

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. This year's forecast is driven, at least in the near-term, by the pace of recovery from the impacts to the U.S. and global economies and the aviation industry resulting from the novel coronavirus (COVID-19). Shifting international dynamics and impacts resulting from the U.S. administration's economic policies could drive further changes. Also, as numerous incidents in the past few years remind us, terrorism remains among the greatest world-wide 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.

The rapid spread of the novel coronavirus (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. Although the FAA forecast is a long-term trend forecast, there is great uncertainty about the path of aviation's recovery from the 2020 downturn. This uncertainty arises from a variety of factors including the speed at which infection rates are brought down to a minimal level, the willingness of consumers to resume air travel as infection rates are reduced, the pace at which vaccinations of the population take place, the success of the strategies U.S. and foreign carriers are employing to recover from the downturn in demand, the stability of consumer attitudes and behaviors towards aviation in a post-COVID environment, as well as the breadth and

depth of the economic recession and the speed and nature of the economic recovery, all of which apply both domestically and globally.

Although oil prices moved lower in 2020 from the previous year, recent volatility reminds us there is still considerable uncertainty as to the future direction of oil prices. The FAA's baseline forecast (derived from economic assumptions in IHS Global Insight's November 2020 U.S. macro forecast and 30-Year Focus released during August 2020) calls for oil prices to decrease to \$36 per barrel in 2021 and rise gradually thereafter. By 2030, oil prices are projected to reach \$75 per barrel and reach \$94 per barrel by the end of the forecast period in 2041. Some forecasters are calling for a more gradual rebound in the price of oil. In October 2020, the World Bank released its latest commodity price forecast. The forecast calls for oil prices to rise gradually from a low of \$41 per barrel in 2020 to just under \$57 per barrel by 2025. After 2025 prices continue to rise and reach \$70 per barrel by 2030. However, there are other oil price forecasts that are considerably more aggressive than the FAA base forecast. The latest Energy Information Administration (EIA) Annual Energy Outlook released in January 2021, sees oil prices rising approximately 5.9% per year between 2020 and 2041. By 2041, the spot price of oil ranges from \$133 per barrel (West Texas Intermediate) to \$138 per barrel (Brent), considerably above the FAA base forecast of \$94. 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, we 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 2021 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 but there is also the possibility of an outcome that leads to greater global economic fragmentation, slower growth, and increased financial instability.

The baseline forecast assumes that the global economic recession that occurred in 2020 will be short lived with recovery beginning in the end of 2020. By the end of 2021 global GDP will be back to pre-COVID (2019) levels led by China and the United States. Thereafter, the baseline forecast assumes that China and India will be growth engines for emerging economies as 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. In the United States, economic growth will rebound strongly in 2021 as the impacts from the latest round of COVID-19 stimulus flow through the economy. The combination of direct payments, extension of unemployment benefits, and direct federal spending will provide money into consumer's wallets boosting their spending. However later on in the decade,

the forecast assumes some measure of fiscal restraint will be implemented as the impact of the 2017 tax cuts and the huge increase in federal spending to combat the economic impacts of COVID-19 have pushed the government debt as percent of GDP to levels that were last seen at the end of World War 2. In Japan, the United Kingdom, and the European Union economic growth over the next few years will be well above rates seen over the past decade as these regions recover from the COVID-19 recession. However, over the forecast horizon, demand growth will remain slow in these regions 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 and many are concerned that policy makers will not take the necessary actions. There exists a non-trivial possibility that authorities will either act prematurely or be excessively timid and late in taking necessary steps to maintain a healthy global economy. The current forecasts call for strong passenger growth for travel between the United States and other world regions, especially over the next five years. Further slowing of worldwide economic activity could seriously inhibit the growth in global passenger demand.

Although U.S. airline finances have been decimated as a result of COVID-19 and the fall in demand, the outlook for further consolidation either through mergers and acquisitions (M&A) or bankruptcy appears to be rather limited. Based on FY 2020 data, the top 6 (American, Delta, United, Southwest, Alaska and JetBlue) accounted for almost 81% of the U.S. airline industry capacity and traffic. For the large network carriers, the

steps they have taken to increase their liquidity have reduced the risk of bankruptcy in the next few years. However, if the demand recovery is slower than expected, the increase in debt that these carriers are servicing may be a burden and increase the possibility of a bankruptcy or liquidation. Low cost carriers and ultra-low cost carriers also took steps to increase their liquidity (stock issuances, debt financing) that when combined with the size of any merger transaction has increased the amount of risk associated with a merger making further merger activity unlikely.

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 is projected to be robust, we are 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. Prior to the COVID downturn in 2020, 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 as a result of the network carrier actions, but the overall impact will most likely reduce opportunities for many regional carriers, increasing financial pressures on these carriers, and may lead to further consolidation in the regional airline industry.

The general aviation sector did suffer a downturn in activity in 2020 due to the impacts of COVID-19, but the magnitude of the

decline was much less than the decline in commercial aviation. However, within the sector, the impacts of the COVID-19 downturn have varied widely, as some segments recovered quickly and by the end of 2020 were already exceeding pre-COVID activity levels. Corporate and business aviation on the other hand saw activity fall significantly after the economy came to a near-halt in March 2020. We project a return to pre-COVID levels of activity in the GA segment will be sooner than for commercial airlines. Once returning to pre-COVID levels of activity, future growth in business and corporate aviation is based largely upon the prospects for economic growth and corporate profits. Uncertainty in these leading indicators poses a risk to the forecast, but the risk 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 may place downward pressure on the forecast.

Overall activity at FAA and contract towers decreased 16.7 percent in 2020, while activity at large and medium hub airports (61 in total) fell 29.9 percent and 22.9 percent in 2020. While FAA's baseline forecast calls for operations at FAA and contract towers to return to pre-COVID levels of activity by 2025, the uneven nature of the demand recovery results in operations at large and medium hub airports growing 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 is changing for this same period. 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. This change in the mix of aircraft will most likely add to workload above and beyond the increasing demand for aviation services resulting from the growth in operations over the forecast period.

Increasing concerns about aviation's environmental impacts could potentially limit or delay the ability of the aviation sector to grow to meet national economic and mobility needs. Airspace modernization and airport expansion or new construction are often contentious because of concerns over noise, air quality, and water quality. Climate change is also of concern and could limit aviation growth. In Europe, concerns about climate change are leading to restrictions on airport expansion activities and proposals to limit short-haul domestic flights. Community concerns across the U.S. about aviation noise

have led to increasing levels of public debate, political interest, and even litigation. Without effective measures to mitigate and abate aviation noise, the infrastructure projects and airspace redesign efforts needed to achieve aviation growth may be delayed.

In addition to providing economic benefits, technologies to improve aircraft fuel efficiency and reduce fuel consumption provide benefits in terms of reduced emissions that impact air quality and climate change; many technologies that improve fuel efficiency also result in reduced noise. Airlines are increasing their use of sustainable aviation fuels, which provides benefits in terms of reduced impacts of aviation on climate change and air quality. The implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA), a global market-based measure for international carbon dioxide emissions, will help ensure an approach that is economically preferable to a patchwork of State or Regional-level regulations around the world is used, and will help to further address the impacts of aviation on climate change. Continued advancements and fleetwide uptake of sustainable aviation fuels and new aircraft and engine technologies that result in improved fuel efficiency, reduced fuel consumption, noise reduction and reduced emissions are required to ensure that access restrictions or operating limitations are not imposed on the in-service fleet, which in turn may depress growth.