



**Federal Aviation
Administration**



FAA AEROSPACE FORECAST

Fiscal Years 2017-2037

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Forecast Highlights (2017–2037)

Since its deregulation in 1978, the U.S. commercial air carrier industry has been characterized by boom-to-bust cycles. The volatility that was associated with these cycles was thought by many to be a structural feature of an industry that was capital intensive but cash poor. However the great recession of 2007-09 marked a fundamental change in the operations and finances of U.S. Airlines. Since the recession, U.S. airlines have fine-tuned their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel efficient aircraft. To increase operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The industry experienced an unprecedented period of consolidation with three major mergers in five years. These changes along with capacity discipline exhibited by carriers have resulted in a seventh consecutive year of profitability for the industry in 2016. Looking ahead there is confidence that the industry has been transformed from that of a boom-to-bust cycle to one of sustainable profits.

Fundamentally, over the medium and long term, demand for aviation is driven by economic activity, and a growing U.S. and world economy provides the basis for aviation to grow over the long run. The 2017 FAA forecast calls for U.S. carrier passenger growth over the next 20 years to average 1.9 percent per year, slightly slower than last year's forecast. The sharp decline in the price of oil in 2015-16 was a catalyst for an uptick in passenger growth in 2016 that will continue into 2017. The price of oil

is projected to rise from around \$39 per barrel in 2016 to \$47 in 2017, and our forecast assumes that it will rise thereafter to exceed \$100 by 2026 and approach \$132 by the end of the forecast period. There are a number of headwinds that are buffeting the global economy – uncertainty surrounding “Brexit”, recession in Russia and Brazil and inconsistent performance in other emerging economies, a “hard landing” in China, and lack of further stimulus in the advanced economies. Although the U.S. economy has managed to avoid a recession, there is uncertainty regarding the impact of the new U.S. administration's policies on economic growth.

System traffic in revenue passenger miles (RPMs) is projected to increase by 2.4 percent a year between 2017 and 2037. Domestic RPMs are forecast to grow 2.0 percent a year while International RPMs are forecast to grow significantly faster at 3.4 percent a year. U.S. carrier system capacity measure in available seat miles (ASMs) is forecast to grow in line with the increases in demand. The number of seats per aircraft is getting bigger, especially in the regional jet market, where we expect the number of 50 seat regional jets to fall to just a handful by 2023, replaced by 70-90 seat aircraft.

Although the U.S. and global economy continued post disappointing growth in 2016, a combination of robust demand and continued low energy prices resulted in record profits for U.S. airlines. U.S. carrier profitability may fall in the near term as rising energy prices and higher labor costs offset higher revenues fed by solid demand. 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 inflation, reflecting over the long term a growing U.S. and global economy.

The long term outlook for general aviation is stable to optimistic, as growth at the high end offsets continuing retirements at the traditional low end of the segment. The active general aviation fleet is forecast to increase 0.1 percent a year between 2016 and 2037, resulting in an increase in the fleet of about 3,400 units. 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 continues to shrink over the forecast. Although fleet growth is minimal, the number of general aviation hours flown is projected to increase an average of 0.9 percent per year

through 2037, as growth in turbine, rotorcraft, and experimental hours more than offset a decline in fixed wing piston hours.

With increasing numbers of regional and business jets in the nation's skies, fleet mix changes, and carriers consolidating operations in their large hubs, we expect increased activity growth which has the potential to increase controller workload. Operations at FAA and contract towers are forecast to increase 0.8 percent a year over the forecast period with commercial activity growing at five times the rate of non-commercial activity. The growth in U.S. airline and business aviation activity is the primary driver. Large and medium hubs will see much faster increases than small and non-hub airports, largely due to the commercial nature of their operations.

Review of 2016

Despite slow economic growth at home and abroad, 2016 was a pretty good year for U.S. aviation. A combination of robust domestic traffic and falling costs offset a decline in revenue caused by lower yields resulting in record profits for the U.S. airline industry. The shift in focus from market share to boosting returns on invested capital has resulted in something the industry has rarely seen – sustained profitability. The U.S. airline industry has become more nimble in adjusting capacity to seize opportunities or minimize losses. U.S. airlines continue to refine strategies for developing additional revenue streams such as charging fees for services that used to be included in airfare (e.g. meal service), as well as for charging for services that were not previously available (e.g. premium boarding and fare lock fees). The impact from these initiatives is evident as the industry (passenger and cargo carriers combined) posted profits for the seventh consecutive year in 2016, despite falling yields.

Demand for air travel in 2016 grew at the fastest pace since 2005 despite modest economic growth in the U.S. In 2016 system revenue passenger miles (RPMs) increased 4.3 percent while enplanements grew 4.2 percent. Domestic RPMs were up 5.5 percent while enplanements were up by 4.3 percent. International RPMs increased by just 1.5 percent despite enplanements growing by 3.6 percent. The system-wide load factor rose 0.2 points to 83.5 percent.

Yields fell for the second consecutive year. In domestic markets, falling oil prices and rapid expansion by ultra-low cost carriers such as Spirit and Allegiant led to a 4.7 per-

cent decline. International yield fell 9.0 percent, impacted by weak demand and currency fluctuations. Despite falling yields U.S. airlines posted record profits in FY 2016 as energy prices continued to decline, allowing profits at lower prices. Data for FY 2016 show that the reporting passenger carriers had a combined operating profit of \$26.6 billion (compared to a \$24.1 billion operating profit for FY 2015). The network carriers reported combined operating profits of \$19.1 billion while the low cost carriers reported combined operating profits of \$6.7 billion as all carriers posted profits.

The general aviation industry recorded a small decline in deliveries in 2016, with only the business jet segment seeing a year over year increase. Overall deliveries were down by 4.2 percent in calendar year (CY) 2016; and U.S. billings decreased 11.7 percent to \$10.6 billion. General aviation activity at FAA and contract tower airports recorded a 0.2 percent decline in 2016 as local activity fell 0.5 percent, more than offsetting a 0.1 percent increase in itinerant operations.

In 2016 total operations at all 517 FAA and contract towers rose for the second consecutive year, up 0.5 percent, compared to 2015. This marks the first time since FY 1999-2000 that operations at FAA and funded towers have increased for two consecutive years. Air carrier activity increased by 4.8 percent, more than offsetting declines in the air taxi, general aviation, and military categories. Activity at large hubs rose by 1.6 percent, while medium hub activity increased by 2.8 percent. Small/non-hub airport activity was down 0.4 percent in 2016 compared to the prior year.

Glossary of Acronyms

Acronym	Term
ASMs	Available Seat Miles
ATP	Air Transport Pilot
AUVSI	Association for Unmanned Vehicle Systems International
BVLOS	Beyond Visual Line of Sight
CFR	Code of Federal Regulations
CY	Calendar Year
FAA	Federal Aviation Administration
FY	Fiscal Year
GA	General Aviation
GAMA	General Aviation Manufacturers Association
GDP	Gross Domestic Product
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
LSA	Light Sport Aircraft
NAS	National Airspace System
NPRM	Notice of Public Proposed Rulemaking
PCE	Personal Consumption Expenditure
RAC	Refiners' Acquisition Cost
RP	Remote Pilot
RPA	Remote Pilot Authorization
RPMs	Revenue Passenger Miles
RTMs	Revenue Ton Miles
sUAS	Small Unmanned Aircraft System(s)
TRACON	Terminal Radar Approach Control
TRB	Transportation Research Board
UAS	Unmanned Aircraft System(s)
USD	United States Dollar
VFR	Visual Flight Rules

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The following people may be contacted for further information:

Section	Contact Name	Phone Number
Economic Environment	Roger Schaufele	(202) 267-3306
Commercial Air Carriers		
• Passenger	Roger Schaufele Li Ding	(202) 267-3306 (202) 267-1846
• Cargo	Nick Miller	(202) 267-3309
General Aviation		
• Forecasts	H. Anna Barlett	(202) 267-4070
• Survey data	H. Anna Barlett	(202) 267-4070
FAA Workload Measures		
• Forecasts	Roger Schaufele	(202) 267-3306
• Data	Roger Schaufele	(202) 267-3306
Unmanned Aircraft Systems	Michael Lukacs Dipasis Bhadra	(202) 267-9641 (202) 267-9027
APO Websites		
• Forecasts and statistical publications	http://www.faa.gov/data_research/aviation_data_statistics/	
• APO databases	http://aspm.faa.gov	
Email for APO staff	First name.last name@FAA.gov	

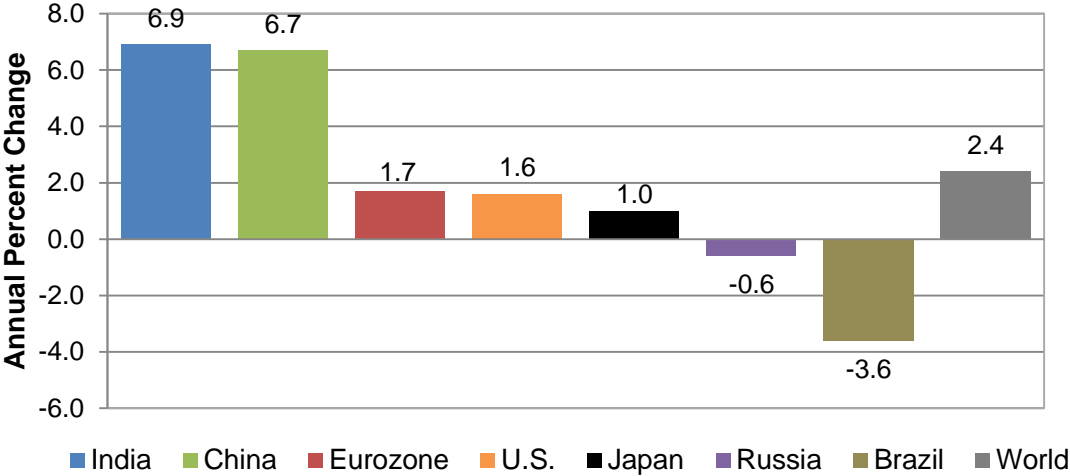
FAA Aerospace Forecasts Fiscal Years 2017-2037

Economic Environment

In the near term, IHS Global Insight projects that world economic growth will pick up from its 2016 low of 2.4 percent to 2.8 percent in 2017 and 3.1 percent in 2018. Growth is forecast to accelerate in the United States as the new U.S. administration puts a stimulus package in place while Europe remains sluggish as the impact from Brexit and political uncertainty hamper growth. Japan's economic growth is projected to be slow

and steady, helped by a weaker yen. In emerging markets, China's growth continues to slow while others such as Brazil and Russia return to positive growth and see an acceleration helped by rising commodity prices and increased demand for exports. In 2016 real GDP in India grew 6.9%, down from 7.5% in 2015, but is projected in 2017-18 to return to levels close to the 2015 rate.

India and China led World Economic Growth in 2016

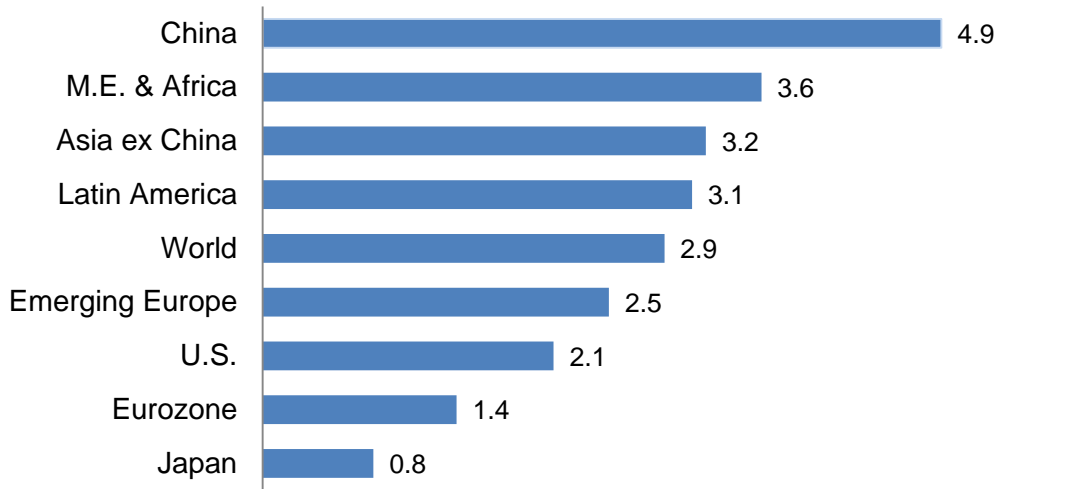


Source: IHS Global Insight

IHS Global Insight forecasts world real GDP to grow at 2.9 percent a year between 2017 and 2037. Emerging markets are forecast to grow above 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 Middle East and Africa, Latin

America, and Eastern Europe. Growth in the more mature economies will be lower than the global trend with the fastest rates in the U.S. followed by Europe. Growth in Japan is projected to be very slow with rates below 1% a year reflecting deep structural issues associated with a shrinking and aging population.

Asia and Africa/Middle East lead global economic growth
Annual GDP % growth 2017-2037

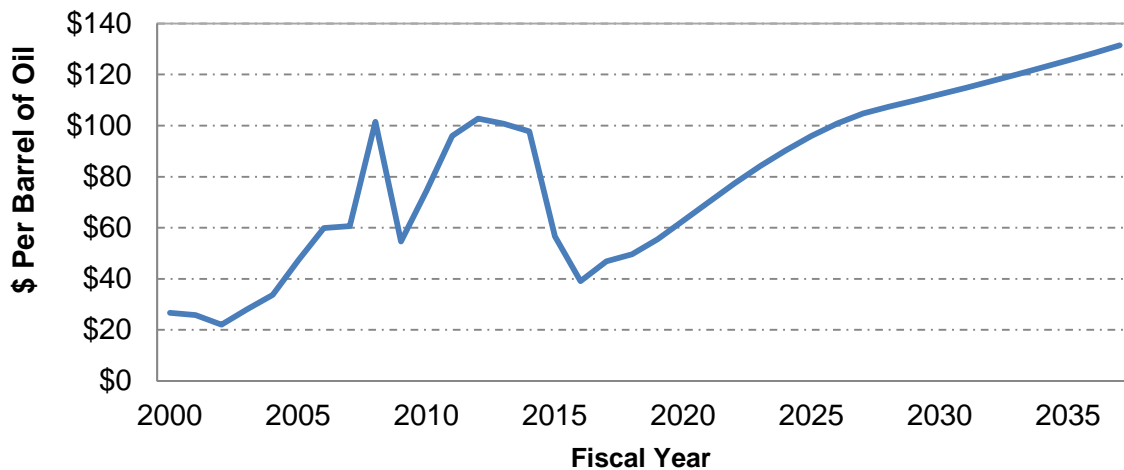


Source: IHS Global Insight, Dec 2016 World Forecast

Oil prices fell by 31% in 2016 to around \$39 per barrel bringing the cumulative decline between 2013 and 2016 to 61%. However 2016 marks the bottom of the latest cycle and IHS Global Insight is projecting oil prices in 2017 to increase by about 20% to \$47

per barrel. Over the long run, oil prices are projected to increase due to growing demand and higher costs of extraction. IHS Global Insight forecasts the price of oil to reach \$101 per barrel by 2026 and continue to rise modestly thereafter to \$131 by 2037.

U.S. Refiners' Acquisition Cost



Source: IHS Global Insight

U.S. Airlines

Domestic Market

Mainline and regional carriers¹ 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.

Shaping today's commercial air carrier industry are three distinct trends: (1) industry consolidation and restructuring; (2) continued capacity discipline in response to external shocks, and (3) the proliferation of ancillary revenues.

The restructuring and consolidation of the U.S. airline industry that began in the aftermath of the 2007-09 recession continued in 2016. In October 2015, the last U.S. Airways flight occurred marking the finalization of the American/US Airways merger and in April 2016, Alaska Airlines announced its intention to merge with Virgin America to create the nation's 5th largest airline. As a result, there are now six airlines in the U.S. – American, Delta, Southwest, United, Alaska/Virgin, and Jet Blue – controlling approximately 85% of the domestic market as measured by revenue passenger miles.

Further consolidation is unlikely. In 2005 there were twelve major mainline airlines.²

The mergers and increasing market presence of low cost carriers like Frontier, Jet-Blue and Southwest have had clear implications on the fares, size of the aircraft being used and the load factors, topics that will be discussed later in this document.

One of the most striking outcomes of industry restructuring has been the unprecedented period of capacity discipline, especially in domestic markets. Between 1978 and 2000, ASMs in domestic markets increased at an average annual rate of 4 percent a year, recording only two years of decline. Even though domestic ASMs shrank by 6.9 percent in FY 2002, following the events of September 11, 2001, growth resumed and by 2007, domestic ASMs were 3.6 percent above the FY 2000 level. Since 2009, U.S. domestic ASMs have increased at an average rate of 2.0% per year. U.S. domestic ASMs are up just 4.1 percent when compared to 2007 as the industry responded first to the sharp rise in oil prices (up 155% between 2004 and 2008) and then the global recession that followed (2009 to the present).

The period of domestic capacity restraint since 2007 has not been shared equally be-

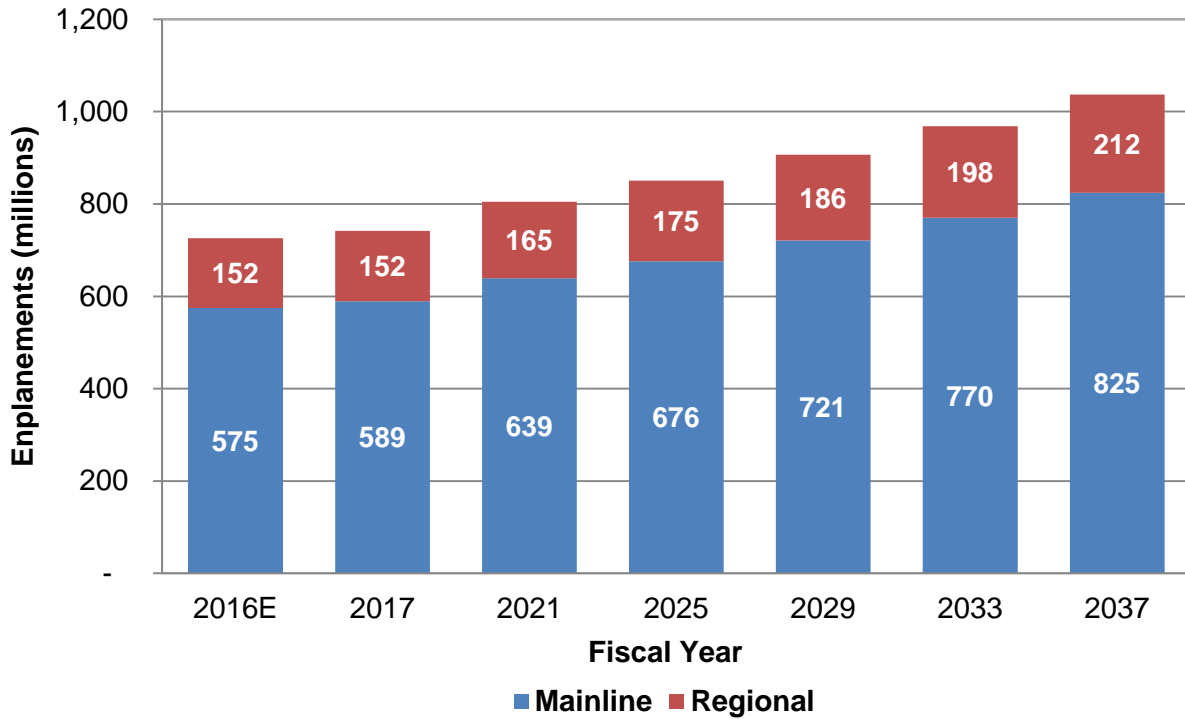
¹ Mainline carriers are defined as those providing service primarily via aircraft with 90 or more seats. Regionals are defined as those providing service primarily via aircraft with 89 or less seats and whose routes serve mainly as feeders to the mainline carriers.

² A major carrier is defined as an air carrier with annual operating revenues exceeding \$1 billion

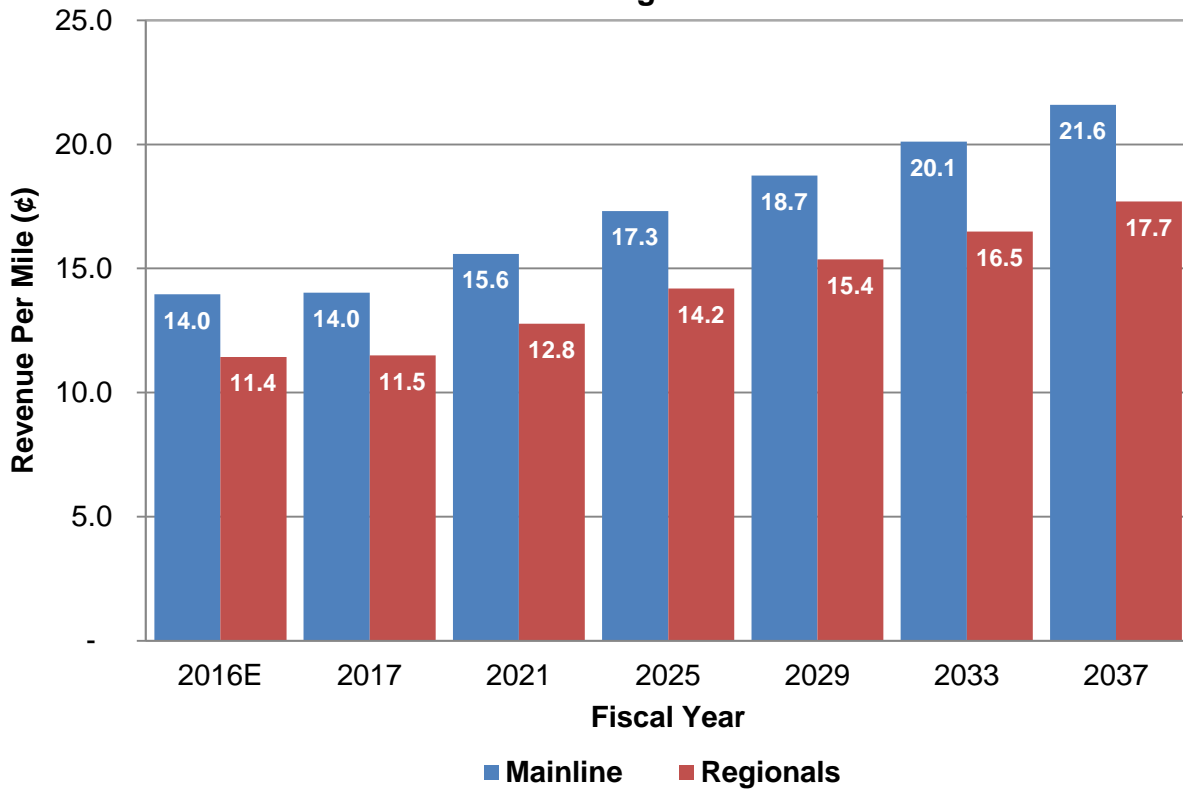
tween the mainline carriers and their regional counterparts. In 2016, the mainline carrier group provided 5 percent more capacity than it did in 2007 while carrying 8 percent more passengers. Capacity flown by the regional group has shrunk by 2.6 percent over the same period (with passengers carried down 3 percent).

The regional market has continued to shrink as the regionals compete for even fewer contracts with the remaining dominant carriers; this has meant slow growth in enplanements and yields.

**U.S. Commercial Air Carriers
Domestic Enplanements by Carrier Group**



U.S. Commercial Air Carriers Domestic Passenger Nominal Yield



The regionals 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. Furthermore, the regional airlines are facing pilot shortages and tighter regulations regarding pilot training. Their labor costs are increasing as they raise wages to combat the pilot shortage while their capital costs have increased in the short-term as they continue to replace their 50 seat regional jets with more fuel efficient 70 seat jets. The move to the larger aircraft will prove beneficial in the future, however, since their unit costs are lower.

Another continuing trend is that of ancillary revenues. Carriers generate ancillary reve-

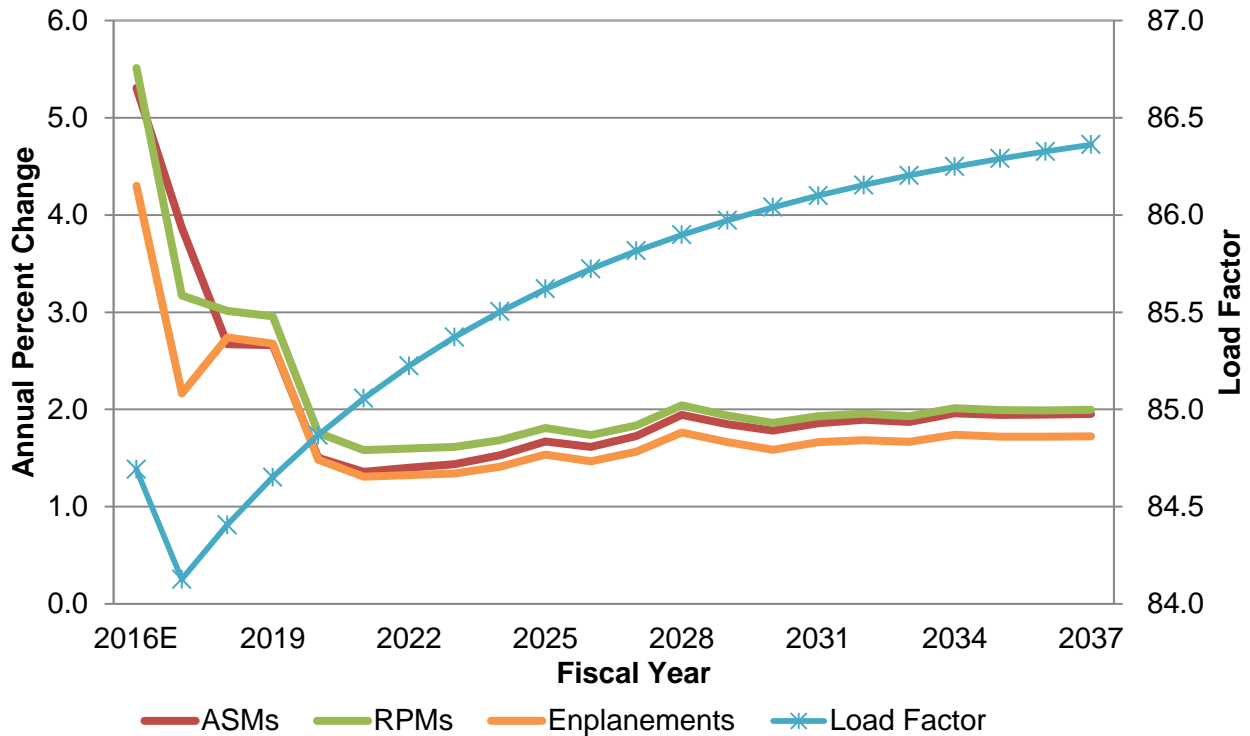
nues by selling products and services beyond that of an airplane ticket to customers. This includes the un-bundling of services previously included in the ticket price such as checked bags and on-board meals, and by adding new services such as boarding priority and internet access. As noted earlier, U.S. passenger carriers posted record net profits for the seventh consecutive year in 2016 with ancillary revenues a contributing factor to the favorable outcome as well as very low oil prices. Airlines are also moving ahead with plans to further segment their passengers into more discreet cost categories based on comfort amenities like seat pitch, leg room, and access to social media and outlets. Delta introduced “Basic Economy” fares in 2015 and expanded the number of markets throughout 2016. United

introduced its version of Basic Economy fares in November 2016 and American is planning to introduce its version in the first quarter of calendar year 2017.

U.S. commercial air carriers' total number of domestic departures rose in 2016 for the first time since 2007, but still remain 17.3 percent below the 2007 level. ASMs, RPMs and enplanements all showed a rebound; these trends underlie the expanding size of aircraft and higher load factors.³ In 2016, the domestic load factor reached a historic high of 84.7 percent for commercial air carriers. It is presently assumed that the load factor will not exceed 86.5 percent in the future due to the logistical difficulties inherent in matching supply perfectly with demand.

³ Commercial air carriers encompass both mainline and regional carriers.

U.S. Commercial Air Carriers Domestic Market



System, that is, the sum of domestic plus international capacity, increased 4.2 percent to 1.112 trillion ASMs in 2016 while RPMs increased 4.3 percent to 928 billion. During the same period system-wide enplanements increased 4.2 percent to 819.6 million. In 2016, U.S. carriers continued to prioritize the domestic over the international market in terms of allocating capacity as domestic capacity increased 5.3 percent while international capacity was up just 1.6 percent. U.S. carriers domestic capacity growth will exceed their international capacity growth in 2017 but carriers will start expanding capacity in international markets faster than domestic markets beginning in 2018 and this trend is projected to continue through 2037 as the domestic market continues to mature.

U.S. mainline carrier enplanement growth in the combined domestic and international market was 5.4 percent in 2016 while regional carriers carried 0.6 percent fewer passengers.

In the domestic market, mainline enplanements increased for the sixth consecutive year, up 5.8 percent, marking the first time since 2000 that the industry recorded six consecutive years of passenger growth in the domestic market. Mainline passengers in international markets posted a seventh year of growth, up 3.1 percent.

With relatively robust demand, industry capacity growth was up 4.2 percent after a 3.9 percent increase in 2015. Solid increases in passenger volume and traffic offset lower yields and along with higher ancillary reve-

nues and falling fuel prices resulted in U.S. carriers finishing up 2016 with record profits.

System load factor increased 0.1 points while trip length increased 1.2 miles (0.1 percent) in 2016, even as seats per aircraft mile increased by 1.6 percent; again reflect-

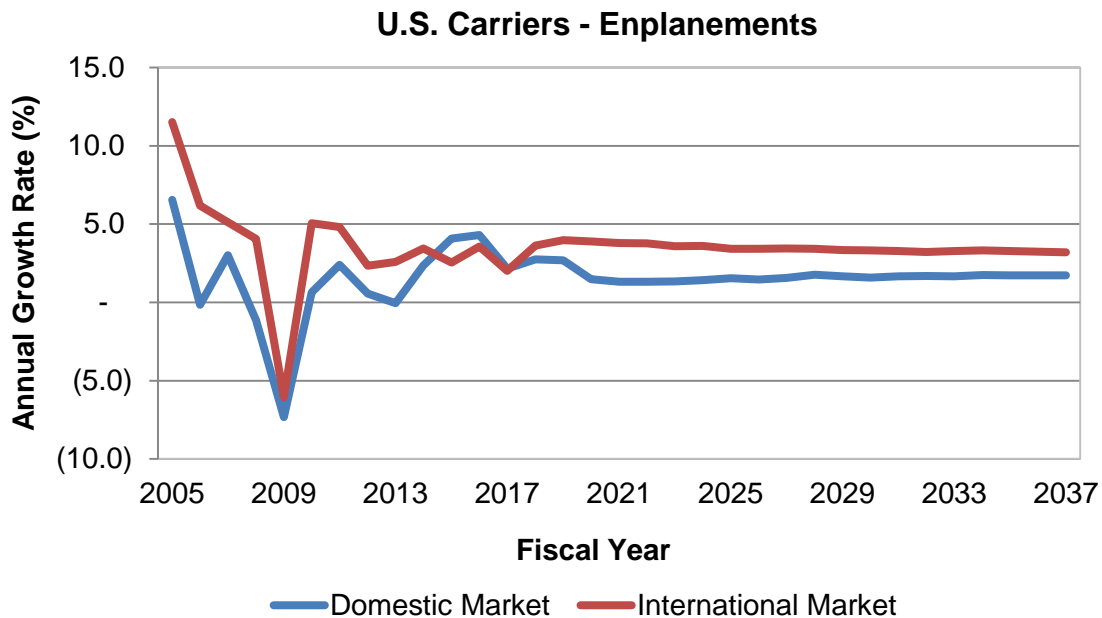
ing the trend towards using larger aircraft. Seats per aircraft mile system wide increased to 151.3 seats (up 2.3 seats per aircraft mile), the highest level since 1992.

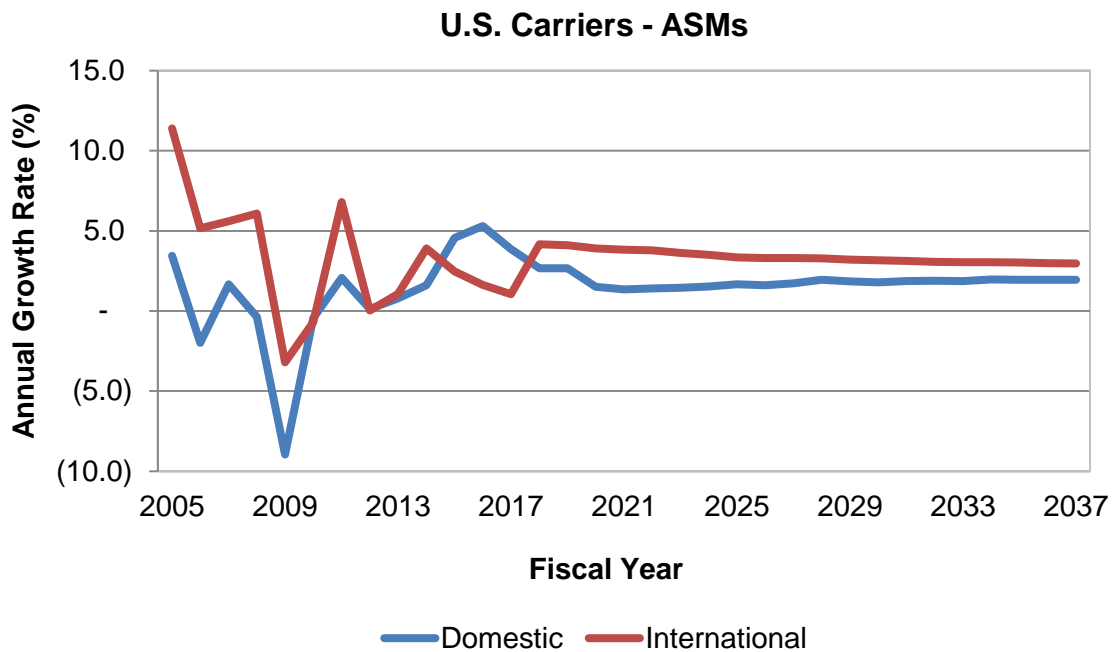
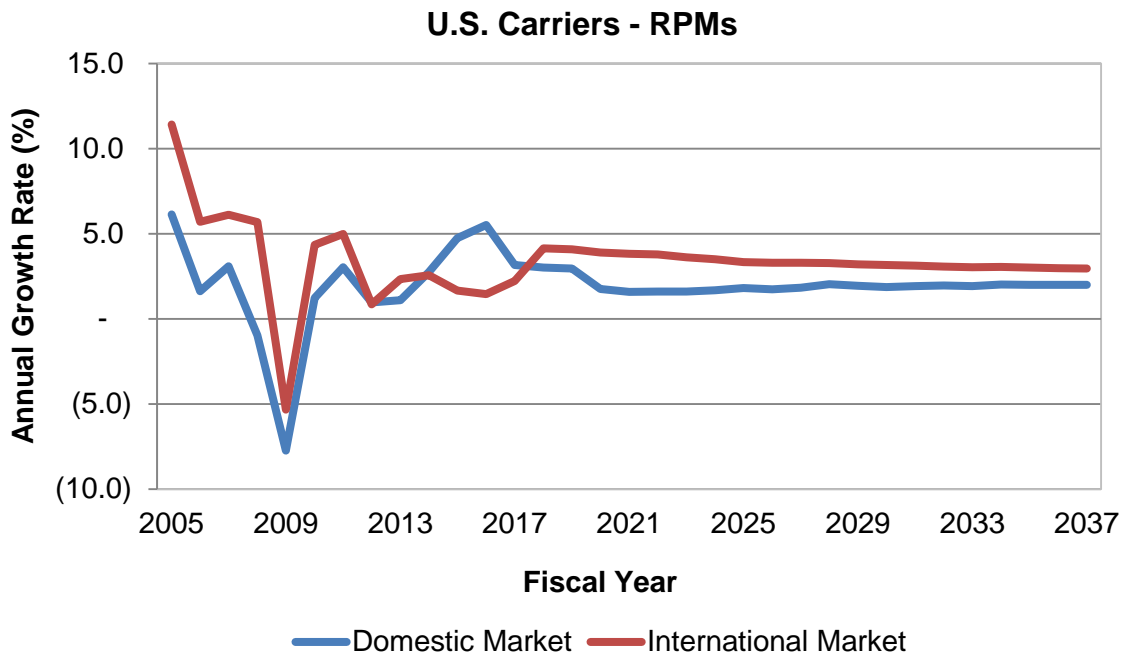
International Market

Over the past decade, the international market has been the growth segment for U.S. carriers when compared to the mature U.S. domestic market. Since 2015 growth in the domestic market has outpaced international markets and 2017 is expected to follow suit as airlines continue to focus on the domestic market. Starting in 2018 the international market (comprised of mainline and regional carriers) should again start outpacing the domestic market in terms of enplanements, RPMs and ASMs at average

annual rates (FY 2018-2037) of 3.4, 3.3, and 3.3 percent, respectively.

The weakness in international demand over the past few years is mainly due to weak worldwide economic growth. The near term outlook remains uncertain as oil prices are moving up, the impact of Brexit is unclear, growth in world trade is still weaker than before the Global Financial Crisis, and security concerns continue to loom over the world as a threat to international tourism.

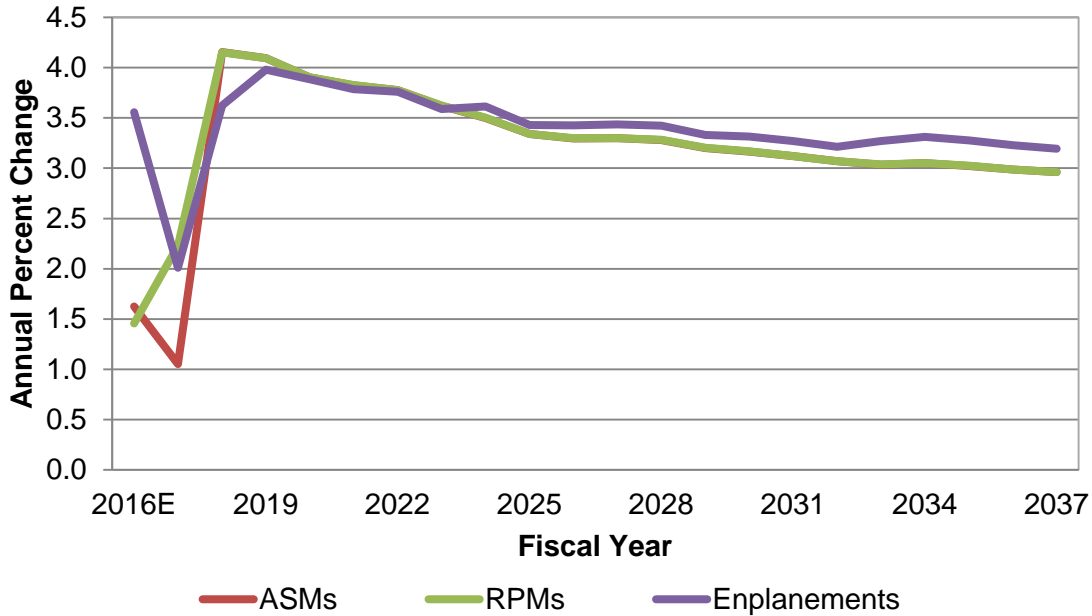




The next five years will feature a rebuilding of international demand by the U.S. carriers with moderate growth averaging around 3.5, 3.5, and 3.4 percent a year for enplanements, RPMs, and ASMs respectively. Air-

lines will exercise capacity restraint and the load factor is expected to stabilize around 81.3%. Load factors this high were last seen in 2014.

U.S. Commercial Air Carriers International Market



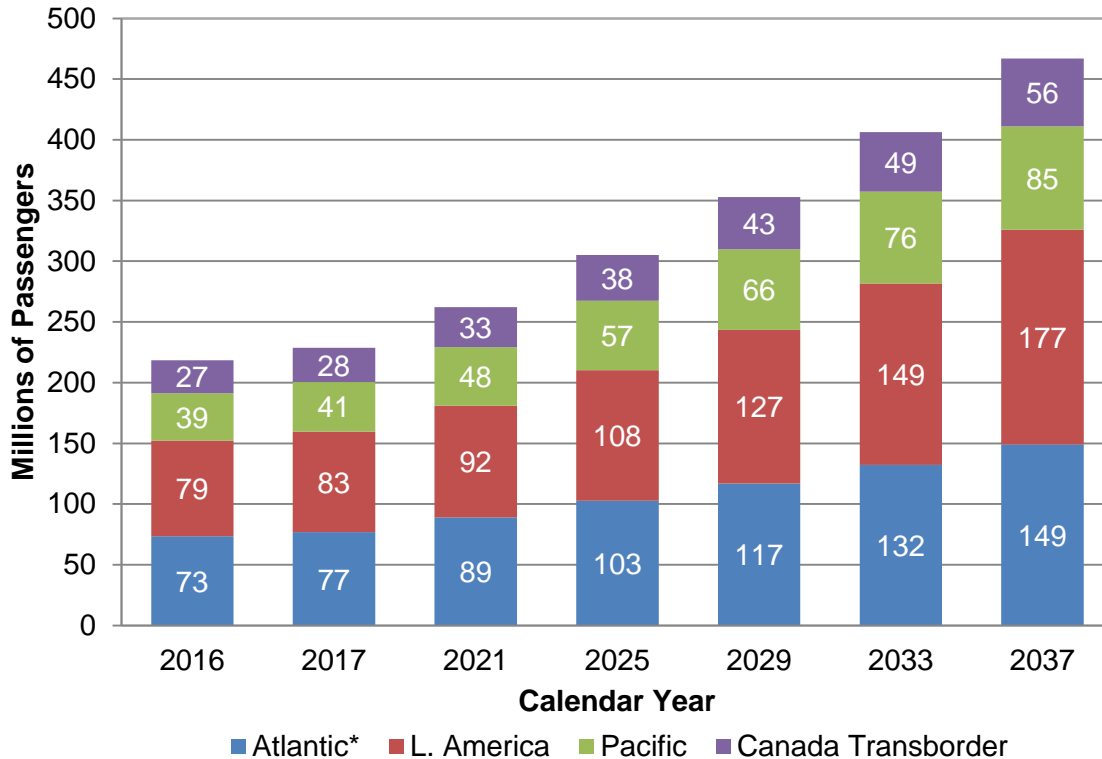
For U.S. carriers, Latin America is still the largest international destination despite the recent economic and political crises of Brazil. Enplanements in 2016 grew an estimated 5.9% while RPMs increased 4.7%. Growth is projected to slow in 2017 as U.S. carriers trim capacity growth to help stabilize yields. Enplanements and RPMs are forecast to increase 1.6 and 1.2 percent, respectively, in 2017. Over the twenty year period 2017-2037, Latin America enplanements are forecast to increase at an average rate of 4.1% a year while RPMs grow 4.4% a year.

Despite the economic growth and potential of air travel to China and India, the Pacific region remains a relatively small market for the U.S. and will remain so for the next twenty years. In 2016, U.S. carriers saw enplanements increase 0.6% over their 2015 levels while traffic (RPMs) increased by 2.5

percent. Between 2017 and 2037, U.S. carrier enplanements and RPMs are forecast to grow 2.5 and 2.6 percent a year, respectively.

In 2016, the Atlantic region saw a drop in enplanements of 1.0% while RPMs fell 2.1% as concerns about Brexit and a weak European economy kept demand in check. U.S. carriers have dialed back on capacity growth in 2017 as demand continues to be weak amid uncertainty associated with Brexit and European elections. As a result, enplanement and RPM growth will hover around 0% (-0.3% and 0.1%, respectively). The Atlantic is a mature region and over the twenty year period 2017-2037, enplanements in the Atlantic region (including the Middle East and Africa) are forecast to grow at an average annual rate of 2.7% a year while RPMs grow 3% a year.

Total Passengers To/From the U.S. American and Foreign Flag Carriers



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

* Per past practice, the Mid-East region and Africa are included in the Atlantic category.

Total passengers (including Foreign Flag carriers) between the United States and the rest of the world increased an estimated 5.3% in 2016 (218.5 million) as all regions posted gains led by an 8.4% increase in the Pacific region.

FAA projects total passenger growth of 4.7% in 2017 as global economic growth accelerates with the highest growth expected in the Latin region. Stable global economic growth (2.8% a year) over the next 20 years (2017-2037) is the foundation for the forecast growth of international passengers of 3.6% a year, as levels more than double from 229 million to 467 million.

The Latin American region is the largest international market and is projected to grow

at the fastest rate (3.9% a year) of any region over the next 20 years. Within the region, Mexico and Brazil are the two largest markets and are expected to remain so over the forecast period.

Powered by the economic growth and potential of air travel to China and India, total passengers in the Pacific region are forecast to double to 85 million by 2037. From 2017 to 2037, passengers between the United States and the Pacific region are forecast to grow 3.8 percent a year.

Both the Atlantic and Canada regions are more mature markets and are projected to have somewhat slower growth than the Latin or Pacific regions. The Atlantic region is forecast to grow at an average rate of 3.4%

a year as an increasing share of the passengers in this region come from the Middle East and Africa markets. The Canadian transborder market is the smallest market in

Cargo

Air cargo traffic contains 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.

U.S. air carriers flew 35.5 billion revenue ton miles (RTMs) in 2016, down 0.9 percent from 2015 with domestic cargo revenue ton miles (RTMs) increasing 1.8 percent to 13.3 billion while international RTMs fell 2.4 percent to 22.2 billion. Air cargo RTMs flown by all-cargo carriers comprised 77.6 percent of total RTMs in 2016, with passenger carriers flying the remainder. Total RTMs flown by the all-cargo carriers decreased 0.4 percent in 2016 while total RTMs flown by passenger carriers declined by 2.6 percent.

U.S. carrier international air cargo traffic can be divided into four regions consisting of Atlantic, Latin, Pacific, and 'Other International.' In 2016 total international RTMs decreased 2.4 percent to 22.2, with all regions posting declines.

Historically, air cargo activity tracks with GDP. Additional factors that affect air cargo growth are fuel price volatility, movement of real yields, and globalization. Significant structural changes have occurred in the air cargo industry; among these are air cargo

terms of passenger volumes and is forecast to grow 3.5% a year.

security regulations by the FAA and TSA, maturation of the domestic express market, a shift from air to other modes (especially truck), use of all-cargo carriers (e.g., FedEx) by the U.S. Postal Service to transport mail, and the increased use of mail substitutes (e.g. e-mail, cloud-based services).

The forecasts of Revenue Ton Miles (RTMs) are based 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 will be tied to economic growth.

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

After decreasing by 0.9 percent in 2016, total RTMs are forecast to grow 1.4 percent in 2017. Driven by steady U.S. and world economic growth, total RTMs are projected to increase at an average annual rate of 3.1 percent for the balance of the forecast period.

Following a 1.8 percent increase in 2016, domestic cargo RTMs are forecast to grow 1.7 percent in 2017 as the U.S. economic recovery continues. Between 2016 and 2037, domestic cargo RTMs are forecast to increase at an average annual rate of 1.3 percent. In 2016, all-cargo carriers carried 89.0 percent of domestic cargo RTMs. The all-cargo share is forecast to grow to 90.5 percent by 2037 based on increases in capacity for all-cargo carriers and ongoing security considerations.

International cargo RTMs fell 2.4 percent in 2016 after posting a 0.9 percent increase in 2015 as slow growth in the U.S. and Europe along with the slowdown in China's economic growth slowed worldwide trade. Growth is expected to turn positive in 2017

to 1.3 percent as global trade growth resumes. For the forecast period (2016-37) international cargo RTMs are forecast to increase an average of 3.8 percent a year based on projected growth in world GDP with the Pacific region having the fastest growth, followed by the Other International, Atlantic, and Latin regions, respectively.

The share of international cargo RTMs flown by all-cargo carriers increased from 49.3 percent in 2000 to 70.8 percent in 2016. Continuing the trend experienced over the past decade, the all-cargo share of international RTMs flown is forecast to increase modestly to 77.1 percent by 2037.

General Aviation

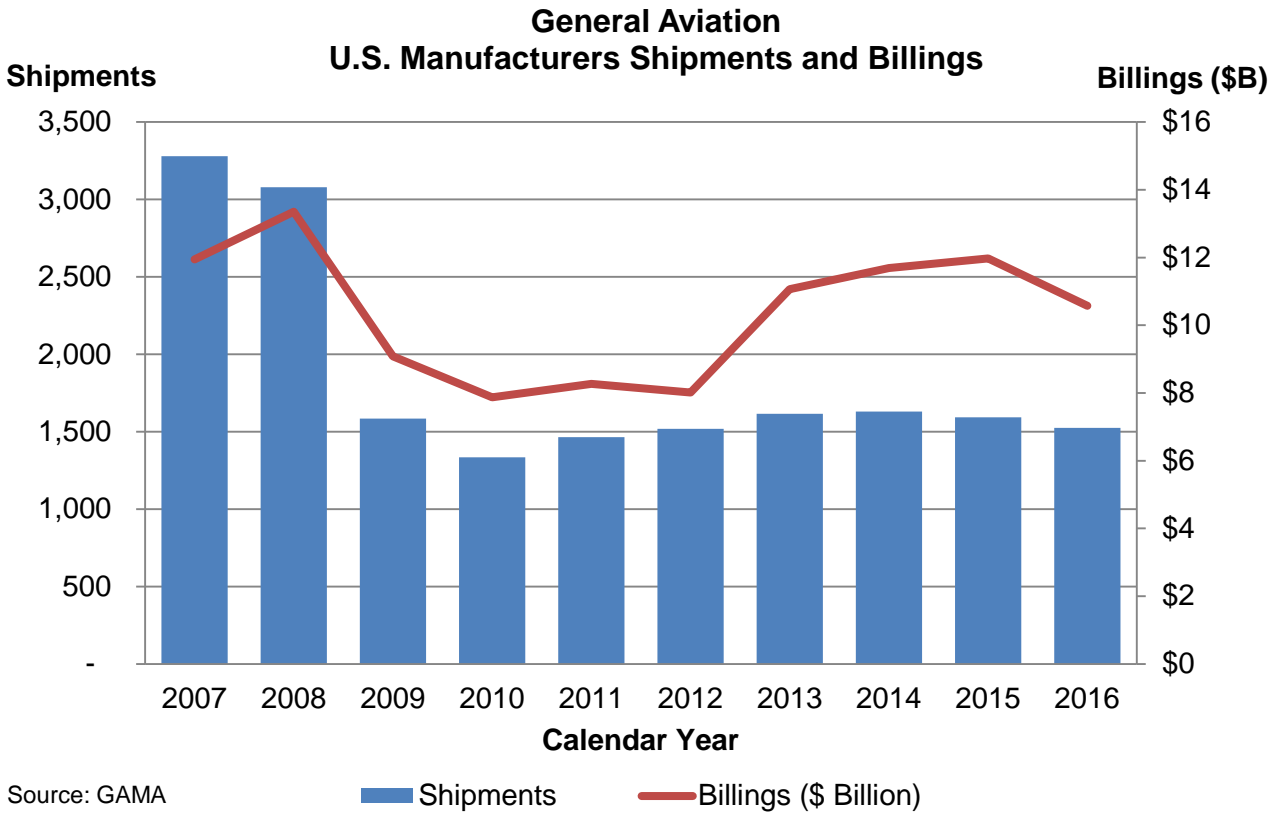
The FAA uses estimates of fleet size, hours flown, and utilization rates from the General Aviation and Part 135 Activity Survey (GA Survey) as baseline figures to forecast the GA fleet and activity. Forecasts of new aircraft deliveries, which use the data from General Aviation Manufacturers Association (GAMA), together with assumptions of retirement rates, produce 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,”⁴ not total aircraft. The FAA’s general aviation forecasts also rely on discussions with the industry experts conducted at industry meetings, including four Transportation Research Board (TRB) meetings of Business Aviation and Civil Helicopter Subcommittees conducted annually in May and January.

The results of the 2015 GA Survey, the latest available, were consistent with the results of surveys conducted since 2004 improvements to the survey methodology. The GA fleet was in decline between 2007 and 2013, especially between 2011 and 2013, primarily due to the impact of the 2010 Rule for Re-Registration and Renewal of Aircraft Registration, which removed cancelled, expired or revoked records from the Registry. In 2014, the GA fleet recorded its first increase since 2008, and the 2015 Survey results showed an increase for the second consecutive year. The active GA fleet was estimated as 210,031 aircraft in 2015

(up 2.8 percent from 2014), with 24.1 million hours flown (up 3.7 percent from 2014).

In 2016, gradual decline in deliveries of the general aviation industry continued from the previous year. While the business jet deliveries by U.S. manufacturers continued their modest increase by 1.8 percent compared to the previous year, turboprop deliveries were down by 2.1 percent, single engine piston deliveries declined by 7.4 percent, and much smaller category of multi-engine piston deliveries declined 23.3 percent. Based on figures released by GAMA, U.S. manufacturers of general aviation aircraft delivered 1,525 aircraft in CY 2016, 4.2 percent fewer than CY 2015. This was the second year of declines since 2011. Overall piston deliveries were down 8.3 percent in 2016. In the turbine categories, total shipments went down by 0.2 percent.

⁴ An active aircraft is one that flies at least one hour during the year.



GAMA and industry experts also reported continuing decreases in rotorcraft deliveries in 2016, particularly resulting from direct and indirect effects of oil price declines.

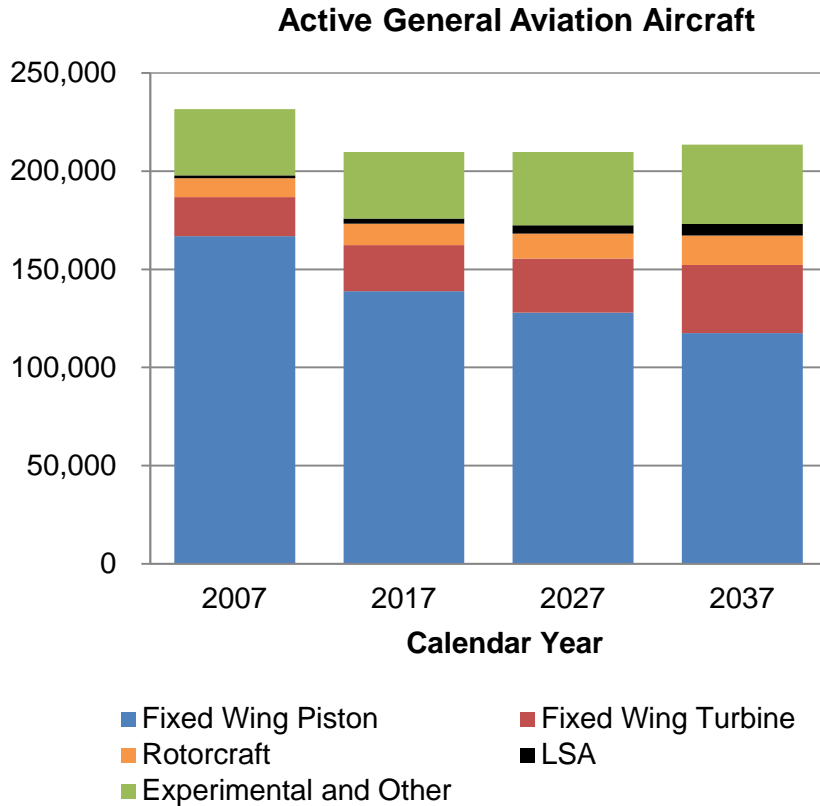
Against these current conditions, the long term outlook for general aviation, driven by turbine aircraft activity, remains stable to favorable. The active general aviation fleet is projected to increase at an average annual rate of 0.1 percent over the 21-year forecast period, as increases in the turbine, experimental, and light sport fleets offset declines in the fixed wing piston fleet. The total active general aviation fleet increases from an estimated 209,905 in 2016 to 213,420 aircraft by 2037.

The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow by 14,700 aircraft -- an average rate of 1.9 percent a year over the forecast period, with the turbojet fleet increasing 2.3 percent a year. 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 over the forecast period by 22,500 aircraft (at an average annual rate of -0.8 percent). Unfavorable pilot demographics, overall increasing cost of aircraft ownership, coupled 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 4.1 percent annually,

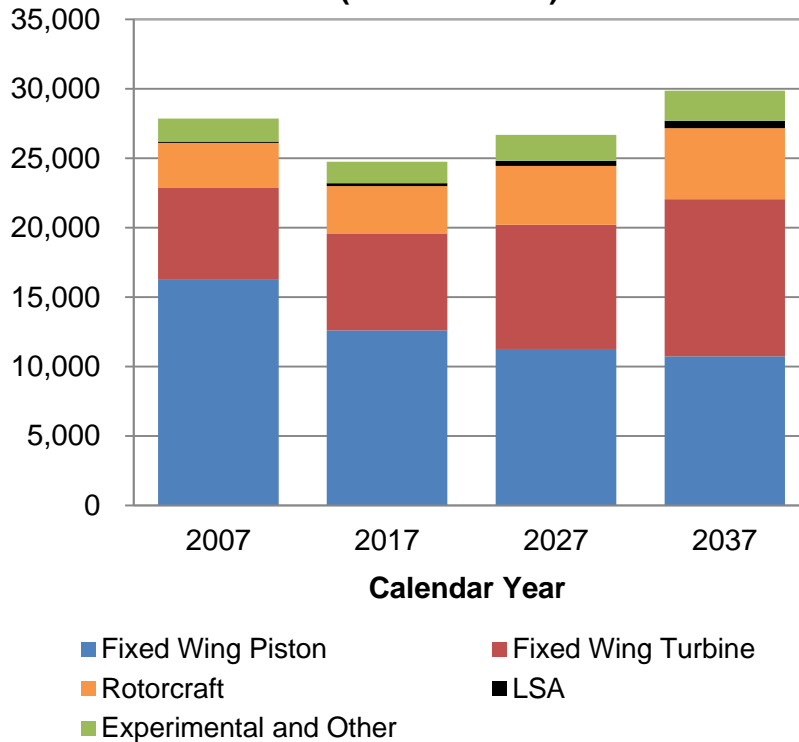
adding about 3,355 new aircraft by 2037, more than doubling its 2015 fleet size.



Although the total active general aviation fleet is projected to increase minimally, the number of general aviation hours flown is forecast to increase an average of 0.9 percent per year through 2037, as the newer aircraft fly more hours each year. Fixed wing piston hours are forecast to decrease by 0.8 percent, the same rate as the fleet declines. Countering this trend, hours flown by turbine aircraft (including rotorcraft) are

forecast to increase 2.4 percent yearly over the forecast period. Jet aircraft are expected to account for most of the increase, with hours flown increasing at an average annual rate of 3.0 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with estimated increases in utilization rates.

**General Aviation Hours Flown
(in thousands)**



Rotorcraft activity, which was not as heavily impacted by the previous economic downturn as other aircraft and rebounded earlier, faces the challenges brought by lower oil prices. They impact utilization rates and new aircraft orders both directly through decreasing activity in oil exploration, and also through associated slowdown in related economic activity. Rotorcraft hours are projected to grow by 2.0 percent annually over the forecast period.

Lastly, the light sport aircraft category is forecasted to see an increase of 4.6 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 584,362 active pilots certificated by FAA at

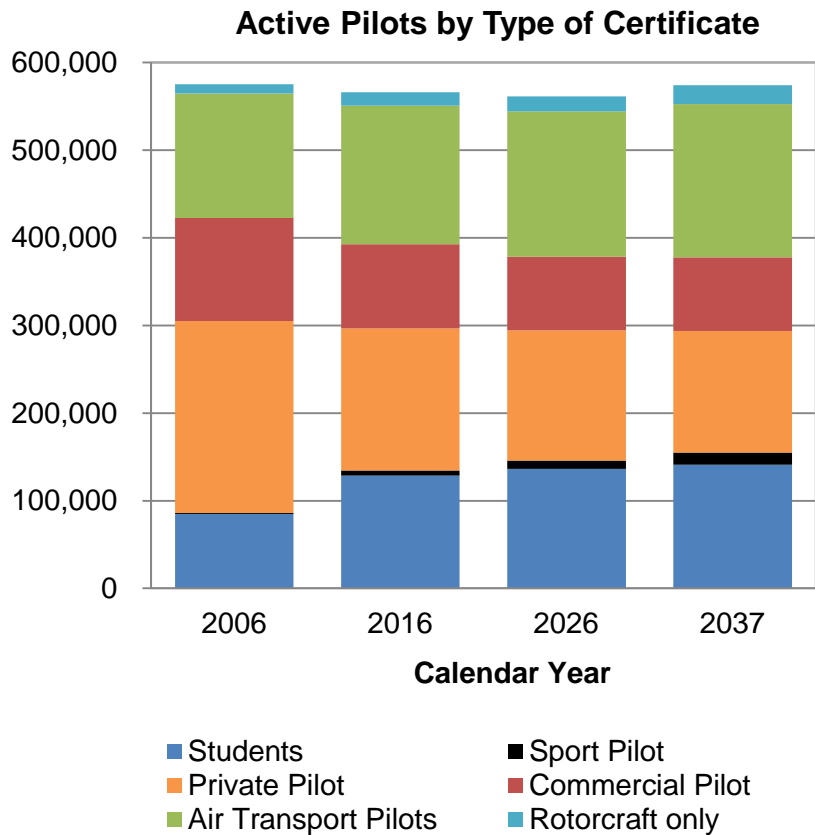
the end of 2016. While private and commercial pilot categories kept their declining trends, ATP and student pilot certificates continued to increase. One regulatory change that affected the number of student pilot certificates was the 2010 rule that increased the duration of validity for student pilot certificates for pilots under the age of 40 from 36 months to 60 months. Since 2011, the student pilot numbers have been rising and reached 128,501 in 2016.

Another change in the legislation impacted commercial and air transport pilot (ATP) certificates. 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. The 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 showed a faster decline in commercial pilot numbers, accompanied by a higher rate of increase in ATP certificates.

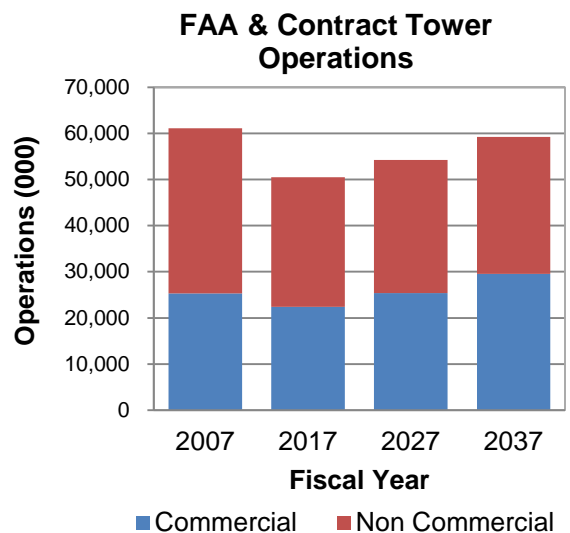
The number of active general aviation pilots (excluding ATPs) is projected to decrease about 7,500 (down 0.1 percent yearly) over the forecast period, while the ATP category

is forecast to increase by 15,500 (up 0.5 percent annually). The student pilots are forecast to increase by 0.4 percent and much smaller category of sport pilots are predicted to increase by 4.1 percent annually over the forecast period. On the other hand, both private and commercial pilot certificates are projected to decrease at an average annual rate of 0.7 and 0.6 percent, respectively until 2037.



FAA Operations

The growth in air travel demand and the business aviation fleet will drive growth in operations at FAA facilities over the forecast period. Activity at FAA and Contract towers is forecast to increase at an average rate of 0.8 percent a year between 2017 and 2037. Commercial operations⁵ at these facilities are forecast to increase 1.5 percent a year, 5 times faster than non-commercial operations. The growth in commercial operations is less than the growth in U.S. airline passenger traffic (1.5 percent vs. 1.9 percent) over the forecast period due primarily to larger aircraft (seats per aircraft mile) and higher load factors. Both of these trends allow U.S. airlines to accommodate more passengers without increasing the number of flights. General aviation operations (which accounted for 51% of operations in 2016) are forecast to increase an average of 0.3 percent a year as increases in turbine powered activity more than offset declines in piston activity.



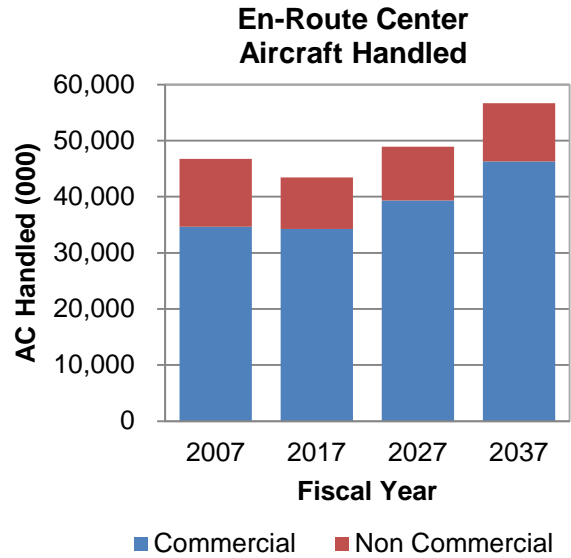
FAA Tracon (Terminal Radar Approach Control) Operations⁶ are forecast to grow slightly faster than at towered facilities. This is in part a reflection of the different mix of activity at Tracons. Total operations are forecast to increase an average of 1.0 percent a year between 2017 and 2037. Commercial operations accounted for approximately 59 percent of Tracon operations in 2016 and are projected to grow 1.3 percent a year over the forecast period. General aviation activity at these facilities is projected to grow only 0.4 percent a year over the forecast.

Activity at FAA En-Route Centers is measured by the number of IFR aircraft handled.

⁵ Sum of air carrier and commuter/air taxi categories.

⁶ 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.

In 2016, aircraft handled at FAA En-Route Centers increased 3.1 percent, led by increases in the Air Carrier and General Aviation categories. Growth in airline traffic and business aviation 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 1.3 percent a year as increases in Air Carrier and General Aviation activity offset declines in Air Taxi activity. Activity at En-Route centers is forecast to grow faster than activity at towered airports because more of the activity at En-Route centers is from the faster growing commercial sector and high-end (mainly turbine) general aviation flying. 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

The number of aircraft in the U.S. commercial fleet is forecast to increase from 7,039 in 2016 to 8,270 in 2037, an average annual growth rate of 0.8 percent a year. Increased demand for air travel and growth in air cargo is expected to fuel increases in both the passenger and cargo fleets.

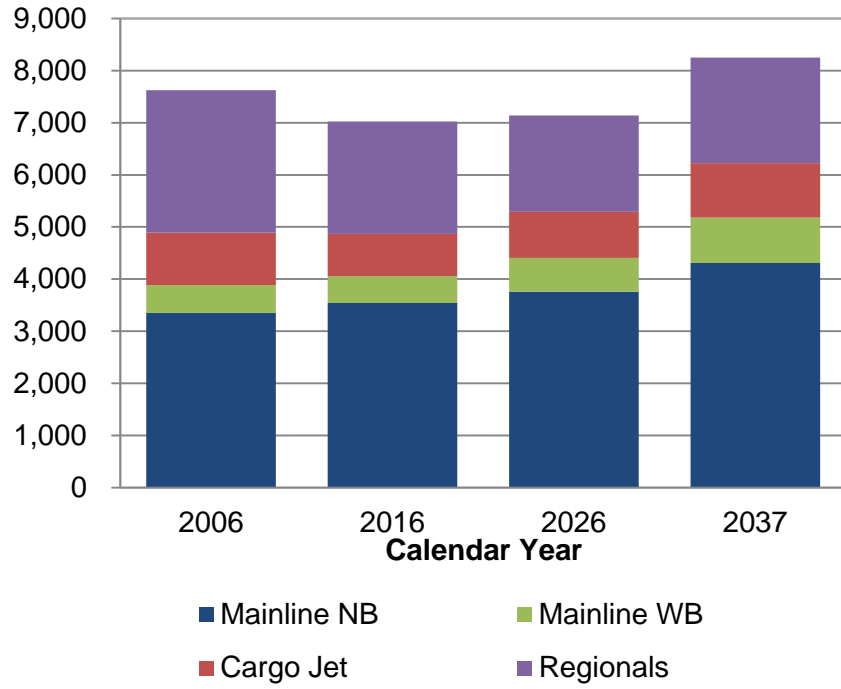
Between 2016 and 2037 the number of jets in the U.S. mainline carrier fleet is forecast to grow from 4,073 to 5,199, an average of 54 aircraft a year as carriers continue to remove older, less fuel efficient narrow body aircraft. The narrow body fleet (including E-series aircraft at American and JetBlue) is projected to grow 37 aircraft a year as carriers replace the 757 fleet and current technology 737 and A320 family aircraft with the next generation MAX and Neo families. The wide-body fleet grows by an average of 17 aircraft a year as carriers add 777-8/9, 787's, A350's to the fleet while retiring 767-300 and 777-200 aircraft. In total the U.S. passenger carrier wide-body fleet increases by 67 percent over the forecast period.

The regional carrier fleet is forecast to decline from 2,156 aircraft in 2016 to 2,027 in

2037 as the fleet shrinks by 14 percent (309 aircraft) between 2016 and 2025. Carriers remove 50 seat regional jets and retire older small turboprop and piston aircraft, while adding 70-90 seat jets, especially the E-2 family after 2020. By 2025 only a handful of 50 seat regional jets remain in the fleet. By 2037, the number of jets in the regional carrier fleet totals 1,828, up from 1,637 in 2016. The turboprop/piston fleet is forecast to shrink by 62% from 519 in 2016 to 199 by 2037. These aircraft account for just 9.8 percent of the fleet in 2037, down from 24.1 percent in 2016.

The cargo carrier large jet aircraft fleet is forecast to increase from 810 aircraft in 2016 to 1,044 aircraft in 2037 driven by the growth in freight RTMs. The narrow-body cargo jet fleet is projected to increase by less than 1 aircraft a year as 757's and 737's are converted from passenger use to cargo service. The wide body cargo fleet is forecast to increase 11 aircraft a year as new 747-800, 777-200, and new and converted 767-300 aircraft are added to the fleet, replacing older MD-11, A300/310, and 767-200 freighters.

U.S. Carrier Fleet



Unmanned Aircraft Systems

An unmanned aircraft system is defined by statute as an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft. A UAS is the unmanned aircraft (UA) and its associated elements (including communication links and the components that control the unmanned aircraft) that are required for the safe and efficient operation of the unmanned aircraft in the National Airspace System (NAS). This forecast is primarily driven by the ongoing evolution of the UAS regulatory environment, the ingenuity of manufacturers and operators, and underlying demand. While continuing to enable the thriving UAS industry, these efforts will facilitate the safe integration of UAS into the NAS.

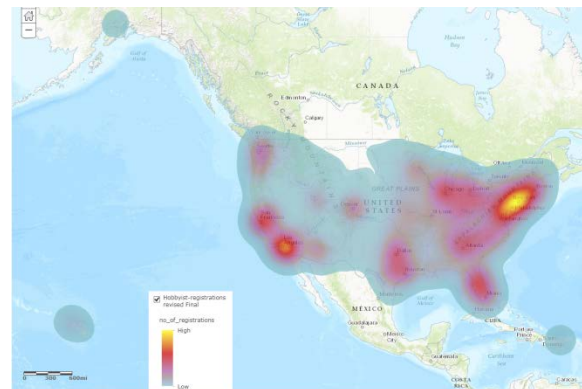
Model Aircraft and Hobbyist Forecast

On December 14, 2015, the FAA issued a rule requiring all UAS weighing more than 0.55 pounds (250 grams) and less than 55 pounds to be registered using a new on-line system (UAS weighing more than 55 pounds must be registered using the existing Aircraft Registration Process). FAA's online registration system went into effect on Dec. 21st, 2015. By December 31, 2016, 626,245 owner-hobbyists had registered. The rule allows hobbyists to register once and apply their unique registration number to multiple aircraft, unlike non-hobbyists who must obtain a unique registration number for each non-hobby aircraft. As a result, for each registration, one or more aircraft is likely to be owned (with a few exceptions of no aircraft being owned as well). For the entire online registration period up to the first week of February 2017, the cumulative registration trend has been one of growth,

with the trend slowing over time. Weekly registration currently averages between 5,000 and 7,000, with anticipated hikes during the holiday seasons.



A geographic distribution shows hobbyist UAS ownership are distributed across the country with denser ownership correlated with population centers.



In addition to information from the registration database, the Transportation Research Board (TRB) of the National Academies of Science held a UAS forecast workshop on October 25-26, 2016 involving industry, academia, and numerous modeler (hobbyist) and industry groups. The primary focus of this workshop was to understand the personalized nature and numerous applications of UAS, maturity trends and their drivers, and safety implications of the UAS fleet from gradual integration into NAS. Further-

more, the Agency engaged outside consulting firms to aid forecasting efforts for both the model and non-model UAS fleets.

The FAA recognizes that uncertainty is abundant in projecting both the model and the non-model UAS fleet. Hence, we provide a base forecast (i.e., likely) with high and low ranges in the following table for the model UAS fleet.

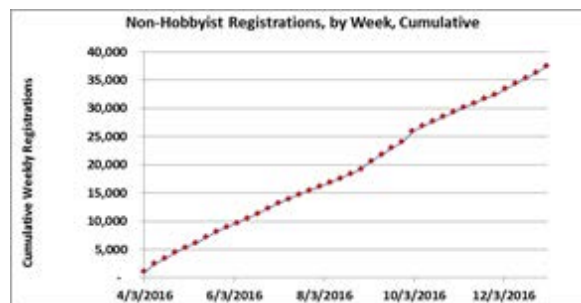
With over 626,000 hobbyists registered as of December 31, 2016, FAA estimates that there are around 1.1 million units that can be identified as distinctly hobbyist or model aircraft. By an examination of last year's data, from February 2016 to February 2017, we calculate the compound annual growth rate to be around 68%. This is a substantial growth rate as anticipated from the introduction of drones as a hobby sport facilitated by falling prices, improved technology such as built-in camera and ease of use. The registration database allowed early adopters to enroll easily. However, the trend is likely to slow as prices settle and early adopters

learn to make use of their aircraft. Given the registration trends observed, expert opinions collected during the TRB-workshop, a review of available industry forecasts, and market/industry research, FAA forecasts that the hobbyist fleet will likely (base scenario) more than triple in size over the next 5 years, from 1.1 million units in 2016 to over 3.5 million units by 2021. The high scenario may reach as high as 4.5 million units while the low scenario could be as low as 2.75 million units over the next 5 years. Growth rates underlying these numbers are fairly steady at the initial years but slowing in the last 2 years.

Year	Total Hobbyist Fleet		
	Million sUAS Units		
	Low	Base	High
2016	1.10	1.10	1.10
2017	1.94	2.15	2.31
2018	2.37	2.80	3.18
2019	2.60	3.20	3.79
2020	2.69	3.40	4.15
2021	2.75	3.55	4.47

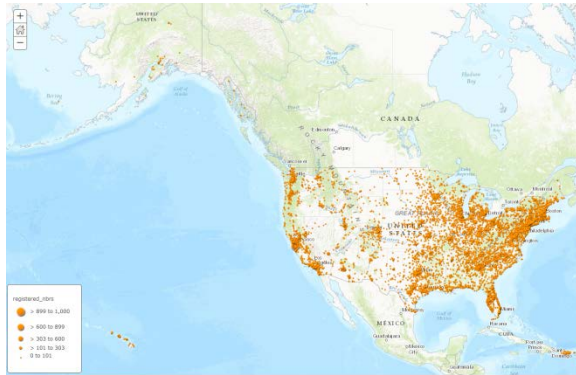
Commercial Small UAS Forecast

Prior to on-line registration, commercial UAS operators were required to register using the legacy paper-based process. Since the on-line system went live on April 1, 2016, more than 44,000 commercial UAS have been registered.



For each week on-line registration has been available, around 1,000 non-hobby units have been registered.

Similar to hobbyists, a geospatial distribution of commercial small UAS ownership shows denser areas correlated with economic or commercial activities across the country.



In June 2016 the FAA issued the Small UAS Rule (14 CFR part 107), which regulates the operation of small unmanned aircraft system in the National Airspace System. This rule, which took effect on August 29, 2016, provided a regulatory structure for the routine operation of small UAS for commercial purposes.

The commercial drone sector is very dynamic and appears to be at an early stage of growth. Unlike the hobbyist sector, FAA anticipates that growth in this sector will continue to accelerate over the next few years. Given the clarity that part 107 has provided to the industry, increasing commercial applications will become likely, which will facilitate additional growth.

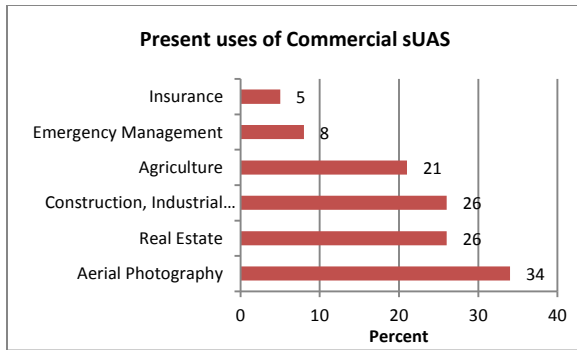
Based on the registration trends observed, expert opinions collected during the TRB-workshop, review of available industry forecasts, and market/industry research, FAA forecasts that the non-hobbyist fleet by 2021 will likely (base scenario) be ten times larger than the size of the fleet in 2016. FAA projects the number of units in the commercial small UAS fleet will exceed

420,000 by 2021, compared to 42,000 in 2016.

The forecast commercial small UAS fleet is primarily (over 95%) consumer grade off-the-shelf aircraft due to lower prices, ease of use, and availability. However, the higher-end, bigger, professional grade fleet stands to expand rapidly over time, especially as newer and more sophisticated uses are devised. Thus, while most (over 90%) of the growth in the commercial small UAS fleet will come from the consumer grade UAS, we anticipate a significant portion of commercial growth will come from professional grade UAS as well.

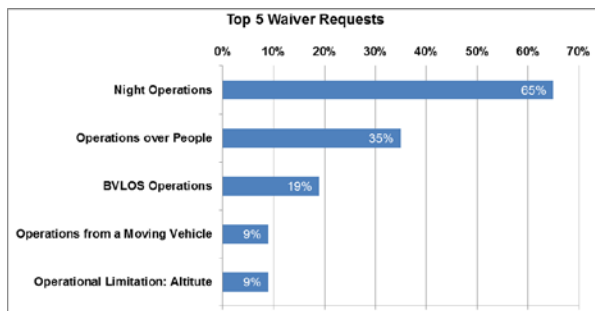
Year	Total Non-Hobbyist (Commercial) Fleet		
	Million sUAS Units		
	Low	Base	High
2016	0.042	0.042	0.042
2017	0.095	0.108	0.235
2018	0.133	0.167	0.445
2019	0.173	0.242	0.742
2020	0.207	0.327	1.133
2021	0.238	0.422	1.616

Commercial small UAS are presently used for numerous applications. A review of available industry/market research (e.g., AUVSI (2015), Bard Primary Use in 2015, Bard Likely Use in 2016, Fredonia (2015), and other reports (2016)) reveals their overall present (2015-2016) uses in the following chart:



Major applications of commercial small UAS are aerial photography (34%), construction, industrial and utility inspection (26%), real estate (26%) and agriculture (21%). Many of these UAS have multiple uses, and hence, the sum of the percentages in the above chart exceeds 100%.

One way to understand trends in commercial small UAS is to analyze the waiver applications that are filed by commercial UAS operators. Both the magnitude and relative composition of the types of waiver requests may indicate the direction of the commercial UAS sector as a whole. A breakdown of the top 5 waiver requests is given in the chart below:

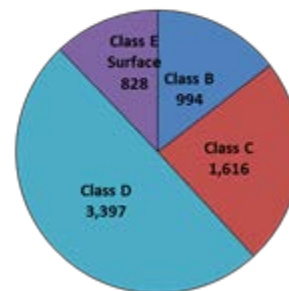


Beyond what is presently allowed under part 107, expanding commercial applications further would require waivers for night operations (65%), operations over people (35%), and beyond visual line of sight or BVLOS (19%). Many of these waiver applications request relief for multiple types of operations, and hence, the above total exceeds

100%. The Agency issues waivers to facilitate case-by-case commercial activities beyond the scope of what is allowed under part 107. Future regulatory development will allow these types of operations on a more routine basis. Meanwhile, analysis of these waiver applications allows us to understand industry trends, one of many metrics that is essential for projecting both the trajectory and growth trends of the sector.

Finally, more than 6,800 airspace waiver requests were submitted for operations in controlled airspace by the end of December, 2016. While almost half of them were for operations in class D airspace (i.e., smaller airports with control towers), other classes were also requested and regularly flown.

Airspace Waiver/Authorization Requests



Remote Pilot Forecast

The other important metric to understand trends in the commercial small UAS industry is remote pilot certifications. The FAA issues Remote Pilots Certificates to individuals who have passed an aeronautical knowledge test or completed online training (current part 61 airmen) under part 107. At present (December, 2016), the FAA has issued more than 29,000 Remote Pilot Certificates. Over 90% of individuals who took the part 107 aeronautical knowledge exam passed, as of February, 2017.

The forecast for remote pilots (RPs) is thus based on two data sources: (a) trends in Remote Pilot certificates issued; and (b) trends in commercial small UAS registration and forecasts. For projecting Remote Pilot growth rates, we assume a ratio of the number of remote pilots to the number of aircraft in the non-hobbyist fleet.

Using these assumptions and the base scenario of commercial small UAS forecast, we

project the number of Remote Pilots will grow significantly following the growth trends of commercial small UAS sector.

	Estimated Number of RPs					
	2016	2017	2018	2019	2020	2021
1 UAS per RPA	20,362	107,800	166,800	241,800	327,000	422,000
1.5 UAS per RPA	20,362	71,867	111,200	161,200	218,000	281,333
2 UAS per RPA	20,362	53,900	83,400	120,900	163,500	211,000

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 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 U.S. and global economies. Shifting international dynamics and any impacts resulting from the new U.S. administration's economic policies could drive further changes. 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 could have an immediate and significant impact on the demand for aviation services that could be greater than its impact on overall economic activity.

Although oil prices remained below \$45 per barrel for most of 2016, 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 January 2017 U.S. macro forecast and 30-Year Focus released during the fourth quarter of 2016) calls for an increase in oil prices in 2017 to \$47 per barrel and rise steadily thereafter, exceeding \$70 by 2021, \$100 by 2026, reaching \$131 per barrel by the end of the forecast period in 2037. Some forecasters are calling for a more gradual rebound in the price of oil. In January 2017, the World Bank released its latest commodity price forecast. The forecast calls for oil prices to rise to \$55 per barrel in

2016, remaining below \$65 until 2022, and reaching \$80 per barrel by 2030. The International Monetary Fund (IMF) also sees oil price increasing at a more moderate rate than the FAA's base forecast, as its October 2016 forecast called for oil prices increasing from \$43 per barrel in 2016 to only \$57.65 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 some level of tax cuts and additional infrastructure spending to the U.S. economy with the new administration. However there is considerable uncertainty as to the magnitude, timing, and nature of these programs which ultimately determines the impact on the future growth of the U.S. economy. In addition there is still much to be worked out on how the U.S. will engage with the rest of the global economy over the next several years. 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 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 con-

tinues to implement reforms to make its economy more competitive. While economic growth appears to be accelerating 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) and in the case of Europe, political elections in 2017. 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 but it is unclear if policy makers will take the steps needed. Given the discomfort many policy makers feel about the measures adopted to combat the Great Recession and uncertainty about the advanced economies' prospects, the possibility that authorities will either act prematurely or be excessively timid and late in taking necessary steps is not insignificant. 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 and the approval of the Alaska Airlines/Virgin America merger, the outlook for further consolidation via mergers and acquisitions (M&A) appears to be rather limited. Based on FY 2016 data, the top 6 (American, Delta, United, Southwest) plus Alaska/Virgin and JetBlue accounted for more than 85% 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. For many low cost carriers, the sheer size of merger transactions or the amount of risk associated with a merger makes further merger activity unlikely. For the network carriers, it is unclear how regulatory authorities will respond to any future proposed mergers.

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 by 2018, 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 American has trimmed its small regional jet fleet by 60 aircraft since the beginning of 2015 and is planning to remove another 55 from service in 2017. At the same time the carrier plans to add 31 larger regional jets to its fleet in 2017, on top of the 83 that have been added in the

past two years. 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 six 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. 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. On the other hand, there could be a pent-up demand for business jets in the near term that could push the forecast higher. While corporate profits have been high for several years, perceived economic and political uncertainties have caused companies to postpone their purchase of new business aircraft. With the new administration's emphasis on policies designed to stimulate economic growth and limit regulation, companies are feeling more optimistic about their future prospects that can translate into additional business jet sales. The impact of fuel price movements on business aircraft demand is also uncertain. Demand is increased due to the positive effect of declining fuel prices on corporate profits. However, business aircraft demand from energy related industries will be negatively impacted by low fuel prices.

Other factors, such as new and more efficient product offerings and increased com-

petition from new entrant manufacturers, serve to broaden the potential of the industry. 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 as well as the anticipated widespread deployment of UAS into the national airspace system will 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 0.5 percent in 2016, activity at large and medium hub airports (61 in total) increased 1.9 percent in 2016 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 continues to grow 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.

Community concerns about aviation related impacts could potentially limit or delay 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. Concerns 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 that are needed to achieve aviation growth may be constrained. In addition to local community concerns outlined previously, the climate impacts of aviation also present global challenges. Aviation currently accounts for two to three percent of global carbon dioxide (CO₂) emissions and without action this percentage is expected to increase with the growth in operations. The international aviation community is focused on implementing ICAO's comprehensive approach achieving carbon neutral growth through a 'basket of measures' comprising of technical, operational, and infrastructure enhancements, sustainable alternative fuels, and the im-

plementation of a global market-based measure as a gap-filler. In addition to providing economic benefits, technologies to improve aircraft fuel efficiency also provide benefits in terms of reduced CO₂ emissions. The use of alternative fuels can also mitigate CO₂ emissions while also providing economic benefits in areas where the fuel is being produced while also mitigating jet fuel price volatility. A global market-based measure for international CO₂ emissions will impose an additional cost to international airlines; however this is economically preferable to a patchwork of State or Regional-level regulations around the world. Continued improvements in fuel efficiency, noise reduction and alternative fuels are required to ensure that access restrictions or operating limitations are not imposed on the fleet in service which in turn may depress growth.

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. In order to help stakeholders better prepare for the future, the FAA has provided alternative scenarios to our baseline forecasts of airline traffic and capacity.

To create the baseline domestic forecast, economic assumptions from IHS Global Insight's 10-year and 30-year U.S. Macro Baselines were used. To develop the alternative scenarios, assumptions from IHS Global Insight's 10-year optimistic and pessimistic forecasts from their January 2017 Baseline U.S. Economic Outlook were combined with the optimistic and pessimistic forecasts from their Fall 2016 30-year U.S. Macro forecast. Inputs from these alternative scenarios were used to create a "high" and "low" traffic, capacity, and yield forecast.

International passengers and traffic are primarily driven by country specific Gross Domestic Product (GDP) forecasts provided by IHS Global Insight. Thus, the alternative scenarios use inputs based on ratios derived from IHS Global Insight's Major Trading Partner and Minor Trading Partners optimistic and pessimistic forecasts in order to create a high and low case.

Scenario Assumptions

The FAA's domestic baseline forecast assumes that the economy experiences a pickup in growth over the next few years as a result of tax cuts and higher infrastructure spending. Oil prices remain low by historic

standards and there are no financial sector collapses.

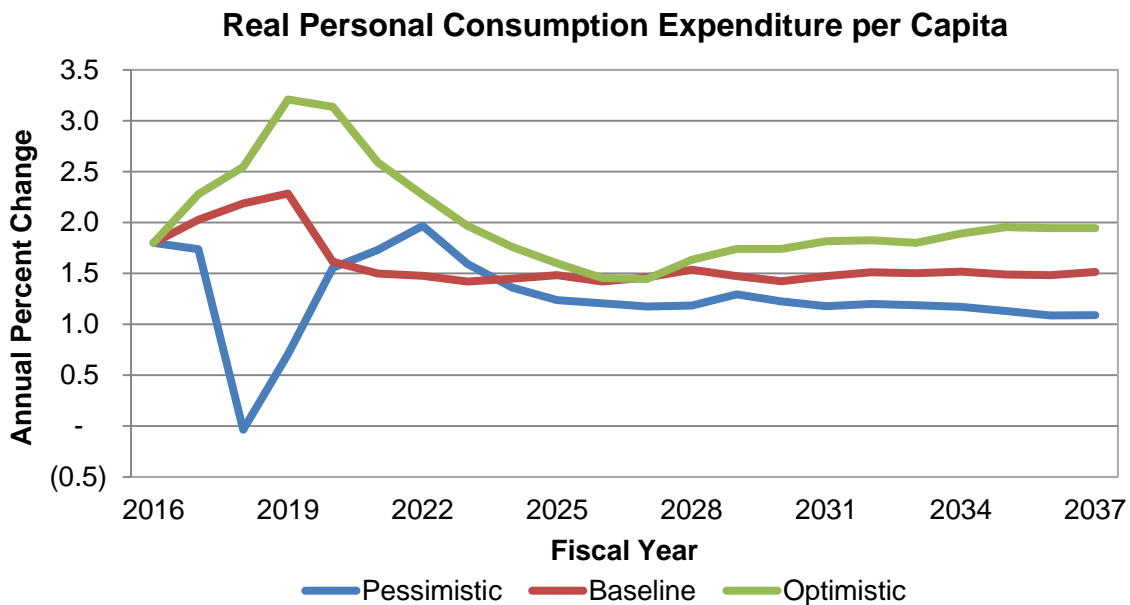
The FAA's high case forecast uses IHS Global Insight's optimistic forecast. The optimistic forecast sees a rollback in regulations and lower corporate taxes resulting in higher capital spending. Stronger growth in investment spending leads to a boost in productivity and raises economic growth above the baseline case. Given the strengthening outlook, both business and consumer confidence improve leading to robust consumer spending with the housing sector remaining an engine of growth. Continuing oversupply in oil markets keep oil prices low. Inflation remains in check with higher productivity, lower oil prices, and higher interest rates than in the baseline case. In this scenario real personal consumption expenditure (PCE) per capita growth averages 0.4 percentage points faster per year than the baseline forecast and unemployment averages 0.3 points lower on a fiscal year basis than the baseline.⁷

Conversely, FAA's low case forecast uses IHS Global Insight's pessimistic scenario. In this forecast, strained relations with major trading partners fuels uncertainty that causes business to cut back on investment and slows productivity growth leading to a

⁷ Real personal consumption expenditure per capita and unemployment are used as an input variables to the FAA's base, high and low forecasts of enplanements.

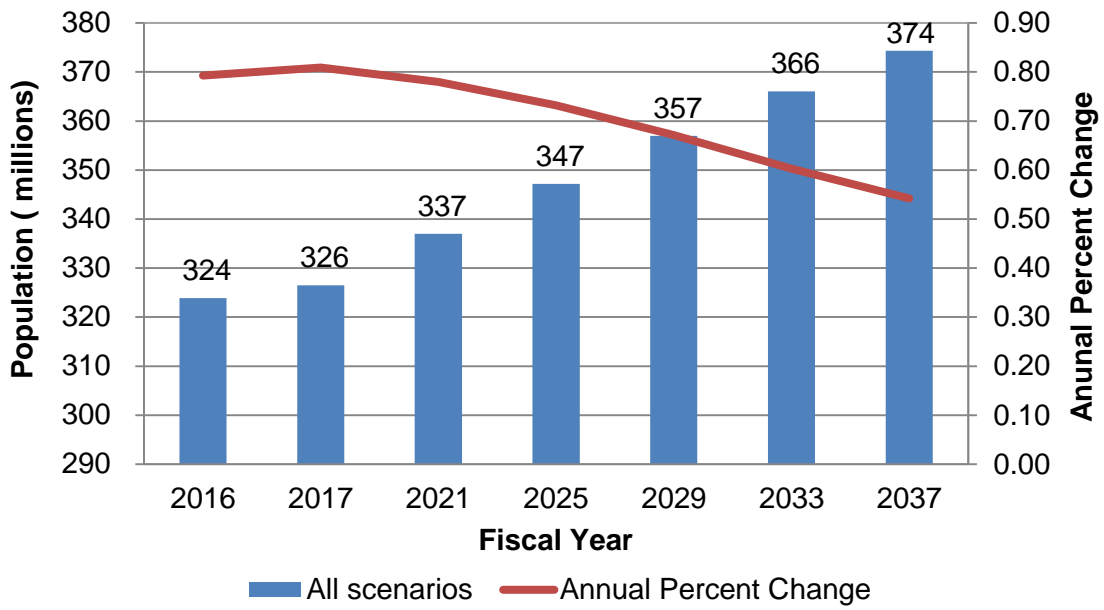
pickup in both wage and price inflation. In addition, the Eurozone's recovery will stall and growth in emerging markets will be less robust. The Federal Reserve raises interest rates to keep inflation in check but business and consumer confidence deteriorate. The combination of higher inflation, higher interest rates, and uncertainty negatively impact consumer spending, the housing market, and business investment, and the U.S. economy suffers a shallow recession in 2018 and the unemployment rate peaks at

6.6%. The Federal Reserve responds by slashing interest rates which spurs a recovery in 2019. In the long run, compared to the baseline forecast, productivity growth remains subdued, oil prices are higher, and economic growth is slower. Real PCE per capita in this scenario grows 0.4 percentage points slower per year than in the baseline; and unemployment, on average, is 0.9 points higher on an annual basis than in the baseline.



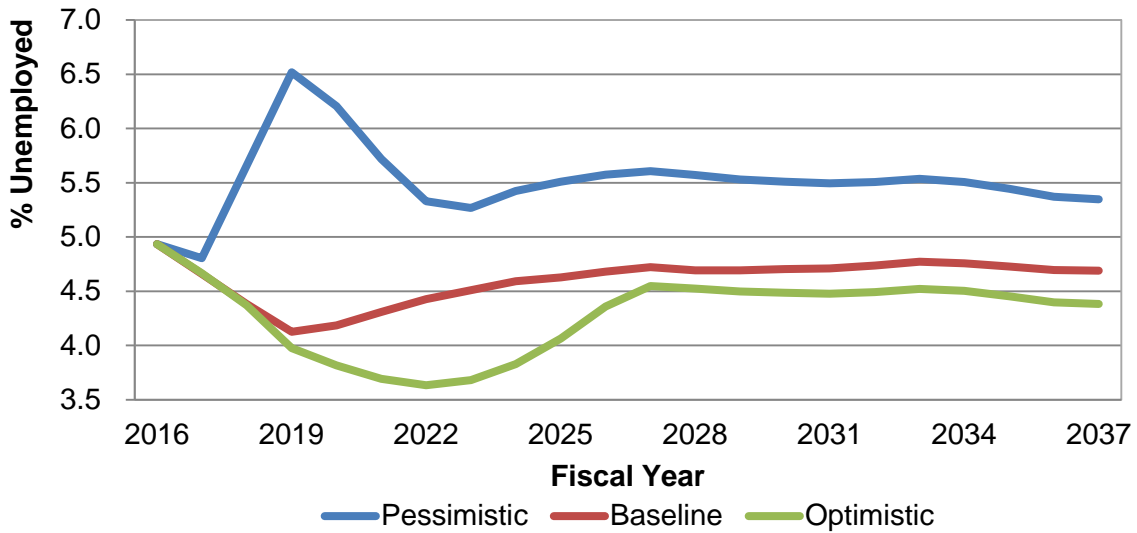
Source: IHS Global Insight

U.S. Population



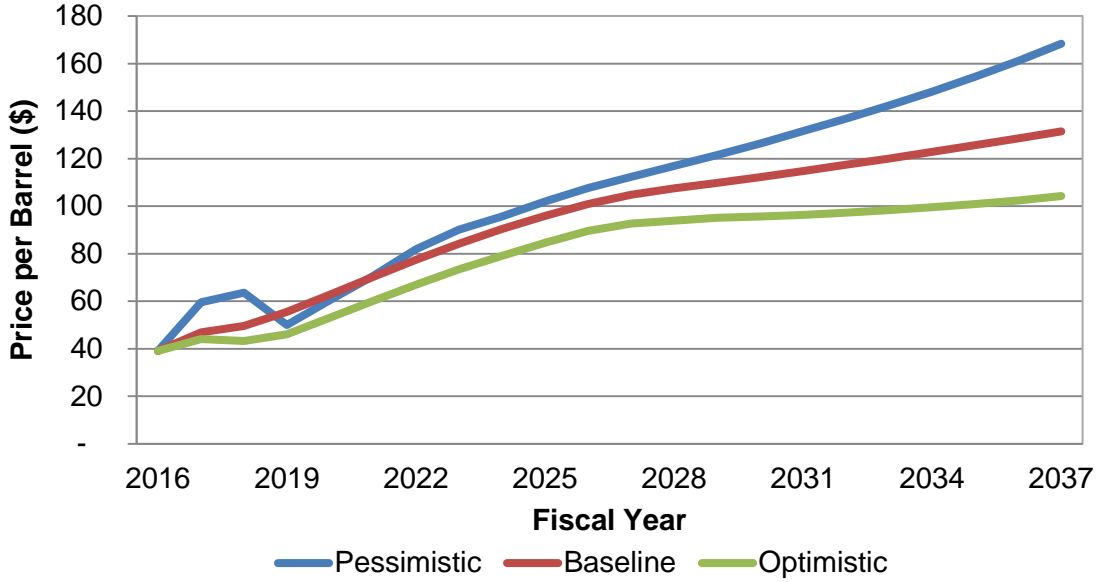
Source: IHS Global Insight

U.S. Unemployment Rate



Source: IHS Global Insight

U.S. Refiners' Acquisition Cost

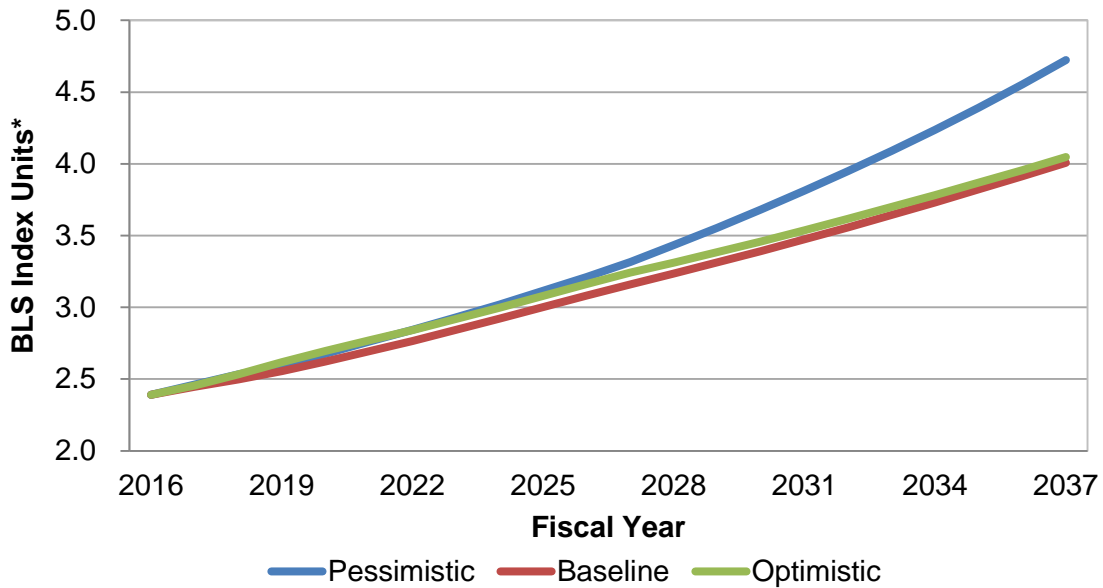


Source: IHS Global Insight

The price of energy is one of the drivers in the growth of consumer prices over the forecast period. In the optimistic case, energy prices and import prices grow more

slowly than in the baseline. In the pessimistic case the opposite occurs with energy prices, wages and import prices rising more rapidly compared to the baseline.

Consumer Price Index - All Urban Consumers



* BLS Units: 1982-84 = 1.00
Source: IHS Global Insight

Alternative Forecasts

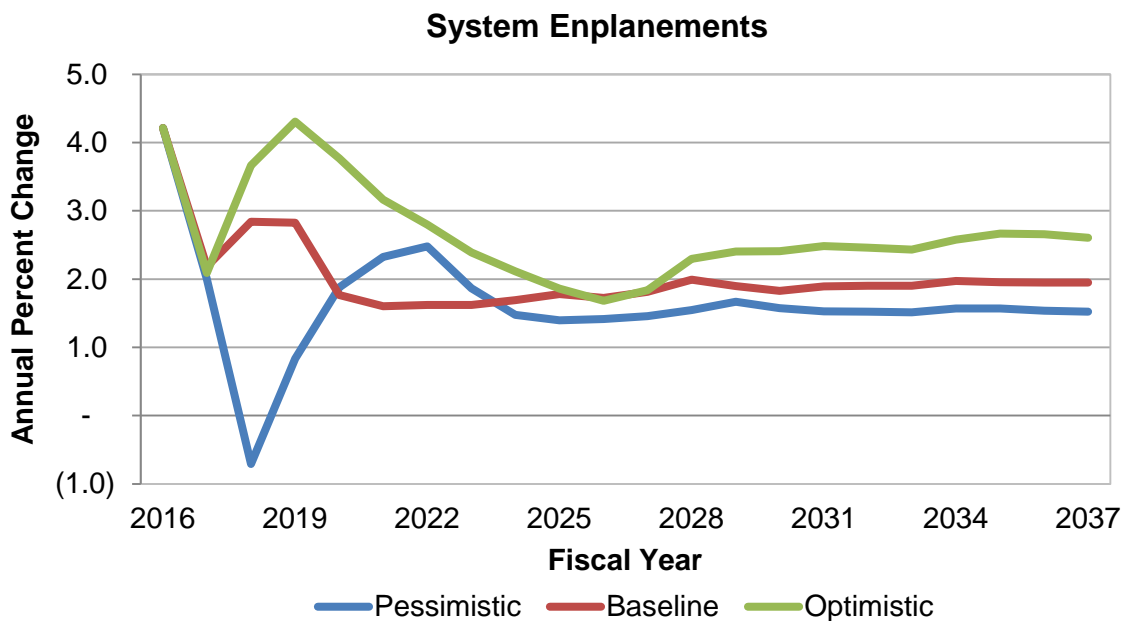
Enplanements

In the baseline forecast, system enplanements are forecast to grow at an average annual rate of 1.9 percent a year over the forecast horizon of 2017-2037 (with domestic and international passengers up 1.7 and 3.5 percent, respectively).

In the optimistic case, enplanements grow at a quicker pace, averaging 2.6 percent per year (up 2.3 percent domestically and 4.7 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 2037, system passen-

gers in the optimistic case are 14.6 percent above the baseline, totaling 1.4 billion, 179 million greater than in the baseline.

The pessimistic case is characterized by a period of weakened consumer confidence brought on by persistent unemployment, low consumer demand, and higher inflation. In this scenario enplanements grow an average of 1.5 percent per year (domestic up 1.3 percent and international up 3.0 percent). In the pessimistic case, system passengers in 2037 are 8.3 percent below the baseline case, totaling 1.125 billion, 101 million fewer than in the baseline.



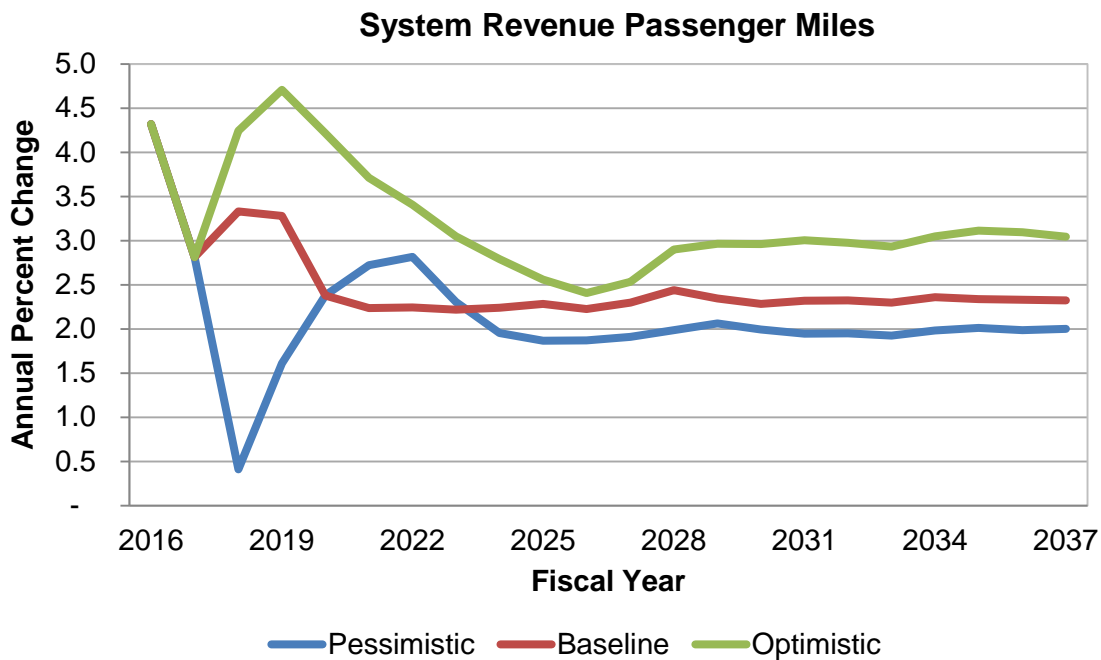
Revenue Passenger Miles

In the baseline forecast, system RPMs grow at an average annual rate of 2.4 percent a year over the forecast horizon (2017-2037), with domestic RPMs increasing 2.0 percent annually and international RPMs growing 3.4 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 (do-

mestic and international RPMs up 2.6 and 4.5 percent, respectively).

In the pessimistic case, the combination of a slower growing economy and higher energy prices result in RPM growth averaging 2.0 percent annually with domestic markets growing 1.5 percent a year while international traffic grows 3.0 percent annually.



Available Seat Miles

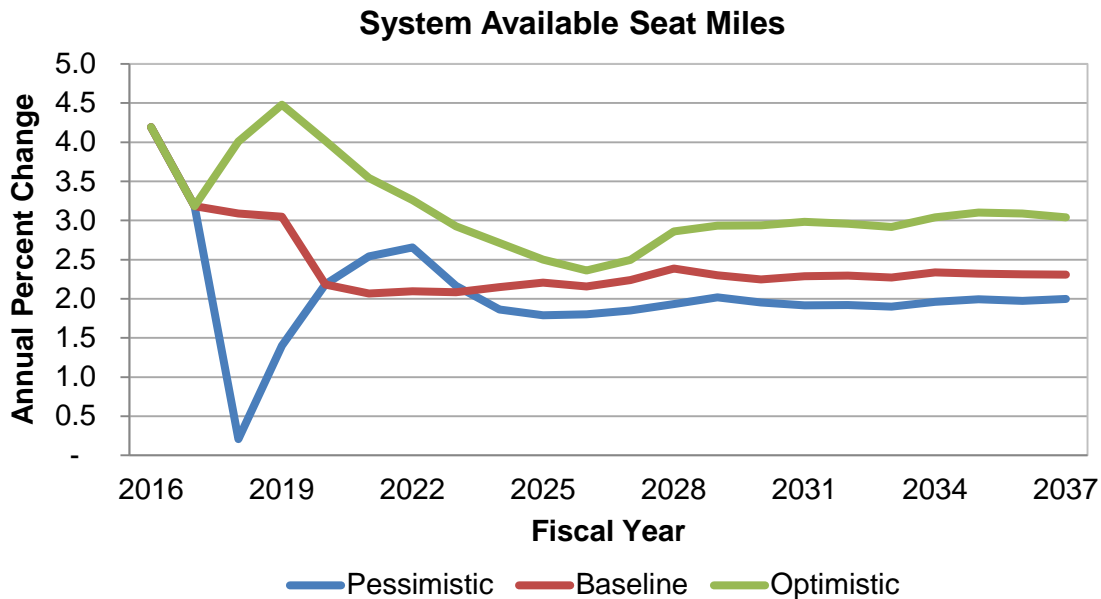
In the base case, system capacity is forecast to increase an average of 2.3 percent annually over the forecast horizon with growth averaging 1.8 percent annually in domestic markets and 3.4 percent a year in international markets.

In the optimistic case, capacity grows at a faster clip than in the baseline forecast, averaging 3.1 percent annually system-wide (2.4 and 4.5 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 1.9 percent annually (domestic growth of 1.4 percent annually and international up 2.9 percent annually).



Load Factor

System load factors over the 20-year forecast period are relatively similar for all three forecast scenarios. System load factor rises from 83.2 percent in 2017 to 84.4 (optimistic), 84.5 (pessimistic), and 84.6 (baseline) percent in 2037, respectively.

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 84.1 percent to 86.3

percent in the optimistic and pessimistic scenarios, respectively, while rising to 86.4 percent in the baseline.

The international load factor is forecast to rise gradually from 80.9 in 2016 to 81.2 percent in 2037 in the optimistic scenario and 81.3 percent in the baseline and pessimistic scenarios. This reflects in part the relative growth in demand and capacity in the three (Atlantic, Latin, and Pacific) international regions under each scenario.

Yield

In the baseline forecast, nominal system yield increases 2.1 percent annually, going from 13.56 cents in 2017 to 20.38 cents in 2037. In domestic markets, yield in the baseline forecast rises from 13.76 cents in 2017 to 21.16 cents in 2037. International yield rises from 13.04 cents in 2017 to 18.89 cents in 2037.

System yield rises in the optimistic case at the same rate as in the baseline, up 2.1 percent annually to 20.46 cents by 2037. Domestic yield increases to 21.33 cents while international yield increases to 18.95 cents. The modest growth in yield in both cases is due to advancements in technolo-

gy, gains in productivity, and relatively favorable fuel prices.

In the pessimistic case, nominal yields rise more rapidly than in the baseline, growing an average of 2.6 percent annually, reaching 22.62 cents by 2037 (24.55 cents domestically and 18.90 cents internationally). This scenario reflects higher general domestic inflation and higher energy prices than in the baseline, forcing carriers to increase fares in order to cover the higher costs of fuel, labor, and capital.

TABLE A-1

FAA FORECAST ECONOMIC ASSUMPTIONS
FISCAL YEARS 2016-2037

Variable	Scenario	Historical		FORECAST							PERCENT AVERAGE ANNUAL GROWTH							
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37						
Economic Assumptions																		
Real Personal Consumption Expenditure per Capita (2009 \$)	Pessimistic	35,306	35,920	38,095	40,668	43,201	45,708											
	Baseline	35,306	36,022	39,406	42,339	45,575	49,102											
	Optimistic	35,306	36,111	41,359	44,874	48,946	53,798											
Refiners Acquisition Cost - Average - \$ Per Barrel	Pessimistic	39.1	59.5	81.9	112.3	136.9	168.3											
	Baseline	39.1	46.9	77.4	104.8	117.4	131.4											
	Optimistic	39.1	44.0	67.0	92.6	97.3	104.2											
Consumer Price Index All Urban, 1982-84 = 1.0	Pessimistic	2.39	2.46	2.84	3.32	3.95	4.72											
	Baseline	2.39	2.45	2.77	3.16	3.56	4.01											
	Optimistic	2.39	2.45	2.84	3.25	3.65	4.12											
Civilian Unemployment Rate (%)	Pessimistic	4.9	4.8	5.3	5.6	5.5	5.3											
	Baseline	4.9	4.7	4.4	4.7	4.7	4.7											
	Optimistic	4.9	4.7	3.6	4.5	4.5	4.4											

Source: IHS Global Insight

TABLE A-2

FAA FORECAST OF AVIATION ACTIVITY*

FISCAL YEARS 2016-2037

Variable	Scenario	Historical		FORECAST							PERCENT AVERAGE ANNUAL GROWTH				
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37			
System															
Aviation Activity															
Available Seat Miles (BL)	Pessimistic	1,111.6	1,147.0	1,253.7	1,377.0	1,516.5	1,671.5	3.2%	1.8%	1.8%	1.9%	1.9%			
	Baseline	1,111.6	1,147.0	1,297.4	1,444.2	1,618.4	1,814.2	3.2%	2.5%	2.3%	2.3%	2.3%			
	Optimistic	1,111.6	1,147.0	1,386.2	1,575.9	1,821.1	2,115.0	3.2%	3.9%	3.2%	3.1%	3.1%			
Revenue Passenger Miles (BL)	Pessimistic	928.0	954.1	1,052.5	1,161.0	1,281.1	1,413.0	2.8%	2.0%	2.0%	2.0%	2.0%			
	Baseline	928.0	954.1	1,089.6	1,217.9	1,367.4	1,534.3	2.8%	2.7%	2.5%	2.4%	2.4%			
	Optimistic	928.0	954.1	1,163.8	1,327.6	1,536.1	1,784.8	2.8%	4.1%	3.4%	3.2%	3.2%			
Enplanements (MIL)	Pessimistic	819.6	836.0	894.2	964.4	1,042.4	1,125.3	2.0%	1.4%	1.4%	1.5%	1.5%			
	Baseline	819.6	837.5	930.6	1,013.8	1,114.0	1,226.6	2.2%	2.1%	1.9%	1.9%	1.9%			
	Optimistic	819.6	836.8	995.7	1,098.0	1,236.9	1,405.5	2.1%	3.5%	2.8%	2.6%	2.6%			
Psg. Carrier Miles Flown (MIL)	Pessimistic	7,346.0	7,518.2	7,950.6	8,534.8	9,210.2	9,948.0	2.3%	1.1%	1.3%	1.4%	1.4%			
	Baseline	7,346.0	7,518.2	8,243.3	8,953.6	9,827.0	10,808.4	2.3%	1.9%	1.8%	1.8%	1.8%			
	Optimistic	7,346.0	7,518.2	8,824.1	9,753.8	11,017.2	12,539.2	2.3%	3.3%	2.6%	2.6%	2.6%			
Psg. Carrier Departures (000s)	Pessimistic	9,058.2	9,280.0	9,506.1	9,946.0	10,359.4	10,816.9	2.4%	0.5%	0.7%	0.7%	0.8%			
	Baseline	9,058.2	9,289.8	9,893.8	10,443.6	11,053.0	11,778.2	2.6%	1.3%	1.2%	1.2%	1.2%			
	Optimistic	9,058.2	9,284.7	10,597.9	11,297.6	12,239.2	13,445.5	2.5%	2.7%	2.0%	1.9%	1.9%			
Nominal Passenger Yield (cents)	Pessimistic	13.44	13.61	15.35	17.46	19.85	22.62	1.3%	2.4%	2.5%	2.5%	2.6%			
	Baseline	13.44	13.55	15.29	17.14	18.69	20.38	0.9%	2.4%	2.4%	2.2%	2.1%			
	Optimistic	13.44	13.59	15.47	17.35	18.82	20.46	1.1%	2.6%	2.5%	2.2%	2.1%			

* Includes domestic and international activity.

TABLE A-3

FAA FORECAST OF DOMESTIC AVIATION ACTIVITY
FISCAL YEARS 2016-2037

Variable	Scenario	Historical					FORECAST						PERCENT AVERAGE ANNUAL GROWTH					
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37						
Domestic Aviation Activity																		
Available Seat Miles (BL)	Pessimistic	783.0	813.3	859.8	924.4	999.1	1,076.9	3.9%	1.1%	1.3%	1.4%	1.4%	1.4%	1.8%	1.8%	2.4%	1.4%	1.4%
	Baseline	783.0	813.3	894.3	968.0	1,061.7	1,168.5	3.9%	1.9%	1.8%	1.8%	1.8%	1.8%	2.5%	2.5%	2.4%	1.8%	1.8%
	Optimistic	783.0	813.3	957.3	1,041.0	1,163.4	1,314.5	3.9%	3.3%	2.5%	2.4%	2.4%	2.4%	2.5%	2.5%	2.4%	2.4%	2.4%
Revenue Passenger Miles (BL)	Pessimistic	663.2	684.2	732.5	792.9	860.2	929.4	3.2%	1.4%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%	2.6%	1.5%	1.5%
	Baseline	663.2	684.2	762.2	830.7	914.7	1,009.2	3.2%	2.2%	2.0%	2.0%	2.0%	2.0%	2.7%	2.7%	2.6%	2.0%	2.0%
	Optimistic	663.2	684.2	815.6	892.9	1,001.7	1,134.4	3.2%	3.6%	2.7%	2.6%	2.6%	2.6%	2.7%	2.7%	2.6%	2.6%	2.6%
Enplanements (ML)	Pessimistic	726.2	741.9	783.6	836.8	895.8	955.0	2.2%	1.1%	1.2%	1.3%	1.3%	1.3%	1.7%	1.7%	2.3%	1.3%	1.3%
	Baseline	726.2	741.9	815.3	876.7	952.6	1,037.0	2.2%	1.9%	1.7%	1.7%	1.7%	1.7%	2.4%	2.4%	2.3%	1.7%	1.7%
	Optimistic	726.2	741.9	872.5	942.4	1,043.1	1,165.7	2.2%	3.3%	2.4%	2.3%	2.3%	2.3%	2.4%	2.4%	2.3%	2.3%	2.3%
Pgr Carrier Miles Flown (ML)	Pessimistic	5,815.9	5,971.2	6,140.9	6,471.5	6,869.1	7,277.4	2.7%	0.6%	0.8%	0.9%	0.9%	0.9%	1.4%	1.4%	2.0%	1.0%	1.0%
	Baseline	5,815.9	5,971.2	6,389.6	6,779.0	7,302.7	7,900.6	2.7%	1.4%	1.3%	1.4%	1.4%	1.4%	2.0%	2.0%	2.0%	1.4%	1.4%
	Optimistic	5,815.9	5,971.2	6,842.5	7,293.0	8,005.7	8,892.1	2.7%	2.8%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Pgr Carrier Departures (000s)	Pessimistic	8,391.5	8,613.7	8,740.4	9,080.1	9,379.9	9,692.4	2.6%	0.3%	0.5%	0.6%	0.6%	0.6%	1.0%	1.0%	1.6%	0.6%	0.6%
	Baseline	8,391.5	8,613.7	9,095.4	9,512.8	9,973.5	10,524.3	2.6%	1.1%	1.0%	1.0%	1.0%	1.0%	1.7%	1.7%	1.6%	1.0%	1.0%
	Optimistic	8,391.5	8,613.7	9,740.9	10,234.8	10,934.5	11,846.1	2.6%	2.5%	1.7%	1.6%	1.6%	1.6%	2.5%	2.5%	2.4%	1.6%	1.6%
Nominal Passenger Yield (cents)	Pessimistic	13.68	13.84	15.81	18.20	21.09	24.55	1.2%	2.7%	2.8%	2.8%	2.8%	2.8%	2.7%	2.7%	2.4%	2.9%	2.9%
	Baseline	13.68	13.76	15.71	17.74	19.37	21.16	0.6%	2.7%	2.6%	2.6%	2.6%	2.6%	2.7%	2.7%	2.3%	2.2%	2.2%
	Optimistic	13.68	13.81	15.96	18.06	19.60	21.33	0.9%	2.9%	2.7%	2.7%	2.7%	2.7%	2.9%	2.9%	2.4%	2.2%	2.2%

TABLE A-4

FAA FORECAST OF INTERNATIONAL AVIATION ACTIVITY*
FISCAL YEARS 2016-2037

Variable	Scenario	Historical		FORECAST					PERCENT AVERAGE ANNUAL GROWTH					
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37		
International Aviation Activity														
Available Seat Miles (BIL)	Pessimistic	328.6	333.7	394.0	452.6	517.4	594.6	1.5%	3.4%	3.1%	3.0%	2.9%		
	Baseline	328.6	333.7	403.1	476.3	556.6	645.6	1.5%	3.9%	3.6%	3.5%	3.4%		
	Optimistic	328.6	333.7	428.8	534.9	657.7	800.5	1.5%	5.1%	4.8%	4.6%	4.5%		
Revenue Passenger Miles (BIL)	Pessimistic	264.8	269.8	320.0	368.1	420.8	483.7	1.9%	3.5%	3.2%	3.0%	3.0%		
	Baseline	264.8	269.8	327.4	387.3	452.7	525.1	1.9%	3.9%	3.7%	3.5%	3.4%		
	Optimistic	264.8	269.8	348.2	434.7	534.4	650.4	1.9%	5.2%	4.9%	4.7%	4.5%		
Enplanements (MIL)	Pessimistic	93.4	94.1	110.7	127.5	146.6	170.3	0.7%	3.3%	3.1%	3.0%	3.0%		
	Baseline	93.4	95.6	115.3	137.1	161.4	189.6	2.3%	3.8%	3.7%	3.6%	3.5%		
	Optimistic	93.4	94.9	123.2	155.6	193.8	239.8	1.5%	5.4%	5.1%	4.9%	4.7%		
P-sgr Carrier Miles Flown (MIL)	Pessimistic	1,530.1	1,546.9	1,809.7	2,063.3	2,341.1	2,670.6	1.1%	3.2%	2.9%	2.8%	2.8%		
	Baseline	1,530.1	1,546.9	1,853.7	2,174.6	2,524.3	2,907.8	1.1%	3.7%	3.5%	3.3%	3.2%		
	Optimistic	1,530.1	1,546.9	1,981.6	2,460.7	3,011.5	3,647.1	1.1%	5.1%	4.8%	4.5%	4.4%		
P-sgr Carrier Departures (000s)	Pessimistic	666.8	666.4	765.7	865.8	979.5	1,124.5	-0.1%	2.8%	2.7%	2.6%	2.7%		
	Baseline	666.8	676.1	798.4	930.8	1,079.4	1,254.0	1.4%	3.4%	3.2%	3.2%	3.1%		
	Optimistic	666.8	671.1	857.0	1,062.8	1,304.7	1,599.4	0.6%	5.0%	4.7%	4.5%	4.4%		
Nominal Passenger Yield (cents)	Pessimistic	12.83	13.03	14.31	15.85	17.31	18.90	1.6%	1.9%	2.0%	1.9%	1.9%		
	Baseline	12.83	13.03	14.31	15.85	17.31	18.89	1.6%	1.9%	2.0%	1.9%	1.9%		
	Optimistic	12.83	13.03	14.33	15.89	17.37	18.95	1.6%	1.9%	2.0%	1.9%	1.9%		

*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 2010-2016 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. For this reason, inclusion of prior periods in an analysis of forecast variance 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 5.6 percent for ASM forecasts prepared 3 years in advance. For the period under examination, preparation of the forecasts for FY 2010 through FY 2016 occurred in FY 2006 through FY 2015.⁸

⁸ 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 - FY 2016) (Forecast Variance from Actual)				
	Forecast Performed Years Prior to Actual				
	1 Year	2 Years	3 Years	4 Years	5 Years
U.S. Real GDP	1.3%	3.0%	5.7%	8.6%	10.6%
ASMs	1.0%	2.3%	5.6%	10.3%	15.2%
RPMs	1.1%	1.9%	4.6%	8.6%	12.5%
Passenger Enplanements	0.8%	1.7%	4.6%	8.5%	12.0%
Mainline Domestic Yield	3.0%	4.8%	5.2%	5.9%	7.5%
IFR Aircraft Handled*	1.6%	3.5%	7.0%	11.6%	17.7%

*Total - scheduled and nonscheduled commercial plus noncommercial

Presenting forecast variances from actual data in such a manner simplifies a review of longer-term trends. Typically, one would expect the variances to decrease as the forecast year is closer to 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 may be attributed to the forecast error in the exogenous variables. Sec-

ond, all the metrics examined show increasing variances as the forecast time horizon lengthens. Third, the variance in the IFR aircraft handled relative to ASM variance is fairly consistent for the 2 to 4 year out horizon. This suggests that beyond a 2 year forecast horizon carriers are able to accommodate changes in capacity by means other than adjusting operations. Many carriers have been systematically reducing the number smaller regional jets in their fleets, replacing them with larger 70-90 seat aircraft. This has allowed carriers to increase capacity without increasing flights. It is worth noting that the forecast variance in these two metrics is relatively consistent even as the time horizon increases suggesting that over the long run ASM growth is a good indicator of operations growth.

Appendix C: Forecast Tables

TABLE 1
U.S. SHORT-TERM ECONOMIC FORECASTS

ECONOMIC VARIABLE	FISCAL YEAR 2016				FISCAL YEAR 2017				FISCAL YEAR 2018			
	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 (2009 \$)	35,045	35,132	35,433	35,614	35,765	35,954	36,101	36,265	36,433	36,690	36,946	37,168
Year over year change	1.7%	1.5%	1.9%	2.0%	2.1%	2.3%	1.9%	1.8%	1.9%	2.0%	2.3%	2.5%
Refiners' Acquisition Cost - Average (Dollars per barrel)	40.61	30.78	42.18	42.90	44.32	45.63	48.25	49.22	48.46	47.39	50.46	52.05
Year over year change	-45.0%	-35.8%	-26.5%	-9.8%	9.1%	48.2%	14.4%	14.7%	9.3%	3.9%	4.6%	5.8%
Consumer Price Index (1982-84 equals 100)	238.1	237.9	239.4	240.4	242.4	244.0	245.4	246.6	247.7	248.9	250.4	251.8
Seasonally Adjusted Annual Rate	0.8%	-0.3%	2.5%	1.6%	3.5%	2.6%	2.2%	2.0%	1.9%	1.8%	2.5%	2.3%

Source: IHS Global Insight

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS

FISCAL YEAR	REAL GROSS DOMESTIC PRODUCT (Billions 2009 \$)	REAL PERSONAL CONSUMPTION EXPENDITURE PER CAPITA (2009 \$)	CONSUMER PRICE INDEX (1982-84=1.00)	REFINERS' ACQUISITION COST AVERAGE (Dollars per barrel)
<u>Historical</u>				
2010	14,685	32,186	2.17	74.61
2011	14,958	32,787	2.23	96.00
2012	15,306	33,034	2.29	102.81
2013	15,510	33,217	2.32	100.78
2014	15,884	33,786	2.36	97.79
2015	16,321	34,682	2.37	56.69
2016E	16,581	35,306	2.39	39.12
<u>Forecast</u>				
2017	16,937	36,022	2.45	46.85
2018	17,365	36,810	2.50	49.59
2019	17,791	37,651	2.56	55.48
2020	18,163	38,259	2.62	62.83
2021	18,563	38,832	2.69	70.19
2022	18,960	39,406	2.77	77.41
2023	19,353	39,965	2.84	84.22
2024	19,730	40,545	2.92	90.38
2025	20,099	41,145	3.00	95.95
2026	20,454	41,729	3.08	100.92
2027	20,834	42,339	3.16	104.79
2028	21,262	42,989	3.24	107.42
2029	21,683	43,623	3.31	109.79
2030	22,114	44,244	3.39	112.24
2031	22,557	44,896	3.47	114.76
2032	23,002	45,575	3.56	117.38
2033	23,448	46,260	3.64	120.05
2034	23,927	46,962	3.73	122.79
2035	24,411	47,662	3.82	125.60
2036	24,901	48,369	3.91	128.48
2037	25,392	49,102	4.01	131.44
Avg Annual Growth				
2010-16	2.0%	1.6%	1.6%	-10.2%
2016-17	2.1%	2.0%	2.4%	19.8%
2016-26	2.1%	1.7%	2.6%	9.9%
2016-37	2.1%	1.6%	2.5%	5.9%

Source: IHS Global Insight

TABLE 3
INTERNATIONAL GDP FORECASTS BY TRAVEL REGION

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 2010 U.S. Dollars)					WORLD
	CANADA	EUROPE / AFRICA/ MIDDLE EAST	LATIN AMERICA / CARIBBEAN / MEXICO	JAPAN / PACIFIC BASIN / CHINA / OTHER ASIA / AUSTRALIA / NEW ZEALAND		
<u>Historical</u>						
2010	1,614	25,032	5,201	19,001	65,811	
2011	1,664	25,651	5,430	19,896	67,844	
2012	1,693	25,854	5,578	20,838	69,504	
2013	1,735	26,088	5,737	21,854	71,226	
2014	1,780	26,579	5,797	22,808	73,140	
2015	1,796	27,052	5,773	23,819	75,037	
2016E	1,820	27,501	5,711	24,851	76,739	
<u>Forecast</u>						
2017	1,858	27,974	5,778	25,928	78,779	
2018	1,902	28,540	5,909	27,064	81,110	
2019	1,945	29,137	6,092	28,252	83,527	
2020	1,984	29,774	6,296	29,473	86,004	
2021	2,026	30,447	6,489	30,802	88,642	
2022	2,067	31,137	6,694	32,195	91,384	
2023	2,109	31,831	6,902	33,629	94,165	
2024	2,150	32,530	7,122	35,109	96,994	
2025	2,192	33,234	7,344	36,608	99,832	
2026	2,236	33,930	7,578	38,137	102,713	
2027	2,279	34,639	7,818	39,684	105,659	
2028	2,322	35,353	8,064	41,232	108,641	
2029	2,365	36,071	8,316	42,791	111,643	
2030	2,409	36,802	8,576	44,350	114,677	
2031	2,454	37,539	8,843	45,898	117,725	
2032	2,500	38,284	9,119	47,447	120,792	
2033	2,547	39,040	9,403	49,019	123,910	
2034	2,595	39,806	9,697	50,609	127,097	
2035	2,645	40,584	10,001	52,240	130,353	
2036	2,696	41,376	10,313	53,914	133,678	
2037	2,748	42,186	10,635	55,623	137,073	
Avg Annual Growth						
2010-16	2.0%	1.6%	1.6%	4.6%	2.6%	
2016-17	2.1%	1.7%	1.2%	4.3%	2.7%	
2016-26	2.1%	2.1%	2.9%	4.4%	3.0%	
2016-37	2.0%	2.1%	3.0%	3.9%	2.8%	

Source: Global Insight website, GDP Components Tables (Interim Forecast, Monthly)

TABLE 4

INTERNATIONAL GDP FORECASTS – SELECTED AREAS/COUNTRIES

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 2010 U.S. Dollars)			
	NORTH AMERICA (NAFTA)	EUROZONE	UNITED KINGDOM	JAPAN CHINA
<u>Historical</u>				
2010	17,629	12,645	2,431	5,713 6,085
2011	17,962	12,846	2,468	5,708 6,668
2012	18,371	12,736	2,500	5,793 7,190
2013	18,692	12,708	2,548	5,910 7,748
2014	19,137	12,858	2,626	5,925 8,314
2015	19,605	13,106	2,684	5,999 8,890
2016E	19,914	13,326	2,740	6,058 9,485
<u>Forecast</u>				
2017	20,362	13,516	2,776	6,120 10,089
2018	20,889	13,732	2,809	6,176 10,717
2019	21,375	13,932	2,852	6,219 11,370
2020	21,830	14,124	2,904	6,230 12,062
2021	22,313	14,333	2,970	6,290 12,787
2022	22,809	14,550	3,039	6,351 13,557
2023	23,297	14,767	3,107	6,418 14,355
2024	23,771	14,984	3,173	6,483 15,191
2025	24,230	15,197	3,239	6,545 16,036
2026	24,700	15,409	3,306	6,607 16,896
2027	25,201	15,620	3,375	6,666 17,765
2028	25,725	15,832	3,444	6,722 18,621
2029	26,248	16,045	3,514	6,779 19,468
2030	26,786	16,258	3,584	6,833 20,302
2031	27,335	16,472	3,656	6,885 21,116
2032	27,888	16,685	3,730	6,936 21,911
2033	28,453	16,898	3,805	6,987 22,707
2034	29,050	17,112	3,881	7,037 23,507
2035	29,657	17,327	3,959	7,085 24,326
2036	30,270	17,541	4,038	7,133 25,166
2037	30,894	17,758	4,119	7,178 26,019
Avg Annual Growth				
2010-16	2.1%	0.9%	2.0%	1.0% 7.7%
2016-17	2.2%	1.4%	1.3%	1.0% 6.4%
2016-26	2.2%	1.5%	1.9%	0.9% 5.9%
2016-37	2.1%	1.4%	2.0%	0.8% 4.9%

Source: Global Insight website, GDP Components Tables (Interim Forecast, Monthly)

TABLE 5

U.S. COMMERCIAL AIR CARRIERS¹

TOTAL SCHEDULED U.S. PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
<u>Historical</u>						
2010	635	77	712	555	231	786
2011	650	81	731	572	242	815
2012	654	83	737	578	245	822
2013	654	85	739	584	250	834
2014	669	88	757	600	257	857
2015	696	90	786	629	261	890
2016E	726	93	820	663	265	928
<u>Forecast</u>						
2017	742	96	838	684	270	954
2018	762	99	861	705	281	986
2019	783	103	886	726	292	1,018
2020	794	107	901	738	304	1,042
2021	805	111	916	750	316	1,066
2022	815	115	931	762	327	1,090
2023	826	119	946	774	339	1,114
2024	838	124	962	788	351	1,139
2025	851	128	979	802	363	1,165
2026	863	132	996	816	375	1,191
2027	877	137	1,014	831	387	1,218
2028	892	142	1,034	848	400	1,248
2029	907	147	1,054	864	413	1,277
2030	921	151	1,073	880	426	1,306
2031	937	156	1,093	897	439	1,336
2032	953	161	1,114	915	453	1,367
2033	968	167	1,135	932	466	1,399
2034	985	172	1,158	951	481	1,432
2035	1,002	178	1,180	970	495	1,465
2036	1,019	184	1,203	989	510	1,499
2037	1,037	190	1,227	1,009	525	1,534
Avg Annual Growth						
2010-16	2.3%	3.2%	2.4%	3.0%	2.3%	2.8%
2016-17	2.2%	2.3%	2.2%	3.2%	1.9%	2.8%
2016-26	1.7%	3.6%	2.0%	2.1%	3.5%	2.5%
2016-37	1.7%	3.4%	1.9%	2.0%	3.3%	2.4%

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

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

TABLE 6

U.S. COMMERCIAL AIR CARRIERS¹
SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL			SYSTEM		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
<u>Historical</u>									
2010	679	555	81.7	281	231	82.1	961	786	81.8
2011	693	572	82.5	300	242	80.7	994	815	82.0
2012	694	578	83.2	300	245	81.4	995	822	82.6
2013	700	584	83.4	303	250	82.6	1,003	834	83.2
2014	711	600	84.4	315	257	81.4	1,026	857	83.5
2015	744	629	84.5	323	261	80.7	1,067	890	83.4
2016E	783	663	84.7	329	265	80.6	1,112	928	83.5
<u>Forecast</u>									
2017	813	684	84.1	334	270	80.9	1,147	954	83.2
2018	835	705	84.4	347	281	80.9	1,182	986	83.4
2019	857	726	84.7	361	292	81.0	1,218	1,018	83.6
2020	870	738	84.9	375	304	81.1	1,245	1,042	83.7
2021	882	750	85.1	389	316	81.1	1,271	1,066	83.9
2022	894	762	85.2	403	327	81.2	1,297	1,090	84.0
2023	907	774	85.4	417	339	81.3	1,324	1,114	84.1
2024	921	788	85.5	432	351	81.3	1,353	1,139	84.2
2025	936	802	85.6	446	363	81.3	1,383	1,165	84.2
2026	952	816	85.7	461	375	81.3	1,413	1,191	84.3
2027	968	831	85.8	476	387	81.3	1,444	1,218	84.3
2028	987	848	85.9	492	400	81.3	1,479	1,248	84.4
2029	1,005	864	86.0	508	413	81.3	1,513	1,277	84.4
2030	1,023	880	86.0	524	426	81.3	1,547	1,306	84.4
2031	1,042	897	86.1	540	439	81.3	1,582	1,336	84.5
2032	1,062	915	86.2	557	453	81.3	1,618	1,367	84.5
2033	1,082	932	86.2	574	466	81.3	1,655	1,399	84.5
2034	1,103	951	86.2	591	481	81.3	1,694	1,432	84.5
2035	1,124	970	86.3	609	495	81.3	1,733	1,465	84.5
2036	1,146	989	86.3	627	510	81.3	1,773	1,499	84.6
2037	1,169	1,009	86.4	646	525	81.3	1,814	1,534	84.6
Avg Annual Growth									
2010-16	2.4%	3.0%		2.6%	2.3%		2.5%	2.8%	
2016-17	3.9%	3.2%		1.5%	1.9%		3.2%	2.8%	
2016-26	2.0%	2.1%		3.4%	3.5%		2.4%	2.5%	
2016-37	1.9%	2.0%		3.3%	3.3%		2.4%	2.4%	

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

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

TABLE 7

U.S. COMMERCIAL AIR CARRIERS¹

TOTAL SCHEDULED U.S. INTERNATIONAL PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS				REVENUE PASSENGER MILES			
	ATLANTIC (Mfl)	LATIN AMERICA (Mfl)	PACIFIC (Mfl)	TOTAL INTERNATIONAL (Mfl)	ATLANTIC (Bil)	LATIN AMERICA (Bil)	PACIFIC (Bil)	TOTAL INTERNATIONAL (Bil)
<u>Historical</u>								
2010	25	40	13	77	109	63	59	231
2011	25	42	14	81	112	67	64	242
2012	25	44	14	83	108	70	66	245
2013	25	46	14	85	107	75	69	250
2014	25	49	14	88	108	80	69	257
2015	25	52	14	90	107	83	71	261
2016E	24	55	14	93	105	87	73	265
<u>Forecast</u>								
2017	24	57	14	96	105	88	77	270
2018	25	59	15	99	110	92	79	281
2019	26	61	15	103	115	97	81	292
2020	27	64	16	107	119	102	83	304
2021	28	67	16	111	123	107	85	316
2022	29	70	16	115	127	112	88	327
2023	30	73	17	119	131	117	90	339
2024	30	76	17	124	135	123	93	351
2025	31	79	18	128	139	128	95	363
2026	32	82	18	132	143	134	98	375
2027	33	86	19	137	147	140	101	387
2028	33	89	19	142	150	146	103	400
2029	34	93	20	147	154	152	106	413
2030	35	96	20	151	158	159	109	426
2031	36	100	21	156	162	165	112	439
2032	37	104	21	161	166	172	114	453
2033	37	108	21	167	171	179	117	466
2034	38	112	22	172	175	186	120	481
2035	39	116	23	178	179	193	123	495
2036	40	120	23	184	183	201	126	510
2037	41	125	24	190	188	209	129	525
Avg Annual Growth								
2010-16	-0.1%	5.5%	1.4%	3.2%	-0.6%	5.6%	3.5%	2.3%
2016-17	-0.3%	3.4%	2.8%	2.3%	0.1%	1.1%	5.4%	1.9%
2016-26	2.7%	4.1%	2.6%	3.6%	3.2%	4.4%	3.0%	3.5%
2016-37	2.5%	4.0%	2.5%	3.4%	2.8%	4.2%	2.8%	3.3%

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

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

TABLE 8

U.S. AND FOREIGN FLAG CARRIERS

TOTAL PASSENGER TRAFFIC TO/FROM THE UNITED STATES

CALENDAR YEAR	TOTAL PASSENGERS BY WORLD TRAVEL AREA (Millions)					TOTAL
	ATLANTIC	LATIN AMERICA	PACIFIC	U.S./CANADA TRANSBORDER		
<u>Historical</u>						
2010	56	53	27	22	157	
2011	58	57	28	23	166	
2012	61	61	31	25	178	
2013	63	65	32	26	185	
2014	66	69	34	28	197	
2015	70	75	36	27	207	
2016E	73	79	39	27	219	
<u>Forecast</u>						
2017	77	83	41	28	229	
2018	79	84	43	30	235	
2019	82	86	44	31	243	
2020	86	89	46	32	252	
2021	89	92	48	33	262	
2022	92	96	50	34	273	
2023	96	99	53	35	283	
2024	99	103	55	37	294	
2025	103	108	57	38	305	
2026	106	112	59	39	316	
2027	110	117	62	40	328	
2028	113	122	64	42	340	
2029	117	127	66	43	353	
2030	121	132	69	44	366	
2031	124	138	71	46	379	
2032	128	143	73	47	392	
2033	132	149	76	49	406	
2034	136	156	78	51	421	
2035	140	163	80	52	436	
2036	145	170	83	54	451	
2037	149	177	85	56	467	
Avg Annual Growth						
2010-16	4.6%	6.8%	6.6%	3.8%	5.6%	
2016-17	4.6%	5.2%	4.4%	3.8%	4.7%	
2016-26	3.7%	3.6%	4.3%	3.6%	3.8%	
2016-37	3.4%	3.9%	3.8%	3.5%	3.7%	

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 ASSUMPTIONS¹

SEATS PER AIRCRAFT MILE AND PASSENGER TRIP LENGTH

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT MILE			AVERAGE PASSENGER TRIP LENGTH		
	DOMESTIC (Seats/Mile)	INTERNATIONAL (Seats/Mile)	SYSTEM (Seats/Mile)	DOMESTIC (Miles)	INTERNATIONAL (Miles)	SYSTEM (Miles)
<u>Historical</u>						
2010	121.8	216.4	139.7	874.8	2,988.0	1,104.2
2011	122.5	216.8	141.1	880.1	2,992.7	1,114.2
2012	123.4	213.9	141.5	883.6	2,949.6	1,116.1
2013	124.9	214.4	143.0	893.6	2,942.1	1,129.5
2014	127.4	214.8	145.6	897.0	2,917.0	1,131.8
2015	131.5	214.8	149.0	902.7	2,892.3	1,131.0
2016E	134.6	214.8	151.3	913.2	2,833.7	1,132.2
<u>Forecast</u>						
2017	136.2	215.7	152.6	922.3	2,821.8	1,139.1
2018	137.1	216.3	153.6	924.7	2,836.0	1,144.6
2019	138.0	216.6	154.6	927.2	2,838.7	1,149.6
2020	138.7	216.9	155.6	929.8	2,838.7	1,156.5
2021	139.4	217.2	156.5	932.3	2,839.4	1,163.7
2022	140.0	217.5	157.4	934.8	2,839.4	1,170.8
2023	140.6	217.8	158.2	937.3	2,840.0	1,177.7
2024	141.2	218.1	159.1	939.9	2,836.4	1,184.0
2025	141.7	218.4	159.8	942.4	2,833.6	1,189.8
2026	142.2	218.7	160.6	944.9	2,829.7	1,195.7
2027	142.8	219.0	161.3	947.5	2,825.6	1,201.4
2028	143.3	219.3	162.0	950.1	2,821.3	1,206.6
2029	143.9	219.6	162.7	952.6	2,817.5	1,211.9
2030	144.4	219.9	163.4	955.2	2,813.1	1,217.4
2031	144.9	220.2	164.0	957.7	2,808.7	1,222.5
2032	145.4	220.5	164.7	960.3	2,804.5	1,227.5
2033	145.9	220.8	165.3	962.8	2,797.8	1,232.3
2034	146.4	221.1	166.0	965.4	2,790.4	1,236.9
2035	146.9	221.4	166.6	967.9	2,783.3	1,241.6
2036	147.4	221.7	167.2	970.5	2,776.4	1,246.3
2037	147.9	222.0	167.8	973.1	2,769.9	1,250.8

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

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

TABLE 10

U. S. MAINLINE AIR CARRIERS
SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	SYSTEM	DOMESTIC	INTERNATIONAL	SYSTEM
<u>Historical</u>						
2010	473	75	548	480	230	710
2011	488	79	567	497	241	738
2012	495	80	575	503	243	746
2013	498	82	580	511	248	759
2014	515	85	600	527	255	782
2015	543	87	630	556	259	815
2016E	575	90	665	590	262	852
<u>Forecast</u>						
2017	589	92	681	611	267	878
2018	606	95	701	629	278	907
2019	622	99	721	648	290	937
2020	631	103	734	659	301	960
2021	639	107	747	669	313	982
2022	648	111	759	680	325	1,004
2023	657	116	772	691	336	1,027
2024	666	120	786	702	348	1,050
2025	676	124	800	715	360	1,075
2026	686	128	815	727	372	1,099
2027	697	133	830	740	384	1,125
2028	709	137	847	755	397	1,152
2029	721	142	863	770	410	1,179
2030	733	147	880	784	423	1,207
2031	745	152	897	799	436	1,235
2032	757	157	914	815	449	1,264
2033	770	162	932	830	463	1,293
2034	783	168	951	847	477	1,324
2035	797	173	970	864	491	1,355
2036	811	179	989	881	506	1,387
2037	825	185	1,009	898	521	1,419
Avg Annual Growth						
2010-16	3.3%	3.2%	3.3%	3.5%	2.2%	3.1%
2016-17	2.6%	2.4%	2.6%	3.5%	1.9%	3.0%
2016-26	1.8%	3.6%	2.1%	2.1%	3.6%	2.6%
2016-37	1.7%	3.5%	2.0%	2.0%	3.3%	2.5%

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

TABLE 11

U.S. MAINLINE AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL			SYSTEM		
	ASMs (BIL)	RPMS (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMS (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMS (BIL)	% LOAD FACTOR
<u>Historical</u>									
2010	581	480	82.7	279	230	82.2	860	710	82.5
2011	594	497	83.6	299	241	80.8	893	738	82.6
2012	599	503	84.1	298	243	81.5	897	746	83.2
2013	607	511	84.2	301	248	82.6	907	759	83.7
2014	620	527	85.0	313	255	81.4	933	782	83.8
2015	653	556	85.1	321	259	80.8	973	815	83.7
2016E	692	590	85.3	325	262	80.7	1,017	852	83.8
<u>Forecast</u>									
2017	722	611	84.6	330	267	80.9	1,052	878	83.5
2018	741	629	84.9	344	278	81.0	1,085	907	83.7
2019	761	648	85.1	357	290	81.0	1,118	937	83.8
2020	772	659	85.4	371	301	81.1	1,143	960	84.0
2021	782	669	85.6	385	313	81.2	1,167	982	84.1
2022	793	680	85.7	399	325	81.3	1,192	1,004	84.2
2023	804	691	85.9	413	336	81.4	1,218	1,027	84.3
2024	817	702	86.0	428	348	81.4	1,244	1,050	84.4
2025	830	715	86.1	442	360	81.4	1,272	1,075	84.5
2026	843	727	86.2	457	372	81.4	1,300	1,099	84.5
2027	858	740	86.3	472	384	81.4	1,330	1,125	84.6
2028	874	755	86.4	488	397	81.4	1,362	1,152	84.6
2029	890	770	86.5	503	410	81.4	1,394	1,179	84.6
2030	906	784	86.5	519	423	81.4	1,425	1,207	84.7
2031	923	799	86.6	535	436	81.4	1,458	1,235	84.7
2032	940	815	86.7	552	449	81.4	1,492	1,264	84.7
2033	958	830	86.7	569	463	81.4	1,526	1,293	84.7
2034	976	847	86.8	586	477	81.4	1,562	1,324	84.7
2035	995	864	86.8	604	491	81.4	1,599	1,355	84.8
2036	1,014	881	86.8	622	506	81.4	1,636	1,387	84.8
2037	1,034	898	86.9	640	521	81.4	1,674	1,419	84.8
Avg Annual Growth									
2010-16	3.0%	3.5%		2.6%	2.2%	-0.3%	2.8%	3.1%	3.1%
2016-17	4.3%	3.5%		1.6%	1.9%	0.4%	3.4%	3.0%	3.0%
2016-26	2.0%	2.1%		3.5%	3.6%	0.1%	2.5%	2.6%	2.6%
2016-37	1.9%	2.0%		3.3%	3.3%	0.0%	2.4%	2.5%	2.5%

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

TABLE 12

U.S. MAINLINE AIR CARRIERS

SCHEDULED INTERNATIONAL PASSENGER ENPLANEMENTS

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (MIL)			TOTAL
	ATLANTIC	LATIN AMERICA	PACIFIC	
<u>Historical</u>				
2010	24.5	37.2	12.9	74.6
2011	25.3	39.8	13.5	78.6
2012	24.8	41.0	14.0	79.9
2013	24.8	43.0	14.4	82.2
2014	25.0	46.2	14.0	85.1
2015	24.6	48.6	14.0	87.2
2016E	24.4	51.5	14.0	89.9
<u>Forecast</u>				
2017	24.3	53.3	14.4	92.1
2018	25.5	55.1	14.8	95.4
2019	26.4	57.7	15.2	99.3
2020	27.2	60.4	15.6	103.2
2021	28.1	63.2	16.0	107.3
2022	28.9	66.1	16.4	111.4
2023	29.7	69.0	16.8	115.5
2024	30.4	72.1	17.3	119.8
2025	31.1	75.1	17.7	124.0
2026	31.9	78.3	18.2	128.3
2027	32.6	81.6	18.6	132.9
2028	33.4	85.0	19.1	137.5
2029	34.2	88.4	19.6	142.2
2030	35.0	91.9	20.1	147.0
2031	35.8	95.5	20.5	151.9
2032	36.6	99.2	21.0	156.8
2033	37.4	103.1	21.5	162.1
2034	38.3	107.2	22.0	167.5
2035	39.2	111.4	22.5	173.1
2036	40.2	115.6	23.0	178.8
2037	41.1	119.9	23.6	184.6
<u>Avg Annual Growth</u>				
2010-16	-0.1%	5.6%	1.4%	3.2%
2016-17	-0.3%	3.6%	2.8%	2.4%
2016-26	2.7%	4.3%	2.6%	3.6%
2016-37	2.5%	4.1%	2.5%	3.5%

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

FISCAL YEAR	ATLANTIC			LATIN AMERICA			PACIFIC			INTERNATIONAL		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
<u>Historical</u>												
2010	131	109	82.9	78	62	79.2	70	59	84.1	279	230	82.2
2011	138	112	80.7	82	66	79.9	78	64	81.8	299	241	80.8
2012	132	108	81.5	85	68	80.9	81	66	82.0	298	243	81.5
2013	128	107	83.3	90	73	81.1	83	69	83.1	301	248	82.6
2014	132	108	81.7	97	78	80.6	84	69	82.0	313	255	81.4
2015	133	107	80.0	101	81	80.3	86	71	82.5	321	259	80.8
2016E	134	105	78.0	104	85	81.4	87	73	83.9	325	262	80.7
<u>Forecast</u>												
2017	133	105	78.9	105	86	81.6	92	77	83.2	330	267	80.9
2018	140	110	79.0	109	89	81.6	95	79	83.2	344	278	81.0
2019	145	115	79.2	115	94	81.6	97	81	83.2	357	290	81.0
2020	150	119	79.4	121	99	81.6	100	83	83.2	371	301	81.1
2021	155	123	79.6	127	104	81.6	103	85	83.2	385	313	81.2
2022	160	127	79.8	134	109	81.6	106	88	83.2	399	325	81.3
2023	164	131	80.0	140	115	81.6	109	90	83.2	413	336	81.4
2024	169	135	80.0	147	120	81.6	112	93	83.2	428	348	81.4
2025	174	139	80.0	154	125	81.6	115	95	83.2	442	360	81.4
2026	178	143	80.0	161	131	81.6	118	98	83.2	457	372	81.4
2027	183	147	80.0	168	137	81.6	121	101	83.2	472	384	81.4
2028	188	150	80.0	175	143	81.6	124	103	83.2	488	397	81.4
2029	193	154	80.0	183	149	81.6	128	106	83.2	503	410	81.4
2030	198	158	80.0	190	155	81.6	131	109	83.2	519	423	81.4
2031	203	162	80.0	198	162	81.6	134	112	83.2	535	436	81.4
2032	208	166	80.0	207	168	81.6	137	114	83.2	552	449	81.4
2033	213	171	80.0	215	175	81.6	141	117	83.2	569	463	81.4
2034	218	175	80.0	224	182	81.6	144	120	83.2	586	477	81.4
2035	224	179	80.0	233	190	81.6	148	123	83.2	604	491	81.4
2036	229	183	80.0	242	197	81.6	151	126	83.2	622	506	81.4
2037	235	188	80.0	251	205	81.6	155	129	83.2	640	521	81.4
Avg Annual Growth												
2010-16	0.4%	-0.6%		4.9%	5.4%		3.7%	3.6%		2.6%	2.2%	
2016-17	-0.9%	-0.2%		1.3%	1.0%		5.8%	4.9%		1.6%	1.9%	
2016-26	2.9%	3.1%		4.4%	4.4%		3.1%	3.0%		3.5%	3.6%	
2016-37	2.7%	2.8%		4.3%	4.3%		2.8%	2.7%		3.3%	3.3%	

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

TABLE 14

U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS

SEATS PER AIRCRAFT MILE

FISCAL YEAR	DOMESTIC (Seats/Mile)	INTERNATIONAL				TOTAL (Seats/Mile)	SYSTEM (Seats/Mile)
		ATLANTIC (Seats/Mile)	LATIN AMERICA (Seats/Mile)	PACIFIC (Seats/Mile)			
<u>Historical</u>							
2010	152.0	231.7	171.7	287.2	220.9	169.2	
2011	152.3	230.5	173.2	282.9	221.0	170.0	
2012	152.7	230.4	171.8	278.3	219.4	169.9	
2013	153.9	233.3	171.8	276.2	219.2	170.8	
2014	155.5	236.1	173.0	276.2	219.7	172.4	
2015	157.7	237.0	173.9	272.1	219.5	173.8	
2016E	159.8	241.7	174.1	266.6	219.8	175.1	
<u>Forecast</u>							
2017	160.4	242.2	174.6	267.3	220.6	175.4	
2018	161.1	242.7	175.1	268.1	221.1	176.2	
2019	161.7	243.2	175.6	268.8	221.4	176.9	
2020	162.3	243.7	176.1	269.6	221.5	177.7	
2021	162.9	244.2	176.6	270.3	221.7	178.5	
2022	163.5	244.7	177.1	271.1	221.9	179.3	
2023	164.0	245.2	177.6	271.8	222.1	180.0	
2024	164.6	245.7	178.1	272.6	222.3	180.7	
2025	165.1	246.2	178.6	273.3	222.6	181.4	
2026	165.6	246.7	179.1	274.1	222.8	182.0	
2027	166.1	247.2	179.6	274.8	223.1	182.6	
2028	166.6	247.7	180.1	275.6	223.3	183.2	
2029	167.0	248.2	180.6	276.3	223.5	183.8	
2030	167.5	248.7	181.1	277.1	223.8	184.4	
2031	167.9	249.2	181.6	277.8	224.0	184.9	
2032	168.3	249.7	182.1	278.6	224.3	185.4	
2033	168.7	250.2	182.6	279.3	224.5	185.9	
2034	169.1	250.7	183.1	280.1	224.8	186.4	
2035	169.5	251.2	183.6	280.8	225.0	187.0	
2036	169.9	251.7	184.1	281.6	225.3	187.5	
2037	170.4	252.2	184.6	282.3	225.6	188.0	

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

TABLE 15
U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS
AVERAGE PASSENGER TRIP LENGTH

FISCAL YEAR	DOMESTIC (Miles)	INTERNATIONAL				TOTAL (Miles)	SYSTEM (Miles)
		ATLANTIC (Miles)	LATINAMERICA (Miles)	PACIFIC (Miles)			
<u>Historical</u>							
2010	1,015	4,433	1,660	4,587	3,077	1,296	
2011	1,017	4,415	1,655	4,707	3,068	1,301	
2012	1,017	4,356	1,668	4,725	3,040	1,298	
2013	1,026	4,313	1,693	4,774	3,023	1,309	
2014	1,024	4,321	1,696	4,910	2,993	1,303	
2015	1,023	4,336	1,669	5,080	2,969	1,292	
2016E	1,027	4,291	1,650	5,176	2,917	1,283	
<u>Forecast</u>							
2017	1,036	4,311	1,611	5,303	2,903	1,288	
2018	1,039	4,332	1,619	5,316	2,917	1,294	
2019	1,041	4,354	1,627	5,328	2,919	1,300	
2020	1,044	4,376	1,635	5,340	2,917	1,307	
2021	1,047	4,393	1,644	5,351	2,915	1,315	
2022	1,049	4,411	1,652	5,362	2,913	1,323	
2023	1,052	4,428	1,660	5,372	2,912	1,330	
2024	1,054	4,446	1,664	5,381	2,907	1,337	
2025	1,057	4,464	1,668	5,391	2,902	1,343	
2026	1,060	4,477	1,673	5,399	2,897	1,349	
2027	1,062	4,491	1,677	5,407	2,891	1,355	
2028	1,065	4,504	1,681	5,415	2,886	1,361	
2029	1,068	4,518	1,685	5,422	2,880	1,366	
2030	1,070	4,527	1,689	5,428	2,875	1,372	
2031	1,073	4,536	1,694	5,434	2,869	1,377	
2032	1,076	4,545	1,698	5,440	2,864	1,382	
2033	1,078	4,554	1,699	5,445	2,856	1,387	
2034	1,081	4,559	1,701	5,449	2,847	1,392	
2035	1,084	4,563	1,703	5,453	2,839	1,397	
2036	1,087	4,568	1,705	5,456	2,831	1,402	
2037	1,089	4,572	1,706	5,459	2,823	1,406	

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

TABLE 16
U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS
PASSENGER YIELDS

FISCAL YEAR	REVENUE PER PASSENGER MILE									
	DOMESTIC				INTERNATIONAL				SYSTEM	
	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)
<u>Historical</u>										
2010	12.62	13.87	12.84	14.11	12.69	13.95				
2011	13.62	14.59	14.09	15.09	13.77	14.75				
2012	14.08	14.73	14.74	15.41	14.30	14.95				
2013	14.42	14.83	14.80	15.23	14.54	14.96				
2014	15.11	15.30	14.94	15.12	15.06	15.24				
2015	14.79	14.93	14.16	14.29	14.59	14.72				
2016E	13.96	13.96	12.88	12.88	13.62	13.62				
<u>Forecast</u>										
2017	14.03	13.70	13.08	12.78	13.74	13.42				
2018	14.29	13.68	13.28	12.71	13.98	13.38				
2019	14.68	13.72	13.51	12.63	14.32	13.39				
2020	15.13	13.78	13.79	12.56	14.71	13.40				
2021	15.58	13.82	14.07	12.48	15.10	13.39				
2022	16.02	13.84	14.36	12.41	15.49	13.38				
2023	16.47	13.84	14.67	12.33	15.88	13.35				
2024	16.90	13.82	14.98	12.25	16.26	13.30				
2025	17.32	13.79	15.29	12.17	16.64	13.25				
2026	17.72	13.74	15.60	12.10	17.00	13.19				
2027	18.09	13.68	15.90	12.02	17.35	13.11				
2028	18.42	13.60	16.19	11.95	17.65	13.03				
2029	18.74	13.52	16.47	11.88	17.95	12.95				
2030	19.07	13.43	16.76	11.81	18.26	12.86				
2031	19.41	13.35	17.07	11.74	18.58	12.78				
2032	19.76	13.27	17.37	11.67	18.91	12.70				
2033	20.11	13.19	17.67	11.59	19.24	12.62				
2034	20.47	13.11	17.99	11.52	19.58	12.54				
2035	20.84	13.03	18.30	11.44	19.92	12.45				
2036	21.21	12.95	18.62	11.37	20.27	12.37				
2037	21.59	12.87	18.95	11.30	20.62	12.29				
Avg Annual Growth										
2010-16	1.7%	0.1%	0.1%	-1.5%	1.2%	-0.4%				
2016-17	0.5%	-1.8%	1.6%	-0.8%	0.9%	-1.5%				
2016-26	2.4%	-0.2%	1.9%	-0.6%	2.2%	-0.3%				
2016-37	2.1%	-0.4%	1.9%	-0.6%	2.0%	-0.5%				

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

TABLE 17

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

FISCAL YEAR	REVENUE PER PASSENGER MILE									
	ATLANTIC		LATIN AMERICA		PACIFIC		TOTAL INTERNATIONAL			
	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)
<u>Historical</u>										
2010	12.73	14.00	13.33	14.65	12.50	13.74	12.84	14.11	12.84	14.11
2011	13.48	14.44	15.13	16.21	14.07	15.07	14.09	15.09	14.09	15.09
2012	13.95	14.58	15.79	16.51	14.95	15.63	14.74	15.41	14.74	15.41
2013	14.45	14.86	15.80	16.25	14.30	14.71	14.80	15.23	14.80	15.23
2014	14.84	15.02	15.76	15.96	14.15	14.32	14.94	15.12	14.94	15.12
2015	14.64	14.77	14.38	14.51	13.20	13.32	14.16	14.29	14.16	14.29
2016E	13.83	13.83	12.72	12.72	11.69	11.69	12.88	12.88	12.88	12.88
<u>Forecast</u>										
2017	14.08	13.76	12.90	12.60	11.90	11.62	13.08	12.78	13.08	12.78
2018	14.31	13.69	13.07	12.51	12.09	11.57	13.28	12.71	13.28	12.71
2019	14.57	13.62	13.27	12.40	12.30	11.50	13.51	12.63	13.51	12.63
2020	14.88	13.55	13.51	12.30	12.56	11.44	13.79	12.56	13.79	12.56
2021	15.20	13.49	13.76	12.20	12.82	11.37	14.07	12.48	14.07	12.48
2022	15.53	13.42	14.01	12.11	13.09	11.31	14.36	12.41	14.36	12.41
2023	15.88	13.35	14.29	12.01	13.38	11.25	14.67	12.33	14.67	12.33
2024	16.24	13.28	14.56	11.91	13.67	11.19	14.98	12.25	14.98	12.25
2025	16.60	13.22	14.83	11.81	13.98	11.13	15.29	12.17	15.29	12.17
2026	16.96	13.15	15.11	11.72	14.28	11.07	15.60	12.10	15.60	12.10
2027	17.31	13.09	15.37	11.62	14.58	11.02	15.90	12.02	15.90	12.02
2028	17.64	13.02	15.62	11.54	14.85	10.96	16.19	11.95	16.19	11.95
2029	17.96	12.96	15.87	11.45	15.13	10.91	16.47	11.88	16.47	11.88
2030	18.30	12.89	16.13	11.37	15.42	10.86	16.76	11.81	16.76	11.81
2031	18.64	12.83	16.42	11.29	15.72	10.81	17.07	11.74	17.07	11.74
2032	19.00	12.76	16.67	11.20	16.02	10.76	17.37	11.67	17.37	11.67
2033	19.36	12.70	16.93	11.10	16.34	10.71	17.67	11.59	17.67	11.59
2034	19.73	12.63	17.19	11.01	16.65	10.66	17.99	11.52	17.99	11.52
2035	20.11	12.57	17.45	10.91	16.98	10.62	18.30	11.44	18.30	11.44
2036	20.49	12.51	17.72	10.82	17.31	10.57	18.62	11.37	18.62	11.37
2037	20.88	12.45	18.00	10.73	17.64	10.52	18.95	11.30	18.95	11.30
Avg Annual Growth										
2010-16	1.4%	-0.2%	-0.8%	-2.3%	-1.1%	-2.7%	0.1%	-1.5%	0.1%	-1.5%
2016-17	1.8%	-0.5%	1.5%	-0.9%	1.8%	-0.6%	1.6%	-0.8%	1.6%	-0.8%
2016-26	2.1%	-0.5%	1.7%	-0.8%	2.0%	-0.5%	1.9%	-0.6%	1.9%	-0.6%
2016-37	2.0%	-0.5%	1.7%	-0.8%	2.0%	-0.5%	1.9%	-0.6%	1.9%	-0.6%

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

TABLE 18

U.S. MAINLINE AIR CARRIER FORECAST ASSUMPTIONS
JET FUEL PRICES

FISCAL YEAR	DOMESTIC		INTERNATIONAL		SYSTEM	
	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)	CURRENT \$ (Cents)	FY 2016 \$ (Cents)
<u>Historical</u>						
2010	219.16	240.87	220.12	241.93	219.49	241.23
2011	289.32	309.89	288.10	308.58	288.87	309.41
2012	314.56	328.93	309.52	323.66	312.64	326.92
2013	308.91	317.82	299.39	308.03	305.24	314.05
2014	300.70	304.44	292.56	296.21	297.61	301.31
2015	207.29	209.21	211.77	213.73	208.96	210.90
2016E	146.17	146.17	147.01	147.01	146.47	146.47
<u>Forecast</u>						
2017	157.22	153.58	158.13	154.47	157.55	153.90
2018	179.11	171.39	180.14	172.38	179.47	171.75
2019	202.66	189.45	203.82	190.54	203.07	189.84
2020	227.59	207.29	228.90	208.48	228.06	207.71
2021	257.83	228.69	259.32	230.00	258.36	229.16
2022	284.91	246.13	286.55	247.54	285.50	246.63
2023	309.63	260.25	311.41	261.74	310.27	260.78
2024	338.22	276.67	340.17	278.26	338.92	277.24
2025	362.44	288.61	364.52	290.27	363.19	289.21
2026	377.05	292.43	379.21	294.11	377.82	293.03
2027	387.25	292.77	389.48	294.45	388.05	293.37
2028	396.44	292.70	398.72	294.38	397.26	293.30
2029	405.38	292.39	407.71	294.07	406.21	292.99
2030	414.46	292.01	416.84	293.69	415.31	292.61
2031	423.84	291.58	426.28	293.25	424.71	292.18
2032	433.49	291.17	435.98	292.84	434.38	291.77
2033	443.37	290.79	445.92	292.46	444.28	291.39
2034	453.53	290.41	456.14	292.08	454.46	291.01
2035	463.93	290.08	466.59	291.74	464.88	290.67
2036	474.55	289.73	477.28	291.40	475.53	290.33
2037	485.46	289.42	488.25	291.08	486.46	290.01
Avg Annual Growth						
2010-16	-6.5%	-8.0%	-6.5%	-8.0%	-6.5%	-8.0%
2016-17	7.6%	5.1%	7.6%	5.1%	7.6%	5.1%
2016-26	9.9%	7.2%	9.9%	7.2%	9.9%	7.2%
2016-37	5.9%	3.3%	5.9%	3.3%	5.9%	3.3%

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

TABLE 19

U.S. COMMERCIAL AIR CARRIERS

AIR CARGO REVENUE TON MILES^{1,2,3}

FISCAL YEAR	ALL-CARGO CARRIER RTMS (Millions)			PASSENGER CARRIER RTMS (Millions)			TOTAL RTMS (Millions)		
	DOMESTIC	INTL.	TOTAL	DOMESTIC	INTL.	TOTAL	DOMESTIC	INTL.	TOTAL
<u>Historical</u>									
2010	11,243	16,733	27,976	1,580	6,332	7,912	12,823	23,065	35,888
2011	10,601	18,980	29,581	1,446	6,250	7,696	12,047	25,230	37,277
2012	10,886	18,310	29,196	1,409	5,952	7,361	12,295	24,262	36,557
2013	10,996	16,741	27,737	1,381	5,700	7,080	12,377	22,441	34,818
2014	11,226	15,890	27,115	1,441	6,614	8,054	12,666	22,503	35,169
2015	11,636	16,008	27,643	1,453	6,704	8,157	13,089	22,712	35,801
2016E	11,851	15,687	27,538	1,469	6,476	7,944	13,320	22,163	35,483
<u>Forecast</u>									
2017	12,059	15,954	28,013	1,483	6,491	7,974	13,542	22,444	35,986
2018	12,446	16,544	28,990	1,519	6,633	8,152	13,965	23,177	37,142
2019	12,813	17,149	29,962	1,552	6,775	8,326	14,365	23,924	38,288
2020	13,013	17,776	30,788	1,563	6,919	8,483	14,576	24,695	39,271
2021	13,269	18,556	31,825	1,582	7,116	8,698	14,851	25,672	40,523
2022	13,499	19,431	32,930	1,597	7,340	8,937	15,096	26,771	41,867
2023	13,702	20,337	34,038	1,608	7,567	9,175	15,309	27,904	43,213
2024	13,842	21,255	35,096	1,611	7,789	9,400	15,453	29,044	44,497
2025	13,943	22,167	36,110	1,610	8,000	9,610	15,553	30,167	45,720
2026	13,992	23,139	37,131	1,603	8,222	9,825	15,595	31,361	46,956
2027	14,089	24,209	38,298	1,600	8,470	10,071	15,689	32,679	48,369
2028	14,287	25,357	39,644	1,610	8,734	10,343	15,897	34,091	49,988
2029	14,452	26,521	40,973	1,615	8,991	10,606	16,066	35,512	51,579
2030	14,620	27,737	42,357	1,620	9,255	10,875	16,240	36,992	53,232
2031	14,801	28,988	43,789	1,627	9,518	11,145	16,427	38,507	54,934
2032	14,966	30,266	45,232	1,631	9,778	11,409	16,597	40,045	56,642
2033	15,114	31,597	46,711	1,633	10,043	11,676	16,748	41,640	58,388
2034	15,323	33,025	48,347	1,641	10,325	11,967	16,964	43,350	60,314
2035	15,521	34,509	50,030	1,648	10,612	12,260	17,169	45,121	62,290
2036	15,716	36,044	51,760	1,655	10,900	12,554	17,371	46,943	64,314
2037	15,890	37,636	53,526	1,659	11,190	12,849	17,548	48,826	66,374
<u>Avg Annual Growth</u>									
2010-16	0.9%	-1.1%	-0.3%	-1.2%	0.4%	0.1%	0.6%	-0.7%	-0.2%
2016-17	1.8%	1.7%	1.7%	1.0%	0.2%	0.4%	1.7%	1.3%	1.4%
2016-26	1.7%	4.0%	3.0%	0.9%	2.4%	2.1%	1.6%	3.5%	2.8%
2016-37	1.4%	4.3%	3.2%	0.6%	2.6%	2.3%	1.3%	3.8%	3.0%

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

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

²Domestic 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.

³Domestic 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)
<u>Historical</u>					
2010	6,865	1,991	8,348	5,860	23,065
2011	7,236	1,832	9,105	7,057	25,230
2012	7,026	1,870	8,569	6,797	24,262
2013	6,662	1,789	8,184	5,806	22,441
2014	6,887	1,740	8,429	5,447	22,503
2015	6,669	1,639	9,021	5,383	22,712
2016E	6,601	1,566	8,761	5,253	22,181
<u>Forecast</u>					
2017	6,613	1,569	9,033	5,229	22,444
2018	6,694	1,606	9,590	5,287	23,177
2019	6,799	1,637	10,098	5,389	23,924
2020	6,927	1,659	10,580	5,529	24,695
2021	7,084	1,680	11,193	5,714	25,672
2022	7,261	1,704	11,869	5,937	26,771
2023	7,448	1,721	12,547	6,187	27,904
2024	7,642	1,732	13,205	6,465	29,044
2025	7,840	1,735	13,829	6,763	30,167
2026	8,046	1,739	14,491	7,085	31,361
2027	8,265	1,750	15,231	7,434	32,679
2028	8,495	1,765	16,028	7,804	34,091
2029	8,730	1,776	16,814	8,193	35,512
2030	8,974	1,789	17,628	8,601	36,992
2031	9,224	1,802	18,454	9,027	38,507
2032	9,480	1,813	19,281	9,470	40,045
2033	9,743	1,825	20,137	9,936	41,640
2034	10,017	1,841	21,065	10,427	43,350
2035	10,298	1,857	22,021	10,944	45,121
2036	10,586	1,872	22,997	11,489	46,943
2037	10,881	1,886	23,998	12,061	48,826
Avg Annual Growth					
2010-16	-0.7%	-3.9%	0.8%	-1.8%	-0.6%
2016-17	0.2%	0.2%	3.1%	-0.5%	1.2%
2016-26	2.0%	1.1%	5.2%	3.0%	3.5%
2016-37	2.4%	0.9%	4.9%	4.0%	3.8%

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

¹Includes freight/express and mail revenue ton miles on mainline air carriers and regionals/commuters.²Figures 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

CALENDAR YEAR	LARGE NARROWBODY		LARGE WIDEBODY				TOTAL	LARGE JETS	REGIONAL JETS	TOTAL JETS	
	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL	2 ENGINE	3 ENGINE					4 ENGINE
<u>Historical</u>											
2010	3,120	8	1	3,129	470	9	43	522	3,651	71	3,722
2011	3,127	7	1	3,135	471	7	41	519	3,654	76	3,730
2012	3,123	7	0	3,130	480	3	40	523	3,653	82	3,735
2013	3,159	5	0	3,164	482	0	40	522	3,686	93	3,779
2014	3,224	2	0	3,226	475	0	37	512	3,738	98	3,836
2015	3,319	2	0	3,321	492	0	31	523	3,844	99	3,943
2016E	3,457	2	0	3,459	490	0	22	512	3,971	97	4,068
<u>Forecast</u>											
2017	3,389	2	0	3,391	506	0	9	515	3,906	100	4,006
2018	3,442	2	0	3,444	523	0	0	523	3,967	90	4,057
2019	3,476	2	0	3,478	537	0	0	537	4,015	80	4,095
2020	3,510	2	0	3,512	564	0	0	564	4,076	80	4,156
2021	3,525	2	0	3,527	586	0	0	586	4,113	82	4,195
2022	3,555	1	0	3,556	604	0	0	604	4,160	85	4,245
2023	3,584	0	0	3,584	616	0	0	616	4,200	88	4,288
2024	3,614	0	0	3,614	625	0	0	625	4,239	91	4,330
2025	3,650	0	0	3,650	635	0	0	635	4,285	95	4,380
2026	3,679	0	0	3,679	647	0	0	647	4,326	99	4,425
2027	3,713	0	0	3,713	661	0	0	661	4,374	102	4,476
2028	3,741	0	0	3,741	673	0	0	673	4,414	102	4,516
2029	3,784	0	0	3,784	684	0	0	684	4,468	102	4,570
2030	3,851	0	0	3,851	697	0	0	697	4,548	100	4,648
2031	3,897	0	0	3,897	719	0	0	719	4,616	100	4,716
2032	3,950	0	0	3,950	748	0	0	748	4,698	100	4,798
2033	4,006	0	0	4,006	773	0	0	773	4,779	100	4,879
2034	4,074	0	0	4,074	794	0	0	794	4,868	100	4,968
2035	4,129	0	0	4,129	819	0	0	819	4,948	100	5,048
2036	4,176	0	0	4,176	844	0	0	844	5,020	100	5,120
2037	4,232	0	0	4,232	867	0	0	867	5,099	100	5,199
Avg Annual Growth											
2010-16	1.7%	-20.6%	N/A	1.7%	0.7%	N/A	-10.6%	-0.3%	1.4%	5.3%	1.5%
2016-17	-2.0%	0.0%	N/A	-2.0%	3.3%	N/A	-59.1%	0.6%	-1.6%	3.1%	-1.5%
2016-26	0.6%	N/A	N/A	0.6%	2.8%	N/A	N/A	2.4%	0.9%	0.2%	0.8%
2016-37	1.0%	N/A	N/A	1.0%	2.8%	N/A	N/A	2.5%	1.2%	0.1%	1.2%

TABLE 22

U.S. MAINLINE AIR CARRIERS

CARGO JET AIRCRAFT

CALENDAR YEAR	LARGE NARROWBODY				LARGE WIDEBODY				TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL	
<u>Historical</u>									
2010	153	104	31	288	265	200	97	562	850
2011	176	89	26	291	281	203	96	580	871
2012	187	67	12	266	292	188	93	573	839
2013	192	19	2	213	296	175	64	535	748
2014	215	18	2	235	294	170	69	533	768
2015	228	22	2	252	309	156	72	537	789
2016E	235	19	2	256	328	149	77	554	810
<u>Forecast</u>									
2017	237	19	2	258	336	138	78	552	810
2018	236	19	2	257	344	125	78	547	804
2019	239	19	2	260	362	112	78	552	812
2020	242	19	2	263	378	100	79	557	820
2021	243	18	2	263	391	97	82	570	833
2022	248	15	2	265	399	97	85	581	846
2023	249	14	2	265	410	97	86	593	858
2024	251	13	2	266	419	98	85	602	868
2025	253	12	2	267	426	98	85	609	876
2026	256	9	1	266	434	98	86	618	884
2027	261	4	0	265	448	94	88	630	895
2028	262	2	0	264	460	90	88	638	902
2029	263	1	0	264	475	86	91	652	916
2030	265	0	0	265	494	80	92	666	931
2031	266	0	0	266	508	73	95	676	942
2032	267	0	0	267	530	67	97	694	961
2033	267	0	0	267	547	61	100	708	975
2034	268	0	0	268	569	55	101	725	993
2035	269	0	0	269	587	49	105	741	1,010
2036	269	0	0	269	609	43	107	759	1,028
2037	269	0	0	269	627	39	109	775	1,044
Avg Annual Growth									
2010-16	7.4%	-24.7%	N/A	-1.9%	3.6%	-4.8%	-3.8%	-0.2%	-0.8%
2016-17	0.9%	0.0%	N/A	0.8%	2.4%	-7.4%	1.3%	-0.4%	0.0%
2016-26	0.9%	N/A	N/A	0.4%	2.8%	-4.1%	1.1%	1.1%	0.9%
2016-37	0.6%	N/A	N/A	0.2%	3.1%	-6.2%	1.7%	1.6%	1.2%

TABLE 23
TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION
U.S. CIVIL AVIATION AIRCRAFT
(Millions of Gallons)

FISCAL YEAR	JET FUEL				AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS ^{1,2}		GENERAL AVIATION	AIR CARRIER	GENERAL AVIATION	TOTAL		
	DOMESTIC	INTL.					TOTAL	
<u>Historical</u>								
2010	11,973	6,290	18,263	1,435	19,698	2	221	19,921
2011	12,092	6,547	18,639	1,456	20,095	2	216	20,313
2012	12,124	6,595	18,720	1,435	20,155	2	206	20,363
2013	12,044	6,418	18,461	1,260	19,721	2	197	19,920
2014	12,167	6,348	18,514	1,466	19,981	2	210	20,192
2015	12,682	6,481	19,163	1,383	20,545	2	196	20,743
2016E	13,337	6,363	19,699	1,471	21,170	2	208	21,380
<u>Forecast</u>								
2017	13,715	6,397	20,112	1,541	21,653	2	203	21,859
2018	13,942	6,594	20,536	1,594	22,130	2	200	22,332
2019	14,171	6,789	20,960	1,646	22,606	2	198	22,806
2020	14,242	6,976	21,218	1,698	22,916	2	197	23,114
2021	14,292	7,164	21,456	1,744	23,200	2	195	23,397
2022	14,349	7,353	21,702	1,781	23,484	2	194	23,680
2023	14,411	7,537	21,948	1,812	23,760	2	193	23,956
2024	14,486	7,723	22,210	1,841	24,051	2	193	24,246
2025	14,583	7,902	22,485	1,869	24,354	2	193	24,549
2026	14,672	8,082	22,754	1,896	24,649	2	192	24,843
2027	14,777	8,266	23,043	1,922	24,965	2	191	25,158
2028	14,915	8,453	23,368	1,952	25,320	2	191	25,513
2029	15,041	8,637	23,678	1,983	25,660	2	190	25,852
2030	15,157	8,822	23,979	2,010	25,990	2	190	26,182
2031	15,286	9,007	24,294	2,038	26,332	2	190	26,524
2032	15,421	9,192	24,613	2,067	26,680	2	190	26,872
2033	15,555	9,377	24,932	2,094	27,026	2	190	27,218
2034	15,702	9,568	25,270	2,120	27,390	2	189	27,581
2035	15,849	9,759	25,608	2,147	27,755	2	189	27,946
2036	15,998	9,951	25,949	2,175	28,124	2	189	28,316
2037	16,149	10,144	26,293	2,204	28,497	2	190	28,689
Avg Annual Growth								
2010-16	1.8%	0.2%	1.3%	0.4%	1.2%	0.0%	-1.0%	1.2%
2016-17	2.8%	0.5%	2.1%	4.8%	2.3%	0.0%	-2.2%	2.2%
2016-26	1.0%	2.4%	1.5%	2.6%	1.5%	0.0%	-0.8%	1.5%
2016-37	0.9%	2.2%	1.4%	1.9%	1.4%	0.0%	-0.4%	1.4%

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

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

²Forecast 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

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT MILE			AVERAGE PASSENGER TRIP LENGTH			REVENUE PER PASSENGER MILE**	
	DOMESTIC (Seats/Mile)	INTL (Seats/Mile)	TOTAL (Seats/Mile)	DOMESTIC (Miles)	INTL (Miles)	TOTAL (Miles)	CURRENT \$ (Cents)	2016 \$ (Cents)
<u>Historical</u>								
2010	56.1	53.2	56.0	464	503	465	15.74	17.30
2011	56.4	52.7	56.3	467	531	468	15.10	16.18
2012	56.1	54.8	56.0	467	606	470	13.16	13.77
2013	56.1	66.8	56.4	469	641	472	11.65	11.98
2014	57.2	58.8	57.3	473	669	477	11.37	11.52
2015	59.9	62.8	60.0	475	696	480	10.94	11.04
2016E	61.3	68.8	61.5	481	721	487	11.32	11.32
<u>Forecast</u>								
2017	62.2	69.1	62.4	482	722	487	11.39	11.12
2018	63.1	69.4	63.3	484	725	489	11.60	11.10
2019	64.1	69.7	64.2	486	728	491	11.91	11.13
2020	64.7	70.0	64.9	488	731	494	12.27	11.17
2021	65.3	70.3	65.5	490	734	496	12.63	11.20
2022	65.8	70.6	66.0	492	737	498	12.99	11.22
2023	66.3	70.9	66.5	494	740	500	13.34	11.22
2024	66.8	71.2	67.0	496	743	502	13.69	11.20
2025	67.3	71.5	67.4	498	746	504	14.02	11.17
2026	67.8	71.8	67.9	500	749	506	14.35	11.13
2027	68.3	72.1	68.4	502	752	508	14.65	11.08
2028	68.8	72.4	68.9	504	755	510	14.91	11.01
2029	69.3	72.7	69.4	506	758	512	15.17	10.94
2030	69.8	73.0	69.9	508	761	514	15.43	10.87
2031	70.4	73.3	70.5	510	764	516	15.71	10.81
2032	70.9	73.6	71.0	512	767	518	15.99	10.74
2033	71.4	73.9	71.5	514	770	520	16.28	10.67
2034	71.9	74.2	72.0	516	773	522	16.57	10.61
2035	72.5	74.5	72.5	518	776	524	16.86	10.54
2036	73.0	74.8	73.1	520	779	526	17.16	10.48
2037	73.5	75.1	73.6	522	782	528	17.47	10.41
Avg Annual Growth								
2010-16	1.5%	4.4%	1.6%	0.6%	6.2%	0.8%	-5.3%	-6.8%
2016-17	1.5%	0.4%	1.5%	0.1%	0.1%	0.1%	0.5%	-1.8%
2016-26	1.0%	0.4%	1.0%	0.4%	0.4%	0.4%	2.4%	-0.2%
2016-37	0.9%	0.4%	0.9%	0.4%	0.4%	0.4%	2.1%	-0.4%

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

** Reporting carriers.

TABLE 25

**U.S. REGIONAL CARRIERS
SCHEDULED PASSENGER TRAFFIC
(In Millions)**

FISCAL YEAR	REVENUE PASSENGERS			REVENUE PASSENGER MILES		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
<u>Historical</u>						
2010	162	3	164	75,030	1,347	76,377
2011	162	2	164	75,513	1,270	76,783
2012	159	3	162	74,330	1,856	76,187
2013	155	3	158	72,956	1,851	74,807
2014	154	3	157	72,953	1,926	74,878
2015	153	3	156	72,753	2,127	74,880
2016E	152	4	155	72,971	2,556	75,527
<u>Forecast</u>						
2017	152	4	156	73,482	2,574	76,056
2018	157	4	160	75,793	2,655	78,448
2019	161	4	165	78,128	2,737	80,865
2020	163	4	167	79,598	2,788	82,386
2021	165	4	169	80,953	2,836	83,788
2022	167	4	171	82,343	2,884	85,227
2023	170	4	174	83,768	2,934	86,703
2024	172	4	176	85,276	2,987	88,263
2025	175	4	179	86,918	3,045	89,963
2026	177	4	181	88,528	3,101	91,629
2027	180	4	184	90,253	3,161	93,415
2028	183	4	187	92,191	3,229	95,420
2029	186	4	190	94,079	3,295	97,375
2030	189	4	193	95,927	3,360	99,287
2031	192	4	196	97,912	3,430	101,342
2032	195	5	200	99,955	3,501	103,456
2033	198	5	203	102,022	3,574	105,596
2034	202	5	207	104,205	3,650	107,855
2035	205	5	210	106,413	3,728	110,141
2036	209	5	214	108,668	3,807	112,474
2037	212	5	217	110,974	3,887	114,861
Avg Annual Growth						
2010-16	-1.1%	4.8%	-1.0%	-0.5%	11.3%	-0.2%
2016-17	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%
2016-26	1.6%	1.6%	1.6%	2.0%	2.0%	2.0%
2016-37	1.6%	1.6%	1.6%	2.0%	2.0%	2.0%

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

TABLE 26

U.S. REGIONAL CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

YEAR	DOMESTIC			INTERNATIONAL			TOTAL		
	ASMs (MIL)	RPMS (MIL)	% LOAD FACTOR	ASMs (MIL)	RPMS (MIL)	% LOAD FACTOR	ASMs (MIL)	RPMS (MIL)	% LOAD FACTOR
<u>Historical</u>									
2010	98,461	75,030	76.2	1,857	1,347	72.5	100,318	76,377	76.1
2011	99,075	75,513	76.2	1,818	1,270	69.9	100,893	76,783	76.1
2012	95,748	74,330	77.6	2,595	1,856	71.5	98,343	76,187	77.5
2013	93,084	72,956	78.4	2,994	1,851	61.8	96,078	74,807	77.9
2014	91,169	72,953	80.0	2,644	1,926	72.8	93,813	74,878	79.8
2015	90,679	72,753	80.2	2,832	2,127	75.1	93,511	74,880	80.1
2016E	91,057	72,971	80.1	3,505	2,556	72.9	94,562	75,527	79.9
<u>Forecast</u>									
2017	91,603	73,482	80.2	3,526	2,574	73.0	95,129	76,056	79.9
2018	94,132	75,793	80.5	3,623	2,655	73.3	97,756	78,448	80.2
2019	96,725	78,128	80.8	3,723	2,737	73.5	100,448	80,865	80.5
2020	98,277	79,598	81.0	3,783	2,788	73.7	102,060	82,386	80.7
2021	99,718	80,953	81.2	3,838	2,836	73.9	103,556	83,788	80.9
2022	101,228	82,343	81.3	3,897	2,884	74.0	105,124	85,227	81.1
2023	102,803	83,768	81.5	3,957	2,934	74.2	106,760	86,703	81.2
2024	104,496	85,276	81.6	4,022	2,987	74.3	108,519	88,263	81.3
2025	106,370	86,918	81.7	4,095	3,045	74.4	110,464	89,963	81.4
2026	108,217	88,528	81.8	4,166	3,101	74.4	112,382	91,629	81.5
2027	110,216	90,253	81.9	4,243	3,161	74.5	114,458	93,415	81.6
2028	112,482	92,191	82.0	4,330	3,229	74.6	116,812	95,420	81.7
2029	114,696	94,079	82.0	4,415	3,295	74.6	119,111	97,375	81.8
2030	116,867	95,927	82.1	4,499	3,360	74.7	121,365	99,287	81.8
2031	119,210	97,912	82.1	4,589	3,430	74.7	123,799	101,342	81.9
2032	121,628	99,955	82.2	4,682	3,501	74.8	126,310	103,456	81.9
2033	124,080	102,022	82.2	4,776	3,574	74.8	128,856	105,596	81.9
2034	126,675	104,205	82.3	4,876	3,650	74.9	131,551	107,855	82.0
2035	129,304	106,413	82.3	4,977	3,728	74.9	134,281	110,141	82.0
2036	131,991	108,668	82.3	5,081	3,807	74.9	137,072	112,474	82.1
2037	134,743	110,974	82.4	5,187	3,887	74.9	139,930	114,861	82.1
Avg Annual Growth									
2010-16	-1.3%	-0.5%		11.2%	11.3%	0.1%	-1.0%	-0.2%	-0.2%
2016-17	0.6%	0.7%		0.6%	0.7%	0.1%	0.6%	0.7%	0.7%
2016-26	1.7%	2.0%		1.7%	2.0%	0.2%	1.7%	2.0%	2.0%
2016-37	1.9%	2.0%		1.9%	2.0%	0.1%	1.9%	2.0%	2.0%

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

TABLE 27

**U.S. REGIONAL CARRIERS
PASSENGER AIRCRAFT**

AS OF JANUARY 1	REGIONAL AIRCRAFT													TOTAL FLEET				
	LESS THAN 9 SEATS	10 TO 19 SEATS		20 TO 30 SEATS		31 TO 40 SEATS			OVER 40 SEATS			TOTAL	NON JET	JET	TOTAL			
		PROP	JET	TOTAL	PROP	JET*	TOTAL	JET	TOTAL	JET	TOTAL							
<u>Historical</u>																		
2010	440	92	82	144	28	172	99	1,728	1,827	857	1,756	2,613						
2011	447	94	67	113	27	140	135	1,683	1,818	857	1,710	2,567						
2012	394	90	55	115	23	138	104	1,559	1,663	758	1,582	2,340						
2013	337	94	52	37	0	37	51	1,642	1,693	571	1,642	2,213						
2014	321	90	56	32	0	32	56	1,602	1,658	555	1,602	2,157						
2015	346	68	13	32	0	32	57	1,628	1,685	516	1,628	2,144						
2016E	365	55	0	59	0	59	40	1,637	1,677	519	1,637	2,156						
<u>Forecast</u>																		
2017	352	53	0	57	0	57	41	1,542	1,583	503	1,542	2,045						
2018	339	51	0	55	0	55	43	1,496	1,539	488	1,496	1,984						
2019	327	49	0	53	0	53	44	1,484	1,528	473	1,484	1,957						
2020	311	47	0	50	0	50	45	1,477	1,522	453	1,477	1,930						
2021	298	45	0	48	0	48	47	1,469	1,516	438	1,469	1,907						
2022	285	43	0	46	0	46	49	1,464	1,513	423	1,464	1,887						
2023	272	41	0	44	0	44	50	1,493	1,543	407	1,493	1,900						
2024	259	39	0	42	0	42	52	1,483	1,535	392	1,483	1,875						
2025	247	37	0	40	0	40	53	1,470	1,523	377	1,470	1,847						
2026	237	36	0	38	0	38	55	1,486	1,541	366	1,486	1,852						
2027	224	34	0	36	0	36	56	1,522	1,578	350	1,522	1,872						
2028	211	32	0	34	0	34	57	1,546	1,603	334	1,546	1,880						
2029	199	30	0	32	0	32	58	1,564	1,622	319	1,564	1,883						
2030	186	28	0	30	0	30	59	1,587	1,646	303	1,587	1,890						
2031	173	26	0	28	0	28	60	1,615	1,675	287	1,615	1,902						
2032	160	24	0	26	0	26	62	1,646	1,708	272	1,646	1,918						
2033	147	22	0	24	0	24	63	1,681	1,744	256	1,681	1,937						
2034	134	20	0	22	0	22	65	1,723	1,788	241	1,723	1,964						
2035	122	18	0	20	0	20	66	1,758	1,824	226	1,758	1,984						
2036	112	17	0	18	0	18	67	1,800	1,867	214	1,800	2,014						
2037	99	15	0	16	0	16	69	1,828	1,897	199	1,828	2,027						
Avg Annual Growth																		
2010-16	-3.1%	-8.2%	-100.0%	-13.8%	N/A	-16.3%	-14.0%	-0.9%	-1.4%	-8.0%	-1.2%	-3.2%						
2016-17	-3.6%	-3.6%	N/A	-3.4%	N/A	-3.4%	2.5%	-5.8%	-5.6%	-3.1%	-5.8%	-5.1%						
2016-26	-4.2%	-4.1%	N/A	-4.3%	N/A	-4.3%	3.2%	-1.0%	-0.8%	-3.4%	-1.0%	-1.5%						
2016-37	-6.0%	-6.0%	N/A	-6.0%	N/A	-6.0%	2.6%	0.5%	0.6%	-4.5%	0.5%	-0.3%						

TABLE 28

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

AS OF DEC. 31	FIXED WING												ROTORCRAFT			TOTAL GENERAL AVIATION FLEET	TOTAL PISTONS	TOTAL TURBINES
	PISTON			TURBINE			TOTAL	PISTON	TURBINE	TOTAL	EXPERIMENTAL**	SPORT AIRCRAFT**	OTHER					
	SINGLE ENGINE	MULTI-ENGINE	TOTAL	TURBO PROP	TURBO JET	TOTAL												
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			
2011E	136,895	15,702	152,597	9,523	11,650	21,173	3,411	6,671	10,082	24,275	6,645	5,681	220,453	156,008	27,844			
2012	128,847	14,313	143,160	10,304	11,793	22,097	3,292	6,763	10,055	26,715	2,001	5,006	209,034	146,452	28,860			
2013	124,398	13,257	137,655	9,619	11,637	21,256	3,137	6,628	9,765	24,918	2,056	4,277	199,927	140,792	27,884			
2014	126,036	13,146	139,182	9,777	12,362	22,139	3,154	6,812	9,966	26,191	2,231	4,699	204,408	142,336	28,951			
2015	127,887	13,254	141,141	9,712	13,440	23,152	3,286	7,220	10,506	27,922	2,369	4,941	210,031	144,427	30,372			
2016E	126,820	13,200	140,020	9,460	13,770	23,230	3,335	7,365	10,700	28,475	2,530	4,950	209,905	143,355	30,595			
Forecast																		
2017	125,760	13,155	138,915	9,285	14,100	23,385	3,380	7,510	10,890	28,970	2,685	4,955	209,800	142,295	30,895			
2018	124,730	13,115	137,845	9,180	14,415	23,595	3,425	7,650	11,075	29,490	2,835	4,960	209,800	141,270	31,245			
2019	123,705	13,080	136,785	9,110	14,760	23,870	3,470	7,785	11,255	29,910	3,000	4,960	209,780	140,255	31,655			
2020	122,685	13,045	135,730	9,080	15,115	24,195	3,515	7,920	11,435	30,240	3,160	4,950	209,710	139,245	32,115			
2021	121,645	13,005	134,650	9,075	15,480	24,555	3,560	8,055	11,615	30,640	3,315	4,950	209,725	138,210	32,610			
2022	120,600	12,965	133,565	9,115	15,845	24,960	3,605	8,195	11,800	30,895	3,480	4,955	209,655	137,170	33,155			
2023	119,540	12,915	132,455	9,185	16,210	25,395	3,650	8,335	11,985	31,175	3,640	4,955	209,605	136,105	33,730			
2024	118,475	12,865	131,340	9,295	16,585	25,880	3,695	8,480	12,175	31,510	3,795	4,955	209,655	135,035	34,360			
2025	117,410	12,820	130,230	9,420	16,965	26,385	3,740	8,625	12,365	31,835	3,965	4,955	209,735	133,970	35,010			
2026	116,335	12,765	129,100	9,570	17,345	26,915	3,785	8,775	12,560	32,065	4,125	4,970	209,735	132,885	35,690			
2027	115,245	12,705	127,950	9,755	17,745	27,500	3,835	8,925	12,760	32,345	4,285	4,965	209,805	131,785	36,425			
2028	114,145	12,640	126,785	9,960	18,155	28,115	3,885	9,075	12,960	32,640	4,445	4,975	209,920	130,670	37,190			
2029	113,065	12,575	125,640	10,180	18,565	28,745	3,935	9,230	13,165	32,970	4,610	4,970	210,100	129,575	37,975			
2030	112,010	12,505	124,515	10,420	18,975	29,395	3,985	9,390	13,375	33,340	4,770	4,985	210,380	128,500	38,785			
2031	110,990	12,430	123,420	10,675	19,385	30,060	4,040	9,555	13,595	33,595	4,930	4,990	210,590	127,460	39,615			
2032	110,000	12,355	122,355	10,950	19,805	30,755	4,095	9,725	13,820	33,900	5,095	4,995	210,920	126,450	40,480			
2033	109,035	12,280	121,315	11,230	20,225	31,455	4,150	9,905	14,055	34,120	5,255	5,005	211,205	125,465	41,360			
2034	108,095	12,200	120,295	11,530	20,655	32,185	4,205	10,090	14,295	34,480	5,415	4,995	211,665	124,500	42,275			
2035	107,205	12,125	119,330	11,835	21,105	32,940	4,265	10,280	14,545	34,720	5,575	5,000	212,110	123,595	43,220			
2036	106,350	12,045	118,395	12,150	21,570	33,720	4,325	10,475	14,800	35,015	5,730	5,010	212,670	122,720	44,195			
2037	105,550	11,970	117,520	12,585	22,040	34,625	4,385	10,680	15,065	35,310	5,885	5,015	213,420	121,905	45,305			
Avg Annual Growth																		
2010-16	-1.6%	-3.1%	-1.7%	0.2%	3.1%	1.8%	-1.2%	2.1%	1.0%	2.3%	N/A	-2.3%	-1.0%	-1.7%	1.9%			
2016-17	-0.8%	-0.3%	-0.8%	-1.8%	2.4%	0.7%	1.3%	2.0%	1.8%	1.7%	6.1%	0.1%	-0.1%	-0.7%	1.0%			
2016-26	-0.9%	-0.3%	-0.8%	0.1%	2.3%	1.5%	1.3%	1.8%	1.6%	1.2%	5.0%	0.0%	0.0%	-0.8%	1.6%			
2016-37	-0.9%	-0.5%	-0.8%	1.4%	2.3%	1.9%	1.3%	1.8%	1.6%	1.0%	4.1%	0.1%	0.1%	-0.8%	1.9%			

* Source: 2001-2010, 2012-2014, 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)

CALENDAR YEAR	FIXED WING										ROTORCRAFT			TOTAL GENERAL AVIATION HOURS	OTHER	TOTAL PISTONS	TOTAL TURBINES	
	PISTON			TURBINE			TURBO PROP	TURBO JET	TOTAL	PISTON	TURBINE	TOTAL	EXPERIMENTAL**					SPORT AIRCRAFT**
	SINGLE ENGINE	MULTI-ENGINE	TOTAL	TURBO PROP	TURBO JET	TOTAL												
<u>Historical*</u>																		
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			
2011E	11,844	1,782	13,626	2,463	3,407	5,871	757	2,654	3,411	1,203	278	181	24,570	14,383	8,524			
2012	11,441	1,766	13,206	2,733	3,418	6,151	731	2,723	3,454	1,243	169	180	24,403	13,937	8,874			
2013	10,706	1,646	12,352	2,617	3,488	6,076	636	2,312	2,949	1,191	173	135	22,876	12,989	8,388			
2014	10,395	1,573	11,967	2,613	3,881	6,494	818	2,424	3,242	1,244	165	158	23,271	12,786	8,918			
2015	11,217	1,608	12,825	2,538	3,837	6,375	798	2,496	3,294	1,295	191	162	24,142	13,623	8,871			
2016E	11,191	1,603	12,794	2,539	4,173	6,712	784	2,565	3,350	1,335	204	162	24,558	13,578	9,278			
<u>Forecast</u>																		
2017	11,007	1,596	12,604	2,538	4,445	6,983	777	2,636	3,413	1,372	218	163	24,753	13,381	9,619			
2018	10,760	1,590	12,350	2,539	4,655	7,194	793	2,705	3,497	1,411	232	163	24,847	13,143	9,899			
2019	10,573	1,584	12,157	2,542	4,863	7,405	809	2,773	3,582	1,446	246	163	25,000	12,966	10,178			
2020	10,416	1,577	11,992	2,545	5,064	7,609	828	2,843	3,671	1,479	260	163	25,174	12,821	10,451			
2021	10,295	1,570	11,865	2,554	5,250	7,804	848	2,905	3,754	1,515	275	163	25,375	12,713	10,709			
2022	10,180	1,566	11,746	2,570	5,437	8,007	869	2,971	3,839	1,544	290	163	25,589	12,615	10,978			
2023	10,077	1,562	11,638	2,593	5,597	8,190	886	3,037	3,922	1,575	305	163	25,794	12,524	11,227			
2024	9,995	1,556	11,551	2,626	5,750	8,376	902	3,105	4,007	1,608	320	164	26,025	12,453	11,481			
2025	9,901	1,550	11,451	2,662	5,894	8,556	919	3,174	4,092	1,640	335	164	26,239	12,369	11,730			
2026	9,807	1,547	11,354	2,706	6,039	8,745	934	3,235	4,169	1,669	351	164	26,451	12,288	11,980			
2027	9,724	1,543	11,267	2,759	6,191	8,949	950	3,297	4,247	1,701	366	164	26,694	12,216	12,247			
2028	9,637	1,542	11,179	2,816	6,351	9,167	966	3,359	4,326	1,733	382	165	26,951	12,145	12,526			
2029	9,561	1,543	11,104	2,881	6,511	9,392	983	3,424	4,406	1,765	398	165	27,230	12,087	12,815			
2030	9,501	1,543	11,044	2,947	6,662	9,609	999	3,488	4,488	1,799	414	165	27,519	12,043	13,097			
2031	9,436	1,545	10,981	3,017	6,820	9,838	1,016	3,555	4,571	1,825	430	165	27,810	11,997	13,392			
2032	9,385	1,549	10,934	3,094	6,976	10,070	1,033	3,623	4,656	1,857	446	166	28,128	11,966	13,694			
2033	9,339	1,553	10,892	3,175	7,125	10,300	1,049	3,696	4,745	1,883	463	166	28,449	11,941	13,996			
2034	9,277	1,558	10,835	3,258	7,270	10,529	1,065	3,770	4,835	1,919	479	166	28,763	11,901	14,298			
2035	9,239	1,559	10,799	3,349	7,422	10,770	1,083	3,846	4,929	1,948	496	166	29,107	11,882	14,616			
2036	9,205	1,563	10,768	3,439	7,583	11,022	1,101	3,923	5,024	1,980	512	167	29,473	11,868	14,946			
2037	9,187	1,566	10,754	3,561	7,736	11,296	1,118	4,005	5,124	2,007	529	167	29,876	11,872	15,302			
Avg Annual Growth																		
2010-16	-1.4%	-2.1%	-1.5%	1.5%	3.6%	2.8%	-0.2%	-0.3%	-0.3%	1.4%	N/A	-1.8%	-0.2%	-1.4%	1.9%			
2016-17	-1.6%	-0.4%	-1.5%	0.0%	6.5%	4.0%	-0.8%	2.7%	1.9%	2.8%	6.8%	0.4%	0.8%	-1.4%	3.7%			
2016-26	-0.9%	-0.4%	-1.2%	0.6%	3.8%	2.7%	1.8%	2.3%	2.2%	2.3%	5.5%	0.1%	0.7%	-1.0%	2.6%			
2016-37	-0.9%	-0.1%	-0.8%	1.6%	3.0%	2.5%	1.7%	2.1%	2.0%	2.0%	4.6%	0.1%	0.9%	-0.6%	2.4%			

* Source: 2001-2010, 2012-2014, 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

AS OF DEC. 31	STUDENTS	RECREA-TIONAL	SPORT PILOT	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	ROTOR-CRAFT ONLY	GLIDER ONLY	TOTAL PILOTS	TOTAL LESS AT PILOTS	INSTRUMENT RATED PILOTS ¹
<u>Historical*</u>											
2010	119,119	212	3,682	202,020	123,705	142,198	15,377	21,275	627,588	485,390	318,001
2011	118,657	227	4,066	194,441	120,865	142,511	15,220	21,141	617,128	474,617	314,122
2012	119,946	218	4,493	188,001	116,400	145,590	15,126	20,802	610,576	464,986	311,952
2013	120,285	238	4,824	180,214	108,206	149,824	15,114	20,381	599,086	449,262	307,120
2014	120,546	220	5,157	174,883	104,322	152,933	15,511	19,927	593,499	440,566	306,066
2015	122,729	190	5,482	170,718	101,164	154,730	15,566	19,460	590,039	435,309	304,329
2016	128,501	175	5,889	162,313	96,081	157,894	15,518	17,991	584,362	426,468	302,572
<u>Forecast</u>											
2017	130,950	175	6,350	160,000	92,500	159,600	15,480	17,700	582,755	423,155	301,400
2018	132,150	175	6,700	158,050	89,950	159,900	15,500	17,500	579,925	420,025	300,300
2019	132,850	175	7,050	156,050	88,150	160,500	15,600	17,400	577,775	417,275	299,900
2020	133,400	175	7,450	154,450	86,900	161,100	15,700	17,300	576,475	415,375	300,000
2021	133,950	170	7,750	153,250	85,950	161,800	15,900	17,200	575,970	414,170	300,300
2022	134,450	170	8,050	152,200	85,350	162,600	16,100	17,100	576,020	413,420	301,000
2023	134,950	170	8,350	151,250	84,900	163,400	16,300	17,000	576,320	412,920	301,700
2024	135,400	170	8,650	150,350	84,550	164,100	16,600	16,950	576,770	412,670	302,600
2025	135,900	170	9,000	149,450	84,350	164,800	16,850	16,850	577,370	412,570	303,600
2026	136,400	165	9,350	148,600	84,150	165,600	17,150	16,750	578,165	412,565	304,700
2027	136,900	165	9,700	147,700	84,050	166,400	17,500	16,700	579,115	412,715	305,800
2028	137,350	165	10,050	146,750	83,950	167,200	17,800	16,700	579,965	412,765	307,000
2029	137,850	165	10,450	145,800	83,900	168,100	18,150	16,650	581,065	412,965	308,300
2030	138,350	165	10,850	144,950	83,850	168,900	18,500	16,650	582,215	413,315	309,500
2031	138,800	165	11,250	144,200	83,850	169,800	18,850	16,600	583,515	413,715	310,800
2032	139,250	165	11,650	143,450	83,850	170,700	19,250	16,600	584,915	414,215	312,100
2033	139,650	165	12,000	142,650	83,800	171,500	19,600	16,550	585,915	414,415	313,400
2034	140,100	165	12,400	141,750	83,800	172,400	20,000	16,550	587,165	414,765	314,700
2035	140,500	165	12,800	140,850	83,800	173,300	20,450	16,550	588,415	415,115	316,100
2036	140,850	165	13,200	139,950	83,800	174,200	20,850	16,550	589,565	415,365	317,600
2037	141,200	165	13,600	139,000	83,800	175,100	21,300	16,550	590,715	415,615	319,100
Avg Annual Growth											
2010-16	1.3%	-3.1%	N/A	-3.6%	-4.1%	1.8%	0.2%	-2.8%	-1.2%	-2.1%	-0.8%
2016-17	1.9%	0.0%	7.8%	-1.4%	-3.7%	1.1%	-0.2%	-1.6%	-0.3%	-0.8%	-0.4%
2016-26	0.6%	-0.6%	4.7%	-0.9%	-1.3%	0.5%	1.0%	-0.7%	-0.1%	-0.3%	0.1%
2016-37	0.4%	-0.3%	4.1%	-0.7%	-0.6%	0.5%	1.5%	-0.4%	0.1%	-0.1%	0.3%

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

¹Instrument 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)

CALENDAR YEAR	FIXED WING						ROTORCRAFT		EXPERI- MENTAL**/ OTHER	SPORT**	TOTAL FUEL CONSUMED		
	PISTON		TURBINE		TURBO JET	PISTON	TURBINE	AVGAS			JET FUEL	TOTAL	
	SINGLE ENGINE	MULTI- ENGINE	TURBO PROP	TURBO									
<u>Historical*</u>													
2010	133	54	187	1,123	11	125	22	1	221	1,435	1,656		
2011E	130	53	195	1,125	10	136	21	1	216	1,456	1,672		
2012	126	54	209	1,077	10	149	16	1	206	1,435	1,641		
2013	117	54	189	945	9	126	16	1	197	1,260	1,457		
2014	120	48	199	1,135	11	132	29	1	210	1,466	1,676		
2015	128	40	191	1,063	10	128	15	1	196	1,383	1,578		
2016E	128	43	190	1,150	10	131	26	1	208	1,471	1,679		
<u>Forecast</u>													
2017	126	41	189	1,219	10	133	25	1	203	1,541	1,744		
2018	123	41	188	1,270	10	136	25	1	200	1,594	1,794		
2019	121	41	187	1,320	10	139	25	2	198	1,646	1,844		
2020	119	40	187	1,368	11	142	25	2	197	1,698	1,894		
2021	117	40	187	1,411	11	146	26	2	195	1,744	1,939		
2022	116	40	187	1,447	11	147	26	2	194	1,781	1,976		
2023	115	39	188	1,475	11	150	26	2	193	1,812	2,006		
2024	114	39	189	1,500	11	153	27	2	193	1,841	2,035		
2025	113	39	192	1,522	12	155	27	2	193	1,869	2,062		
2026	111	39	194	1,544	12	158	28	2	192	1,896	2,088		
2027	110	39	196	1,567	12	160	28	2	191	1,922	2,113		
2028	109	39	199	1,591	12	162	29	2	191	1,952	2,143		
2029	108	38	204	1,615	12	164	29	2	190	1,983	2,173		
2030	107	38	207	1,636	13	167	30	3	190	2,010	2,200		
2031	106	39	212	1,658	13	169	30	3	190	2,038	2,228		
2032	105	39	216	1,679	13	172	30	3	190	2,067	2,257		
2033	104	39	221	1,697	13	175	31	3	190	2,094	2,284		
2034	103	39	226	1,715	13	179	31	3	189	2,120	2,309		
2035	102	39	231	1,733	14	182	32	3	189	2,147	2,336		
2036	101	39	236	1,753	14	186	32	3	189	2,175	2,365		
2037	101	39	243	1,770	14	190	32	3	190	2,204	2,393		
Avg Annual Growth													
2010-16	-0.7%	-3.7%	0.2%	0.4%	-1.1%	0.8%	2.9%	N/A	-1.0%	0.4%	0.2%		
2016-17	-1.6%	-3.8%	-0.5%	6.0%	-0.8%	1.7%	-2.9%	5.7%	-2.2%	4.8%	3.9%		
2016-26	-1.4%	-1.0%	0.2%	3.0%	1.7%	1.9%	0.9%	5.3%	-0.8%	2.6%	2.2%		
2016-37	-1.1%	-0.4%	1.2%	2.1%	1.6%	1.8%	1.1%	4.5%	-0.4%	1.9%	1.7%		

*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)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION			ITINERANT	MILITARY		TOTAL	NUMBER OF TOWERS	
			ITINERANT	LOCAL	TOTAL		LOCAL	TOTAL		FAA	CONTRACT
<u>Historical</u>											
2010	12,658	9,410	14,864	11,716	26,580	1,309	1,298	2,607	51,255	264	244
2011	12,866	9,279	14,528	11,437	25,965	1,319	1,311	2,630	50,740	264	248
2012	12,873	8,994	14,522	11,608	26,130	1,309	1,270	2,579	50,576	264	250
2013	12,776	8,803	14,117	11,688	25,806	1,275	1,276	2,552	49,937	264	252
2014	13,015	8,440	13,979	11,675	25,654	1,270	1,245	2,515	49,624	264	252
2015	13,755	7,895	13,887	11,691	25,578	1,292	1,203	2,495	49,722	264	252
2016E	14,417	7,580	13,904	11,632	25,536	1,317	1,145	2,462	49,995	264	252
<u>Forecast</u>											
2017	15,022	7,381	13,936	11,664	25,600	1,318	1,146	2,464	50,466	264	253
2018	15,677	6,983	13,972	11,706	25,678	1,318	1,146	2,464	50,802	264	253
2019	16,338	6,530	14,009	11,747	25,756	1,318	1,146	2,464	51,088	264	253
2020	16,980	6,090	14,046	11,789	25,835	1,318	1,146	2,464	51,369	264	253
2021	17,596	5,687	14,084	11,831	25,915	1,318	1,146	2,464	51,661	264	253
2022	18,093	5,451	14,121	11,873	25,995	1,318	1,146	2,464	52,002	264	253
2023	18,450	5,433	14,159	11,916	26,075	1,318	1,146	2,464	52,422	264	253
2024	18,757	5,483	14,197	11,959	26,156	1,318	1,146	2,464	52,859	264	253
2025	19,067	5,537	14,235	12,003	26,238	1,318	1,146	2,464	53,305	264	253
2026	19,400	5,593	14,273	12,046	26,320	1,318	1,146	2,464	53,775	264	253
2027	19,733	5,649	14,312	12,090	26,402	1,318	1,146	2,464	54,248	264	253
2028	20,067	5,706	14,351	12,135	26,486	1,318	1,146	2,464	54,723	264	253
2029	20,410	5,764	14,390	12,179	26,569	1,318	1,146	2,464	55,208	264	253
2030	20,754	5,824	14,430	12,224	26,654	1,318	1,146	2,464	55,695	264	253
2031	21,099	5,883	14,469	12,270	26,739	1,318	1,146	2,464	56,185	264	253
2032	21,445	5,944	14,509	12,315	26,825	1,318	1,146	2,464	56,677	264	253
2033	21,794	6,005	14,550	12,361	26,911	1,318	1,146	2,464	57,173	264	253
2034	22,153	6,067	14,590	12,408	26,998	1,318	1,146	2,464	57,681	264	253
2035	22,526	6,129	14,631	12,454	27,085	1,318	1,146	2,464	58,205	264	253
2036	22,902	6,193	14,672	12,501	27,174	1,318	1,146	2,464	58,732	264	253
2037	23,272	6,257	14,713	12,549	27,262	1,318	1,146	2,464	59,255	264	253
Avg Annual Growth											
2010-16	2.2%	-3.5%	-1.1%	-0.1%	-0.7%	0.1%	-2.1%	-0.9%	-0.4%		
2016-17	4.2%	-2.6%	0.2%	0.3%	0.3%	0.0%	0.1%	0.1%	0.9%		
2016-26	3.0%	-3.0%	0.3%	0.4%	0.3%	0.0%	0.0%	0.0%	0.7%		
2016-37	2.3%	-0.9%	0.3%	0.4%	0.3%	0.0%	0.0%	0.0%	0.8%		

Source: FAA Air Traffic Activity.

TABLE 33

TOTAL TRACON OPERATIONS
(in Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
<u>Historical</u>					
2010	13,174	9,511	13,864	2,438	38,987
2011	13,068	9,349	13,503	2,375	38,295
2012	13,045	8,977	13,424	2,332	37,778
2013	12,914	8,797	13,048	2,225	36,984
2014	13,186	8,390	13,018	2,229	36,823
2015	13,948	7,861	13,076	2,286	37,171
2016E	14,640	7,672	13,090	2,311	37,713
<u>Forecast</u>					
2017	15,250	7,457	13,093	2,311	38,111
2018	15,902	7,010	13,137	2,311	38,361
2019	16,558	6,501	13,176	2,311	38,547
2020	17,197	6,005	13,215	2,311	38,728
2021	17,809	5,551	13,256	2,311	38,927
2022	18,305	5,283	13,302	2,311	39,202
2023	18,664	5,258	13,358	2,311	39,591
2024	18,972	5,309	13,417	2,311	40,009
2025	19,284	5,364	13,476	2,311	40,436
2026	19,619	5,422	13,538	2,311	40,890
2027	19,954	5,480	13,600	2,311	41,345
2028	20,290	5,539	13,662	2,311	41,803
2029	20,636	5,599	13,726	2,311	42,272
2030	20,982	5,660	13,789	2,311	42,742
2031	21,329	5,722	13,853	2,311	43,215
2032	21,677	5,785	13,917	2,311	43,690
2033	22,028	5,847	13,982	2,311	44,169
2034	22,390	5,911	14,048	2,311	44,660
2035	22,765	5,977	14,115	2,311	45,168
2036	23,143	6,043	14,183	2,311	45,680
2037	23,516	6,109	14,251	2,311	46,186
Avg Annual Growth					
2010-16	1.8%	-3.5%	-1.0%	-0.9%	-0.6%
2016-17	4.2%	-2.8%	0.0%	0.0%	1.1%
2016-26	3.0%	-3.4%	0.3%	0.0%	0.8%
2016-37	2.3%	-1.1%	0.4%	0.0%	1.0%

Source: FAA Air Traffic Activity.

TABLE 34

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

FISCAL YEAR	IFR AIRCRAFT HANDLED					TOTAL
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY		
<u>Historical</u>						
2010	22,342	8,624	6,550	2,982		40,498
2011	23,432	9,010	6,557	2,228		41,227
2012	23,651	8,932	6,472	1,860		40,915
2013	23,205	8,673	6,440	1,676		39,994
2014	24,267	8,507	6,741	1,830		41,346
2015	25,270	7,847	7,007	1,795		41,918
2016E	26,318	7,787	7,301	1,826		43,231
<u>Forecast</u>						
2017	27,273	7,710	7,428	1,826		44,236
2018	27,925	7,533	7,470	1,826		44,755
2019	28,525	7,333	7,494	1,826		45,178
2020	29,114	7,123	7,510	1,826		45,573
2021	29,682	6,944	7,525	1,826		45,977
2022	30,304	6,772	7,549	1,826		46,451
2023	31,023	6,616	7,596	1,826		47,061
2024	31,779	6,458	7,650	1,826		47,714
2025	32,514	6,343	7,709	1,826		48,392
2026	33,180	6,329	7,777	1,826		49,112
2027	33,857	6,313	7,847	1,826		49,843
2028	34,544	6,294	7,918	1,826		50,582
2029	35,248	6,272	7,993	1,826		51,339
2030	35,952	6,257	8,068	1,826		52,103
2031	36,619	6,284	8,145	1,826		52,873
2032	37,292	6,310	8,222	1,826		53,650
2033	37,973	6,336	8,301	1,826		54,436
2034	38,669	6,361	8,382	1,826		55,239
2035	39,373	6,398	8,467	1,826		56,064
2036	40,078	6,441	8,553	1,826		56,900
2037	40,784	6,484	8,640	1,826		57,734
Avg Annual Growth						
2010-16	2.8%	-1.7%	1.8%	-7.8%		1.1%
2016-17	3.6%	-1.0%	1.7%	0.0%		2.3%
2016-26	2.3%	-2.1%	0.6%	0.0%		1.3%
2016-37	2.1%	-0.9%	0.8%	0.0%		1.4%

Source: FAA Air Traffic Activity