought leaders who participated in this study were asked to identify the major issues, challenges and opportunities facing supply chain managers today and what is needed to achieve their vision of the supply chain of the future. As part of these conversations, they were asked to comment on the role of the government; that is, what could or should the government do to address current problems and facilitate progress toward their vision.

Responses ranged from the very specific (e.g., increase legal gross vehicle weight by so many pounds) to the more philosophical (e.g., the regulatory environment must keep up with the rate of change) and from reforming current regulations (e.g., reduce minimum age for Class A over-the-road drivers from 21 to 18) to proposing bold system changes (e.g., build a national highway traffic control system based on the air traffic control system).

Transportation cost and capacity optimization, supply chain visibility, emerging technologies and innovation, changing labor requirements and shortages, nonuniformity of state and federal regulations and urban freight logistics challenges were the dominant themes that emerged consistently from discussions with the thought leaders. These themes are not mutually exclusive; for instance, technological changes are requiring workers to possess new skill sets and labor (driver) shortages are impacting transportation cost and capacity. Collectively, the thought leaders identified the following areas of greatest importance for public policy focus:

FOCUS AREAS

Optimize freight movement over national transportation networks

Increase the skilled labor pool for supply chain

Increase harmonization and digitization

Improve urban/ metro freight logistics

Promote supply chain technology, process and service innovation

Identify, manage, support and protect critical supply chains

Focus Area 1:
Optimize freight movement over national transportation networks

Transportation elicited more comments and suggestions than any other single topic, and the focus was almost exclusively on trucking. This is not surprising given the CPG industry's heavy reliance on truck transportation and that the annual truck transportation spend in the U.S. is nearly $700 billion. Truck transportation also comprises more than 40% of total freight logistics costs in the country. Transportation accounts for the largest share of order cycle time variability in most supply chains, thus affecting inventory levels, stock-out costs and on-time delivery. Consequently, the thought leaders identified issues related to both cost efficiency and quality of service.

Driver Shortage: The truck driver shortage and related issues were mentioned most often by thought leaders. As is commonly known in the industry, the greatest barrier to capacity expansion for most trucking companies is the availability of drivers. Unless things change, the situation will only get worse given the aging driver population. The policy changes most favored by the thought leaders are:

- **Reduce the minimum age for a Class A commercial driver's license from 21 to 18.**

  Proponents of lowering the driving age note that the enhanced safety technologies on commercial trucks today (e.g., adaptive cruise control and automatic emergency braking systems) and emerging technologies (e.g., truck platooning and highly automated trucks) substantially reduce the risk of using less experienced drivers. Currently, we are missing the opportunity to capture young adults (18-year-olds) at the critical time they are looking for a career. Of course, the government should set stringent requirements for training and preparation (e.g., apprenticeships, mentoring, licensing) and insurance companies must be onboard as well, as their rate structure currently pressures trucking companies not to hire young drivers.

- **Increase the government role in providing training and education.**

  Emerging technologies, particularly autonomous vehicles, will require drivers to possess different technical skills in the future. Government financial support for education and training and government promotion of truck driving as a high-need, technical field would be valuable aids to recruiting next generation drivers. The nature of many supply chain jobs is becoming more technical and complex, requiring more advanced training. To sustain our position as the world's strongest economy, the government should be more proactive in identifying, supporting and promoting all career fields that it considers strategic and essential to avoid future talent shortages.

- **Consider driver shortages when establishing transportation policy and regulations (e.g., hours of service requirements and potentially national driver dwell time standards), immigration policy (e.g., allowing drivers to come in from Canada and Mexico) and other public policy areas that impact the labor pool and the working environment for drivers.**

Transportation Infrastructure: The primary concern expressed about transportation infrastructure involved the need to eliminate congestion and bottlenecks to reduce delays and variability of transit time. Of course, transportation volumes and lanes are dynamic, and it is imperative that the government be able to anticipate or forecast future bottlenecks in the system. Additionally, there are serious concerns about the long-term funding of transportation infrastructure given that user fee revenues are not keeping up with inflation and the growth in vehicle demand. Finally, automated and connected vehicle systems and other emerging technologies will place new and different demands on the transportation system. Many of these technologies are in the advanced testing stage and industry adoption of some is on the near horizon. These technologies have the potential to significantly increase transport cost efficiency and expand transportation capacity (e.g., improve traffic flow and reduce the need for drivers). Public policy recommendations include:

- **Develop new funding mechanisms that enable the Department of Transportation (DOT) to maintain, expand and modernize the national highway system to meet the long-term needs of freight transportation.**

  The American Society of Civil Engineers recently estimated that about $4.1 trillion will be needed from 2020 through 2039 to sustain surface transportation nationwide, but only about $2 trillion in spending is projected. Additional funds need to be found or raised to meet this $2.1 trillion gap. The Transportation Research Board (TRB) of the National Academy of Sciences in its 2019 study, *Renewing the National Commitment to the Interstate Highway System: A Foundation for the Future* identified and analyzed several alternative funding mechanisms to be considered, including reallocation of DOT funds to higher priority projects (see next recommendation), mileage-based user fees, tolls, use of general funds to supplement user fee revenues and others. Given the wide disparity between funds needed and funds available, this concern needs to be addressed immediately.

- **Target public funding toward the most important and impactful projects.**

  The emphasis again was on truck transportation over the national highway system, but the growth of online sales and direct-to-consumer delivery prompted a number of thought leaders to cite last mile delivery issues, particularly in urban areas (to be discussed later). Additionally, ocean port congestion and delays, a result of capacity challenges both at the port and the land transport connections, were mentioned.

- **Anticipate future changes in freight transportation demand and how they will impact the national transportation infrastructure.**

  For instance, the regionalization of manufacturing would impact freight volumes and flows. If the government is successful in bringing manufacturing of critical products back onshore or near-shore, there will be an increase in freight volumes and changes in the types of freight and the routes over which they will be moved. Imports of critical finished goods will decrease as they will be produced domestically. Increases in the transportation of raw materials, component parts, ingredients and other factor inputs will occur as this freight flows through the domestic manufacturers' supply chain networks. Forecasting these new flows and

their impact on the national transportation system will require better communication and collaboration between government and industry.

- **Identify heavy truck traffic corridors and investigate potential for truck-specific toll roads and dedicated truck lanes.**

  An alternative suggested by some thought leaders was to provide separation of commercial freight and passenger traffic as a means to speed the flow of truck traffic.

- **Transformative technologies such as connected vehicle technologies and automated vehicles are rapidly approaching viability, and the government needs to establish a framework for accommodating these technologies.**

  According to TRB, connected vehicle systems involve wireless communications among vehicles (vehicle-to-vehicle, or V2V), between vehicles and the highway infrastructure (vehicle-to-infrastructure, or V2I), infrastructure-to-vehicle (I2V) and between vehicles and other entities (V2X). Connectivity would enable the transportation system to operate more effectively as an integrated system. Automated vehicle systems involve varying degrees of automation and driver engagement. Many automated vehicle operating functions are currently in use, and they have greatly benefited drivers' ability to increase vehicle efficiency and safety. Higher levels of automation are advancing quickly, and TRB suggests that automated truck platoons with the following trucks being driverless could be operational within the next five years. The DOT needs to closely monitor the development of these technologies and establish appropriate and timely testing protocols, safety requirements and plans for adapting and modernizing the infrastructure to accommodate them.

Freight Capacity Visibility: One of the more interesting and novel ideas suggested by some of the thought leaders highlights the importance of greater real-time visibility into the location of moving freight and freight capacity across the national highway system. Visibility is crucial for supply chain security, responsiveness, resilience and efficiency. Greater real-time knowledge of freight capacity availability would enable increased utilization of existing carrier capacity which has many social benefits as well. By reducing the number of vehicles needed to serve a given level of freight demand, safety, environmental impact, congestion and wear and tear on the roads would all be enhanced. Specifically, the recommendation is to:

- **Devise a highway traffic control system analogous to the FAA's air traffic control system.**

  Employ Internet of Things (IoT) applications to enable the matching of freight demand with available transportation capacity (both vehicle and driver). There are several private sector initiatives doing this (e.g., Project 44, Macro Point and Trimble), but each is constrained by the number of shippers and carriers subscribing to their service. Only the federal government can mandate the participation of all trucking companies (and other highway users) to achieve true optimization. Government, as well as data security and privacy issues, appear to be the primary obstacles because the technology to accomplish this already exists. The system could also include passenger vehicles for urban and last mile parcel delivery.

  Transportation issues involving urban freight logistics and the lack of standardization/ uniformity of regulations across the nation were also raised. They are discussed in the following sections.

Focus Area 2:
Increase the skilled labor pool for supply chain

Deficiencies in the current labor pool and the changing skill sets required of employees were mentioned by nearly every thought leader. Transportation labor issues have already been discussed, but labor challenges are pervasive throughout supply chain operations. Several thought leaders specifically referred to the labor market being tight at the warehouse/DC level. While automation and advanced technologies are easing some of the need for labor, they do not solve the problem. Furthermore, the labor-technology interface is changing the skills required for many supply chain jobs, as new technologies such as autonomous vehicles, robotics and improved automated systems using AI/machine learning are being adopted. One individual asserted that digital fluency in the workforce is becoming mandatory; coding skills are critical, as is the ability to build algorithms that account for a disruptive environment. Specific proposals for government involvement include:

- **Education and training for the skills required in the future supply chain is an area ripe for public-private partnership, as is the recruitment of employees.**

  Technical knowledge of the equipment and processes involved in supply chain operations will be more important in the future as their complexity is increases. Most supply chain jobs are technology jobs, and, as the pandemic has revealed, supply chain is an essential "industry" for the nation. Hence, it is in the interests of both the government and business to promote supply chain career opportunities.

- **Immigration policies should be reformed to increase the employee pool for supply chain jobs.**

  Similar to the discussion on truck driver openings, supply chain labor needs should be considered in immigration policy to support critical supply chain operations.

- **Promote labor policies that allow companies to efficiently scale their operations to market conditions.**

  The ability to expand and contract capacity is vital to supply chain flexibility and efficiency. The use of independent contractors in transportation, for example, is particularly important as transportation demand is highly volatile and dependent on the health of the general economy. Of course, fair labor practices must continue to be maintained.

Focus Area 3:
Increase harmonization and digitization

Several thought leaders lamented the lack of harmonization or standardization of various governmental regulations across the nation. Environmental regulations, product labeling requirements and food ingredient requirements were identified as areas where state regulations often differ from one another as well as differing from federal regulations. Additionally, state permitting for transportation operations lack uniformity, as do state and local government labor policies (e.g., regarding sick pay, workers comp, etc.). Consistent and standardized regulations and compliance requirements would facilitate faster and more efficient supply chain performance, as well as enhance the ability of supply chain partners to integrate their operations and transact more efficiently with one another.

In a similar vein, there is wide variance among the states and among federal government units in their level of digitization. Government generally lags behind industry in this regard, and this is particularly true for supply chain operations. Standardization may be an issue here too, as realizing the full potential benefits of digitization depends on the interoperability of IT systems and software applications. Increased digitization can reduce the costs associated with government compliance reporting, foster data collection and maintenance, increase the availability of real-time information and enhance the integration and transactions between supply chain partners. There are risks associated with increased digitization, most prominent among them the threat of cyberattacks. The government has been diligent in strengthening its cybersecurity and should continue to make this a high priority.

The recommendations of the thought leaders are simply stated, though challenging to fulfill:

- **State and federal regulations pertaining to the environment, transportation and labor need to be harmonized.**

  The thought leaders, though strong advocates of sustainability initiatives, cited the lack of standardized environmental regulations as creating operational challenges for supply chains. They specifically mentioned the lack of standardization in CO2 levels/reduction targets and packaging regulations and plastic bans as key issues for their own companies. They also expressed concern about how these are established, suggesting that the government and industry working collaboratively on these issues would lead to more effective and less disruptive regulations.

- **State and federal governments should accelerate their efforts in digitization and cybersecurity.**

  The 21st Century Integrated Digital Experience Act was signed into law in December 2018. It requires all executive branch agencies to modernize their websites, digitize services and forms, accelerate use of e-signatures, improve customer experience and standardize and transition to centralized shared services. Great progress has been made by a number of government entities, but digitization relevant to managing supply chains appears to be lagging. For instance, while increased digitization has enabled the U.S. DOT to significantly increase the number of databases it makes available to the public, there has been little effort made to collect and share data in real time with transportation system users. Most of the focus on DOT digitization, data collection and data analytics for freight transportation has been for internal purposes, i.e., to improve systems planning and development, rather than to provide useful information that enables shippers and carriers to operate more efficiently and safely. This will be discussed later when reviewing the DOT's recently released National Freight Strategic Plan.

Focus Area 4:
Improve urban/metro freight logistics

Multiple thought leaders noted the challenges associated with urban deliveries, an important CPG supply chain activity that is becoming even more so given the surge in e-commerce and growth of direct-to-consumer shipments. Local (rather than federal) government policies are more germane as the potential solutions involve community investments and regulations related to infrastructure improvements, local traffic regulations and curbside management. However, the federal government can and should play a supporting role.

A 2015 policy document titled *Improving Freight System Performance in Metropolitan Areas: A Planning Guide* by Holguin-Veras, et al. and funded by the National Cooperative Freight Research Program (of the National Academy of Sciences) reports the results of a global scan of public sector freight initiatives and identifies 48 distinct initiatives that were classified into seven major groups:

- **Infrastructure Management:** Includes improvements in transportation infrastructure to enhance freight mobility; examples include ring roads, improved geometric design and physical characteristics, freight clusters (freight villages or logistics terminals) and ramps for handcarts and forklifts.
- **Parking/Loading Areas Management:** These initiatives attempt to ensure that freight and service vehicles have suitable and adequate places to park to conduct their activities; examples include both on-street and off-street initiatives — freight parking and loading zones, loading and parking restrictions, vehicle parking reservation systems, timeshare of parking space and staging areas.
- **Vehicle-Related Initiatives:** These generally attempt to improve environmental conditions; examples include emission standards and low noise delivery programs.
- **Traffic Management:** Initiatives focused on improving traffic flow and conditions. Examples include vehicle size and weight restrictions, designated truck routes and time access restrictions.
- **Financial Approaches:** Initiatives include road and parking pricing, non-monetary incentives (e.g., recognition programs, certification programs) and taxation.
- **Logistical Management:** These initiatives focus on influencing the way deliveries are made to reduce adverse environmental impacts and congestion; examples include urban consolidation centers, use of Intelligent Transportation Systems (e.g., Vertical Height Detection Systems, dynamic routing, real-time information on road safety and congestion conditions) and last mile delivery practices (e.g., driver training programs, anti-idling programs, pick-up/delivery to alternate locations).
- **Demand/Land Use Management:** The focus is on altering the demand for deliveries rather than how they are handled. Initiatives are related to freight demand management (e.g., off-hour delivery programs, staggered work hours program, time slotting of pick-ups and deliveries, receiver-led delivery consolidation program) and land use policy (e.g., relocation of large traffic generators, integrating freight into land use planning process).

Determining the most effective combination of these governmental tools to produce an efficient urban freight logistics system while enhancing urban livability (e.g., environmental impact, congestion, etc.) and generating/protecting the revenue stream for the metro government (e.g., parking permits, parking fines) to finance its approach is a challenging undertaking. As Holguin-Veras, et al. (2020, Part I, p. 361) note:

"One of the reasons is that, while the private sector agents engaged in the activity know the intricate details of their operations, the public sector decision makers rarely have detailed knowledge of the inner workings of these operations and have not received formal training on freight transportation policy and management. In this context, when faced with the need to address freight issues, frequently public sector decision makers tend to use familiar approaches based on engineering and regulations of various kinds. Although seemingly a natural response, the reliance on familiar approaches overlooks the fact that they are not necessarily the most effective."

They elaborate further on what would benefit local policy makers:

"There is a tremendous need to: (1) conduct research that assesses the effectiveness, advantages and disadvantages of the wide range of initiatives that the public sector could use to address freight issues; (2) make available to transportation professionals technical materials that provide guidance on when to use public sector initiatives of one kind or another; and (3) identify processes to help transportation professionals take steps to improve public sector freight management, policy, planning."

Two general recommendations emerge from the preceding discussion. The first applies more to the local authority and the second articulates a federal role:

- **Stakeholder engagement beginning in the planning stage and public-private initiatives are essential for developing workable solutions to meet urban freight logistics needs.**

- **The federal government should increase its financial support for urban freight logistics research and for urban freight pilot programs and initiatives designed to alleviate congestion and environmental problems and improve freight delivery efficiency.**

  Analogous to the earlier discussion of prioritizing highway infrastructure investment, the federal government should develop a national strategy and provide guidelines for addressing urban freight logistics challenges and target federal funds for the most important and impactful projects. Funding priority considerations should include the development and/or application of new technologies and innovations that show great potential, which is the focus of the next set of recommendations.

Focus Area 5:
Promote supply chain technology, process and service innovation

Technology and innovation are essential to increasing supply chain security, flexibility, resilience and efficiency. The federal government approval process for new technologies tends to be slow, explaining why many new technologies are developed or tested outside the U.S. This jeopardizes the country's position as a global leader in innovation. The government needs to incentivize and support the development and adoption of new technologies and innovations:

- **Government policies should encourage research, experimentation and field testing of new technologies, processes and services.**

  The government should employ the various tools at its disposal — direct investment, tax incentives, data sharing and streamlined and faster approval processes. It should encourage and support entrepreneurship and workforce development/training in emerging technologies.

- **Furthermore, many of the emerging technologies will also require modernization of the physical infrastructure and revision of operating and safety regulations (e.g., autonomous vehicles and unmanned aerial vehicles, or drones).**

  The government's ability to anticipate and prepare for such requisite changes in regulatory and investment policies would be enhanced by its closer collaboration and support of private sector innovations.

Focus Area 6:
Identify, manage, support and protect critical supply chains

As noted at the beginning of this report, the pandemic has taught us some valuable lessons by revealing deficiencies and vulnerabilities in the supply chains of critical products, components and ingredients. This includes the need to have greater control within the nation of these essential items and the need to prioritize the protection of workers in critical supply chains.

Congress responded with numerous bills intended to reduce the nation's reliance on other countries for critical items and to improve the government's monitoring of critical supply chains to prevent future disruptions. Additionally, President Biden's campaign revealed a plan to ensure that the country does not face future shortages of critical equipment, and a major component of the plan is to rebuild U.S. supply chains. The goal is to increase the strength and resiliency of supply chains in pharmaceuticals, medical supplies and equipment, energy and grid resilience technologies, semiconductors, key electronics and related technologies, telecommunications infrastructure and key raw materials. The urgency of this need is highlighted by the commitment to initiate a 100 day review immediately upon taking office to identify critical national security risks across America's international supply chains. The Biden supply chain plan also proposes working with Congress and regulatory agencies to require companies involved in the manufacturing, distribution and use of designated critical products to regularly identify potential supply chain vulnerabilities and develop plans for addressing them.

In essence, the government and companies in critical supply chains need to implement supply chain risk management (SCRM) planning. A key component of SCRM is supply chain mapping. Simplistically stated, supply chain mapping is knowing where the production facilities of your suppliers (and their suppliers) are physically located and knowing which parts or materials are produced at each location. In essence, mapping one's supply chain enables a company to know where and by whom each part, component and material comprising their product is produced. Mapping is a vital tool for identifying where vulnerabilities lie within the supply chain, but it is a very complex undertaking, given the expansive network of suppliers forming most private sector supply chains. Mapping also includes additional contextual information pertaining to the many factors that impact supply chain operations and performance, such as unit cost, total volume, relative dependence upon the supplier, supplier capabilities, political environment of the source country, etc.

Besides mapping targeted, critical supply chains (i.e., those impacting national health and security) the government should invest in critical supply chain infrastructure, maintaining strategic inventory reserves and providing incentives for onshoring or nearshoring. Clearly, this is another issue requiring a strong public-private partnership. Government needs to collaborate with industry to develop appropriate, workable long-term solutions. Furthermore, data collaboration between government and business would enable more efficient and secure supply chains. Key caveats include maintaining data security, protecting proprietary data and ensuring consumer privacy.

Federal agencies responded to the pandemic by issuing guidelines for identifying and protecting essential workers. For instance, the Cybersecurity & Infrastructure Security Agency (CISA) in the Department of Homeland Security issued the Advisory Memorandum on Ensuring Essential Critical Infrastructure Workers Ability to Work During the COVID-19 Response on August 18, 2020. The memorandum provided a list of critical industries and categories of workers directly and indirectly involved in supporting these industries. Additionally, it provided guidelines to help companies advance worker safety to ensure the continuity of critical functions. The memorandum emphasized that its lists and guidelines were advisory in nature and not to be considered a federal directive or standard. The thought leaders expressed support and appreciation for CISA's guidelines but argued that stronger and clearer directives are needed to ensure the continuity of essential operations during worst case scenarios. These should be provided at the federal level so there is uniformity across state lines and international borders, particularly with Canada, Mexico and our other large trading partners.

- **The federal government should collaborate closely with business to develop strategies and tactics to protect critical supply chains, drawing upon the expertise of the private sector and sharing data and information that will contribute to more efficient and secure supply chains.**

- **The federal government should determine why manufacturers of critical products, components and ingredients do not choose to locate to the U.S. and take corrective or proactive measures to make the U.S. a more desirable location.**

  The realization that high percentages of critical medical, pharmaceutical, rare earth materials and other essential items are sourced from outside the country has reenergized many policy makers to sponsor legislation that would provide incentives for U.S. companies to reshore their operations. A 2016 OECD policy paper, "Reshoring: Myth or Reality?" notes that "Because reshoring is closely related to the attractiveness of countries for investment, policy measures that impact countries' location factors will also directly benefit reshoring," (p. 24). It advises governments to consider and align the totality of their investment, R&D, tax, trade and regulatory policies to create a business environment that enables companies to succeed and to support national markets for their products. Clearly, this is a long-term undertaking that is well worth the effort. In the short term, however, identifying specific measures that will entice local production and sourcing of materials essential to national security and health care is vital.

- **The federal government should establish more explicit standards, requirements and directives for keeping essential workers safe and performing their critical operations, including giving them top priority for personal protective equipment, medicines and vaccines.**

  Federal categorizations and requirements for essential workers should supersede those of state and local authorities to ensure continuity in the provision of critical goods and services. The existing guidelines do not address the role the government should play in making sure that essential workers are provided the protective equipment and medical treatments, including vaccines, that will enhance their safety and allow them to perform their critical operations and services. This was a severe nationwide problem early in the pandemic and still remains so across the country on a more localized basis. Furthermore, there was no uniformity in how state and local leaders implemented the guidelines coming from the Centers for Disease Control and Prevention (CDC) and other federal agencies.

SECTION 3:

The Federal Landscape: Selected Recent Public-Private Sector Initiatives

3

There are noteworthy recent policy statements and initiatives from key government agencies that reveal a keen awareness of the benefits of collaborating with the private sector on supply chain matters and a greater willingness to do so. Additionally, supply chain risk management has become pervasive in the strategic planning and operational activities of several departments and agencies. Finally, recognition of the nation's supply chain vulnerabilities exposed by the COVID-19 pandemic has inspired Congress to draft several bills that address supply chains critical to U.S. national security and public health, including many intended to bring critical manufacturing back to the U.S. A brief overview of the more significant developments during the last two years follows.

New Era of Smarter Food Safety – FDA's Blueprint for the Future

The U.S. Food and Drug Administration (FDA) released its new approach to creating a safer and more digital, traceable food system during the second week of July 2020. The "New Era of Smarter Food Safety – FDA's Blueprint for the Future" builds on the work FDA did to implement the Food Safety Modernization Act (FSMA), which established science and risk-based protections. This ambitious plan incorporates or addresses many of the themes that emerged in the discussions with the supply chain thought leaders. Thus, it may serve as a model for other agencies involved in the regulation or oversight of supply chains.

The four foundational pillars of "New Era" are:

1. **Tech-Enabled Traceability**
2. **Smarter Tools and Approaches for Prevention and Outbreak Response**
3. **New Business Models and Retail Modernization**
4. **Food Safety Culture**

A brief description of the major objectives and approaches involved in each follow.

Pillar 1:
Tech-Enabled Traceability

FDA notes that documentation in the food supply chain is still largely paper-based, resulting in an inability to rapidly track and trace food. Hence, a key focus will be encouraging and incentivizing industry adoption of digitally-enabled tracing technologies that are interoperable across the supply chain to facilitate public-private data sharing, increased transparency and more rapid response to food safety problems. To help accomplish this, FDA plans to harmonize or standardize the key data elements and critical tracking events needed for enhanced traceability. FDA acknowledges the need to protect confidentiality and proprietary interests while advancing transparency.

On September 23, 2020 FDA published a proposal in the *Federal Register* to improve traceability to enable more efficient and effective traceback and traceforward investigations, "Requirements for Additional Traceability Records for Certain Foods." The purpose of the proposed requirements is to address three significant gaps in food safety regulation: lack of coverage of all sectors involved in food production, distribution and sale; lack of uniform data collection (particularly regarding the source of food ingredients used in each lot of finished product and the requirement to record a lot code or other identifier); and the inability to link incoming with outgoing product within a firm and from one point in the supply chain to the next. Prior to developing the proposal, FDA met with stakeholders and reviewed the current state of food traceability standards, systems and technologies.

FDA summarizes the main elements of its proposed new requirements that would apply to designated foods on the Food Traceability List (i.e., foods identified to be at higher risk for foodborne illnesses and microbiological or chemical contamination):

"The core components of the proposed rule are the requirements to establish and maintain records containing key data elements (KDEs) associated with different critical tracking events (CTEs) in a listed food's supply chain, including the growing, receiving, transforming, creating and shipping of listed foods. The recordkeeping requirements we propose emphasize the importance of documenting the applicable traceability lot codes and linking these codes to other KDEs at critical points in the supply chain of a food to aid product tracing during an investigation of a foodborne illness outbreak or during a recall."

The proposed rule represents a huge step forward in developing industry standards for terminology, traceability capabilities, information requirements and recordkeeping. Though it stops short of requiring the use of electronic records and electronic communications for traceability, perhaps because earlier pilot projects discovered that many firms in the food supply chain produced information in forms that cannot be electronically manipulated, it strongly encourages firms to incorporate electronic recordkeeping and communication procedures into their traceability programs.

Pillar 2:
Smarter Tools and Approaches for Prevention and Outbreak Response

The focus here is on enhancing and strengthening root cause analyses and predictive analytics to prevent contamination events and outbreaks. Standardized protocols for root cause analysis and reporting, public-private information sharing, improved communications and expanded use of artificial intelligence and machine learning tools are critical components for success. FDA stresses the importance of public-private collaboration in generating, sharing and analyzing data (i.e., public-private "data trusts") to strengthen the foodborne predictive capabilities and risk management decision making of both sectors.

Pillar 3:
New Business Models and Retail Modernization

FDA recognizes that it needs to adapt its approaches and policies to changes in the food supply chain, notably how food is produced and how it is distributed. Innovation in novel ingredients, new foods and new food production systems must be understood to address potential food safety vulnerabilities. Similarly, the emergence of e-commerce and omnichannel distribution alters the path food takes from farm to table, brings new supply chain members into the equation and changes the consumer's interaction with the product (e.g., potential safety issues are different for direct delivery to home vs. purchasing at retail establishment). FDA identifies several approaches it will implement, most of which entail close collaboration with industry, including encouraging the use of technology that automatically monitors product risk factors, partnering with food delivery companies to provide education on the importance of proper food handling and increasing engagement with industry and regulatory partners to target food safety practices most effective in preventing foodborne illness.

Pillar 4:
Food Safety Culture

FDA asserts that a strong food safety culture throughout the supply chain is a prerequisite to effective food safety management. Much of its efforts to this end will be marketing, educating and training to instill the knowledge, attitudes and behaviors that will lead to better safety outcomes. Industry leaders are viewed as important influencers who can help FDA in this effort. One noteworthy opportunity for industry is FDA's intent to consider how companies' positive food safety culture can factor into reduced inspection frequencies. FDA should collaborate with industry to identify those characteristics and practices that indicate a facility has a robust food safety culture.

FDA has developed a strong blueprint to guide its future efforts for improving food safety within the country. Importantly, a strong partnership with the private sector is a key component of the blueprint as FDA recognizes the synergies and mutual benefits the public and private sector can produce when working together.

U.S. Department of Transportation National Freight Strategic Plan

The U.S. Department of Transportation (DOT) released its National Freight Strategic Plan during the first week of September, the first such effort to address the needs of and challenges faced by the freight transportation industries and its customers. Mandated by the FAST Act (Fixing America's Surface Transportation Act), it is rather astonishing that this is the first time in its 53-year history that the DOT has developed a freight strategic plan.

On the positive side, a formal freight strategic plan appears to reflect a greater appreciation for the needs of carriers and shippers and the importance of freight transportation to the national economy. It may also offer a new, or better, opportunity for industry, particularly shippers, to inform and influence the DOT on key supply chain issues. The DOT acknowledges that it does not have a strong understanding of shipper decision making processes and considerations:

"Proprietary concerns have traditionally inhibited the ability of public agencies to study and understand the decision-making of shippers and carriers that ultimately influence the geography of goods movement and the performance of freight transportation systems. Because data on the cost of shipping goods is not well understood, it is difficult for policy makers to integrate the cost of product transportation for businesses and consumers into transportation programming and policy decisions." (p. 79)

DOT goes on to comment on the advances in technology that allow for more cost-effective collection, storage and analysis of data, both public and private, on a local or granular scale that would better inform DOT's policy decisions. However, it does not seem to consider that it may have a role in collecting and sharing data that would benefit the public to the private sector and the performance of their supply chains on a national level, even though the strategic plan document describes a very successful program funded by the Federal Highway Administration (FHWA) that does just that for the Ports of Los Angeles and Long

Beach. FHWA funded the Freight Advanced Traveler Information System (FRATIS) used by the ports to optimize short-haul drayage freight between the marine terminal operators and nearby distribution centers. FRATIS enabled the dray carriers to significantly reduce idle times and fuel costs at the port facilities. The Los Angeles County Metropolitan Transportation Authority expanded the functions and capabilities of FRATIS as part of its Drayage, Freight and Logistics Exchange (DrayFLEX) Program:

"DrayFLEX uses information from marine terminal operators, trucking companies and traveler information systems to provide status updates on container availability, enable trucking companies to set up automated appointments and provide truck drivers with the best routes to access and depart from the port. It is scheduled to deploy as a pilot program in late 2020 and will use data from MTOs, trucking companies and traveler information systems to optimize container movements in and around the ports. LA Metro and the ports plan to use the system's information-sharing capabilities to explore connected vehicle (CV) applications in the freight sector." (p. 37)

While the DOT welcomes, and indeed seeks, input from system users, it is more for its own planning and policy purposes. It should be seeking more direct engagement with the private sector that could lead to a more dynamic, interactive collaboration that would enable the users of the national freight transportation system to be more efficient, safe and resilient.

There are three overarching strategic goals articulated in the National Freight Strategic Plan:

1. **Safety:** Improve the safety, security and resilience of the national freight system
2. **Infrastructure:** Modernize the freight infrastructure and operations to grow the economy, increase competitiveness and improve quality of life.
3. **Innovation:** Prepare for the future by supporting the development of data, technologies and workforce capabilities that improve system performance

Several of the stated strategic objectives supporting the infrastructure and innovation goals align closely with the themes emerging from discussions with the thought leaders. These are delineated below.

Goal 1:
Infrastructure

The DOT's intent to improve consideration of freight in transportation planning is manifested primarily by focusing resources where they will have the greatest impact on improving freight flows and efficiencies.

- Fund targeted investments in freight capacity and national goals.
- Prioritize projects that improve freight intermodal connectivity and enhance freight flows on first- and last-mile connectors and at major trade gateways.
- Develop a methodology for identifying freight bottlenecks.

The strategic plan reports that congestion cost the trucking industry an estimated $74.5 billion in 2018, and that growing urban populations and increasing e-commerce will exacerbate congestion challenges in the future. Additionally, by 2045, future demand is projected to cause peak-period stop-and-go conditions on more than 27,000 miles of the National Highway System (or more than 10% of the NHS), including on long stretches of the interstate system in the eastern part of the country and along the west coast and in and around major metropolitan areas across the country.

Goal 2:
Innovation

The DOT proposes innovations to improve its own operations in terms of freight data, modeling and analytical tools and resources and to strengthen the professional capacity of its workforce. However, DOT recognizes it needs to be more supportive of private sector innovations as well, illustrated by the following objectives:

- Support the development and adoption of automation and connectivity, including V2X (i.e., vehicle-to-everything) technologies.
- Support the safe deployment of unmanned aircraft systems (UAS) technology.
- Streamline or eliminate regulations to improve governance, efficiency and economic competitiveness.
- Invest in freight research.
- Support regulatory frameworks that foster freight innovation.
- Strengthen workforce professional capacity.

DOT's intent to streamline or eliminate regulations that impede the efficiency and economic competitiveness of U.S. industry is commendable. However, it should take this a step further and work with state DOTs to develop more consistent or standardized

transportation regulations across the country and, thus, address a key concern of the private sector. DOT does comment on the differences among the individual states, regarding how they conduct their planning, forecasting, measuring, etc. and how this has created challenges for its own planning. Therefore, DOT should understand the challenges and inefficiencies that shippers suffer from the lack of standardization across the country. DOT has considerable influence over the states through the power of the purse and should make this a priority.

Two recent actions by agencies within DOT related to the above stated objectives pertaining to technologies and workforce are worth mentioning. In late August, the Federal Aviation Administration (FAA) issued a Part 135 air carrier certificate to Amazon for its fleet of Prime Air drones, making it the third company to receive such certification, after Wing Aviation (which is owned by Alphabet) and UPS Flight Forward. In early September, the Federal Motor Carrier Safety Administration (FMCSA) announced that it is proposing and seeking public comments on a new pilot program to allow drivers aged 18, 19 and 20 to operate commercial motor vehicles in interstate commerce. FMCSA sought public comments on such a pilot program in May 2019, seeking input on several issues such as training, qualifications, driving limitations, insurance, research, data and others.

DOT's National Freight Strategic Plan provides an excellent segue for industry to inform and influence national transportation policy. DOT underestimates the role it can play in facilitating the supply chain of the future.

Critical Issues in The Trucking Industry – The ATA's 2020 Report:

Since transportation issues were among the most cited by the thought leaders, and since most transportation issues involved trucking, it is useful to look at what the trucking industry has identified as its most pressing issues and its recommendations for public policy action. The most recent annual report on the critical issues facing the trucking industry was prepared by The American Transportation Research Institute (ATRI) for the American Trucking Associations (ATA), released in October 2020.

The industry's top issues, and its stance on them, are very similar to those identified by the thought leaders. The following issues comprise the top 10 issues identified by commercial drivers and the motor carrier companies surveyed by ATRI:

Rankings by Commercial Drivers

1. Truck Parking
2. Driver Compensation
3. Detention/Delay at Customer Facilities
4. Hours-of-Service (HOS)
5. Driver Training Standards
6. Automated Truck Technology
7. Compliance, Safety, Accountability (CSA)
8. Driver Health & Wellness
9. Speed Limiters
10. ELD Mandate

Rankings by Motor Carriers

1. Driver Shortage
2. Driver Retention
3. Compliance, Safety, Accountability (CSA)
4. Insurance Availability/Cost
5. Tort Reform
6. Economy
7. Transportation Infrastructure/Congestion/ Funding
8. Driver Distraction
9. Detention/Delay at Customer Facilities
10. Hours-of-Service (HOS)

Several of the strategies proposed by ATRI over the last two years (2019 and 2020) address the above issues and align with suggestions made by the thought leaders.

With respect to the driver shortage issue, ATRI recommends that ATA take the following positions to increase the labor pool or improve the work environment for drivers:

- **Advocate for Congress and federal agencies to develop an apprenticeship program to attract, train and retain safe 18-20-year-old interstate drivers to the industry.**

  The DRIVE-Safe Act provides a framework for an apprenticeship program including hours of training, technology use and performance benchmarks.

- **Research the safety and economic impacts of customer detention on truck drivers and trucking operations.**

  Identify best practices, technologies and strategies that reduce or eliminate driver detention at shipper/receiver facilities. Quantify impacts on detention times that may have occurred since the ELD mandate.

ATRI recommendations address reforming or reducing regulations:

- **Analyze how HOS rules might be modified for highly automated trucks and identify what research and data would be necessary to justify future rule changes.**

  This also potentially affects the driver's work environment and compensation level, and thus ties in with the driver shortage issue.

- **Advocate for reforming/repealing ineffective and burdensome regulations that add to industry costs without providing benefits.**

  ATRI specifically referenced California's greenhouse gas emissions standards. This recommendation was presented within the economy issue – what government can do to stimulate the economy and/or facilitate greater transportation efficiency.

ATRI recommendations for supporting infrastructure funding:

- **Identify strategic locations on the National Freight Network for new or expanded truck parking due to increased traffic congestion, staging needs and industry/regulatory changes.**

  Also create a new dedicated federal funding program designed to increase truck parking capacity at freight-critical locations and research the role and value of real-time truck parking information systems and truck parking reservation systems.

- **Continue to advocate for long-term highway funding through an increase in the fuel tax or other direct user fees and prevent additional diversion of revenue to non-highway projects.**

  ATRI states that the persistent shortfall of highway funding is due in part to an erosion of federal motor fuels tax revenue.

- **Create a new funding program to focus federal resources on truck bottlenecks along major freight corridors.**

  ATRI suggests that in the face of limited resources, funding should be targeted at bottlenecks along major freight routes.

- **Increase funding for federal aid highway programs that focus on funding highways with significant volumes.**

  Analogous to focusing on bottlenecks, an alternative approach is to target resources on those corridors with significant freight volumes.

Federal Agency Supply Chain Risk Management Initiatives:

Over the last few years, several federal agencies have embraced the tenets and framework of supply chain risk management (SCRM) in the execution of their duties and responsibilities. SCRM provides an excellent foundation for a government-wide perspective on supply chain policies as it requires an understanding of the current structure, design and operations of a supply chain; identification of its key vulnerabilities and risks; an assessment of the probabilities and costs associated with risk occurrences; the development of risk mitigation and avoidance strategies; monitoring supply chain performance and changes in risk profiles; and the formulation of plans for recovery and operational continuity in the event of supply chain disruptions. It is a positive sign that such an integrated and comprehensive approach to supply chain matters is being applied in multiple parts of the federal government. However, until very recently, the efforts across agencies seemed unconnected and there was no central entity leading and coordinating these interagency efforts. That changed in one domain with the creation of the Federal Acquisition Security Council (FASC).

FASC

The Federal Acquisition Supply Chain Security Act of 2018 (Title II of the SECURE Technology Act of 2018) established the FASC, an executive branch interagency council, chaired by a senior-level official from the Office of Management and Budget, and comprised of representatives from the General Services Administration, Department of Homeland Security, Office of the Director of National Intelligence, Department of Justice, Department of Defense and Department of Commerce. FASC was empowered with the authority to develop government-wide criteria for federal supply chain risk management programs, criteria for sharing relevant supply chain risk information across the government and protecting federal information technology. In August 2020 FASC released its Strategic Plan for Addressing and Managing Supply Chain Risks.

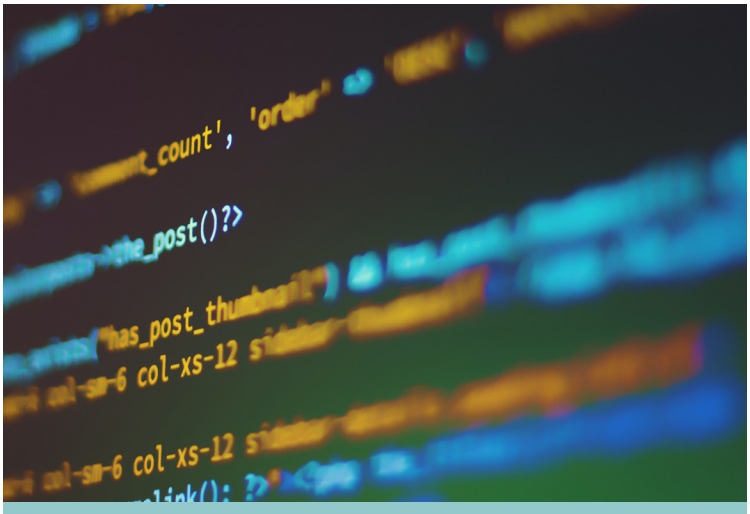
The strategic plan articulates the FASC's mission and strategic objectives:

- Facilitate the creation of an effective and consistent process for identifying, assessing and responding to ICT (information and communication technology) risk, including mitigations and recommendations for exclusion and removal of ICT sources, goods and services that pose a risk to our nation's supply chain.
- Ensure all federal departments and agencies have access to best practices for their respective SCRM functions.
- Facilitate the creation of an effective information sharing construct to ensure all federal departments and agencies have access to information essential to their SCRM functions.
- Facilitate the use of services and common contract solutions to maximize efficiency and minimize resources needed to effectively manage the ICT supply chain across the federal enterprise.
- Improve stakeholder engagement (e.g., non-Executive Branch Federal entities, private sector and non-governmental organizations) to enhance partnerships to reduce supply chain risk.

FASC designated the Department of Homeland Security (DHS), primarily through its Cybersecurity and Infrastructure Agency (CISA), to serve as the information sharing agency (ISA). As the ISA, CISA is responsible for standardizing processes and procedures for submission and dissemination of supply chain information. CISA has an ICT SCRM Task Force currently consisting of 17 government agencies and 34 private sector firms equally divided between the information technology and communication sectors.

The focus of the FASC and the legislation that created it is on federal government product and service acquisitions in the ICT industry sector. A primary responsibility given to the FASC was to provide leadership, develop uniform standards and approaches and coordinate the SCRM plans of the departments and agencies represented in the FASC. As noted in its strategic plan, prior to the SECURE Technology Act there was "no centralized construct for unifying federal supply chain risk management (SCRM) activities."

The FASC may serve as a good model for the establishment of a single entity within the federal government to provide leadership and coordination of the many, diverse supply chain public policy initiatives and SCRM approaches that prevail throughout the federal government and in the private sector. Just to illustrate, a few examples of substantive supply chain initiatives involving public-private, inter-agency and inter-industry collaborations are provided next. Each example is doing excellent work, but the apparent lack of coordination among these efforts and the missed opportunities to derive synergies from joining forces result in suboptimality by not managing supply chain public policy holistically.



FEMA/DHS

An excellent example of a non-ICT supply chain risk management approach is detailed in the Federal Emergency Management Agency's (FEMA) Supply Chain Resilience Guide published in April 2019. The document provides emergency managers with recommendations on how to analyze supply chains and work with the private sector to rapidly restore pre-disaster supply chain systems. FEMA notes that emergency managers have two primary roles: to foster collaboration among supply chain partners to make supply chains of critical goods and services more resilient and to develop an awareness of supply chains and their vulnerabilities to inform response and recovery planning. This requires working across the private and public sectors to ensure that these critical goods and services in the "community lifeline" are managed and/or made available as quickly as possible: Safety and Security (for both responders and survivors); Food, Water, Sheltering; Health and Medical; Energy (Power and Fuel); Communication; Transportation; and Hazardous Material.

The guide also lays out a supply chain resilience process that focuses on understanding key supply chain stakeholders, vulnerabilities and challenges, and identifies actions that may need to be implemented in the event of a supply chain disruption. Finally, it provides an approach to detailed logistics planning that includes infrastructure and route considerations, engagement with public and private sector logistics service providers and knowledge of supply sources and distribution points. The guide includes recommendations for pre-disaster planning and operations during the emergency.

FEMA's approach to supply chain resilience is presented here because it illustrates the integrative, comprehensive, systematic approach needed to identify and address supply chain vulnerabilities and challenges in disaster response and management situations. The federal government needs to take this same perspective and approach in setting supply chain public policies.

Department of Commerce Advisory Committee on Supply Chain Competitiveness

Per the Department of Commerce website, "The 45-member Advisory Committee on Supply Chain Competitiveness was formed to provide the Secretary of Commerce with detailed advice on the elements of a comprehensive national freight infrastructure and freight policy to support U.S. supply chain and export competitiveness." Committee members come from the public sector (e.g., transportation-related authorities), private sector (e.g., companies and professional associations) and academia.

The committee provides detailed policy and technical advice, information and recommendations to the Secretary regarding:

- National, state or local factors in trade programs and policies that affect the efficient domestic and international operation and competitiveness of U.S. global supply chains from point of origin to destination.
- Elements of national policies affecting the movement of goods, infrastructure, investment and regulatory factors that affect supply chain competitiveness and sustainability.
- Information and data systems to generate metrics that can be used to quantify and improve supply chain performance.

In administering this committee, the Department of Commerce works closely with the Department of Transportation and other supply chain related agencies.

Congressional Supply Chain Caucus

The House of Representatives launched a Congressional Supply Chain Caucus in early March 2020, citing a need to focus on ongoing supply chain challenges related to manufacturing, trade, delivery, resiliency and other factors brought on by the COVID-19 outbreak. In addition to conducting its own hearings, investigations and analyses, the bipartisan caucus also seeks to serve as a clearinghouse by bringing together relevant issues from the various supply chain-related caucuses in Congress, including the Air Cargo Caucus, the Digital Trade Caucus, the House Manufacturing Caucus and the U.S.-China Working Group. In a letter to Consumer Brands, the new caucus refers to the complexity and integrated nature of supply chains:

> **"Infrastructure, environment and data protection, security and technology enablement are the key pillars of supply chain success, but the success of each hinges on the other."**

American Logistics Aid Network (ALAN)

Established in 2005 in the aftermath of Hurricane Katrina, ALAN is an industry-wide organization that provides free supply chain assistance to disaster relief organizations (and other nonprofits) before, during and after catastrophic events. It accomplishes this by bringing the expertise and resources of the logistics industry together with non-profit disaster relief organizations to help solve their most pressing supply chain challenges immediately after disasters strike. Currently, there are more than 30 industry associations and more than 75 government, emergency management and non-profit organizations comprising ALAN. Industry participants provide both in-kind support (services, equipment, expertise) and financial support.

As its website notes, studies show that up to 80% of spending during a disaster crisis goes to logistics and as much as 40% of that may be wasted because the disaster relief organizations don't have the right supply chain equipment, knowledge or connections available to them. By meeting these supply challenges, ALAN both helps save lives and frees up the scarce resources needed to survive and bounce back from catastrophic events.

Critical Infrastructure Supply Chain Council

The Critical Infrastructure Supply Chain Council (CISCC), launched in May 2020 by the Consumer Brands Association, is an excellent example of supply chain collaboration within the private sector. CISCC is a multi-industry alliance of more than 100 trade associations committed to the common goal of advancing uniform, national policies that strengthen the nation's supply chains and ensure the timely flow of critical products. Toward that end, the CISCC:

- Shares information with federal, state and local officials regarding the importance and operations of critical supply chains and provides recommendations and suggested best practices.
- Leverages the vast experience and resources of its members to engage government at all levels to find solutions when there are potential breakdowns.
- Serves as a forum across industries to anticipate, draw attention to and address emerging supply chain challenges.

Proposed Legislation in Current Congress

A search of the Library of Congress reveals that by mid-September 2020, there were more than 125 bills proposed by the 116th Congress that make some reference to supply chains in the text of the legislation, including 10 that have supply chain in the title. This does not include bills pertaining to transportation infrastructure funding.

The focus of most of these bills is on supply chains critical to national security (e.g., cyber security, computer technology, critical minerals, defense industries, etc.) and public health (medical supplies and equipment, pharmaceuticals). Most emerged in response to supply chain problems experienced as a result of the pandemic. The shortages of medical supplies and equipment and pharmaceuticals during the pandemic have revealed our heavy reliance on other nations for these products, particularly China. The Los Angeles Times reported in mid-July 2020 that there were no fewer than 62 bills pending in Congress that sought to lower our dependence on China, with many focused on bringing manufacturing home. The onshoring of critical medical supply chains and replenishment of the strategic national stockpile of critical medical supplies are key components of the U.S. MADE Act of 2020 (S4264) and the Health and Economic Recovery Omnibus Emergency Solutions (HEROES) Act (H.R. 6800). There is strong bipartisan support in both chambers for bringing the production of medical supplies and equipment and pharmaceuticals back to the U.S.

Both the House and Senate versions of the National Defense Authorization Act (H.R. 6395 and S.4049) contain many provisions to expand domestic defense manufacturing and to address defense supply chain vulnerabilities. One of the House provisions is analogous to a key recommendation emanating from our discussions with supply chain thought leaders — the establishment of a centralized database made available to industry. Amendment 377 calls for the creation of a National Supply Chain Database run by the Manufacturing Extension Partnership (MEP) Centers to connect small and mid-size manufacturers and prevent supply chain disruptions.

Clearly, supply chain issues and supply chain management have the attention of Congress, the federal government and the public. It is an opportune time for the private sector to take the initiative and exert more influence on public policy. Indeed, there are many supply chain initiatives being undertaken both within industry sectors and across verticals to build coalitions to address many of the key issues and challenges faced by all supply chains. Engaging the public sector and integrating these private initiatives and expertise into the public decision-making framework would greatly enhance supply chain outcomes at the national level.

CONSUMER BRANDS ASSOCIATION

SECTION 4:

Summary and Final Recommendations

4

The primary objective of this study is to identify the most important supply chain challenges facing the nation, as well as possible approaches to address them, to inform public policy. Though the COVID-19 pandemic has brought considerable attention to problems in the supply chains of critical goods and services, the rationale for such a study goes beyond the current situation.

A nation's supply chain infrastructure and capabilities are fundamental to its economy, security and quality of life.

In pursuit of its objective, the study draws on the experience, expertise and insights of supply chain thought leaders and reviews research by academia, governments and NGOs. A strong consensus of key supply chain issues was found and recommendations for government action were suggested. Many of the recommendations were intentionally broad in nature, reflecting the complexity of the issues and the need for deeper analysis and more discourse. Some recommendations were more specific or narrow, as they pertain to current regulatory directions, technology developments or industry practices.

Successful supply chain public policy requires close collaboration between the public and private sectors. Several examples of the public and private sectors working well together were found. Yet, in most cases, these efforts appear not to be reaching their full potential primarily because of a suboptimal organizational structure resulting in a lack of communication, collaboration and standardization across the many government departments and agencies that deal with elements of the supply chain. However, some very recent organizational changes and strategic plans can serve as models or blueprints to overcome this shortcoming.

Specifically, an Office of Supply Chain in the federal government is desperately needed to provide the required leadership to develop sound public policy, monitor its implementation and assess its results.

Creating an Office of Supply Chain

The World Economic Forum has identified an Office of Supply Chain as an important step for a country to ensure that its supply chain infrastructure and capabilities make it competitive in the global economy, and leading U.S. industry associations have advocated for such an office as well. The FASC, established as the overarching council to lead and coordinate the ICT acquisition policies and procedures of all federal departments and agencies, provides an excellent template for an Office of Supply Chain (OSC) that would oversee and coordinate public policy affecting private sector supply chains. FASC is empowered with the authority to develop government-wide criteria for federal supply chain risk management programs, is situated in the OMB and has representatives from 17 government departments and agencies and 34 private sector firms. An OSC would have a much broader scope of responsibility, but the need for a centralized construct for unifying federal policies and activities impacting private sector supply chains is analogous to the rationale for creating the FASC.

The OSC should focus on three high-level (or macro-level) objectives of national supply chain policy: Supply Chain Security, Supply Chain Efficiency and Supply Chain Resilience. These are the fundamental requirements of a strong and enabling national supply chain. The OSC should develop national supply chain policies and the metrics for assessing progress in achieving them.

Supply Chain Policy Recommendations

The recommendations presented earlier in this document collectively provide a comprehensive approach to strengthening these primary components and enablers of national supply chain security, efficiency and resilience:

- **Supply Chain Physical Infrastructure:** A robust transportation system that produces efficient traffic flow and promotes safe operations is essential as predictable, consistent and timely deliveries are a primary performance requirement of supply chains. Though the federal investment in highways and roads was mentioned most often by the supply chain thought leaders, efficient customs operations and clearance, port facilities and operations (airports, ocean ports, river ports) and railroads are essential parts of the infrastructure as well and must function as a seamless, integrated system.
- **Supply Chain Standardization:** When regulations and regulatory processes are not harmonized or standardized among the states or between the states and federal government, it presents a major obstacle to achieving an integrated, seamless supply chain operation and adversely affects costs and service.
- **Supply Chain Digitization and Cybersecurity:** Optimal supply chain decisions by both the public and private sectors require accurate, real-time, secure data. Digitization also helps achieve visibility across the supply chain and product traceability, two vital capabilities for efficiency, security and resilience.

- **Supply Chain Labor:** Qualified employees, the backbone of any supply chain operation, are becoming more difficult to find as the technical skills required of the jobs are increasing. One essential occupation, line-haul truck driving, has experienced a chronic shortage of qualified employees and deserves special attention.
- **Supply Chain Technology/Innovation:** Supply chain operations are increasingly becoming the focus of entrepreneurs who are developing new technologies or coming up with innovative applications of existing technologies to advance supply chain performance. Many of the emerging technologies and applications may require government approval, modernization or adaptation of public infrastructure or financial support.

Priority should be given to the following 12 recommendations as they appear to address the most significant challenges or barriers to supply chain performance. A timeframe is suggested for each recommendation based on the urgency of need and reasonable anticipated time to see initial results. (Near term: 1-2 years; Medium term: 3-5 years; Long term: >5 years)

Near term: 1-2 years **Medium term: 3-5 years** **Long term: >5 years**

1. **Develop new funding mechanisms that enable the Department of Transportation to maintain, expand and modernize the national highway system to meet the long-term needs of freight transportation.** A significant portion of the U.S. transportation infrastructure is in substandard condition and will only get worse if an adequate model and levels for funding are not developed.

2. **DOT should target public funding toward the most important and impactful transportation projects.** Priority should be on interstate and federal highways and other transportation infrastructure supporting critical supply chains. The focus should be on reducing traffic congestion and delays as they greatly impact both speed of delivery and the reliability or predictability of delivery time, key metrics for supply chain management.

3. **Transformative technologies such as connected vehicle technologies and automated vehicles are rapidly approaching viability, and the government needs to establish a framework for accommodating these technologies.** These hold great promise for easing the driver shortage problem, increasing supply chain visibility and tracking/tracing and for facilitating unimpeded and efficient traffic flow.

4. **State and federal regulations pertaining to the environment, transportation and labor need to be harmonized or standardized.** Private sector input is greatly needed to understand the impacts of missing standards, to identify industry capabilities and best practices and to establish priorities for tackling the inconsistencies that exist.

Near term: 1-2 years Medium term: 3-5 years Long term: >5 years

5. **State and federal governments should accelerate their efforts in digitization and cybersecurity.** The digitization focus needs to shift from government-individual transactions to government-business transactions with a goal of enhancing and streamlining supply chain reporting and data collection and dissemination.

6. **The federal government should collaborate closely with business to develop strategies and tactics to protect critical supply chains, drawing upon the expertise of the private sector and sharing information that will contribute to more efficient and secure supply chains.** Increasing supply chain visibility and traceability for critical goods is paramount to ensuring the efficiency, safety, security and resilience of critical supply chains. Recent FDA efforts to increase visibility and traceability in food supply chains provide a good model to emulate.

7. **Reduce the minimum age for a Class A commercial driver's license from 21 to 18.** The FMCSA is already moving in this direction and should be supported in its efforts. The driver-supporting technologies that currently exist, and the emerging automated technologies, along with proposed driver apprentice and training programs, change the risk profile of younger drivers.

8. **Training for the skills required in the future supply chain is an area ripe for public-private partnership, as is the recruitment of employees.** Supply chain jobs are becoming more technical in nature, and this is true of jobs outside the supply chain disciplines as well. Advanced manufacturing is a sector that the U.S. should promote as we have the potential to be a global leader. Thus, there should be a high ROI for government investment in technical skill training and development.

9. **Immigration policies should be reformed to increase the employee pool for supply chain jobs.** National demographic trends and the existing labor market support a strategic reform of immigration policy to attract the skill sets required for a technology-oriented economy.

10 **Government policies should encourage research, experimentation and field testing of new technologies, processes and services.** The U.S. is one of the world leaders in innovation and technology development, but a reduction in federal R&D expenditures and lengthy regulatory approval processes put that status in jeopardy.

Near term: 1-2 years Medium term: 3-5 years Long term: >5 years

11. **The federal government should determine why manufacturers of critical products, components and ingredients do not choose to locate in the U.S. and take corrective or proactive measures to make the U.S. a more desirable location.** The quality of the supply chain infrastructure and government policies favorable to supply chain performance are not the only factors that impact where businesses choose to locate, but they are certainly among the most important. While the current concerns and focus on critical goods is obviously driven by the COVID-19 pandemic, what's good for critical supply chains will also be good for all supply chains and economic growth.

12. **The federal government should increase its financial support for urban freight logistics research, pilot programs and initiatives designed to alleviate congestion and environmental problems and improve freight delivery efficiency.** The remarkable growth of e-commerce and direct-to-consumer (and consumer pick-up) service is expected to continue. Timely and efficient delivery of freight is already a challenge in most large metropolitan areas and the negative externalities (congestion, air pollution, noise pollution) are getting worse. The federal government should play a much greater facilitative and supportive role to help the metropolitan areas.

Potential OSC Metrics

The OSC should develop a supply chain dashboard for tracking its metrics or KPIs. At the OSC level the KPIs should be at a very high level and mapped to the components and enablers for OSC's major supply chain objectives of Security, Efficiency and Resilience. A relatively small number of KPIs should be used. The departments and agencies represented within OSC will have much more granular KPIs and these may be informative for developing OSC's dashboard.

Potential KPIs might include:

Supply Chain Physical Infrastructure

- Congestion measures (cost or time):
  - For strategic, critical highway corridors and lanes
  - At and around ports of entry
  - Customs delays as percentage of total volume
  - For selected metropolitan areas
- Transportation infrastructure condition (using ASCE measures)

Supply Chain Standardization

- Standardization of key, selected regulations (environmental, transportation, etc.)
  - Proposed, In progress, Completed

Supply Chain Digitization and Cybersecurity

- Digitization rate and cybersecurity measures for selected supply chain transactions/functions

Supply Chain Labor

- Percentage of critical supply chain positions that are unfilled

Supply Chain Technology/Innovation

- Federal R&D expenditures on supply chain technologies
- Federal approval process time for selected new technologies

Critical Supply Chains (Risk Diversification Measures)

- Sourcing percentage by geopolitical location for selected critical goods
- Traceability percentage for selected critical goods
- Level of stockpiling/strategic reserves for selected critical goods

Conclusion

The recommendations outlined in this document are achievable because the concerns or challenges prompting them are widely acknowledged and irrefutable, the public and private sectors recognize the joint benefits of working together more closely, there is bipartisan support in government to strengthen the nation's supply chain and there is already momentum on some of the issues. The timing is significant as well, as the hardships and lessons learned from the pandemic are fresh in everyone's mind and there is consensus that something needs to be done. This must be the catalyst — and guide — we use to create the meaningful action that our country's supply chains, and the people that rely on them, deserve.

References

The American Transportation Research Institute, *Critical Issues in the Trucking Industry* – 2019, Prepared for the American Trucking Associations, October 2019.

The American Transportation Research Institute, *Critical Issues in the Trucking Industry* – 2020, Prepared for the American Trucking Associations, October 2020.

Arvis, et.al., *Connecting to Compete 2018 - Trade Logistics in the Global Economy: The Logistics Performance Index and Its Indicators*, The International Bank for Reconstruction and Development/The World Bank, Washington, D.C., 2018.

The Biden Plan to Rebuild U.S. Supply Chains and Ensure the U.S. Does Not Face Future Shortages of Critical Equipment (Biden-Harris website: joebiden.com/supply chains/)

Bolter, Kathleen and Jim Robey. 2020. "Strategic Reshoring: A Literature Review." Prepared for The Fund for our Economic Future (FFEF). W.E. Upjohn Institute for Employment Research.

Cybersecurity and Infrastructure Security Agency (CISA), *Advisory Memorandum on Ensuring Essential Critical Infrastructure Workers Ability to Work During the COVID-19 Response*, U.S. Department of Homeland Security, Washington, D.C., August 18, 2020.

Cybersecurity and Infrastructure Security Agency (CISA), *Building a More Resilient ICT Supply Chain: Lessons Learned During the COVID-19 Pandemic, An Analysis*, U.S. Department of Homeland Security, Washington, D.C., November 2020.

Cybersecurity and Infrastructure Security Agency (CISA), CISA INSIGHTS - Risk Management for Novel Coronavirus (COVID-19), March 18, 2020.

De Backer, K. et al. (2016), "Reshoring: Myth or Reality?", OECD Science, Technology and Industry Policy Papers, No. 27, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jm56frbm38s-en

Federal Acquisition Security Council, *Strategic Plan for Addressing and Managing Supply Chain Risks*, Office of Management and Budget, 2018.

Federal Emergency Management Administration, *Developing and Maintaining Emergency Operations Plans: Comprehensive Preparedness Guide (CPG) 101*, Version 2.0, U.S. Department of Homeland Security, Washington, D.C., 2010.

Feigenbaum, *Autonomous Vehicles: A Guide for Policymakers*, Reason Foundation, March 2018

FreightWaves FreightIntel Research, *Consumer Packaged Goods Supply Chain Report*, May 2020.

Handfield, *Planning for the Inevitable: The Role of the Federal Supply Chain in Preparing for National Emergencies*, IBM Center for The Business of Government, 2010.

Holguin-Veras, Leal, Sanchez-Diaz, Browne, and Wojtowicz, "State of the art and practice of urban freight management Part I: Infrastructure, vehicle-related, and traffic operations," *Transportation Research Part A*, 137 (2020), pp. 360-382.

Holguin-Veras, Leal, Sanchez-Diaz, Browne, and Wojtowicz, "State of the art and practice of urban freight management Part II: Financial approaches, logistics, and demand management," *Transportation Research Part A*, 137 (2020), pp. 383-410.

Holguín-Veras, J., Amaya-Leal, Wojtowicz, Jaller, González-Calderón, Sánchez-Díaz, Wang, Haake, Rhodes, Hodge, Frazier, Nick, Dack, Casinelli, Browne, *NCFRP Report 33: Improving Freight System Performance in Metropolitan Areas*, National Cooperative Freight Research Program, Transportation Research Board, Washington, D.C., pp. 1–212, 2015.

National Academies of Sciences, Engineering, and Medicine 2019. *Renewing the National Commitment to the Interstate Highway System: A Foundation for the Future*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25334

National Academies of Sciences, Engineering, and Medicine 2018. *Critical Issues in Transportation 2019*, Washington, DC: The National Academies Press.

Quintiq and eft, *Dynamic Distribution Disruption State of Retail Supply Chain Report, 2019*, January 2019.

Redwood Logistics and FreightWaves, *The New Supply Chain Imperative*, April 2020

U.S. Department of Homeland Security, *Supply Chain Resilience Guide*, Washington, D.C., April 2019.

U.S. Food and Drug Administration, *New Era of Smarter Food Safety: FDA's Blueprint for the Future*, Silver Spring, MD, 2020.

U.S. Food and Drug Administration, R*equirements for Additional Traceability Records for Certain Foods*, Federal Register – Proposed Rules, Vol. 85, No. 185, September 23, 2020.

U.S. Department of Transportation, *National Freight Strategic Plan*, Washington, D.C., 2020.

World Economic Forum (in collaboration with Bain & Company and the World Bank), *Enabling Trade: Valuing Growth Opportunities*, Geneva, Switzerland, 2013.