

## WHITE PAPER: SPIREON - SMART TRAILER TECHNOLOGY

# Avoid the Dreaded Capacity Crunch

The US economy is in one of its longest running expansions in recent memory. We've heard it time and again: we are prospering at a record rate with near full employment and freight trucks accounting for 70.9 percent of the nation's freight by tonnage shipped. All is bright and rosy, right?

The trickle-down effect on the freight industry, however, is a very real problem with widespread ramifications.

"For all intents and purposes, LTL carrier networks are completely saturated and operating at full capacity," according to Mike Regan, chief relationship officer at TranzAct Technologies.

The industry just can't keep up. It's the dreaded capacity crunch.

"When there is a sudden spike in demand or a sudden change requiring extra trucks, [LTL carrier networks] simply don't have the capacity to provide those trucks to shippers," Regan goes on.

The Fed reported industrial production in August 2018 was up 4.9 percent year-over-year, which indicates a significant rise in materials flooding into freight networks nationwide.

This economic prosperity and the resulting volume has put a strain on the market and caught us all in the freight industry off guard. What's worse, we are all essentially waiting in anticipation for the gravy train to head back to the station.

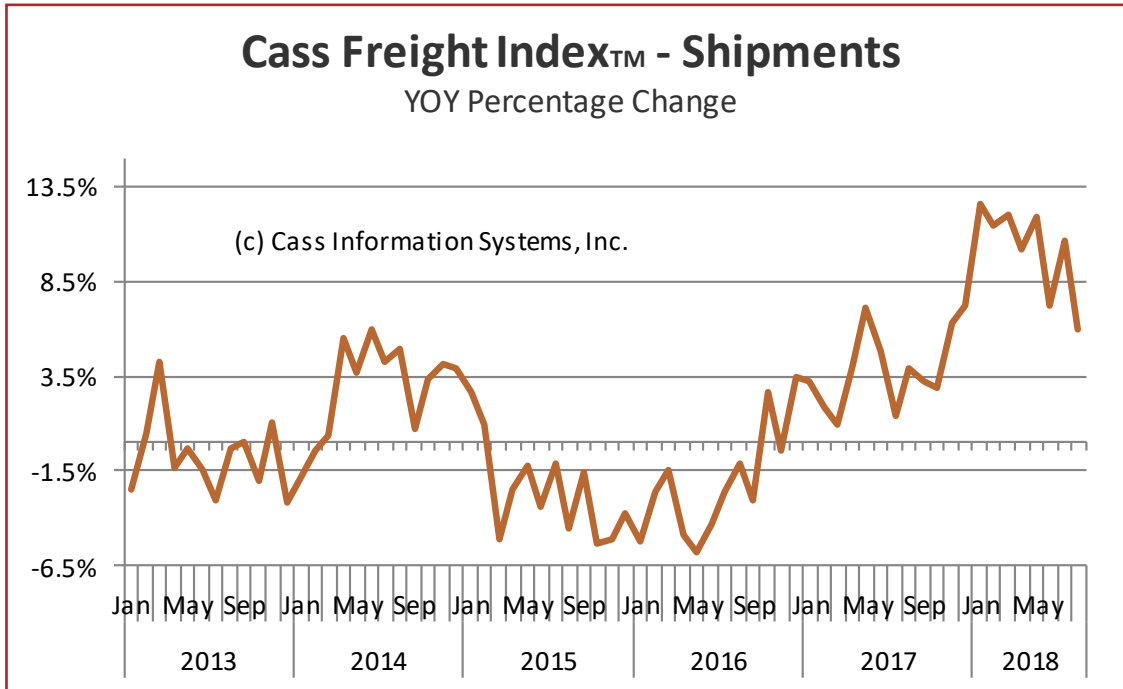
In years past, we could reasonably rely on the cyclical ebbs and flows of supply and demand in transportation to temper conditions. In the years since the Great Recession of the late 2000s, a January lull was typical, with a gradual ramp-up throughout the year that would slow back down come January. However, in the last year-and-a-half, that cycle has been broken. The industry hasn't had any time to catch its breath. Instead of tailing off at the appropriate time, the economy has shot up.

"There's a race for people to start grabbing capacity," says Zach Strickland, market analyst at FreightWaves. "However, they are a little hesitant to do so knowing the potential for things to eventually contract. Still, the trend right now has stayed rapid and up-and-to-the-right."



## PUMP UP THE VOLUME

Shipment volumes continue to expand very rapidly. The “Cass Freight Index” from August of 2018 shows just how great a turnaround the market has seen. Recovery started in the second half of 2016 and has outpaced all other growth spurts since the initial rebound from the Great Recession in 2009.



Per Cass Information Systems: “The current level of volume and pricing growth is signaling that the U.S. economy is growing, but that level of growth may have reached its near-term expansion limit,” ... “[M]any modes are reporting limited amounts of capacity or even no capacity at any price shippers are willing to pay.”

As if the economic climate weren’t enough to contend with, regulations such as the electronic logging device (ELD) mandate, have had a massive impact on drivers and carriers. With the driver shortage continuing to hemorrhage, obstacles such as ELD compliance just add to the strain.

“Volume is as high as it has been in 10 years,” says Strickland. “Rapid expansion is like attaching a garden hose to a fire hydrant. Nobody expected this level of shipment volume coming through this system. Capacity is extremely fragile right now.”

Of course when volume flies off the charts, shipping and freight rates follow. Carriers tend to lack the precision to gauge where their capacity is and if they are about to bump into it. By mid 2017, capacity had evaporated. Carriers had to scramble to cover additional costs to build out greater infrastructure to handle the surge in volume, not to mention the associated costs of ELD

implementation. Bottom line, carriers have had to increase rates quite a bit just to fund expansion.

When volume surges, it spills over from the contract market to the spot market. With this phenomenon occurring across the country, there are not enough resources available to shift to specific markets of need. In the end, shippers are not prepared to pay the resulting prices all at once.

“Shippers had a rude awakening in the last year, year-and-a-half,” states Strickland.

### **INEFFICIENCIES ABOUND**

Recent FreightWaves studies have revealed great inefficiencies at docks. Shippers are often caught up managing the dock itself rather than identifying low-performing areas. No doubt, when not operating at capacity or near-capacity in prior years, there was less incentive to shore up any leaks. Now that the garden hose is attached to the fire hydrant, shippers are scrambling to figure out how to tighten up operations to run at maximum efficiency.

Detention is the single worst problem for carriers grappling with capacity issues. Truckload and less than truckload (LTL) carriers alike need to know when their trucks are going to be available, especially when attempting to plan out their next week or two. When detention periods become extended, drivers don’t make it to their next loads, have to be pulled off, and a carrier’s entire load plan is jeopardized. This scenario also negatively impacts shipper relations.

There is a corrosive effect on a freight network too. Rates become more volatile. Carriers must find stability to accurately measure and predict the future. Any unexpected delay will wreak havoc across the board.



## **THE LTL CHALLENGE**

Despite LTL carriers being a release valve for the constrained, under-contract truckload network, they may experience the woes of the capacity crunch most of all.

“LTL providers are typically one of the last to know when capacity is gone,” observes Strickland. “Their dispatches are there to pick up the load, so they don’t have full visibility of what those pallets are doing on their journey to the destination. They don’t turn down the freight like truckload carriers can; they do not have that same luxury.”

Managing space on those trailers is an extensive challenge. When they experience a large surge in volume through their channels, LTL carriers need to plan where that volume will move through their network.

“When you have 10,000 pounds or a quarter truckload or a half truckload coming through a network that’s designed to handle a certain amount of volume, that quarter to half a truckload can really throw off your entire network and your load plan for the next couple of weeks,” Strickland continues.

Margins are so thin for these carriers, they don’t have a margin for error. If there are two open pallet spaces sitting on a truck, they will lose money on that load. These conditions make it extremely challenging in LTL right now.

## **THE SMART TRAILER MOVEMENT**

With all of these variables flying about, utilization becomes one of the only factors carriers can control and improve. It behooves them to improve utilization in any way manageable or else face loss of profit. Born of this necessity is the smart trailer movement: extremely reliable load detection systems that can alert a carrier as load status changes in real time. Smart trailer technology has pushed beyond the inherent boundaries of traditional ultrasonic cargo sensors.

“There are real limitations in ultrasonic cargo sensing technology,” says Reza Hemmati, senior director of product management at Spireon. “Ultrasonic cargo sensors are heavily impacted by conditions inside a trailer, such as temperature and humidity, cargo types, and the distance between the sensor and cargo.”

Indeed, soft materials such as foam or cotton can distort the accuracy of readings by absorbing sonic waves. Material placed directly up against an ultrasonic sensor could block the sonic waves, potentially leading to a false “unloaded” statuses.

To solve the problem, Spireon has developed new smart trailer technology that combines multiple sensors with sophisticated processing power and packaged it in a single device. Cargo overload detection is accomplished in real time using lasers for time-of-flight measurements, eliminating cargo-type and proximity problems. Laser technology is also found in cars as pre-crash sensors, meaning it is highly reliable.



Lasers alone, however, come with a range limitation, so Spireon also incorporates a camera in its device. By combining optical imaging with time-of-flight data — a first in one sensor — with advanced algorithms to accurately detect cargo load, this technology can accurately capture the space inside an entire 53-foot trailer regardless of environmental conditions or varying cargo types.

If a laser beam hits a soft target, it would still bounce back and still give an accurate time-of-flight measurement. Image detection algorithms with a camera have no reliance or dependence on cargo type. And using infrared, this solution even works in conditions with essentially zero light. Combining all of the resulting data with computation power and analytics virtually removes all legacy hurdles.

“Carriers always look at how close they can get to 100 percent accuracy inside the trailer,” Hemmati continues. “We believe that with our IntelliScan technology and our unique approach to cargo detection, we are able to get closer to this target than any other existing solution.”

Combined with existing tools, smart trailer technology can help carriers make quick, accurate business decisions. Real-time alerts triggered by highly accurate data can lead to optimizations in daily operations, increased turns, and maximized driver hours of service and detention fees.

Spireon has also managed to incorporate machine learning intelligence into its offering. The sensor is a powerful computer in itself that works hand-in-hand with the company’s data platform on the backend to learn and adapt to different trailer types and environments and further improve performance and accuracy over time. Combined with over-the-air firmware upgrades, these improvements can be pushed to the field in near real time.



## THE BOTTOM LINE

“The average age of a driver is 56-ish; that’s not changing anytime soon. The GDP grew at 4.1 percent in the second quarter this year. These numbers don’t just disappear. Even if there is a natural regression, we are going to run into the same capacity situation again eventually,” Strickland posits. “A lot of people have pointed to autonomous vehicles as a solution that could save the day, but that’s simply not the case. We are very far away from full autonomy. Efficiencies really need to be found quickly.”

According to Strickland, the market conditions we are currently experiencing are likely an extended event that will last through the rest of the year and at least into the first quarter of 2019. However, the long-term capacity problem will not simply disappear. The climate is such that carriers across the nation must seek utilization efficiencies to help alleviate the capacity crunch. The smart trailer movement, highlighted by technology such as FleetLocate by Spireon coupled with its IntelliScan cargo sensors, is a major step in the right direction.

For more information on the smart trailer movement and how to maximize trailer utilization visit [spireon.com/trailer-management/](http://spireon.com/trailer-management/) or call one of our friendly experts at 800.557.1449.

Zach Strickland was the featured guest speaker for *“Smart Trailer Is the Future: The Future Is Now,”* a recent webinar hosted by Spireon. To see the upcoming slate of Spireon webinars featuring fleet and trailer management, visit [spireon.com/webinars](http://spireon.com/webinars).

