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Cold comfort: Food companies can benefit from using reefer data as their costs for freight (and everything else) rise

We didn't need to see acceleration in the Consumer Price Index last week to tell us that inflation is becoming increasingly problematic. Food companies, in particular, are struggling with rising costs of agricultural commodities and other ingredients, labor, packaging and freight.

What makes freight costs different from those other categories (aside from its being our area of expertise) is that they cannot be easily hedged the way that agricultural commodities and fuel can be.

Packaged food companies are raising prices to offset (at least a portion of) the rising costs. Still in the early stages of price increases, it is unclear how consumers will respond, but their pricing power is likely limited since: (1) most consumers have become unaccustomed to meaningful price increases the past few years and (2) retailers have ramped up their private label brands, which are typically priced at a discount to the national brands. The counterpoint is that the economy is growing quickly and, since prices are rising everywhere, price increases to consumers are more likely to stick.

Further complicating matters, demand questions abound largely related to whether pandemic-era consumer habits, such as cooking meat at home, will stick.

In this report, we discuss the numerous datasets contained in the FreightWaves SONAR platform and associated use cases for packaged food companies and other refrigerated shippers.

The primary refrigerated datasets contained in SONAR are:

1) Electronic tender data (Pages 5-7)

2) Transactional data for completed contracted loads (Pages 7-8)

3) Predictive spot rates (Page 9)

4) Carrier performance surveys (Pages 10-11)

5) Load board data (Pages 12-13)

In addition, at the end of this report, we discuss what the financial impact can be on a large food company (Pages 14-15) that is able to reduce its freight spend. In general, the companies in the meat industry have among the most to gain from improving their freight efficiency, and we estimate that food companies with average margins and an average relative freight spend could save $300 for every $1 million in revenue by improving freight efficiencies by 1%. That scales nicely when put in the context of multibillion-dollar food companies, as we illustrate in this report.

Mike Baudendistel
Rail/Intermodal Market Expert
mbaudendistel@freightwaves.com
(773) 991-9534

Tony Mulvey
Analyst
tmulvey@freightwaves.com
(423) 637-1940

Aside from the early days of the pandemic, this is perhaps the most challenging time to be in the food industry.

As the pandemic's impact on the U.S. winds down, here is a sample of the issues that food companies are facing:

- Heightened demand uncertainty given the lack of visibility into what pandemic-era behavior will stick. Food products for away-from-home and at-home consumption, even in the same food categories, are very different products. In addition, during the pandemic, consumers cooked more meat, ate more snacks and bought more spices, among many other changes.

- Rampant inflation throughout the supply chain for ingredients, packaging, labor and freight costs. Clearly, higher freight costs are just one of food companies' inflationary pressures.

- The pressure on food companies to expand their presence in the higher-growth food sectors (e.g., healthy eating, plant-based substitution products and pet food) given the slow rate of U.S. population growth (less than 1% annually) and the associated slow growth rates of traditional food categories.

- The need to raise prices to offset the impact that higher costs are having on margins without alienating customers or losing share. Before the recent rise in inflationary pressure, food prices had, in general, only been rising in the low-single digits. That will have to change to maintain margins.

- Shortages of certain ingredients (or complementary products) that are leading to reduced product availability (or reduced demand for certain food products). An example is the shortage of certain spices, which, in turn, hurts demand for foods cooked with those spices.

- Pressure to react to consumers' newfound willingness to buy groceries online, which may involve developing or enhancing an omnichannel and/or e-commerce strategy.

- Aggressiveness on the part of retailers to expand their own private label brands, which earn the retailers higher margins. Costco, Target, Aldi and Trader Joe's have been very successful with their private label brands.

Clearly, food companies' challenges in the current inflationary environment extend well beyond our specialty of freight transportation and logistics.

In addition, food companies and other shippers that require temperature controls contend with many unique logistical issues. The same can be said for refrigerated carriers. Among those issues:

- Shippers typically pay more for transportation capacity with temperature controls than for dry van capacity. With many food products being relatively low-value freight, the freight costs can be a relatively high portion of the total delivered cost.

- Refrigerated carriers face higher capital equipment costs than dry van carriers, mainly due to the more expensive trailing equipment. Refrigerated trailers are more expensive than dry van trailers and also do not last as long. Refrigerated carriers' higher and more frequent capital costs contribute to higher per-mile freight rates, and also serve as a higher barrier to entry than what exists in dry van truckload.

- Refrigerated freight demand is much more seasonal than dry van.

- Refrigerated freight flows are generally more imbalanced than dry van given the geographies where produce and other foods are grown (e.g., the Central Valley of California) and consumed (large population centers in the East and Midwest).

- Freight needing temperature control is more time-sensitive than dry van freight given the potential for spoilage. With service levels of greater importance combined with the limited refrigerated intermodal service, rail intermodal is typically not an option for most refrigerated loads (although, some companies are trying to change that).

- The refrigerated truckload industry is a smaller and more concentrated industry than dry van truckload, which contributes to greater volatility in rates and capacity availability.

- There is a lack of publicly available information on the refrigerated freight market since there is only one "pure play" reefer carrier that is publicly traded (i.e., Marten Transport).

That list of issues results in higher transportation costs for food companies and other shippers that need temperature controls, when compared to dry van. In addition to higher costs, there is less room for service errors given the perishable nature of the freight. To mitigate some of that volatility, shippers may want to make use of dedicated capacity or private fleets, or simply deepen their relationships with their core carriers as they look to become a "preferred shipper."

From the carriers' perspective, the issues listed above highlight the extra challenges of keeping the capital-intensive refrigerated equipment highly utilized. In a market where freight flows are less balanced, having to deadhead or accept low-rated brokered loads can quickly negate profit earned on headhaul loads. In addition, carriers and brokers need to know how to price for the type of freight, the time of year, the service requirements, the lane and the current freight market.

How can food companies and other reefer shippers benefit from using SONAR?

The reefer data contained in SONAR comes from several sources as well as from FreightWaves' in-house analytics to analyze the reefer market from multiple angles. In the following pages, we go through a sampling of refrigerated freight data from a range of sources, each with multiple use cases.

The sources/categories of the reefer data contained in SONAR include:

- Electronic tender data (Pages 5-7): Electronic tenders (requests from shippers for carriers to move loads) filtered for refrigerated loads show volume, market tightness, lane balance, seasonality, and how carriers and shippers are reacting to the current freight market.

- Transactional data from completed contracted loads (Pages 7-8): The SONAR Supply Chain Intelligence (SCI) application shows rates on refrigerated loads broken down by lane and shipper industry. It allows shippers to see what peers are paying to ship very similar loads to know if they are paying above-market or below-market rates.

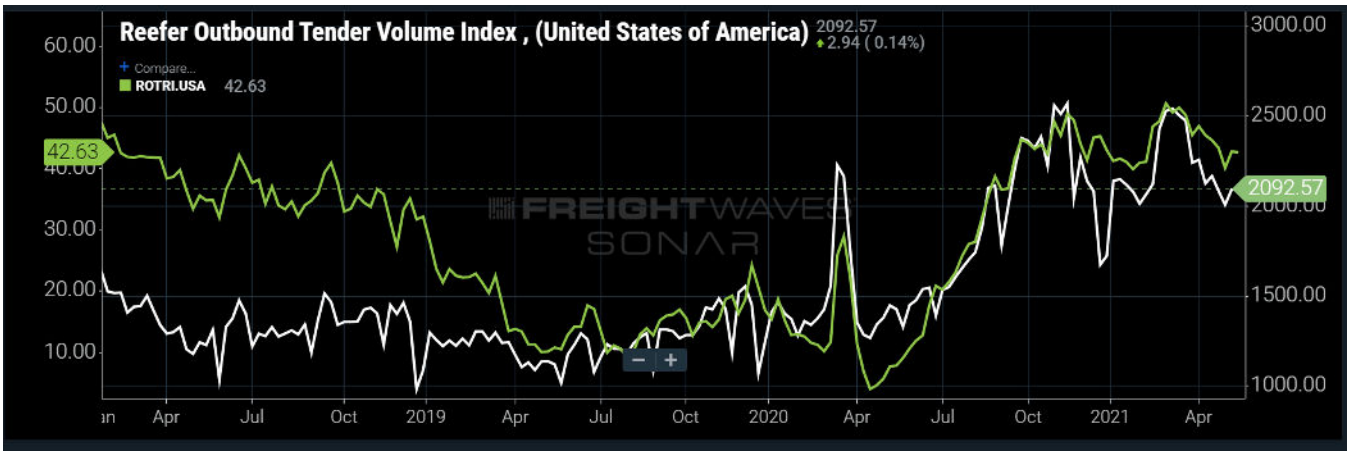
- Predictive spot rates (Page 9): The SONAR Predictive Rates App shows forecast spot rates for the next 12 months for any refrigerated (or dry van) lane in the U.S. It allows customization for specific fuel surcharge terms.

- Carrier surveys (Pages 10-11): Reefer data from carrier surveys show the performance of small and midsize carriers, which can be used by shippers in negotiation or by carriers for benchmarking.

- Load board data (Pages 12-13): Reefer data from Truckstop.com show the volume of reefer loads that has fallen through routing guides by lane and the rates the spot market will bear in those lanes.

The clearest use cases for the data in the above categories support day-to-day operations; we describe numerous use cases for that data in the coming pages. In addition, SONAR data could be used by food companies for strategic and longer-term decision-making, such as deciding where to source ingredients or locate processing facilities.

<u>Electronic tenders:</u> Reefer data from electronic tenders show volume, market tightness, lane balance, seasonality, and how carriers and shippers are reacting to the current freight market.



(Chart: SONAR, Reefer Outbound Tender Volume Index {white} and Reefer Outbound Tender Reject Index {green})

The Reefer Outbound Tender Volume Index (ROTVI — white in the above chart) is an index of electronically tendered reefer loads that are being both accepted and rejected by carriers, measuring the total requests for capacity in a given market. In short, it measures total refrigerated truckload demand. One reason why SONAR tender volume data should be studied by shippers is to understand seasonal freight trends so they can understand when freight typically surges and get ahead of the coming tightness.

The Reefer Outbound Tender Rejection Index (ROTRI — green in the above chart) measures the rate at which carriers reject tendered loads. There are numerous reasons why carriers reject freight out of a given market, but the most common are: (1) rates are too low relative to higher-rated available spot loads in the market and (2) or the destination is less than desirable (such as a small, backhaul freight market with little outbound freight). Rising tender rejection rates means that shippers are going to find it more difficult to get their loads covered and are more likely to pay more to ship loads in the spot market. In anticipation of those periods, food companies may want to endeavor to become their carriers' "shipper of choice," which involves not only establishing rates at reasonable levels, but loading/unloading quickly and consistently feeding carriers volume in corridors where they can easily get reloaded.

COVID-19 placed immense pressure on the reefer market as increased grocery demand was driven by stay-at-home orders; the result was increased reefer requests for capacity from the onset of the pandemic compared to the previous year (2019). The increased reefer demand has continued to hold strong throughout 2021 even as state and local governments have eased restrictions.

The increased reefer demand, as measured by requests for capacity, has been accompanied by a drastic increase in the overall tender rejection rate, as reefer capacity demand outpaced reefer capacity supply. As a result, carriers became increasingly selective with the freight they moved, resulting in "coin-flip compliance" as reefer rejection rates surged over 50%.

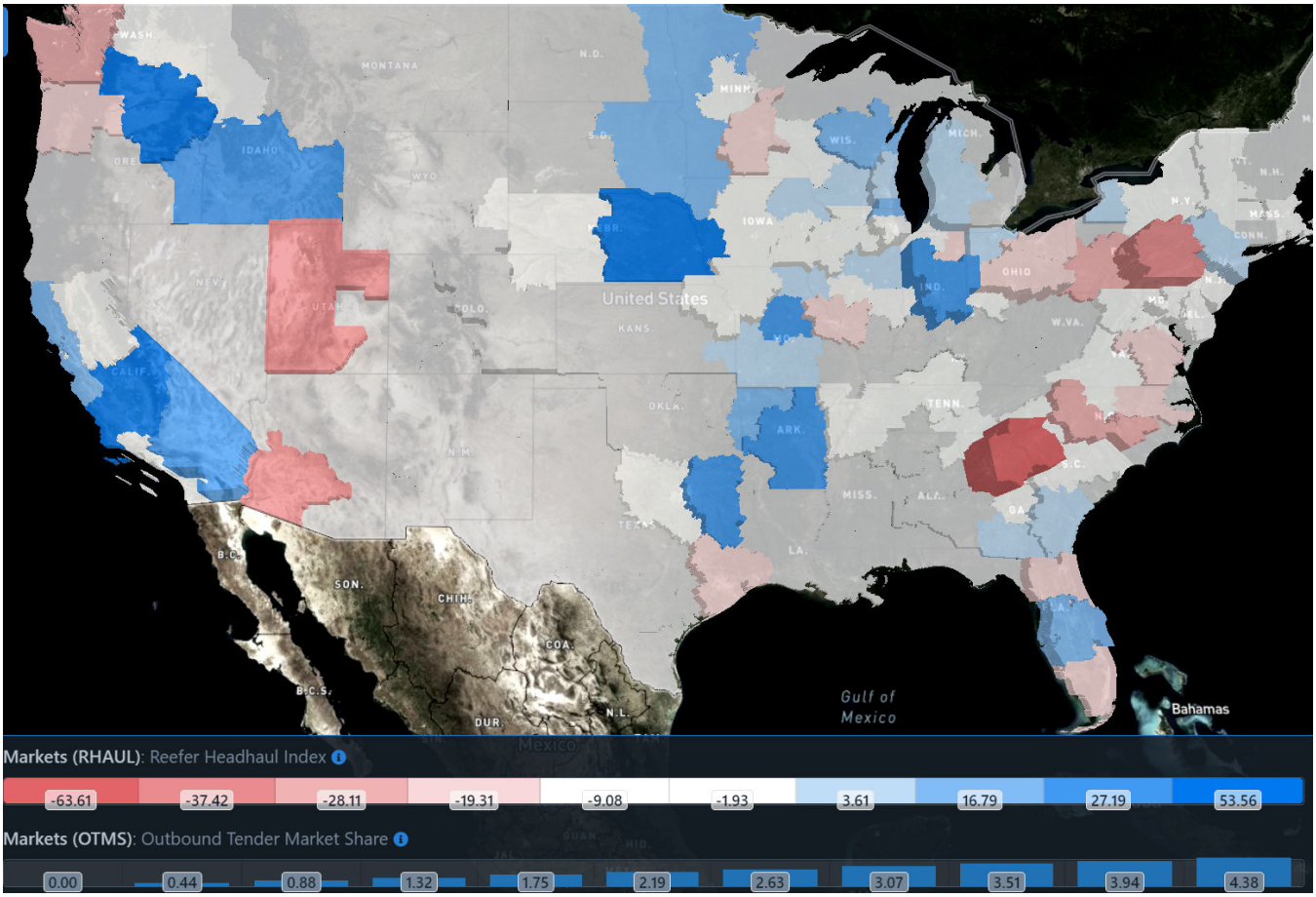
ROTVI shows that reefer requests for capacity (demand) are running up over 44% year-over-year and nearly 85% higher on a two-year basis. After adjusting for the impact of the higher tender rejection rate, the accepted reefer tender volume is actually running down 10% y/y but remains higher by 17%

on a two-year basis. The year-over-year decline in accepted tender volumes isn't a surprise since we are lapping a period of panic-buying, as consumers rushed to stock their freezers with food and shippers rushed to restock shelves. In short, reefer demand is very strong and capacity remains very tight.

The Reefer Headhaul Index (RHAUL) shows freight imbalances at the freight market level as the index measures the difference between outbound and inbound reefer demand. A positive number means there is more outbound demand than inbound demand and a negative number means there is more inbound demand than outbound demand.

Food companies should look at the Reefer Headhaul Index of the destination for their loads. A destination freight market with a positive Headhaul Index means that carriers will be willing to head to that market since they know it will be relatively easy to get reloaded. As a result, shippers have more negotiating leverage when the Headhaul Index of the destination of their load is positive and less negotiating leverage when the Headhaul Index of their loads' destination is negative.

Atlanta is one of the deepest backhaul (shown in dark red) markets in the U.S., which suggests that food shippers may struggle to get carriers to take loads to Atlanta.



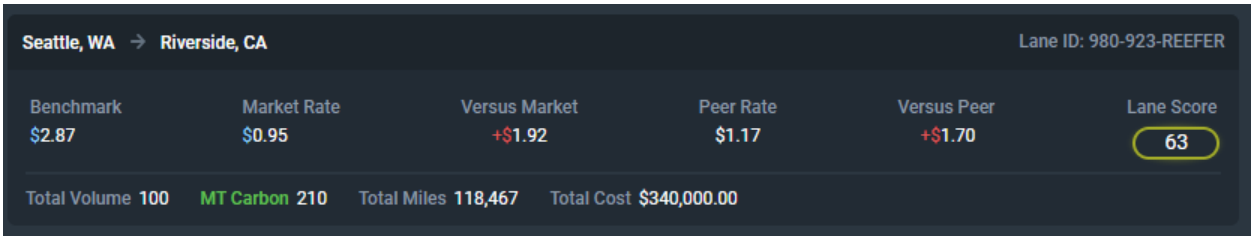
The largest reefer headhaul markets in the country are among the largest produce markets in the country, as produce season really ramps as we enter the summer season. The California markets of Ontario and Fresno, large producers, detached from large consumption centers, are among the leaders with the highest Headhaul Index. Conversely, large consumption centers and markets that

don't have a lot of outbound produce make up the backhaul reefer lanes, like Atlanta, Salt Lake City and Phoenix.

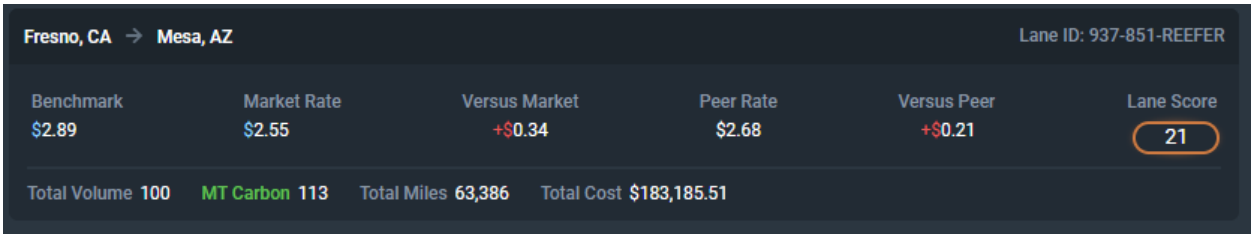
<u>Transactional data from completed contracted loads:</u> The SONAR Supply Chain Intelligence (SCI) application shows rates on refrigerated loads broken down by lane and shipper industry. In short, it allows shippers to see what peers are paying to ship similar loads.

FreightWaves' Supply Chain Intelligence (SCI) platform allows for shippers to benchmark themselves against the overall freight market as well as members of a shipper's peer group, in this case food and agriculture shippers. The platform allows for both dry van and reefer lanes to be scored.

A higher Lane Score (on a scale from 1 to 100) indicates that it is an easier lane for shippers to find and manage transportation capacity and, therefore, typically have more pricing leverage.



The above example from hypothetical Shipper X shows that a backhaul lane from Seattle to Southern California, in this case Riverside, is relatively easy for a shipper to manage over a long period of time. However, even though the Lane Score is relatively high, the shipper is paying well above both the market and peer-group average rate. Based on historical rejection rates and rate data along the lane, Shipper X may be able to lower its freight spend by lowering its rate in this lane, especially since the lane is naturally an easier lane to cover.



Likewise, Shipper X will have difficulty managing a lane from Fresno, California, to Mesa, Arizona, as Mesa is predominantly a backhaul market, with little outbound freight meaning that Shipper X will often have to pay carriers more to secure regular capacity. Based on the benchmark rate that Shipper X is paying, which exceeds both the overall market rate and Shipper X's peer-group rate, Shipper X is taking the necessary steps to secure capacity on a regular basis, making a difficult lane to cover slightly easier. As a result, a smaller percentage of Shippers X's tenders will likely be rejected by carriers relative to its peers.

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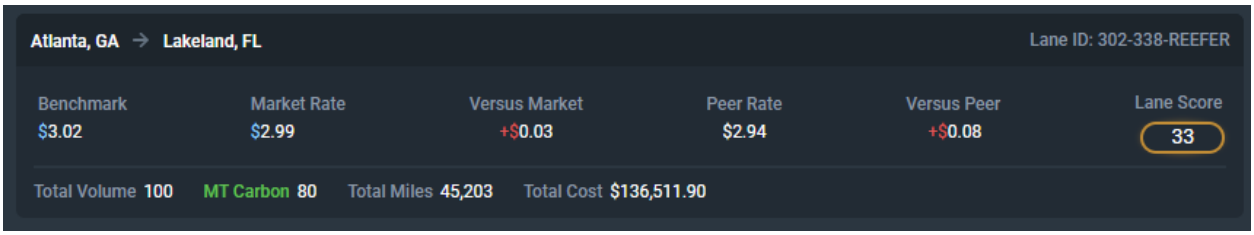
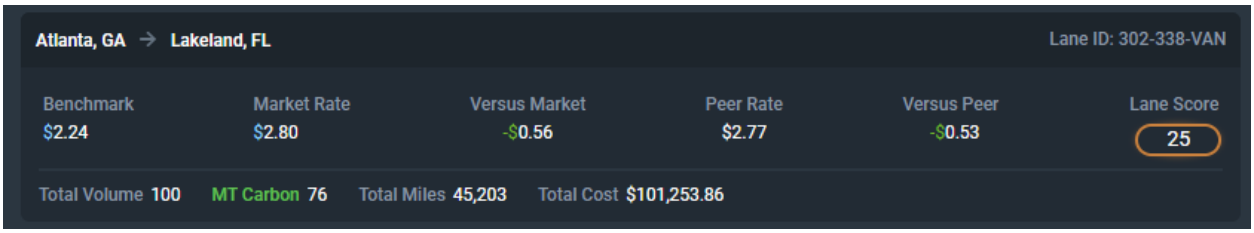


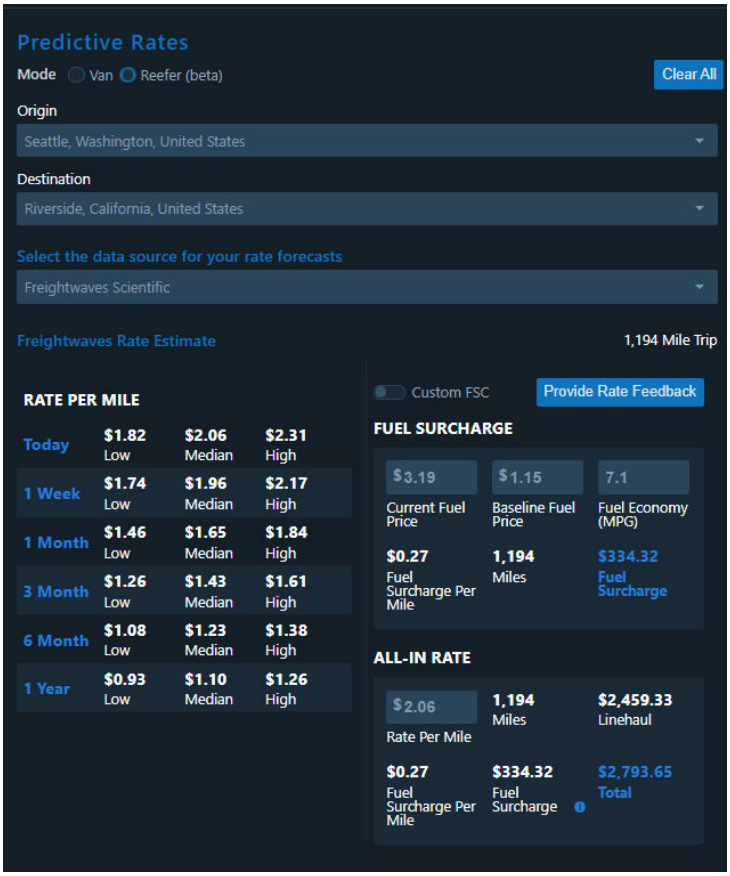
FreightWaves SCI allows Shipper X, which also operates facilities on the East Coast, using both dry van and reefer trailers throughout the network, to view how its rates compare to the market in both networks. Shipper X moves both van and reefer loads between Atlanta and Lakeland, Florida. The reefer load is slightly easier to cover, resulting in a higher Lane Score, 35 in this instance, compared to the dry van load with a Lane Score of 25. Shipper X pays slightly more on the reefer lane compared to both the market and peer group, making it slightly easier to cover. Additionally, understanding that Lakeland has more outbound reefer freight than inbound freight allows Shipper X to be more aggressive with its rates when securing capacity going into the market.



The dry van lane from Atlanta to Lakeland is significantly more difficult for Shipper X to cover as the benchmark rate is significantly below the overall market and peer-group rates. Shipper X may want to mitigate the volatility that is likely to occur in this lane by utilizing a private fleet or a dedicated service (if they have enough capacity) to secure capacity at a predetermined rate, or raise the overall benchmark rate (the rate the shipper is paying) to closer to market and peer-group rate.

<u>Predictive spot rates:</u> The SONAR Predictive Rates App shows forecast spot rates for any refrigerated (or dry van) lane in the U.S.

Shipper X has a few reefer loads that will have to be moved in the spot market but aren't as time-sensitive as the contracted freight that is being moved regularly throughout the network. Using the Predictive Rates tool within SONAR, Shipper X is able to use FreightWaves' Scientific Spot Rate forecast for a specific lane to receive predictive spot rate quotes for today, one week out, one month out, three months out, six months out and one year out. Within the app, predictive spot rates for all lanes longer than 250 miles are available, giving insight into what is expected from a capacity and rate perspective.



Using one of Shipper X's largest lanes, Seattle to Riverside, a one-off load that needs to be moved outside of current contract agreements, rates are expected to decline over the next year. Spot rates have historically been mean-reverting, which underpins the estimated 46% decline in spot rates over the next year for median-cost carriers.

Each rate is broken down by low-cost, median-cost and high-cost carriers based on the operating expenses of carriers. Carriers' costs range based on their operational efficiency as well as their relative service levels, with expedited carriers generally having higher-cost operations.

Shipper X will also be able to set a custom fuel surcharge within the Predictive Rates app that is consistent with its average loads to obtain more accurate all-in rates.

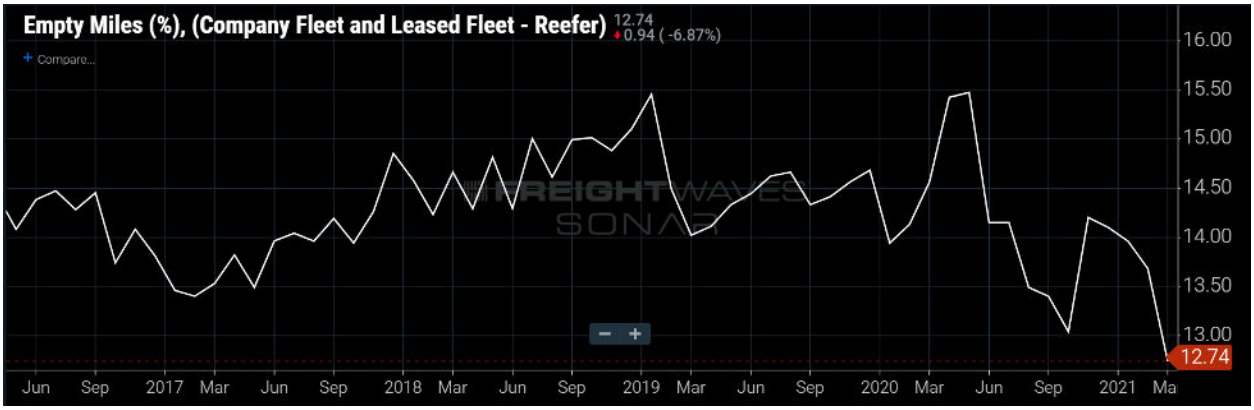
The predictive rates are based on tender data from electronically tendered loads, so the rates are based on daily data that are tied closely to the volume of freight hitting the spot market as well as the rates the market will bear for those spot loads. If freight volumes are increasing faster than relative capacity, tightening in a given market will put upward pressure on spot rates that Shipper X will have to navigate.

Coupling tender data with the predictive spot rate data will allow Shipper X to make rational and timely decisions around moving freight in the spot market. In other words, tender rejection rates tell shippers what the risk is that their loads will not be accepted by carriers, while predictive spot rate data tells shippers how big of a risk they are taking if loads must be moved on the spot market.

<u>Carrier surveys:</u> Reefer data from carrier surveys show the performance of small and midsize carriers — use for benchmarking or in negotiations.

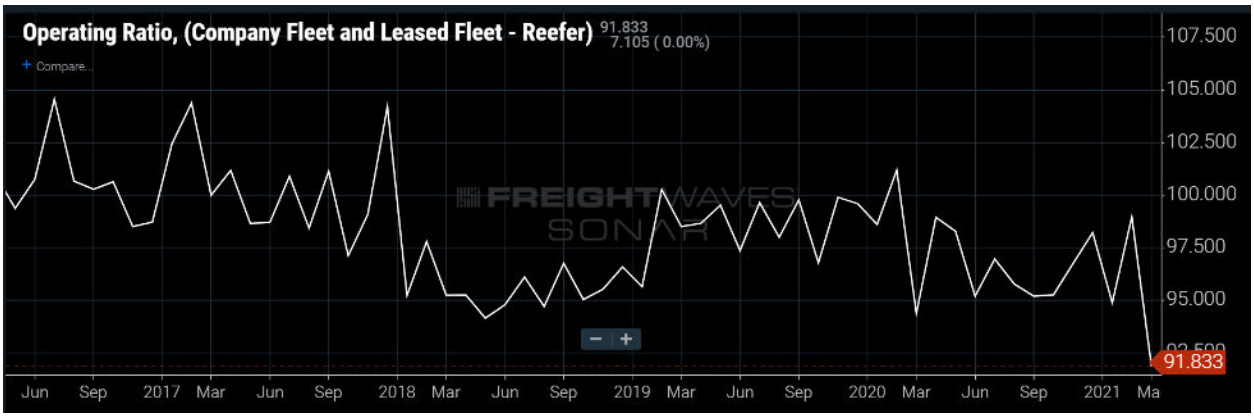
FreightWaves also houses numerous benchmarking indices from the Truckload Carriers Association's Profitability Program, is a consortium of small and midsize, asset-based carriers. These indices can be beneficial to shippers, especially looking at indices like empty mileage percentages and operating ratios.

Since the indices from TCA carrier surveys are based on a sample of small and midsize carriers, they show a more complete and accurate picture of the carriers' financial conditions when compared to the data reported by the publicly traded carriers, which are among the largest, the most sophisticated and best-capitalized carriers. In other words, the financial metrics of the publicly traded carriers are not representative of the overall carrier marketplace.



During periods of plentiful freight demand, carriers tend to upgrade their freight selection and focus on moving freight within their preferred network compared to moving any freight that they are able to secure during a soft freight environment. The empty miles percentage for reefer carriers is currently the lowest percentage since the inception of the index in late 2019. With more than enough freight, carriers were less willing to accept loads that would force them to deadhead.

Shipper X should monitor the industry's empty miles percentage as a signal for when freight markets tighten or loosen. If carriers are more willing to leave their preferred lanes (and empty miles percentage rises), it shows that the market is loosening.



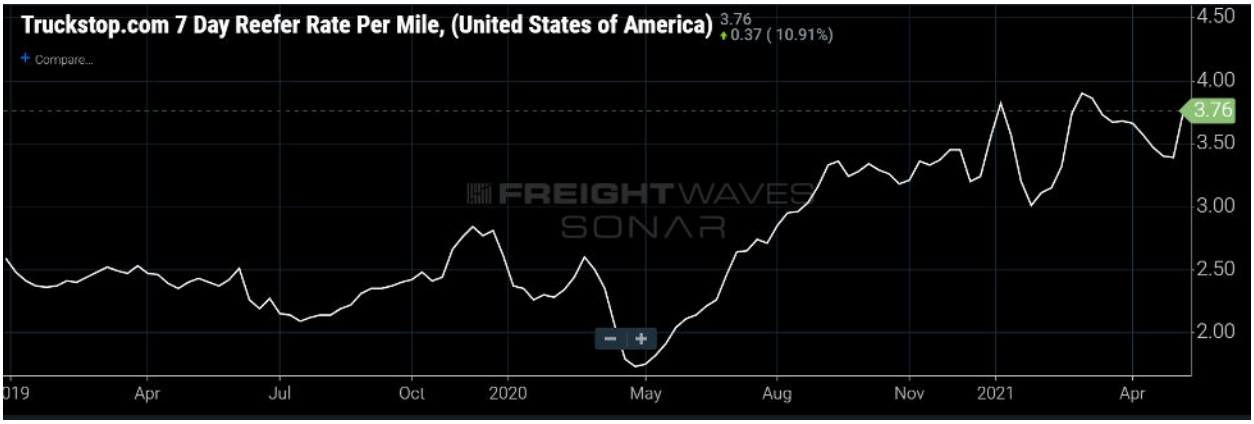
Additionally, understanding carriers' current business conditions will allow shippers to approach negotiations with a better understanding of what their carrier partners are facing. The operating ratio is a direct measure of truckload carriers' profitability (1 minus the operating margin) and will give Shipper X the ability to go into discussions more informed.

During periods when the freight market is relatively soft, operating ratios are typically elevated, like during 2019, one of the softest freight environments in the past few years, which also resulted in the highest operating ratio for reefer carriers over a prolonged period. During periods of freight market tightness, carrier operating ratios fall significantly as carriers bring in higher revenue levels while operating expenses typically rise more modestly.

When reviewing bids, shippers should consider average carrier profitability levels in conjunction with other datasets, such as tender rejection rates, Lane Scores and estimated spot rates. When operating ratios are at cyclical lows, carriers may have a hard time securing capacity in a tight market, and when operating ratios are at cyclical highs, the freight market may be loose, but carriers will only accept loads if they are at least more than covering their variable (per-mile) costs.

<u>Load boards</u>: Reefer data from Truckstop.com show the volume of reefer loads that has fallen through routing guides and the rates the market will bear.

SONAR also offers shippers an aggregated view of 102 different lanes from Truckstop.com's load board, breaking down volumes on the load board as well as the average spot rate (including fuel surcharges and other accessorials) across the lanes. The view into what is happening in the spot market gives shippers valuable information into the risk that their loads might fall into the spot market as well as the likely financial impact of having to pay spot market rates.



The current reefer spot rate sits at $3.76/mi inclusive of fuel surcharge, well above where rates have been for much of the past three years. Knowing that spot rates are elevated is putting upward pressure on contracted rates, and Shipper X will be able to realize that lanes that are typically difficult to cover might be even harder than normal and rates being paid may need to be increased further to avoid freight falling through to the spot market.

Additionally, insight into which lanes are seeing the largest increase in spot volumes, as shown by Truckstop.com's load board on a given week, will allow Shipper X to understand where routing guides are failing and loads are falling all the way down the routing guide. In the tree map below of Truckstop.com's reefer volumes on lanes with more than 500 loads posted, some of the densest freight lanes are seeing exorbitant growth in spot volumes over the past month.

Outbound Los Angeles and Chicago reefer spot volumes were among the only lanes that experienced any slowdown over the past month. Meanwhile, lanes where freight is flowing westbound into Chicago from markets like Elizabeth, New Jersey, and Philadelphia have grown by over 20% in the past month. The increase of spot volume into the Chicago market signifies that carriers are charging more to go into the market as routing guide compliance slips.

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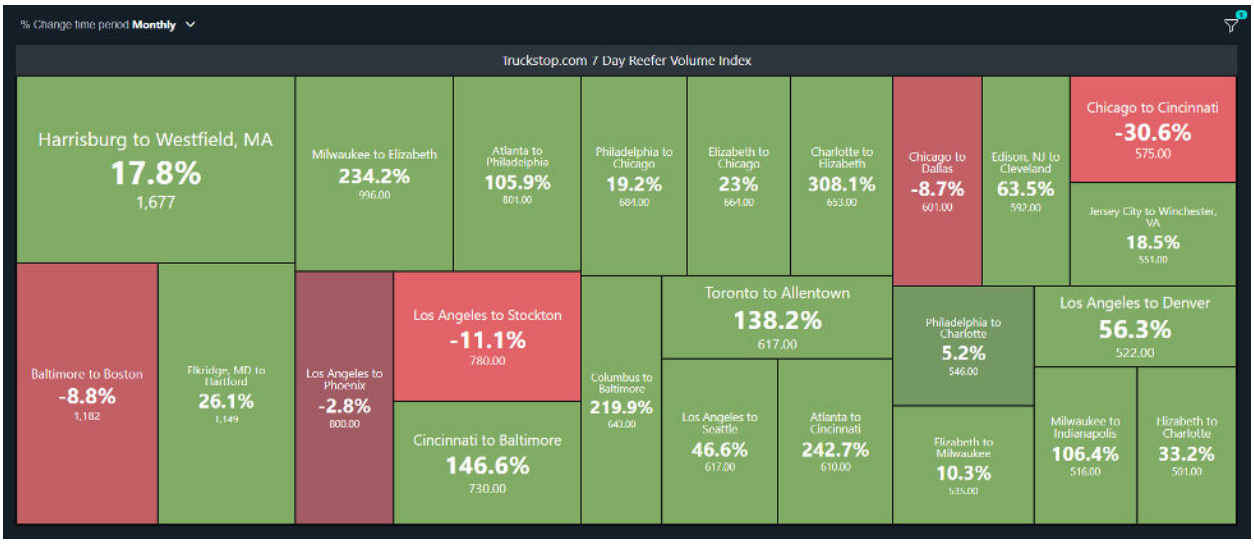

Combining the lanes where spot volumes and spot rates are changing with FreightWaves' Outbound Tender Volume Index and Outbound Tender Rejection Index will give Shipper X signals where market dynamics are changing and rates likely need to change as well. The ability to be a savvy shipper and understanding the freight market dynamics as well as challenges that carriers face should lead to savings in freight spend while mitigating risks at various points in the supply chain.

Financial outcomes that improved freight market intelligence can deliver

Food companies' freight costs vary widely, and freight costs are not typically broken out, but we believe that reasonable point estimates are 5% of Cost of Goods Sold or 3% of sales.

Transportation and logistics costs are typically included in food companies' income statements within the COGS line items and therefore, directly impact the companies' gross margins. The gross margin for large food companies varies widely, with name-brand packaged food companies typically enjoying higher gross margins. In the analysis below we use the 10%-50% range for gross margins, but packaged food companies' gross margins will sometimes exceed that range for well-established brands that have a difficult-to-replicate taste. Transportation costs as a percentage of food companies' cost of sales can also vary widely and are typically highest for perishable, time-sensitive products. The range we use in the analysis below is the assumption that transportation costs range from 3% to 7% of retailers' cost of sales (5% of Cost of Goods Sold is a median point estimate).

Food companies' estimated freight costs as a percentage of revenue

	Food Co. Freight Cost as a Percentage of COGS (3%-7%)				
Food Co.'s gross margin (10%-50%)	3%	4%	5%	6%	7%
10%	2.7%	3.6%	4.5%	5.4%	6.3%
20%	2.4%	3.2%	4.0%	4.8%	5.6%
30%	2.1%	2.8%	3.5%	4.2%	4.9%
40%	1.8%	2.4%	3.0%	3.6%	4.2%
50%	1.5%	2.0%	2.5%	3.0%	3.5%

What a sample of the nation's largest food companies may be paying for domestic freight ($MM)

($ in millions)	Food Co.'s Freight Cost as a Percentage of COGS						
Food Companies	3%	4%	5%	6%	7%	N. Amer Revenue	Gross margin
Nestle	$ 571	$ 762	$ 952	$ 1,143	$ 1,333	37,411	49.1%
JBS	$ 740	$ 987	$ 1,233	$ 1,480	$ 1,727	27,924	11.7%
Tyson	$ 1,024	$ 1,365	$ 1,706	$ 2,048	$ 2,389	39,000	12.5%
Pepsi	$ 590	$ 786	$ 983	$ 1,179	$ 1,376	43,490	54.8%
Mondelez	$ 149	$ 198	$ 248	$ 297	$ 347	8,157	39.3%

Estimated pre-tax savings associated with a 1% reduction in freight costs

($ in millions)	Food Co.'s Freight Cost as a Percentage of COGS				
Food Companies	3%	4%	5%	6%	7%
Nestle	$ 5.7	$ 7.6	$ 9.5	$ 11.4	$ 13.3
JBS	$ 7.4	$ 9.9	$ 12.3	$ 14.8	$ 17.3
Tyson	$ 10.2	$ 13.7	$ 17.1	$ 20.5	$ 23.9
Pepsi	$ 5.9	$ 7.9	$ 9.8	$ 11.8	$ 13.8
Mondelez	$ 1.5	$ 2.0	$ 2.5	$ 3.0	$ 3.5

Nestle includes Americas (AMS segment) revenue which also includes South America
JBS revenue includes only JBS USA Beef and JBS USA Pork
Pepsi revenue includes only Frito-Lay North America, Quaker Foods North America and PepsiCo North America
Source: company data and FreightWaves estimates

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The charts above (which use only the North American segments of those respective companies) are intended to highlight the importance that reducing freight costs can have on a large food company. In the top chart, a food company with a 40% gross margin may have freight costs that are the equivalent of 3% of revenue. For a company with lower gross margins of 10%, freight costs would be closer to 4.5% of revenue. Therefore, a 1% reduction in freight cost could save $300 for every $1 million in sales for a company with 30% gross margins or $450 in freight costs for a company that has 10% gross margins. That scales quickly in the context of food companies that do many billions of dollars in North American sales annually, such as those above.

The charts above also show that the freight savings opportunity within the food industry varies widely by segment. The companies in the above chart that show the greatest hypothetical savings by reducing their freight costs by 1% are JBS and Tyson, which we roughly estimate could save $12 million and $17 million in annual freight costs, respectively. Meat producers tend to have lower gross margins than the snack makers like Pepsi and Mondelez. Plus, freight costs tend to run higher in the meat industry, which typically has time-sensitive and temperature-controlled freight.