

Risks to the Forecast

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 impact the degree to which these forecasts are realized. This year's forecast is driven, at least in the short-term, by a number of factors including the strength of the economic recovery and any impact resulting from the U.S. government fiscal situation. Also, as numerous incidents in the past few years (like the downing of a Russian A321 in the Sinai in October 2015) remind us, terrorism remains among the greatest risks to aviation growth. Any terrorist incident aimed at aviation would have an immediate and significant impact on the demand for aviation services that would be greater than its impact on overall economic activity.

Although oil prices remained below \$60 per barrel for most of 2015, the 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 December 2015 U.S. macro forecast and 30-Year Focus released during the fourth quarter of 2015) calls for a decline in oil prices in 2016 to \$43 per barrel and then rising steadily thereafter, exceeding \$75 by 2020, \$125 by 2025, and reaches \$152 per barrel by the end of the forecast period in 2036. Some forecasters are calling for a more gradual rebound in the price of oil. In January 2016, the World Bank released its latest commodity price forecast. The forecast calls for oil prices to fall to \$34 per barrel in 2016, remaining below \$60 until 2021, and only exceeding \$80 per barrel by 2025.

The International Monetary Fund (IMF) also sees oil price increasing at a more moderate rate than the FAA's base forecast, as its January 2016 forecast called for oil prices increasing from \$35 per barrel in 2016 to only \$50.50 per barrel by 2021. Over the long run, lower oil prices give consumers an impetus for additional spending, including air travel, and should enhance industry profitability.

The baseline forecast assumes that global economic growth will accelerate after 2016, but weakness in certain areas may threaten the strength and sustainability of the expansion. The baseline forecast assumes that China and India will be growth engines for emerging economies as China successfully transitions the economy from reliance on heavy 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. While economic growth appears to be holding up in the U.S., there are concerns about the strength of demand in Japan and in the European Union as these areas continue to be constrained by structural economic problems (high debt, slow population growth, weak public finances for example). Furthermore, the steps that were taken to stabilize the global economy during the Great Recession have resulted in additional distortions and imbalances. There are concerns that central banks may not raise interest rates in time to contain asset bubbles and inflationary expectations. In advanced economies, governments need to shore up their finances by constraining spending and raising taxes. Given the discomfort many policy makers feel about the measures adopted to

combat the Great Recession and uncertainty about the advanced economies' prospects, there is considerable risk that authorities will either act prematurely or be excessively timid and late in taking necessary steps. The current forecasts assume strong passenger growth for travel between the United States and other world regions. Any slowing of worldwide economic activity could seriously inhibit the growth in global passenger demand.

With the merger of American Airlines and US Airways completed, the outlook for further consolidation via mergers and acquisitions (M&A) appears to be rather limited. Based on FY 2015 data, the Big 3 (American, Delta, and United) plus Southwest accounted for more than 76% of the U.S. airline industry capacity and traffic. Of the network carriers, only Alaska remains independent, although it does have code share agreements with both American and Delta. There appears to be little appetite for further consolidation as there are significant obstacles. For many low cost carriers, the sheer size of merger transactions or the amount of financial risk associated with a merger makes further merger activity unlikely. For the network carriers, regulatory authorities are increasing their scrutiny over carrier practices (e.g. Department of Justice investigation into impacts of "capacity discipline" on pricing) suggesting any future proposed merger will face a less receptive audience than in the past decade.

However, U.S. airlines continue to explore other options including global alliances. Many of the major carriers in the U.S. are members of global alliances that operate with some measure of anti-trust immunity from the U.S. DOT. While anti-trust immunity may provide flexibility for airline operators across borders, it may create an anti-

competitive environment in the marketplace. These market consolidating vehicles, particularly the anti-trust immunity provisions, may invite increased regulatory scrutiny. If such oversights are launched in the future, this will complicate the evolving structure of the airline industry and may impact demand via new regulations.

The forecast assumes the addition of sizable numbers of large regional jets (70 to 90 seats) into the fleet of regional carriers. However, network carrier consolidation and new rules on pilot training have left regional carriers saddled with either excess capacity or a lack of pilots. Although air travel demand continues to recover, the bankruptcy filing of Republic Airlines in February 2016 is a reminder that financial pressures on regional operators have not abated. Network carriers continue to make adjustments to the size and breadth of their networks, without providing opportunities for regional carriers to backfill the loss of the mainline service. Delta is well along in its plans to reduce its small (read 50 seat) regional jet fleet and plans to retire another 50 to bring its total to just 125, down from almost 500 at the end of 2009. United has reduced the number of small regional jets flown by its partners from an estimated 380 in 2012 to 242 by the end of 2015 with a target of 100 by 2019. It is adding 85 Embraer 175's to its partners' regional fleet to partially replace the reduction in small jet flying. Meanwhile the new American Airways is planning to reduce its small regional jet fleet by 29 aircraft in 2016, after removing 31 in 2015. At the same time the carrier plans to add 49 larger regional jets to its fleet in 2016. While these actions may provide some opportunities for well positioned regional carriers, the overall impact of consolidation so

far has been to reduce opportunities for regional flying substantially.

After suffering through a significant downturn in 2009, business and corporate aviation have seen a partial recovery during the past five years. The pace of the recovery in business and corporate aviation is largely based upon the future prospects of economic growth and corporate profits. Future uncertainty in these leading indicators could pose a risk to the forecast, but the risk is not limited to these factors. Public perception of business and corporate aviation, potential environmental regulations and taxes, along with increased security measures placed on business jets, will place downward pressure on the forecast. On the other hand, while corporate profits are currently high, perceived economic and political uncertainties are causing companies to postpone their purchase of new business aircraft. Translation of this pent-up demand into sales of business jets in the near future can create an upward impact on the forecast. The impact of fuel price decline on business aircraft demand is also uncertain. While a positive effect on corporate profits will increase the demand, revenue losses resulting from low fuel prices may move the demand in the other direction.

Other factors, such as new and more efficient product offerings and increased competition from new entrant manufacturers, serve to broaden the potential of the industry. The potential easing of regulations on the use of airspace in foreign countries would offer promising scenarios for business jet manufacturers. Raising the level of security restrictions, and the subsequent travel hassles placed on airline passengers, could make corporate jet travel look increasingly appealing.

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 regional jets and business jets will increase the impact on the national airspace system and make the FAA's job more challenging. This change in the mix of aircraft will impact workload strictly due to the increasing demand for aviation services projected over the forecast period.

While overall activity at FAA and contract towers increased 0.2 percent in 2015, activity at the Core 30 airports increased 0.7 percent in 2015 and delays remained at historically high levels at many U.S. airports. FAA forecasts operations at these airports to grow substantially faster than the overall national trend. As demand recovers and workload increases, congestion and delays could become a critical limit 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.

There are concerns that aviation's impact on the environment could potentially restrict the ability of the aviation sector to grow to meet national economic and mobility needs. Airport expansion or new construction is often a contentious issue because of noise, air quality, and water quality concerns. There is also an ongoing effort to address the climate impacts of aviation. Aviation currently accounts for 2 to 3 percent of global carbon emissions, but this percentage is expected to increase with the growth

in operations unless mitigated with new technologies and standards, renewable fuels, operational improvements and potentially as a gap filler, market based measures. While certain measures to address climate impacts can result in reduced costs, such as increased fuel efficiency, other measures, such as market instruments could pose additional constraints on growth. Energy concerns are also rising, driven by spikes in fuel prices, supply and security issues, and concerns about fossil fuel emissions contributing to global climate change. Lack of progress in improving the environmental and energy outlook for the future fleet may result in more access restrictions or operating limitations on the fleet in service which in turn may depress growth. By contrast, breakthroughs in quieter, cleaner aircraft technologies and renewable fuels could reduce environmental and energy constraints on the forecast, and enable sustainable growth.