Federal Aviation Administration

# FAA AEROSPACE FORECAST

## FISCAL YEARS 2025-2045

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# Forecast Highlights (2025–2045)

The U.S. commercial air carrier industry has managed several years of tumultuous supply and demand environments. 2019 saw the last of ten years of unprecedented stability with lower costs and capacity discipline leading to solid profitability. Then, with the onset of the pandemic in 2020, demand collapsed overnight, bringing profitability down as well. The recovery began in 2022, but it was so uneven across markets and passenger segments that it was nearly impossible to plan for. Domestic leisure traffic surged, followed by Latin and finally Atlantic markets in 2023, but Pacific traffic still lags its 2019 levels and overall business traffic remains below trend. In addition, supply chain disruptions and manufacturing missteps continue to plague aircraft production, resulting in delays and overall unpredictability of deliveries.

In 2024, the environment continued to shift as some carriers benefited more than others and overall weakness appeared as the year progressed. Passengers continued to display a preference for premium and international travel, desires that strengthened following the depths of the pandemic as their focus moved from spending on goods to experiences. That evolution helped spur a surge in travel across the Atlantic but suppressed domestic travel. However, carriers increased domestic capacity in anticipation of a repeat of 2023 that didn't occur, leaving the market oversupplied and resulting in a drop in yields and profitability. The importance of premium travel to passengers became even more evident and, by the end of the year, carriers whose business strategies shunned premium products began to implement or plan for such offerings. Taken together, these shifts meant that carriers with broad international footprints, a wide range of fare classes and other perceived benefits were able to operate profitably while others posted losses. In 2024, the top eight U.S. passenger carriers posted net profits of $6.4 billion, including losses at two carriers that totaled $2.0 billion, and were down from $8.0 billion in 2023.

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 recent 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 the 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 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 2025 FAA forecast calls for U.S. carrier domestic passenger growth over the next 20 years to average 2.4 percent per year. Passenger growth is forecast to be slightly higher in the first 10 years of the forecast horizon compared to the last 10 years of the forecast.

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 and 2024. Prices are forecast to remain at about that level for a few years before climbing slowly to reach $99 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 2.8 percent in 2024. The forecast for growth in 2025 is for a continued slight slowing to 2.5 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 at about 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 2.8 percent a year between 2025 and 2045. Domestic RPMs are forecast to grow 2.7 percent a year while International RPMs are forecast to grow slightly faster at 2.8 percent a year. System capacity as measured by available seat miles (ASMs) is forecast to grow slightly slower than RPMs over the forecast horizon.

In aggregate, U.S. carriers posted profits in FY2024, although not all carriers or quarters were profitable. 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 continue to moderate capacity growth, pay down debt, innovate their products and maintain pricing power, consistent profitability should emerge. 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.

The general aviation (GA) sector has been experiencing fast growth following the recovery from the impact of the COVID-19 crisis as private aviation became an attractive substitute for wealthier individuals. This trend is reversing and the growth in GA

activity is slowing down, in both the higher end turbine and the lower end piston segments of general aviation use. Flight hours by single-engine piston powered aircraft, most frequently used in training, have shown record increases in the past few years as the highest numbers in new pilot certifications in almost all categories have been recorded. While this increase is softening, FAA expects turbine activity, mostly used in business and closely follows economic growth, to remain robust in the long run, with possible fluctuations in the near term. 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 10.6 percent between 2025 and 2045. The turbine aircraft fleet, including rotorcraft, did not show a decline between 2019 and 2023, and continued its fast growth of 3.6 percent in 2022 and 2.3 percent growth in 2023. This fleet is projected to have an average growth rate of 2.1 percent per year during the forecast period. The total piston fleet (single and multi-engine pistons, and piston rotorcraft) declined by 1.6 percent between 2019 and 2023 and is estimated to have shrunk by an additional 0.4 percent in 2024. The average annual growth rate of the piston fleet between 2025 and 2045 is forecast to be -0.1 percent. When experimental aircraft are included, the majority of which are pistons, the growth rate of this combined fleet is 0.04 percent per year over the forecast period, with a total growth of 0.8 percent by 2045. 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 in the next 20 years, 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 an average annual growth of 0.5 percent of the active GA fleet between 2023 and 2045, the number of GA hours flown is projected to increase by 19.0 percent during this period (an average of 0.8 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 2025 and steady growth thereafter, FAA expects increased activity growth that has the potential to increase controller workload. U.S. airline activity has recovered from the COVID downturn and is projected to see steady growth over the forecast horizon driven by growing passenger and traffic volumes. Operations at FAA and Contract Towers were 5.0 percent above pre-COVID levels in 2024 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 almost four times the rate of non-commercial (general aviation and military) activity.

Commercial Space launch activity has been steadily growing over the past 6 years. FY2024 actuals were the highest in U.S. history at 148, accounting for 17.0% of the activity since 1989. FAA forecasts launch and re-entry activity to increase from a low-high range of 174-183 in FY2025 to a low-high range of 259-566 by FY2034. Much of this increase is attributable to the lineup of reusable vehicles, satellite deployment and replacement, and the expectation for

increased human space exploration and space tourism.

The drone segment has 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 National Airspace System (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 medical supplies. Public service uses, such as conducting search and rescue support missions following natural disasters, are proving to be promising as well. The FAA forecasts that the recreational small drone fleet will (i.e., base scenario) attain its peak over the next 5 years, from the present 1.87 million units to approximately 1.93 million units by 2029, thus attaining a cumulative annual growth rate of 0.7 percent between 2024 and 2029. Based on registration data, the size of the commercial drone fleet (> 0.5 lbs. and up to 55 lbs.) totaled approximately 966,000 aircraft by the end of 2024. 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 1.18 million by 2029.

Another sector showing promise is Advanced Air Mobility (AAM). Based on research performed by others, the FAA believes that AAM entry into service (EIS) is likely 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. It is expected that the initial five years after EIS will be required to resolve many outstanding issues including establishing solid AAM business cases. Depending upon the sector’s resolution of the outstanding issues, the 2030-2040 timeframe will see a moderate growth trajectory. Beyond that period, FAA anticipates a sustainable, mature sector on a longer-term growth trajectory.

# Review of 2024

As the US aviation industry entered the fourth year since the start of the COVID-19 pandemic and approached the one-year anniversary of the end of the public health emergency, it finally surpassed 2019 levels of both domestic and international RPMs. Domestic passengers also exceeded 2019's level, a milestone international passengers achieved the previous year. However, the industry continued to grapple with conditions that were still evolving in response to the pandemic. After being caught somewhat unprepared in 2023 for the surge in demand, carriers feared a repeat in 2024. To ensure sufficient capacity to match projected demand, carriers increased utilization and added aircraft even as they were hindered somewhat by delivery delays of new aircraft. As the year progressed, excess capacity became evident, particularly in leisure markets, and yields moved lower. Demand that had showed strength in domestic markets in 2023 had shifted its interest to international markets in 2024. Premium product demand, however, continued and benefited carriers with such offerings. Low-Cost Carriers (LCCs) generally lacked both premium and long-haul international products, constraining their ability to capitalize on those areas of demand strength and harming their outlooks. Mainline carriers were impacted by a business travel recovery surge that never materialized, growing slowly and generally remaining below pre-pandemic volumes. By the end of the year and the busy holiday season, carriers had started to rein in capacity growth and reduce it in some areas, leading to a solid improvement in profitability.

Air cargo activity pulled back from the boost it received during the pandemic, consistent with the normalization of consumer spending from goods back into services. The general aviation segment saw growth in aircraft deliveries, although total flight hours were little changed from the year before. Unmanned Aircraft System(s) (UAS) activity grew solidly, and commercial space launches surged in 2024, both of which had expanded in 2023.

U.S. system passengers grew to 8 percent above 2019 levels with domestic levels 6 percent higher and international 24 percent higher. Transportation Security Administration (TSA) checkpoint throughput reflected this activity and comfortably exceeded 2019's levels. In 2024, average daily throughput was 2.39 million passengers compared to 2.28 million in 2023 and 2.25 million in 2019. International leisure traffic, mainly in the Atlantic and Latin regions, drove much of the strength during the year. In the business segment, activity increased but never displayed a recovery surge as leisure traffic had done previously. Consistent with reduced business travel, reports indicated that office occupancy rates in major metro areas remained at about half of 2019 levels, where they had been for more than a year.

The overall increase in activity supported industry employment during 2024 after a slowdown in 2023. According to the Bureau of Transportation Statistics (BTS), airline employment rose during the year with an average increase of about 1,400 jobs per month, not far below the pre-pandemic rate in 2019 of 1,500 per month. At year end, employment was 66,000 higher than in December 2019 and the staffing issues of previous years had largely dissipated.

Attrition rates were returning to normal, regional carriers had the crews needed to build back operations, and some carriers were pausing hiring. The FAA increased its hiring of air traffic controllers as it worked to eliminate shortages at some facilities. In FY2024, the FAA met its hiring goal of 1,800 controllers, bringing the total number in training to about 3,400.

In FY2024, system traffic as measured by RPMs grew 9.1 percent from the previous year while system enplanements rose 7.0 percent and were 7.6 above 2019 levels. Domestic RPMs were 5.5 percent higher while enplanements were up 5.9 percent. International RPMs increased by 18.4 percent after increasing by more than 36 percent in 2023, while enplanements rose by 15.6 percent – the relative difference due to the pickup in long-haul Atlantic markets. Despite being hampered by constraints, system ASM grew faster than RPMs, up 9.9 percent with domestic ASM growing 6.0 percent and international up 20.3 percent. As a result, the system-wide load factor fell 0.7 percent to 83.1 percent.

System nominal yields fell in 2024, down 2.9 percent after rising 8.2 percent in 2023. Several factors contributed, primarily the addition of excess capacity in lower yielding leisure markets (Florida, Caribbean). On the demand side, consumers were eager to travel as demand remained robust and, in aggregate, tolerated the fare increases.

With the surge in activity during the year, financial results improved as well. Data for FY2024 shows that the reporting passenger carriers had a combined operating profit of $14.7 billion – a number approaching the average profit of $22.1 billion over the five years ending in FY2019 but not beginning to recover the $58 billion in combined losses in 2020 and 2021. As with operations, profitability was uneven throughout the year as combined profits were just $26 million during the March quarter. On the other hand, strong activity during the June quarter generated profits of $7.7 billion that rivalled pre-pandemic highs.

The general aviation industry continued its growth in CY2024 with an increase of 3.1 percent in deliveries of U.S. manufactured aircraft from the previous year (22.5 percent above its 2019 levels), Deliveries of piston aircraft were up by 5.4 percent while turbine deliveries were up by 0.4 percent (business jet segment of turbines were up by 4.1 percent). Global billings increased by 14.3 percent to $26.7 billion (13.7 percent above 2019 levels), however specific figures for U.S. factory billings were not available as of the publication date of this report.

Total operations in 2024 at FAA and contract towers increased by 3.6 percent compared to 2023, the fourth consecutive year of growth. Air carrier activity increased by 5.5 percent, exceeding pre-COVID (2019) levels, while air taxi operations rose by 4.3 percent. General aviation activity increased by 3.5 percent and military activity was down by 11.2 percent. Activity at large and medium hubs rose by 4.1 percent and 3.4 percent, respectively, while small and non-hub airport activity rose by 4.2 percent in 2024 compared to the prior year.

# Glossary of Acronyms

| Acronym | Term |
|---|---|
| **AAM** | Advanced Air Mobility |
| **ANG** | FAA Office of NextGen |
| **ARP** | FAA Office of Airports |
| **ASMs** | Available Seat Miles |
| **AST** | FAA Office of Commercial Space Transportation |
| **ATC** | Air Traffic Control |
| **ATO** | FAA Air Traffic Organization |
| **ATP** | Air Transport Pilot |
| **AUVSI** | Association for Unmanned Vehicle Systems International |
| **BVLOS** | Beyond Visual Line of Sight |
| **CAPS** | COA Application Processing System |
| **CBP** | Customs and Border Patrol |
| **CFR** | Code of Federal Regulations |
| **COAs** | Certification of Authorizations |
| **CORSIA** | Carbon Offsetting and Reduction Scheme for International Aviation |
| **CRS** | Commercial Resupply Services |
| **CY** | Calendar Year |
| **DARPA** | Defense Advanced Research Projects Agency |
| **DHS** | Department of Homeland Security |
| **DoD** | Department of Defense |
| **DoE** | Department of Energy |
| **DoI** | Department of Interior |
| **EIS** | Entry Into Service |
| **EMS** | Emergency Medical Services |
| **eVTOL** | Electric Vertical Take-off and Landing |
| **FAA** | Federal Aviation Administration |
| **FRIA** | FAA-Recognized Identification Areas |
| **FY** | Fiscal Year |
| **GA** | General Aviation |
| **GAMA** | General Aviation Manufacturers Association |
| **GC** | Grand Challenge |
| **GDP** | Gross Domestic Product |
| **ICAO** | International Civil Aviation Organization |
| **IFR** | Instrument Flight Rules |
| **IMF** | International Monetary Fund |
| **ISS** | International Space Station |
| **LAANC** | Low Altitude Authorization and Notification Capability |
| **LCC** | Low-Cost Carriers |
| **LSA** | Light Sport Aircraft |
| **lUAS** | Large Unmanned Aircraft System(s) |
| **NAS** | National Airspace System |
| **NASA** | National Aeronautics and Space Administration |
| **NDAA** | National Defense Authorization Act |
| **NOTAM** | Notices to Airmen |
| **NPRM** | Notice of Public Proposed Rulemaking |
| **PCE** | Personal Consumption Expenditure |

| | |
|---|---|
| **PDARS** | Performance Data Analysis and Reporting Systems |
| **RAC** | Refiners' Acquisition Cost |
| **RLV** | Reusable Launch Vehicle |
| **RP** | Remote Pilot |
| **RPA** | Remote Pilot Authorization |
| **RPMs** | Revenue Passenger Miles |
| **RTMs** | Revenue Ton Miles |
| **sUAS** | Small Unmanned Aircraft System(s) |
| **SpaceX** | Space Exploration Technologies Corp. |
| **TRACON** | Terminal Radar Approach Control |
| **TRB** | Transportation Research Board |
| **TSA** | Transportation Security Administration |
| **UAM** | Urban Air Mobility |
| **UAS** | Unmanned Aircraft System(s) |
| **UASFM** | UAS facility maps |
| **USD** | United States Dollar |
| **VFR** | Visual Flight Rules |

# Acknowledgements

This document was prepared by the Forecast and Performance Analysis Division (APO-100), Office of Aviation Policy and Plans, under the direction of Roger Schaufele and Michael Lukacs.

Special thanks to Roger Schaufele for his many years of service to the FAA and developing the Aerospace Forecast. Roger retired in 2025 after nearly 25 years of excellence in aviation forecasting.

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APO Websites

- Forecasts and Statistical publications http://www.faa.gov/data_research/aviation_data_statistics/
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# FAA Aerospace Forecasts
# Fiscal Years 2025-2045

# Economic Environment

In 2024, global real GDP expanded but continued its gradual deceleration from the spike in the second year of the pandemic. GDP surged by 6.4 percent in 2021 but slowed to 2.7 percent in 2024, a few tenths slower than the average over the decade prior to the pandemic. During the pandemic, inflation spiked, and government deficits swelled, conditions that monetary and fiscal authorities have worked to combat with higher interest rates and reduced spending – efforts that have restrained economic growth. Global GDP is expected to ease further in 2025 to 2.5 percent due to still-elevated interest rates, before edging up a couple of tenths to approach its long-term trend rate.

In the U.S., real GDP growth slows from 2.9 percent in FY2024 to 2.1 percent in FY2025 and 1.7 percent in FY2026. This "soft landing" scenario projected by S&P Global results from a combination of still-high interest rates, fading impacts from COVID relief measures, and slowing growth of household wealth. Accompanying slowing growth, unemployment begins to rise, with rates increasing from 3.9 percent in FY2024 to 4.4 percent, 4.7 percent and then 4.8 percent in the three subsequent years. This restrains demand but also inflation which allows the Federal Reserve to lower interest rates steadily through the end of the decade. Dampened demand, however, shows up in restrained consumer spending which grows 2.7 percent in FY2024, 2.6 percent in FY2025 and 1.7 percent in FY2026 before returning to trend at over 2 percent. After FY 2026 through the end of the forecast, GDP growth averages 1.7 percent per year and the unemployment rate stabilizes at 4.2 percent. As with other advanced economies, U.S. GDP growth is hindered by an aging population that slows labor force growth and contributes to the decline in the participation rate.

Compared to the U.S., real GDP growth in the European Union plus U.K. is considerably weaker in 2024 at 0.9 percent and again at 1.1 percent in 2025. From there, growth bumps up to 1.5 percent before settling to its trend rate of about 1.3 percent. Aggressive deficit reduction efforts, high interest rates and population growth that turns negative in 2025 all dampen GDP growth.

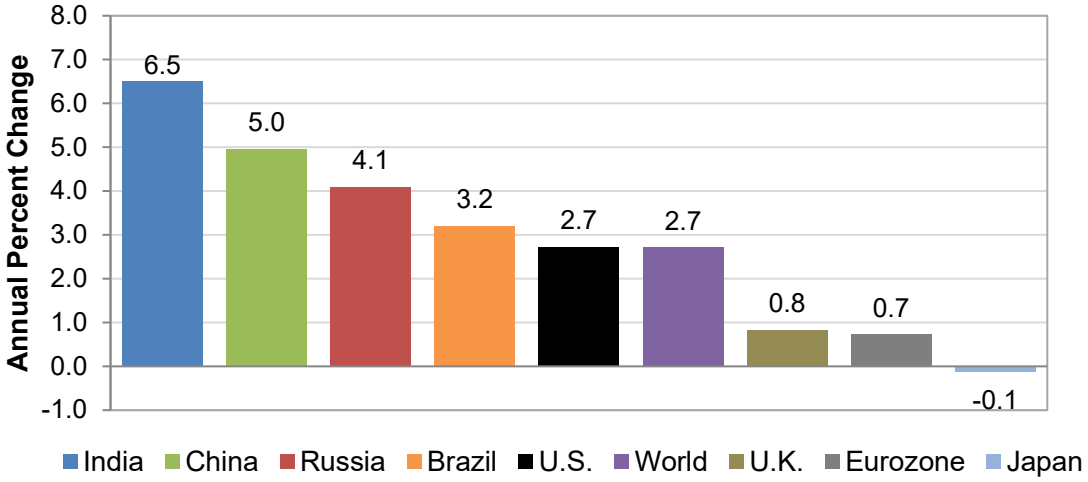
In Japan, owing to sluggish consumption and exports, GDP declined by a slight 0.1 percent in 2024. Growth strengthens to 1.0 percent in 2025 with increased consumption from elevated wage growth and moderating inflation, although exports remain under pressure. Trend growth rates of 0.8 percent resume in the second half of the decade as the country's longstanding problems of a shrinking labor force and aging population persist, though partially offset by some productivity increases.

Although China's GDP growth remains relatively strong, its long-term slowing continued in 2024 with growth of 5.0 percent that followed a rate of 5.2 percent the previous year. The slowdown is expected to extend through the forecast horizon with a rate of 3.9 percent in 2035 and 3.1 percent in 2045. Contributing factors include a shrinking population, declining returns on infrastructure investments, excess supply in the housing market and sluggish domestic demand.

Among large emerging markets, Brazil's economy sees growth slow in 2025 to 2.3

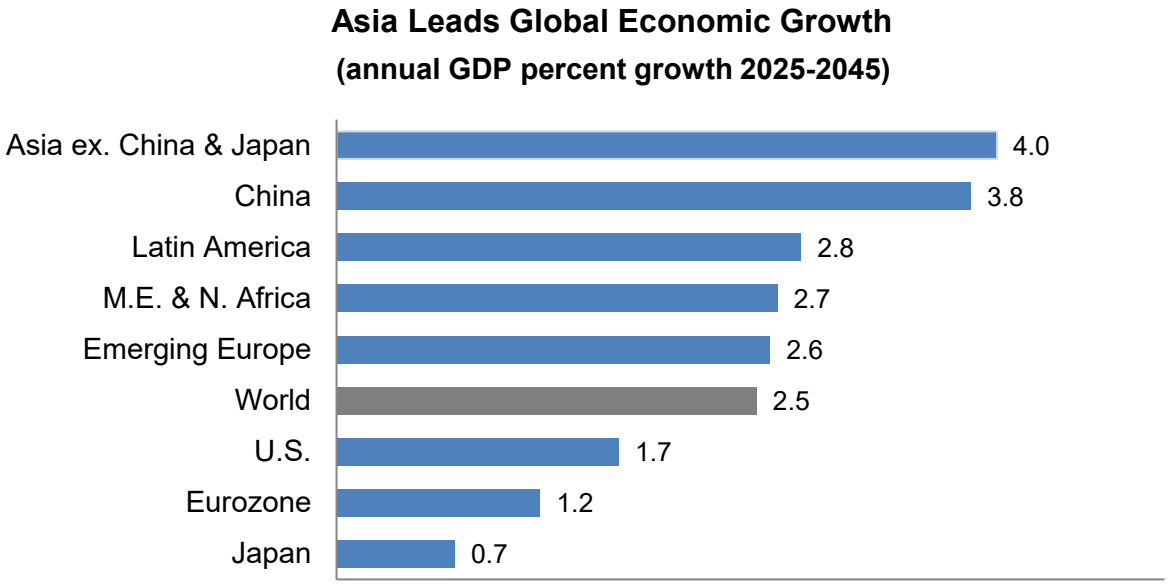
percent due to restrictive monetary policy and a contraction in the labor market. Longer term, Brazil's economy benefits from its large domestic market and abundant natural resources but is restrained by high interest rates and large fiscal deficits. Russian growth rose in 2024 to 4.1 percent from wartime government spending but easing consumption and a cooling labor market are expected to slow growth in 2025 to 2.6 percent. Growth eases steadily to end the decade at 2.0 percent as the emigration of skilled professionals and military age people adds to downward demographic trends. Productivity losses from the withdrawal of foreign companies and investment also contribute to the slowdown. Finally, India's strong expansion in both the manufacturing and services sectors was tempered in 2024 to 6.5 percent due to reduced government investment and the central bank's policy tightening. In the medium-term, declining contributions from the public sector will be offset by favorable demographics including strong consumer spending from growing middle-income households, increasing contributions from the service sectors, and undeveloped natural resources.

**World Economic Growth in 2024**



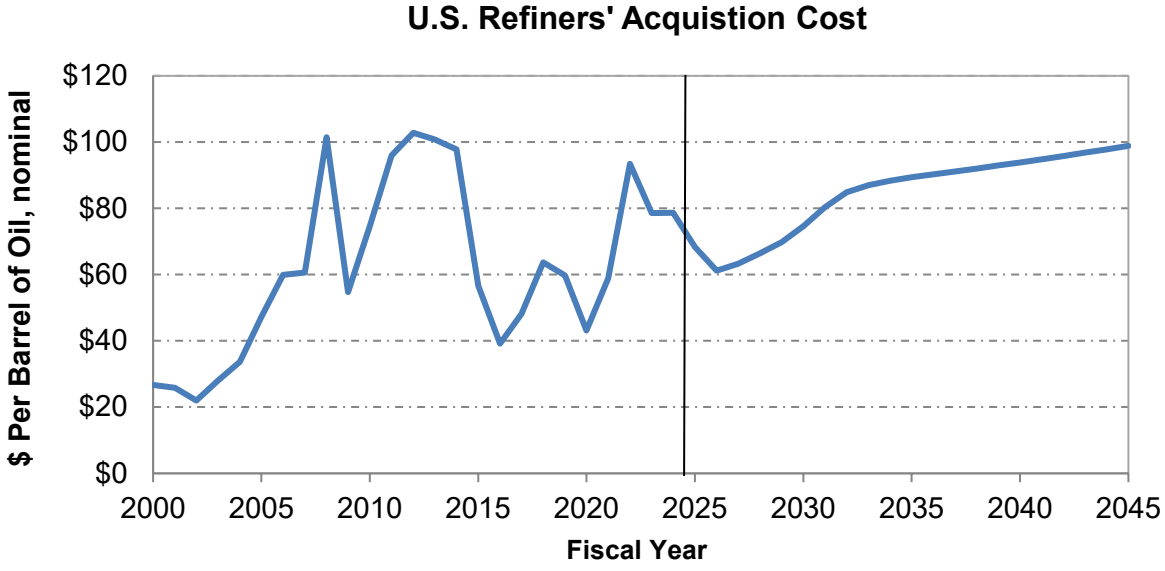

Source: S&P Global

S&P Global forecasts world real GDP to grow at 2.5 percent a year between 2025 and 2045. Emerging markets, at 3.7 percent a year, are forecast to grow faster than the global average but at lower rates than in the early 2000's. Asia (excluding Japan), led by India and China, is projected to have the fastest growth followed by Latin America, Eastern Europe, Africa and the Middle East. Growth in the more mature economies (1.5 percent a year) will be lower than the global trend with the fastest rates in the U.S. followed by Europe. Growth in Japan is forecast to be very slow at 0.7 percent a year reflecting deep structural issues associated with a shrinking and aging population.




Source: S&P Global, Dec 2024 Comparative World Overview; APO-100 calculations

Oil held steady at about $79 per barrel in 2023 and 2024 but is expected to decline in 2025 and 2026 as sluggish global demand combines with increasing supply. Over the long-run, S&P Global expects the price of oil to increase due to growing global demand and higher costs of extraction. S&P Global forecasts U.S. refiner's acquisition cost of crude to rise to $99 per barrel at the end of the forecast horizon.




Source: S&P Global

# U.S. Airlines

## Domestic Market

Mainline and regional carriers[1] offer domestic and international passenger service between the U.S. and foreign destinations, although regional carrier international service is confined to the border markets in Canada, Mexico, and the Caribbean.

Although the public health emergency caused by the pandemic officially ended in 2023 and most measures of aviation activity had returned to 2019's levels by last year, impacts were still being felt by carriers and are expected to continue through the end of the decade.

On the supply side, materials shortages, lower worker productivity and manufacturing missteps have slowed aircraft production, hindering carriers' ability to add more, and more efficient, aircraft. As airframers are holding sizable order books, the delivery delays will cascade out through the end of the decade. Besides constraining expansion plans, these delays will impact profitability as carriers hold on to older, less efficient aircraft and aircraft that are poorly sized for current market needs. Pilot shortages were another constraint to expansion that emerged during the pandemic, but these have largely been resolved.

Also constraining supply, under-staffing at some Air Traffic Control (ATC) facilities may, under certain circumstances, limit the number of aircraft that can be handled in those places. This will be slow to correct although FAA is accelerating efforts. In 2023, 1,512 controllers were hired, in 2024 that number rose to 1,811 and in 2025, the plan is for 2,000, the most in over a decade. All these issues will be slow to reverse and weigh on the forecast of capacity production for the next three to five years, or possibly longer.

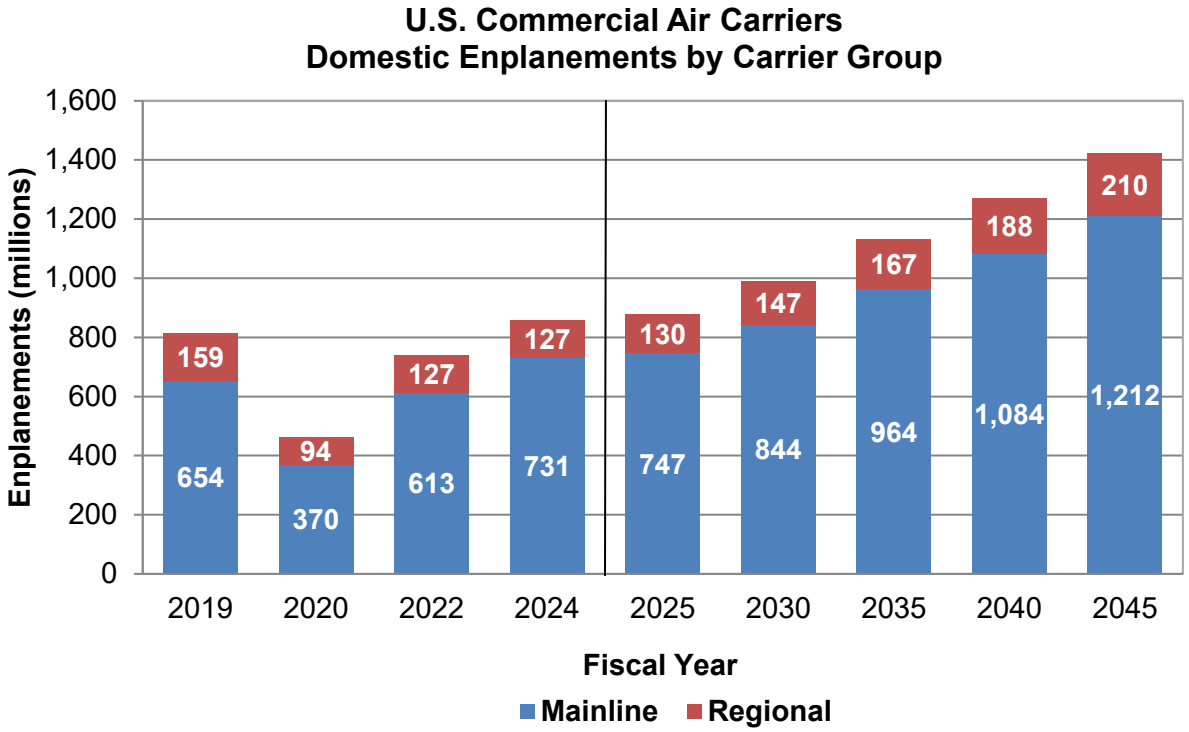
The pandemic altered the demand side as well, with many of those impacts still evolving. Leisure traveler demand surged after the pandemic and is expected to continue as the main driver, although travelers have shown a clear preference for premium offerings and carriers are adapting cabins to claim more of these higher-yielding passengers. Whether this trend continues in coming years is something carriers will monitor closely. And while the pandemic caused a wave of blended leisure and business trips that altered peak day-of-week and seasonal patterns, they have started to return to pre-pandemic norms. Unlike leisure trips, business trips have grown slowly, a factor that is likely to continue in the near term especially since in-office work remains below pre-pandemic levels and is also increasing.

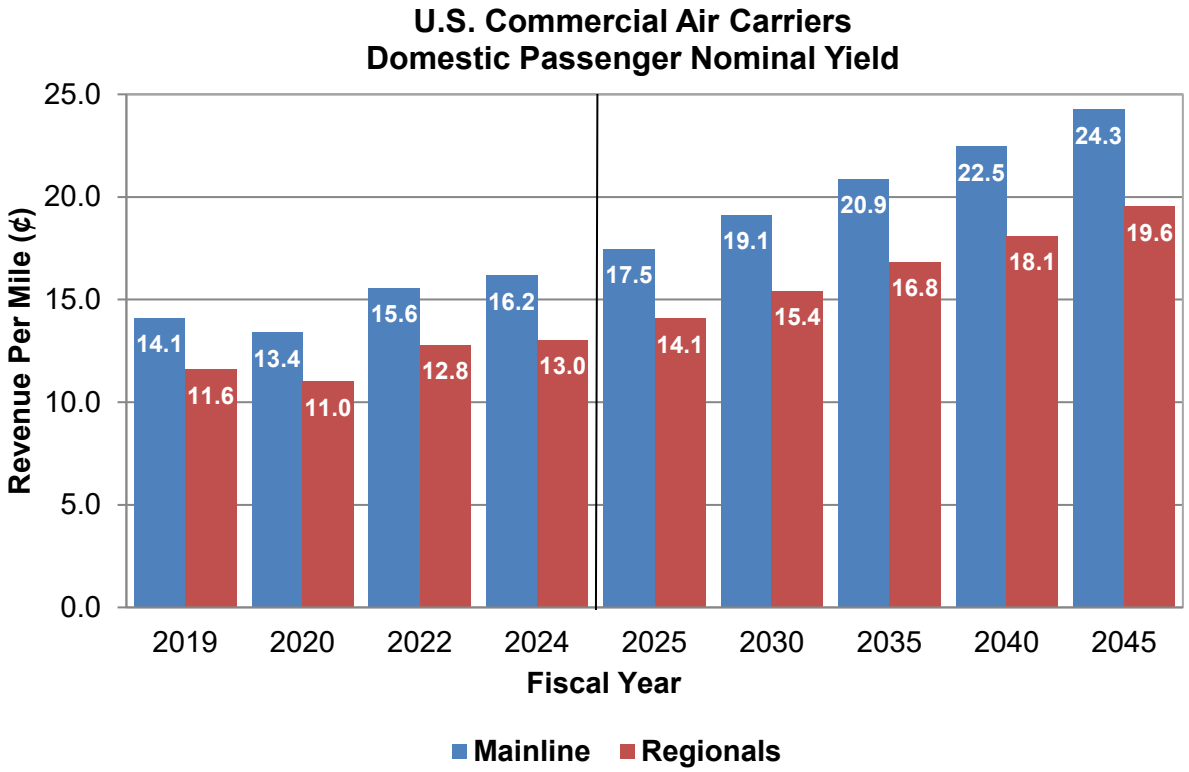
Higher airfares have already resulted from increased labor expenses necessary to attract and retain workers and this elevated spending is expected to be permanent. Labor unions representing pilots and flight attendants have found considerable leverage in the post-pandemic environment, making cost increases, and therefore fare increases, an industry-wide phenomenon. Passengers have been largely undeterred,

[1] Mainline carriers are defined as those providing service primarily via aircraft with 90 or more seats. Regionals are defined as those providing service primarily via aircraft with 89 or fewer seats and whose routes serve mainly as feeders to the mainline carriers.

allowing some carriers to add additional fare or fee increases that are helping to pay down debt incurred during the pandemic. Until debt returns to more typical levels, it will act as an additional restraint on investment and expansion.

During the first years of the pandemic, regional carriers suffered similar consequences of COVID-19 as mainline carriers. However, the impacts in recent years have differed. In 2024, regionals provided just 7.4 percent of domestic capacity, down from 11.1 percent in 2019, a result of both the shift in demand and difficulty supplying capacity as flight crews moved up to higher paying mainline jobs. In terms of traffic, regionals saw similar declines, dropping to 7.2 percent of RPM in 2024 compared to 10.4 percent in 2019. The deviations in 2024 have improved slightly from 2023 and are expected to revert over time as travel patterns and airline operations continue the slow recovery to more normal conditions.






Regional carriers have less leverage with the mainline carriers than they have had in the past as the mainline carriers have negotiated contracts that are more favorable for their operational and financial bottom lines. As mainline carriers have cut service to smaller cities since the pandemic, regional partners have been most affected. Furthermore, mainline carriers successfully reduced costs by offering voluntary retirements to flight crews but as activity rebounded, they drew replacements from the ranks of the regional carriers, exacerbating their pre-pandemic pilot shortages. Shortages of senior regional captains are likely to persist through next year due to the time required for training and experience.

A trend for regionals that was largely unaffected by the pandemic is the longstanding increase in the number of seats per aircraft. This measure rose by more than 55 percent over the decade from 1997 to 2007 and although it slowed more recently to an increase of 17 percent in the ten years ending in 2019, it is a trend that is expected to continue. A consequence of this drive to replace 50-seat regional jets with more fuel-efficient 70-seat jets is that capital costs have increased. The move to the larger aircraft will prove beneficial in coming years, however, since their unit costs are lower.

Mainline carriers have also been increasing seats per aircraft flown although, unlike that for the regionals, the trend had been accelerating up until 2019. From 2009-2019, the measure grew by an average of 0.9 percent per year. Then during the pandemic, seats per aircraft jumped around, ranging from an increase of 3.0 percent in 2021 to a 0.4 percent decrease in 2022 as carriers first flew some of their idle long-haul international aircraft on domestic routes and then

reallocated them to more typical markets. That aircraft positioning seemed to normalize in 2024 when seats per aircraft grew 0.3 percent, about their 30-year average.

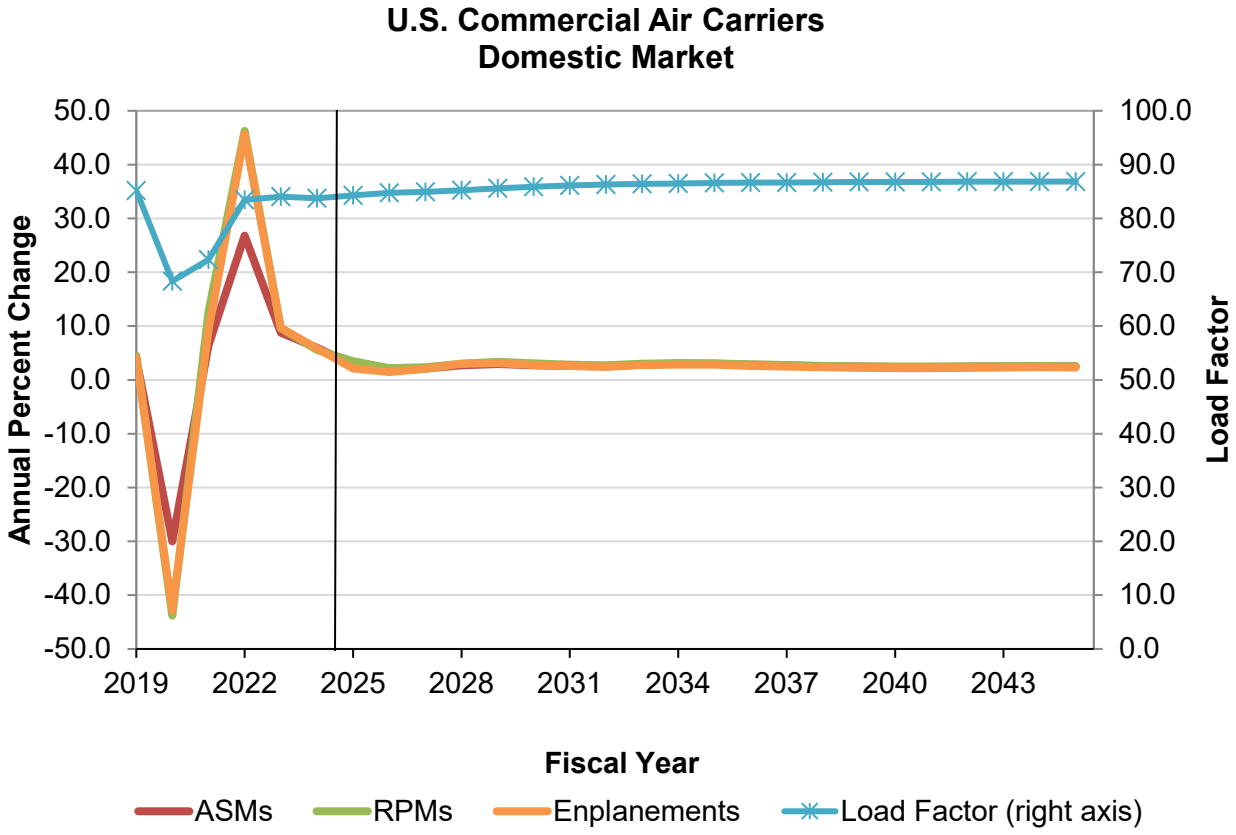
Besides the operational adjustments that carriers use to drive profitability, there are many less visible strategies that mainly revolve around passenger segmentation: categorizing passengers according to their willingness to pay differing amounts to travel between the same points. The primary tools to accomplish this are the revenue management systems that enable carriers to price fares optimally for each seat on each flight. Because they rely on historical data to make price and schedule predictions, the unprecedented nature of the collapse in 2020 meant they could provide little guidance in market, time-of-day or day-of-week pricing decisions. As demand stabilized, revenue management systems became relevant again. Going forward, the application of artificial intelligence will make these systems more adaptive and pricing more dynamic, leading to even more nuanced segmentation of passengers.

Yet another continuing trend and method of passenger segmentation is product differentiation through ancillary sales. Carriers generate ancillary revenues by selling products and services beyond that of an airplane ticket to customers. This includes the un-bundling of services previously included in the ticket price such as checked bags, on-board meals, and seat selection, and adding new services such as boarding priority and internet access. After posting record net profits in 2015, U.S. passenger carrier profits declined subsequently on rising fuel and labor costs, and flat yields, but were supported by ancillary revenues. Even in 2020 when profits turned to staggering losses, this remained a meaningful source of revenue for carriers.

One source of ancillary revenue, change fees, was broadly scrapped in 2020. As traveler plans were forced to change due to COVID-19-related restrictions, airlines began dropping fees for itinerary changes in many ticket classes. As a share of total passenger revenue, cancellation fees dropped from about 2 percent in 2019 and prior years to under 0.6 percent in 2024. Most airlines have made the elimination of change fees a permanent move, although it applies only to tickets for the main cabin and above. Baggage fees remain a solid source of revenue at 4.0 percent of passenger revenue in 2024, the same as in 2019.

Other methods of segmenting passengers into more discrete cost categories based on comfort amenities like seat pitch, leg room, and power outlets were unaffected by the pandemic. The offering of Basic Economy fares has been part of an effort by network carriers to protect market share in response to the rapid growth LCCs have achieved in recent years. Between 2007 and 2019, network carrier domestic enplanements increased almost 19 percent, but low-cost carrier enplanements grew by 39 percent. RPMs over the same period showed a similar pattern with network carrier domestic RPMs up almost 23 percent and LCC RPMs fully 48 percent higher. These longer-term trends were interrupted in 2020 with enplanements and RPM dropping across both mainline and LCC carriers to just over half of 2019 levels. By 2023, the strength of LCCs became apparent again as their enplanements and RPMs had recovered to about 9 percent above 2019 levels. In 2024, however, the combination of mainline competition and excess capacity in domestic markets forced LCCs and Ultra Low-Cost Carriers (ULCC) to adapt their marketing strategies. Just as mainline carriers had used Basic Economy

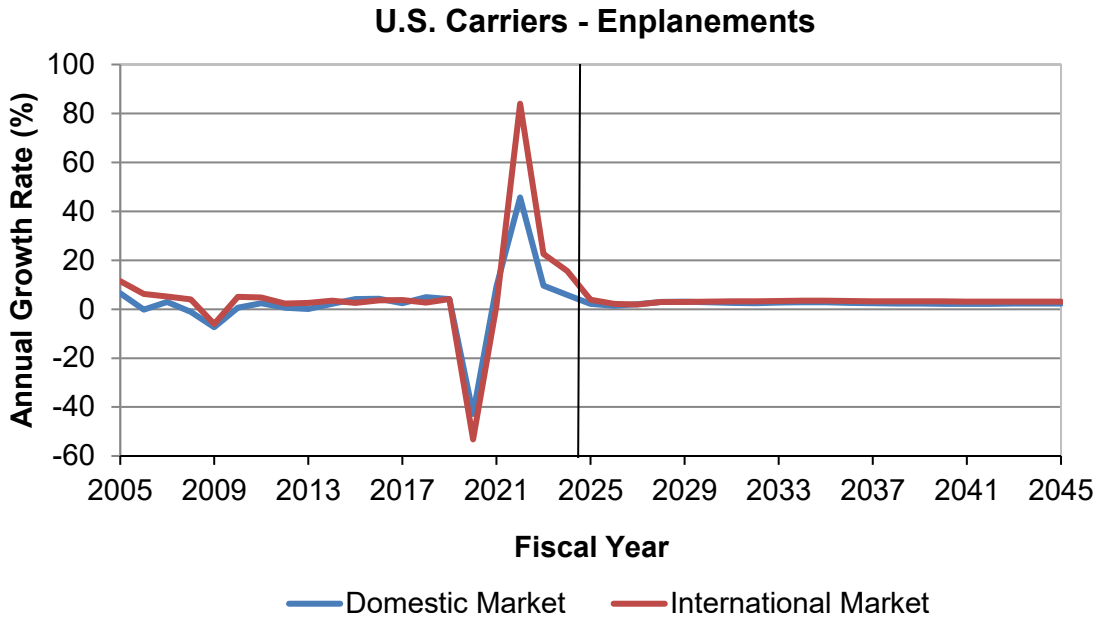
fares to capture LCC customers, LCCs and ULCCs began to use premium offerings to capture network carrier customers. These carriers introduced or announced seats with more legroom, blocked middle seats, re-bundled of fares to include some ancillaries, and added more attractive loyalty programs. Given the overall shift in consumer preferences to experiences over goods, and towards premium travel, LCCs and ULCCs will continue battling directly for network carrier customers in the medium-term at least.

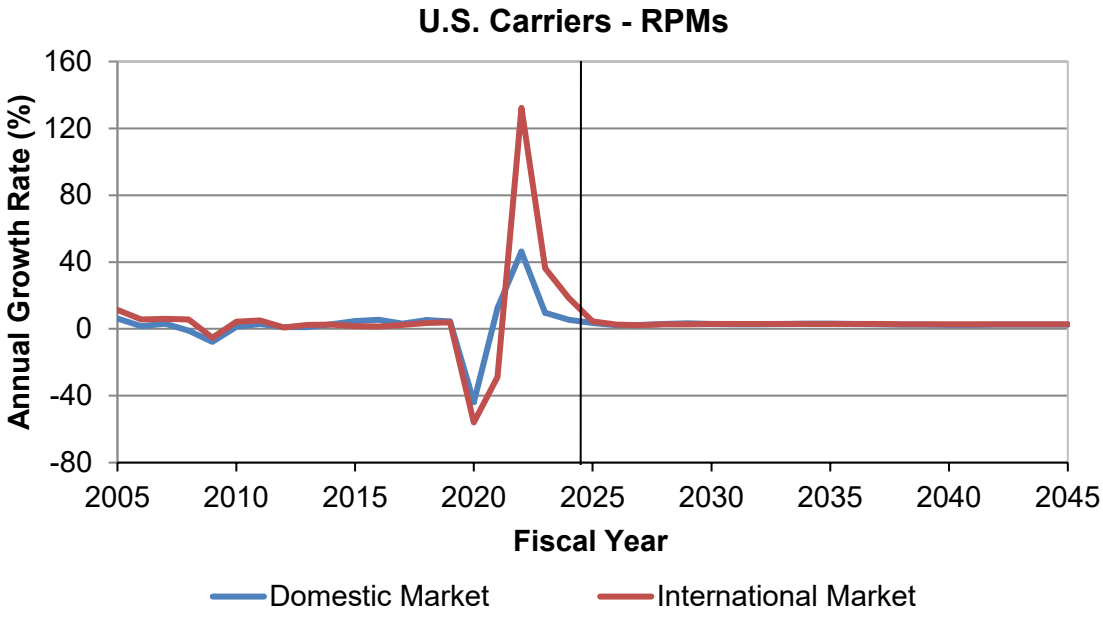


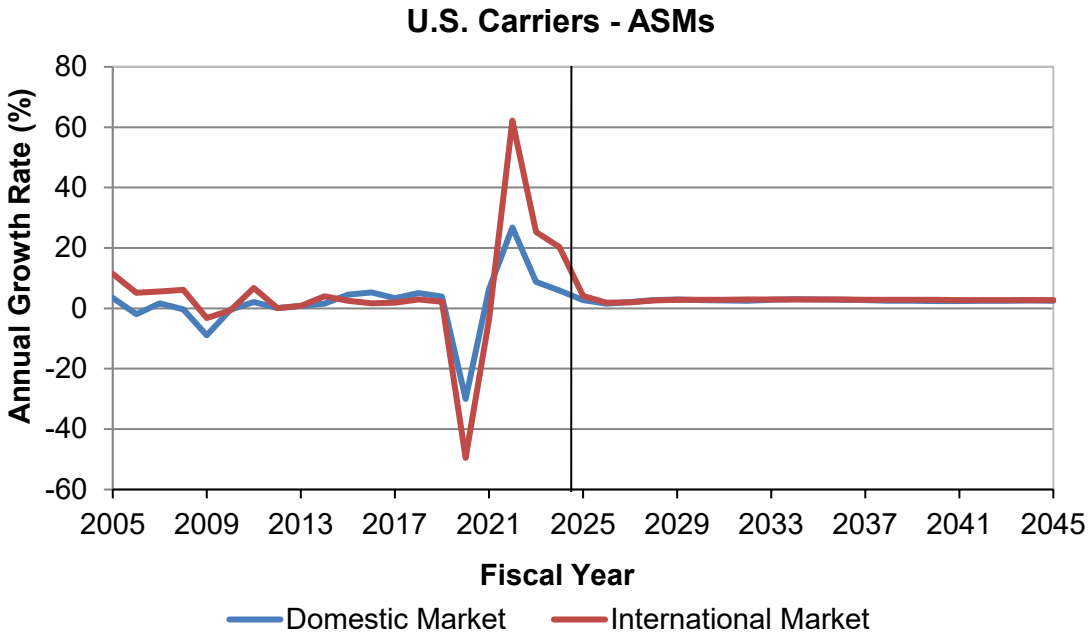

## International Market

Over most of the past decade, the international market has been the growth segment for U.S. carriers when compared to the mature and much larger U.S. domestic market. For the ten years ending in 2024, international enplanements grew by 31 percent while domestic enplanements grew 24 percent. However, during the downturn in 2020 and the first years of the recovery, domestic activity fell less and recovered faster. But by 2024, domestic enplanements had grown only 6 percent above 2019's level, while international enplanements showed much stronger improvement, exceeding 2019 levels by 24 percent. International travel had

been particularly impacted by border closings, quarantine requirements and other travel restrictions, as well as the uncertainty of when requirements might change. However, as restrictions lifted, activity rebounded sharply. On the domestic side, the fall in business travel contributed to the decline and slower recovery, even as leisure travel surged. International travel is expected to show further gains in 2025, supported by the strong dollar and increased preferences for overseas trips.



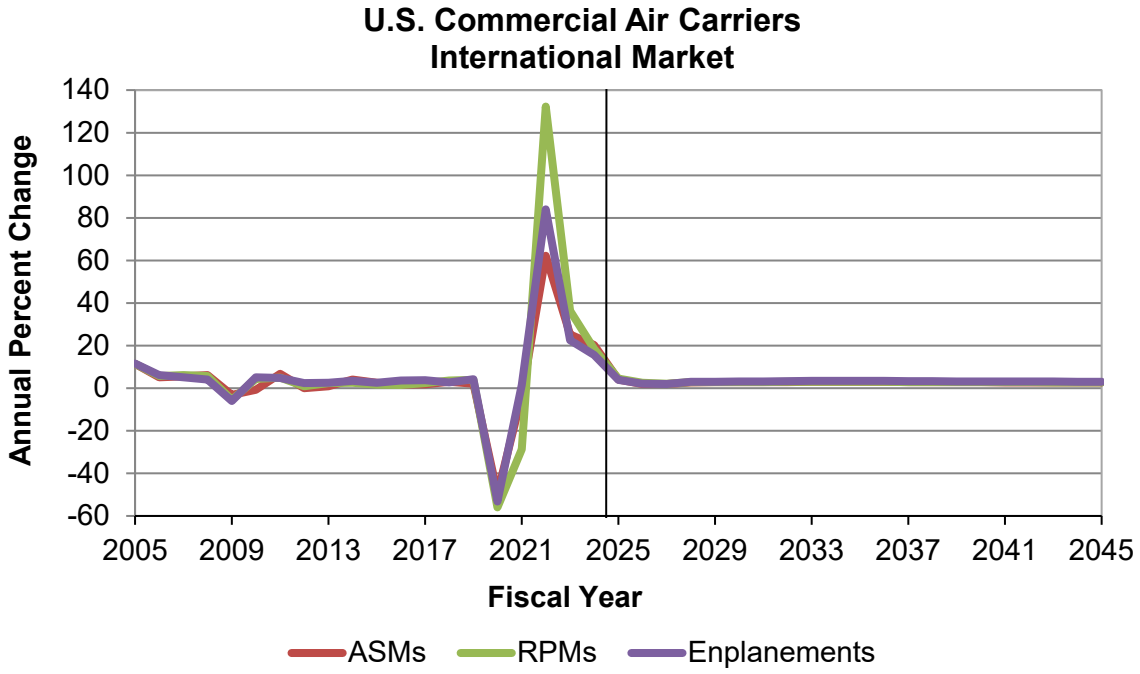



International capacity and demand will see another year of solid growth in 2025 as the recovery concludes and rates return to more typical values in 2026. For FY2025 the annual growth rates for international ASM and RPM are forecast at 4.1 percent and 4.5 percent, respectively, and enplanements at 3.9 percent as aggregate trip lengths grow due to increasing Atlantic and Pacific activity. From FY2026-2045, annual growth for ASMs and RPMs are forecast to grow at 2.7 percent and 2.8 percent, respectively, while enplanements will grow at a rate of 3.1 percent.

Load factors recovered sharply again in 2023, reaching 83 percent, more than 6 points above the previous year and similar to 2019's level. However, some overcapacity in 2024 suppressed a further increase and load factors dropped back to 82 percent. Load factors are believed to be close to their maximum and projected to rise only slightly throughout the remainder of the decade to reach 83 percent at the end of the forecast.

In the long-run, growth of major global economies will slow from the above-trend rates of recent, pre-pandemic years. Several moderating factors are at work, including high inflation and interest rates, reduced global trade, and political stresses. The European and Japanese economies are generally seeing slow growth, in part due to weak trade with Asia, mainly China. Overall, global conditions appear set to return to a stable path once the economic environment improves with looser financial conditions, diminished risk of recession, and improved government fiscal positions. Rising oil prices, however, will create some drag on this otherwise supportive environment for air travel demand.




The impact of COVID-19 on travel by region has varied considerably, as have the recovery paths. Factors affecting the responses by market are similar to those affecting travel as a whole: COVID-19 case counts, governmental restrictions, predominant traveler segments, and macroeconomic conditions. As a result, enplanements to the Latin region had fully recovered in 2022, and to the Atlantic region in 2023. The Pacific region has been the slowest and is forecast to be fully recovered in 2028.

For U.S. carriers, the Latin region remains the largest international destination with more than twice the enplanements of the Atlantic region in 2024, due to its proximity to the U.S., strong trade ties, and popular leisure destinations. In 2024, Latin region enplanements rose by 13 percent while RPMs rose 15 percent. Much of the strength was

again driven by leisure traffic heading to warm weather destinations and the appeal of nearby foreign locations. Enplanement and RPM growth are expected to slow substantially in 2025, decelerating to long-term trend rates. Over the twenty-year period of 2025-2045, Latin region enplanements are forecast to increase at an average rate of 3.6 percent a year while RPMs grow 3.8 percent a year.

The Pacific region is the smallest in terms of enplanements which do not yet reflect the region's emerging markets' economic growth and potential for air travel. Enplanements bottomed out at just 5.8 percent of 2019's level in 2021 as many countries enforced stringent travel restrictions, especially China, a very large market in the region. RPM also collapsed by a similar amount. In 2022, enplanements and RPMs came off the 2021 trough and by 2024, recovered to about 83 percent of 2019 levels. In 2025, those measures of activity are expected to continue expanding to above 92 percent. With comparatively slow trend growth, the region's enplanements take time to fully recover to 2019's level but are within 2 percent by 2027 while RPMs are fully recovered in that year. Growth of RPMs and enplanements in 2025 will slow to 11 percent, a deceleration from 47 percent in 2024. From FY2026 through the end of the forecast, Pacific enplanements and RPMs are forecast to grow at average rates of 2.6 percent and 2.7 percent, respectively. Although the region is forecast to have the strongest economic growth of any region over the next 20 years, led by China and India, enplanements and RPMs over the period are restrained in part because of generally low incomes and relatively small middle classes. Consequently, demand centers on smaller but wealthier countries such as Japan and Korea, rather than the large, faster growing economies.

The Atlantic region ranks in size between the Latin and Pacific regions, with pre-pandemic enplanements roughly twice those in the Pacific region and half those in the Latin region. After contracting in 2015 and 2016, Atlantic enplanement growth began rising to reach 7.0 percent in 2019. This growth was supported by U.S. demand as well as growth of Middle East and African markets, even as the European economies slowed in 2019. In 2020, like the other regions, Atlantic enplanements tumbled and bottomed out in 2021 at 21 percent of 2019's level. Subsequent percentage gains were large, returning enplanements to 130 percent of 2019 levels in 2024. Although Western Europe is a mature area with moderate economic growth, the economically smaller Middle East and Africa areas are expanding rapidly with GDP growth rates more than twice that of Europe. As a result, a growing share of the forecast aviation demand in the Atlantic region is linked to those two areas, particularly in the second half of the forecast period. Over the forecast horizon from 2025 to 2045, enplanements and RPMs in the Atlantic region are expected to grow at average annual rates of 1.8 percent and 2.0 percent, respectively.

### *Total Passengers to/from the U.S. on American and Foreign Flag Carriers*

*Actual Results:*

During CY2024, total passengers flown on U.S. and Foreign Flag carriers between the United States and the Atlantic, Latin, Pacific, and Canada Transborder regions grew 9.3 percent to total 266.9 million passengers, marking the return to pre-COVID passenger

levels.[2] Passenger levels steadily improved after the 73.4 percent drop posted in CY2020, with growth of 47.4 percent in CY2021, 97.3 percent in CY2022, 25.0 percent in CY2023, and 9.3 percent in CY2024.

Although growth in total passengers has been strong, the path to recovery for the individual regions has been mixed. The Latin and Atlantic Regions led the recovery, with the Latin region returning to pre-COVID levels last year (CY2023), followed by the Atlantic region in CY2024.

Conversely, the recovery for the Canada Transborder and Pacific regions has not been as robust. Passenger levels for both regions endured two consecutive years of post-COVID decline.[3] At the end of CY2024, Canada Transborder passenger levels were 99 percent of pre-COVID levels and are forecast to surpass that mark during 2025.

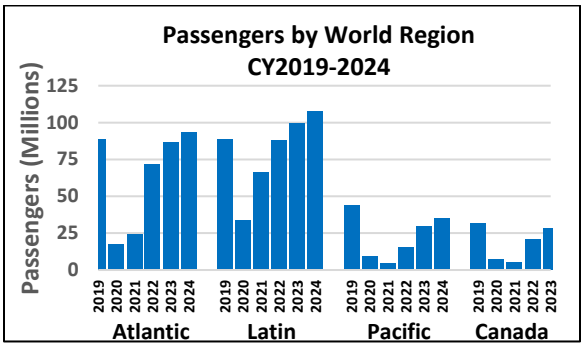
Recovery for the Pacific region remains elusive. Passenger levels for this region remain 30 percent below pre-COVID levels and remain below until CY2027.

The chart below shows the tempo at which the individual world regions have recovered/are recovering to pre-COVID passenger levels.

| *Recovery to Pre-COVID Passenger Levels Indexed to 2019 (by World Region)* | | | | | | |
|---|---|---|---|---|---|---|
| **Region** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Atlantic | 100 | 19.6 | 27.2 | 80.7 | 98.0 | 105.4 |
| Latin | 100 | 37.7 | 74.1 | 99.2 | 112.3 | 121.0 |
| Pacific | 100 | 21.6 | 10.0 | 34.8 | 67.2 | 79.2 |
| Canada | 100 | 21.9 | 15.1 | 65.3 | 89.1 | 99.0 |
| Total | 100 | 26.6 | 39.2 | 77.3 | 96.6 | 105.5 |

Comparing the share of total passengers by world region for CY2024 shows the Latin region with the largest share at 38.5 percent (107.3 million passengers). The Atlantic region is second in terms of passenger share. During CY2024, the Atlantic region held a 35.0 percent share of total passengers (93.3 million passengers). Ranking three and four were the Pacific region with a 12.7 percent share (34.7 million passengers), and Canada Transborder region with an 11.8 percent share (31.5 million passengers).

The percentage growth in passengers from CY2023 to CY2024, for the four regions ranked from highest to lowest, was Pacific (18.0 percent), Canada Transborder (11.0 percent), Latin (7.7 percent), and Atlantic (7.5 percent). Passenger levels for CY2019-24 are presented below by world region.



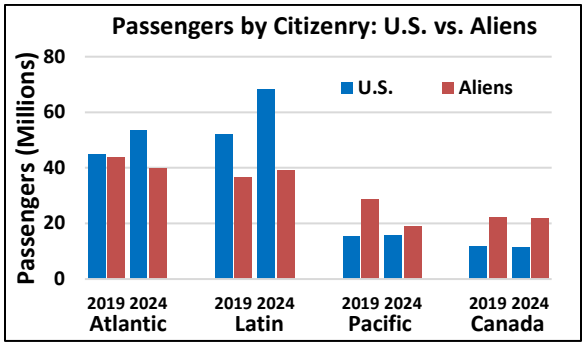

Notably, the U.S. citizen share of passengers travelling between the U.S. and three of the world regions has been increasing vis-a-vis foreign citizen passenger share. The increase in U.S. citizen passenger share may be indicative of a faster return to pre-COVID activity in the U.S., both in terms of economic

[2] The recovery of passengers to pre-COVID and pre-911 levels took five years, although the drop in passenger levels due to covid was far more severe than the drop in passengers resulting from the terror attacks (down 73.4 percent vs.14.0 percent, respectively).

[3] Passenger levels for the Atlantic and Latin regions started to rebound in CY2021, one year after the covid downturn.

growth and the ending of the COVID era restrictions on mobility. Comparing CY2019 to CY2024, the Atlantic, Latin, and Pacific regions each showed an increase in U.S. citizens as a share of total passengers. To the contrary, U.S. citizen passenger shares in the Canada Transborder region decreased.

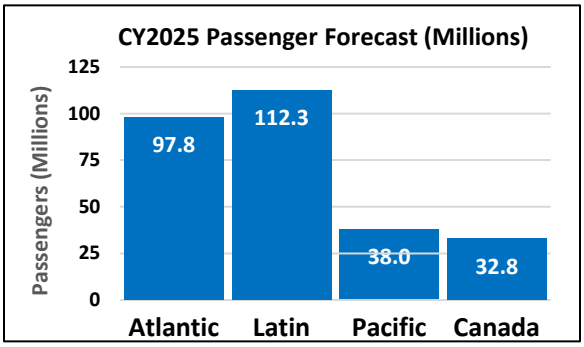
The U.S. citizen share of passengers in the Atlantic region increased 6.4 points (going from 50.8 percent in CY2019 to 57.2 percent in CY2024). In the Latin region, U.S. citizen share of passengers increased 4.9 points (going from 58.6 percent in CY2019 to 63.5 percent in CY2024). In the Pacific region, U.S. citizen passenger share increased 10.0 points (going from 34.8 percent to 44.8 percent. To the contrary, U.S. citizen passenger shares in the Canada Transborder region posted a slight decline of 0.2 points (going from 34.5 percent in CY2019 to 34.3 percent in CY2024).




*Forecast Results:*

For CY2025, combined passengers for all four world regions are forecast to grow 5.2 percent over CY2024 levels to 280.8 million passengers.

Of the four regions, the Pacific is forecast to grow fastest with year-over-year growth of 9.3 percent for CY 2025. Growing at a slower pace are the Atlantic and Latin regions, with growth of 4.8 percent and 4.6 percent, respectively. Canada is forecast to grow slowest with growth of 3.9 percent.




Over the 20-year forecast horizon, international passengers for the combined regions are forecast to grow an average of 3.1 percent annually, going from 266.9 million passengers in CY2024 to 502.3 million in CY2045. Growth during the first half of the forecast period is 3.4 percent versus 2.7 percent during the last half. Some of the factors that may impact future international air travel demand include demographics, travel costs, technological advancements, consumer behavior, and globalization.

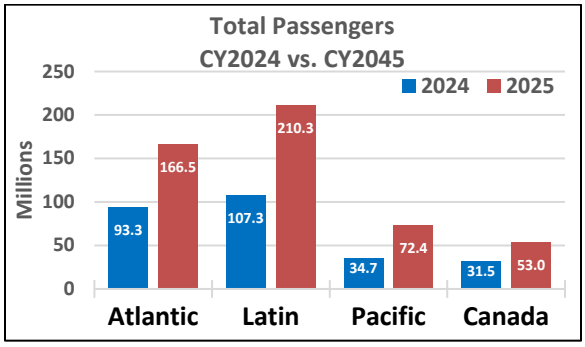
The Pacific region is forecast to grow fastest with average annual growth of 3.6 percent over the forecast period, totaling 72.4 million passengers by CY2045. The faster growth for this region partially reflects a drawn-out recovery from pre-COVID levels compared to the Atlantic, Latin, and Canada Transborder regions.

Growing at a slightly slower pace is the Latin region. This region is forecast to grow at an average annual rate of 3.3 percent, totaling 210.3 million passengers by the end of the forecast period.

The Atlantic and Canada Transborder regions are forecast to grow at more modest rates, with average annual growth rates of 2.8 percent and 2.5 percent, respectively,

over the 20-year forecast period. By CY2045, Atlantic region passengers are forecast to total 166.5 million and Canada Transborder passengers are forecast to total 53.0 million.

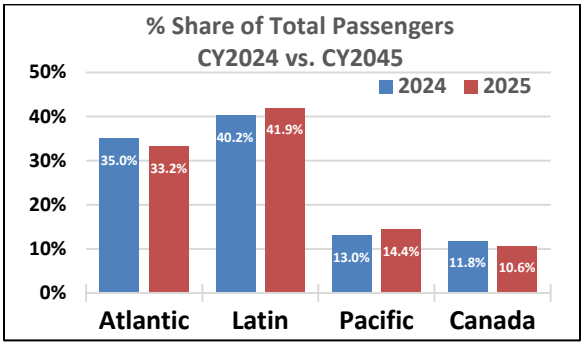
The chart below compares passenger totals posted for CY2024 to the CY2045 passenger forecast.




The ranking of regions by share of total passengers is forecast to remain stable – with the CY2024 rankings holding through CY2045. Going from largest passenger share to smallest share are the Latin, Atlantic, Pacific, and Canada Transborder regions.

While the overall rankings for passenger share remain steady over the forecast horizon, two regions are forecast to have an increase in passenger share (Latin and Pacific) while the other two regions (Atlantic and Transborder) show a decrease in passenger share. The Latin and Pacific regions gain 1.6 points and 1.4 points of passenger share, respectively, while the Atlantic and Canada Transborder regions lose 1.9 points and 1.2 points, respectively.

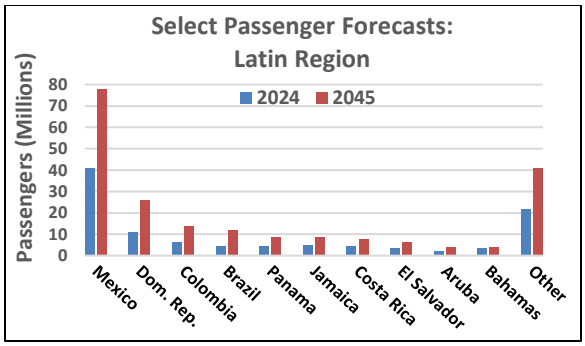
By the end of the 20-year forecast period, the Latin region is forecast to have a 41.8 percent share of total passengers (up from 40.2 percent in CY2024). The Atlantic region share of passengers is forecast to be 33.1 percent in CY2045 (down from 35.0 percent in CY2024); Pacific region passenger share is forecast to be 14.4 percent (up from 13.0 percent in CY2024); and Canada Transborder region passenger share is forecast to be 10.6 percent in CY2045 (down from 11.8 percent in CY2024).



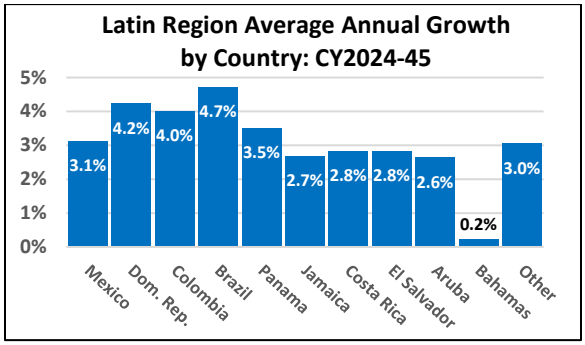

On an individual basis, the countries posting the top three passenger levels in CY2024 were Mexico, Canada and United Kingdom, with passenger totals of 40.8 million, 31.5 million, and 21.2 million passengers, respectively. These three countries retain their ranking at the end of the forecast period.

Ranking 4, 5, and 6 in CY2024 was Germany (11.0 million passengers), Dominican Republic (10.9 million passengers), and Japan (9.9 million passengers). By the end of the forecast period, Dominican Republic and Germany trade rankings, while France replaces Japan to be ranked number 6.

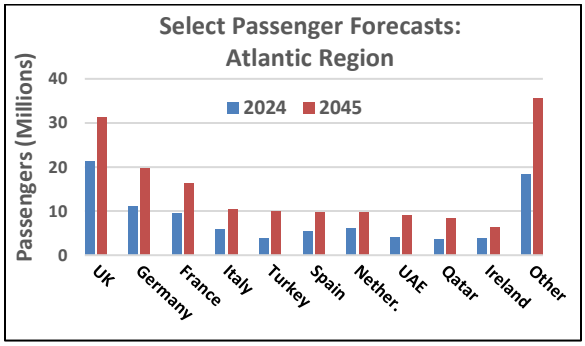
Of the countries within the Latin region, the top three as measured by CY2024 passenger totals remain as the top three at the end of the forecast period. These three countries are Mexico, Dominican Republic, and Columbia. At the end of the forecast period passenger levels are forecast to be 77.9 million for Mexico; 26.1 million for the Dominican Republic; and 14.0 million for Colombia.



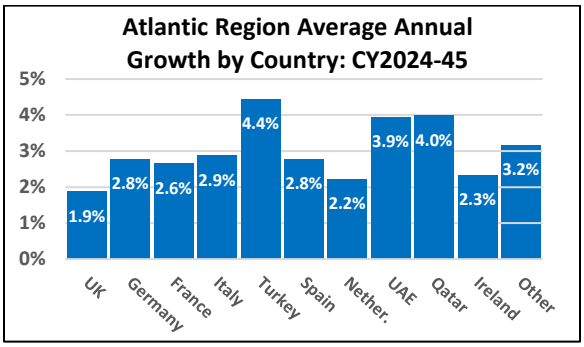

Correspondingly, those countries within the Latin region with the highest average annual percentage growth over the 20-year forecast period are Brazil (4.7 percent), the Dominican Republic (4.2 percent), and Colombia (4.0 percent).



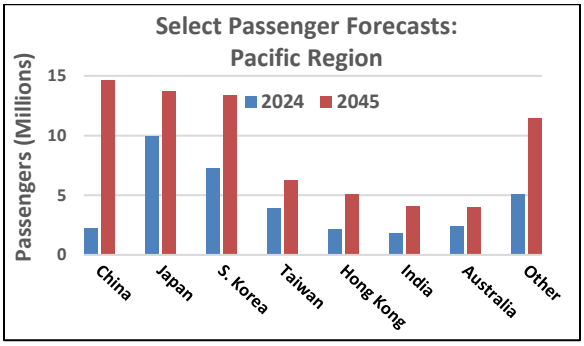

In the Atlantic region, the countries with the top three CY2024 passenger totals were the United Kingdom, Germany, and France. These three countries retain their rankings at the end of the forecast period with CY2045 passenger totals of 34.0 million for the United Kingdom, 21.7 million for Germany and 18.6 million for France.



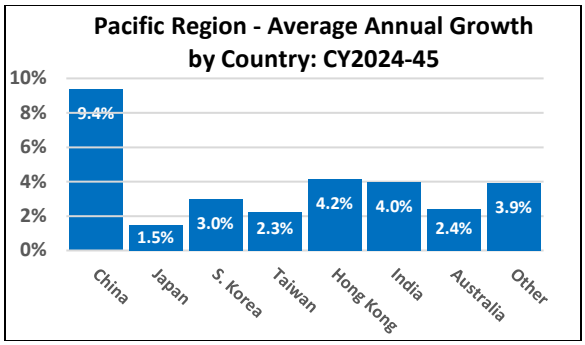

The countries with the highest average annual growth rate in the Atlantic region over the forecast period are Turkey (4.4 percent), Qatar (4.0 percent), and United Arab Emirates (3.9 percent).



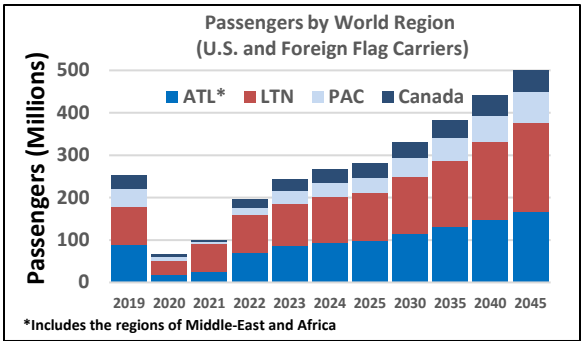

The top three countries in the Pacific region as measured by CY2024 passenger totals were Japan, South Korea, and Taiwan. At the end of the forecast period China ranks one (14.7 million passengers), Japan ranks two (13.7 million passengers), and South Korea ranks three (13.4 million passengers).




Countries forecast to have the highest average annual growth in the Pacific region are China (9.4 percent), Hong Kong (4.2 percent), and India (4.0 percent). China growth is coming off a depressed base, reflecting the slow recovery from the COVID downturn.




The chart below presents historical and forecast data for passengers travelling between the U.S. and the four world regions on U.S. and foreign flag carriers.



## Cargo

Air cargo traffic includes both domestic and international freight/express and mail. The demand for air cargo is a derived demand resulting from economic activity. Cargo moves in the bellies of passenger aircraft and in dedicated all-cargo aircraft on both scheduled and nonscheduled service. Cargo carriers face price competition from alternative shipping modes such as trucks, container ships, and rail cars, as well as from other air carriers.

Historically, air cargo activity tracks with GDP. Other factors that affect air cargo growth are fuel price volatility, movement of real yields, globalization, and trade. The forecasts of revenue ton miles (RTMs) rely on several assumptions specific to the cargo industry. First, security restrictions on air cargo transportation will remain in place. Second, most of the shift from air to ground transportation has occurred. Finally, long-term cargo activity depends heavily on economic growth.

The forecasts of RTMs derive from models that link cargo activity to GDP. Forecasts of domestic cargo RTMs use real U.S. GDP as the primary driver of activity. Projections of international cargo RTMs depend on growth in world and regional GDP, adjusted for inflation. FAA forecasts the distribution of RTMs between passenger and all-cargo carriers based on an analysis of historic trends in shares, changes in industry structure, and market assumptions.

U.S. carrier international air cargo traffic spans four regions consisting of Atlantic, Latin, Pacific, and 'Other International.'

U.S. air carriers flew 48.0 billion RTMs in 2024, a small increase from 47.3 billion in 2023. During the pandemic, households made huge changes in spending patterns, shifting out of services and into goods, goods that were often shipped by air. As a result, RTMs surged to 20 percent above 2019's level by 2022. Consumer spending then began to revert in 2023, bringing system RTMs down to 10 percent above 2019's level. Domestic cargo RTMs rose 3.1 percent to 18.1 billion in 2024 while international RTMs grew just 0.5 percent to 29.9 billion. Air cargo RTMs flown by all-cargo carriers averaged 78.7 percent of the total in the years leading up to 2020 but then spiked to 88.0 percent in 2020 and 2021, with passenger carriers flying the remainder. Since 2021, and the return of passenger flights and their belly-hold capacity, the share of air cargo RTMs flown by all-cargo carriers has dropped to 83.7 percent in 2024. Total RTMs flown by the all-cargo carriers fell 0.9 percent in 2024 while total RTMs flown by passenger carriers jumped by 15.7 percent.

After rising by 1.5 percent in 2024, total RTMs are expected to grow 4.2 percent in 2025 as the normalization of consumer demand for goods versus services concludes and air cargo is again governed by economic activity. Buoyed by steady U.S. and world economic growth in the long term, FAA projects total RTMs to increase at an average annual rate of 2.9 percent over the forecast period (from 2025 to 2045).

Domestic cargo RTMs from 2025 to 2045 are forecast to increase at an average annual rate of 2.0 percent. In 2024, all-cargo carriers carried 93.3 percent of domestic cargo

RTMs. The all-cargo share is forecast to remain roughly flat in the medium-term as passenger flights return to the system. In the long-term, the all-cargo share rises only slightly to 94.5 percent by 2045 based on increases in capacity for all-cargo carriers.

International cargo RTMs rose slightly in 2024 with the normalization of spending and as international passenger flights returned, RTMs shifted away from all-cargo carriers. With the post-pandemic return of passenger flights, international RTMs on passenger aircraft jumped 19.1 percent in 2024 and is expected to grow rapidly in 2025, increasing about 8 percent, but then slowing down to just over 3 percent in 2026. Over the same years, all-cargo RTMs will grow about 4.5 percent per year as some tonnage is lost to passenger carriers. The share of international cargo RTMs flown by all-cargo carriers fell to 78.0 percent in 2024 and is forecast to decline in the near term before gradually increasing in line with historical trends and ending at 82.3 percent in 2045.

Following the period of recovery and readjustment, growth for both types of carriers returns to long-run trend rates. For the forecast period (2025-2045), international cargo RTMs are expected to increase an average of 3.3 percent a year based on projected growth in world GDP. The Other International region has the fastest annual RTM growth (4.0 percent), followed by Pacific (3.5 percent), Atlantic (2.6 percent), and Latin America region (1.7 percent).

# General Aviation

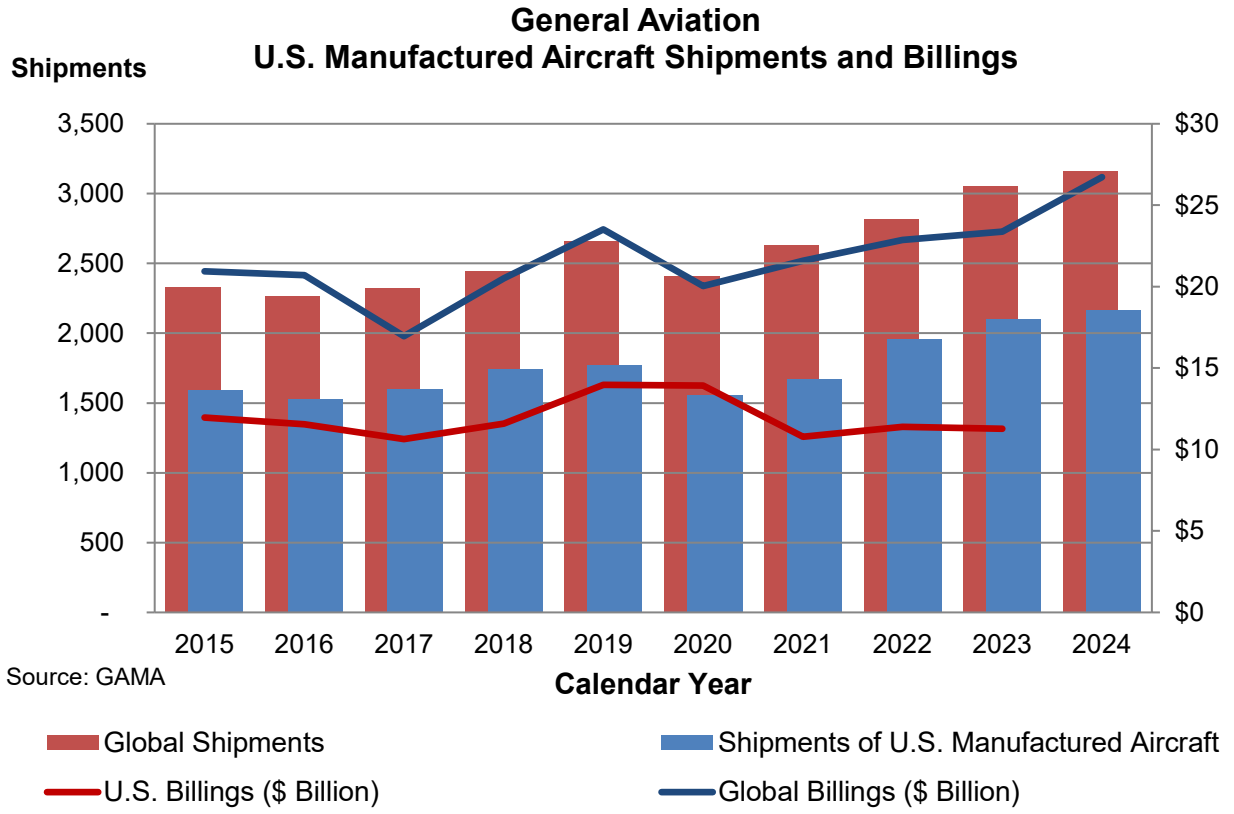
The FAA uses estimates of fleet size, hours flown, and utilization rates[4] from the General Aviation and Part 135 Activity Survey (GA Survey) as baseline figures to forecast the GA fleet and activity. Since the survey is conducted on a calendar year (CY) basis and the records are collected by CY, the GA forecast is done by CY. Forecasts of new aircraft deliveries, using data from General Aviation Manufacturers Association (GAMA), together with assumptions of retirement rates, generate growth rates of the fleet by aircraft categories, which are applied to the GA Survey fleet estimates. The forecasts are carried out for "active aircraft,"[5] not total aircraft. The FAA's general aviation forecasts also rely on discussions with industry experts conducted at industry meetings, including the Transportation Research Board (TRB) meetings of Business Aviation and Civil Helicopter Subcommittees conducted twice a year in January and May or June.

The results of the 2023 GA Survey, the latest available, were consistent with the results of surveys conducted since major improvements to the survey methodology were introduced in 2004. The active GA fleet was estimated to be 214,222 aircraft in 2023 (2.2 percent higher than 2022). Fleet increases were observed in all categories of piston and turbine aircraft with the exception of gliders and the lighter than air category (together forming the other aircraft). Single-engine and multi-engine pistons were up by 1.1 percent, turbine aircraft, including rotorcraft, were up by 2.3 percent, while piston rotorcraft, light-sport aircraft (LSA), and experimental aircraft were up by 5.9, 12.8, and 7.3 percent, respectively. Total hours flown were estimated to be 28.6 million in 2023, up 6.0 percent from the previous year (11.7 percent above 2019 levels), and were at their highest level since 2000. Flight hours increased in the experimental, single-engine and multi-engine piston, rotorcraft, and light-sport aircraft (LSA) categories, up 24.7, 12.4, 4.2, 4.7, and 53.5 percent, respectively. Hours flown by turbojets fell 11.6 percent while hours flown by turboprops and other aircraft (gliders and lighter than air) were down 0.2 and 13.4 percent, respectively.

In 2024, deliveries of the general aviation aircraft manufactured in the U.S. increased to 2,169 -- 3.1 percent above CY 2023 and 22.5 percent higher than their 2019 level. Deliveries of fixed-wing piston aircraft were up by 5.4 percent with single-engine piston aircraft up 5.0 percent, while the much smaller segment of multi-engine piston deliveries saw a 21.7 percent increase. Business jet deliveries increased by 4.1 percent, but a 3.4 percent decline in turboprop deliveries resulted in only a 0.4 percent increase in fixed wing turbine shipments. While the GAMA statistics for factory net billings in 2024 were not available for the U.S. manufactured GA aircraft yet (they were $11.3 billion in 2023), global billings increased in 2024 by 14.3 percent to $26.7 billion.

[4] In this context, flight hours refer to the total hours flown by a certain type of aircraft (i.e., single-engine piston, turboprop, experimental) during the survey year as inferred by the responses to the survey for the total of active GA aircraft; utilization rate is average hours flown by an aircraft of a certain type.

[5] An active aircraft is one that flies at least one hour during the survey year.




GAMA also reported that rotorcraft deliveries increased at a global level in 2024 in both piston and turbine segments by 0.5 percent and 9.6 percent, respectively, for an overall 7.6 percent increase.

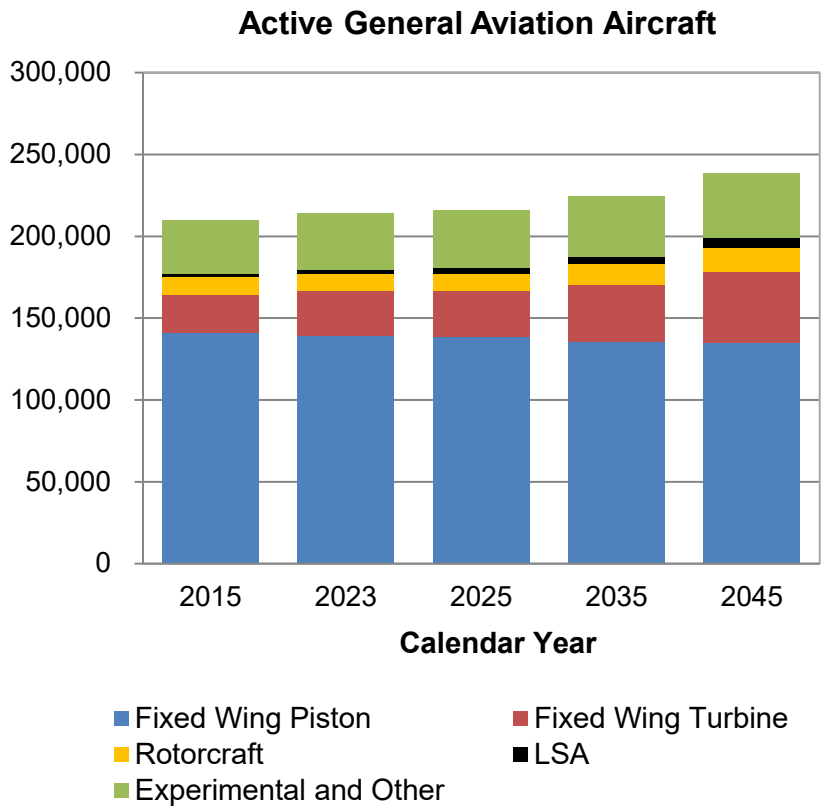
These current conditions indicate continuing growth in the GA sector. The active fleet in 2023 was 1.5 percent above the 2019 level and at its highest since 2010, with the turbine aircraft, including rotorcraft, experimental, LSA and other aircraft (gliders and lighter than air vehicles) categories above their 2019 levels. The long-term outlook for general aviation, driven by turbine aircraft activity, remains stable. The active general aviation fleet, which showed an increase of 2.2 percent between 2022 and 2023, is forecast to increase from its 2023 level of 214,222 aircraft to 238,350 by 2045, as the declines in the fixed-wing piston fleet are offset by increases in fixed-wing turbine, rotorcraft, experimental, and light sport aircraft fleets. The total active general aviation fleet grows at a rate of 0.5 percent annually.

The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow by 20,055 aircraft between 2023 and 2045 to total 54,685, displaying an average annual growth rate of 2.1 percent during this period, with the turbojet fleet increasing 2.7 percent a year. Cumulative growth for the turbine-powered fleet is 57.9 percent from 2023 to 2045. The growth in U.S. GDP and corporate profits are catalysts for the growth in the turbine fleet.

The largest segment of the fleet, fixed wing piston aircraft, is predicted to shrink by 4,450

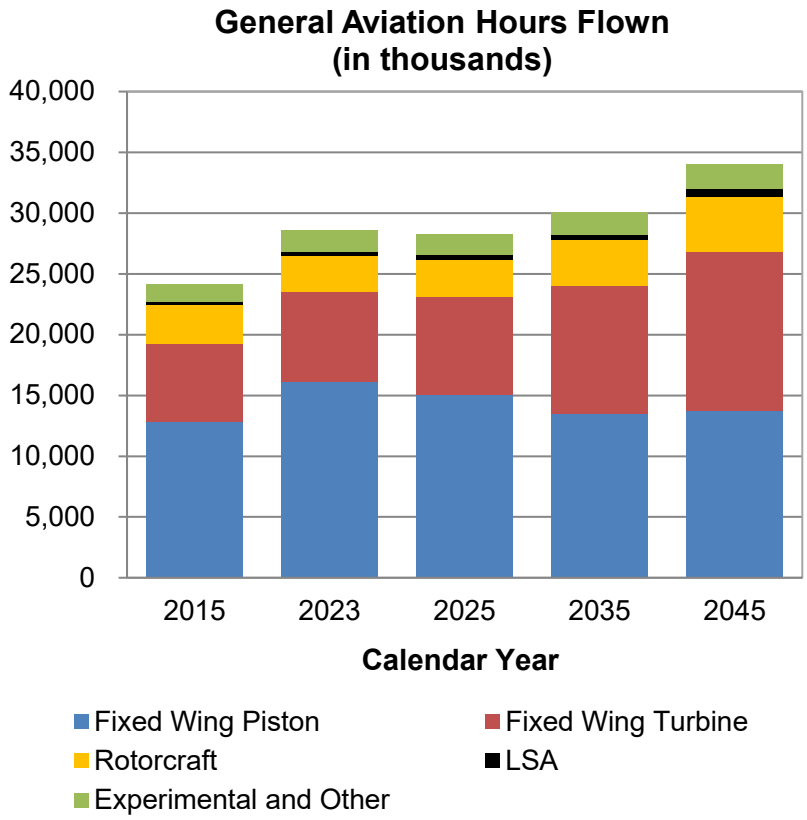
aircraft between 2023 and 2045, with an average annual growth rate of -0.1 percent. Unfavorable pilot demographics, overall increasing cost of aircraft ownership, availability of much lower cost alternatives for recreational usage, combined with new aircraft deliveries not keeping pace with retirements of the aging fleet are the drivers of the decline.

On the other hand, the smallest category, light-sport-aircraft (created in 2005), is forecast to grow by 3.1 percent annually, adding about 2,860 new aircraft by 2045 to nearly double its 2023 fleet size of 3,007.




The number of general aviation hours flown is forecast to grow faster than the active fleet, increasing an average of 0.8 percent per year through 2045, compared to a 0.5 percent annual increase in the active fleet. The growth in hours over the forecast period totals 19.0 percent, from 28.6 million in 2023 to 34.0 million by 2045, as the newer aircraft fly more hours each year. Fixed wing piston hours are forecast to decrease at a slightly faster rate than the fixed wing piston fleet, an average of 0.7 percent a year, largely due to an aging fleet. In 2023, 24.2 percent of the fixed wing piston aircraft were 60 years old or older and FAA expects that figure to increase over the forecast period. Countering this trend, hours flown by turbine aircraft (including rotorcraft) are forecast to increase 2.5 percent yearly between 2023 and 2045. Jet aircraft account for most of the increase, with hours flown increasing at an average annual rate of 3.2 percent during

this period. The large increases in jet hours result mainly from the increasing size of the business jet fleet.




Rotorcraft activity, positively impacted by additional and replacement demand from Emergency Medical Services (EMS), firefighting (due to longer and regionally overlapping fire seasons) and Search and Rescue operations, contributed to higher rotorcraft deliveries in 2024. Potential effects of Advanced Air Mobility (AAM, including electric vertical take-off and landing--eVTOLs) in the later years of the forecast period are too uncertain to include in the forecast yet. Some industry experts suggest AAM would have a complementary impact to rotorcraft demand while others argue that the large size of some of the newly developed AAM vehicles will necessitate new infrastructure before large scale use of AAM can occur. In addition, softening oil prices will negatively impact oil exploration activity, one of the leading uses of rotorcraft, resulting in a slowdown in rotorcraft demand. Taking these factors into account, the active fleet of rotorcraft is projected to grow at about the same rate compared to the previous year's forecast, 1.7 percent a year, going from a total (piston and turbine together) of 10,051 in 2023 to 14,715 in 2045. Rotorcraft hours are projected to grow by 2.0 percent annually during this period as the share of the higher utilization turbine rotorcraft fleet increases over the forecast period.

Lastly, the light sport aircraft category is forecasted to see an increase of 2.2 percent a year in hours flown, primarily driven by growth in the fleet.

The FAA also conducts a forecast of pilots by certification categories, using the data compiled by the Administration's Mike Monroney Aeronautical Center. There were 848,770 active pilots certificated by FAA at the end of 2024. The number of certificates in all pilot categories continued to increase except for the recreational pilot certificates that only 59 pilots carry. The FAA suspended the student pilot forecast since 2018. The number of student pilot certificates has been affected by a regulatory change that went into effect in April 2016 and removed the expiration date on the new student pilot certificates. The number of student pilots jumped from 128,501 at the end of 2016 to 149,121 by the end of 2017, and to 345,495 at the end of 2024. The 2016 rule change generates a cumulative increase in the certificate numbers and breaks the link between student pilot and advanced certificate levels of private pilot or higher. There is not sufficient data to provide a reliable forecast for the student pilots.

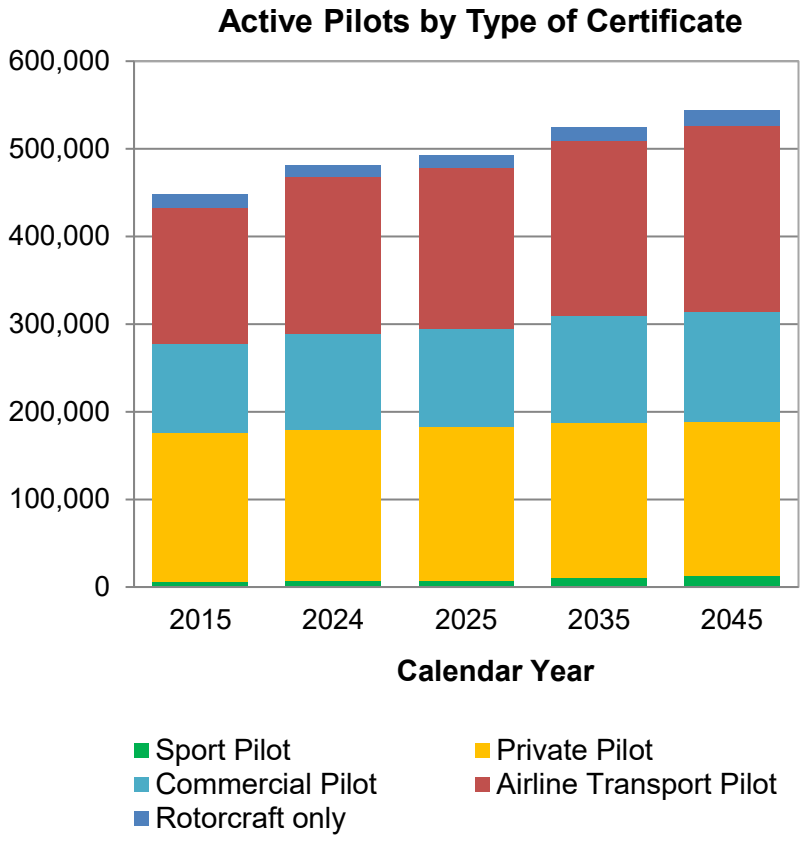
Commercial and air transport pilot (ATP) certificates have been impacted by legislative changes as well. The Airline Safety and Federal Aviation Administration Extension Act of 2010 mandated that all Part 121 (scheduled airline) flight crew members would hold an ATP certificate by August 2013. Airline pilots holding a commercial pilot certificate and mostly serving at Second in Command positions at the regional airlines could no longer operate with only a commercial pilot certificate after that date, and the FAA data initially showed a faster decline in commercial pilot numbers, accompanied by a higher rate of increase in ATP certificates. The number of commercial pilot certificates started to increase in 2017 and reached 109,727 in 2024, following a 2.8 percent increase from 2023. The number of ATP certificate holders increased every year from 2010 through 2019. There was a small decline in the number of certificate holders in both 2020 and 2021 due to the impact of the COVID-19 pandemic, but the decline was more than offset by an increase in 2022. The number of pilots holding an ATP certificate has continued to increase since 2022 and totaled 179,194 in 2024, a 2.9 percent increase from the previous year.

Private pilots continued their increase in 2024, up 2.6 percent from 167,711 in the previous year to 172,012. Sport pilot certificates, created in 2005, maintained their steady increase since their inception to reach 7,309 by December 31, 2024. Rotorcraft pilot certificates held steady at 13,429 in 2024, compared to 13,428 at the end of 2023.

The number of active general aviation pilots (excluding students and ATPs) is projected to increase slightly between 2024 and 2045 from 324,081 to 355,180 (0.4 percent annually). The ATP category is forecast to increase by 34,200 (an average of 0.8 percent annually). The much smaller category of sport pilots is predicted to increase by 2.6 percent annually over the forecast period. Private pilot certificates are projected to have a marginal growth of 0.1 percent per year between 2024 and 2045, while commercial pilot certificates are projected to increase at an average annual rate of 0.6 percent over the forecast horizon.

The declining trend in private pilot certifications flattened after 2016 and started to increase in 2022. As other less costly recreational choices become more attractive and sport pilot certificates provide an alternative

for hobby use of flying, it is forecasted that the increase in the number of private pilots will level by 2030, while this certificate will continue to be a means to attain higher ratings, such as instrument, or to move up on the path to become professional pilots by earning commercial and ATP certificates. Consequently, higher rates of increase are estimated for commercial pilots and ATPs.



# FAA Operations

The traffic at FAA facilities underwent drastic changes during the period of 2019 and 2020 from the COVID-19 impact. There was a 16.7 percent decline in traffic from 53.3 million in 2019 to 44.4 million in 2020. After completing the recovery from the COVID-19 downturn in 2023, airport operations at FAA and contract towers continued their robust growth path, up 3.6 percent in 2024, totaling 56.5 million.

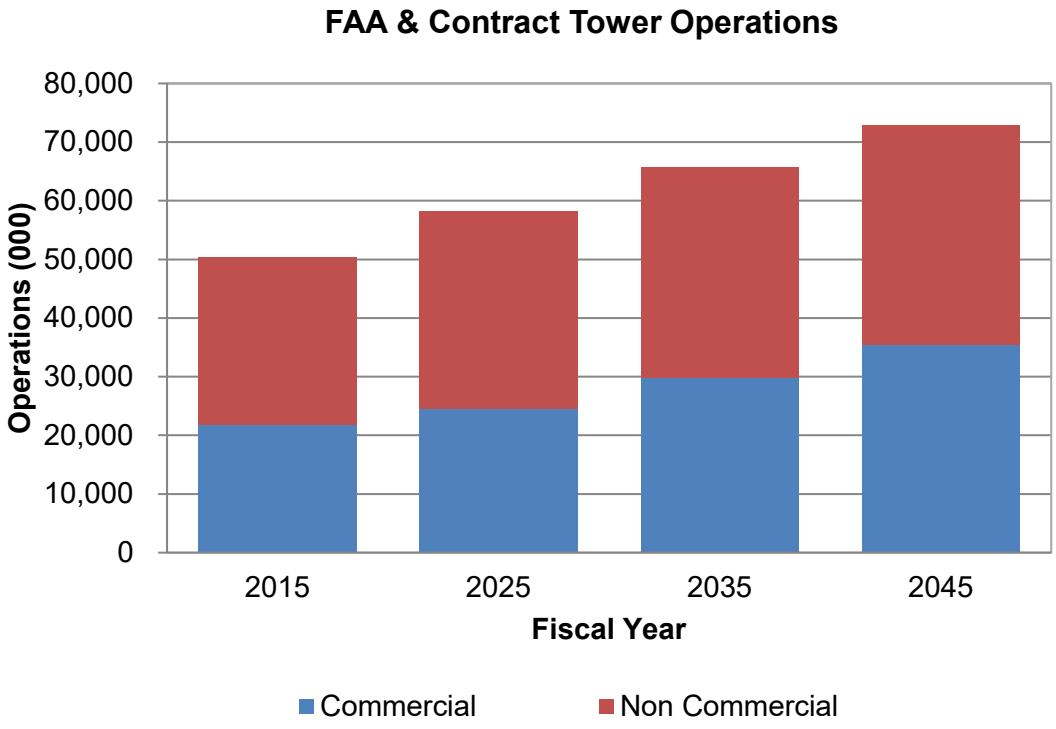
In the long run, economic growth in air travel demand and the business aviation fleet will drive long-term growth in operations at FAA facilities over the forecast period. Activity at FAA towers and contract towers is projected to increase at an average rate of 1.1 percent a year through 2045 from 58.2 million in 2025 to 72.8 million in 2045. The 1.1 percent annual growth forecast equals the 1.1 percent forecast for 2024-2044 last year. Commercial operations[6] at these facilities are forecast to increase 1.9 percent a year, approximately four times faster than non-commercial operations. The growth in commercial operations is less than the growth in U.S. airline passengers (1.9 percent versus 2.5 percent) over the forecast period due primarily to larger aircraft (seats per aircraft mile) and higher load factors. Both trends allow U.S. airlines to accommodate more passengers without increasing the number of flights.

General aviation operations are forecast to increase an average of 0.5 percent a year as increases in turbine powered activity more than offset declines in piston activity. General aviation operations accounted for 54.7 percent of total operations in 2024. This is slightly higher than pre-COVID share of 51.7 percent in 2019. The decline of general aviation traffic was relatively mild during the early years of the pandemic where recovery speed was swift.

The growth in operations at towered airports is not uniform. Most of the activity at large and medium hubs[7] is commercial in nature, as these are the airports where the vast majority (about 88 percent in 2023) of the passenger enplanements in the U.S. occur.

[6] Commercial operations include air carrier and commuter/air taxi operations.

[7] A large hub is defined to have 1 percent or more of total U.S. revenue passenger enplanements in FY 2023. A medium hub is defined to have at least 0.25 percent but less than 1 percent of total U.S. revenue passenger enplanements. In the 2023 TAF there were 31 large hub airports and 33 medium hub airports.




Given the growth in airline demand that is forecast and with most of that demand is at large and medium hubs, activity at the large and medium hubs is expected to grow substantially faster than smaller airports including small hub and non-hub facilities. The forecasted annual growth in operations is 1.9 percent at large hubs, 1.6 percent at medium hubs, 0.8 percent at small hubs and non-hubs, respectively, between 2025 and 2045.

Among the 31 large hubs, the airports with the fastest long-term annual growth forecast are those located along the coastal sections of the country where most large cities are located. Large cities have historically generated robust economic activity, which in turn drives up passenger demand. In terms of COVID-19 recovery, the airports with mostly domestic traffic and located at popular leisure destinations have had stronger recoveries.

FAA TRACON (Terminal Radar Approach Control) Operations[8] are forecast to grow slightly faster than at towered facilities. This is in part a reflection of the different mix of activities at TRACONs. TRACON operations are forecast to increase an average of 1.4 percent a year between 2025 and 2045. Commercial operations accounted for approximately 58 percent of TRACON operations in 2024 and are projected to grow 1.8 percent a year over the forecast period. General aviation activity at these facilities is projected to grow only 0.5 percent a year over the forecast.

[8] TRACON operations consist of itinerant Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) arrivals and departures at all airports in the domain of the TRACON as well as IFR and VFR overflights.

The number of IFR aircraft handled is the measure of FAA En-Route Center activity. Growth in airline traffic is expected to lead to increases in activity at En-Route centers. Over the forecast period, aircraft handled at En-Route centers are forecast to increase at an average rate of 1.7 percent a year from 2025 to 2045, with commercial activity growing at the rate of 1.8 percent annually. Activity at En-Route centers is forecast to grow faster than activity at towered airports and FAA TRACONs because more of the activity at En-Route centers is from the faster growing commercial sector and high-end (mainly turbine) general aviation flying.[9] In 2024, the share of commercial IFR aircraft handled at FAA En-Route centers is about 82.5 percent, which is greater than the 58 percent share at TRACONs or the 42 percent share at FAA and Contract Towers.

[9] Much of the general aviation activity at towered airports, which is growing more slowly, is local in nature, and does not impact the centers.

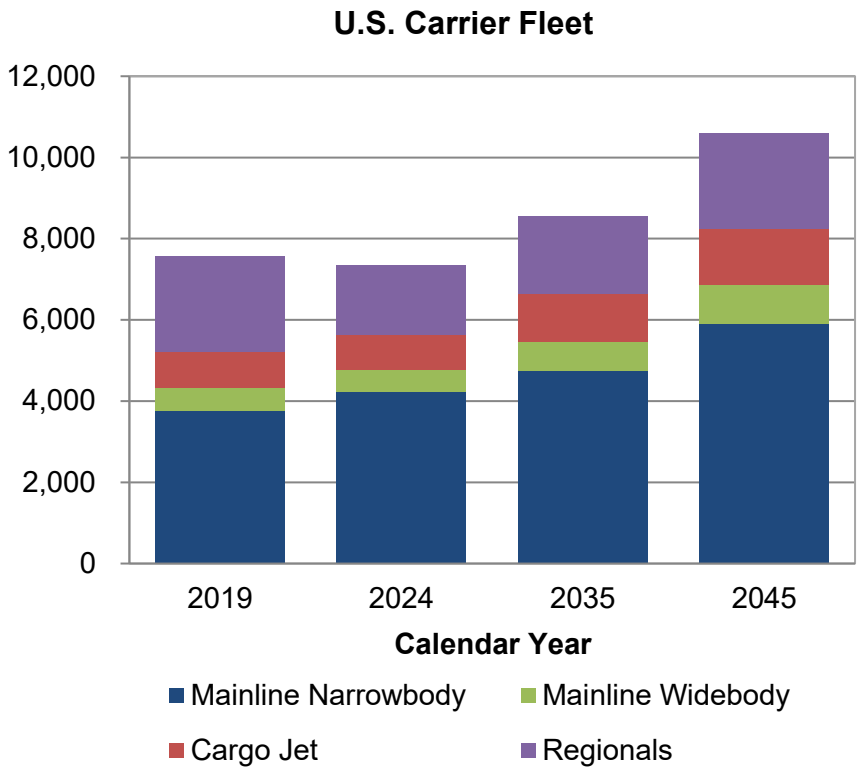
# U.S. Commercial Aircraft Fleet

Restrained by retirements and maintenance work, the number of active aircraft in the U.S. commercial fleet contracted slightly in 2023-24 (a decrease of 185 aircraft). The total number of commercial aircraft is forecast to increase from 7,387 in 2024 to 10,607 in 2045, an average annual growth rate of 1.7 percent a year. Long-term increases in demand for air travel and growth in air cargo is expected to fuel increases in both the passenger and cargo fleets.

Between 2024 and 2045 the number of jets in the U.S. mainline passenger carrier fleet (including regional jets) is forecast to grow from 4,829 to 6,854, a net average of 96 aircraft a year as carriers continue to remove older, less fuel-efficient narrowbody aircraft. As the industry continues to feel the effects of the COVID-19 downturn, increasing utilization rates, production issues and continuing supply chain constraints are all hampering near term growth. These factors result in declines in the narrowbody fleet (including E-series aircraft as well as A220-series at JetBlue and A220-series at Delta) through 2027. After 2030, the narrowbody passenger fleet sees solid increases averaging 112 aircraft per year as carriers replace older technology 737 and A320 family aircraft with more efficient MAX and Neo families over the entire forecast period. Over the entire forecast period, the widebody passenger fleet grows by an average of 21 aircraft a year as carriers add 777-8/9, 787's, A350's to the fleet while retiring 767-300/400, A330-200/300 and 777-200 aircraft. In total the U.S. passenger carrier widebody fleet increases by 2.7 percent a year over the forecast period.

The regional carrier fleet is forecast to increase from 1,697 aircraft in 2024 to 2,354 in 2045 as the fleet expands by 1.6 percent (31 aircraft) a year over that period. Carriers remove 50-seat regional jets and retire older small turboprop and piston aircraft, while adding 70-90 seat jets, especially the ERJ-175s. By 2045, the number of jets in the regional carrier fleet totals 2,114, up from 1,370 in 2024. The turboprop/piston fleet is forecast to shrink by 27% from 327 in 2024 to 240 by 2045. These aircraft account for 10 percent of the regional fleet in 2045, down from 19 percent in 2024.

The cargo carrier large jet aircraft fleet is forecast to increase from 861 aircraft in 2024 to 1,399 aircraft in 2045 driven by the growth in freight RTMs. The narrowbody cargo jet fleet is projected to increase on net by just 4 aircraft a year as 737-800/900MAX's are converted from passenger use to cargo service as older 757-200's are retired. The widebody cargo fleet is forecast to increase 22 aircraft a year as new 777-8 and converted 767-300 aircraft are added to the fleet, replacing older MD-11, A300, and 747-400 freighters as well as additional capacity for growing demand.


U.S. Carrier Fleet
12,000
10,000
8,000
6,000
4,000
2,000
0
2019
2024
2035
2045
Calendar Year
Mainline Narrowbody
Mainline Widebody
Cargo Jet
Regionals

# Commercial Space

The FAA's Office of Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activities including launch and reentry of vehicles and operation of non-federal launch and reentry sites authorized by Executive Order 12465 and Title 51 U.S. Code, Subtitle V, Chapter 509 (formerly the Commercial Space Launch Act). Title 51 and the Executive Order also direct the U.S. Department of Transportation to encourage, facilitate, and promote U.S. commercial launches. The FAA's mission is to license and regulate commercial launch and reentry operations and non-federal launch sites to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States.

The FAA licenses launches or reentries carried out inside the U.S. and by U.S. persons (which includes U.S. corporations) inside or outside the United States. The FAA does not license launches or reentries the U.S. Government carries out for the Government (such as those owned and operated by National Aeronautics and Space Administration (NASA) or the Department of Defense). Amateur-class rockets do not require a FAA license or permit[10].

To accomplish its mission, the FAA performs the following major functions:

- Maintains an effective regulatory framework for commercial space transportation activities,
- Provides guidance to prospective commercial operators on how to comply with regulatory requirements for obtaining an authorization and operating safely,
- Evaluates applications for licenses, experimental permits, and safety element approvals for launch and reentry operations and related commercial space transportation activities,
- Evaluates applications for licenses for launch and reentry site operations,
- Monitors and enforces regulatory compliance through safety inspections of launches, reentries, sites, and other regulated commercial space activities,
- Provides U.S. Government oversight of investigations associated with the mishap of an FAA authorized launch or reentry,
- Facilitates the integration of commercial space launch and reentry operations into other modes of transportation including the National Airspace System (NAS) by establishing appropriate hazard areas and limits to ensure the protection of the public,
- Coordinates research into the safety and operational implications of new technologies and the evolving commercial space transportation industry,
- Conducts outreach to the commercial space industry by hosting working groups and conferences,
- Collaborates with Government partners, such as the Department of Defense and

[10] Per 14 CFR Chapter 1, Part 1, section 1.1: Amateur rocket means an unmanned rocket that is propelled by a motor or motors having a combined total impulse of 889,600 Newton-seconds (200,000 pound-seconds) or less; and cannot reach an altitude greater than 150 kilometers above the earth's surface.

NASA to assure consistent approaches to regulations, policy, and standards, and

- Conducts outreach to international counterparts to promote the U.S. regulatory framework across the world.

In addition to AST headquarters offices in Washington, D.C., AST maintains staff with assigned duty locations near active launch ranges to facilitate communication with space launch operators and to implement FAA's regulatory responsibilities more efficiently. AST personnel are currently assigned to duty locations near Kennedy Space Center and Cape Canaveral Space Force Station in Florida; Johnson Space Center in Texas; Wallops Flight Facility in Virginia; FAA's Western-Pacific Regional Office; Vandenberg Space Force Base, and the Mojave Air and Space Port in California. FAA also directly supports NASA's commercial space initiatives by providing on-site staff at both the Johnson Space Center and Kennedy Space Center to coordinate the FAA's regulatory and compliance activities with NASA's development and operational requirements for commercial space.

## FAA Regulatory Safety Oversight Activities

FAA supports commercial space oversight and operations throughout the regulatory process. There are many activities performed by FAA during this process. The most notable activities are described here.

### *Pre-Application Consultation for Licenses, Experimental Permits, and Safety Element Approvals*

Prospective applicants seeking commercial space transportation licenses, experimental permits, or safety element approvals are required by regulation to consult with FAA before submitting their applications. During this period, FAA assists them in identifying potential obstacles to authorization issuance and determining potential approaches to regulatory compliance. In addition, many new operators are seeking to incorporate new technologies, vehicle types, or operational models creating opportunities for FAA to assist in determining the applicable regulations or approach to regulatory compliance.

### *Licenses, Permits, and Safety Element Approvals*

FAA authorizes commercial space transportation activities via the issuance of licenses, permits, and safety element approval. Typically, FAA issues a license with a narrow scope to a single vehicle configuration and mission trajectory. With the dynamic commercial space industry, these licenses are required to be modified to add additional vehicle configurations and mission profiles. FAA's new regulatory regime under Part 450 intends to allow flexibility by allowing authorization to conduct launch or reentry activities for various vehicle configurations and trajectories from multiple sites.

Within safety and oversight is the requirement to conduct both policy and payload reviews. When conducting a policy review, FAA determines whether the proposed launch, reentry, or site operation presents any issues that would adversely affect U.S. national security or foreign policy interests or be inconsistent with international obligations of the United States. If not otherwise exempt from review, FAA reviews a payload proposed for launch or reentry to determine whether the payload would jeopardize public health and safety, the safety of property, U.S. national security or foreign policy interests, or the international obligations of the United

States. The policy and/or payload determination becomes part of the licensing record on which FAA's licensing determination is based.

FAA issues launch and reentry site operator licenses and license renewals. FAA coordinates with Federal, state, and local governments and with the commercial range operators or users for commercial space licenses and operations. As part of the evaluation of applications for launch licenses, reentry licenses, and site operator licenses, FAA also conducts environmental reviews consistent with its responsibilities under the National Environmental Policy Act.

FAA anticipates issuing a growing number of safety element approvals for space launch systems equipment, processes, technicians, training, and other supporting activities. FAA reviews, evaluates, and issues safety approvals to support the continued introduction of new safety systems, safety operations applications, and safety element approval renewal applications.

### *Safety Analyses*

FAA conducts flight safety, system safety, maximum probable loss, and explosive safety analyses to support the evaluation and issuance of licenses and permits. FAA also evaluates and analyzes the performance of a vehicle operator's safety systems including safety-critical systems and any associated crew involved in the function of the safety system to determine how they affect public safety risk.

### *Inspections and Enforcement*

FAA currently conducts as many as 750 preflight/reentry, flight/reentry, and postflight/reentry safety inspections per year. Inspections often occur simultaneously at any of the 14 licensed commercial space launch sites, as well as at 4 Federal launch ranges and 3 exclusive use launch sites. The establishment of non-federal launch sites requires additional inspections in areas such as ground safety that have traditionally been overseen by the U.S. Air Force (now the U.S. Space Force) at Federal ranges. At spaceports and launch sites with high launch rates (e.g., Cape Canaveral Space Force Station, Kennedy Space Center, and Vandenberg Air Force Base), at least 70 percent of inspections are typically conducted by locally based field inspectors. Currently, the FAA intends to leverage a risk-based approach to respond to a dynamic operational tempo, minimize cost, and increase efficiency.

### *Mishap Investigations*

Mishap events have demonstrated that FAA needs to have the capacity to oversee the investigation of at least two space launch or reentry mishaps or accidents simultaneously anywhere in the world, and to lead/oversee as many as nine investigations during a single year. FAA anticipates an increase in mishaps with new operators coming online. FAA reviews all applicant mishap plans and accident investigation procedures as part of the license and permit evaluation process.

### *NAS Integration*

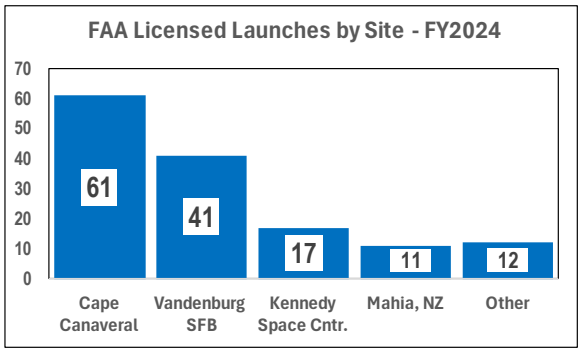
AST works in partnership with all FAA lines-of-business, notably the Air Traffic Organization (ATO) and Office of Airports (ARP), to support the safe and efficient integration of commercial launch and reentry operations through the NAS and its system of airports and air traffic managed by the ATO. Further, AST works with the ATO and the Office of NextGen (ANG) as FAA develops technologies to facilitate safe and efficient integration of commercial launch and reentry operations

through the NAS, including technologies to improve the integration of launch and reentry data into FAA air traffic control systems and technologies to improve the timely and accurate development and distribution of notices of aircraft hazard areas.

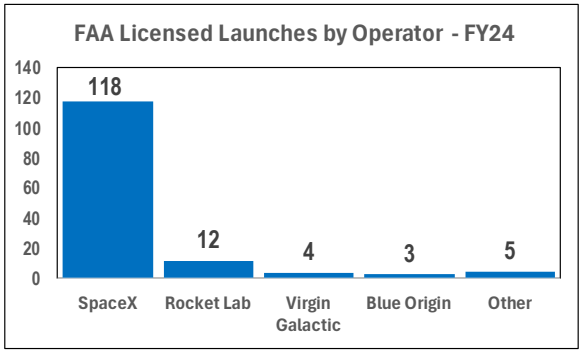
## FY 2024 Results

Between 1989 and 2024, FAA licensed 824 launch/reentries. Most of this activity occurred in the last five years (2020-2024). During this period, 432 launches and reentries occurred, accounting for over 56 percent of the total. In FY 2024, launch and reentry operations totaled 148, the highest posted in U.S. history, and 17 percent of all activity since 1989.

A vast majority of the licensed launches (130 out of 142) occurred at three U.S. sites and one international site. The top U.S. launch sites included Cape Canaveral, Florida (61 launches), Vandenburg Space Force Base (SFB), California (41 launches), and Kennedy Space Center, Florida (17 launches). Eleven U.S. licensed launches occurred at Mahia, New Zealand. The remaining 12 licensed launches occurred at five different sites.[11]




Correspondingly, the 142 launches were conducted by six operators, with SpaceX accounting for 83 percent of the total (118 launches). The remaining 17 percent were conducted by Rocket Lab (12 launches), Virgin Galactic (4 launches), Blue Origin (3 launches), United Launch Alliance (2 launches), Firefly Aerospace (2 launches), and Stratolaunch (1 launch).




The total number of licensed reentries in FY2024 was six. Four reentries were in the Gulf of America, one reentry was in the Atlantic Ocean, and one occurred at the Utah Test and Training Range. Five of the six reentries were conducted by SpaceX, with the remaining reentry conducted by Varda.

The launches covered a variety of missions, including the first-ever privately funded spacewalk by non-government astronauts.[12] Other missions included (but were not limited to) space tourism, satellite deployment,

[11] Boca Chica, Texas; Van Horn, Texas; Mid-Atlantic Regional Spaceport, Virginia; Mojave Air & Space Port, California; Spaceport America, New Mexico

[12] The excursion represented the first use of a privately-created space suit designed for spacewalks, and was the first time four people from one mission were exposed to the vacuum of space at the same time. Source: https://www.inc.com/kit-eaton/the-commercial-space-race-took-flight-in-2024/91070229.

global emissions tracking of methane, and earth observation. Future missions are anticipated to also include cislunar operations, space travel to Mars, and in-orbit services.

In FY2024, ten licensed operations resulted in a mishap (eight during CY2024).

## Forecast

The starting point for FAA's launch and reentry operations forecast relies on data collected from operators and prospective applicants, tying launch and reentry activity directly to anticipated operations by commercial space transportation firms known to FAA. The forecasts are presented as a low case scenario and a high case scenario to provide a range of future activity, reflecting uncertainty at the pace of which launches and reentries will occur. All FAA-authorized commercial space operations are included in this forecast, regardless of where they occur.

In previous years, the commercial space operations forecast covered a five-year horizon. This year marks the first time the forecast spans a ten-year horizon. The expanded timeframe, along with the high case scenario and a low case scenario, is intended to better aid government and industry planners.

### *Increase in Operations Over Previous Projections*

In the high case scenario, FAA forecasts 4,010 authorized space operations over the ten-year forecast horizon – going from 183 operations in FY2025 to 566 operations in FY2034. In the low case scenario, FAA forecasts 2,067 authorized space operations -- going from 174 operations in FY2025 to 259 operations in FY2034. The increase in operations reflects demand for activities such as in-orbit servicing, assembly, and manufacturing (ISAM); cislunar operations; Mars exploration; satellite deployment and replacement; and space tourism.[13]

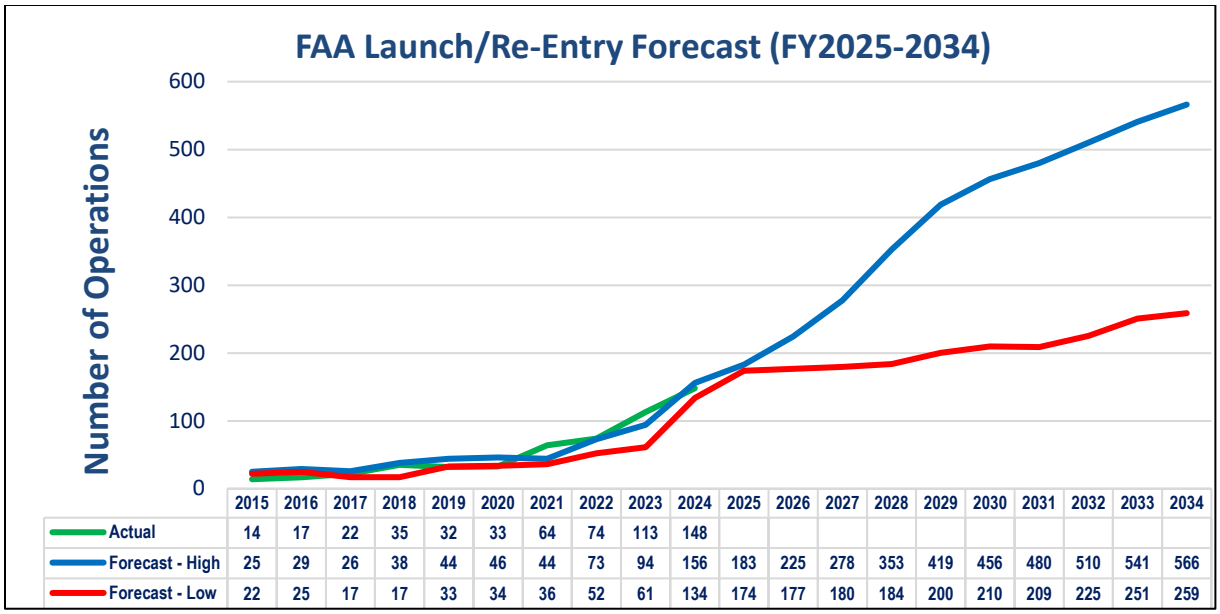
A comparison of scenarios between the current forecast and the previously released forecast for the period FY2025-28 shows an overall increase of 65 operations for the high case scenario.[14] Similarly, a comparison of the low case scenarios shows an overall increase of 68 operations.

The following graph shows FAA's low and high case forecasts, as well as historical activity. FAA is forecasting launch and reentry activity to increase from a range of 174 to 183 in FY2025 to a range of 259 to 566 in FY2034.[15]

[13] ISAM (In-orbit servicing, assembly, and manufacturing) is an emerging field within the aerospace industry that involves the use of robotic technology to perform tasks in space, such as repairing and maintaining satellites. Cislunar operations are those that would extend up to the Moon's orbit and may include commercial activities such as resource mining, placing satellites to enhance global communications networks, and providing lunar habitats as a base for scientific research and tourism.

[14] Prior forecasts of FAA authorized space operations were presented on a five-year basis.

[15] This forecast does not include launch activity not authorized by the FAA (e.g., launches the Government carries out for the Government) or launch activity for other nations.




| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actual | 14 | 17 | 22 | 35 | 32 | 33 | 64 | 74 | 113 | 148 | | | | | | | | | | |
| Forecast - High | 25 | 29 | 26 | 38 | 44 | 46 | 44 | 73 | 94 | 156 | 183 | 225 | 278 | 353 | 419 | 456 | 480 | 510 | 541 | 566 |
| Forecast - Low | 22 | 25 | 17 | 17 | 33 | 34 | 36 | 52 | 61 | 134 | 174 | 177 | 180 | 184 | 200 | 210 | 209 | 225 | 251 | 259 |

## Factors Affecting Forecast Accuracy

The commercial space transportation industry is rapidly evolving. The industry's growth through technological innovation and the development of new markets increases the challenges associated with forecasting commercial space transportation operations

There are several factors that magnify the challenges with predicting the number of launches and reentries expected in any given year. These factors include:

- a dynamic list of firms that launch or intend to launch,
- development of new technologies,
- launch rates for reusable launch vehicles,
- commercial spaceflight by both government astronauts and private citizens,
- the dynamic nature of flight test programs,
- loosening or tightening of the regulatory environment, and
- mishaps.[16]

### *Satellite Deployment*

Many of the missions included in the launch forecasts are affiliated with initial satellite deployment and their eventual replacement as they reach end of useful life. The timing for the deployment of satellites can affect forecast accuracy, especially in the latter years. In the near-term, forecast accuracy can be impacted by cancellation of satellite constellations. For example, last year's forecast included the launch of Boeing's V-Band constellation. Boeing surrendered their license for this constellation in September 2023, stating that surrendering their license was a

[16] New technologies [e.g., reusable launch vehicles] allow a faster operational tempo, and at the same time, early use of these technologies can increase the probability of a mishap. The time between mishap investigations and subsequent "return to flight" for impacted entities can take months, drastically impacting launch plans.

business decision regarding spectrum allocation.[17]

The current forecast for satellite deployment in the near term includes (but is not limited to), Amazon's Kuiper and SpaceX's Starlink. Deployment of Amazon's Kuiper is expected to begin in 2025 with 100 percent deployment by 2031, also marking the year that satellite replenishment begins. Starlink's LEO is expected to be 100 percent deployed by the end of 2025, with satellite replenishment beginning the same year.

### *Changes to the List of Firms Intending to Launch*

There is potential for launch service providers that have not been included in this forecast to emerge and begin conducting launches. Conversely, there is also the risk that a current launch service provider, or even multiple providers, may drop out of the market.

The list of firms intending to launch is dynamic, with smaller launch providers struggling in an increasingly competitive market. New arrivals to the industry face steep barriers to entry, including high development costs and intense competition from their established counterparts that provide reliable, frequent, and more cost-effective services.

At the start of 2024, there were 12 launch service providers in the U.S. During the year, ABL Space Systems withdrew from the commercial launch business to focus on missile defense.[18] In the previous year (2023), Virgin Orbit filed for bankruptcy protection. It ceased operations and sold its assets and equipment to other aerospace companies. Other market changes could occur in the future.

### *Move to Larger Launch Vehicles*

Several rocket manufacturers are developing larger launch vehicles. SpaceX is continuing development of its 398-foot rocket, Starship. Starship's first launch occurred in April 2023. Blue Origin's 320-foot New Glenn rocket successfully launched to orbit during its first test flight in January 2025, although the goal of recovering the reusable booster stage during re-entry was not achieved. Relativity Space is developing Terran R, a 216-foot rocket. The Terran R is not expected to be launched until 2026, at the earliest.

Larger launch vehicles possess several key attributes that will enable operators to lower costs on a per launch basis. A brief description of these attributes as they pertain to Starship, New Glenn, and Terran R are provided below.

*Increased Payload Mass:* Terran R, New Glenn, and Starship will be able to launch payloads of up to 20, 45, and 150 metric tons, respectively, to low earth orbit.[19] For comparison purposes, the Atlas V, classified as a medium to heavy-lift launch vehicle, can carry a payload of 18.9 metric tons to low earth orbit.[20]

*Increased Payload Volume*: The larger launch vehicles will allow for heftier, more

[17] Source: Boeing Relinquishes License For LEO Broadband Constellation | Aviation Week Network

[18] Source: ABL Space exits commercial launch market, shifts focus to missile defense - Space News

[19] Sources: https://tlpnetwork.com/news/america/relativity-space-update-terran-r-preparing-for-first-flight; https://www.blueorigin.com/new-glenn; https://www.spacex.com/vehicles/starship/

[20] Source: https://en.wikipedia.org/wiki/Atlas_V

complex cargo, such as satellites, spacecraft, telescopes, and supplies in a single mission.

*Reusability of Launch Vehicles:* Starship is a fully reusable launch vehicle that is expected to launch 100 times before retirement.[21] New Glenn is designed with a reusable first stage and a partially reusable second stage. New Glenn is expected to conduct multiple missions prior to retirement. The Terran R will have a fully reusable first stage and a second stage that will be discarded after use. Initially Terran R will be designed for 20 reuses.[22]

*Increased Launch Frequency*: By 2026, Starship is expected to be capable of 25 launches per year. Once fully operational, New Glenn is expected to be capable of 24 launches per year.

### *New Markets for Commercial Space Transportation*

In a shift away from past space domination by governmental agencies such as NASA and the Soviet Union's space program, private companies are increasingly interested in accessing the commercial space market.[23] Spurring optimism is the development of commercial space transportation technologies. Space data, products, and services provide tangible benefits and economic opportunities to people worldwide.[24]

The demand for space activities such as exploration, tourism, cislunar operations, placement of satellites, and in-orbit servicing, assembly, and manufacturing (ISAM), are expected to grow with each successful mission. Subsequently, launch providers are motivated towards technology that will allow for launches to occur at an increased pace.

In the report *Space: The $1.8 Trillion Opportunity for Global Economic Growth,* it is estimated the space economy will be worth between $1.4 trillion and $2.3 trillion by 2035, up from $630 billion in 2023.[25] The main drivers for this growth include:

1) a decrease in launch costs, which have fallen 10-fold over the last 20 years.

2) commercial innovation, which has led to the use of smaller satellites that can provide higher resolution pictures at a lower cost.

3) diversification of investment and applications, with private sector investment reaching all-time highs and space-enabled activities, such as tourism, becoming mainstream.

4) cultural awareness and enthusiasm, as evidenced by government and business leaders increasingly consider what space could enable in the future.

[21] Sources: Source: https://gizmodo.com/spacex-sets-ambitious-goal-25-starship-flights-in-2025-2000524527
[22] Source: https://www.relativityspace.com/press-release/2023/4/12/terran-r
[23] Source: The Future of Space: Economic Opportunities and Challenges | New Space Economy
[24] Deployment of SpaceX's Starlink at little to no charge for users allowed for communication and internet services critical for residents and emergency responders impacted by Hurricane Helene, Hurricane Milton and the Los Angeles wildfires. https://www.ntd.com/free-starlink-service-coming-to-los-angeles-areas-hit-by-wildfires-musk-says_1039603.html.
[25] Report published by the World Economic Forum in knowledge partnership with McKinsey & Company. Source: https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/space-the-1-point-8-trillion-dollar-opportunity-for-global-economic-growth

# Emerging Aviation Entrants: Unmanned Aircraft System and Advanced Air Mobility

## New Entrants: Analysis and Forecasts

Unmanned aircraft systems (UAS or drones) are relatively new entrants into the national airspace system (NAS) and are experiencing rapid diversification, both in terms of operations and aircraft. UAS 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. A drone consists of a remotely-piloted aircraft and its associated elements—including the ground control station and the associated communication links—that are required for safe and efficient operation in the NAS. The introduction of drones in the NAS has opened numerous possibilities, especially from a commercial perspective, e.g., package deliveries. 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 small businesses carrying out focused missions to large companies delivering commercial packages, infrastructure inspections and delivering medical supplies. Public service uses, such as conducting search and rescue support missions following natural disasters, are proving promising as well.

The other new entrant, Advanced Air Mobility (AAM), has seen rapid development of aircraft, and operations are expected to begin in the near future. AAM is an umbrella term for aircraft that are typically highly automated, utilize electrically powered propulsion, and have vertical take-off and landing capability. Many of these aircraft fall into the powered-lift category and are often referred to as air taxis. Urban Air Mobility (UAM) is a subset of the AAM concept which involves cooperative air transportation services in and around urban areas while Regional Air Mobility (RAM) are AAM operations that are highly automated and conducted outside of urban areas. Several proposed use cases for AAM/UAM aircraft include passenger and cargo transport and the provision of emergency services.

This section provides a broad overview covering recreational and commercial unmanned aircraft[26] and their recent trends, as

[26] These are also called, interchangeably, hobby or model and non-hobby or non-model UAS, respectively. On October 5, 2018, the President signed the FAA Reauthorization Act of 2018 (Pub. L. 115-254). Section 349 of that Act repealed the Special Rule for Model Aircraft (section 336 of Pub. L. 112-95; Feb. 14, 2012) and replaced it with new conditions to operate recreational sUAS without requirements for FAA certification or operating authority. The Exception for Limited Recreational Operations of Unmanned Aircraft established by section 349 is codified at 49 U.S.C. 44809 [see https://bit.ly/30tUf1Z for more details]. Recreational flyers, under Section 349, are referred to as "recreational flyers or modeler community-based organizations" [see https://bit.ly/2PUhMCI]. In previous notes including other documents of the Agency, these terms are often interchanged.

gathered from trends in registrations, surveys, tracking the overall market, and operational information. Using these trends and insights from the industry, the FAA produces a number of forecasts. Forecasts reported in the following sections are driven primarily by assumptions of the continuing evolution of the regulatory environment, the commercial ingenuity of manufacturers and operators, persistent recreational uses, and underlying demand for drone services. The forecasts for UAS and AAM are supported by analyses of recent survey findings, data on imported equipment, remote pilots, and waivers and exemptions of small UAS. The section also provides analysis and forecasts of large UAS. Finally, an analysis of AAM is provided together with some initial projections drawn from FAA-sponsored and other research, government and industry reports.

## Trends in Recreational/Model Aircraft New Registration

The FAA's online registration system for recreational/model small drones went into effect on December 21, 2015. This required all drones weighing more than 0.55 pounds (or 250 grams) and fewer than 55 pounds (or 25 kilograms) to be registered using the online system or the existing (paper-driven) aircraft registry.[27] With the continuing registration, over 1.61 million (new) recreational drone owners had already registered cumulatively with the FAA by end of December of 2024.[28] On average, new owner registration stood at around 5,810 per month during January – December in 2024 with some expected peaks during the holiday seasons and summer. In comparison, the average new owner registration stood at around 6,053 per month during January – December in 2023. Prior to that, the average new owner registration per month stood at around 7,866 in 2022. Clearly, the average monthly registrations have been declining over the years.

As evident, the current pace of new registration (and, presumably, sales of drones requiring registration) has decreased compared to last year in the same period; average new monthly registration during 2024 stood at 243 less than the number observed in 2023. In 2023, the number stood at 1,813 less than in 2022 and this trend has been relatively consistent over the last few years. We expect this trend to continue over the five-year forecast horizon.

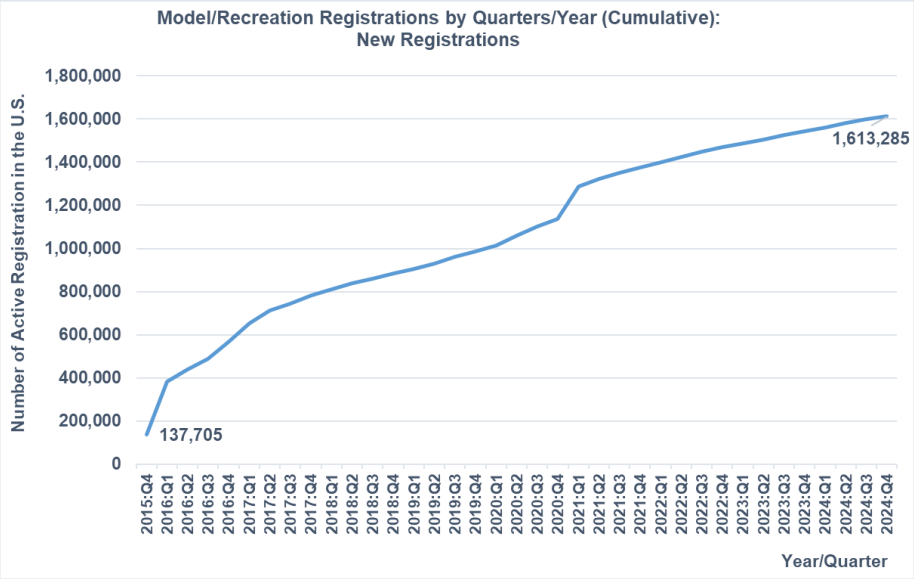
At present, recreational ownership registration does not correspond one-to-one with aircraft. Unlike their commercial non-model counterpart, the registration rules for recreational operators do not require owners of small recreational drones (sUAS) to register each individual aircraft; only operators are registered.[29] For each registration, therefore, one or more aircraft may be owned. In some instances, there is no equipment associated with registration. Free registration at the initial phase may have incentivized some to create a registration without any equipment

[27] See https://bit.ly/2IfJ1cm.

[28] For our estimate and projections using the registration database, applied to recreational, commercial/Part 107 and remote pilots, we use only those who are registered in the US and the territories for the period January – December, 2024. Furthermore, we draw a clear distinction between new registrations, cancellations, and renewals in this document that has been explained later on.

[29] https://bit.ly/3WqIbNH

to report. Notwithstanding these challenges, there is information available, from industry and academia and surveys, allowing us to understand aircraft ownership. Furthermore, as a result of robust strategic drone research planning, the FAA has launched various research projects to understand the magnitude of the sector, implications for aircraft that may be used for recreational flying, as well as potential safety impacts of drone integration into the NAS. Finally, the Agency has incorporated outside analysis and launched surveys[30] to understand the magnitude of the sector and improve forecasting efforts.




With over 1.61 million new recreational operators cumulatively registered as of December 2024, the FAA estimates that there are approximately 1.87 million sUAS in the fleet distinctly identified as recreational aircraft, i.e., equipment is 16 percent higher than the total new registrations. Comparing industry sales and other data, we conclude that the number of recreational aircraft is almost 16 percent higher than ownership registration. Applying cumulative net gain/loss calculations from the registry, the effective/active fleet is estimated to be around 455,106 as of December 2024. This provides us with the lower bound of the effective/active fleet of recreational small drones in the NAS.

A comparison of last year's data (2023) with this year's (2024) shows the annual growth rate for new registrations to be a little over 4.5 percent, a slight drop from the 4.9 percent growth in the year before (2023) and continuing the trend from the year before (2022) of 6.7 percent. Nevertheless, it is still an increasing trend, albeit at a lower rate. This is possibly due to the continuation of drones playing a dominant role in recreation, facilitated by decreasing equipment prices,

[30] Survey and results have been reported below.

improved technology such as built-in cameras and higher capability sensors, and relatively easy maneuvering. Nevertheless, like all technologies fueling growth of hobby or recreational items, the trend in recreational small drone ownership registration has been slowing. It is likely to slow down further as the pace of falling prices diminishes and the early adopters begin to experience limits in their experiments, or simply because recreational eagerness plateaus.

Given trends in registration and market developments, the FAA forecasts that the recreational small drone market will saturate at around 1.93 million units over the next five years.[31,32] However, there is still some upside uncertainty due to further changes in technology, faster regulatory integration, and the likely continued decreasing prices. This leads to upside possibilities in the forecast of as many as 1.97 million units by 2029. If registration renewals are kept up over time, effective/active fleet would likely converge to base forecasts, i.e., derived from cumulative new registrations combined with multiplicity of craft ownership. In the presence of slower renewal tendency, as data presently indicates, it is likely that the effective/active fleet will be lower than that derived from base forecasts. This provides the FAA with an opportunity to derive low-side forecasts using effective/active fleet calculations. Nonetheless, the low-side uncertainty growth trajectory (i.e., annual growth rates) tracks closer to the base forecast in the outer years of 2027-2029. A forecast base (i.e., the most likely outcome), together with high and low scenarios, is provided in the table below:[33]

| | Total Recreation/Model Fleet (Million sUAS units) | | | |
|---|---|---|---|---|
| | Calendar Year | Low* | Base** | High** |
| Historical | 2024 | 0.4551 | 1.8670 | 1.8670 |
| | | | | |
| Forecast | 2025 | 0.4600 | 1.8894 | 1.9043 |
| | 2026 | 0.4848 | 1.9110 | 1.9287 |
| | 2027 | 0.4978 | 1.9228 | 1.9452 |
| | 2028 | 0.5055 | 1.9258 | 1.9588 |
| | 2029 | 0.5072 | 1.9297 | 1.9725 |
| | | | | |
| '*': effective/active fleet counts combined with multiplicity of craft ownership; | | | | |
| '**': new registration counts combined with multiplicity of craft ownership; | | | | |

The FAA forecasts that the recreational small drone fleet will likely maintain its peak with average or trend growth over the next 5 years, from the present around 1.87 million units to approximately 1.93 million units by

[31] These forecasts have two dimensions worth emphasizing. When looked at from the cumulative base, "total" captures the number of drones that are reported to be in the system (i.e., base and high); while "effective/active fleet" refers to aircraft that are presently operating in the system (i.e., low).

[32] As we extend the forecast time period by a year from 2028 to 2029 for rolling 5-year projections, the sector is expected to expand by around 63,000 from what we forecasted last year: 1.8830 million in 2028 to 1.9297 million in 2029. This trend is likely to continue due to secular growth in the sector.

[33] As noted earlier, low scenario reports effective/active fleet using a net gain/loss calculation. By definition, low scenario differs from base and high scenarios, which are based on new registrations only. Hence, a low scenario counting of fleet for the year 2024 is markedly different than the baseline and high scenarios for the same year.

2029 thus attaining an average annual growth rate of 0.66 percent during 2024-2029. During the last year, it was reported to be 1.2 percent for 2023-2028.

Following somewhat different growth trajectory than the base or high growth, there will likely be approximately 507,237 active/effective small drones (or, 52,131 more than what was observed during 2024) over the next five years in 2029, which is now the low forecast for recreational/model small drones. This ensures an average annual growth rate of 2.2 percent during 2024-2029. Active/effective fleet count is determined and projected based on the net gain/loss calculation derived by using five underlying components from the registry. The high scenario, on the other hand, may reach as high as 1.97 million units (or 1.1 percent average annual growth rate).

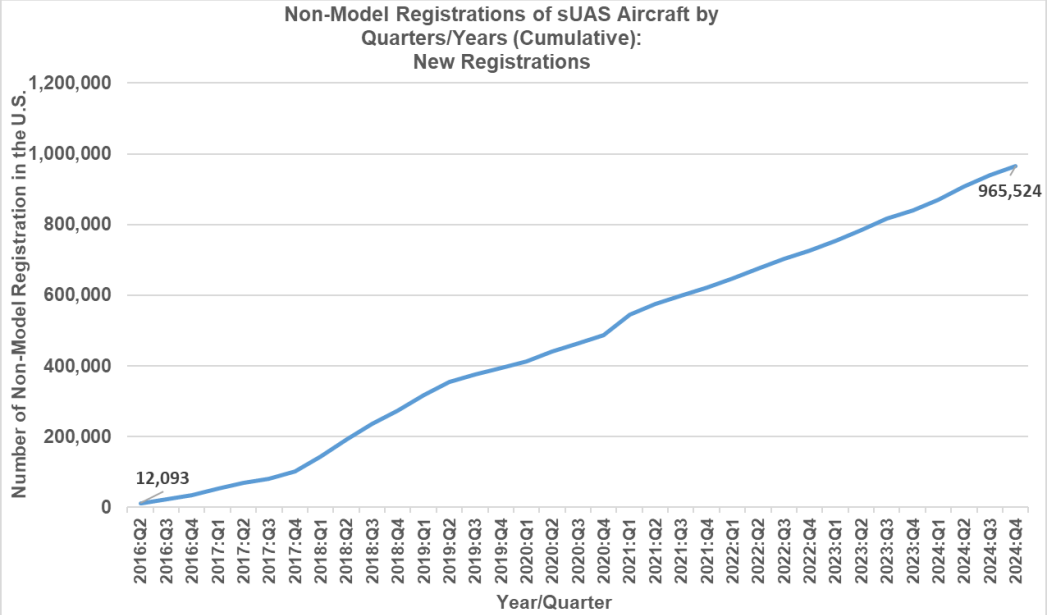
Notice that eventual saturation is at somewhat higher levels in comparison to last year's projections, reflecting continued new registrations, albeit at a slower rate, by recreational flyers observed during 2024 and extension of the forecast projection by a year. The increased new registration trend, in part driven by COVID-19, may or may not continue in the longer run.[34] In comparison, low side forecasts assume the present trend in renewals combined with new registration followed by similar expiry and cancellation trends. Nevertheless, the growth rates underlying these numbers are steady in the initial years but fade faster in the last two to three years. The gradual saturation that is projected in five years and beyond in the recreational small drone fleet parallels other consumer technology products and the Agency's projections from the last few years, particularly with respect to base and high forecasts. However, both the numbers and the growth trajectory for the low scenario (i.e., effective/active fleet) are fundamentally different from the past couple years for the reasons described above. Nevertheless, it provides a lower bound that is likely to be closer to reality in terms of small drones that are in use and operationally active in the NAS.

### Trends in Commercial/Non-Model Aircraft and Forecasts Using Registrations vs. Effective/Active Fleet

Online registration for commercial/non-model small drones went into effect on April 1, 2016. Unlike recreational/model ownership, rules for commercial registration require owners to register each unmanned aircraft, thus creating a one-to-one correspondence between registration and aircraft. During the period of January – December 2024, more than 124,000 commercial operators registered their equipment. In comparison, during the period of January – December 2023, more than 115,000 commercial operators registered their new equipment. The pace of monthly new registration in 2024, at around 10,370, is higher than monthly registrations of 9,627 during 2023 which was

[34] It is quite likely that many users were buying and experimenting with recreational small drones given the COVID-19 public health emergency and the substantial portion of the workers presently working from home. This trend may or may not continue once regular work patterns resume.

higher than those observed during 2022 at 8,750. The number of new registrations is higher in comparison to earlier years. As the pace of recreational registration has slowed somewhat, particularly last year, FAA expects new registrations for commercial sUAS to follow suit.




The commercial small drone sector is dynamic and appears to be at an inflection point, as is evident from the monthly registrations, demonstrating powerful stages of growth. Unlike the recreational small drone sector, the FAA anticipates that the growth rate in this sector will remain high over the next few years. This is primarily driven by the regulatory clarity that Part 107 continues to provide for the industry.

**Total Commercial/Non-Model Fleet**
**(Thousand sUAS units)**

| Calendar Year | | Low* | Base** | High** |
|---|---|---|---|---|
| Historical | 2024 | 388 | 966 | 966 |
| | | | | |
| Forecast | 2025 | 395 | 1030 | 1035 |
| | 2026 | 402 | 1089 | 1099 |
| | 2027 | 408 | 1135 | 1151 |
| | 2028 | 411 | 1165 | 1187 |
| | 2029 | 413 | 1180 | 1209 |

**'*': effective/active fleet counts.**
**'**': new registration counts based fleet counts.**

The FAA uses the trends observed in registration during previous years, calculation of net gain/loss, information from the annual survey, a review of available industry forecasts/workshops and past FAA Drone Symposiums, and FAA-sponsored research.[35] Using these and a time series model fitted onto the monthly data, the FAA forecasts that the commercial drone fleet will (i.e., base scenario) exceed the million mark in 2025 and total 1.118 million by 2029, 22 percent above the total as of the end of 2024.[36]

Using the low or effective/active fleet, FAA forecasts an expansion of the small drone fleet by 25,000, or 7 percent of the currently calculated effective/active fleet of around 388,000 units.[37] As the present base (i.e., the cumulative total) increases, the FAA anticipates the growth rate of the sector will slow down over time, and the effective/active fleet will likely catch up with the growth trajectory of new registrations. Nevertheless, the sector will be much larger than what was understood only a few years earlier.

Unlike the small recreational drone segment, it is extremely difficult to put a floor on the growth of the commercial small drone sector due to its composition (i.e., consumer vs. professional grades) and the varying business opportunities and growth paths. As commercial small drones become operationally more efficient and safer, battery life expands, and integration continues (e.g., recent final rules involving operations over people; flying at night, remote ID, and future Normalizing UAS Beyond Visual Line of Sight Operations rulemaking[38]), new business models will begin to develop, thus enhancing robust supply-side responses. These responses, in turn, will create demand forces (e.g., consumer responses to receiving commercial delivery packages, routine blood delivery to hospitals, and search-and-rescue operations) that are latent and in the experimental stages at present. Unlike a developed sector of aviation such as passenger air transportation, it is impossible to put a marker on "intrinsic demand" (or core demand) primarily driven by the economic and demographic factors underlying this sector.

In this year's forecast the FAA makes a provisional attempt to provide a "low" side for now, essentially capturing the intrinsic demand and making use of the calculation of effective/active fleet. In addition, FAA provides a likely or base scenario together with the enormous potential embodied in a "high" scenario, with average annual growth rates of 4.1 percent and 4.6 percent, respectively (lowered by a percentage point from last year). As noted earlier, the low scenario is driven by two positive factors (i.e., new registration and renew+) and two negative factors (i.e., cancellations and expiry). The average annual growth rate corresponding to the low scenario is thus determined by the combined effect of both positive and negative factors and is approximately 1.3 percent a year. This is much smaller than both the base and high scenarios because the effective/active count is driven to catch up with the

[35] See https://bit.ly/432Gxn5.

[36] Last year, the ratio of end-year forecast to base-year forecast was 1.33-times. That is, the FAA forecasted the end-year to be 1.33-times base-year (2023) numbers in 5-year (2028). Higher forecasts are often the result of improved regulatory environments, as noted below, and environments following the process of rule-making evaluation (See fn. #30; and #33-#36 for these) in the face of new opportunities.

[37] This is driven by the combined effects of projected underlying growth rates of cancellations, expiry, new registrations, and renewals.

[38] See https://tinyurl.com/3scmxzcu for more details.

new registrations trend.[39,40] Commercial small drones are currently used for numerous purposes. As the sector grows, the FAA anticipates there will be more uses for, and much more use of, small commercial drones. This is increasingly evident, for example, from the work to begin implementing the UAS traffic management system (UTM) ecosystem,[41] successful completion of the UAS Integration Pilot Program (IPP),[42] and continuation in BEYOND,[43] and package delivery by Part 135 drones. [44]

## 2024 Survey and Preliminary Results

The FAA requires an understanding of the flight characteristics and operations of UAS across the U.S. Unlike commercial aviation, which has statutory reporting requirements, UAS operate mostly outside of airports and are free to operate without reporting activities to aviation authorities while in uncontrolled space. As such, little is known about the general operations of UAS, which has hindered FAA efforts to effectively integrate UAS into the NAS.

To improve the FAA's understanding of UAS activities, it has developed and conducted a survey of UAS operators. The survey design is a stratified random sample of UAS operators with type of operator, recreational or Part 107, and geography, U.S. County, as the strata. The survey frame is constructed from the recreational UAS and the Part 107 registries.[45] A total 97,857 invitations were sent to UAS registrants: 54,634 recreational registrants and 43,223 Part 107 registrants.[46] Recreational registrants had a 26% response rate while Part 107 registrants had a 22% response rate.

All respondents were asked about their total number of flights conducted in 2024, defined as a takeoff and a subsequent landing. Respondents from the Part 107 registry were asked to report their total number of non-recreational flights and their total number of recreational flights conducted in 2024 while respondents from the recreational registry were only asked about their recreational flights.

Respondents from the Part 107 registry reported an average of 75.4 nonrecreational flights (median of 2) and an average of 34.9 recreational flights (median of 5) in 2024. Respondents from the recreational registry reported an average of 46.2 recreational flights (median of 10).

[39] Findings from our survey, discussed last year and this year in a later section, also support this observation.
[40] See prior footnotes for a similar explanation pertaining to effective/active count for recreational registration.
[41] See https://bit.ly/3KucgX4
[42] See https://bit.ly/2O4tzPP for more details.
[43] See https://bit.ly/3nKAOIK. We provided a detailed analysis of the BEYOND program in last year's document.
[44] See https://bit.ly/3CnroEj for more details.
[45] As noted earlier, 49 U.S. Code § 44809 requires recreational UAS aircraft systems operators to register with the FAA. In addition, 14 CFR Part 107 requires non-recreational operators to register with the FAA. UAS operators must register with one of these registers at FAA's https://bit.ly/41328Kr and paper forms are no longer available.
[46] The survey design is a stratified random sample of registered operators. The strata are the registries and the U.S. County in which the operator is domiciled. Each county had 30 registrants randomly selected to receive an invitation to the survey. If the number of registrants in the county were fewer than 30, all registrants in the county were sent an invitation. For more information, a survey supplement is available upon request.

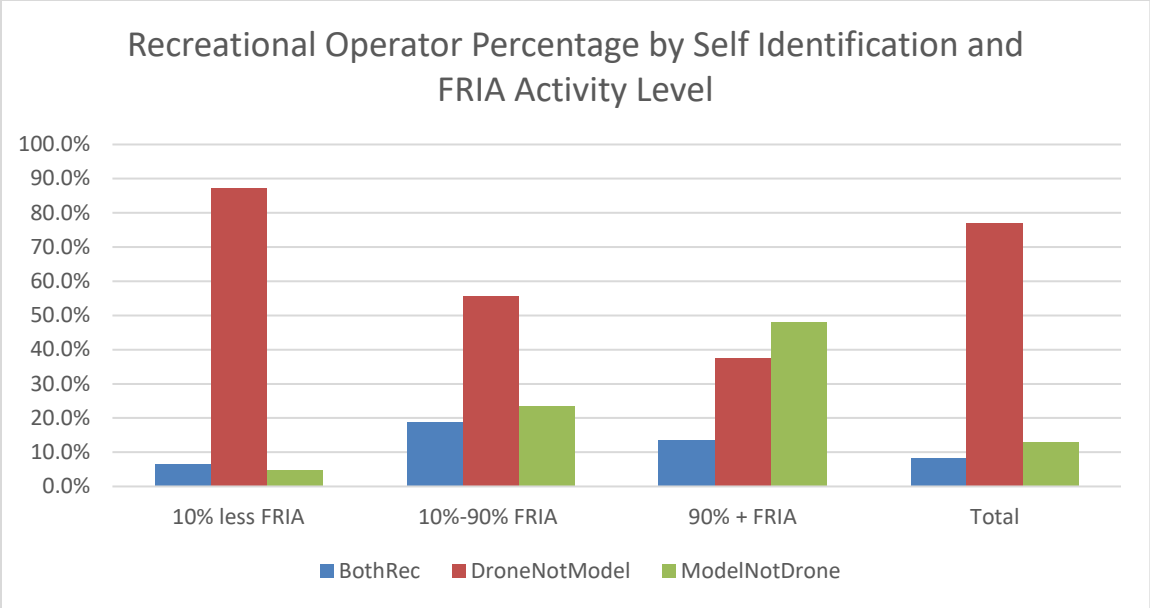
The number of active FAA-Recognized Identification Areas (FRIAs) in the United States reached 2,481[47] at the end of 2024, and the extent of their use has not been quantitatively measured. As such, respondents from the recreational registry were also asked how many of their recreational flights were conducted in FRIAs.[48] Respondents reported an average of 18.0 of their flights were conducted in a FRIA (median of 0). Moreover, the question revealed that recreational operators are either all-in on FRIAs or not at all, operating nearly entirely within or outside their boundaries. In addition, 17 percent of recreational registrants are High FRIA operators who, when compared to Low FRIA operators, conduct 2.8 times as many annual flights with different airframes, in particular more fixed wing.

Respondents from the recreational registry were differentiated into groups based on their percentage of activity in a FRIA. First, Low FRIA activity recreational respondents (77.8%; n=8391) who conducted 10 percent or less of their operations in a FRIA. Second, Mixed FRIA activity recreational respondents (5.4%; n=582) who conducted greater than 10 and less than 90 percent of their operations in a FRIA. Third, High FRIA activity recreational respondents (16.8%; n=1812) who conducted 90 percent or more of their operations in a FRIA. Low FRIA operators conducted an average of 38.2 annual flights with 0.2 of those flights in a FRIA. Mixed FRIA operators conducted an average of 98.6 annual flights with 49.1 of those flights in a FRIA. High FRIA operators conducted an average of 107.2 annual flights with 106.3 of those flights in a FRIA.

The survey also contained a self-report question on the type of UAS operator the respondent considered themselves. This question contained two possible categories of recreational operators: drone operator and model aircraft operator. As such, three types of recreational operator emerged: those who identified as a drone but not model aircraft operator (Drone not Model), those who identified as a model aircraft but not drone operator (Model not Drone), and those who identified as both drone and model aircraft operators (Both Rec). The FRIA activity categories tended to vary with the three categories of recreational operators from the self-identification question. The Low FRIA group was dominated with Drone not Model operators (87.1 percent). The Mixed FRIA group was more balanced with 55.6 percent Drone not Model operators, 18.9 percent Drone and Model operators, and 23.5 percent Model not Drone operators. The High FRIA group is 48.2 percent Model not Drone operators, 37.5 percent Drone not Model operators, and 8.3 percent Drone and Model operators. These data reveal a predictable trend, that model aircraft operators favor FRIAs while Drone operators favor operating outside FRIAs.

[47] See https://udds-faa.opendata.arcgis.com/datasets/c7ad6f733cce47b9a653e12010742361_0/explore?location=38.732240%2C-77.118017%2C8.28&showTable=true

[48] FAA-Recognized Identification Areas (FRIAs) are a defined geographic area where drones can be flown if they don't have Remote ID equipment. FRIAs are often used by community organizations and educational intuitions. [see https://www.faa.gov/uas/getting_started/remote_id/fria]




These categories also revealed differences in the number of aircraft owned, number of aircraft operated, and airframe type operated in 2024. Low FRIA operators owned an average of 2.5 aircraft and operated 2.0, while High FRIA operators owned an average of 9.6 aircraft and operated 6.5. Additionally, Low FRIA operators operated 1.5 quadcopters and 0.4 fixed wing aircraft while High FRIA operators operated 0.8 quadcopters and 7.8 fixed wing aircraft on average.

This preliminary analysis of the survey reveals operating groups that are varied, unique, and more differentiable than previously believed. With these activities and groups identified, the FAA can better serve the public and make more informed decisions that improve the safety of the NAS.

## Remote Pilot Forecast

An important final metric in commercial small drones is the trend in remote pilot (RP) certifications. RPs[49] are used primarily to facilitate commercial and public use (i.e., law enforcement and first responder) small drone flights, as discussed in the preceding section. As of December 2024, a total of 427,598 RP certifications had been issued, an increase of a little less than 59,000 from the same time last year (2023).

Approximately three-quarters (77 percent) of the RPs have only a Part 107 RP certificate, while the remainder (23 percent) have a Part 107 RP certificate along with a Part 61 pilot certificate. Over 90 percent of those who took

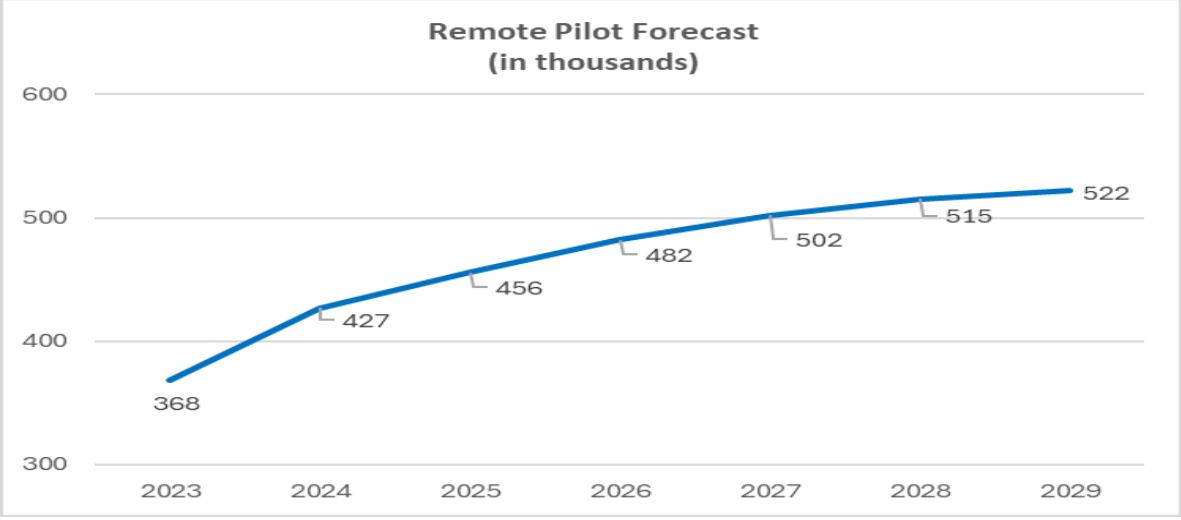
[49] In our accounting of RPs, we take pilots who passed the initial knowledge test (or Part 107), plus current traditional pilots who took online training in lieu of the knowledge test (or Part 61).

the exam passed and obtained RP certification.[50]

The RP forecasts presented below are based on three primary data sources: (a) trends in total RPs; (b) renewal trends; and (c) trends in commercial small drone registration, or Part 107 and forecasts of fleet. In this context, it is important to note that the empirical relationship between trends in RP and commercial/Part 107 small drone registration, particularly new registration, has changed in the past few years with a decline in the ratio of units registered to RPs. Given the trends in registration and our forecast of the commercial small drone fleet (i.e., base forecasts), the FAA assumes that the trend in remote pilots to units of small commercial drones will remain at its 2024 level of 2.26.

Using these assumptions combined with the base scenario of the commercial/Part 107 small drone forecast, FAA projects RPs in the graph below. Last year, the FAA projected RPs to be a little under 400,000 by the end of 2024. Actual registrations by the end of 2024 totaled 427,598 (or over 28,000 more than last year's projection) thus the number of actual RPs exceeded last year's projection by 7.0 percent for 2024.

Given the actual numbers at the end of 2024, RPs are set to experience tremendous growth following the growth trends of the commercial (or Part 107) small drone sector. Starting from the base of 427,598 RPs in 2024, the expected growth in commercial activities leads to a 22 percent increase in the total number of RPs by 2029 (522,325), showcasing tremendous opportunities for growth in employment—almost 95,000 new RP opportunities—associated with commercial and public use activities of small drones. The potential for RPs may increase even more if larger drones are used in commercial activities and advanced air mobility (AAM) becomes a reality in the near future, two topics discussed in the sections below.



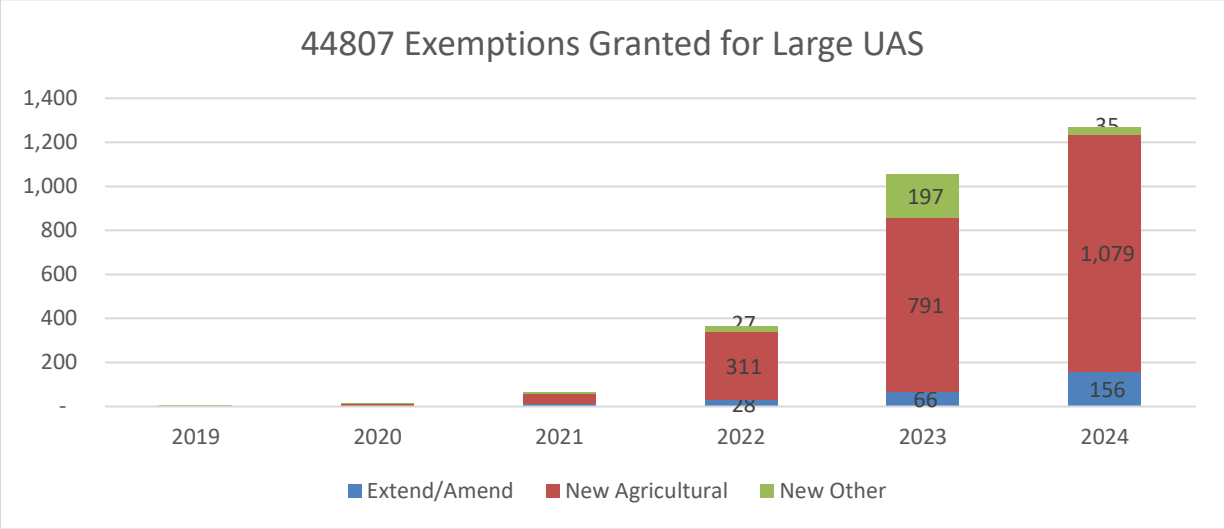

[50] Comparing data from last year, we notice that RP numbers have been revised downwards, by around 4,000 (or around -2%), over the entire program period. This is due to data clean up throwing out duplicate data and wrong data entry noticed during renewal.

## Large UAS

Part 107 limits the gross takeoff weight of unmanned aircraft (or sUAS) to below 55lbs. Thus, unmanned aircraft with gross takeoff weights above 55lbs must operate under separate rules and are considered a separate category of UAS, which we refer to as simply large UAS (lUAS) for this analysis. Since these lUAS are not type certified and do not fall under the Part 107 operating rules, operation of these aircraft requires a section 49 U.S.C § 44807 exemption or a public aircraft operator (PAO) certification.[51] In addition, the FAA requires lUAS operating under a 44807 exemption or PAO to receive a tail number by registering the unmanned aircraft in the Part 47 aircraft registry.[52]

The FAA has been granting 44807 exemptions since their introduction in the FAA Reauthorization Act of 2018. Both applications for a 44807 exemption by individuals and organizations and the decisions by the FAA are publicly available.[53] Since 44807 exemptions are required to operate a lUAS for commercial purposes, these exemptions are a leading indicator of both the purchases, which increase the fleet, and the operations of civilian lUAS. The 44807 exemption was slated to sunset in May of 2024, but the FAA Reauthorization Act of 2024 extended the 44807 exemption's sunset to the end of September 2033.[54]

The FAA has granted 1,114 new exemptions for lUAS in 2024, a 13 percent increase from 2023.[55] Almost 97 percent (1,079) of the new exemptions granted were for large agriculture unmanned aircraft. Just under 12 percent (156) of all exemptions granted (1,270) were extensions or amendments.




The increased number of exemptions granted in 2023 and 2024 suggests that granting exemptions by regulators has become routine, particularly for lUAS used in

[51] See bit.ly/3KxiuVX for more details.
[52] See bit.ly/3ZIcCxJ.
[53] All 44807-exemption applications and decisions are available at regulations.gov in the "Other" category.
[54] See http://tinyurl.com/mpkhmzzd
[55] Changes in count methodology.

agricultural operations. While agricultural exemptions granted continue to grow, exemptions for other IUAS operations, such as package delivery or long-range infrastructure inspection, have slowed. This suggests that, although agricultural IUAS exemptions are routine, the safety cases for other IUAS operations have not been sufficiently proven for these exemptions to become routine. Since 44807 exemptions are only valid for two years, the extensions and amendments should be a function of the new exemptions granted over the previous two years. The portion of the existing IUAS exemptions that were extended or amended has fallen each year from 66 percent in 2021 to 11 percent in 2024.

Since IUAS are required to register with the Part 47 Aircraft Registry (PAR), we can use the PAR to estimate the IUAS active fleet. Using the Aircraft Reference file from the publicly available PAR, FAA identifies the IUAS in the Aircraft Registration Master file and the Deregistered Aircraft file from which it can calculate the active fleet of IUAS.[56] In 2024, 2,800 new IUAS aircraft were added to the PAR, a 156 percent increase from 2023. Twenty one percent (409) of aircraft registered at the end of 2023 were delisted in 2024, producing an active fleet of 4,314 IUAS by the end of 2024.

The rapid growth of IUAS in the Part 47 registry is supported by the imports of IUAS into the United States. Imports of IUAS grew from 3,100 in 2023 to 5,145 in 2024, a two-thirds increase. Given that imported IUAS are likely to become new aircraft in the registry, this suggests that the fleet of IUAS is still growing exponentially.

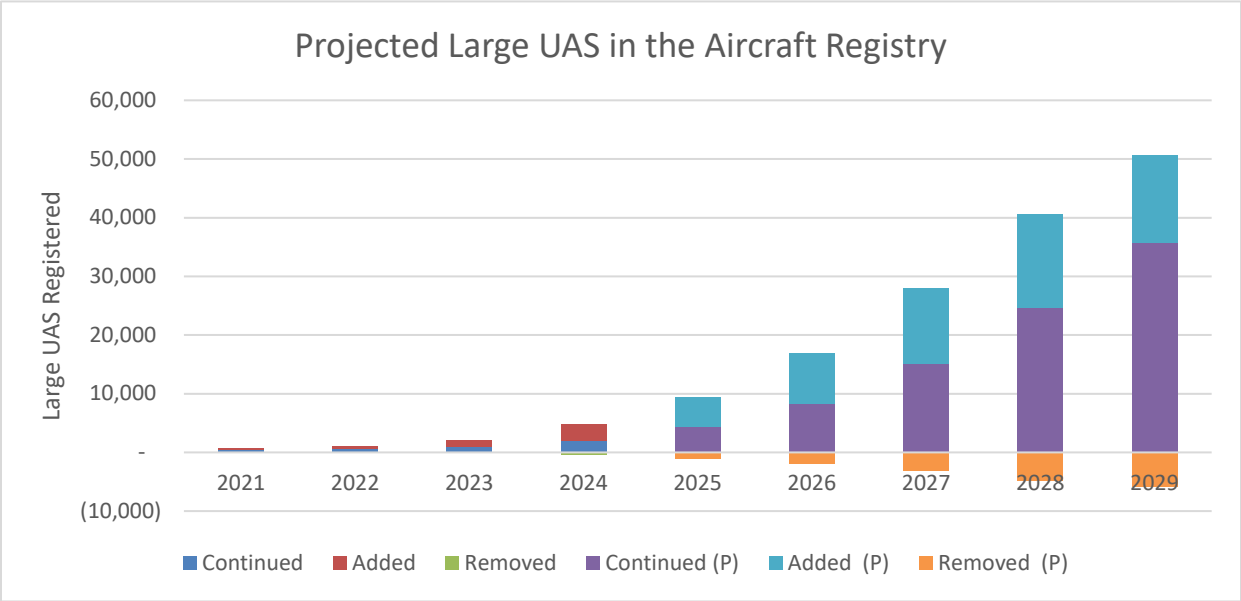
With robust demand for IUAS operations indicated by 44807 exemptions and strong supply suggested from import data, FAA expects the growth of new IUAS over the next 5 years to keep pace with the growth observed in 2024. However, assuming 44807 exemptions remain the primary authority by which IUAS are operated, it is expected that an inflection point in 2027 or 2028 will occur after which the new IUAS added to the PAR are expected to decrease in the following years. As such, FAA projects 14,896 new IUAS will be added to the PAR in 2029, with a total active IUAS fleet of 44,740 aircraft by the end of 2029.

Although the active fleet can be observed from the PAR, the operations of IUAS are more difficult to observe. The majority of registered IUAS in the PAR are agricultural spraying aircraft from just three manufacturers.[57] Moreover, the majority of new IUAS registered in the PAR were agricultural spraying aircraft in both 2023 (67percent)

[56] The Public Aircraft Registry data for 2022 is available at https://bit.ly/433iqET. Unmanned aircraft are separated from crewed aircraft using the "NO-SEATS" field in the Aircraft Reference file. The "AC-WEIGHT" field is used to remove all small unmanned aircraft, and the "TYPE-ACFT" field is used to remove all lighter-than-air aircraft, including blimps and balloons. The remaining codes – held within the "CODE" field – are matched with the "MFR MDL CODE" in the Aircraft Registration Master file and the Deregistered Aircraft file and adjusted based on the "STATUS CODE" field. The remaining aircraft are sorted for the year they registered using the "CERT ISSUE DATE" or "LAST ACTION DATE". The count of new registration, older registrations, and delisted registrations are used to construct the active IUAS fleet.

[57] DJI, Hylio, and Yamaha's agricultural-spraying UAS account for just over 50% of the registered large UAS in the Part 47 aircraft registry.

and 2024 (51 percent). As such, the vast majority of IUAS operations will be conducted close to the ground with only a few organizations operating IUAS in the NAS, let alone in the controlled airspace.




## Advanced Air Mobility

Advanced Air Mobility (AAM) is an umbrella term for aircraft that are typically highly automated, utilize electrically powered propulsion, and have vertical take-off and landing capability. Many of these aircraft that fall into the powered-lift category are often referred to as air taxis. Urban Air Mobility (UAM) is a subset of the AAM concept which involves highly automated, cooperative air transportation services in and around urban areas. Several proposed use cases for AAM/UAM aircraft include passenger and cargo transport, and the provision of emergency services.

To prepare for the safe and efficient integration of AAM operations into the NAS, the FAA led several initiatives including the release of the FAA UAM CONOPS Version 2.0 in April 2023, as well as the publication of the FAA AAM Implementation Plan and the issuance of the final rule that adds the “powered-lift” definition to the regulations covering certain air carrier and commercial operations, both in July 2023. More recently, in November 2024 the FAA issued the final rule establishing the requirements for pilot certification and powered-lift operations and published an updated engineering brief for vertiport design standards in December 2024.

Despite a challenging environment from a wave of consolidations, several AAM Original Equipment Manufacturer (OEMs) including Joby Aviation, Archer Aviation, and Beta Technologies have made significant progress toward entry into service (EIS) and are planning to launch operations in the 2025-2026 timeframe. Archer Aviation plans to launch air taxi services in Abu Dhabi by late 2025, and Joby Aviation plans to launch air taxi services in Dubai by early 2026. In the U.S., these OEMs have either entered or are close to entering the final phases of aircraft certification. They have also established manufacturing facilities in the U.S., with initial aircraft production starting in 2025 followed by production ramp up over the next several years.

Considering the recent regulatory advancements and operator progress toward EIS, it is essential to incorporate the latest available information into AAM demand estimates. These estimates will aid in the development of vertiports and other infrastructure, airspace design and procedures, spectrum availability, workforce considerations, safety assessments and other analyses. Drawing from FAA-sponsored AAM demand research conducted by The MITRE Corporation (MITRE) in March 2025,[58] a NAS-wide AAM demand forecast starting from Year 1 (defined as the EIS year[59] for the first expected AAM use case in the U.S.) through Year 6 (five years after EIS) is shown in the table below:

| NAS-wide AAM Demand Forecast | | | | | | |
|---|---|---|---|---|---|---|
| | Year 1 (EIS) | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Annual trips | 42,405 | 323,038 | 616,115 | 1,029,883 | 1,826,525 | 2,820,956 |
| Daily trips | 116 | 885 | 1,688 | 2,822 | 5,004 | 7,729 |

Unconstrained demand for AAM departures across the NAS is estimated to be 42,405 departures in its first full year, growing to over 600,000 departures annually by Year 3. As technology adoption and community acceptance continue to increase, the NAS-wide demand could continue to accelerate and could reach 2.8 million departures annually by the end of Year 6 (or around 7,700 daily flights).

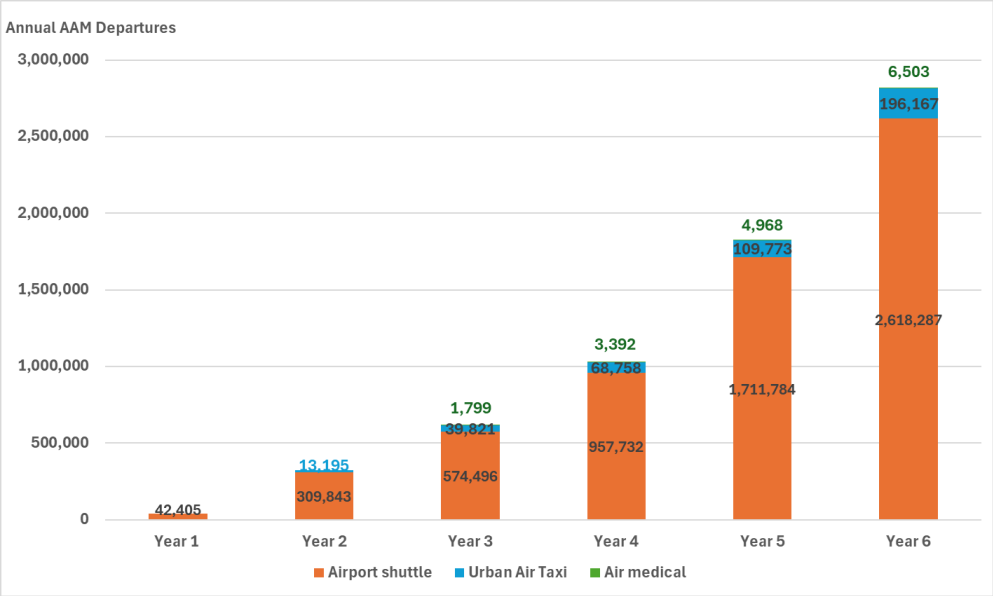
Among the three most-likely AAM use cases, it is projected that initial operations in the U.S. will commence with airport shuttles in a few major cities, followed by air taxis, and then air medical missions. This is because airport shuttles will have the most robust passenger demand traveling between fixed and concentrated points of interest (i.e., airports and downtown areas). Urban air taxi flights for commuters, on the other hand, will be spread across more routes depending on where commuters live and work. Lastly, air medical missions are expected to lag behind airport shuttle and air taxi services due to a lower level of operator interest currently, as well as potential requirements for retrofitting aircraft for medical-use, additional time

[58] "Advanced Air Mobility Demand Forecast for the National Airspace System", The MITRE Corporation, MP250135, Mclean, VA, March 2025.

[59] Year 1 does not have a definitive calendar year assigned as the timing for AAM operations to be granted EIS in the U.S. is still uncertain and is dependent on several external factors beyond the scope of the AAM demand research.

needed for aircraft certification, and deployment of charging infrastructure to support air medical missions.

The figure below shows the anticipated AAM departures for each forecast year, by use case.




The Airport Shuttle projections constitute the largest portion of the overall AAM forecasts for a couple of reasons. First, the Airport Shuttle is anticipated to be the initial AAM use case to be implemented, with demand increasing annually in tandem with the rise in airline passengers from the growing number of MSAs that could adopt an AAM airport shuttle service. Secondly, the number and proportion of commuters likely to consider AAM are generally lower than the estimates for airline passengers.

The fleet sizes required to support the projected departures for the three use cases were estimated by assuming each AAM aircraft would conduct 28 trips per day, on average (2 trips per hour over a 14-hour operating day) for the Airport Shuttle and Urban Air Taxi use cases and 2.5 trips a day for the Air Medical use case. The projected NAS-wide AAM daily trips and the estimated fleet sizes to support those trips are shown in the table below. Based on announcements of expected fleet production capacities from several AAM OEMs, the fleet sizes needed to support the number of trips should be attainable and not be a constraining factor.

| NAS-wide AAM Demand Forecast | | | | | | |
|---|---|---|---|---|---|---|
| | Year 1 (EIS) | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Daily trips | 116 | 885 | 1,688 | 2,822 | 5,004 | 7,729 |
| Fleet size | 4 | 32 | 62 | 104 | 184 | 283 |

# Forecast Uncertainties

The forecasts in this document are forecasts of aviation demand, driven by models built on forecasts of economic activity. There are many assumptions in both the economic forecasts and in the FAA models that could affect the degree to which these forecasts are realized. Now that passenger and traffic volumes have returned to pre-COVID levels, this year's forecast is driven, at least in the near-term, by the strength of the U.S. and global economies that may be offset partially by supply chain constraints, most notably aircraft deliveries. It does go without saying that terrorism remains among the greatest worldwide risks to aviation growth. Any terrorist incident aimed at aviation could have an immediate and significant impact on the demand for aviation services that could be greater than its impact on overall economic activity.

In addition, changes in the geo-political landscape could lead to outcomes very different than the forecasts provided in this document. The ongoing crises in Ukraine and in the Middle East represent a very large uncertainty to this year's forecast. The impacts are still evolving and dependent in large part on the outcome of the armed conflicts. While there was an initial negative impact on airline bookings as well as a surge in oil prices, those impacts have diminished over time. The impact of the economic sanctions on Russia pushed the Russian economy (the world's 10th largest as of 2021) into a sharp four-quarter recession in 2022. European economic growth remained muted in 2023 as Europe moved to further restrict trade with Russia and its allies and reduce its dependence on energy from Russia. Many forecasters see continued low European economic growth in 2025 as well due to the impacts of the conflict. In the longer run, most analysts are seeing a return to higher tensions between Russia and the West resulting in higher expenditures on defense that may push taxes higher and leave consumers with less money to spend on items like air travel.

The rapid spread of COVID-19 that began in early 2020 resulted in the largest decline in aviation activity since the jet era began in the late 1950's. While aviation activity has fully recovered to pre-pandemic levels, there is still a good deal of uncertainty about the long run path of aviation activity. There are questions as to whether the strategies that U.S. and foreign carriers employed to recover from the downturn in demand will be successful in a post-COVID environment. Other questions surround the stability of consumer attitudes and behaviors towards aviation in a post-COVID environment, as well as the speed and nature of the economic recovery, all of which apply both domestically and globally.

The future direction of oil prices presents another considerable uncertainty in producing the forecast. The FAA's baseline forecast (derived from economic assumptions in S&P Global December 2024 U.S. macro forecast and 30-Year Focus released during November 2024) calls for oil prices to fall from $79 per barrel in 2024 to $68 per barrel in 2025. Over the long term, the FAA baseline forecast assumes that oil prices will rise gradually to about $75 per barrel in 2030 and about $99 per barrel by the end of the forecast period in 2045. However, there are other oil price forecasts that vary considerably from the FAA base forecast in the next 2-5 years. These include the latest Energy Information Administration (EIA) Short Term Energy Out-

look released in March 2025, the International Monetary Fund (IMF) Commodity Price Forecast released in October 2024 and the World Bank Commodity Price Forecast released in October 2024. The EIA forecast projects the spot price of oil will fall to $65 per barrel by 2026, considerably above the FAA base forecast of $61. The IMF forecast sees the price of oil declining to around $67 in 2026 and continuing to fall to $64 per barrel in 2029, well below the FAA base forecast of $69 per barrel. The World Bank forecast has oil prices at $72 per barrel in 2026. Over the long run, lower oil prices give consumers an impetus for additional spending, including air travel, and should enhance industry profitability. In the case where oil prices turn out to be higher than the FAA forecast, FAA would expect lower spending on air travel by consumers, higher costs for fuel to airlines and reduced industry profitability.

The baseline forecast incorporates additional infrastructure spending in 2024 and beyond. However, there is considerable uncertainty as to the magnitude, timing, and nature of these programs that ultimately determines the impact on the future growth of the U.S. economy. In addition, how the U.S. will engage with the rest of the global economy over the next several years continues to evolve. Under the right conditions, a period of sustained high and more inclusive growth along with increased financial stability could occur. However, considering the recent Russia-Ukraine conflict there is an increased possibility of an outcome that leads to greater global economic fragmentation due to rising tensions resulting in slower growth and increased financial instability.

The baseline forecast assumes that the global economic recovery that began at the end of 2020 will continue but at a slower pace in 2025. Thereafter, the baseline forecast assumes that China and India will be growth engines for emerging economies. The forecast assumes China successfully transitions the economy from heavy reliance on manufacturing and resource industries to one more oriented towards the services and technology sectors and India continues to implement reforms to make its economy more competitive. Many analysts are concerned that in light of the Russia-Ukraine conflict, China moves closer to Russia, limiting opportunities to further transition its economy away from manufacturing and resource intensive industries. In the case of India, the impact of the Russia-Ukraine conflict on energy prices and food prices may put pressure on trade and fiscal deficits resulting in a slowdown of reforms.

In the United States, economic growth in the near term is expected to be slow as the impact of the Federal Reserve's moves to reduce inflation by raising interest rates are felt by consumers and businesses. The forecast anticipates that inflation returns to acceptable levels by 2025. Over the forecast horizon economic growth (real GDP) remains below 2 percent as population growth and productivity growth remain lower than historic averages. The forecast does not assume any measure of fiscal restraint will be implemented, despite government debt totals exceeding 100 percent of GDP and approaching levels that were last seen at the end of World War 2.

In the United Kingdom, the European Union, and Japan, economic growth over the next few years will be well below rates seen over the past few years as these regions recovered from the COVID-19 recession. Demand growth will remain slow in these regions over the forecast horizon as they continue to be constrained by structural economic problems

(high debt, slow population growth, weak public finances, for example) and political instability. In most of the major advanced economies, governments need to shore up their finances after the increases in government spending to offset the impacts of COVID-19. If implemented, higher tax rates or reduced government spending would further contribute to suppressing demand growth and a delayed strengthening of finances could result in even greater impacts. The current forecasts call for strong passenger growth for travel between the United States and other world regions, especially over the next few years. An unexpected slowing of worldwide economic activity could suppress that growth.

Although demand has recovered and U.S. airline finances have improved considerably since the devastating impacts of COVID-19, the outlook for U.S. airline finances is not without risk. For the large network carriers, the steps taken to pay down debt incurred during COVID-19 have reduced the risk of bankruptcy in the next few years. However, many carriers have placed large orders for new aircraft to be delivered over the next 5 years and as new contracts with labor groups (pilots, flight attendants, mechanics) are negotiated and put into effect, U.S. airlines face substantially higher costs. If the recovery in demand is slower than forecast, the increase in debt that these carriers are servicing plus the financing of large new aircraft orders along with higher labor costs increase the possibility of bankruptcy or liquidation. Based on FY 2024 data, the top 6 (American, Delta, United, Southwest, Alaska (including Hawaiian) and JetBlue) carrier accounted for about 85.2 percent of the U.S. airline industry capacity.

The forecast assumes the addition of sizable numbers of large regional jets (70 to 90 seats) into the fleets of regional carriers. While the recovery in air travel demand from the COVID downturn has been robust, FAA is not projecting a uniform recovery across all segments. As network carriers continue to adjust the size and breadth of their networks in anticipation of the post-COVID environment, they are continuing to move forward with plans to significantly reduce the numbers of small regional jets they will need. Strong air travel demand has not ensured financial stability for regional carriers, as the bankruptcy filings of Republic Airways in 2016, Great Lakes Airlines in 2018 and Trans States Airlines in 2020 have shown. Financially strong and well positioned regional carriers may see increased opportunities for regional flying because of the network carrier actions, but the overall impact will most likely reduce opportunities for many regional carriers. In addition to managing changing relationships with network carriers, regional carriers have struggled with pilot shortages that were exacerbated during the pandemic recovery. The downturn prompted mainline carriers to reduce costs by, among other measures, offering voluntary retirements to flight crews but, as activity picked up, they drew replacements from the ranks of regionals, causing additional shortages for those carriers. To attract and recruit crews, carriers have raised salaries and offered bonuses, further increasing financial pressures, and possibly leading to new consolidation in the regional airline industry. In April 2025 two regional carriers, Republic Airlines and Mesa Airlines, announced their intention to merge which should result in a stronger company due to its larger scale. However, the merger could result in some service cutbacks to smaller communities and less competition-induced growth.

Growth in the business and corporate aviation segment of the general aviation is based largely upon the prospects for economic growth and corporate profits. The possibility of the reintroduction of bonus depreciation and a potential decline in interest rates could spur demand for business and corporate aviation. On the other hand, the most recent developments concerning tariffs with associated exceptions have introduced another level of uncertainty into business jet transactions. While some argue that users of private aviation are not as price sensitive as the public in their demand for services, piston aircraft purchases at the lower end of the general aviation may be impacted unfavorably. The risk for general aviation is not limited to these factors. Other influences, such as potential environmental regulations and taxes, do not seem to be as much of a concern in the short term, but over the long term, uncertainties about the direction of these influences could be difficult to foresee.

Overall activity at FAA and contract towers rose 3.6 percent in 2024. Activity at large and medium hub airports (64 in total) increased 4.1 percent and 3.4 percent, respectively, in 2024, resulting in congestion and delays. In the long run, operations at large and medium hub airports grow faster than the overall national trend and congestion and delays could become critical limits to growth over the forecast period. FAA's forecasts of both demand and operations are unconstrained in that they assume that there will be sufficient infrastructure to handle the projected levels of activity. Should the infrastructure be inadequate and result in even more congestion and delays, it is likely that the forecasts of both demand and operations would not be achieved.

Not only is the volume of aircraft operating at most large hubs expected to increase over the next 20 years, but the mix of aircraft and vehicles is changing as well. The expected increases in the numbers of larger regional jets and business jets as well as the anticipated widespread deployment of UAS and Advanced Air Mobility (AAM) vehicles into the national airspace system will make the FAA's job more challenging. For example, with these new vehicles entering the system, traditional aircraft may be replaced. The integration of UAS and AAM could add to the workload above and beyond the current demand for aviation services.

As passenger demand and activity levels have returned to pre-COVID levels, there have been increasing concerns about the resources needed by the FAA to effectively manage the nation's airspace. The projected increase in activity by traditional aviation sectors (airlines, general aviation) coupled with anticipated growth in new entrant activity (commercial space, UAS/AAM) has renewed focus on FAA resources. In addition, much of the physical infrastructure supporting the nation's air traffic control system needs to be repaired or replaced, further exacerbating the resource concerns. FAA resources may prove to be inadequate to effectively address the many future challenges. Notably, in May 2025, Transportation Secretary Sean Duffy announced a major initiative to modernize the air traffic control system for NAS efficiency and safety. Without the implementation of this initiative, the likely result would be greater congestion and delays at airports, increasing airline passenger dissatisfaction. Furthermore, slower growth in new entrant activity could occur, delaying or reducing the benefits to the nation from expansion of these activities.

Airspace modernization and airport expansion, including new construction, face chal-

lenges due to concerns over noise, air quality, and water quality. Concerns across the U.S. about aviation noise have led to increasing levels of public debate. In Europe, concerns about aviation's environmental impacts are leading to restrictions on airport expansion activities and limits on short-haul domestic flights. Without effective measures to mitigate and abate aviation noise, the infrastructure projects and airspace redesign efforts needed to support currently forecasted aviation growth may be delayed. Similarly, community concerns about environmental and/or other considerations (e.g., privacy concerns) associated with UAS, AAM, and commercial space launch activity could impact growth in these aviation areas.

Technologies to improve aircraft fuel efficiency and reduce fuel consumption provide clear economic benefits by reducing fuel costs for airlines and enabling greater ranges for the same fuel payload. UAS and AAM vehicles, and the electrification of conventional general aviation and short haul aircraft are emerging novel aviation technologies that may improve vehicle efficiency. The impacts of these new entrants from a noise perspective must also be properly understood, recognizing that these vehicles may interact with communities in different ways than the traditional vehicles they replace. The expansion of commercial space launch activity could also change the mix of aircraft in service, with associated impacts on aviation noise and emissions. The magnitude of the impacts from commercial space operations is unknown at this time due to the various fuel types currently used to launch vehicles.

# Appendix A: Alternative Forecast Scenarios

Uncertainty exists in all industries, but especially in the commercial air travel industry. As volatility in the global environment has increased, the importance of scenarios for planning purposes has increased. To help stakeholders better prepare for the future, the FAA provides alternative scenarios to the baseline forecasts of airline traffic and capacity.

To create the baseline domestic forecast, economic assumptions from S&P Global's November 2024 30-year U.S. Macro Baseline were used. To develop the alternative scenarios, assumptions from S&P Global's 30-year optimistic and pessimistic forecasts from their August 2024 *US Economic Outlook* were utilized. Inputs from these alternative scenarios were used to create "Optimistic" and "Pessimistic" traffic, capacity, and yield forecasts.

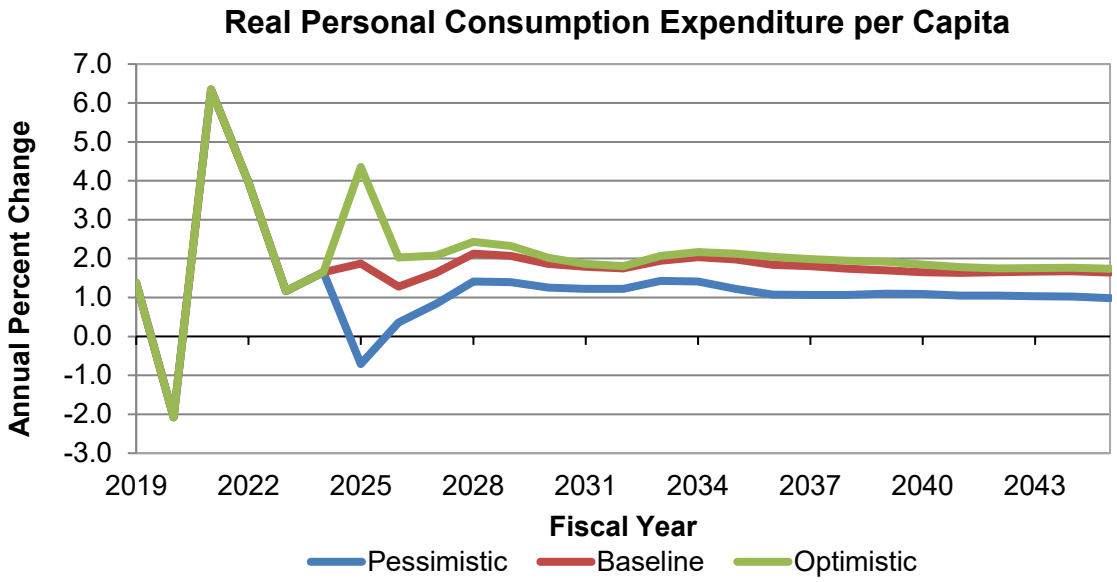
International passengers and traffic are primarily driven by country specific Gross Domestic Product (GDP) forecasts provided by S&P Global. Thus, the alternative scenarios use inputs based on ratios derived from S&P Global's Major Trading Partner and Other Important Trading Partners optimistic and pessimistic forecasts to create high and low cases.

## Scenario Assumptions

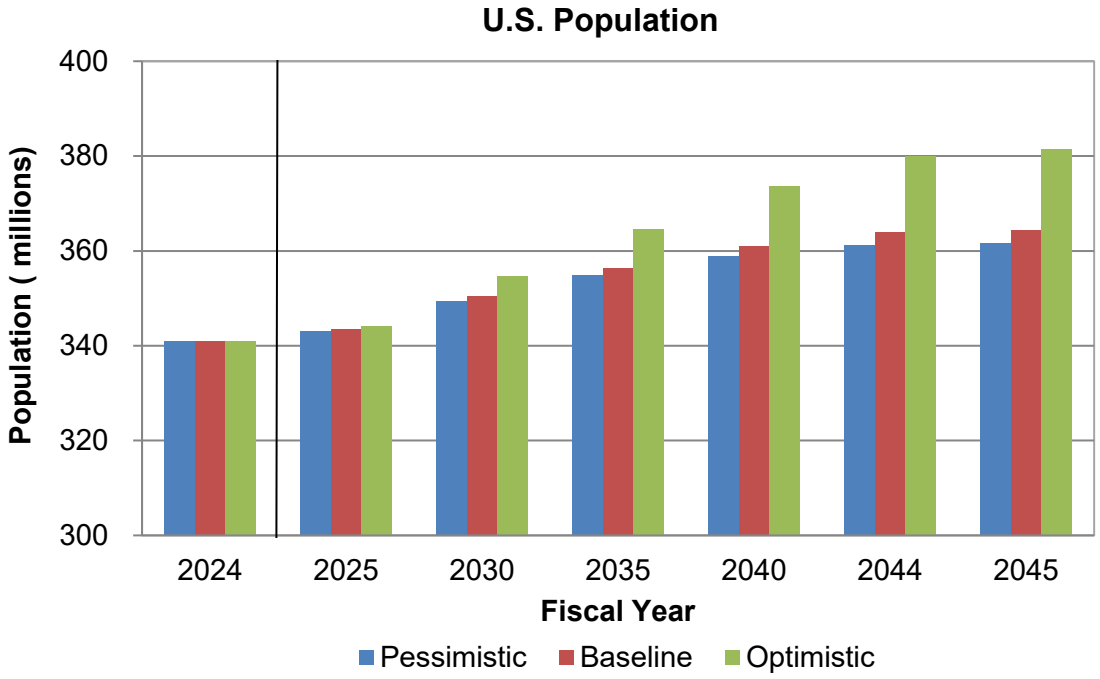
The FAA's domestic baseline forecast assumes growth slightly above trend in 2025 followed by a slowdown in 2026 and 2027. GDP growth in 2025 comes in at about 2.1 percent but drops to 1.7 percent in subsequent years, somewhat below its long-term potential rate. The below-trend rate in the medium term causes the unemployment rate to rise and peak at 4.7 percent in 2027. Slower growth and higher unemployment contribute to tamp down inflation, and the Federal Reserve can begin lowering interest rates. By the end of the decade, slowing population growth restrains potential GDP growth, and the economy stabilizes with GDP growth at 1.6 percent and unemployment at 4.2 percent. Crude oil prices bottom out at $61 in 2026 before gradually rising throughout the remainder of the forecast. With increasing global demand, the oil price rises to $99 per barrel at the end of the forecast.

The FAA's high case forecast draws from S&P Global's optimistic forecast. The optimistic scenario is characterized by a faster resolution to the fighting in Gaza and a cessation of fighting in the Russia-Ukraine war resulting in lower energy prices. Near-term differences from the baseline include GDP growth of 5.3 percent in 2025 compared to 2.1 percent in the baseline, driven mainly by stronger consumer spending. Consumer spending surges in 2025 by 5.3 percent before moderating to 2.7 percent in 2026, versus 2.6 percent and 1.7 percent in the base forecast. Stronger spending results from lower energy expenditures and increased confidence due to lessened political tensions. The unemployment rate still rises but peaks about 3 tenths of a percent lower than in the baseline.

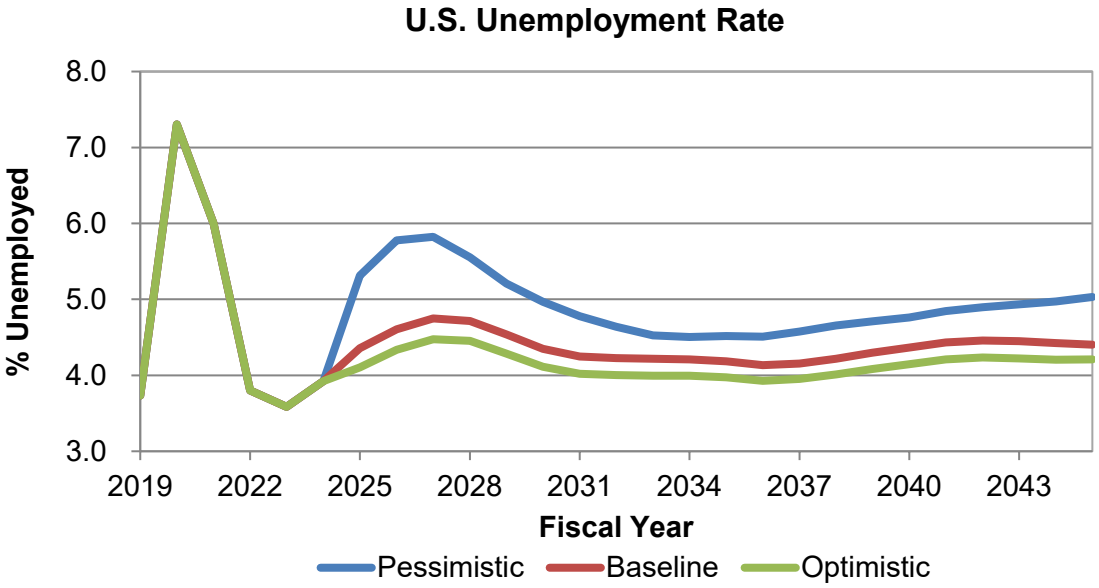
Conversely, FAA's low case forecast relies on S&P Global's pessimistic scenario. In this forecast, the worse outcome is mainly due to a decline in consumer spending caused by banking sector turmoil and tighter lending standards. Meanwhile, worsening conflicts in Ukraine and Gaza contribute to slumping consumer demand and drive oil prices higher. GDP declines in 2025 by 1.0 percent compared to an increase of 2.1 percent in the baseline while consumption shrinks 0.1 percent compared to the baseline's increase of 2.6 percent. Over the forecast horizon, average GDP growth is almost seven tenths slower than in the baseline. Oil prices rise sharply throughout the forecast to end at $174 in 2045 -- 76 percent higher than the baseline. As in the baseline, the unemployment rate peaks in 2027 but is one and a tenth percentage points higher than the baseline at that time. It remains elevated by about half a percentage point through the end of the forecast.



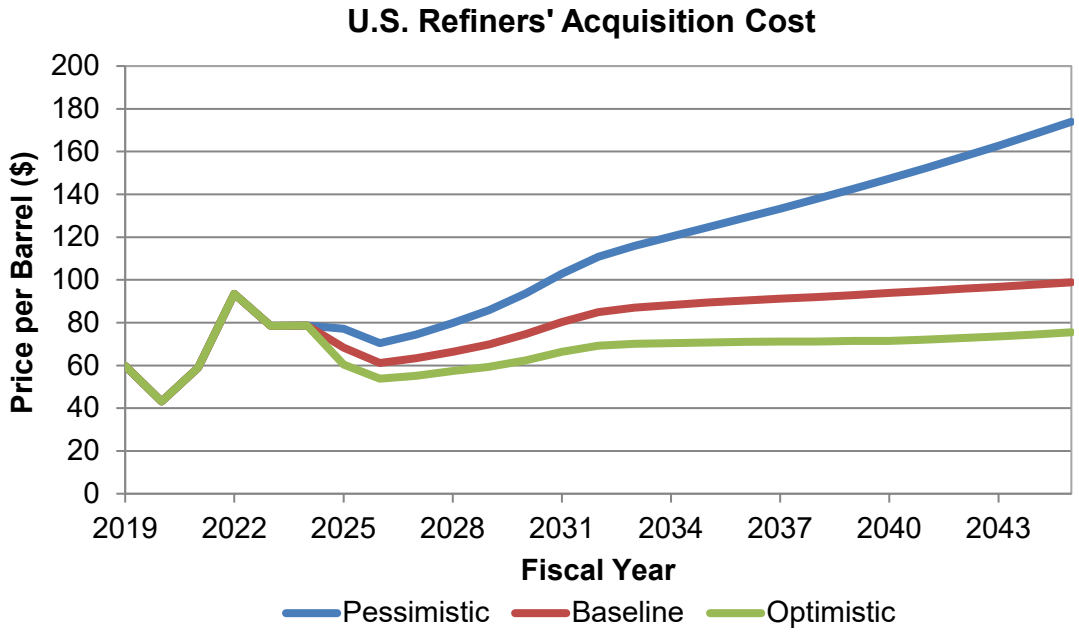

Source: S&P Global




Source: S&P Global

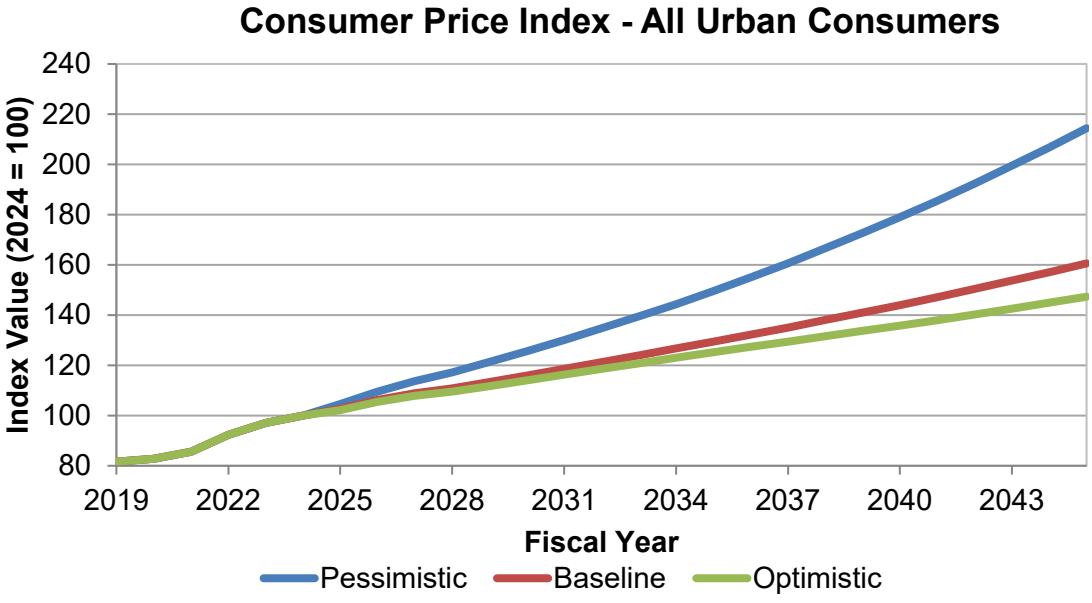



Source: S&P Global




Source: S&P Global

The price of energy is one of the drivers in the growth of consumer prices over the forecast period. In the optimistic case, slow growth of energy prices and import prices counteracts faster growth of other consumer goods prices, causing the optimistic CPI to rise somewhat slower than the baseline. In the pessimistic case, energy prices, wages and import prices all rise more rapidly compared to the baseline.




Source: S&P Global

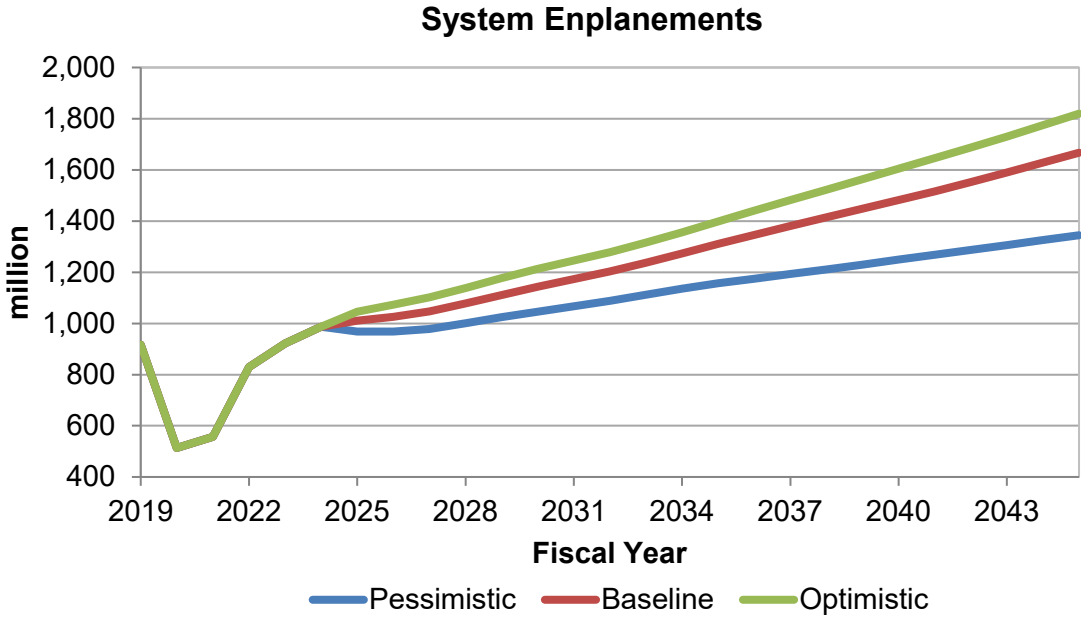
# Alternative Forecasts

## Enplanements

In the baseline forecast, system enplanements are forecast to grow at an average annual rate of 2.5 percent a year over the forecast horizon of 2025-2045 (with domestic and international passengers increasing at rates of 2.4 and 3.1 percent, respectively).

In the optimistic case, enplanements grow at a slightly quicker pace, averaging 3.0 percent per year (up 2.9 percent domestically and 3.2 percent internationally). This scenario is marked by a more favorable business environment and lower fuel prices which make the price of flying more affordable to business and leisure travelers. By the end of the forecast period in 2045, system passengers in the optimistic case are 9 percent above the baseline, totaling 1.8 billion, 153 million greater than in the baseline.

The pessimistic case is characterized by a period of weakened consumer spending combined with high inflation, leading to higher interest rates, and curtailed investment. In this scenario, enplanements grow an average of 1.5 percent per year (domestic up 1.3 percent and international up 2.8 percent). In the pessimistic case, system passengers in 2045 are 19 percent below the baseline case, totaling 1.3 billion, or 322 million fewer than in the baseline.

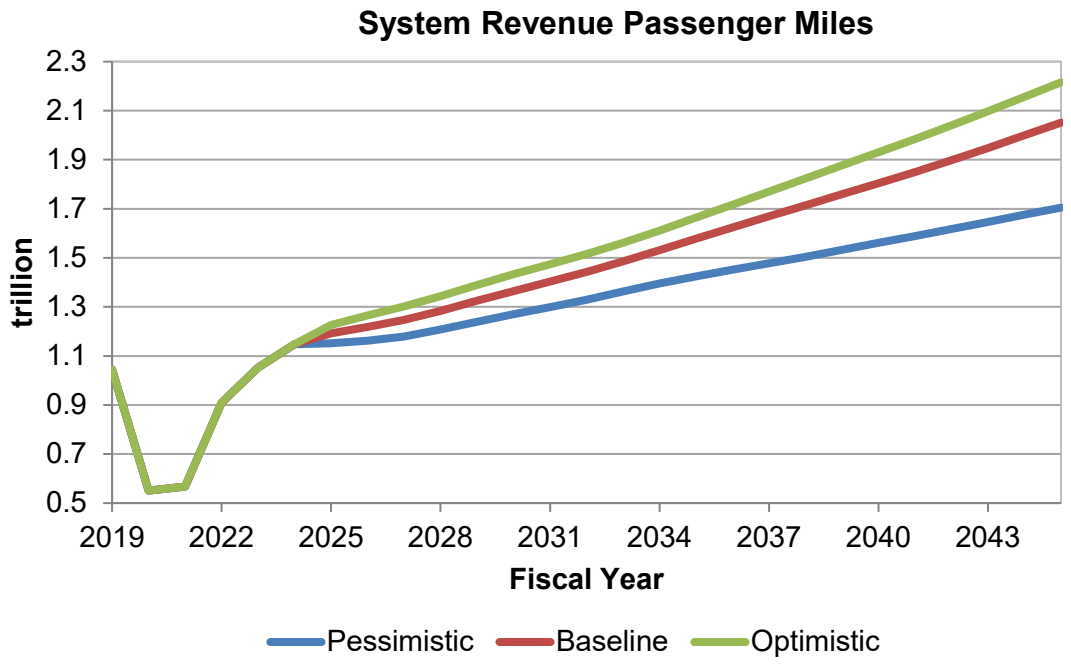


## Revenue Passenger Miles

In the baseline forecast, system RPMs grow at an average annual rate of 2.8 percent a year over the forecast horizon (2025-2045), with domestic RPMs increasing 2.8 percent annually and international RPMs growing 2.9 percent annually.

In the optimistic case, the faster growing economy coupled with lower energy prices drives RPMs higher than the baseline, with growth averaging 3.2 percent per year (domestic and international RPMs up 3.2 and 3.0 percent, respectively).

In the pessimistic case, the combination of a slower growing economy and higher energy prices result in RPM growth averaging 1.9 percent annually with domestic markets growing 1.6 percent a year while international traffic grows 2.6 percent annually.



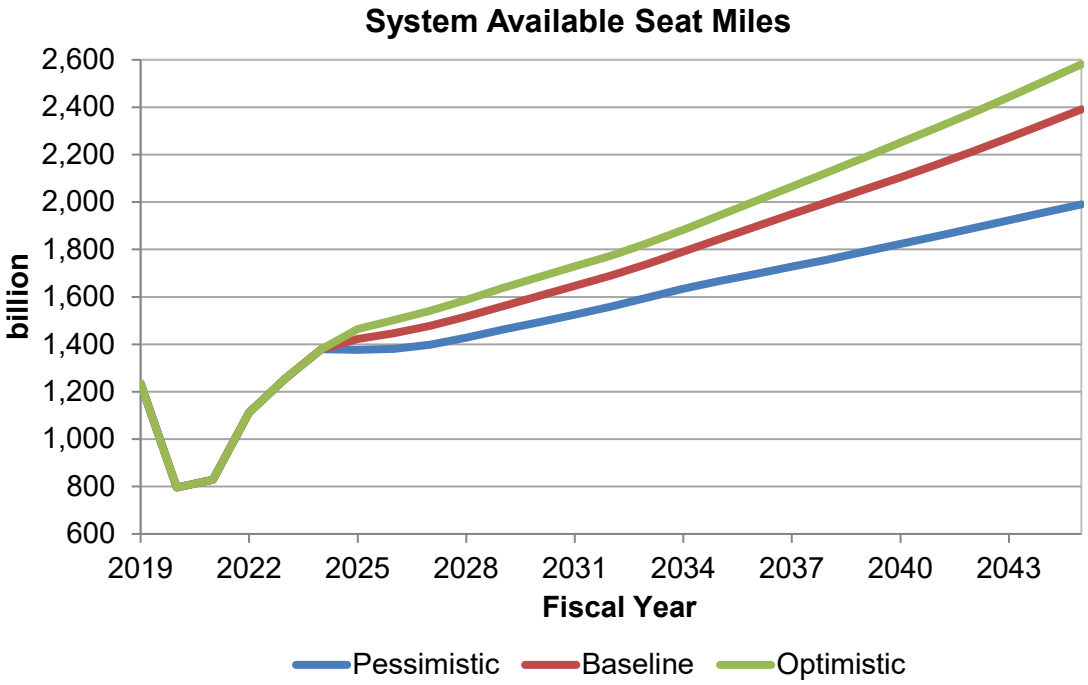

## Available Seat Miles

In the base case, system capacity is forecast to increase an average of 2.7 percent annually over the forecast horizon with growth averaging 2.6 percent annually in domestic markets and 2.8 percent a year in international markets.

In the optimistic case, capacity grows somewhat faster than in the baseline forecast, averaging 3.0 percent annually system-wide (3.1 and 2.9 percent for domestic and international markets, respectively). Carriers increase capacity compared to the baseline forecast to accommodate increased travel

demand brought about by a more favorable economic environment.

In the pessimistic case, demand for air travel is lower than in the baseline, thus system capacity grows at a slower pace of 1.8 percent annually (domestic growth of 1.4 percent annually and international up 2.5 percent annually).




## Load Factor

System load factors over the 20-year forecast period are similar for all three forecast scenarios. System load factor rises from 83.2 percent in 2024 to 85.8 (optimistic), 85.7 (pessimistic), and 85.8 (baseline) percent in 2045.

In all three scenarios it is assumed that carriers will keep load factors on the high side by actively managing capacity (seats) to more precisely meet demand (passengers).

The domestic load factor increases over the forecast horizon from 83.7 percent to 86.9 percent in the baseline, optimistic and pessimistic scenarios.

The international load factor rises in the baseline from 82.1 percent to 83.4 percent in all three scenarios. This reflects in part the relative growth in demand in the three (Atlantic, Latin, and Pacific) international regions and carriers' ability to manage capacity.

## Yield

In the baseline forecast, nominal system yield increases 1.9 percent annually, rising from 16.11 cents in 2024 to 23.71 cents in 20454. In domestic markets, yield in the baseline forecast rises from 15.96 cents in 2024 to 23.91 cents in 2045. International yield rises from 16.46 cents in 2024 to 23.25 cents in 2045.

System yield rises in the optimistic case at a slower rate than in the baseline, up 1.5 percent annually to 21.89 cents in 2045. Domestic yield increases to 21.66 cents while international yield increases to 22.45 cents. The moderate growth in yield in both cases is due to advancements in technology, gains in productivity, and modestly rising fuel and other costs.

In the pessimistic case, nominal yields rise more rapidly than in the baseline, growing an average of 3.1 percent annually, reaching 30.42 cents by 2045 (32.54 cents domestically and 26.38 cents internationally). This scenario reflects higher general domestic inflation and markedly higher energy prices than in the baseline, forcing carriers to increase fares to cover the higher costs of fuel, labor, and capital.

**TABLE A-1**

## FAA FORECAST ECONOMIC ASSUMPTIONS

## FISCAL YEARS 2024-2045

| | | Historical | FORECAST | | | | | PERCENT AVERAGE ANNUAL GROWTH | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Scenario | 2024E | 2025 | 2030 | 2035 | 2040 | 2045 | 2024-25 | 2025-30 | 2025-35 | 2025-40 | 2025-45 |
| **Economic Assumptions** | | | | | | | | | | | | |
| Real Personal Consumption | Pessimistic | 46,712 | 46,380 | 48,872 | 52,139 | 55,018 | 57,902 | -0.7% | 1.1% | 1.2% | 1.1% | 1.1% |
| Expenditure per Capita | Baseline | 46,712 | 47,585 | 52,008 | 57,140 | 62,308 | 67,629 | 1.9% | 1.8% | 1.8% | 1.8% | 1.8% |
| (2017 $) | Optimistic | 46,712 | 48,748 | 54,290 | 59,959 | 66,033 | 72,046 | 4.4% | 2.2% | 2.1% | 2.0% | 2.0% |
| Refiners Acquisition Cost - | Pessimistic | 78.6 | 77.2 | 93.5 | 124.6 | 147.3 | 173.9 | -1.9% | 3.9% | 4.9% | 4.4% | 4.1% |
| Average - $ Per Barrel | Baseline | 78.6 | 68.3 | 74.6 | 89.4 | 93.8 | 98.9 | -13.1% | 1.8% | 2.7% | 2.1% | 1.9% |
| | Optimistic | 78.6 | 60.4 | 62.4 | 70.7 | 71.5 | 75.5 | -23.2% | 0.7% | 1.6% | 1.1% | 1.1% |
| Consumer Price Index | Pessimistic | 3.02 | 3.16 | 3.80 | 4.52 | 5.41 | 6.48 | 4.5% | 3.7% | 3.7% | 3.7% | 3.7% |
| All Urban, 1982-84 = 1 | Baseline | 3.02 | 3.10 | 3.50 | 3.91 | 4.35 | 4.85 | 2.7% | 2.4% | 2.3% | 2.3% | 2.3% |
| | Optimistic | 3.02 | 3.09 | 3.45 | 3.79 | 4.10 | 4.45 | 2.2% | 2.2% | 2.1% | 1.9% | 1.8% |
| Civilian Unemployment Rate | Pessimistic | 3.9 | 5.3 | 5.0 | 4.5 | 4.8 | 5.0 | 35.5% | -1.3% | -1.6% | -0.7% | -0.3% |
| (%) | Baseline | 3.9 | 4.4 | 4.3 | 4.2 | 4.4 | 4.4 | 11.1% | 0.0% | -0.4% | 0.0% | 0.1% |
| | Optimistic | 3.9 | 4.1 | 4.1 | 4.0 | 4.1 | 4.2 | 4.6% | 0.0% | -0.3% | 0.1% | 0.1% |

Source: S&P Global

## TABLE A-2

## FAA FORECAST OF AVIATION ACTIVITY*

## FISCAL YEARS 2024-2045

| | | Historical | FORECAST | | | | | PERCENT AVERAGE ANNUAL GROWTH | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Scenario | 2024E | 2025 | 2030 | 2035 | 2040 | 2045 | 2024-25 | 2025-30 | 2025-35 | 2025-40 | 2025-45 |
| **System Aviation Activity** | | | | | | | | | | | | |
| Available Seat Miles | Pessimistic | 1,379.6 | 1,376.2 | 1,493.2 | 1,666.3 | 1,823.5 | 1,990.0 | -0.2% | 1.6% | 1.9% | 1.9% | 1.9% |
| (BIL) | Baseline | 1,379.6 | 1,423.2 | 1,603.5 | 1,844.2 | 2,104.6 | 2,390.9 | 3.2% | 2.4% | 2.6% | 2.6% | 2.6% |
| | Optimistic | 1,379.6 | 1,463.9 | 1,683.3 | 1,942.9 | 2,250.8 | 2,581.0 | 6.1% | 2.8% | 2.9% | 2.9% | 2.9% |
| Revenue Passenger Miles | Pessimistic | 1,148.3 | 1,152.1 | 1,269.9 | 1,424.6 | 1,561.2 | 1,704.6 | 0.3% | 2.0% | 2.1% | 2.0% | 2.0% |
| (BIL) | Baseline | 1,148.3 | 1,191.8 | 1,364.6 | 1,578.4 | 1,804.2 | 2,051.2 | 3.8% | 2.7% | 2.8% | 2.8% | 2.8% |
| | Optimistic | 1,148.3 | 1,226.1 | 1,433.1 | 1,663.9 | 1,930.8 | 2,215.5 | 6.8% | 3.2% | 3.1% | 3.1% | 3.0% |
| Enplanements | Pessimistic | 986.9 | 967.8 | 1,045.8 | 1,156.4 | 1,249.3 | 1,344.5 | -1.9% | 1.6% | 1.8% | 1.7% | 1.7% |
| (MIL) | Baseline | 986.9 | 1,010.1 | 1,142.7 | 1,310.3 | 1,482.0 | 1,666.9 | 2.3% | 2.5% | 2.6% | 2.6% | 2.5% |
| | Optimistic | 986.9 | 1,045.7 | 1,212.8 | 1,398.2 | 1,604.9 | 1,819.6 | 6.0% | 3.0% | 2.9% | 2.9% | 2.8% |
| Psgr Carrier Miles Flown | Pessimistic | 8,052.8 | 7,971.9 | 8,493.5 | 9,294.1 | 9,967.6 | 10,662.3 | -1.0% | 1.3% | 1.5% | 1.5% | 1.5% |
| (MIL) | Baseline | 8,052.8 | 8,278.3 | 9,191.4 | 10,392.1 | 11,639.9 | 12,979.5 | 2.8% | 2.1% | 2.3% | 2.3% | 2.3% |
| | Optimistic | 8,052.8 | 8,540.4 | 9,696.5 | 11,010.3 | 12,516.0 | 14,078.3 | 6.1% | 2.6% | 2.6% | 2.6% | 2.5% |
| Psgr Carrier Departures | Pessimistic | 8,989.4 | 8,733.5 | 9,054.2 | 9,668.4 | 10,095.8 | 10,516.3 | -2.8% | 0.7% | 1.0% | 1.0% | 0.9% |
| (000s) | Baseline | 8,989.4 | 9,106.2 | 9,891.0 | 10,956.2 | 11,976.0 | 13,037.5 | 1.3% | 1.7% | 1.9% | 1.8% | 1.8% |
| | Optimistic | 8,989.4 | 9,417.3 | 10,485.0 | 11,669.7 | 12,940.9 | 14,208.3 | 4.8% | 2.2% | 2.2% | 2.1% | 2.1% |
| Nominal Passenger Yield | Pessimistic | 16.11 | 17.47 | 19.89 | 22.66 | 26.23 | 30.42 | 8.5% | 2.6% | 2.6% | 2.7% | 2.8% |
| (cents) | Baseline | 16.11 | 17.13 | 18.79 | 20.45 | 21.99 | 23.71 | 6.4% | 1.9% | 1.8% | 1.7% | 1.6% |
| | Optimistic | 16.11 | 16.97 | 18.47 | 19.85 | 20.80 | 21.89 | 5.3% | 1.7% | 1.6% | 1.4% | 1.3% |

* Includes domestic and international activity.

## TABLE A-3

## FAA FORECAST OF DOMESTIC AVIATION ACTIVITY

## FISCAL YEARS 2024-2045

| | | Historical | FORECAST | | | | | PERCENT AVERAGE ANNUAL GROWTH | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Scenario | 2024E | 2025 | 2030 | 2035 | 2040 | 2045 | 2024-25 | 2025-30 | 2025-35 | 2025-40 | 2025-45 |
| **Domestic Aviation Activity** | | | | | | | | | | | | |
| Available Seat Miles (BIL) | Pessimistic | 961.3 | 940.2 | 1,005.4 | 1,106.7 | 1,195.9 | 1,288.2 | -2.2% | 1.4% | 1.6% | 1.6% | 1.6% |
| | Baseline | 961.3 | 987.9 | 1,112.6 | 1,276.6 | 1,450.9 | 1,642.3 | 2.8% | 2.4% | 2.6% | 2.6% | 2.6% |
| | Optimistic | 961.3 | 1,027.7 | 1,190.8 | 1,376.8 | 1,588.6 | 1,811.9 | 6.9% | 3.0% | 3.0% | 2.9% | 2.9% |
| Revenue Passenger Miles (BIL) | Pessimistic | 804.9 | 792.6 | 863.6 | 958.2 | 1,037.7 | 1,119.0 | -1.5% | 1.7% | 1.9% | 1.8% | 1.7% |
| | Baseline | 804.9 | 832.8 | 955.6 | 1,105.2 | 1,259.1 | 1,426.5 | 3.5% | 2.8% | 2.9% | 2.8% | 2.7% |
| | Optimistic | 804.9 | 866.4 | 1,022.8 | 1,192.0 | 1,378.6 | 1,573.8 | 7.6% | 3.4% | 3.2% | 3.1% | 3.0% |
| Enplanements (MIL) | Pessimistic | 858.5 | 834.3 | 895.5 | 980.7 | 1,048.3 | 1,115.6 | -2.8% | 1.4% | 1.6% | 1.5% | 1.5% |
| | Baseline | 858.5 | 876.7 | 990.9 | 1,131.2 | 1,271.8 | 1,422.2 | 2.1% | 2.5% | 2.6% | 2.5% | 2.4% |
| | Optimistic | 858.5 | 912.0 | 1,060.6 | 1,220.0 | 1392.6 | 1,569.1 | 6.2% | 3.1% | 3.0% | 2.9% | 2.7% |
| Psgr Carrier Miles Flown (MIL) | Pessimistic | 6,207.6 | 6,055.7 | 6,366.8 | 6,866.2 | 7,257.3 | 7,647.5 | -2.4% | 1.0% | 1.3% | 1.2% | 1.2% |
| | Baseline | 6,207.6 | 6,363.8 | 7,047.8 | 7,923.9 | 8,811.5 | 9,758.3 | 2.5% | 2.1% | 2.2% | 2.2% | 2.2% |
| | Optimistic | 6,207.6 | 6,621.8 | 7,545.5 | 8,548.7 | 9,651.8 | 10,770.8 | 6.7% | 2.6% | 2.6% | 2.5% | 2.5% |
| Psgr Carrier Departures (000s) | Pessimistic | 8,169.9 | 7,891.5 | 8,120.1 | 8,586.8 | 8,868.7 | 9,131.9 | -3.4% | 0.6% | 0.8% | 0.8% | 0.7% |
| | Baseline | 8,169.9 | 8,262.8 | 8,944.5 | 9,848.8 | 10,686.9 | 11,549.8 | 1.1% | 1.6% | 1.8% | 1.7% | 1.7% |
| | Optimistic | 8,169.9 | 8,571.4 | 9,534.7 | 10,566.1 | 11,636.9 | 12,684.3 | 4.9% | 2.2% | 2.1% | 2.1% | 2.0% |
| Nominal Passenger Yield (cents) | Pessimistic | 15.96 | 17.67 | 20.64 | 24.09 | 27.98 | 32.54 | 10.7% | 3.2% | 3.2% | 3.1% | 3.1% |
| | Baseline | 15.96 | 17.23 | 18.86 | 20.58 | 22.15 | 23.91 | 8.0% | 1.8% | 1.8% | 1.7% | 1.7% |
| | Optimistic | 15.96 | 17.01 | 18.34 | 19.63 | 20.58 | 21.66 | 6.6% | 1.5% | 1.4% | 1.3% | 1.2% |

*Includes mainline and regional carriers.

## TABLE A-4

## FAA FORECAST OF INTERNATIONAL AVIATION ACTIVITY*

## FISCAL YEARS 2024-2045

| Variable | Scenario | Historical 2024E | FORECAST 2025 | 2030 | 2035 | 2040 | 2045 | PERCENT AVERAGE ANNUAL GROWTH 2024-25 | 2025-30 | 2025-35 | 2025-40 | 2025-45 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **International Aviation Activity** | | | | | | | | | | | | |
| Available Seat Miles (BIL) | Pessimistic | 418.3 | 436.0 | 487.8 | 559.6 | 627.6 | 701.8 | 4.2% | 2.3% | 2.5% | 2.5% | 2.4% |
| | Baseline | 418.3 | 435.3 | 490.9 | 567.6 | 653.7 | 748.6 | 4.1% | 2.4% | 2.7% | 2.7% | 2.7% |
| | Optimistic | 418.3 | 436.2 | 492.5 | 566.2 | 662.1 | 769.1 | 4.3% | 2.5% | 2.6% | 2.8% | 2.9% |
| Revenue Passenger Miles (BIL) | Pessimistic | 343.3 | 359.5 | 406.3 | 466.4 | 523.5 | 585.6 | 4.7% | 2.5% | 2.6% | 2.5% | 2.5% |
| | Baseline | 343.3 | 358.9 | 409.0 | 473.1 | 545.2 | 624.7 | 4.5% | 2.6% | 2.8% | 2.8% | 2.8% |
| | Optimistic | 343.3 | 359.6 | 410.3 | 471.9 | 552.2 | 641.7 | 4.7% | 2.7% | 2.8% | 2.9% | 2.9% |
| Enplanements (MIL) | Pessimistic | 128.4 | 133.5 | 150.4 | 175.7 | 201.0 | 228.9 | 3.9% | 2.4% | 2.8% | 2.8% | 2.7% |
| | Baseline | 128.4 | 133.4 | 151.9 | 179.1 | 210.2 | 244.8 | 3.9% | 2.6% | 3.0% | 3.1% | 3.1% |
| | Optimistic | 128.4 | 133.7 | 152.2 | 178.2 | 212.3 | 250.5 | 4.1% | 2.6% | 2.9% | 3.1% | 3.2% |
| Psgr Carrier Miles Flown (MIL) | Pessimistic | 1,845.2 | 1,916.2 | 2,126.6 | 2,427.9 | 2,710.3 | 3,014.8 | 3.8% | 2.1% | 2.4% | 2.3% | 2.3% |
| | Baseline | 1,845.2 | 1,914.5 | 2,143.7 | 2,468.2 | 2,828.4 | 3,221.2 | 3.8% | 2.3% | 2.6% | 2.6% | 2.6% |
| | Optimistic | 1,845.2 | 1,918.6 | 2,151.0 | 2,461.5 | 2,864.2 | 3,307.4 | 4.0% | 2.3% | 2.5% | 2.7% | 2.8% |
| Psgr Carrier Departures (000s) | Pessimistic | 819.6 | 842.0 | 934.1 | 1,081.6 | 1,227.1 | 1,384.5 | 2.7% | 2.1% | 2.5% | 2.5% | 2.5% |
| | Baseline | 819.6 | 843.4 | 946.5 | 1,107.4 | 1,289.1 | 1,487.6 | 2.9% | 2.3% | 2.8% | 2.9% | 2.9% |
| | Optimistic | 819.6 | 845.9 | 950.3 | 1,103.7 | 1,304.0 | 1,524.0 | 3.2% | 2.4% | 2.7% | 2.9% | 3.0% |
| Nominal Passenger Yield (cents) | Pessimistic | 16.46 | 17.05 | 18.27 | 19.72 | 22.76 | 26.38 | 3.6% | 1.4% | 1.5% | 1.9% | 2.2% |
| | Baseline | 16.46 | 16.90 | 18.62 | 20.14 | 21.61 | 23.25 | 2.7% | 2.0% | 1.8% | 1.7% | 1.6% |
| | Optimistic | 16.46 | 16.87 | 18.79 | 20.40 | 21.34 | 22.45 | 2.5% | 2.2% | 1.9% | 1.6% | 1.4% |

*Includes mainline and regional carriers.

# Appendix B: FAA Forecast Accuracy

Forecasts, by their nature, have a degree of uncertainty incorporated in them. They involve not only statistical analyses and various scientific methods, but also judgment and reliance on industry knowledge and the forecaster's experience to incorporate industry trends not yet reflected in recent results. The FAA's annual Aerospace Forecast is no exception. Given the volatile nature of the U.S. airline industry, it is not surprising that each year's forecast would contain a certain degree of forecast variance. Therefore, FAA forecasters have tried to build forecast models that give a consistent and predictable pattern of results. Analysts relying on the forecasts produced by the models would then be able to adjust for the predictable variance from actual results.

The table below presents an analysis of the variance from historical results for a primary forecast assumption along with five key forecast metrics during the FY 2010-2019, and 2023-24 forecast period. Although many of the forecasts prepared for the period examined were developed while the U.S. airline industry was going through upheaval, the FAA's forecast methodology remained consistent during this time. Given the sudden nature of the COVID-19 pandemic and its unprecedented impacts to global aviation, forecasts developed for FY 2020-22 period were excluded from this analysis as inclusion of forecasts for these years might lead to inconclusive or inaccurate implications about the accuracy of FAA's current forecast methodology.

The table below contains the mean absolute percent errors for the projected values versus the actual results for U.S. carriers' system operations along with the projected values versus actual results for U.S. GDP. Each metric has five values showing the relative forecast variance by the number of years in advance the preparation of the forecast took place. For example, the "3 Years" column for ASMs shows that the mean absolute percent error was 5.3 percent for ASM forecasts prepared 3 years in advance. For the period under examination, preparation of the forecasts for FY 2010 through FY 2019 occurred in FY 2006 through FY 2016. Forecasts for the period FY 2023 through FY 2024 were prepared in 2019 through 2023. [60]

[60] It should be noted that the first forecasted year for each respective fiscal year is that very same year. Therefore, FY 2010's first forecasted year is FY 2010, and the third forecasted year is FY 2012.

**U.S. AIR CARRIERS**
**SYSTEM SCHEDULED PASSENGER ACTIVITY**
**FORECAST EVALUATION**

| Forecast Variable | Mean Absolute Percent Error (Combined FY 2010-19, FY 2023-24) (Forecast Variance from Actual) Forecast Performed Years Prior to Actual | | | | |
|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| U.S. Real GDP | 1.2% | 2.6% | 4.3% | 6.2% | 7.5% |
| ASMs | 1.0% | 2.2% | 4.9% | 8.4% | 10.4% |
| RPMs | 0.9% | 1.8% | 4.5% | 7.4% | 9.5% |
| Passenger Enplanements | 0.7% | 1.8% | 4.3% | 7.2% | 9.2% |
| Mainline Domestic Yield | 2.4% | 5.3% | 9.6% | 10.7% | 9.0% |
| Commercial Operations at FAA/Contract Towers | 0.8% | 2.8% | 6.8% | 9.7% | 13.0% |

Presenting forecast variances from actual data in such a manner simplifies a review of longer-term trends. Typically, one would expect the variances to increase as the forecast year moves farther from the year the forecast is prepared. Presenting forecast variances in this way allows an examination of changes in the relative variances by time horizon, signaling when dramatic shifts in accuracy occur.

Examination of the forecast variances reveals several items. First, the forecast variances for GDP, a key exogenous variable, are similar to the variances of the key traffic measures, Passenger Enplanements and RPMs. This suggests that a substantial amount of the forecast variance for the traffic variables is attributable to the forecast error in the exogenous variables. Second, all the metrics examined have increasing variances as the forecast time horizon lengthens. Third, the variance between RPMs and Enplanements is relatively constant, even as the time horizon increases suggesting that over the long run, enplanement growth is a good indicator of RPM growth. Finally, the variance of Commercial Operations at FAA/Contract Towers relative to ASMs widens considerably after 2 years. This suggests that, beyond a 2-year forecast horizon, carriers are accommodating changes in capacity by means other than adjusting operations. Many carriers have been systematically reducing the number of smaller regional jets in their fleets, replacing them with larger 70-90 seat aircraft. This has allowed carriers to increase capacity without increasing flights.

# Appendix C:  Forecast Tables

## TABLE 1

## U.S. SHORT-TERM ECONOMIC FORECASTS

| | FISCAL YEAR 2024 | | | | FISCAL YEAR 2025 | | | | FISCAL YEAR 2026 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECONOMIC VARIABLE | 1ST. QTR. | 2ND. QTR. | 3RD QTR. | 4TH. QTR. | 1ST. QTR. | 2ND. QTR. | 3RD QTR. | 4TH. QTR. | 1ST. QTR. | 2ND. QTR. | 3RD QTR. | 4TH. QTR. |
| **Real Personal Consumption Expenditure per Capita** | | | | | | | | | | | | |
| (2017 $) | 46,447 | 46,551 | 46,767 | 47,080 | 47,312 | 47,528 | 47,683 | 47,818 | 47,948 | 48,081 | 48,281 | 48,467 |
| Year over year change | 1.9% | 1.1% | 1.6% | 2.0% | 1.9% | 2.1% | 2.0% | 1.6% | 1.3% | 1.2% | 1.3% | 1.4% |
| **Refiners' Acquisition Cost - Averag** | | | | | | | | | | | | |
| (Dollars per barrel) | 79.55 | 76.38 | 81.81 | 76.79 | 71.04 | 68.71 | 67.31 | 66.27 | 63.75 | 61.28 | 58.83 | 60.74 |
| Year over year change | -4.2% | 2.5% | 10.3% | -6.9% | -10.7% | -10.0% | -17.7% | -13.7% | -10.3% | -10.8% | -12.6% | -8.3% |
| **Consumer Price Index** | | | | | | | | | | | | |
| (1982-84 = 1) | 3.081 | 3.110 | 3.132 | 3.141 | 3.164 | 3.179 | 3.214 | 3.242 | 3.269 | 3.302 | 3.324 | 3.346 |
| Year over year change | 3.2% | 3.2% | 3.2% | 2.6% | 2.7% | 2.2% | 2.6% | 3.2% | 3.3% | 3.9% | 3.4% | 3.2% |

Source: S&P Global

## TABLE 2

## U.S. LONG-TERM ECONOMIC FORECASTS

| FISCAL YEAR | REAL GROSS DOMESTIC PRODUCT (Billions 2017 $) | REAL PERSONAL CONSUMPTION EXPENDITURE PER CAPITA (2017 $) | CONSUMER PRICE INDEX (1982-84=1.00) | REFINERS' ACQUISITION COST AVERAGE (Dollars per barrel) |
|---|---|---|---|---|
| Historical | | | | |
| 2010 | 16,675 | 36,370 | 2.17 | 74.61 |
| 2019 | 20,546 | 41,958 | 2.54 | 59.77 |
| 2020 | 20,321 | 41,086 | 2.58 | 43.15 |
| 2021 | 21,198 | 43,693 | 2.67 | 58.91 |
| 2022 | 21,963 | 45,424 | 2.88 | 93.50 |
| 2023 | 22,493 | 45,953 | 3.02 | 78.56 |
| 2024E | 23,156 | 46,712 | 3.12 | 78.63 |
| | | | | |
| Forecast | | | | |
| 2025 | 23,634 | 47,585 | 3.20 | 68.33 |
| 2030 | 25,790 | 52,008 | 3.61 | 74.58 |
| 2035 | 28,072 | 57,140 | 4.03 | 89.41 |
| 2040 | 30,454 | 62,308 | 4.49 | 93.85 |
| 2045 | 32,930 | 67,629 | 5.00 | 98.86 |
| | | | | |
| Avg Annual Growth | | | | |
| 2010-24 | 2.4% | 1.8% | 2.6% | 0.4% |
| 2024-25 | 2.1% | 1.9% | 2.7% | -13.1% |
| 2025-35 | 1.7% | 1.8% | 2.3% | 2.7% |
| 2025-45 | 1.7% | 1.8% | 2.3% | 1.9% |

Source: S&P Global

## TABLE 3

## INTERNATIONAL GDP FORECASTS BY TRAVEL REGION

| | GROSS DOMESTIC PRODUCT (In Billions of 2019 U.S. Dollars) | | | | |
|---|---|---|---|---|---|
| CALENDAR YEAR | CANADA | EUROPE / AFRICA / MIDDLE EAST | LATIN AMERICA / CARIBBEAN / MEXICO | JAPAN / PACIFIC BASIN / CHINA / OTHER ASIA / AUSTRALIA / NEW ZEALAND | WORLD |
| Historical | | | | | |
| 2010 | 1,439 | 21,721 | 4,643 | 19,950 | 67,172 |
| 2019 | 1,744 | 26,007 | 5,413 | 30,737 | 87,749 |
| 2020 | 1,656 | 24,611 | 5,052 | 30,470 | 85,110 |
| 2021 | 1,754 | 26,169 | 5,413 | 32,503 | 90,562 |
| 2022 | 1,828 | 27,218 | 5,627 | 33,555 | 93,462 |
| 2023 | 1,856 | 27,483 | 5,758 | 34,995 | 96,082 |
| 2024E | 1,879 | 27,819 | 5,879 | 36,375 | 98,687 |
| Forecast | | | | | |
| 2025 | 1,907 | 28,274 | 6,004 | 37,731 | 101,188 |
| 2030 | 2,069 | 31,221 | 6,894 | 45,431 | 115,521 |
| 2035 | 2,247 | 34,332 | 7,963 | 54,082 | 131,277 |
| 2040 | 2,456 | 37,584 | 9,168 | 63,746 | 148,459 |
| 2045 | 2,679 | 40,996 | 10,529 | 74,359 | 167,064 |
| Avg Annual Growth | | | | | |
| 2010-24 | 1.9% | 1.8% | 1.7% | 4.4% | 2.8% |
| 2024-25 | 1.5% | 1.6% | 2.1% | 3.7% | 2.5% |
| 2025-35 | 1.7% | 2.0% | 2.9% | 3.7% | 2.6% |
| 2025-45 | 1.7% | 1.9% | 2.8% | 3.5% | 2.5% |

Source: S&P Global, Comparative World Overview Tables (Interim Forecast, Monthly)

## TABLE 4

## INTERNATIONAL GDP FORECASTS – SELECTED AREAS/COUNTRIES

| | GROSS DOMESTIC PRODUCT (In Billions of 2019 U.S. Dollars) | | | | |
|---|---|---|---|---|---|
| CALENDAR YEAR | NORTH AMERICA (USMCA) | EUROZONE | UNITED KINGDOM | JAPAN | CHINA |
| Historical | | | | | |
| 2010 | 19,986 | 12,033 | 2,398 | 4,731 | 7,550 |
| 2019 | 24,588 | 13,595 | 2,851 | 5,117 | 14,278 |
| 2020 | 23,923 | 12,752 | 2,557 | 4,902 | 14,594 |
| 2021 | 25,372 | 13,552 | 2,777 | 5,038 | 15,828 |
| 2022 | 26,054 | 14,039 | 2,911 | 5,084 | 16,295 |
| 2023 | 26,787 | 14,109 | 2,921 | 5,159 | 17,150 |
| 2024E | 27,471 | 14,212 | 2,945 | 5,153 | 18,002 |
| Forecast | | | | | |
| 2025 | 27,973 | 14,337 | 2,974 | 5,203 | 18,759 |
| 2030 | 30,548 | 15,331 | 3,168 | 5,417 | 23,131 |
| 2035 | 33,317 | 16,356 | 3,363 | 5,626 | 28,197 |
| 2040 | 36,269 | 17,349 | 3,569 | 5,828 | 33,769 |
| 2045 | 39,395 | 18,352 | 3,781 | 5,986 | 39,639 |
| Avg Annual Growth | | | | | |
| 2010-24 | 2.3% | 1.2% | 1.5% | 0.6% | 6.4% |
| 2024-25 | 1.8% | 0.9% | 1.0% | 1.0% | 4.2% |
| 2025-35 | 1.8% | 1.3% | 1.2% | 0.8% | 4.2% |
| 2025-45 | 1.7% | 1.2% | 1.2% | 0.7% | 3.8% |

Source: S&P Global, Comparative World Overview Tables (Interim Forecast, Monthly)

## TABLE 5

## U.S. COMMERCIAL AIR CARRIERS[1]

## TOTAL SCHEDULED U.S. PASSENGER TRAFFIC

| | REVENUE PASSENGER ENPLANEMENTS (Millions) | | | REVENUE PASSENGER MILES (Billions) | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC | INTERNATIONAL | TOTAL | DOMESTIC | INTERNATIONAL | TOTAL |
| Historical | | | | | | |
| 2010 | 635 | 77 | 712 | 555 | 231 | 786 |
| 2019 | 813 | 104 | 917 | 752 | 292 | 1,044 |
| 2020 | 465 | 49 | 513 | 423 | 129 | 551 |
| 2021 | 508 | 49 | 557 | 476 | 92 | 567 |
| 2022 | 739 | 91 | 830 | 696 | 213 | 909 |
| 2023 | 811 | 111 | 922 | 763 | 290 | 1,053 |
| 2024E | 858 | 128 | 987 | 805 | 343 | 1,148 |
| Forecast | | | | | | |
| 2025 | 877 | 133 | 1,010 | 833 | 359 | 1,192 |
| 2030 | 991 | 152 | 1,143 | 956 | 409 | 1,365 |
| 2035 | 1,131 | 179 | 1,310 | 1,105 | 473 | 1,578 |
| 2040 | 1,272 | 210 | 1,482 | 1,259 | 545 | 1,804 |
| 2045 | 1,422 | 245 | 1,667 | 1,426 | 625 | 2,051 |
| Avg Annual Growth | | | | | | |
| 2010-24 | 2.2% | 3.7% | 2.4% | 2.7% | 2.9% | 2.7% |
| 2024-25 | 2.1% | 3.9% | 2.3% | 3.5% | 4.5% | 3.8% |
| 2025-35 | 2.6% | 3.0% | 2.6% | 2.9% | 2.8% | 2.8% |
| 2025-45 | 2.4% | 3.1% | 2.5% | 2.7% | 2.8% | 2.8% |

Source: Forms 41 and 298-C, U.S. Department of Transportation.

[1]Sum of U.S. Mainline and Regional Air Carriers.

## TABLE 6

## U.S. COMMERCIAL AIR CARRIERS[1]

## SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

| | DOMESTIC | | | INTERNATIONAL | | | SYSTEM | | |
|---|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR |
| Historical | | | | | | | | | |
| 2010 | 679 | 555 | 81.7 | 281 | 231 | 82.1 | 961 | 786 | 81.8 |
| 2019 | 883 | 752 | 85.2 | 352 | 292 | 82.9 | 1,235 | 1,044 | 84.5 |
| 2020 | 618 | 423 | 68.3 | 178 | 129 | 72.3 | 796 | 551 | 69.2 |
| 2021 | 658 | 476 | 72.3 | 171 | 92 | 53.5 | 829 | 567 | 68.5 |
| 2022 | 834 | 696 | 83.4 | 278 | 213 | 76.6 | 1,112 | 909 | 81.7 |
| 2023 | 907 | 763 | 84.1 | 348 | 290 | 83.4 | 1,255 | 1,053 | 83.9 |
| 2024E | 961 | 805 | 83.7 | 418 | 343 | 82.1 | 1,380 | 1,148 | 83.2 |
| Forecast | | | | | | | | | |
| 2025 | 988 | 833 | 84.3 | 435 | 359 | 82.5 | 1,423 | 1,192 | 83.7 |
| 2030 | 1,113 | 956 | 85.9 | 491 | 409 | 83.3 | 1,604 | 1,365 | 85.1 |
| 2035 | 1,277 | 1,105 | 86.6 | 568 | 473 | 83.4 | 1,844 | 1,578 | 85.6 |
| 2040 | 1,451 | 1,259 | 86.8 | 654 | 545 | 83.4 | 2,105 | 1,804 | 85.7 |
| 2045 | 1,642 | 1,426 | 86.9 | 749 | 625 | 83.4 | 2,391 | 2,051 | 85.8 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | 2.5% | 2.7% | | 2.9% | 2.9% | | 2.6% | 2.7% | |
| 2024-25 | 2.8% | 3.5% | | 4.1% | 4.5% | | 3.2% | 3.8% | |
| 2025-35 | 2.6% | 2.9% | | 2.7% | 2.8% | | 2.6% | 2.8% | |
| 2025-45 | 2.6% | 2.7% | | 2.7% | 2.8% | | 2.6% | 2.8% | |

Source: Forms 41 and 298-C, U.S. Department of Transportation.

[1]Sum of U.S. Mainline and Regional Air Carriers.

## TABLE 7

## U.S. COMMERCIAL AIR CARRIERS[1]

## TOTAL SCHEDULED U.S. INTERNATIONAL PASSENGER TRAFFIC

| | REVENUE PASSENGER ENPLANEMENTS | | | | REVENUE PASSENGER MILES | | | |
|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | ATLANTIC (Mil) | LATIN AMERICA (Mil) | PACIFIC (Mil) | TOTAL INTERNATIONAL (Mil) | ATLANTIC (Bil) | LATIN AMERICA (Bil) | PACIFIC (Bil) | TOTAL INTERNATIONAL (Bil) |
| Historical | | | | | | | | |
| 2010 | 25 | 40 | 13 | 77 | 109 | 63 | 59 | 231 |
| 2019 | 28 | 63 | 13 | 104 | 121 | 96 | 75 | 292 |
| 2020 | 11 | 32 | 6 | 49 | 48 | 49 | 31 | 129 |
| 2021 | 6 | 43 | 1 | 49 | 27 | 60 | 4 | 92 |
| 2022 | 23 | 65 | 3 | 91 | 100 | 97 | 15 | 213 |
| 2023 | 32 | 72 | 7 | 111 | 141 | 106 | 43 | 290 |
| 2024E | 36 | 81 | 11 | 128 | 159 | 121 | 63 | 343 |
| Forecast | | | | | | | | |
| 2025 | 37 | 84 | 12 | 133 | 162 | 127 | 70 | 359 |
| 2030 | 40 | 98 | 14 | 152 | 179 | 148 | 82 | 409 |
| 2035 | 44 | 119 | 16 | 179 | 198 | 183 | 93 | 473 |
| 2040 | 48 | 144 | 18 | 210 | 218 | 222 | 105 | 545 |
| 2045 | 53 | 172 | 20 | 245 | 239 | 266 | 119 | 625 |
| Avg Annual Growth | | | | | | | | |
| 2010-24 | 2.9% | 5.2% | -1.2% | 3.7% | 2.7% | 4.8% | 0.5% | 2.9% |
| 2024-25 | 1.6% | 3.9% | 11.2% | 3.9% | 2.1% | 4.2% | 11.4% | 4.5% |
| 2025-35 | 1.8% | 3.5% | 2.7% | 3.0% | 2.0% | 3.7% | 2.8% | 2.8% |
| 2025-45 | 1.8% | 3.6% | 2.6% | 3.1% | 2.0% | 3.8% | 2.7% | 2.8% |

Source: Forms 41 and 298-C, U.S. Department of Transportation.

[1]Sum of U.S. Mainline and Regional Air Carriers.

## TABLE 8

## U.S. AND FOREIGN FLAG CARRIERS

## TOTAL PASSENGER TRAFFIC TO/FROM THE UNITED STATES

| | TOTAL PASSENGERS BY WORLD TRAVEL AREA (Millions) | | | | |
|---|---|---|---|---|---|
| CALENDAR YEAR | ATLANTIC | LATIN AMERICA | PACIFIC | U.S./CANADA TRANSBORDER | TOTAL |
| Historical | | | | | |
| 2010 | 56 | 53 | 27 | 22 | 158 |
| 2019 | 89 | 89 | 44 | 32 | 253 |
| 2020 | 17 | 33 | 9 | 7 | 67 |
| 2021 | 24 | 66 | 4 | 5 | 99 |
| 2022 | 71 | 88 | 15 | 21 | 195 |
| 2023 | 87 | 100 | 29 | 28 | 244 |
| 2024E | 93 | 107 | 35 | 32 | 267 |
| | | | | | |
| Forecast | | | | | |
| 2025 | 98 | 112 | 38 | 33 | 281 |
| 2030 | 115 | 133 | 47 | 37 | 332 |
| 2035 | 131 | 156 | 55 | 42 | 384 |
| 2040 | 148 | 182 | 63 | 47 | 441 |
| 2045 | 167 | 210 | 72 | 53 | 502 |
| | | | | | |
| Avg Annual Growth | | | | | |
| 2010-24 | 3.7% | 5.2% | 1.8% | 2.7% | 3.8% |
| 2024-25 | 4.8% | 4.6% | 9.3% | 3.9% | 5.2% |
| 2025-35 | 3.0% | 3.4% | 3.7% | 2.5% | 3.2% |
| 2025-45 | 2.7% | 3.2% | 3.3% | 2.4% | 3.0% |

Source: US Customs & Border Protection data processed and released by Department of Commerce; data also received from Transport Canada.

## TABLE 9

## U.S. COMMERCIAL AIR CARRIERS' FORECAST ASSUMPTIONS[1]

## SEATS PER AIRCRAFT MILE AND PASSENGER TRIP LENGTH

| | AVERAGE SEATS PER AIRCRAFT MILE | | | AVERAGE PASSENGER TRIP LENGTH | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC (Seats/Mile) | INTERNATIONAL (Seats/Mile) | SYSTEM (Seats/Mile) | DOMESTIC (Miles) | INTERNATIONAL (Miles) | SYSTEM (Miles) |
| Historical | | | | | | |
| 2010 | 121.9 | 216.4 | 139.7 | 874.9 | 2,988.0 | 1,104.2 |
| 2019 | 141.1 | 221.3 | 157.4 | 924.9 | 2,813.9 | 1,138.8 |
| 2020 | 141.1 | 217.1 | 153.1 | 909.2 | 2,647.9 | 1,073.7 |
| 2021 | 144.9 | 198.6 | 153.4 | 937.3 | 1,859.6 | 1,018.9 |
| 2022 | 149.0 | 215.4 | 161.5 | 941.2 | 2,347.5 | 1,094.8 |
| 2023 | 154.6 | 224.9 | 169.3 | 940.4 | 2,610.0 | 1,141.5 |
| 2024E | 154.9 | 226.7 | 171.3 | 937.6 | 2,673.1 | 1,163.5 |
| Forecast | | | | | | |
| 2025 | 155.2 | 227.4 | 171.9 | 950.0 | 2,690.0 | 1,179.9 |
| 2030 | 157.9 | 229.0 | 174.5 | 964.4 | 2,693.1 | 1,194.1 |
| 2035 | 161.1 | 230.0 | 177.5 | 977.0 | 2,642.2 | 1,204.6 |
| 2040 | 164.7 | 231.1 | 180.8 | 990.0 | 2,593.5 | 1,217.4 |
| 2045 | 168.3 | 232.4 | 184.2 | 1,003.0 | 2,552.3 | 1,230.5 |
| Avg Annual Growth | | | | | | |
| 2010-24 | 1.7% | 0.3% | 1.5% | 0.5% | -0.8% | 0.4% |
| 2024-25 | 0.2% | 0.3% | 0.4% | 1.3% | 0.6% | 1.4% |
| 2025-35 | 0.4% | 0.1% | 0.3% | 0.3% | -0.2% | 0.2% |
| 2025-45 | 0.4% | 0.1% | 0.3% | 0.3% | -0.3% | 0.2% |

Source: Forms 41 and 298-C, U.S. Department of Transportation.

[1]Sum of U.S. Mainline and Regional Air Carriers.

## TABLE 10

## U. S. MAINLINE AIR CARRIERS

## SCHEDULED PASSENGER TRAFFIC

| | REVENUE PASSENGER ENPLANEMENTS (Millions) | | | REVENUE PASSENGER MILES (Billions) | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC | INTERNATIONAL | SYSTEM | DOMESTIC | INTERNATIONAL | SYSTEM |
| Historical | | | | | | |
| 2010 | 473 | 75 | 548 | 480 | 230 | 710 |
| 2019 | 654 | 100 | 754 | 674 | 290 | 963 |
| 2020 | 370 | 47 | 417 | 376 | 127 | 503 |
| 2021 | 402 | 47 | 449 | 422 | 90 | 512 |
| 2022 | 613 | 89 | 701 | 634 | 211 | 845 |
| 2023 | 696 | 109 | 805 | 710 | 289 | 998 |
| 2024E | 731 | 126 | 857 | 747 | 342 | 1,088 |
| Forecast | | | | | | |
| 2025 | 747 | 131 | 878 | 772 | 357 | 1,129 |
| 2030 | 844 | 149 | 993 | 886 | 407 | 1,293 |
| 2035 | 964 | 176 | 1,140 | 1,024 | 471 | 1,495 |
| 2040 | 1,084 | 207 | 1,290 | 1,166 | 543 | 1,708 |
| 2045 | 1,212 | 241 | 1,453 | 1,320 | 622 | 1,942 |
| Avg Annual Growth | | | | | | |
| 2010-24 | 3.2% | 3.8% | 3.3% | 3.2% | 2.9% | 3.1% |
| 2024-25 | 2.1% | 3.9% | 2.4% | 3.4% | 4.5% | 3.8% |
| 2025-35 | 2.6% | 3.0% | 2.6% | 2.9% | 2.8% | 2.8% |
| 2025-45 | 2.5% | 3.1% | 2.6% | 2.7% | 2.8% | 2.7% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 11

## U.S. MAINLINE AIR CARRIERS

## SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

| | DOMESTIC | | | INTERNATIONAL | | | SYSTEM | | |
|---|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR |
| Historical | | | | | | | | | |
| 2010 | 581 | 480 | 82.7 | 279 | 230 | 82.2 | 860 | 710 | 82.5 |
| 2019 | 785 | 674 | 85.8 | 349 | 290 | 83.0 | 1,134 | 963 | 85.0 |
| 2020 | 547 | 376 | 68.7 | 176 | 127 | 72.4 | 723 | 503 | 69.6 |
| 2021 | 582 | 422 | 72.6 | 169 | 90 | 53.4 | 751 | 512 | 68.2 |
| 2022 | 756 | 634 | 83.9 | 276 | 211 | 76.6 | 1,032 | 845 | 81.9 |
| 2023 | 842 | 710 | 84.3 | 346 | 289 | 83.4 | 1,188 | 998 | 84.1 |
| 2024E | 890 | 747 | 83.9 | 416 | 342 | 82.1 | 1,306 | 1,088 | 83.3 |
| Forecast | | | | | | | | | |
| 2025 | 914 | 772 | 84.5 | 433 | 357 | 82.5 | 1,347 | 1,129 | 83.8 |
| 2030 | 1,028 | 886 | 86.2 | 489 | 407 | 83.3 | 1,516 | 1,293 | 85.3 |
| 2035 | 1,179 | 1,024 | 86.9 | 565 | 471 | 83.4 | 1,744 | 1,495 | 85.7 |
| 2040 | 1,339 | 1,166 | 87.1 | 651 | 543 | 83.4 | 1,990 | 1,708 | 85.9 |
| 2045 | 1,515 | 1,320 | 87.1 | 745 | 622 | 83.5 | 2,260 | 1,942 | 85.9 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | 3.1% | 3.2% | | 2.9% | 2.9% | | 3.0% | 3.1% | |
| 2024-25 | 2.7% | 3.4% | | 4.1% | 4.5% | | 3.1% | 3.8% | |
| 2025-35 | 2.6% | 2.9% | | 2.7% | 2.8% | | 2.6% | 2.8% | |
| 2025-45 | 2.6% | 2.7% | | 2.7% | 2.8% | | 2.6% | 2.7% | |

Source: Form 41, U.S. Department of Transportation.

## TABLE 12

## U.S. MAINLINE AIR CARRIERS

## SCHEDULED INTERNATIONAL PASSENGER ENPLANEMENTS

| | REVENUE PASSENGER ENPLANEMENTS (MIL) | | | |
|---|---|---|---|---|
| FISCAL YEAR | ATLANTIC | LATIN AMERICA | PACIFIC | TOTAL |
| Historical | | | | |
| 2010 | 24.5 | 37.2 | 12.9 | 74.6 |
| 2019 | 27.9 | 59.2 | 13.2 | 100.2 |
| 2020 | 10.8 | 30.3 | 5.6 | 46.7 |
| 2021 | 5.7 | 40.9 | 0.8 | 47.4 |
| 2022 | 22.6 | 63.3 | 2.6 | 88.5 |
| 2023 | 31.8 | 69.7 | 7.4 | 109.0 |
| 2024E | 36.3 | 78.9 | 10.9 | 126.1 |
| | | | | |
| Forecast | | | | |
| 2025 | 36.9 | 82.0 | 12.1 | 131.0 |
| 2030 | 40.2 | 95.0 | 14.0 | 149.1 |
| 2035 | 44.1 | 116.0 | 15.9 | 176.0 |
| 2040 | 48.4 | 140.4 | 18.0 | 206.7 |
| 2045 | 52.9 | 167.7 | 20.3 | 240.9 |
| | | | | |
| Avg Annual Growth | | | | |
| 2010-24 | 2.9% | 5.5% | -1.2% | 3.8% |
| 2024-25 | 1.6% | 4.0% | 11.2% | 3.9% |
| 2025-35 | 1.8% | 3.5% | 2.7% | 3.0% |
| 2025-45 | 1.8% | 3.6% | 2.6% | 3.1% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 13

## U.S. MAINLINE AIR CARRIERS
## SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS
## BY INTERNATIONAL TRAVEL REGIONS

| | ATLANTIC | | | LATIN AMERICA | | | PACIFIC | | | INTERNATIONAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR | ASMs (BIL) | RPMs (BIL) | % LOAD FACTOR |
| Historical | | | | | | | | | | | | |
| 2010 | 131 | 109 | 82.9 | 78 | 62 | 79.2 | 70 | 59 | 84.1 | 279 | 230 | 82.2 |
| 2019 | 146 | 121 | 82.9 | 112 | 94 | 83.5 | 91 | 75 | 82.6 | 349 | 290 | 83.0 |
| 2020 | 69 | 48 | 69.3 | 63 | 48 | 76.2 | 44 | 31 | 71.8 | 176 | 127 | 72.4 |
| 2021 | 57 | 27 | 47.8 | 92 | 59 | 63.5 | 20 | 4 | 22.4 | 169 | 90 | 53.4 |
| 2022 | 128 | 100 | 78.1 | 121 | 96 | 79.6 | 27 | 15 | 56.3 | 276 | 211 | 76.6 |
| 2023 | 171 | 141 | 82.6 | 122 | 104 | 85.8 | 54 | 43 | 80.5 | 346 | 289 | 83.4 |
| 2024E | 193 | 159 | 82.5 | 141 | 120 | 84.8 | 83 | 63 | 76.6 | 416 | 342 | 82.1 |
| Forecast | | | | | | | | | | | | |
| 2025 | 196 | 162 | 82.7 | 147 | 125 | 84.8 | 90 | 70 | 78.1 | 433 | 357 | 82.5 |
| 2030 | 216 | 179 | 82.7 | 173 | 146 | 84.8 | 100 | 82 | 82.1 | 489 | 407 | 83.3 |
| 2035 | 239 | 198 | 82.7 | 213 | 180 | 84.8 | 113 | 93 | 82.1 | 565 | 471 | 83.4 |
| 2040 | 264 | 218 | 82.7 | 259 | 219 | 84.8 | 128 | 105 | 82.1 | 651 | 543 | 83.4 |
| 2045 | 290 | 239 | 82.7 | 311 | 263 | 84.8 | 145 | 119 | 82.1 | 745 | 622 | 83.5 |
| Avg Annual Growth | | | | | | | | | | | | |
| 2010-24 | 2.8% | 2.7% | | 4.3% | 4.9% | | 1.1% | 0.5% | | 2.9% | 2.9% | |
| 2024-25 | 1.7% | 2.1% | | 4.2% | 4.2% | | 9.2% | 11.4% | | 4.1% | 4.5% | |
| 2025-35 | 2.0% | 2.0% | | 3.7% | 3.7% | | 2.3% | 2.8% | | 2.7% | 2.8% | |
| 2025-45 | 2.0% | 2.0% | | 3.8% | 3.8% | | 2.4% | 2.7% | | 2.7% | 2.8% | |

Source: Form 41, U.S. Department of Transportation.

## TABLE 14

## U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS

## SEATS PER AIRCRAFT MILE

| | | INTERNATIONAL | | | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC (Seats/Mile) | ATLANTIC (Seats/Mile) | LATIN AMERICA (Seats/Mile) | PACIFIC (Seats/Mile) | TOTAL (Seats/Mile) | SYSTEM (Seats/Mile) |
| Historical | | | | | | |
| 2010 | 152.0 | 231.7 | 171.7 | 287.2 | 220.9 | 169.2 |
| 2019 | 166.0 | 251.6 | 177.9 | 269.9 | 225.6 | 180.7 |
| 2020 | 166.7 | 256.2 | 178.5 | 256.5 | 221.8 | 177.4 |
| 2021 | 171.7 | 255.4 | 178.8 | 205.8 | 202.4 | 177.8 |
| 2022 | 171.0 | 260.0 | 180.4 | 265.8 | 218.3 | 181.5 |
| 2023 | 172.2 | 256.3 | 183.1 | 278.8 | 227.2 | 185.2 |
| 2024E | 172.7 | 254.1 | 184.6 | 279.6 | 229.0 | 187.4 |
| | | | | | | |
| Forecast | | | | | | |
| 2025 | 173.2 | 254.6 | 185.1 | 280.4 | 229.7 | 188.1 |
| 2030 | 175.8 | 257.1 | 187.6 | 284.1 | 231.3 | 190.5 |
| 2035 | 178.9 | 259.6 | 190.1 | 287.9 | 232.2 | 193.3 |
| 2040 | 182.4 | 262.1 | 192.6 | 291.6 | 233.3 | 196.4 |
| 2045 | 186.0 | 264.6 | 195.1 | 295.4 | 234.5 | 199.6 |
| | | | | | | |
| Avg Annual Growth | | | | | | |
| 2010-24 | 0.9% | 0.7% | 0.5% | -0.2% | 0.3% | 0.7% |
| 2024-25 | 0.3% | 0.2% | 0.3% | 0.3% | 0.3% | 0.4% |
| 2025-35 | 0.3% | 0.2% | 0.3% | 0.3% | 0.1% | 0.3% |
| 2025-45 | 0.4% | 0.2% | 0.3% | 0.3% | 0.1% | 0.3% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 15

## U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS

## AVERAGE PASSENGER TRIP LENGTH

| | | INTERNATIONAL | | | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC (Miles) | ATLANTIC (Miles) | LATIN AMERICA (Miles) | PACIFIC (Miles) | TOTAL (Miles) | SYSTEM (Miles) |
| Historical | | | | | | |
| 2010 | 1,015 | 4,433 | 1,660 | 4,587 | 3,077 | 1,296 |
| 2019 | 1,030 | 4,330 | 1,582 | 5,709 | 2,890 | 1,278 |
| 2020 | 1,015 | 4,442 | 1,577 | 5,634 | 2,725 | 1,207 |
| 2021 | 1,050 | 4,756 | 1,434 | 5,809 | 1,906 | 1,140 |
| 2022 | 1,035 | 4,435 | 1,517 | 5,835 | 2,388 | 1,206 |
| 2023 | 1,020 | 4,428 | 1,498 | 5,841 | 2,649 | 1,241 |
| 2024E | 1,021 | 4,370 | 1,520 | 5,800 | 2,711 | 1,270 |
| | | | | | | |
| Forecast | | | | | | |
| 2025 | 1,034 | 4,388 | 1,523 | 5,810 | 2,727 | 1,287 |
| 2030 | 1,049 | 4,450 | 1,543 | 5,846 | 2,730 | 1,301 |
| 2035 | 1,062 | 4,485 | 1,555 | 5,843 | 2,676 | 1,311 |
| 2040 | 1,076 | 4,508 | 1,563 | 5,849 | 2,625 | 1,324 |
| 2045 | 1,089 | 4,530 | 1,571 | 5,854 | 2,582 | 1,337 |
| | | | | | | |
| Avg Annual Growth | | | | | | |
| 2010-24 | 0.0% | -0.1% | -0.6% | 1.7% | -0.9% | -0.1% |
| 2024-25 | 1.3% | 0.4% | 0.2% | 0.2% | 0.6% | 1.3% |
| 2025-35 | 0.3% | 0.2% | 0.2% | 0.1% | -0.2% | 0.2% |
| 2025-45 | 0.3% | 0.2% | 0.2% | 0.0% | -0.3% | 0.2% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 16

# U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS

## PASSENGER YIELDS

| | REVENUE PER PASSENGER MILE | | | | | |
|---|---|---|---|---|---|---|
| | DOMESTIC | | INTERNATIONAL | | SYSTEM | |
| FISCAL YEAR | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) |
| Historical | | | | | | |
| 2010 | 12.62 | 17.55 | 12.84 | 17.85 | 12.69 | 17.64 |
| 2019 | 14.12 | 16.79 | 13.47 | 16.00 | 13.92 | 16.55 |
| 2020 | 13.40 | 15.70 | 13.48 | 15.79 | 13.42 | 15.72 |
| 2021 | 11.73 | 13.31 | 12.84 | 14.57 | 11.93 | 13.53 |
| 2022 | 15.58 | 16.37 | 15.35 | 16.14 | 15.52 | 16.31 |
| 2023 | 16.68 | 17.19 | 16.93 | 17.45 | 16.75 | 17.27 |
| 2024E | 16.19 | 16.19 | 16.48 | 16.48 | 16.28 | 16.28 |
| Forecast | | | | | | |
| 2025 | 17.48 | 17.02 | 16.93 | 16.48 | 17.31 | 16.85 |
| 2030 | 19.13 | 16.51 | 18.64 | 16.09 | 18.98 | 16.38 |
| 2035 | 20.88 | 16.13 | 20.18 | 15.58 | 20.66 | 15.96 |
| 2040 | 22.48 | 15.61 | 21.64 | 15.03 | 22.21 | 15.43 |
| 2045 | 24.26 | 15.11 | 23.29 | 14.50 | 23.95 | 14.91 |
| Avg Annual Growth | | | | | | |
| 2010-24 | 1.8% | -0.6% | 1.8% | -0.6% | 1.8% | -0.6% |
| 2024-25 | 8.0% | 5.2% | 2.7% | 0.0% | 6.3% | 3.5% |
| 2025-35 | 1.8% | -0.5% | 1.8% | -0.6% | 1.8% | -0.5% |
| 2025-45 | 1.7% | -0.6% | 1.6% | -0.6% | 1.6% | -0.6% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 17

## U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS
## INTERNATIONAL PASSENGER YIELDS BY REGION

| | REVENUE PER PASSENGER MILE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ATLANTIC | | LATIN AMERICA | | PACIFIC | | TOTAL INTERNATIONAL | |
| FISCAL YEAR | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) |
| Historical | | | | | | | | |
| 2010 | 12.73 | 18.25 | 13.33 | 19.11 | 12.50 | 17.92 | 12.84 | 18.40 |
| 2019 | 14.04 | 17.20 | 14.20 | 17.39 | 11.63 | 14.25 | 13.47 | 16.49 |
| 2020 | 13.49 | 16.29 | 14.60 | 17.63 | 11.75 | 14.19 | 13.48 | 16.27 |
| 2021 | 11.82 | 13.82 | 12.59 | 14.71 | 22.48 | 26.27 | 12.84 | 15.01 |
| 2022 | 15.68 | 16.98 | 14.64 | 15.85 | 17.79 | 19.27 | 15.35 | 16.63 |
| 2023 | 17.09 | 17.62 | 16.75 | 17.26 | 16.85 | 17.37 | 16.93 | 17.45 |
| 2024E | 17.30 | 17.30 | 15.69 | 15.69 | 15.92 | 15.92 | 16.48 | 16.48 |
| Forecast | | | | | | | | |
| 2025 | 17.68 | 17.21 | 16.32 | 15.88 | 16.28 | 15.84 | 16.93 | 16.48 |
| 2030 | 19.42 | 16.78 | 18.07 | 15.61 | 17.98 | 15.54 | 18.65 | 16.11 |
| 2035 | 21.16 | 16.37 | 19.38 | 14.99 | 19.63 | 15.19 | 20.18 | 15.61 |
| 2040 | 22.88 | 15.96 | 20.59 | 14.36 | 21.27 | 14.84 | 21.65 | 15.10 |
| 2045 | 24.83 | 15.57 | 21.95 | 13.76 | 23.13 | 14.50 | 23.29 | 14.60 |
| Avg Annual Growth | | | | | | | | |
| 2010-24 | 2.2% | -0.4% | 1.2% | -1.4% | 1.7% | -0.8% | 1.8% | -0.8% |
| 2024-25 | 2.2% | -0.5% | 4.0% | 1.2% | 2.2% | -0.5% | 2.7% | 0.0% |
| 2025-35 | 1.8% | -0.5% | 1.7% | -0.6% | 1.9% | -0.4% | 1.8% | -0.5% |
| 2025-45 | 1.7% | -0.5% | 1.5% | -0.7% | 1.8% | -0.4% | 1.6% | -0.6% |

Source: Form 41, U.S. Department of Transportation.

## TABLE 18

## U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS

## JET FUEL PRICES

| | DOMESTIC | | INTERNATIONAL | | SYSTEM | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) | CURRENT $ (Cents) | FY 2024 $ (Cents) |
| Historical | | | | | | |
| 2010 | 219.16 | 314.09 | 220.12 | 315.48 | 219.49 | 314.57 |
| 2019 | 205.67 | 251.95 | 207.82 | 254.58 | 206.42 | 252.86 |
| 2020 | 166.65 | 201.23 | 167.21 | 201.90 | 166.84 | 201.45 |
| 2021 | 177.23 | 207.17 | 171.82 | 200.84 | 175.49 | 205.13 |
| 2022 | 309.28 | 334.98 | 315.20 | 341.40 | 311.23 | 337.10 |
| 2023 | 295.08 | 304.17 | 290.73 | 299.68 | 293.57 | 302.61 |
| 2024E | 271.52 | 271.52 | 273.49 | 273.49 | 272.23 | 272.23 |
| | | | | | | |
| Forecast | | | | | | |
| 2025 | 236.02 | 229.85 | 237.73 | 231.51 | 236.63 | 230.44 |
| 2030 | 241.36 | 208.31 | 243.11 | 209.82 | 241.99 | 208.85 |
| 2035 | 294.50 | 227.46 | 296.64 | 229.10 | 295.27 | 228.05 |
| 2040 | 309.74 | 215.12 | 311.99 | 216.68 | 310.55 | 215.68 |
| 2045 | 326.39 | 203.26 | 328.75 | 204.73 | 327.23 | 203.79 |
| | | | | | | |
| Avg Annual Growth | | | | | | |
| 2010-24 | 1.5% | -1.0% | 1.6% | -1.0% | 1.5% | -1.0% |
| 2024-25 | -13.1% | -15.3% | -13.1% | -15.3% | -13.1% | -15.3% |
| 2025-35 | 2.2% | -0.1% | 2.2% | -0.1% | 2.2% | -0.1% |
| 2025-45 | 1.6% | -0.6% | 1.6% | -0.6% | 1.6% | -0.6% |

Source: Form 41, U.S. Department of Transportation

## TABLE 19

## U.S. COMMERCIAL AIR CARRIERS

## AIR CARGO REVENUE TON MILES[1, 2, 3]

| | ALL-CARGO CARRIER RTMS (Millions) | | | PASSENGER CARRIER RTMS (Millions) | | | TOTAL RTMS (Millions) | | |
|---|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC | INT'L. | TOTAL | DOMESTIC | INT'L. | TOTAL | DOMESTIC | INT'L. | TOTAL |
| Historical | | | | | | | | | |
| 2010 | 11,306 | 15,971 | 27,276 | 1,495 | 6,246 | 7,742 | 12,801 | 22,217 | 35,018 |
| 2019 | 14,737 | 19,668 | 34,405 | 1,468 | 6,984 | 8,452 | 16,205 | 26,652 | 42,857 |
| 2020 | 16,665 | 21,964 | 38,630 | 1,136 | 4,130 | 5,266 | 17,801 | 26,095 | 43,896 |
| 2021 | 18,555 | 26,580 | 45,135 | 1,318 | 4,836 | 6,154 | 19,873 | 31,416 | 51,289 |
| 2022 | 18,376 | 26,090 | 44,466 | 1,447 | 5,625 | 7,072 | 19,823 | 31,715 | 51,539 |
| 2023 | 16,358 | 24,184 | 40,542 | 1,219 | 5,522 | 6,741 | 17,577 | 29,706 | 47,283 |
| 2024E | 16,901 | 23,285 | 40,185 | 1,221 | 6,580 | 7,800 | 18,121 | 29,865 | 47,986 |
| Forecast | | | | | | | | | |
| 2025 | 17,376 | 24,247 | 41,622 | 1,243 | 7,120 | 8,363 | 18,618 | 31,367 | 49,985 |
| 2030 | 19,596 | 29,959 | 49,555 | 1,334 | 8,181 | 9,515 | 20,930 | 38,140 | 59,070 |
| 2035 | 21,763 | 35,848 | 57,611 | 1,408 | 9,074 | 10,482 | 23,171 | 44,922 | 68,093 |
| 2040 | 23,937 | 42,301 | 66,237 | 1,467 | 9,890 | 11,357 | 25,404 | 52,191 | 77,595 |
| 2045 | 26,155 | 49,470 | 75,625 | 1,515 | 10,639 | 12,155 | 27,670 | 60,110 | 87,780 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | 2.9% | 2.7% | 2.8% | -1.4% | 0.4% | 0.1% | 2.5% | 2.1% | 2.3% |
| 2024-25 | 2.8% | 4.1% | 3.6% | 1.8% | 8.2% | 7.2% | 2.7% | 5.0% | 4.2% |
| 2025-35 | 2.3% | 4.0% | 3.3% | 1.3% | 2.5% | 2.3% | 2.2% | 3.7% | 3.1% |
| 2025-45 | 2.1% | 3.6% | 3.0% | 1.0% | 2.0% | 1.9% | 2.0% | 3.3% | 2.9% |

Source: Form 41, U.S. Department of Transportation

[1]Includes freight/express and mail revenue ton miles on mainline air carriers and regionals/commuters.

[2]Domestic figures from 2000 through 2002 exclude Airborne Express, Inc.; international figures for 2003 and beyond include new reporting of contract service by U.S. carriers for foreign flag carriers.

[3]Domestic figures from 2003 and beyond include Airborne Express. Inc.

## TABLE 20

## U.S. COMMERCIAL AIR CARRIERS

## INTERNATIONAL AIR CARGO REVENUE TON MILES BY REGION[1, 2]

| FISCAL YEAR | ATLANTIC (MILLIONS) | LATIN AMERICA (MILLIONS) | PACIFIC (MILLIONS) | OTHER INTERNATIONAL (MILLIONS) | TOTAL (MILLIONS) |
|---|---|---|---|---|---|
| Historical | | | | | |
| 2010 | 6,786 | 1,990 | 7,897 | 5,545 | 22,217 |
| 2019 | 7,426 | 1,661 | 10,429 | 7,135 | 26,652 |
| 2020 | 6,669 | 1,296 | 10,198 | 7,931 | 26,095 |
| 2021 | 7,603 | 1,608 | 11,555 | 10,650 | 31,416 |
| 2022 | 8,763 | 1,666 | 10,905 | 10,382 | 31,715 |
| 2023 | 8,352 | 1,418 | 12,015 | 7,921 | 29,706 |
| 2024E | 8,436 | 1,696 | 11,001 | 8,732 | 29,865 |
| | | | | | |
| Forecast | | | | | |
| 2025 | 8,748 | 1,717 | 11,646 | 9,256 | 31,367 |
| 2030 | 10,182 | 1,911 | 14,611 | 11,437 | 38,140 |
| 2035 | 11,567 | 2,107 | 17,346 | 13,902 | 44,922 |
| 2040 | 13,016 | 2,273 | 20,110 | 16,791 | 52,191 |
| 2045 | 14,549 | 2,417 | 23,011 | 20,133 | 60,110 |
| | | | | | |
| Avg Annual Growth | | | | | |
| 2010-24 | 1.6% | -1.1% | 2.4% | 3.3% | 2.1% |
| 2024-25 | 3.7% | 1.2% | 5.9% | 6.0% | 5.0% |
| 2025-35 | 2.8% | 2.1% | 4.1% | 4.2% | 3.7% |
| 2025-45 | 2.6% | 1.7% | 3.5% | 4.0% | 3.3% |

Source: Form 41, U.S. Department of Transportation

[1]Includes freight/express and mail revenue ton miles on mainline air carriers and regionals/commuters.

[2]Figures for 2003 and beyond include new reporting of contract service by U.S. carriers for foreign flag carriers.

## TABLE 21

## U.S. MAINLINE AIR CARRIERS

## PASSENGER JET AIRCRAFT

| | LARGE NARROWBODY | | | | LARGE WIDEBODY | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALENDAR YEAR | 2 ENGINE | 3 ENGINE | 4 ENGINE | TOTAL | 2 ENGINE | 3 ENGINE | 4 ENGINE | TOTAL | LARGE JETS | REGIONAL JETS | TOTAL JETS |
| Historical | | | | | | | | | | | |
| 2010 | 3,120 | 8 | 1 | 3,129 | 470 | 9 | 43 | 522 | 3,651 | 71 | 3,722 |
| 2019 | 3,775 | 0 | 0 | 3,775 | 553 | 0 | 0 | 553 | 4,328 | 60 | 4,388 |
| 2020 | 2,860 | 0 | 0 | 2,860 | 298 | 0 | 0 | 298 | 3,158 | 23 | 3,181 |
| 2021 | 2,828 | 0 | 0 | 2,828 | 281 | 0 | 0 | 281 | 3,109 | 23 | 3,132 |
| 2022 | 3,429 | 0 | 0 | 3,429 | 426 | 0 | 0 | 426 | 3,855 | 60 | 3,915 |
| 2023 | 4,210 | 0 | 0 | 4,210 | 550 | 0 | 0 | 550 | 4,760 | 72 | 4,832 |
| 2024E | 4,240 | 0 | 0 | 4,240 | 540 | 0 | 0 | 540 | 4,780 | 49 | 4,829 |
| Forecast | | | | | | | | | | | |
| 2025 | 4,079 | 0 | 0 | 4,079 | 523 | 0 | 0 | 523 | 4,602 | 24 | 4,626 |
| 2030 | 4,241 | 0 | 0 | 4,241 | 615 | 0 | 0 | 615 | 4,856 | 0 | 4,856 |
| 2035 | 4,753 | 0 | 0 | 4,753 | 701 | 0 | 0 | 701 | 5,454 | 0 | 5,454 |
| 2040 | 5,262 | 0 | 0 | 5,262 | 817 | 0 | 0 | 817 | 6,079 | 0 | 6,079 |
| 2045 | 5,917 | 0 | 0 | 5,917 | 937 | 0 | 0 | 937 | 6,854 | 0 | 6,854 |
| Avg Annual Growth | | | | | | | | | | | |
| 2010-24 | 2.2% | N.A. | N.A. | 2.2% | 1.0% | N.A. | N.A. | 0.2% | 1.9% | -2.6% | 1.9% |
| 2024-25 | -3.8% | N.A. | N.A. | -3.8% | -3.1% | N.A. | N.A. | -3.1% | -3.7% | N.A. | -4.2% |
| 2025-35 | 1.5% | N.A. | N.A. | 1.5% | 3.0% | N.A. | N.A. | 3.0% | 1.7% | N.A. | 1.7% |
| 2025-45 | 1.9% | N.A. | N.A. | 1.9% | 3.0% | N.A. | N.A. | 3.0% | 2.0% | N.A. | 2.0% |

Note: N.A. - Not Applicable

## TABLE 22

## U.S. MAINLINE AIR CARRIERS

## CARGO JET AIRCRAFT

| | LARGE NARROWBODY | | | | LARGE WIDEBODY | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CALENDAR YEAR | 2 ENGINE | 3 ENGINE | 4 ENGINE | TOTAL | 2 ENGINE | 3 ENGINE | 4 ENGINE | TOTAL | TOTAL |
| Historical | | | | | | | | | |
| 2010 | 153 | 104 | 31 | 288 | 265 | 200 | 97 | 562 | 850 |
| 2019 | 216 | 10 | 2 | 228 | 419 | 120 | 112 | 651 | 879 |
| 2020 | 200 | 10 | 0 | 210 | 414 | 115 | 109 | 638 | 848 |
| 2021 | 213 | 8 | 0 | 221 | 434 | 111 | 110 | 655 | 876 |
| 2022 | 219 | 7 | 0 | 226 | 469 | 118 | 122 | 709 | 935 |
| 2023 | 225 | 9 | 0 | 234 | 494 | 107 | 133 | 734 | 968 |
| 2024E | 182 | 2 | 0 | 184 | 488 | 65 | 124 | 677 | 861 |
| Forecast | | | | | | | | | |
| 2025 | 189 | 2 | 0 | 191 | 519 | 57 | 127 | 703 | 894 |
| 2030 | 255 | 0 | 0 | 255 | 653 | 33 | 140 | 826 | 1,081 |
| 2035 | 264 | 0 | 0 | 264 | 756 | 33 | 137 | 926 | 1,190 |
| 2040 | 256 | 0 | 0 | 256 | 900 | 13 | 118 | 1,031 | 1,287 |
| 2045 | 265 | 0 | 0 | 265 | 1,039 | 2 | 93 | 1,134 | 1,399 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | 1.2% | -24.6% | N.A. | -3.1% | 4.5% | -7.7% | 1.8% | 1.3% | 0.1% |
| 2024-25 | 3.8% | 0.0% | N.A. | 3.8% | 6.4% | -12.3% | 2.4% | 3.8% | 3.8% |
| 2025-35 | 3.4% | N.A. | N.A. | 3.3% | 3.8% | -5.3% | 0.8% | 2.8% | 2.9% |
| 2025-45 | 1.7% | N.A. | N.A. | 1.7% | 3.5% | -15.4% | -1.5% | 2.4% | 2.3% |

Note: N.A. - Not Applicable

## TABLE 23

## TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

## U.S. CIVIL AVIATION AIRCRAFT

**(Millions of Gallons)**

| | JET FUEL | | | | | AVIATION GASOLINE | | | |
|---|---|---|---|---|---|---|---|---|---|
| | U.S. AIR CARRIERS[1, 2] | | | | | | | | |
| FISCAL YEAR | DOMESTIC | INT'L. | TOTAL | GENERAL AVIATION | TOTAL | AIR CARRIER | GENERAL AVIATION | TOTAL | TOTAL FUEL CONSUMED |
| Historical | | | | | | | | | |
| 2010 | 12,036 | 6,315 | 18,351 | 1,435 | 19,786 | 2 | 221 | 223 | 20,009 |
| 2019 | 14,648 | 7,043 | 21,691 | 1,510 | 23,202 | 2 | 200 | 202 | 23,404 |
| 2020 | 10,538 | 4,732 | 15,270 | 1,342 | 16,612 | 2 | 204 | 206 | 16,818 |
| 2021 | 11,587 | 4,824 | 16,410 | 1,909 | 18,320 | 2 | 229 | 231 | 18,550 |
| 2022 | 14,170 | 6,116 | 20,287 | 2,048 | 22,334 | 2 | 233 | 235 | 22,569 |
| 2023 | 14,488 | 6,931 | 21,419 | 1,776 | 23,195 | 2 | 256 | 258 | 23,452 |
| 2024E | 14,855 | 7,590 | 22,446 | 1,840 | 24,286 | 2 | 249 | 251 | 24,537 |
| Forecast | | | | | | | | | |
| 2025 | 15,464 | 7,821 | 23,285 | 1,904 | 25,190 | 2 | 242 | 244 | 25,434 |
| 2030 | 16,572 | 8,391 | 24,963 | 2,178 | 27,141 | 2 | 225 | 227 | 27,368 |
| 2035 | 18,090 | 9,231 | 27,322 | 2,443 | 29,765 | 2 | 221 | 223 | 29,989 |
| 2040 | 19,563 | 10,115 | 29,679 | 2,695 | 32,374 | 2 | 221 | 223 | 32,597 |
| 2045 | 21,069 | 11,022 | 32,091 | 2,933 | 35,024 | 2 | 225 | 227 | 35,250 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | 1.5% | 1.3% | 1.4% | 1.8% | 1.5% | 0.0% | 0.9% | 0.9% | 1.5% |
| 2024-25 | 4.1% | 3.0% | 3.7% | 3.5% | 3.7% | 0.0% | -2.7% | -2.7% | 3.7% |
| 2025-35 | 1.6% | 1.7% | 1.6% | 2.5% | 1.7% | 0.0% | -0.9% | -0.9% | 1.7% |
| 2025-45 | 1.6% | 1.7% | 1.6% | 2.2% | 1.7% | 0.0% | -0.4% | -0.4% | 1.6% |

Source: Air carrier jet fuel, Form 41, U.S. Department of Transportation; all others, FAA APO estimates.

[1]Includes both passenger (mainline and regional air carrier) and cargo carriers.

[2]Forecast assumes 1.0% annual improvement in available seat miles per gallon for U.S. Commercial Air Carrier

## TABLE 24

## U.S. REGIONAL CARRIER FORECAST ASSUMPTIONS

| | AVERAGE SEATS PER AIRCRAFT MILE | | | AVERAGE PASSENGER TRIP LENGTH | | | REVENUE PER PASSENGER MILE** | |
|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC (Seats/Mile) | INT'L (Seats/Mile) | TOTAL (Seats/Mile) | DOMESTIC (Miles) | INT'L. (Miles) | TOTAL (Miles) | CURRENT $ (Cents) | 2023 $ (Cents) |
| Historical | | | | | | | | |
| 2010 | 56.1 | 53.2 | 56.1 | 464 | 503 | 465 | 15.74 | 22.55 |
| 2019 | 64.1 | 70.9 | 64.3 | 492 | 670 | 496 | 11.48 | 14.06 |
| 2020 | 64.6 | 70.7 | 64.8 | 494 | 675 | 497 | 10.96 | 13.24 |
| 2021 | 66.0 | 72.9 | 66.1 | 508 | 662 | 511 | 9.63 | 11.25 |
| 2022 | 66.3 | 72.5 | 66.4 | 488 | 640 | 490 | 12.77 | 13.83 |
| 2023 | 66.9 | 73.4 | 67.1 | 458 | 630 | 461 | 13.62 | 14.04 |
| 2024E | 67.7 | 72.2 | 67.8 | 458 | 652 | 461 | 13.00 | 13.00 |
| | | | | | | | | |
| Forecast | | | | | | | | |
| 2025 | 68.2 | 72.5 | 68.3 | 468 | 665 | 471 | 14.02 | 13.65 |
| 2030 | 70.7 | 74.0 | 70.8 | 477 | 679 | 481 | 15.33 | 13.23 |
| 2035 | 73.3 | 75.5 | 73.4 | 487 | 692 | 490 | 16.73 | 12.92 |
| 2040 | 76.1 | 77.0 | 76.1 | 496 | 706 | 500 | 18.00 | 12.50 |
| 2045 | 78.9 | 78.5 | 78.9 | 506 | 720 | 510 | 19.42 | 12.10 |
| | | | | | | | | |
| Avg Annual Growth | | | | | | | | |
| 2010-24 | 1.3% | 2.2% | 1.4% | -0.1% | 1.9% | -0.1% | -1.4% | -3.9% |
| 2024-25 | 0.7% | 0.4% | 0.7% | 2.1% | 2.1% | 2.1% | 7.8% | 5.0% |
| 2025-35 | 0.7% | 0.4% | 0.7% | 0.4% | 0.4% | 0.4% | 1.8% | -0.5% |
| 2025-45 | 0.7% | 0.4% | 0.7% | 0.4% | 0.4% | 0.4% | 1.6% | -0.6% |

Source: Form 41 and 298C, U.S. Department of Transportation.

** Reporting carriers.

## TABLE 25

## U.S. REGIONAL CARRIERS

## SCHEDULED PASSENGER TRAFFIC

**(In Millions)**

| | REVENUE PASSENGERS | | | REVENUE PASSENGER MILES | | |
|---|---|---|---|---|---|---|
| FISCAL YEAR | DOMESTIC | INTERNATIONAL | TOTAL | DOMESTIC | INTERNATIONAL | TOTAL |
| Historical | | | | | | |
| 2010 | 162 | 3 | 164 | 75,028 | 1,347 | 76,375 |
| 2019 | 159 | 4 | 163 | 78,358 | 2,376 | 80,734 |
| 2020 | 94 | 2 | 96 | 46,667 | 1,229 | 47,896 |
| 2021 | 106 | 2 | 108 | 53,699 | 1,221 | 54,921 |
| 2022 | 127 | 2 | 129 | 61,839 | 1,335 | 63,175 |
| 2023 | 115 | 2 | 118 | 52,787 | 1,348 | 54,136 |
| 2024E | 127 | 2 | 130 | 58,289 | 1,532 | 59,820 |
| Forecast | | | | | | |
| 2025 | 130 | 2 | 132 | 60,759 | 1,597 | 62,356 |
| 2030 | 147 | 3 | 149 | 69,936 | 1,838 | 71,774 |
| 2035 | 167 | 3 | 170 | 81,429 | 2,140 | 83,568 |
| 2040 | 188 | 3 | 192 | 93,365 | 2,454 | 95,818 |
| 2045 | 210 | 4 | 214 | 106,469 | 2,798 | 109,267 |
| Avg Annual Growth | | | | | | |
| 2010-24 | -1.7% | -0.9% | -1.7% | -1.8% | 0.9% | -1.7% |
| 2024-25 | 2.1% | 2.1% | 2.1% | 4.2% | 4.2% | 4.2% |
| 2025-35 | 2.6% | 2.6% | 2.6% | 3.0% | 3.0% | 3.0% |
| 2025-45 | 2.4% | 2.4% | 2.4% | 2.8% | 2.8% | 2.8% |

Source: Form 41 and 298C, U.S. Department of Transportation.

## TABLE 26

## U.S. REGIONAL CARRIERS

## SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

| | DOMESTIC | | | INTERNATIONAL | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| YEAR | ASMs (MIL) | RPMs (MIL) | % LOAD FACTOR | ASMs (MIL) | RPMs (MIL) | % LOAD FACTOR | ASMs (MIL) | RPMs (MIL) | % LOAD FACTOR |
| Historical | | | | | | | | | |
| 2010 | 98,454 | 75,028 | 76.2 | 1,857 | 1,347 | 72.5 | 100,311 | 76,375 | 76.1 |
| 2019 | 98,120 | 78,358 | 79.9 | 3,116 | 2,376 | 76.3 | 101,236 | 80,734 | 79.7 |
| 2020 | 70,861 | 46,667 | 65.9 | 1,812 | 1,229 | 67.9 | 72,673 | 47,896 | 65.9 |
| 2021 | 75,964 | 53,699 | 70.7 | 1,836 | 1,221 | 66.5 | 77,800 | 54,921 | 70.6 |
| 2022 | 77,916 | 61,839 | 79.4 | 1,833 | 1,335 | 72.8 | 79,749 | 63,175 | 79.2 |
| 2023 | 65,422 | 52,787 | 80.7 | 1,685 | 1,348 | 80.0 | 67,107 | 54,136 | 80.7 |
| 2024E | 71,343 | 58,289 | 81.7 | 1,943 | 1,532 | 78.8 | 73,286 | 59,820 | 81.6 |
| Forecast | | | | | | | | | |
| 2025 | 74,187 | 60,759 | 81.9 | 2,020 | 1,597 | 79.0 | 76,207 | 62,356 | 81.8 |
| 2030 | 84,852 | 69,936 | 82.4 | 2,311 | 1,838 | 79.5 | 87,163 | 71,774 | 82.3 |
| 2035 | 97,831 | 81,429 | 83.2 | 2,664 | 2,140 | 80.3 | 100,495 | 83,568 | 83.2 |
| 2040 | 111,811 | 93,365 | 83.5 | 3,045 | 2,454 | 80.6 | 114,856 | 95,818 | 83.4 |
| 2045 | 127,319 | 106,469 | 83.6 | 3,467 | 2,798 | 80.7 | 130,786 | 109,267 | 83.5 |
| Avg Annual Growth | | | | | | | | | |
| 2010-24 | -2.3% | -1.8% | | 0.3% | 0.9% | | -2.2% | -1.7% | |
| 2024-25 | 4.0% | 4.2% | | 4.0% | 4.2% | | 4.0% | 4.2% | |
| 2025-35 | 2.8% | 3.0% | | 2.8% | 3.0% | | 2.8% | 3.0% | |
| 2025-45 | 2.7% | 2.8% | | 2.7% | 2.8% | | 2.7% | 2.8% | |

Source: Form 41 and 298C, U.S. Department of Transportation.

## TABLE 27

## U.S. REGIONAL CARRIERS

## PASSENGER AIRCRAFT

| | REGIONAL AIRCRAFT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 31 TO 40 SEATS | | | OVER 40 SEATS | | | TOTAL FLEET | | |
| AS OF JANUARY 1 | LESS THAN 9 SEATS | 10 TO 19 SEATS | 20 TO 30 SEATS | PROP | JET | TOTAL | PROP | JET | TOTAL | NON JET | JET | TOTAL |
| Historical | | | | | | | | | | | | |
| 2010 | 440 | 92 | 82 | 144 | 28 | 172 | 99 | 1,728 | 1,827 | 857 | 1,756 | 2,613 |
| 2019 | 374 | 72 | 19 | 11 | 0 | 11 | 39 | 1,846 | 1,885 | 515 | 1,846 | 2,361 |
| 2020 | 276 | 74 | 20 | 11 | 0 | 11 | 40 | 1,434 | 1,474 | 421 | 1,434 | 1,855 |
| 2021 | 268 | 69 | 16 | 10 | 0 | 10 | 38 | 1,406 | 1,444 | 401 | 1,406 | 1,807 |
| 2022 | 247 | 59 | 18 | 3 | 3 | 6 | 49 | 1,623 | 1,672 | 376 | 1,626 | 2,002 |
| 2023 | 245 | 57 | 7 | 3 | 1 | 4 | 24 | 1,435 | 1,459 | 336 | 1,436 | 1,772 |
| 2024E | 240 | 56 | 7 | 3 | 1 | 4 | 21 | 1,369 | 1,390 | 327 | 1,370 | 1,697 |
| Forecast | | | | | | | | | | | | |
| 2025 | 237 | 55 | 7 | 3 | 1 | 4 | 19 | 1,406 | 1,425 | 321 | 1,407 | 1,728 |
| 2030 | 221 | 52 | 6 | 3 | 0 | 3 | 20 | 1,440 | 1,460 | 302 | 1,440 | 1,742 |
| 2035 | 203 | 47 | 6 | 3 | 0 | 3 | 22 | 1,634 | 1,656 | 282 | 1,634 | 1,916 |
| 2040 | 183 | 43 | 5 | 3 | 0 | 3 | 25 | 1,862 | 1,887 | 260 | 1,862 | 2,122 |
| 2045 | 164 | 38 | 5 | 3 | 0 | 3 | 30 | 2,114 | 2,144 | 240 | 2,114 | 2,354 |
| Avg Annual Growth | | | | | | | | | | | | |
| 2010-24 | -4.2% | -3.5% | -16.1% | -24.2% | -21.2% | -23.6% | -10.5% | -1.6% | -1.9% | -6.7% | -1.8% | -3.0% |
| 2024-25 | -1.2% | -1.2% | -1.2% | 0.0% | 0.0% | 0.0% | -9.5% | 2.7% | 2.5% | -1.8% | 2.7% | 1.8% |
| 2025-35 | -1.5% | -1.5% | -1.5% | 0.0% | N.A. | N.A. | 1.5% | 1.5% | 1.5% | -1.3% | 1.5% | 1.0% |
| 2025-45 | -1.8% | -1.8% | -1.8% | 0.0% | N.A. | N.A. | 2.3% | 2.1% | 2.1% | -1.5% | 2.1% | 1.6% |

Note: N.A. - Not Applicable

## TABLE 28

## ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

| | FIXED WING | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PISTON | | | TURBINE | | | ROTORCRAFT | | | | | | TOTAL GENERAL | | |
| AS OF DEC. 31 | SINGLE ENGINE | MULTI-ENGINE | TOTAL | TURBO PROP | TURBO JET | TOTAL | PISTON | TURBINE | TOTAL | EXPERI-MENTAL** | LIGHT SPORT | OTHER | AVIATION FLEET | TOTAL PISTONS | TOTAL TURBINES |
| Historical* | | | | | | | | | | | | | | | |
| 2010 | 139,519 | 15,900 | 155,419 | 9,369 | 11,484 | 20,853 | 3,588 | 6,514 | 10,102 | 24,784 | 6,528 | 5,684 | 223,370 | 159,007 | 27,367 |
| 2019 | 128,926 | 12,470 | 141,396 | 10,242 | 14,888 | 25,130 | 3,089 | 7,109 | 10,198 | 27,449 | 2,675 | 4,133 | 210,981 | 144,485 | 32,239 |
| 2020 | 124,059 | 11,947 | 136,006 | 10,317 | 15,316 | 25,633 | 2,930 | 6,816 | 9,746 | 26,367 | 2,570 | 3,818 | 204,140 | 138,936 | 32,449 |
| 2021 | 126,735 | 11,885 | 138,620 | 10,391 | 15,270 | 25,661 | 3,012 | 7,020 | 10,032 | 27,960 | 2,650 | 4,271 | 209,194 | 141,632 | 32,681 |
| 2022 | 126,076 | 11,652 | 137,728 | 10,713 | 16,126 | 26,839 | 2,748 | 7,021 | 9,769 | 28,062 | 2,666 | 4,476 | 209,540 | 140,476 | 33,860 |
| 2023 | 127,573 | 11,727 | 139,300 | 10,951 | 16,537 | 27,488 | 2,909 | 7,142 | 10,051 | 30,114 | 3,007 | 4,262 | 214,222 | 142,209 | 34,630 |
| 2024E | 127,105 | 11,645 | 138,750 | 11,030 | 17,010 | 28,040 | 2,930 | 7,300 | 10,230 | 30,295 | 3,175 | 4,450 | 214,940 | 141,680 | 35,340 |
| Forecast | | | | | | | | | | | | | | | |
| 2025 | 126,690 | 11,580 | 138,270 | 11,100 | 17,505 | 28,605 | 2,955 | 7,465 | 10,420 | 30,425 | 3,285 | 4,595 | 215,600 | 141,225 | 36,070 |
| 2030 | 125,265 | 11,275 | 136,540 | 11,425 | 20,235 | 31,660 | 3,100 | 8,340 | 11,440 | 31,190 | 3,865 | 4,710 | 219,405 | 139,640 | 40,000 |
| 2035 | 124,340 | 11,085 | 135,425 | 11,935 | 23,335 | 35,270 | 3,230 | 9,290 | 12,520 | 32,325 | 4,500 | 4,765 | 224,805 | 138,655 | 44,560 |
| 2040 | 123,800 | 10,950 | 134,750 | 12,660 | 26,565 | 39,225 | 3,335 | 10,285 | 13,620 | 33,475 | 5,180 | 4,800 | 231,050 | 138,085 | 49,510 |
| 2045 | 123,925 | 10,925 | 134,850 | 13,540 | 29,865 | 43,405 | 3,435 | 11,280 | 14,715 | 34,670 | 5,870 | 4,840 | 238,350 | 138,285 | 54,685 |
| Avg Annual Growth | | | | | | | | | | | | | | | |
| 2010-24 | -0.7% | -2.2% | -0.8% | 1.2% | 2.8% | 2.1% | -1.4% | 0.8% | 0.1% | 1.4% | -5.0% | -1.7% | -0.3% | -0.8% | 1.8% |
| 2024-25 | -0.3% | -0.6% | -0.3% | 0.6% | 2.9% | 2.0% | 0.9% | 2.3% | 1.9% | 0.4% | 3.5% | 3.3% | 0.3% | -0.3% | 2.1% |
| 2025-35 | -0.2% | -0.4% | -0.2% | 0.7% | 2.9% | 2.1% | 0.9% | 2.2% | 1.9% | 0.6% | 3.2% | 0.4% | 0.4% | -0.2% | 2.1% |
| 2025-45 | -0.1% | -0.3% | -0.1% | 1.0% | 2.7% | 2.1% | 0.8% | 2.1% | 1.7% | 0.7% | 2.9% | 0.3% | 0.5% | -0.1% | 2.1% |

* Source: 2001-2010, 2012-2023, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

**Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

## TABLE 29

## ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

**(In Thousands)**

| | FIXED WING | | | | | | | | | | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PISTON | | | TURBINE | | | ROTORCRAFT | | | | | | GENERAL | | |
| AS OF DEC. 31 | SINGLE ENGINE | MULTI-ENGINE | TOTAL | TURBO PROP | TURBO JET | TOTAL | PISTON | TURBINE | TOTAL | EXPERI-MENTAL** | LIGHT SPORT AIRCRAFT** | OTHER | AVIATION HOURS | TOTAL PISTONS | TOTAL TURBINES |
| Historical* | | | | | | | | | | | | | | | |
| 2010 | 12,161 | 1,818 | 13,979 | 2,325 | 3,375 | 5,700 | 794 | 2,611 | 3,405 | 1,226 | 311 | 181 | 24,802 | 14,773 | 8,311 |
| 2019 | 12,700 | 1,731 | 14,431 | 2,619 | 3,926 | 6,546 | 628 | 2,369 | 2,997 | 1,269 | 189 | 135 | 25,566 | 15,059 | 8,914 |
| 2020 | 11,603 | 1,336 | 12,939 | 2,344 | 3,336 | 5,681 | 537 | 1,871 | 2,408 | 1,176 | 202 | 86 | 22,492 | 13,477 | 7,552 |
| 2021 | 12,808 | 1,494 | 14,302 | 2,720 | 4,868 | 7,587 | 578 | 2,178 | 2,756 | 1,394 | 245 | 156 | 26,441 | 14,880 | 9,765 |
| 2022 | 12,999 | 1,432 | 14,431 | 2,846 | 5,238 | 8,084 | 537 | 2,238 | 2,775 | 1,279 | 231 | 153 | 26,953 | 14,969 | 10,322 |
| 2023 | 14,613 | 1,492 | 16,105 | 2,841 | 4,628 | 7,469 | 668 | 2,239 | 2,907 | 1,594 | 355 | 132 | 28,563 | 16,773 | 9,708 |
| 2024E | 14,087 | 1,493 | 15,580 | 2,936 | 4,850 | 7,786 | 674 | 2,295 | 2,969 | 1,564 | 352 | 143 | 28,394 | 16,254 | 10,082 |
| Forecast | | | | | | | | | | | | | | | |
| 2025 | 13,584 | 1,495 | 15,079 | 2,994 | 5,085 | 8,079 | 682 | 2,354 | 3,036 | 1,531 | 350 | 152 | 28,227 | 15,760 | 10,434 |
| 2030 | 12,238 | 1,498 | 13,736 | 3,184 | 6,125 | 9,309 | 724 | 2,670 | 3,394 | 1,575 | 362 | 168 | 28,544 | 14,460 | 11,979 |
| 2035 | 11,990 | 1,498 | 13,488 | 3,347 | 7,186 | 10,533 | 759 | 3,012 | 3,771 | 1,656 | 423 | 172 | 30,044 | 14,247 | 13,545 |
| 2040 | 12,035 | 1,507 | 13,542 | 3,548 | 8,253 | 11,802 | 788 | 3,359 | 4,147 | 1,744 | 498 | 175 | 31,908 | 14,330 | 15,161 |
| 2045 | 12,232 | 1,539 | 13,771 | 3,782 | 9,320 | 13,102 | 816 | 3,712 | 4,528 | 1,837 | 576 | 177 | 33,991 | 14,587 | 16,814 |
| Avg Annual Growth | | | | | | | | | | | | | | | |
| 2010-24 | 1.1% | -1.4% | 0.8% | 1.7% | 2.6% | 2.3% | -1.2% | -0.9% | -1.0% | 1.8% | 0.9% | -1.7% | 1.0% | 0.7% | 1.4% |
| 2024-25 | -3.6% | 0.1% | -3.2% | 2.0% | 4.8% | 3.8% | 1.2% | 2.6% | 2.2% | -2.1% | -0.6% | 6.4% | -0.6% | -3.0% | 3.5% |
| 2025-35 | -1.2% | 0.0% | -1.1% | 1.1% | 3.5% | 2.7% | 1.1% | 2.5% | 2.2% | 0.8% | 1.9% | 1.3% | 0.6% | -1.0% | 2.6% |
| 2025-45 | -0.5% | 0.1% | -0.5% | 1.2% | 3.1% | 2.4% | 0.9% | 2.3% | 2.0% | 0.9% | 2.5% | 0.8% | 0.9% | -0.4% | 2.4% |

* Source: 2001-2010, 2012-2023, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

**Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

## TABLE 30

## ACTIVE PILOTS BY TYPE OF CERTIFICATE, EXCLUDING STUDENT PILOTS*

| AS OF DEC. 31 | RECREA-TIONAL | SPORT PILOT | PRIVATE | COMMERCIAL | AIRLINE TRANSPORT | ROTOR-CRAFT ONLY | GLIDER ONLY | TOTAL LESS STUDENT PILOTS | INSTRUMENT RATED PILOTS[1] | GA PILOTS (EXCLUDING STUDENTS & ATPs) |
|---|---|---|---|---|---|---|---|---|---|---|
| Historical** | | | | | | | | | | |
| 2010 | 212 | 3,682 | 202,020 | 123,705 | 142,198 | 15,377 | 21,275 | 508,469 | 318,001 | 366,271 |
| 2019 | 127 | 6,467 | 161,105 | 100,863 | 164,947 | 14,248 | 19,143 | 466,900 | 314,168 | 301,953 |
| 2020 | 105 | 6,643 | 160,860 | 103,879 | 164,193 | 13,629 | 19,753 | 469,062 | 316,651 | 304,869 |
| 2021 | 85 | 6,801 | 161,459 | 104,610 | 163,934 | 13,191 | 20,328 | 470,408 | 317,169 | 306,474 |
| 2022 | 79 | 6,957 | 164,090 | 104,498 | 166,738 | 13,180 | 20,804 | 476,346 | 321,217 | 309,608 |
| 2023 | 71 | 7,144 | 167,711 | 106,711 | 174,113 | 13,428 | 21,292 | 490,470 | 332,313 | 316,357 |
| 2024 | 59 | 7,309 | 172,012 | 109,727 | 179,194 | 13,429 | 21,545 | 503,275 | 342,400 | 324,081 |
| Forecast | | | | | | | | | | |
| 2025 | 50 | 7,560 | 174,950 | 112,200 | 183,900 | 13,600 | 21,800 | 514,060 | 351,350 | 330,160 |
| 2030 | 5 | 8,815 | 178,550 | 120,000 | 192,000 | 14,500 | 23,100 | 536,970 | 363,900 | 344,970 |
| 2035 | 0 | 10,090 | 176,700 | 123,150 | 199,400 | 15,650 | 23,750 | 548,740 | 373,650 | 349,340 |
| 2040 | 0 | 11,405 | 175,550 | 124,300 | 206,300 | 16,650 | 24,050 | 558,255 | 382,300 | 351,955 |
| 2045 | 0 | 12,530 | 176,100 | 124,750 | 213,400 | 17,650 | 24,150 | 568,580 | 390,450 | 355,180 |
| Avg Annual Growth | | | | | | | | | | |
| 2010-24 | -8.7% | 5.0% | -1.1% | -0.9% | 1.7% | -1.0% | 0.1% | -0.1% | 0.5% | -0.9% |
| 2024-25 | -15.3% | 3.4% | 1.7% | 2.3% | 2.6% | 1.3% | 1.2% | 2.1% | 2.6% | 1.9% |
| 2025-35 | -100.0% | 2.9% | 0.1% | 0.9% | 0.8% | 1.4% | 0.9% | 0.7% | 0.6% | 0.6% |
| 2025-45 | -99.9% | 2.6% | 0.0% | 0.5% | 0.7% | 1.3% | 0.5% | 0.5% | 0.5% | 0.4% |

** Source: FAA U.S. Civil Airmen Statistics.

*Starting with April 2016, there is no expiration date on the new student pilot certificates. This generates a cumulative increase in the student pilot numbers and breaks the link between student pilot and private pilot or higher level certificates. Since there is no sufficient data yet to forecast the student certificates unter the new rule, student pilot forecast is suspended and excluded from this table.

[1] Instrument rated pilots should not be added to other categories in deriving total.

Note: An active pilot is a person with a pilot certificate and a valid medical certificate.

## TABLE 31

## GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

**(In Millions of Gallons)**

| | FIXED WING | | | | | | | | TOTAL FUEL CONSUMED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PISTON | | TURBINE | | ROTORCRAFT | | | | | | |
| CALENDAR YEAR | SINGLE ENGINE | MULTI-ENGINE | TURBO PROP | TURBO JET | PISTON | TURBINE | EXPERI-MENTAL** / OTHER | LIGHT SPORT** | AVGAS | JET FUEL | TOTAL |
| Historical* | | | | | | | | | | | |
| 2010 | 133 | 54 | 187 | 1,123 | 11 | 125 | 22 | 1 | 221 | 1,435 | 1,656 |
| 2019 | 131 | 45 | 213 | 1,170 | 8 | 127 | 16 | 1 | 200 | 1,510 | 1,711 |
| 2020 | 146 | 35 | 201 | 1,036 | 8 | 105 | 14 | 1 | 204 | 1,342 | 1,546 |
| 2021 | 155 | 47 | 230 | 1,557 | 8 | 123 | 18 | 1 | 229 | 1,909 | 2,138 |
| 2022 | 158 | 45 | 242 | 1,683 | 8 | 123 | 21 | 1 | 233 | 2,048 | 2,281 |
| 2023 | 175 | 46 | 237 | 1,420 | 9 | 118 | 24 | 2 | 256 | 1,776 | 2,032 |
| 2024E | 168 | 46 | 244 | 1,475 | 9 | 121 | 24 | 2 | 249 | 1,840 | 2,089 |
| Forecast | | | | | | | | | | | |
| 2025 | 162 | 46 | 248 | 1,533 | 10 | 123 | 23 | 2 | 242 | 1,904 | 2,147 |
| 2030 | 144 | 45 | 258 | 1,785 | 10 | 136 | 24 | 2 | 225 | 2,178 | 2,403 |
| 2035 | 140 | 44 | 264 | 2,030 | 11 | 149 | 25 | 2 | 221 | 2,443 | 2,665 |
| 2040 | 137 | 43 | 274 | 2,260 | 11 | 162 | 26 | 2 | 221 | 2,695 | 2,916 |
| 2045 | 139 | 44 | 285 | 2,479 | 11 | 168 | 28 | 3 | 225 | 2,933 | 3,157 |
| Avg Annual Growth | | | | | | | | | | | |
| 2010-24 | 1.7% | -1.1% | 1.9% | 2.0% | -0.9% | -0.2% | 0.7% | 1.8% | 0.9% | 1.8% | 1.7% |
| 2024-25 | -3.8% | -0.3% | 1.5% | 3.9% | 1.1% | 2.3% | -1.5% | -0.9% | -2.7% | 3.5% | 2.7% |
| 2025-35 | -1.5% | -0.4% | 0.6% | 2.8% | 1.0% | 1.9% | 0.8% | 1.5% | -0.9% | 2.5% | 2.2% |
| 2025-45 | -0.8% | -0.2% | 0.7% | 2.4% | 0.8% | 1.6% | 0.9% | 2.2% | -0.4% | 2.2% | 1.9% |

*Source: FAA APO Estimates.

**Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.

Note: Detail may not add to total because of independent rounding.

## TABLE 32

## TOTAL COMBINED AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

**(In Thousands)**

| | | | GENERAL AVIATION | | | MILITARY | | | | NUMBER OF TOWERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FISCAL YEAR | AIR CARRIER | AIR TAXI/ COMMUTER | ITINERANT | LOCAL | TOTAL | ITINERANT | LOCAL | TOTAL | TOTAL | FAA | CONTRACT |
| Historical | | | | | | | | | | | |
| 2010 | 12,658 | 9,410 | 14,864 | 11,716 | 26,580 | 1,309 | 1,298 | 2,607 | 51,255 | 264 | 244 |
| 2019 | 16,195 | 7,274 | 14,459 | 13,373 | 27,832 | 1,401 | 1,134 | 2,536 | 53,836 | 264 | 256 |
| 2020 | 11,742 | 5,514 | 12,791 | 12,597 | 25,387 | 1,245 | 1,020 | 2,265 | 44,907 | 264 | 256 |
| 2021 | 12,214 | 5,893 | 13,891 | 13,652 | 27,543 | 1,339 | 1,075 | 2,414 | 48,064 | 264 | 258 |
| 2022 | 15,150 | 6,522 | 14,635 | 14,029 | 28,664 | 1,268 | 986 | 2,254 | 52,591 | 264 | 260 |
| 2023 | 16,158 | 6,456 | 14,582 | 15,270 | 29,852 | 1,194 | 866 | 2,060 | 54,526 | 264 | 262 |
| 2024E | 17,052 | 6,733 | 14,917 | 15,971 | 30,888 | 1,131 | 697 | 1,829 | 56,502 | 264 | 264 |
| Forecast | | | | | | | | | | | |
| 2025 | 17,529 | 7,029 | 15,348 | 16,456 | 31,804 | 1,145 | 722 | 1,867 | 58,229 | 264 | 265 |
| 2030 | 20,076 | 7,108 | 16,180 | 17,289 | 33,469 | 1,145 | 722 | 1,867 | 62,521 | 264 | 265 |
| 2035 | 22,024 | 7,753 | 16,480 | 17,621 | 34,101 | 1,145 | 722 | 1,867 | 65,744 | 264 | 265 |
| 2040 | 24,138 | 8,430 | 16,788 | 17,963 | 34,751 | 1,145 | 722 | 1,867 | 69,187 | 264 | 265 |
| 2045 | 26,382 | 9,143 | 17,106 | 18,316 | 35,421 | 1,145 | 722 | 1,867 | 72,813 | 264 | 265 |
| Avg Annual Growth | | | | | | | | | | | |
| 2010-24 | 2.2% | -2.4% | 0.0% | 2.2% | 1.1% | -1.0% | -4.3% | -2.5% | 0.7% | | |
| 2024-25 | 2.8% | 4.4% | 2.9% | 3.0% | 3.0% | 1.2% | 3.5% | 2.1% | 3.1% | | |
| 2025-35 | 2.3% | 1.0% | 0.7% | 0.7% | 0.7% | 0.0% | 0.0% | 0.0% | 1.2% | | |
| 2025-45 | 2.1% | 1.3% | 0.5% | 0.5% | 0.5% | 0.0% | 0.0% | 0.0% | 1.1% | | |

Source: FAA Air Traffic Activity.

## TABLE 33

## TOTAL TRACON OPERATIONS

**(In Thousands)**

| FISCAL YEAR | AIR CARRIER | AIR TAXI/ COMMUTER | GENERAL AVIATION | MILITARY | OVERFLIGHT | TOTAL |
|---|---|---|---|---|---|---|
| Historical | | | | | | |
| 2010 | 12,575 | 8,512 | 10,761 | 2,050 | 4,840 | 38,738 |
| 2019 | 16,014 | 6,600 | 10,960 | 1,946 | 3,706 | 39,227 |
| 2020 | 11,617 | 5,153 | 9,691 | 1,763 | 3,050 | 31,274 |
| 2021 | 12,045 | 5,462 | 10,742 | 1,894 | 3,393 | 33,536 |
| 2022 | 14,967 | 5,925 | 11,376 | 1,825 | 3,601 | 37,694 |
| 2023 | 15,957 | 5,823 | 11,001 | 1,699 | 3,509 | 37,988 |
| 2024E | 16,841 | 6,054 | 11,133 | 1,630 | 3,599 | 39,256 |
| | | | | | | |
| Forecast | | | | | | |
| 2025 | 17,308 | 6,319 | 11,413 | 1,630 | 3,701 | 40,371 |
| 2030 | 19,802 | 6,136 | 12,057 | 1,630 | 3,997 | 43,622 |
| 2035 | 21,702 | 6,644 | 12,253 | 1,630 | 4,259 | 46,488 |
| 2040 | 23,767 | 7,174 | 12,454 | 1,630 | 4,540 | 49,566 |
| 2045 | 25,960 | 7,729 | 12,660 | 1,630 | 4,836 | 52,815 |
| | | | | | | |
| Avg Annual Growth | | | | | | |
| 2010-24 | 2.1% | -2.4% | 0.2% | -1.6% | -2.1% | 0.1% |
| 2024-25 | 2.8% | 4.4% | 2.5% | 0.0% | 2.8% | 2.8% |
| 2025-35 | 2.3% | 0.5% | 0.7% | 0.0% | 1.4% | 1.4% |
| 2025-45 | 2.0% | 1.0% | 0.5% | 0.0% | 1.3% | 1.4% |

Source: FAA Air Traffic Activity.

## TABLE 34

## IFR AIRCRAFT HANDLED
## AT FAA EN ROUTE TRAFFIC CONTROL CENTERS
**(In Thousands)**

| | IFR AIRCRAFT HANDLED | | | |
|---|---|---|---|---|
| FISCAL YEAR | COMMERCIAL | GENERAL AVIATION | MILITARY | TOTAL |
| Historical | | | | |
| 2010 | 30,965 | 6,550 | 2,982 | 40,498 |
| 2019 | 35,783 | 6,309 | 1,645 | 43,737 |
| 2020 | 25,608 | 5,096 | 1,404 | 32,108 |
| 2021 | 26,449 | 6,124 | 1,525 | 34,098 |
| 2022 | 32,891 | 7,034 | 1,511 | 41,437 |
| 2023 | 34,436 | 6,461 | 1,416 | 42,313 |
| 2024E | 36,209 | 6,284 | 1,385 | 43,878 |
| Forecast | | | | |
| 2025 | 36,868 | 6,427 | 1,385 | 44,681 |
| 2030 | 41,452 | 6,830 | 1,385 | 49,667 |
| 2035 | 45,240 | 7,036 | 1,385 | 53,661 |
| 2040 | 49,391 | 7,252 | 1,385 | 58,029 |
| 2045 | 53,810 | 7,480 | 1,385 | 62,676 |
| Avg Annual Growth | | | | |
| 2010-24 | 1.1% | -0.3% | -5.3% | 0.6% |
| 2024-25 | 1.8% | 2.3% | 0.0% | 1.8% |
| 2025-35 | 2.1% | 0.9% | 0.0% | 1.8% |
| 2025-45 | 1.9% | 0.8% | 0.0% | 1.7% |

Source: FAA Air Traffic Activity