Managing Headwinds: Commercial Airlines Find Opportunities in COVID Vaccine

Applied Value

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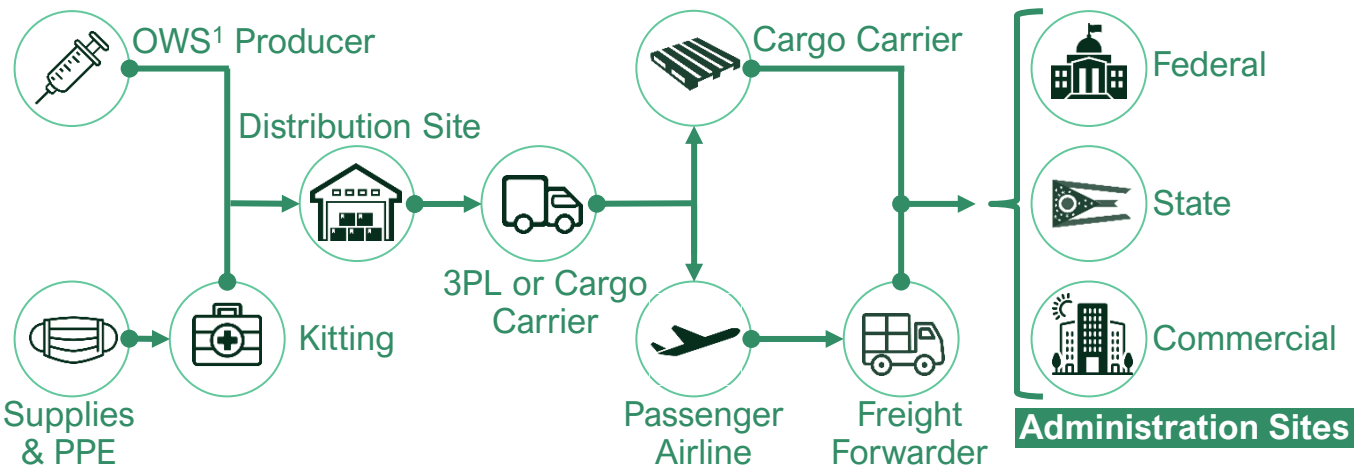
A vaccine and the need for commercial transport

As drug makers near COVID-19 vaccine approval, public health planners are anticipating another challenge: distribution. Once the FDA issues emergency authorization for any of the 13 vaccines in Phase 3 of clinical testing, drug makers will need to collaborate with governments and private industry to distribute billions of doses to the public.

Transporting billions of small, glass vials around the world at ultra-cold temperatures is no small task. To effectively distribute COVID-19 vaccinations, passenger airlines – one of the industries most shaken by COVID – will have the chance to play a critical role. United has already begun transporting Pfizer's vaccine ahead of FDA approval.

The International Air Transport Association expects vaccine shipments to require a volume equivalent to 8,000 fully-loaded Boeing 747s. A DHL study supported this conclusion, suggesting vaccine distribution will necessitate 15 million cold storage boxes. Such intensive transport requirements will likely mean mobilizing U.S. Air Force cargo planes and recruiting multiple years of support from commercial airlines.

Figure 1. COVID Vaccine Distribution and Administration Channels



Source: U.S. Department of Health and Human Services

While shipping cold storage is not entirely new for passenger airlines, the volume and scope of this effort is unprecedented. Increased complexities will require airlines to address potential bottlenecks, training needs, security concerns, and supplier risk management in novel ways.

Industry and society should care about how quickly vaccines can be shipped: a safe and widespread return to a pre-COVID lifestyle is dependent on widespread vaccination. Passenger airlines must be prepared to add the needed capabilities to support global vaccination efforts.

[1] *Operation Warp Speed*

Freight carriers cannot do the job alone

The challenge of capacity limitations and network viability

In the face of this unprecedented need, cargo carriers will require expanded support from passenger airlines. As evidenced by supply chain disruptions and delivery delays, cargo carriers are already strained by continued demand for PPE and e-commerce shipments, and holiday shipments will only exacerbate the problem.

Capacity levels capture the depth of this strain. Air cargo demand is down 12% since last year, which would typically result in poor financial performance. But due to reduced passenger airline flights, cargo capacity is down a staggering 25.2% causing cargo load factors to rise 10.6%. With capacity cut at nearly 3x the rate of contraction in demand, freighters are flying fuller than usual, and capacity remains a key concern.

Nowhere is the supply-demand imbalance clearer than in supervening shipping cost increases. Constrained capacity has shot yields up by more than 40%. Belly cargo freight rates have increased by 30-60% globally, and international cargo prices have nearly doubled on some major trade routes since the start of 2020.

Figure 2a. Air Cargo Prices, Indexed

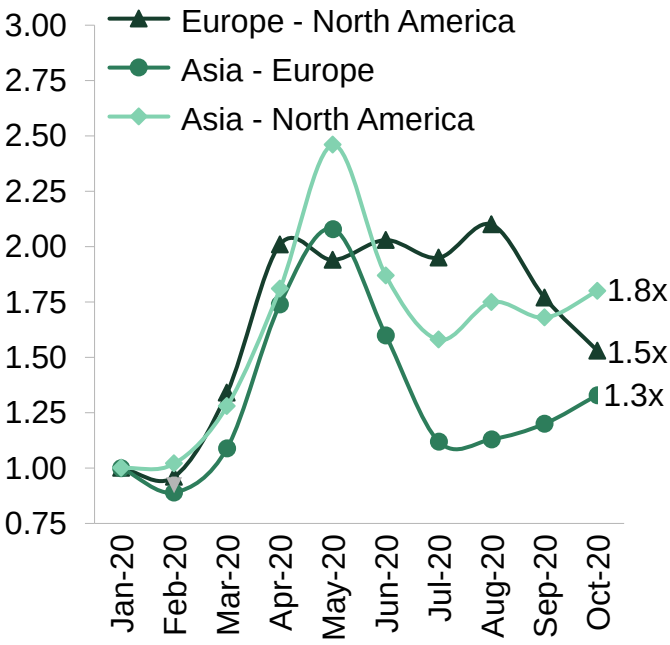
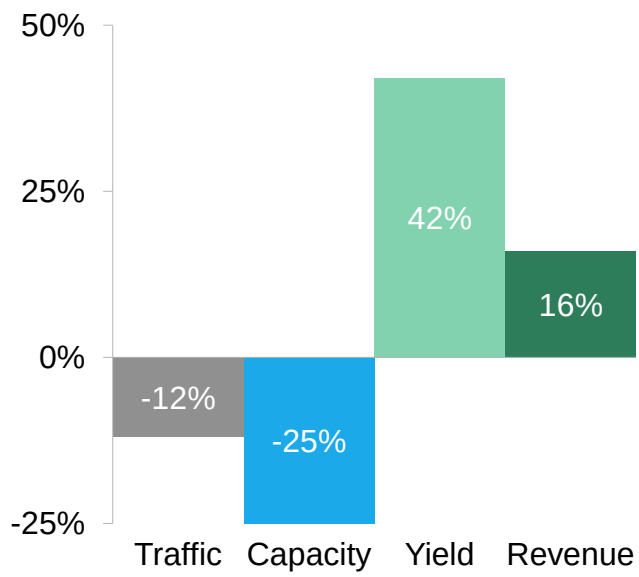


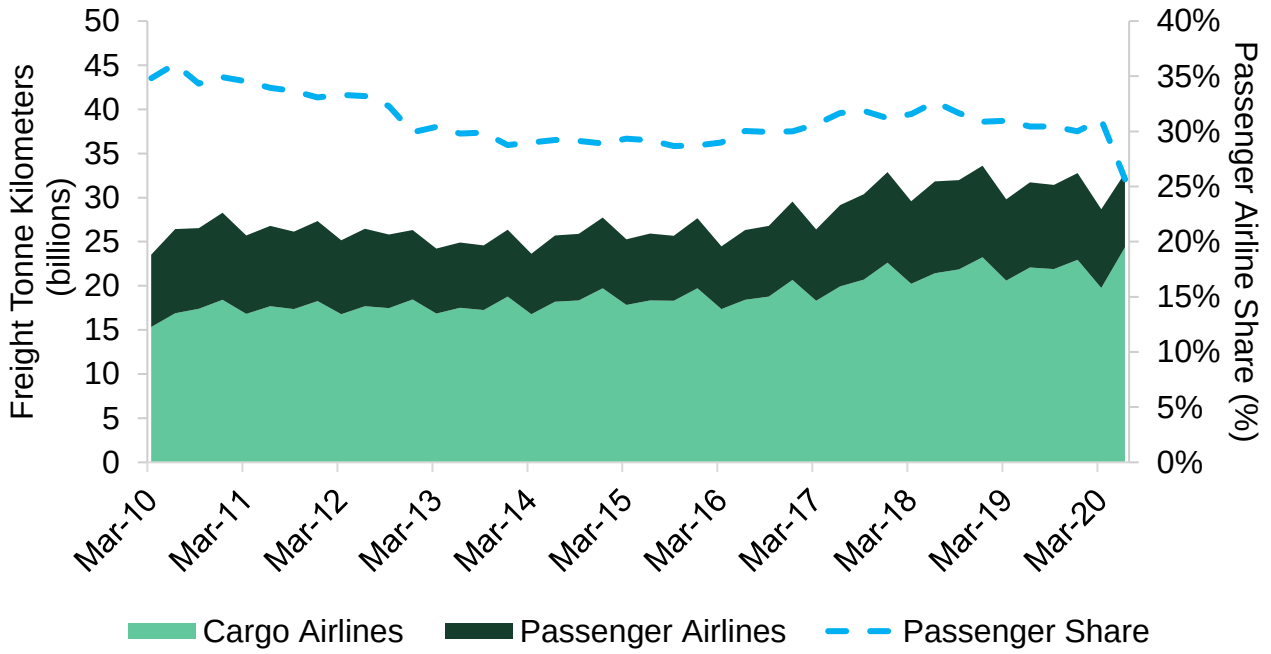
Figure 2b. Air Cargo Change, YoY



Source: TAC, IATA, Boeing

Passenger airline support with cargo shipping is not without precedent, particularly for temperature controlled (TC) cargo. Before pandemic times, roughly 60% of air cargo globally was flown in the belly-hold of passenger flights. Nearly 50% of all pharmaceutical shipments were also transported via passenger aircraft. Passenger airlines serve a wider array of destinations at higher frequencies, enabling them to get shipments closer to their final destinations faster, making them a prime fit for sensitive vaccine pharmaceutical shipping.

Figure 3. Air Cargo[1] Supply Segmentation



Source: U.S. Department of Transportation

Additionally, passenger airlines are suffering from the blow of COVID, and capacity shortages are severe. Airlines have retired hundreds of aircraft and daily frequencies are down 40%. Today, nearly 10,000 aircraft remain voluntarily parked. With passenger traffic in 2020 expected to be down 66% compared to 2019 levels, global airlines have little incentive to begin ramping up again. A COVID vaccine, however, could be the needed relief that can get planes in the air again.

Cold Storage Requirements

A shortage of cold chain infrastructure will complicate cargo carriers' ability to handle vaccine distribution. Pfizer's vaccine uses a new technology known as synthetic mRNA to activate the immune system against the virus and has proven 95% effective based on early results. To avoid spoilage, however, the vaccine must be kept at minus 94°F or below. Fully integrated freight carriers like UPS, FedEx, DHL who have robust cold chain capabilities will be first in line to distribute the influx of vaccine shipments.

UPS and FedEx have been already been bolstering cold storage capabilities. UPS built two freezer farms in Louisville, KY and the Netherlands near its main hubs. FedEx has approximately 90 cold chain facilities it began building a decade ago to support the H1N1 vaccination. However, their cold chain cannot independently handle the bow wave of unprecedented demand.

[1] *United States only, does not include mail*

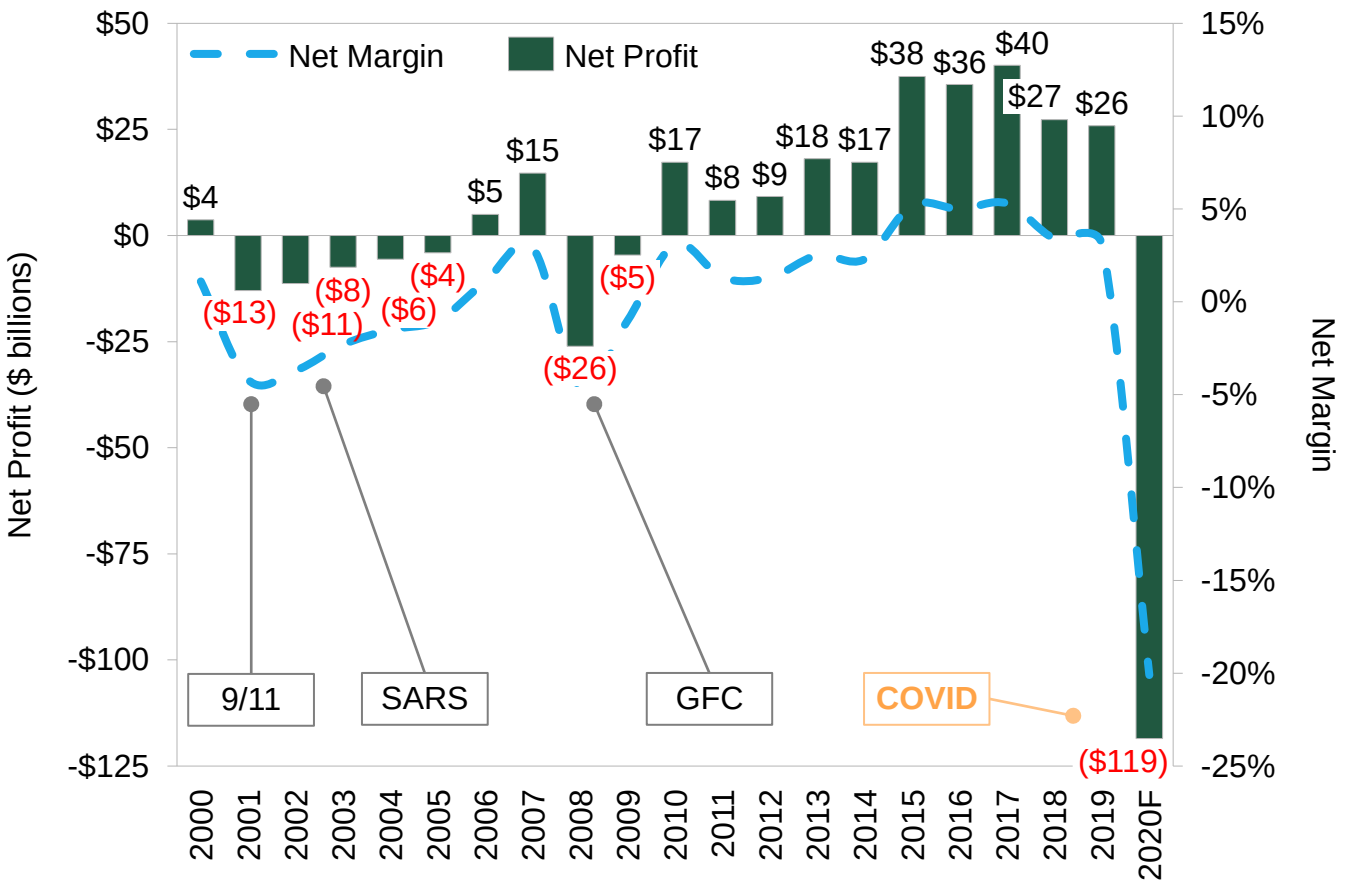
Pfizer is planning to purchase cargo space on an average of 20 planes per day to transport as many as 7.6 million doses daily. Some of those doses will arrive directly at their final destination, but most will require further processing. A shortage in cold storage capacity will make passenger airline participation necessary to reach remote vaccination centers that are underserved by freight carriers.

Drug companies are aware and anticipating that not all vials will be shipped through a dedicated cold chain, and the technology for commercial vaccine transportation will need to be put into place. Pfizer has preemptively developed a reusable suitcase-sized container that can keep thousands of doses for up to 10 days. With these capabilities, passenger airlines will have the opportunity to get in on the action.

Opportunities await

While the commercial airline industry has dealt with demand shocks before, COVID's impact dwarfs the effects of previous downcycles. Passenger airlines have been among the hardest-hit of all sectors, and 2020 will be the worst year in history for airlines with a forecasted net loss of $118.5 billion.

Figure 4. Global Airline Net Profit and Net Margin



Source: U.S. Department of Transportation, IATA

For a struggling industry, vaccine distribution presents an opportunity. Several converging incentives make vaccine distribution support a prudent decision for commercial airlines.

1. Revenue Capture and Diversification

Vaccine distribution could be a lifeline for revenue capture and diversification. Applied Value projects that air shipments of the COVID vaccine could represent a $3.7B opportunity, which would help offset low passenger revenue yields, already down 50.4% in 2020.

Cargo prices have also increased this year even before the vaccine, suggesting that price increases are likely which would support commercial revenue. With contracts all but guaranteed by the federal government, distribution presents a low-risk opportunity with potential long-term benefits in the form of multi-year distribution demand.

2. Operational Benefits

Vaccine shipments can also promote operational efficiencies. Airlines are unique; their product is created and consumed at the same time, meaning they must fly to turn a profit, but doing so demands large fixed costs. Vaccine distribution will incentivize increased levels of flying, which in turn affords tangible operational benefits. Namely, airlines will be able to keep planes out of storage, keep crews active, ensure pilots maintain recency requirements, and satisfy landing-slot allocation mandates.

3. Extra Capacity Already Exists

As of October 2020, passenger airlines are flying 60% full leaving valuable capacity unused. Due to the high fixed and semi-fixed costs of operating flights, adapting quickly by filling unused capacity with vaccines can help airlines recoup lost value.

International travel restrictions have disproportionately affected standard long-haul routes, leading to the underutilization of many widebody fleets. As freight forwarders prefer the palletized cargo capabilities of widebody aircraft, airlines should focus on repurposing this segment of their fleet first.

4. Humanitarian Relief

U.S.-based airlines received $25b in taxpayer aid in April to help keep them out of bankruptcy even after many spent billions over the last decade on share buybacks. As one of the only means in which the vaccines can be distributed quickly, over vast distances, and with a high level of security, airlines have a moral responsibility to provide their services to the public.

5. Positive Feedback Loop

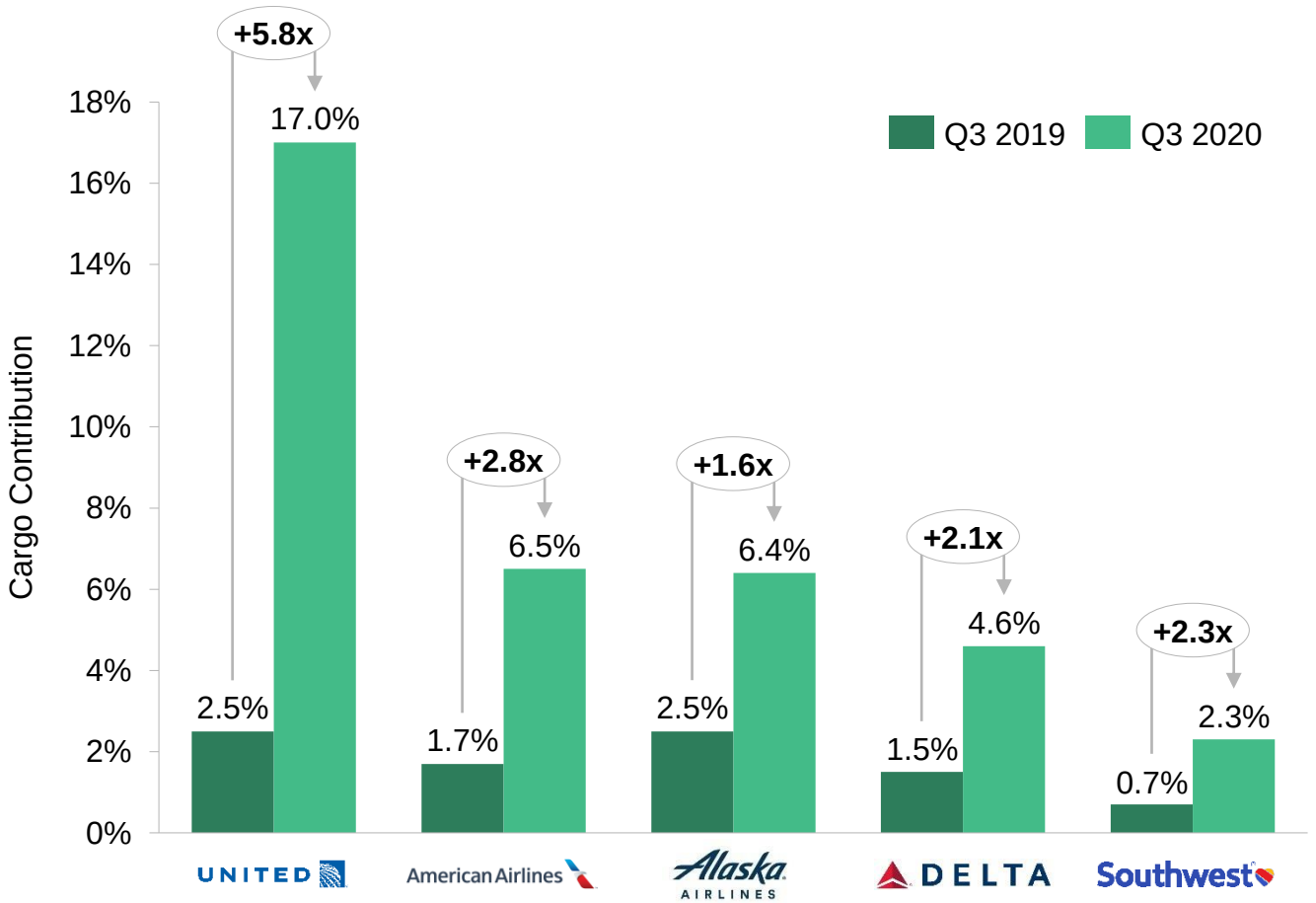
Finally, accelerating vaccine distribution is in airlines' own self-interest. The sooner populations are safe to travel free of health concerns, the sooner commercial airlines will reap the benefits of restored demand.

Airlines can prepare for a vaccine

The switch to cargo flights is already underway. Delta, United, and American have all started flying cargo-only flights during the pandemic to satisfy the immediate demand for lift. Even smaller airlines like Sun Country and Mesa have gotten in on the action, making deals with Amazon and DHL, respectively.

The five largest U.S.-based carries have all grown cargo revenue contribution year over year, although some have outpaced others. United grew its share of revenue attributable to cargo operations by a staggering 5.8x over the same quarter last year and was the only major U.S. carrier to post absolute cargo-related revenue gains in Q3.

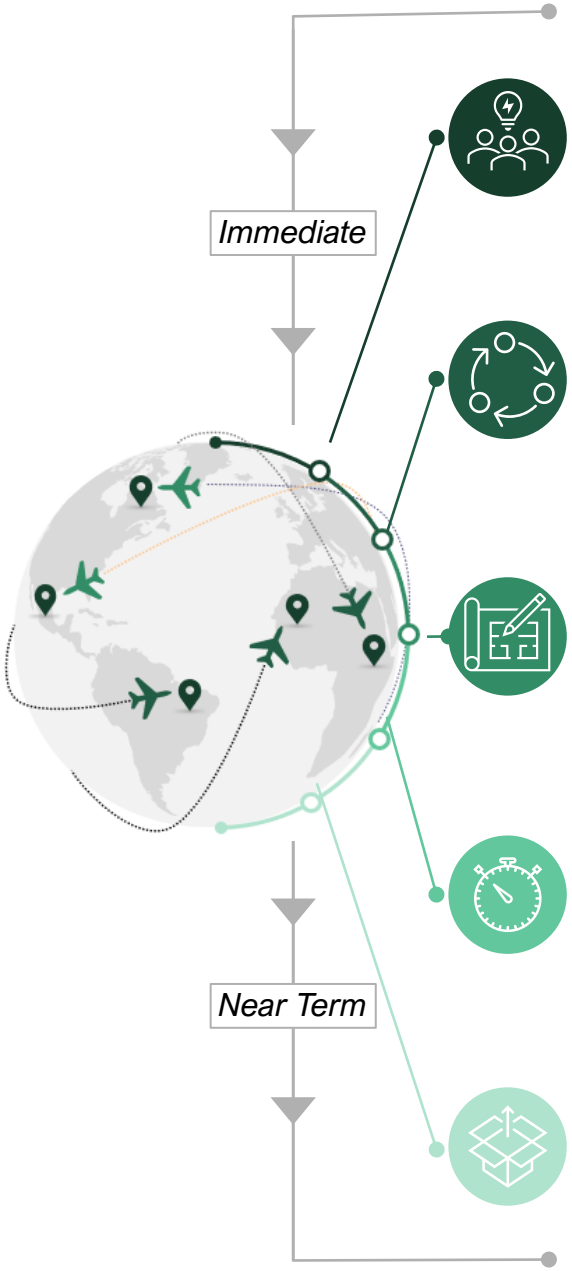
Figure 5. Top Five U.S. Carrier Cargo Revenue as a Percentage of Total Revenue



Source: Company reports

While airlines' increased emphasis on cargo puts them in a better spot than they would have been in 2019 to handle a COVID vaccine, specific actions are needed to prepare for the unique logistics requirements and ensure quick adoption once ready.

Figure 6. Preemptive COVID Vaccine Planning Steps



Task Force Creation

- Cross-functional team to assess gaps, identify opportunities, and assign responsibilities
- Operational committee needs ability, standing, and flexibility to affect change

Private & Public Collaboration Channels

- Leverage existing relationships as basis for pre-planning rapid distribution
- Formulate new partnerships to respond quickly to unexpected challenges

3PL Planning

- Distribution pickup and last mile solution frameworks
- Negotiate with freight carriers to take on neutral shipments, opening valuable cold chain capacity

Schedule & Capacity Planning

- Focus on specialized routes or those underserved by freight carriers to capture unmet demand
- Identify and plan for increased frequencies, staffing & loads on new or existing route network

Technical Planning

- Specify aircraft type, palletization, & ballast needs
- Compliance with dry ice limits[1] and load plans
- Train staff on temperature-controlled shipments and security protocols

Conclusion

Distributing COVID vaccines across the world is a mammoth undertaking that not only requires the development of new vaccines in record time but also the ability to distribute those vaccines efficiently and effectively.

Passenger airlines are facing a window of opportunity. By developing a go-forward strategy, anticipating supply chain disruptions, and maturing relationships and competencies, commercial airlines can benefit from new demand for cargo transport.

[1] *Widebodies typically limited to ~1,000kg due to gaseous output*

To improve and prepare for this operating pivot, airlines will need to engage in cross-industry collaboration and explore new business considerations regarding supply chain changes, partnerships, regulatory approvals, headcount planning, logistics, and more. Doing so will help passenger airlines return to the comfort of their pre-pandemic business models, and, more importantly, save countless lives in the process.

About Applied Value

Applied Value Group is a premier boutique management consulting, investment, and social impact firm with a global presence. We focus heavily on ROI and tangible bottom-line results for our clients. We service both global conglomerates as well as small and medium-size companies on improving their cost and capital productivity from our offices in New York, San Francisco, Stockholm, and Shanghai.

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