

## Forecast Highlights (2024–2044)

The U.S. commercial air carrier industry experienced a decade of relative stability, unprecedented in modern times, that extended from the end of the great recession in 2009 up to 2020 when COVID-19 emerged. During that period, U.S. airlines revamped their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel-efficient aircraft. To increase operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The results of these efforts were impressive: 2019 marked the eleventh consecutive year of profitability for the U.S. airline industry.

The outbreak of the COVID-19 pandemic in 2020, however, brought a rapid and cataclysmic end to those boom years. Airline activity and profitability tumbled almost overnight and without the financial and competitive strength built up during the boom, airlines would have faced even greater challenges. As it was, they were able to slash capacity and costs, and then, relying on their balance sheets, credit ratings and value inherent in their brands, to raise capital through borrowing and restructuring fleets allowing them to withstand the period of losses. Although several small regional carriers ceased operations in 2020, no mainline carriers did. Cargo activity was one of few bright spots as it surged, boosted by consumers purchasing goods to enhance time spent at home as necessitated by the pandemic, and by surface transportation disruptions caused by worker shortages due to COVID-19 illnesses.

In 2022, each passenger carrier across the industry continued to face generally similar headwinds and tailwinds as the others. Demand for travel to leisure destinations domestically and in the Latin region surged. Carriers were caught off guard and struggled to bring aircraft back into service, open new routes and hire staff to meet the demand. Just as all carriers were impacted by the challenges, they also generally all benefitted from the resurgent desire to travel and the two-year string of quarterly losses for the industry was halted.

Then in 2023 the landscape changed again. As a wider array of accessible destinations opened up, travelers responded by seeking flights across the Atlantic and to some Pacific markets. Domestic and Latin activity remained solid, but it didn't match the increases of those other regions or of its own growth the year before. Besides that regional shift, passengers also began to embrace premium offerings and loyalty programs more fully. Increasingly, passengers were willing to pay for some additional comfort and valued the ability to convert everyday credit card purchases into airline miles. These shifts and greater demand for product differentiation meant that most LCCs, with single-class service and domestic-heavy networks, were unable to capture demand to the extent the mainline carriers could. Furthermore, after being unprepared for the surge in demand in the previous year, all carriers hired and added capacity aggressively in 2023 in efforts to avoid a repeat. This saw flight crews migrating up the chain to mainline carriers and the added capacity put downward pressure on fares in many domestic markets, both of which

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added to the strains some, but not all, carriers faced. Aircraft delivery delays and manufacturing missteps also worked asymmetrically to dampen productivity of some airlines but not others.

Even as carriers worked to accurately assess shifting preferences and fine tune the supply response, the overall level of demand was strong and supportive of the industry's aggregate results. Consumer demand for experiences over goods continued to fuel the desire for leisure trips and a willingness to pay higher fares that exceeded their 2019 levels. Meanwhile, business travel (but not fares) remained depressed relative to 2019. For the year, business demand was roughly ten to twenty percent below its pre-pandemic level. The strong overall demand led to positive aggregate financial results but with losses at some carriers. For all of CY2023, the top eight U.S. passenger carriers posted operating profits of \$12.7 billion and net profits of \$8.0 billion, including losses at three of the eight.

The business modifications necessitated by the downturn will shape the industry for years to come, long after the recovery is complete. Primarily, airlines will be smaller having retired aircraft and encouraged voluntary employee separations. Fleets, however, become younger and more fuel-efficient as retirements targeted the oldest and the least efficient aircraft.

In the medium-term, airlines will strive to determine which shifts in demand that occurred following the pandemic will be long-lasting and which will fade as impacts of the pandemic recede. For example, the surge in demand for travel to Florida and Caribbean leisure destinations seems to be waning and reverting to pre-pandemic levels. Similarly, the changes to travel patterns – both day-of-

week and time-of-day – due to fewer business trips and more hybrid business and leisure trips have been partially unwound but may not fully revert. On the other hand, many carriers are investing in premium cabins with the expectation that customers will continue to be willing to pay for upgraded experiences. Although that willingness has been very evident during the past two years, it is not certain to continue. Furthermore, trade tensions that emerged during the pandemic have weighed on some international traffic, particularly to China and other parts of Asia. This will likely continue to lag activity in other regions, but the duration is unknown.

In the long run, many of the strengths and capabilities developed over during decade between the end of the great recession and the onset of COVID-19 will become evident again. There is confidence that the U.S. airline industry as a whole has finally transformed from a capital intensive, highly cyclical industry to an industry that can generate solid returns on capital and sustained profits.

Fundamentally, over the long-term, aviation demand is driven by economic activity, and a growing U.S. and world economy provides the basis for aviation to grow. The 2024 FAA forecast calls for U.S. carrier domestic passenger growth over the next 20 years to average 2.5 percent per year. This average, however, includes robust growth in 2024, as activity returns to pre-pandemic levels. Following the recovery period, trend rates resume with average growth through the end of the forecast of 2.3 percent. Annual domestic passengers in 2024 are forecast to exceed 2019 levels by 6 percent.

After averaging \$55 per barrel over the five years ending in 2021, oil prices surged to \$93 per barrel with the Russian invasion of Ukraine in 2022 but then moderated to \$78

dollars per barrel in 2023. Prices are forecast to remain at about that level for a few years before climbing slowly to reach \$107 per barrel at the end of the forecast period.

Just as U.S. economic activity drives domestic demand for air transport, foreign economic activity affects international travel demand. In 2021, global real GDP rose above 6 percent, driven by worldwide pandemic relief programs. As central banks raised interest rates to restrain inflation caused by demand imbalances, growth moderated to 2.7 percent in 2023. The forecast for growth in 2024 is for a continued slight slowing to 2.3 percent. The U.S. and the Latin America region slow somewhat below that level but Europe experiences much slower growth with some individual countries seeing outright declines. The Asia region, however, supports the global figure with growth over 4 percent. Beginning in 2025, global growth returns close to trend rates although some individual countries take longer.

System traffic in revenue passenger miles (RPMs) is projected to increase by 2.7 percent a year between 2024 and 2044. Domestic RPMs are forecast to grow 2.6 percent a year while International RPMs are forecast to grow slightly faster at 2.8 percent a year, as international RPMs have almost fully recovered to pre-COVID (2019) levels in FY2023. Thus, unlike prior forecasts, these figures will not be boosted by several years of high growth rates coming off the low levels of 2021 and 2022. System capacity as measured by available seat miles (ASMs) is forecast to grow somewhat slower than RPM during the recovery period as airlines seek to restore load factors but, subsequently, ASM grow in line with the increases in demand.

After U.S. carriers posted profits in FY 2023, the FAA expects U.S. carriers to remain

profitable over the next few years as rising demand -- despite higher fares -- more than offsets higher costs for labor and fuel. As carriers return to levels of capacity consistent with their fixed costs, shed excess debt, and yields stabilize, consistent profitability should continue. Over the long term, we see a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than overall inflation, reflecting growing U.S. and global economies.

Recovery of the general aviation (GA) sector from the impact of the COVID-19 crisis was faster than the airlines. Private aviation had become an attractive substitute for wealthier individuals who could afford to pay during the heaviest times of the pandemic. Some reversal in this trend has been observed among the turbojet users offering rides to extended family and friends, even though many of these newcomers continue to fly privately. At the lower end of the general aviation use, mostly by single engine piston powered aircraft, we see highest numbers in the past three decades attracted to flying and becoming student pilots, and highest numbers among them since 1995 earning their private pilot certificates. Other pilots contributing to GA activity more than ever included private pilots earning their commercial pilot certificates and commercial pilots becoming Air Transport Pilots (ATP) as the new pilot certifications in these two categories reached new peaks in 2023. The long-term outlook for general aviation thus is promising, as growth at the higher-end offsets continuing retirements at the traditional low end, mostly piston-powered part of the sector. The active GA fleet is forecast to increase by 9.0 percent between 2024 and 2044. The turbine aircraft fleet, including rotorcraft, did not show a decline

between 2019 and 2022, and in fact, experienced a fast growth of 3.6 percent from 2021 to 2022. This fleet is projected to have an average growth rate of 2.0 percent per year during the forecast period. The total piston fleet (single and multi-engine pistons, light-sport aircraft, and piston rotorcraft) declined by 2.7 percent between 2019 and 2022 and is estimated to have shrunk by an additional 0.4 percent in 2023. The average annual growth rate of the piston fleet between 2023 and 2044 is forecast to be -0.1 percent. Including experimental aircraft, the majority of which are pistons, the growth rate of the combined fleet is flat over the forecast period, with a total growth of less than one percent in 21 years. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed wing piston aircraft will continue to shrink over the forecast period, just to be offset by the growing experimental aircraft fleet. Any additional growth in the GA fleet is expected to occur in turbine aircraft. Despite average annual growth of the active GA fleet between 2022 and 2044 of 0.4 percent, the number of GA hours flown is projected to increase by 17.4 percent during this period (an average of 0.7 percent per year), as growth in turbine, rotorcraft, and experimental hours more than offset declines in fixed wing piston hours.

With robust air travel demand growth in 2024 and steady growth thereafter, we expect increased activity growth that has the potential to increase controller workload. The continuing recovery in U.S. airline activity from the COVID downturn is the primary driver. The U.S. commercial aviation sector was hit by the pandemic much harder than the non-commercial sector. Operations at FAA and Contract Towers returned to pre-COVID levels in 2023 and are forecast to

grow from these levels, led by strong growth in commercial operations. Large and medium hubs will continue to see faster increases than small and non-hub airports, largely due to the commercial nature of their operations. Over the entire forecast period, operations at FAA and contract towers are forecast to grow 1.1 percent a year with commercial activity growing at approximately four times the rate of non-commercial (general aviation and military) activity.

Commercial Space launch activity has been steadily growing over the past 5 years. FY2023 actuals were the highest in U.S. history at 113, accounting for 16.7% of the activity since 1989. FAA is forecasting launch and re-entry activity to increase from a low-high range of 134-156 in FY2024 to a low-high range of 195-338 by FY2028. Much of this increase is attributable to the lineup of reusable vehicles and the expectation for increased human space exploration and space tourism.

Drones have been experiencing healthy growth in the United States and around the world over the past decade. The last few years have been no exception despite the profound impact of COVID-19 on the overall economy. The introduction of drones in the NAS has opened numerous possibilities, especially from a commercial perspective. That introduction has also brought operational challenges including safe and secure integration of drones into the NAS. Despite these challenges, the drone sector holds enormous promise; potential uses range from individuals flying solely for recreational purposes to individual businesses carrying out focused missions to large companies delivering commercial packages and delivering medical supplies. Public service uses, such as conducting search and rescue support missions

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following natural disasters, are proving to be promising as well. The FAA forecasts that the recreational small drone fleet will likely (i.e., base scenario) attain its peak over the next 5 years, from the present 1.78 million units to approximately 1.88 million units by 2028, thus attaining cumulative annual growth rate of 1.2% during 2023-2028. Based on registration data, the size of the commercial drone fleet (> 0.5 lbs. and up to 55 lbs.) totaled approximately 842,000 aircraft by the end of 2023. As the base (i.e., the cumulative total) increases, the FAA anticipates the growth rate of the sector to slow over time, and forecasts the commercial drone fleet to (i.e., base scenario) be about 1.12 million by 2028.

Another sector showing promise is Advanced Air Mobility (AAM). Based on research performed by others, the FAA believes that AAM will likely enter into service (EIS) in the 2025-2027 timeframe. Starting from limited services to initial launch cities, services will be experimental, slow, and likely gain a gradual trajectory of growth until 2030. We expect that initial 5 years or so will be required to resolve many outstanding issues including establishing solid AAM business cases. Depending upon the sector's resolving the outstanding issues, this will be followed by a moderate service trajectory during 2030-2040. Beyond that period, we anticipate a sustainable, mature sector on a longer-term growth trajectory.