



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

As of 1600 Hours (Eastern) on Friday, May 22, 2020

This is the ninth Ecosystem Assessment focused on national freight systems. This document assesses the national freight systems that connect demand and supply networks for many critical commodities and incorporates a local snapshot with a national lens to understand strategic risk and, potentially, offer recommendations.

**Consensus Assessment:** Freight systems are complex and their transactional markets react to many different factors. **The COVID-19 pandemic has introduced numerous disruptions and market shifts that have tested the system's ability to adapt.** Following massive oscillations in volumes and rates, truckload contract and spot markets have stabilized somewhat recently. **If demand and supply networks remain reasonably stable, the trucking industry – which has low barriers to entry and has adapted quickly thus far - should be able to keep up with demand despite capacity loss; other freight systems such as ocean shipping may be slower to react but have also adapted well.** However, supply and demand network stability is far from certain. Retailers adapting to shifts from brick-and-mortar to e-commerce will continue to force adaptation to accommodate more short-haul delivery. Manufacturing and material handling capacity may continue at reduced levels due to safety measures. Companies across the supply chain will continue to navigate risky operating environments that dynamically depend on strategies for shutdowns and social distancing measures and [further waves of cases](#). **Freight systems have adapted but have also been strained and fatigued.** Supply chains are more vulnerable than normal to additional shocks, such as natural disasters. **Monitoring the status of dynamic freight systems using indicators such as economic demand, volume levels across modes, truck rates and capacity, and inventories, may be critical in preparing to adapt to further shocks.**

**Force on Target:** Transmission of COVID-19 poses a direct risk to all, including essential supply chain workers and soon to be non-essential workers as states lift restrictions. Unprecedented shifts in shipper demand among essential and non-essential businesses will continue to challenge freight system agility.

**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 discrete sectors within a complex adaptive system that preserves its integrity. 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.

*The assessment begins with a synthesis of “sentinel indicators” regarding freight movement. Sentinels are individuals with experience and insight regarding flow, operating context, and system performance.*

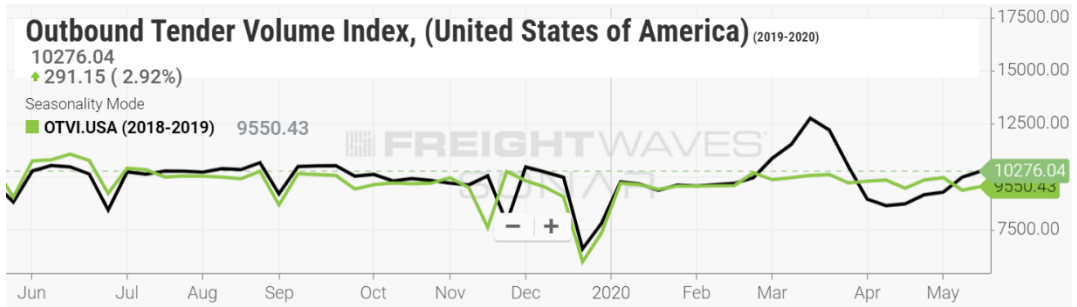
**Demand and Supply Networks: Economic demand indicators continue to trend downward, despite all 50 states beginning to reopen.** The [Weekly Economic Index](#), which was 1.6 in February, decreased this past week from -10.4 to -11.7. [Housing starts](#) fell 30% in April, which may have a continued impact on construction-related freight volume. The U.S. [Manufacturing PMI](#) went up in May to 39.8 from 36.1 in April. **However, due to the auto industry's dependency on part suppliers, it may take [many months before production](#) levels are back up to pre-COVID levels.** [U.S. Transportation and Warehousing Q1 revenue](#) is down 3.7% compared to Q1 2019, and [truck orders](#), which were down in 2019, are expected to continue to fall by an average of 5% in 2020. [Grocery spending](#) has slowed and is up 23% YoY compared to last week (up 49% YoY). This may help the U.S. meat supply catch up, [which is still down](#) and could take months to recover. Even though retail sales are up 23% since the last month, [apparel prices have dropped by 12% in April \(similar to Black Friday levels\)](#). [Up to a third of global fashion players, such as brands and department stores, are not expected to survive the crisis.](#) Overall trucking volumes have stabilized around last year's levels. The FreightWaves Outbound Tender Volume Index (see data below) increased 4.3% since last week and is up 5.8% from last year. May 2019 was a softer year and pre-COVID forecasts

put volume levels higher than last year, especially leading up to a holiday weekend. [Spot market volume](#) has jumped 27% since last week, sitting at 82% of last year's volume. Flatbed volume saw the strongest growth this past week, up 35%, but is still 30% lower YoY. This is notable since flatbed trucks are used in construction and manufacturing industries.

**Operating Environment: Non-essential businesses are starting back up, but [production will not be at the same speed](#) as before due to altered processes, [sick employees](#), and [supplier dependencies](#).** Some meat processing plants will be operating at a reduced capacity (70 - 95% of pre-COVID capacity) for as long as the virus is prevalent. The Department of Justice published a statement that it would not interfere with the [National Pork Producers Council and USDA](#) to work together to address challenges pork farmers are facing. The CDC released a [60-page document](#) on Tuesday that further outlines and details how businesses, schools, and local jurisdictions can safely reopen. This comes [after all 50 states have relaxed restrictions](#). **Even e-commerce giants, like [Amazon](#), are still struggling with safety amidst the pandemic despite attempts to stay ahead of the curve.** [Automation](#) continues to be a relevant topic as [more companies increase or speed up investments](#) and partnerships are announced. For example, new robotics will help grocery store workers clean stores and process orders. **A [new FMCSA ruling](#), which goes into effect in September, will give both short- and long-haul drivers more flexibility in how they manage their hours.** Some argue that this will put [pricing power into shippers' hands](#). [Unemployment](#) continues to climb as another 2.43 million workers filed for unemployment this week. **This number will continue to worsen if [more small businesses](#) are forced to close.**

**Freight Systems: [Exports from Asia](#) to Europe and North America have fallen by 15 - 20%, leaving 2.5 to 3 million twenty-foot-equivalents (TEU) of capacity idle and has put further strain on rising [equipment imbalances](#). **Blank sailings have put a capacity squeeze on shipments from China to the U.S., as [vessels are currently overbooked for the next couple of weeks](#). [European ports](#) have been hit the hardest so far and need [financial support](#). [China to Europe volume has started to shift](#) from ocean to rail, which increased by 47% since last year. A [pattern of reduced U.S. imports from China](#), intensified by trade conflicts, seems to be accelerating due to COVID, and Vietnam has captured the highest share of this business. Fixed lease payments may help [ports survive the crisis](#), but could put more strain on terminals, carriers and operators. **Trucking spot market rates have continued to improve, mostly due to [produce season](#), which has positively impacted reefer rates in California and Florida.** A survey by the American Transportation Research Institute (ATRI) and Owner-Operator Independent Drivers (OOIDA) showed [short-haul activity increased](#) in March and April. The highest-volume trucking lanes in the U.S. are already shorter than 100 miles. **This [shift](#) - partially attributed to [increases in e-commerce](#) - demonstrates the impact that the pandemic has had on trucking markets and the mix of freight.** For example, some [retailers are turning stores into distribution centers](#) or considering [moving manufacturing closer to home](#). **These shifts have put strain on delivery service providers, like FedEx, who recently put a cap on the number of items retailers are allowed to ship from certain locations.** [Comcar](#), which had 4500 employees and 4000 trucks, filed for Chapter 11 bankruptcy. The company will sell-off its five subsidiaries to other buyers, **which is important to note as this capacity will not be lost.** Additionally, even though [Uber laid off](#) 3,000 more employees, [Uber Freight](#) is [staying the course](#) and feels well positioned to combat future supply chain disruptions. **Small businesses are [returning Paycheck Protection Program \(PPP\) loans due to fear of being penalized for how the loans are used](#).** Additionally, as these [funds run out](#), more carriers may be forced to park their trucks. Sixty-five to seventy-five percent of the Truckload Carriers Association (TCA) Profitability Program (TPP) members have received funds under the PPP. **Ten to fifteen percent of its members are choosing to park trucks** and most have a small percentage of spot market exposure, which is expected to have increased due to COVID-19 and its impact on contract lane volume. Owner-Operators, a group with the most exposure, are asking for more visibility and [transparency on rates](#) from brokers.****

The assessment continues with “data indicators” regarding freight movement based on indices that draw on an array of industry data feeds and aggregate data provided by individual companies.



The Tender Volume Index (TVI) was established on March 1, 2018, at a national level of 10,000. The national index reflects overall tender growth (e.g.

Figure 1: Outbound Tender Volume Index; Source FreightWaves SONAR

12,000 would indicate 20% growth). Tender volumes indicate shipper needs and are tracked by inbound and outbound movements for each freight market. Figure 1 shows U.S. tender volumes for the most recent 12 months (black line), and last year’s tender volumes (green line). At its peak in March, with COVID-related panic buying, U.S. tender volumes had surged 30% from mid-February and were the highest in three years. This was followed by a sharp drop in the latter half of March, until freight volume found its bottom in April. Currently, the TVI for the U.S. is slightly higher than it was this time last year, as volume has stabilized for the time being.

The spot market load-to-truck ratio and rates have also been steadily increasing for the past month. Figure 2 displays that reefer rates, which were impacted the least, rebounded the fastest and are back at 2019 levels due to produce season. Dry van rates have been slower to come up due to non-essential business closures but continue to approach 2019 levels.

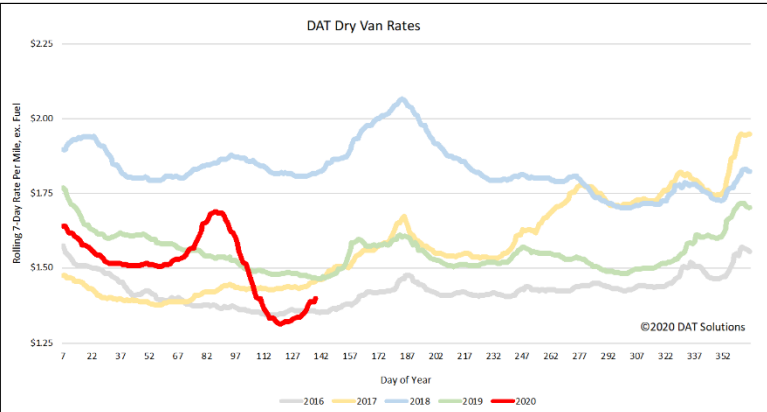
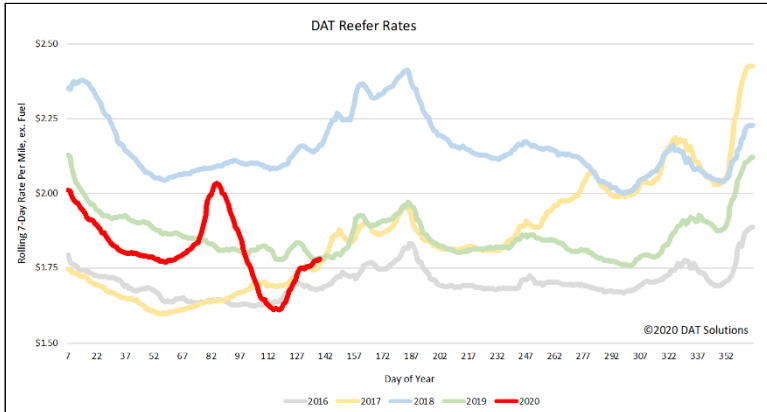


Figure 2: Reefer Spot Market Rates; Source DAT [(c) DAT Solutions, LLC.]

Figure 3: Dry Van Spot Market Rates; Source DAT [(c) DAT Solutions, LLC.]

Figure 4 shows DAT’s Reefer [Market Condition Index](#) (MCI) by region for May 19. The Reefer MCI has been steadily improving and has had consistently ‘hotter’ markets than the Dry Van MCI. The MCI considers several factors, including: Load-to-truck ratio, historical trends, load searches, truck searches, and overposting detection. ‘Hot or Tight Markets’ (red) indicates that trucks are in demand and rates are higher. ‘Cool or Loose Markets’ (blue) indicates lower demand and rates.

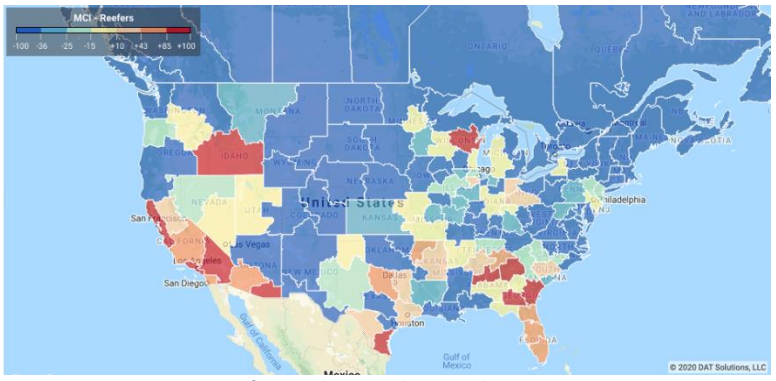


Figure 4: Reefer Market Condition Index, May 19, 2020  
Source DAT [(c) DAT Solutions, LLC.]

Figures 5 and 6 show DAT's Dry Van MCI on April 14 and May 19 respectively to highlight the notable improvements the dry van spot market has experienced since volumes and rates reached their bottom in April.

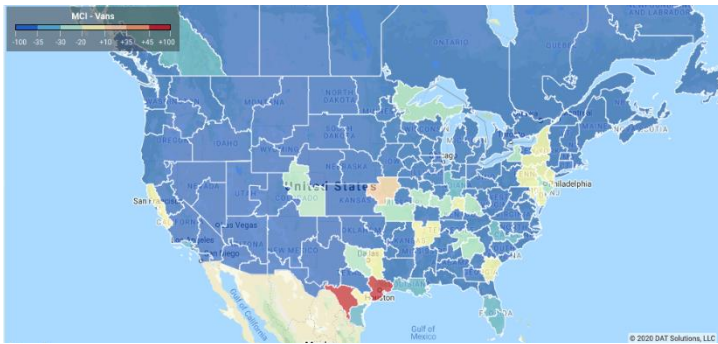


Figure 5: Dry Van Market Condition Index, April 14, 2020  
Source DAT [(c) DAT Solutions, LLC.]

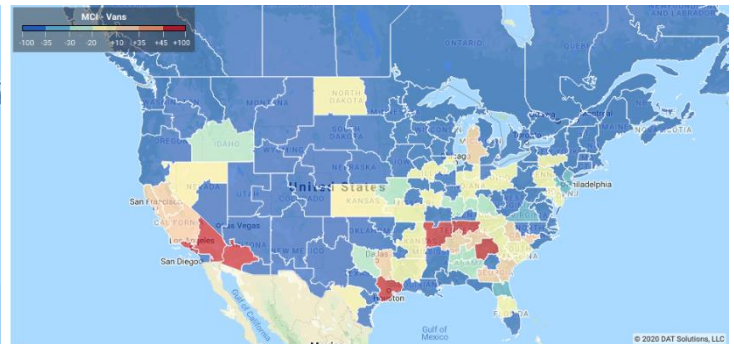


Figure 6: Dry Van Market Condition Index, May 19, 2020  
Source DAT [(c) DAT Solutions, LLC.]

Supply chain and freight systems adaptability has been seen throughout the response to the pandemic brought on by COVID-19. A recent [survey](#) of shipping and freight professionals sought to quantify this resilience and discovered that only 8% (24/300) of respondents had to shut down operations completely due to COVID-19, despite the fact that 34.7% were not prepared at all for the pandemic. Almost half of the respondents reported zero to a few problems experienced while adapting their supply chains.

The assessment continues with a **“local snapshot”** regarding how nationally trending characteristics of demand and supply networks are being experienced in a particular locality.

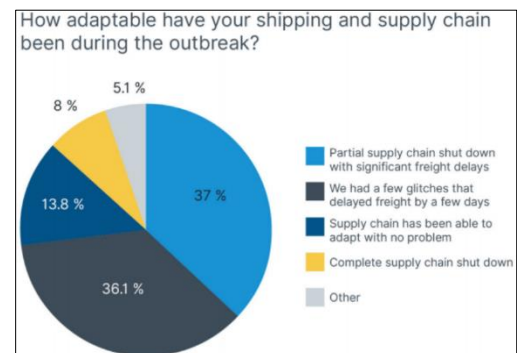
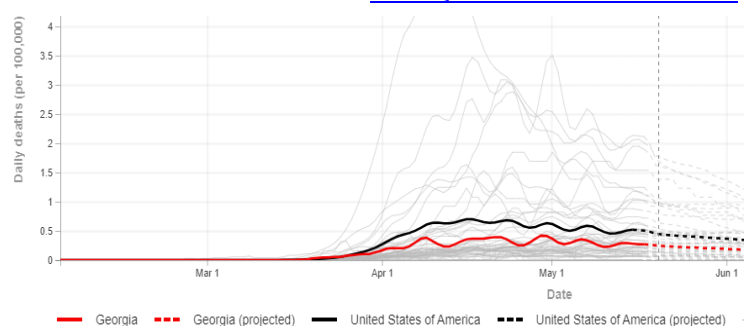


Figure 8: Shipping and Supply Chain Adaptability during COVID-19; Source Ocean Insights

Georgia lifted its Stay-At-Home order on May 1. It was replaced by an [Executive Order \(updated\)](#) intended to “revive a healthy Georgia.” The state continues under a healthcare state of emergency. The most recent [30-page executive order](#) includes and defines, “all residents and visitors of Georgia shall practice Social Distancing...” and restricts “Gathering” to ten or fewer persons, among several other restrictions on population behavior designed to slow and contain transmission of the virus. According to the [Georgia Department of Public Health](#), the seven-day moving average of new confirmed cases has consistently fallen from an April 22 peak of 767.85. On May 21 the moving average was under 514.

The [population of Georgia](#) is more than 10.6 million. The [Atlanta Metropolitan Statistical Area](#) has a population of more than 5.9 million. Despite the early “reopening” of Georgia, population behavior continues to diverge from pre-pandemic patterns. According to the most recent [Google Mobility Report](#), visits to workplaces in Georgia are 40 percent below the pre-pandemic baseline and visits to retail and recreational venues are 16 percent lower. In urban Fulton County (Atlanta) workplace visits are 55 percent lower and retail/recreational visits have declined 34 percent. Given these behavioral shifts, it is not surprising that [April sales tax revenue](#) was hit hard. Receipts from the state’s Net Sales and Use Tax, for example, declined 14.3 percent. In Georgia, as in most of the United States, [grocery purchases](#) continue to show Year-Over-Year growth of roughly 15 to 20 percent. (Sales taxes are not collected on groceries in Georgia.) But there is evidence that while consumers are buying more groceries,

Figure 9: Georgia confirmed covid deaths per 100,000 persons  
Source [Institute for Health Metrics and Evaluation](#)



they are shopping at stores less often. Google Mobility shows a 13 percent decline in visits to Fulton County grocery stores and pharmacies (2 percent decline for Georgia overall).

On May 1 Georgia's government reversed many of the most rigorous Non-Pharmaceutical Interventions (NPIs) that had "shutdown" the state's recovery. But many [businesses and consumers have continued in "slowdown" mode](#). [According to Bloomberg](#), the continued decline in confirmed cases, "may have resulted from many of the state's restaurants and other businesses staying closed even after they were allowed to reopen, as well as residents practicing social distancing and wearing masks, said Robert Bednarczyk, an epidemiologist at the Rollins School of Public Health at Emory University in Atlanta." ([more](#) and [more](#)) Since mid-March approximately [1.6 million Georgians have applied for unemployment insurance](#) benefits, further reducing workplace travel and retail demand ([more](#)). On May 21 the Mayor of Atlanta outlined [plans for reopening the city's economy](#).

As seen across the [United States](#) and in [other locations](#) around the world, [demand has been seriously disrupted by NPIs](#). But where sufficient capacity preexisted, U.S. supply chains have effectively adapted to these dramatic shifts. Despite all the economic shocks and continued volatility, during May the Atlanta freight market has mostly tracked with 2019 outbound tender volumes and currently shows slightly higher volumes. Inbound tender volumes have generally been within seven percent Year-Over-Year. By most counts, Atlanta is now the top freight market in the United States and [since mid-April has experienced close to "normal" volumes](#), even as rates remain depressed reflecting very "loose" capacity ([more](#)).

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 but continue to be depressed despite the fact that all states have begun to reopen and ease restrictions**. Within the nation's "new normal", supply chains and freight systems will continue to experience disruption and volatility. **Freight systems have demonstrated impressive adaptability even while strained and fatigued. In the case of a sudden onset crisis, the fragility emerging from the dramatic shifts of the last two months should not be underestimated.** The longer demand is suppressed and linked to the virus, the more likely supply will dry up in response. **The speed at which low consumer spending is reversed remains the most significant open question.** How this question is answered will have a cascading effect on the freight market and its road to recovery. **Carefully monitoring economic and freight behaviors prepares FEMA to recognize when and how a systemic crisis is emerging in demand and supply networks and/or how these networks are prepared (or not) to respond to a sudden onset extreme event.**