



Emergent Issues related to Freight Systems Impacted by the COVID-19 Pandemic

As of 1800 Hours (Eastern) on Friday, April 24, 2020

This document assesses the national freight system that connects demand and supply networks for many critical commodities in order to understand strategic risk and, potentially, offer recommendations. The Supply Chain Analysis Network (SCAN) supports the FEMA Logistics Management Directorate with analysis and subject matter expertise. The background, points-of-view, and opinions expressed by SCAN do not necessarily represent the positions or policies of the Department of Homeland Security or the Federal Emergency Management Agency.

This is the fifth Ecosystem Assessment focused on national freight systems. Previous versions were produced on March 27 and April 4, 10, and 17.

Overall Assessment: National truckload volumes ended a three-week nose-dive. Data from contract and spot markets indicate that a “bottom” in volume has been reached just as signs of increasing consumer spending emerge in spite of continued non-essential business closures. However, this new normal of lower demand continues to put pressure on freight rates and, thus, on the financial viability for many carriers that are critical for system resilience. International freight volumes remain low while equipment is positioned to avoid bottlenecks during economic recovery. Companies across the supply chain are burdened with incremental expense and employee time to contend with varying guidelines in order to safely retain their workforce. **Data across transportation modes align with economic indicators and begin to paint a picture of a new normal for the pandemic marketplace.** Continued monitoring of flows, equipment, workers, and finances will assist public and private efforts to adapt strategies and policies.

Force on Target: Transmission of COVID-19 poses a direct risk to all, including essential supply chain workers. Unprecedented shifts in shipper demand among essential and non-essential businesses have challenged freight system agility. Carriers must adapt in the midst of a novel operating environment due to public and private efforts to control virus transmission.

Geography Targeted: This document focuses on supply chains in the Contiguous United States (CONUS). It is difficult to assess risks spanning national demand and supply networks for an economic sector. Instead, this document assesses national-level risks for freight services that connect network nodes for any supply chain.

Population Targeted: The entire CONUS population of over 300 million is a potential host for COVID-19.

Demand and Supply Networks: Has the recent plummet in freight volume hit bottom? Signs point to yes. Tender volumes in the contract market remained steady after three weeks of rapid decline; and the ratio of loads and trucks posted on the spot market stabilized this week (see data below). Economic activity is showing more life as some states start to re-open economies and the first tranche of stimulus checks kicks in. [Consumer transaction data from Factus indicates an upward trend in spending this past week to reach 2019 levels \(though timing of the Easter holiday may be a factor in YoY comparisons\).](#) Spending was buoyed by sharp increases in spending for home supply warehouses (63% higher YoY), discount stores (62%), and wholesale clubs (35%) to complement continued higher grocery demand (15%) this year. Protein supply concerns spread as Smithfield Foods closed 3 plants nationally, one of which accounts for 4-5% of the country’s pork production. Pork processing plant closures align with declines in recent freight volumes from these regions (see data below). Outbound tender volumes from Los Angeles rebounded from their bottom in response to an uptick in port volume but remain more than 30% below volumes this time last year. Rail container volumes nationally have also reversed a downward trend (see data below). **Stabilizing freight volumes across modes align with a [slight upward revision in the Weekly Economic Index](#) to mark the end of sharp declines in activity across demand and supply networks.**

Operating Environment: Headlines have drawn attention to [food processing plant closures](#) revealing workplace risks. As the number of sick workers increases so do [walkouts](#). Absenteeism is rising due to the combination of risk aversion, childcare needs, and increased illness among workers and/or their family members. As a result,

hiring numbers for essential businesses remain high and companies are offering “hazard pay” to incentivize workers. FEMA recently released [guidance](#) that summarizes strategies for organizations to manage and procure personal protective equipment (PPE) for workers, and procured masks that will be [delivered to drivers](#) at rest stops across six different states. Still, companies report issues with buying PPE due to limited supply, extremely high prices, and risk of counterfeits. **High PPE and cleaning costs combined with hazard pay are financial burdens for essential businesses operating at this time.** In addition, there are liability concerns with COVID positive employees, as companies are left to their own devices to formalize guidance spanning [different state guidelines](#). For example, drivers are given certificates with proof of temperature and warehouses workers adopt staggered shifts and picking strategies to accommodate social distancing. With no central directive, state and local officials define various workplace safety guidelines on different schedules. **In addition to higher financial burdens, individual companies must continually update cohesive plans spanning the jurisdictions in which they operate and invest time to ensure employee safety in a fragmented workspace.**

Freight Systems: As freight volumes stabilize at lower levels than last year, spot market rates continue to decline. Carriers are adjusting their networks to a new normal and allocating capacity to cover their contracts. Less than 4% of contracted loads are being rejected, starving spot markets of freight and prompting further rate decline. **Even if spot rates stabilize soon, they may do so at levels too low to support profitability.** Failure of small trucking companies with limited reserves and uncertain access to credit or financial aid [continues to be likely](#), which would reduce trucking diversity and system resilience. The [Less-Than-Truckload \(LTL\) market continues to face layoffs and salary cuts, though service remains good](#), with published transit days largely being met and carriers remaining disciplined on contractual pricing. Urgency and low fuel prices are responsible for maintaining competitive trucking rates compared to rail, contributing to rail volume declines of more than 20% compared with last year. International freight flows remain low and equipment is being positioned in novel ways to avoid bottlenecks and prepare for economic recovery. [CMA CGM is the latest carrier to offer a "Delay in Transit" option, allowing customers to temporarily store containers in one of nine transshipment hubs](#) until the recipient is ready for their shipments to arrive at the final destination shown on the bill of lading. Maersk Line offers storage at origin ports in Asia, where goods can be quickly loaded once demand returns. [Seafaring capacity may soon be constrained as crew changes become impossible in many places](#) due to restricted air-travel or port rules. **Freight systems continue to adapt to novel market and operating conditions though perhaps in ways that strain financial viability.**

The assessment continues with further exploration of data regarding freight movement based on indices and an array of industry data feeds.

Several large pork processing plants (in [South Dakota](#), [Minnesota](#), [Illinois](#), [Kansas](#), and [Iowa](#)) have closed due to COVID-19 outbreaks among workers. Significant pork production takes place in this region (see Figure 1). These closures resulted in a reduction of [10%](#) of the U.S. hog slaughtering capacity. Figure 2 shows how transportation tenders have dropped in this region compared to two weeks ago (darker red markets have less volume).

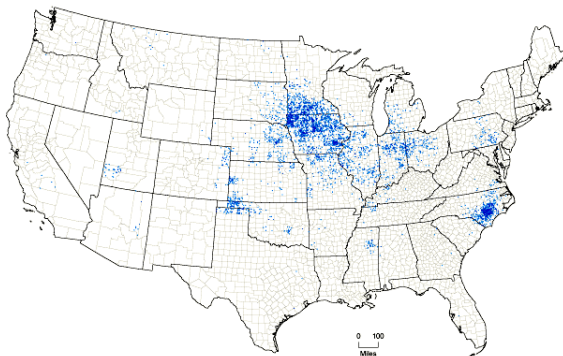


Figure 1: Hogs and Pigs Inventory; Source: 2017 U.S. Census of Agriculture

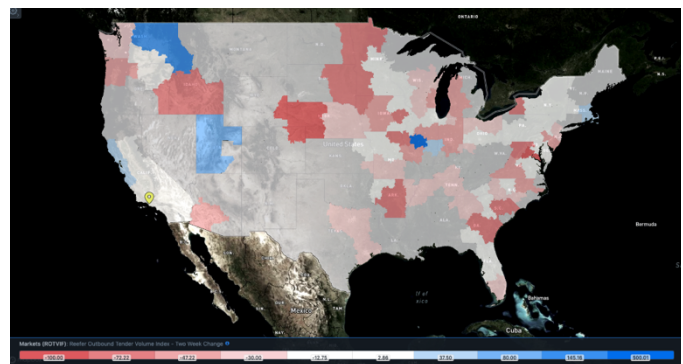


Figure 2: Two Week Change in Outbound Reefer Tender Volume Index; Source FreightWaves SONAR

Even as specific markets see declines, data indicate that national freight volumes may have hit bottom or at least found a new floor. The sharp decline in contract tender volumes stabilized at levels above the holiday troughs in late 2019 (see Figure 3, which shows national volumes for the most recent six months [black line] compared with the same period a year earlier [green line]). In New York, truck activity started a [positive uptick](#) during the week of April 12.

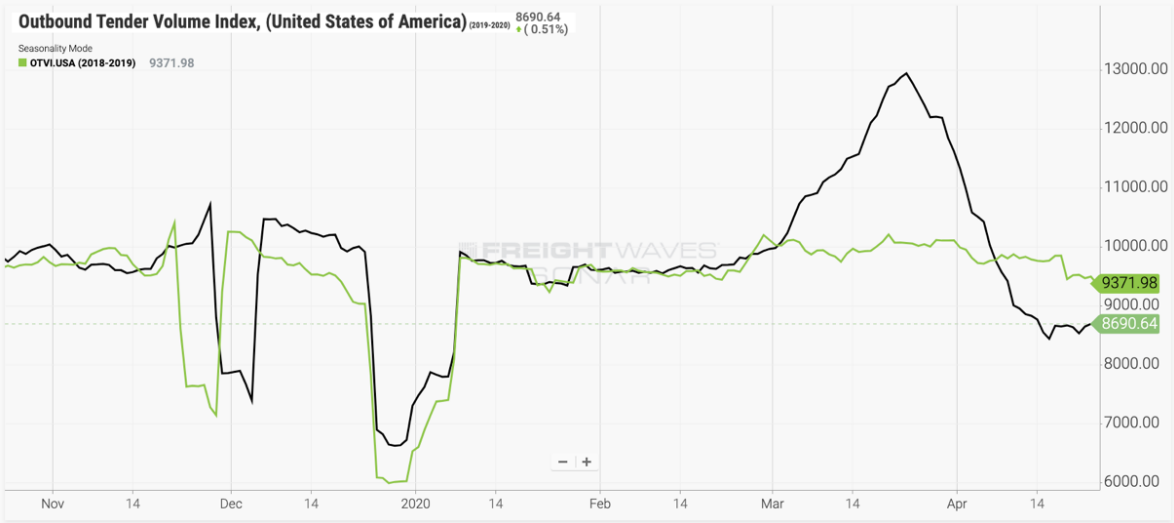


Figure 3: Outbound Tender Volume Index; Source FreightWaves SONAR

The TVI, shown in Figure 2 and 3 above, was established on March 1, 2018 and reflects shipper requests for contracted fleets, whereas data below represents the spot market. The ratio of loads and trucks posted on spot market load boards has halted its slide as well. Truckstop.com’s Market Demand Index (see Figure 4) shows stabilization across equipment type.

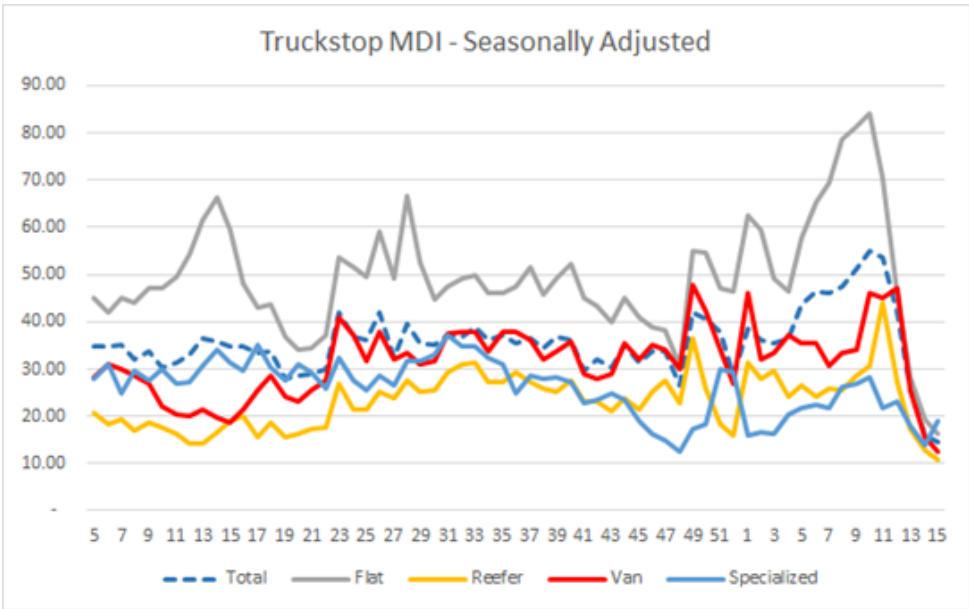


Figure 4: Truckstop.com Market Demand Index; Source Truckstop.com

DAT's Dry Van Load-to-Truck ratio turned up this past week (see Figure 5) and the Reefer Load-to-Truck ratio moderated its slide (see Figure 6) but continued to fall, perhaps reflecting reduced meat processing capacity.

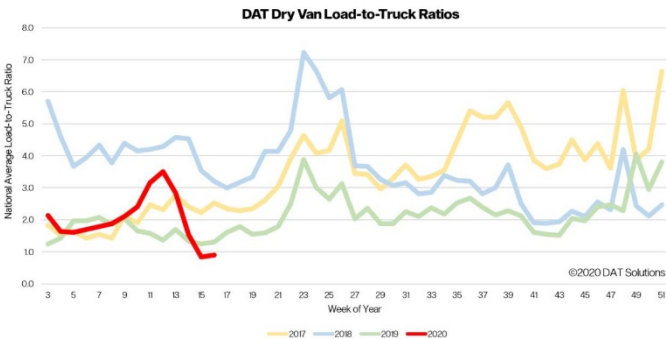


Figure 5: DAT Dry Van Load-to-Truck Ratio; Source DAT Solutions

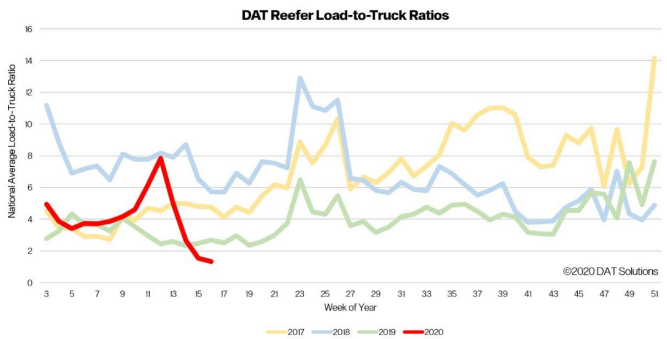


Figure 6: DAT Reefer Load-to-Truck Ratio; Source DAT Solutions

With national freight volumes having stabilized at lower levels than last year, carriers have stopped rejecting contracted loads. This has kept freight off of the spot market (as seen in the three previous figures). Spot market rates have continued to fall as a result (see Figure 7). Even if rates stabilize soon, they may do so below levels capable of supporting carriers with cash flow issues.

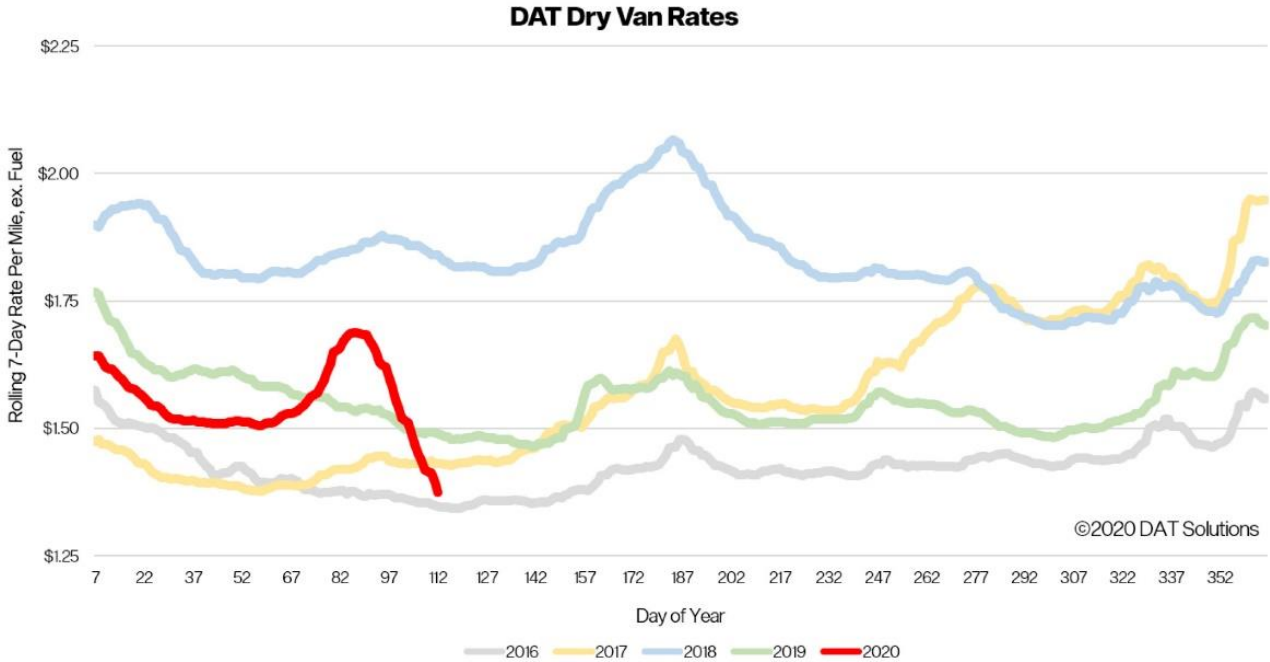


Figure 7: DAT Dry Van Spot Market Rates; Source DAT Solutions

Turning to international flows, U.S. Customs and Border Protection (USCBP) reports on domestic maritime import volume by counting the bill of lading (a documented financial transaction between shipper and buyer) for containerized and bulk shipments. The data is reported four to five days after clearing customs. Current shipments into the U.S. from China are down over 22% from the prior year.

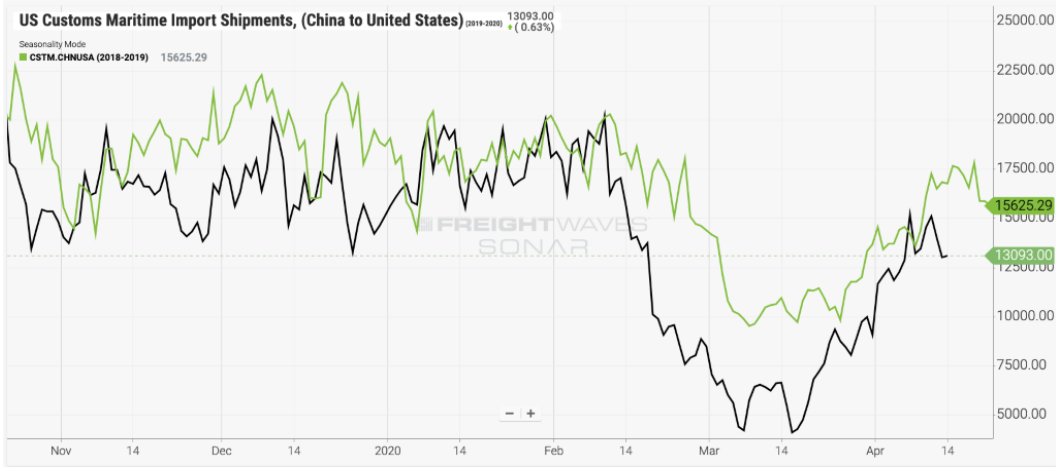


Figure 8: USCBP Maritime Import Shipments from China to U.S.; Source: FreightWaves SONAR

Demand dropped amidst reports of retailers canceling orders and intercepting and storing shipments in Asia. Container terminals are feeling the impact of falling demand. Volumes in Los Angeles and Long Beach are down sharply, while Oakland received nearly a quarter fewer containership calls in March than it would in a normal year. [Port of Virginia](#), [Port of Baltimore](#), and [Port of Miami](#) have all had temporary closures due to low volume.

In response to low demand, container vessel operators have [blanked sailings](#), which occurs when a carrier cancels a scheduled sailing or skips ports. Container vessel operators in recent weeks have canceled hundreds of sailings affecting schedules into June and have idled [13% of their capacity](#).

The Freightos Baltic Index highlights the impact of these reduced sailings. This index measures the average daily price per 40-foot containers across major maritime lanes. Typically, as demand drops and creates excess capacity in the market, the cost to move containers will decline. As carriers have reduced capacity through blank sailings, the price to move freight has been supported (See Figure 9).

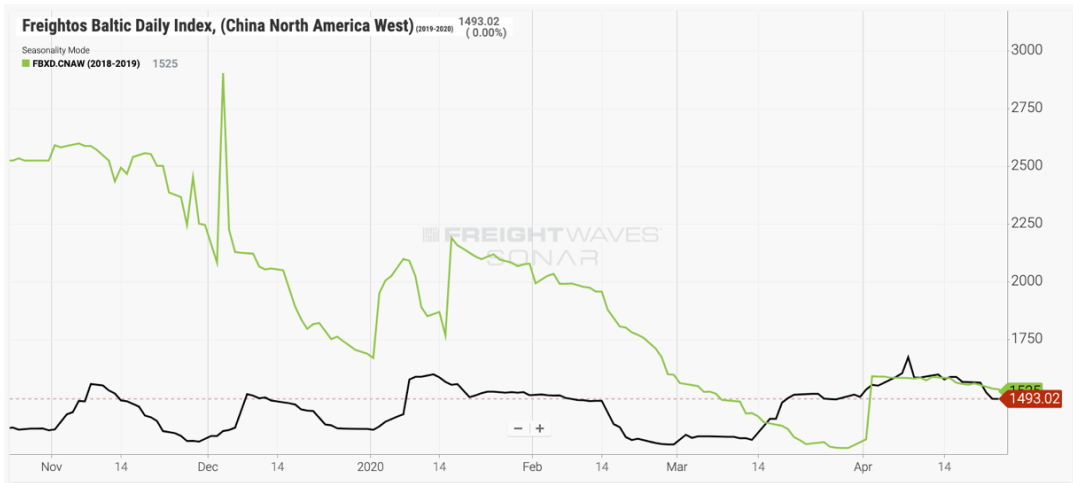


Figure 9: Freightos Baltic Daily Index (China to the West Coast); Source FreightWaves

Despite a recent uptick in national rail container volume, lower volumes at ports has contributed to a [23.3% YoY decline](#) in US rail traffic. Looking at the volume of international containers, the loss of import volume, as reported by the [Association of American Railroads](#), becomes clear in Figure 10. As intermodal is the largest single source of U.S. freight rail revenue, this demonstrates the headwinds that rail will experience as part of COVID-19.

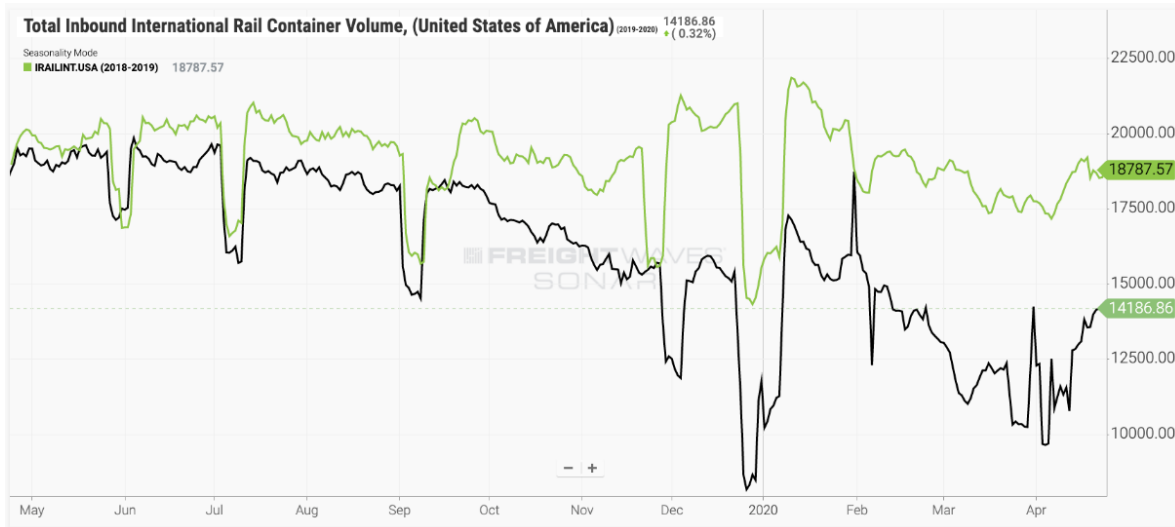


Figure 10: Inbound International Rail Container Volume; Source FreightWaves SONAR

SCAN is intended to answer two questions:

1. Are key demand and supply networks failing?
2. If so, when, where, why, and with whom can FEMA engage to be most effective in reversing failure?

Data continue to indicate that **demand and supply networks are not failing** while further revealing that **flows have reached a new “bottom” following weeks of decline**. Across transportation modes carriers are adapting to a new normal for pandemic economic activity. We also begin to see how freight data offer a more complete picture to complement economic indicators and publicized anecdotes. Analysis indicates some signs of preparation for economic recovery, such as positioning freight at transshipment hubs, and some signs of risk, such as vulnerable carriers facing negative margins as rates decline. Continued monitoring of flows, equipment, workers, and finances will assist public and private efforts to adapt strategies and policies. **In addition to the complexity of adapting to volatile markets, companies across the supply chain carry the additional burden of incremental expense and employee time to contend with varying guidelines in order to safely retain their workforce**. Public sector efforts to increase the ease of safely doing business will directly contribute to supply chain resilience as society awaits a vaccine to address the COVID-19 threat.