

The Economics of Ocean Freight in 2021 and Beyond



Introduction

The current freight market turbulence is a strange tale of inventory shortages for companies shipping inventory. That is to say that **shippers have more cargo to move around the world than there are spaces or containers for that cargo to be transported**. How do we know this? Well, as an everyday consumer, one can see delays in goods being delivered¹ or increases in delivery prices². And as a logistics technology provider, **Logward lives and breathes the economic model of ocean freight**. This allows us to better understand the supply and demand side drivers of this shortage, both leading up to and during the pandemic and its ongoing effects. **Time and time again throughout 2020 and 2021 we've seen the benefits of allocation management as an approach to circumnavigating limited TEU capacity.**

Microeconomics 101

For a brief microeconomics primer, a shortage occurs when the demand for something exceeds its supply – the output being less goods sold, but at higher prices. An increase in demand, a decrease in supply, or both can drive a shortage. **Let's examine how both forces are at work in today's freight market.**

Supply side forces

The supply side of shipping goods can be defined as TEU capacity, with the main factors of supply being the number of vessels sailing, their sizes, the routes they sail, and the containers available to go onboard. When examining the decrease in supply, factors from “business as usual” times get compounded by events that happened in the wake of COVID-19. Vessel demolition, low vessel growth, and sailing speeds all played a factor leading up to the pandemic. The disbursement of equipment after the pandemic made factors even worse.

Taking a step back, the evidence for a supply shrink can be seen when looking at **TEU capacity growth rate decreasing over the past 20+ years**, suggesting that carriers have added vessels at a much slower pace.

Figure 1: Fleet Growth: YoY change in TEU capacity (%)



Net-net: Demolition and Construction

Actions that decreased supply took place from 2009-2019, the 10-year period preceding the pandemic, as carriers demolished old vessels at increasing rates and took TEU capacity out of the market³. While carriers have a duty to remove out-of-date equipment, the rapid increase in demolitions suggests a desire to decommission more vessels instead of utilizing alternatives like repairs or scrapping parts. Furthermore, increased vessel demolitions might not ordinarily have a negative effect if new vessels replaced the old at a similar rate, but this has not been the case. Orders for new vessels had peaked at record highs in 2009 but now sit at historic lows³. This is partly due to the IMO's Greenhouse Gas initiatives. Carriers are converting their fleets to more sustainable vessels, which is a slow and costly process. **With these renovations, space availability may remain less than optimal until the goal to reduce carbon emissions by 40% in the next decade is fulfilled.**

Finally, it's also likely that carriers were attempting to reestablish market power after shippers owned the market out of a previous overabundance of capacity that kept rates low. Given that ocean freight is highly consolidated, with the three largest alliances covering 80% of volume, **a strategic capacity reduction aimed at improved profitability doesn't involve a lot of decision makers (or require collusion).**

Taking things slow

With fewer vessels on the water, one might think that each would steam faster in order to cover as many sailings as possible. However, carriers have also reduced sailing speeds driven by the same environmental and financial intent as capacity. **Reduced vessel speed lowers fuel usage, which decreases not only CO2 emissions but also fuel costs.** The latter being a large incentive for carriers as gas prices remain high, and the former gets driven by the International Maritime Organization (IMO) 2018 goal to reduce the total annual GHG emission by at least 50% by 2050 compared to 2008. While these are noble pursuits, **the unintended consequence of reducing vessel speeds is a reduction of sailings** given that voyage time increases, and with less sailings comes less TEU capacity on certain routes.

To put this into perspective, if a vessel spends typically half of a year on the water, then a 10% reduction in sailing speed gets enacted, that eliminates over 2 week's available transit time. Applying this to all vessels and noting that many reduce up to 30% in speed at any given time, **shippers lose out on thousands of days that cargo could be in transit.**

COVID Implications: the container glass is half empty

The above indicators already show a significant decrease in TEU capacity supply, but the global pandemic held further difficulties in store for shippers. Due to government attempts to contain the spread of COVID through air and sea border closures, carriers made the decision to reduce the number of vessels operating on certain routes like the Asian-North America West coast trade route and the Asia – North Europe trade route⁴. This also coincided with reduced production of goods due to short-staffing and plant closures in various lockdown phases in APAC, North America, and Europe. These actions limited the spread of the virus, but they also prevented containers from circulating.

With no exports going back to Asia from the US and EU, empty containers began to pile up on the US West Coast and elsewhere. Because containers were not available at ports of loading in Asia where primarily Chinese based shippers needed them, **finished goods and raw materials became bottlenecked**, causing supply chain interruptions globally.

Even as ports and borders reopened, carriers eventually began to send empty containers back to Asia from Europe and North America, something they typically try to avoid as they plan capacity and pricing based on both the outbound and inbound leg of a voyage. **They did this because it was ultimately more profitable to get the containers back to Asia as soon as possible rather than to lose time waiting for exports from Europe and North America to return**⁵. To compensate for the cost of shipping empty containers around, carriers began raising prices, which added to the impact capacity shortages were already having on prices. Hence the rapid increases in Transpacific rates at the end of 2020 and beyond.

Demand side forces

The shortage of TEU capacity supply was further exacerbated by the eventual increase in demand. At the beginning of the pandemic, global demand decreased only to rebound significantly throughout the rest of 2020 as factories and consumers resumed normal, and even abnormal activity levels to make up lost ground. Evidence of this impacting the ocean freight market exists when looking at containership earnings per day. Vessels earn more per day as demand for container space increased. **And this becomes even more significant as World Throughput Change exceeded the World Fleet Change in 2020 – a trend expected to continue through 2022**, given that demand exceeds supply now and for the foreseeable future.

Figure 2: Clarksons Average Containership Earnings \$/day Jan 2008 to Jan 2021

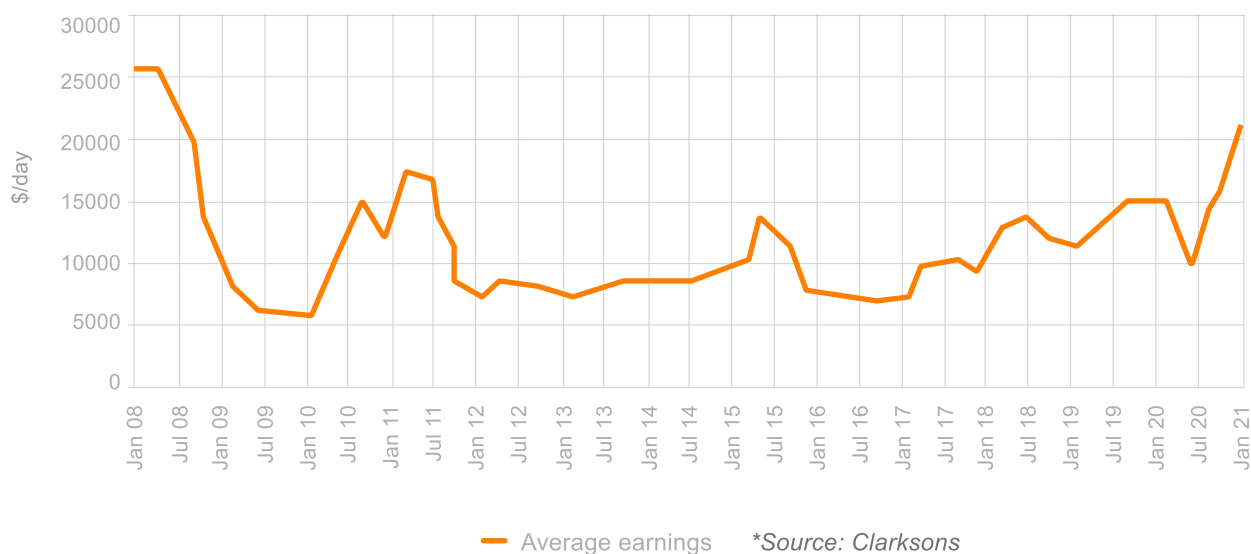


Figure 3: Clarksons Average Containership Earnings \$/day Dec 2019 to Jan 2021

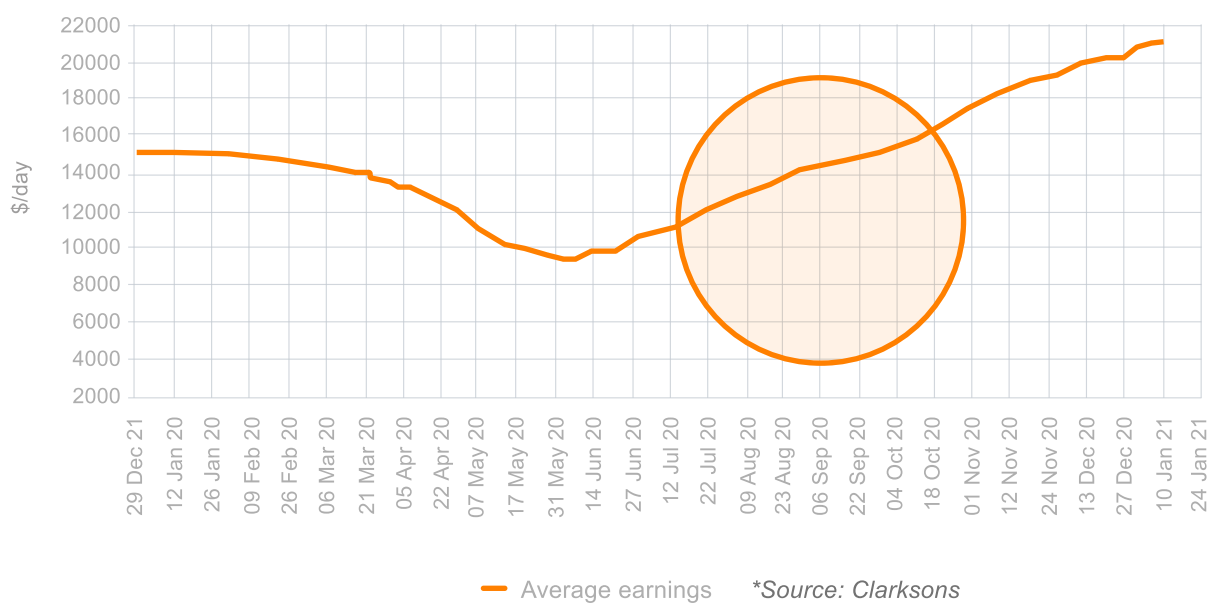
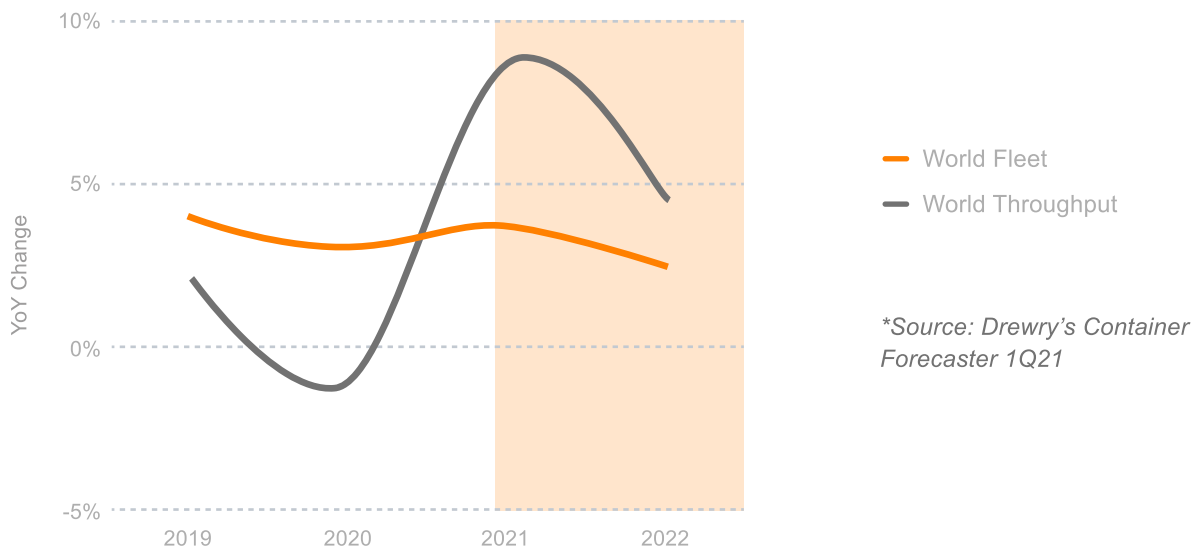


Figure 4: World Throughput Change vs. World Fleet Change



COVID Implications: the container glass is full but stuck

A large build-up in demand for shipping capacity occurred following the openings and closings of factories and ports throughout 2020. When factories in China closed temporarily, many containers were held at ports, leading to an initial drop in demand. As the virus stabilized in China, lockdowns started in Europe and the US, **meaning that tons of ready-to-ship goods were kept held until regulations were eased**, and employees went back to work at the destination ports. Furthermore, Chinese factories reopened and began producing again, contributing even further to the backlog of goods to be sent from China⁵. Meanwhile, **demand for everything from household goods and entertainment devices to food and consumables grew** as e-commerce benefitted from the lockdowns, as shown further below.

With demand for TEU capacity growing to ship from China, **shippers affected by seasonality took notice of scarce TEU capacity and began increasing orders to avoid shipping problems closer to peak**. This, and other disruptions to the normal flow of shipping activities, lead to uncertainty about how and when to collect empty containers in order to avoid blank sailings. Shippers sought to continue filling containers with their goods as orders for their goods grew but felt frustrated that they did not have control over the containers. The dispute grew between shippers and carriers for the rising demand. The problem wasn't going to be solved by the container owners, who may have ordered more containers to be manufactured. **As the demand for containers kept rising, the priority for carriers was profitability and selling slots at the highest rates.**

COVID Implications: consumption changes and increases

Taking a step back, let's look at the consumer behaviors that drove the shipper activity that ultimately increased the capacity demand for TEUs. **At the onset of the pandemic, consumer fear led to excessive demands for various products**. Panic for potential toilet paper shortages, among other items, caused households to purchase copious amounts of certain items. **The dramatic change left the manufacturers and distributors unable to cope.**

As seen in the graphs below, the Purchasing Managers' Index (PMI) sunk at the beginning of the pandemic but then soared as businesses bought more to refill emptied shelves. GDP also recovered quickly, as consumers resumed normal spending. GDP is based on spending on goods and services, but because of the lockdowns, **people were unable to use services or do travelling that leads to more spend on goods and less on services**. While stuck at home, households began making home improvements, replacing appliances, buying cooking equipment, furniture, outdoor building materials, and home gyms, etc. **So not only did GDP grow, but the share of goods relative to services also grew, meaning more goods needed shipping!**

Figure 5: US PMI and GDP

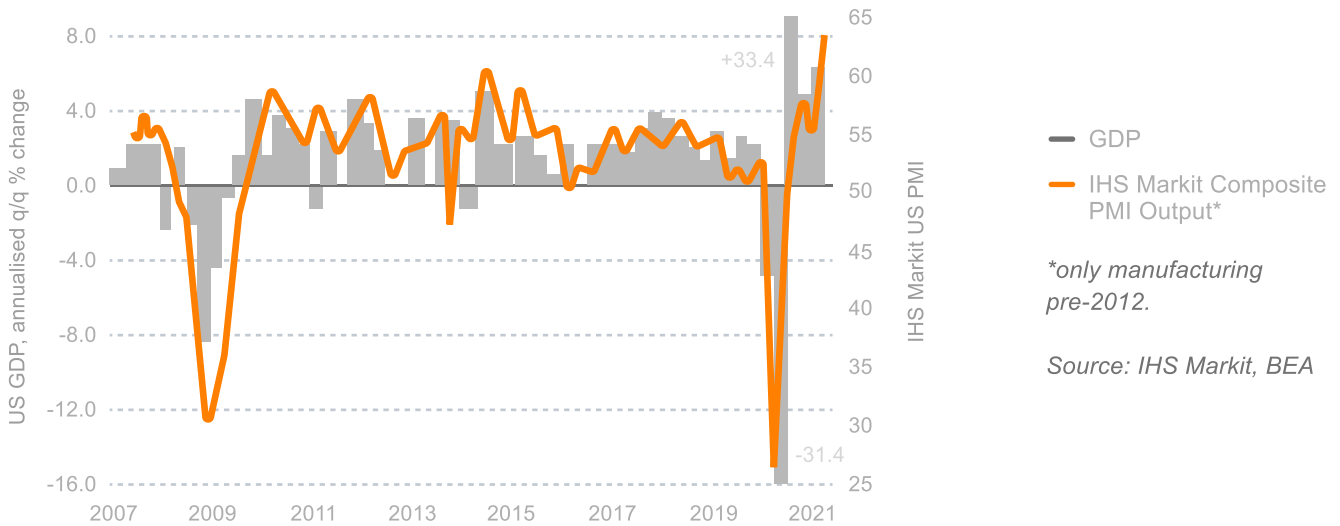


Figure 6: Consumer Services, New Orders Index
50 = no change on prior month

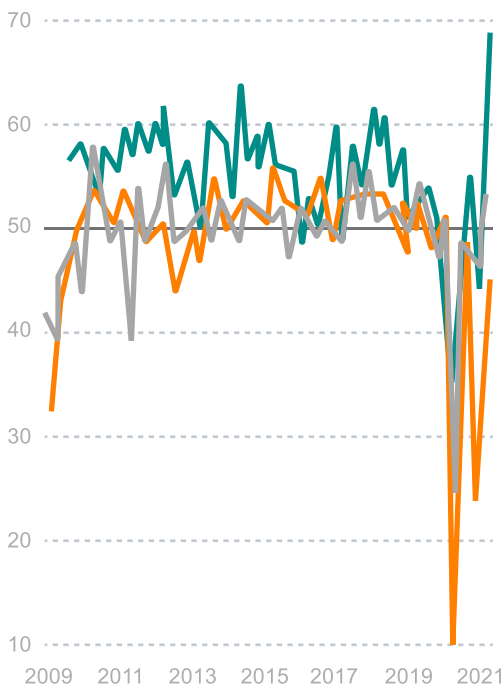
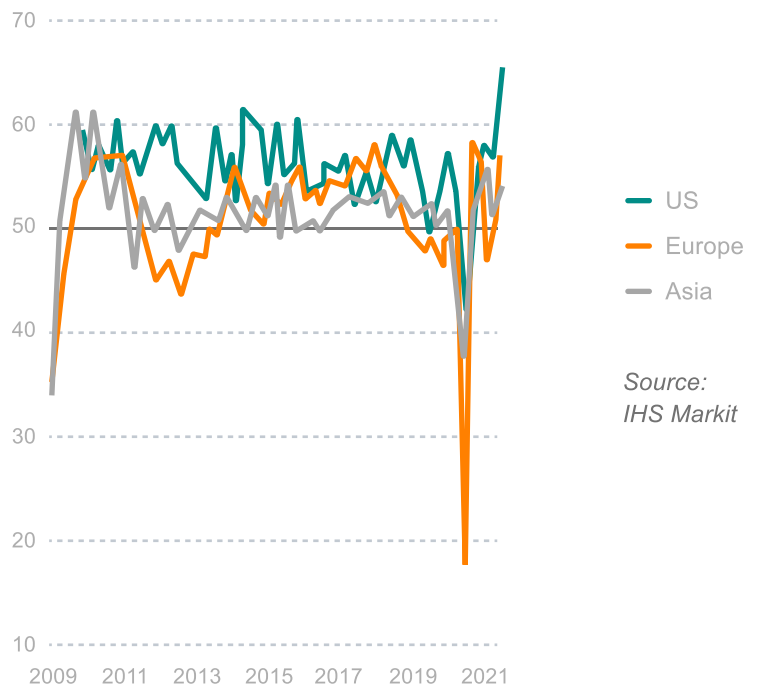


Figure 7: Consumer Goods, New Orders Index
50 = no change on prior month



The “emergency” purchases for essential goods at the onset of the pandemic, coupled with the shift towards purchasing more durable goods, caused almost immediate supply chains stress. Beyond the stop and start, rise and fall patterns, consumer focus on specific types of goods – supply chains were not ready to act quickly enough. As stocks for these goods decreased rapidly, online orders continued, which caused increased production and the resulting demand for TEU capacity. One could also argue that the “winners” of the shift in consumption, such as furniture, appliances, and devices, are primarily large goods that take up even more container volume, which led to even more demand for capacity.

Overall, the pandemic consumption trends resulted in volume volatility and shifting demand for capacity, leaving shippers desperate to move goods and willing to pay exorbitant rates and relying on 3PLs for alternative routing.

The general cyclical nature of TEU capacity demand

Fleet capacity management is already complex during stable periods. As global fleet operators, carriers have difficulties adjusting short and long-term capacity to meet short and long-term shifts in demand. **Just as plant operators try not to turn production lines on and off repeatedly, due to the operational and financial costs of doing so, carriers try not to add and remove vessels from rotation on an ad-hoc basis.** Furthermore, the increasing size of vessels means that adding or removing a vessel has a bigger impact, in the same way a loudspeaker with only two settings is harder to calibrate than one with one through ten.

This has led to forming alliances to share space and cooperate on route coverage, with alliances eventually reaching over 80% of the total sea transportation market since they began taking shape in the 1990s. The alliances base their slot sharing by market analysis and forecasting, but despite their efforts to have total control of the usage of their assets, in 2020 and 2021, many find themselves facing a huge problem: the allocation of limited capacity within the network and the impact of overbooking practices.

Overbooking is a common practice for carriers. When they set up a service, they promise to depart from a determined point regardless of whether the ship is at full capacity or not. In order to avoid losing money and manage capacity utilization, they overbook space in case some shippers or NVOs cancel or can't fulfill the capacity projections. While in times of lower-than-expected volume, this helps keep capacity utilization high, in times of high shipping demand, overbooking ends in bottlenecks for (angry) shippers. At the same time, in times like these **the carriers must certainly be tempted by the availability of demand in the spot market, which might 10x or more revenue, compared to a previously tendered rate.**

On the other side of the overbooking are BCOs that often plan their TEU allocations months in advance and trust their carriers to honor their commitments as defined in the tender.

What they may not realize is that many other BCOs have oftentimes done the same and share the same expectations from the carriers. When a vessel is overbooked, the carriers will attempt to solve the issue by rolling the cargo or finding them the slots with other carriers within the alliance, which can come with an associated cost to be borne by the shipper. **This conflict between shippers and carriers ends with misunderstandings and a lack of accountability of assets.** Since this is a common practice, shippers have frequently been left frustrated and forced to pay unplanned costs outside their original projections.⁶

Given that the current dynamics have led to a rapid increase in rates, carriers may be reluctant to address the issues, in spite of the shipper dissatisfaction it can cause. After all, there are few alternatives, even though some shippers such as Home Depot have gone so far as to charter their own vessel.

It may be unrealistic to think that liners will end up solving problems that are only making them more profitable, **so some shippers are turning to allocation management as a potential solution.**

Allocation Management as a partial answer

Perhaps the shippers most affected by current capacity bottlenecks on the ocean freight market are BCOs that ship large cargo volumes globally because **they face constant exposure to market conditions and many different influences across their supply chain.** Despite running tenders, whether yearly, quarterly, or monthly to establish pricing and volume ahead of time, these companies struggle to track their performance against their allocations. As a result, **when a carrier denies a booking request or attempts to roll their cargo, the shipper is unable to reference the commitment** in a fact-based demand for space.

First, successful allocation management assumes the running of a successful tender. **One of the biggest logistical challenges in an industrial company, even if they procure freight through tenders, is a proper volume forecast and the "translation" of these numbers into the next global or regional tender.** Most companies use the historical data of the prior tender, leaving quantities to be tendered at the same level or adding a percentage to the old quantities as an expected increase. This may not account for actual volumes, but rather rely on the prior projected volumes which leaves room for error. Next, this "notional" quantity structure is split into port-pairs and receiving regions, which may have shifted. Finally, container sizes are chosen, and the tender is given to carriers or 3PLs for quotation.

Carriers, in turn, calculate the available capacity according to vessels operating on service strings, which reflects the port rotation on a service. One can already see here why volume nominations done by shippers to carriers/3PLs on a port pair basis, and the available vessel space (which is based on service strings), are rarely in line and lead to heated arguments when vessel space turns out to be scarce. **While the shipper believes it can still load 10 TEU from Rotterdam to Pusan with the nominated carrier, the latter's response that the allocation has already been used up and the booking cannot be accepted is incomprehensible to the shipper.**

In the face of such complexity and misalignment, **how can shippers make sure that the booked cargo will be loaded on the desired vessel with the appropriate departure and arrival dates?** The simple answer may be by using “modern Allocation Management.”

Logward’s Allocation Management starts by automatically loading the tender results of the shipper. Here, the volume by week, month, etc. and by port-pair, container size, calendar week, etc., are matched with the service string of the respective carrier in synchronization with the carrier viewpoint. **The result, available for easy viewing and searching, is the basis for a fact-based approach to transport planning.**

As the tender period begins, bookings are compared with allocations, tracking usage on the individual port-pairs and calendar weeks to maintain a clear view of open capacity. Based on this, at the next booking, a shipper can quickly see whether the carrier should be willing to accept their request, regardless of the carrier’s response. **When presented with documented proof of remaining allocations, carriers have less room for “storytelling” about capacity.** Not only can shippers draw meaningful conclusions and support their arguments in the present, but they can also adapt future tenders to actual needs and avoid undesirable developments by analyzing carrier adherence to commitments, blank sailings, and more.

The result is that both parties now have the same picture in real time, whether when trying to make a booking or discussing prior performance during the next tender. **As a provider of allocation management for large BCOs throughout 2020-2021, we have seen shippers:**

- Reduce booking rejections and rollings
- Recognize potential bottlenecks as their open allocations are used
- Improve OTIF performance
- Mitigate rate increases and avoid over usage of the spot market
- Maintain fact-based dialogue during stressful periods
- Use prior performance against projections as basis for tender and pricing discussions

In short, **this allocation management approach gave our shippers increased reliability and improved customer experience, and on the other hand, decreased unplanned costs with real-time transparency.**

Looking forward

In the face of unprecedented demand and supply shocks related to lockdowns and consumer behavior, and the slow burn of longer-term changes such as fleet capacity reduction, **shippers and logistics companies are saturated by information and awash in challenges.** Sometimes, rather than allowing oneself to get lost in the complexity, the answer is to try to sort out the basics of what, where, and when in a simple and clear way and to maintain open dialogue with service providers and customers alike. **This is exactly what solutions such as Logward’s allocation management tool provide.**

With no end in sight to the high freight rates and capacity shortages, **perhaps large shippers should emulate consumer lockdown behavior and look for home-improvement projects.** Where someone else needs a new appliance or a new hobby, **maybe your supply chain needs a new approach to procurement and allocations.**

Citations

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