

## 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 provides alternative scenarios to our baseline forecasts of airline traffic and capacity.

To create the baseline domestic forecast, economic assumptions from IHS Markit's 10-year and 30-year U.S. Macro Baselines were used. To develop the alternative scenarios, assumptions from IHS Markit's 30-year optimistic and pessimistic forecasts from their

### Scenario Assumptions

The FAA's domestic baseline forecast assumes that economic growth rebounds moderately in 2021 and then remains slightly above trend in the medium-term, supported primarily by consumer spending and in particular, some catch-up in services spending that were most impacted during 2020. The forecast assumes no fiscal stimulus in the fourth quarter of 2020 which negatively affects GDP growth in 2021. The unemployment rate retreats gradually, reaching its pre-pandemic rate in 2024. Oil prices remain moderate by historic standards and there are no external shocks.

The FAA's high case forecast uses IHS Markit's optimistic forecast. The optimistic scenario is characterized by a quicker recovery in the near term than in the baseline but shows only slight improvement over the balance of the forecast. Near-term differences

August 2020 *US Economy: The 30-Year Focus* were utilized. Inputs from these alternative scenarios were used to create "high" and "low" traffic, capacity, and yield forecasts.

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

include a fiscal stimulus package which boosts consumer spending as well as personal savings in 2021. Accelerated COVID-19 vaccinations lead to a more rapid decline in case counts and an earlier return of consumers to their pre-COVID spending patterns. The unemployment rate also falls faster than in the baseline, reaching the pre-pandemic rate about a year sooner. And the price of oil is lifted slightly above the baseline as stronger economic activity generates increased oil demand.

In this scenario, real personal consumption expenditure (PCE) per capita growth over the entire forecast is similar to that in the baseline and unemployment averages 0.15

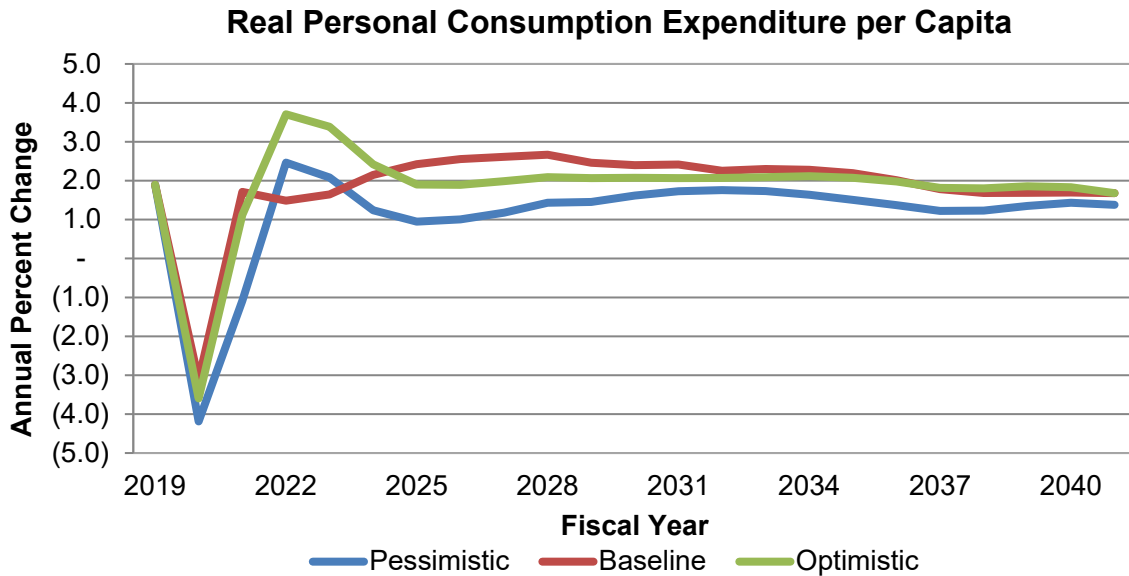
points lower on a fiscal year basis than the baseline.<sup>40</sup>

Conversely, FAA’s low case forecast uses IHS Markit’s pessimistic scenario. In this forecast, an upturn in new COVID-19 cases, hospitalizations, and deaths, slows the pace of “opening up” and results in some retrenchment in consumer spending which falls below the baseline path, removing support from the economic recovery. The economy slows with negative GDP growth in both 2020 and 2021 and recovery rates below the baseline. GDP growth averages 0.8 percentage points lower than in the baseline over the forecast horizon.

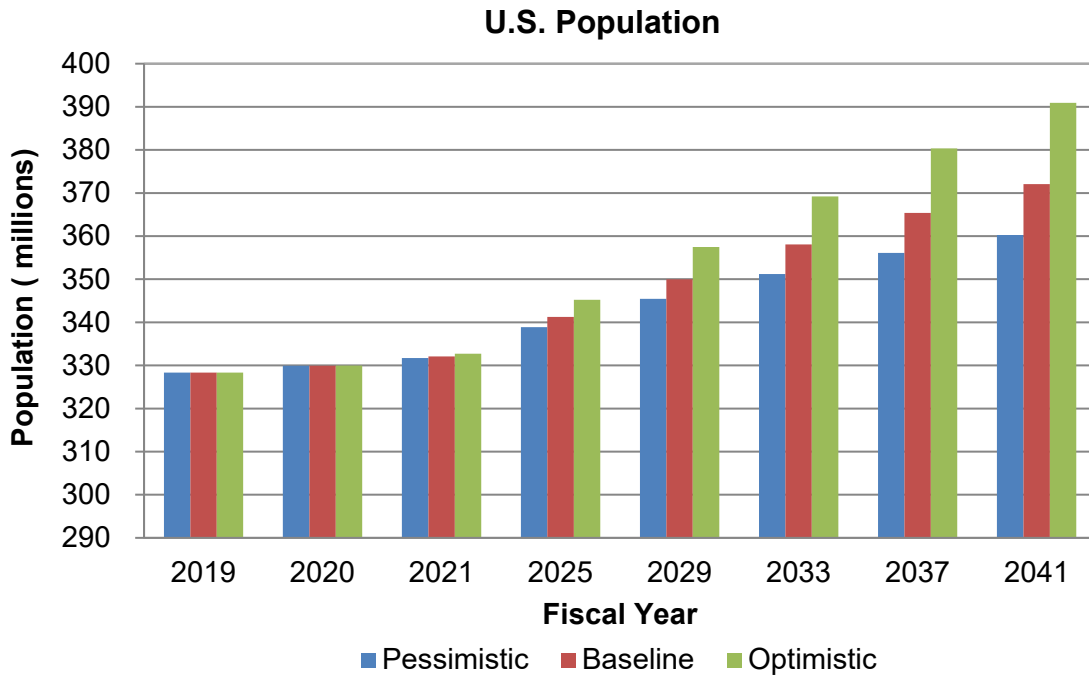
In addition to slower GDP growth in this scenario, productivity, the labor force and capital investments also grow more slowly than in the baseline. Personal income growth is

pressured leading to depressed consumer confidence and spending, with durable goods consumption, particularly of housing and motor vehicles, impacted the most. Financial conditions are tight and the higher interest rates reflect concerns about the inflationary outlook, given the Fed’s accommodative monetary policy and accelerating inflation. Inflation is fanned by higher commodity prices and rising energy prices, wages, and import prices combine to push consumer price inflation above the baseline.

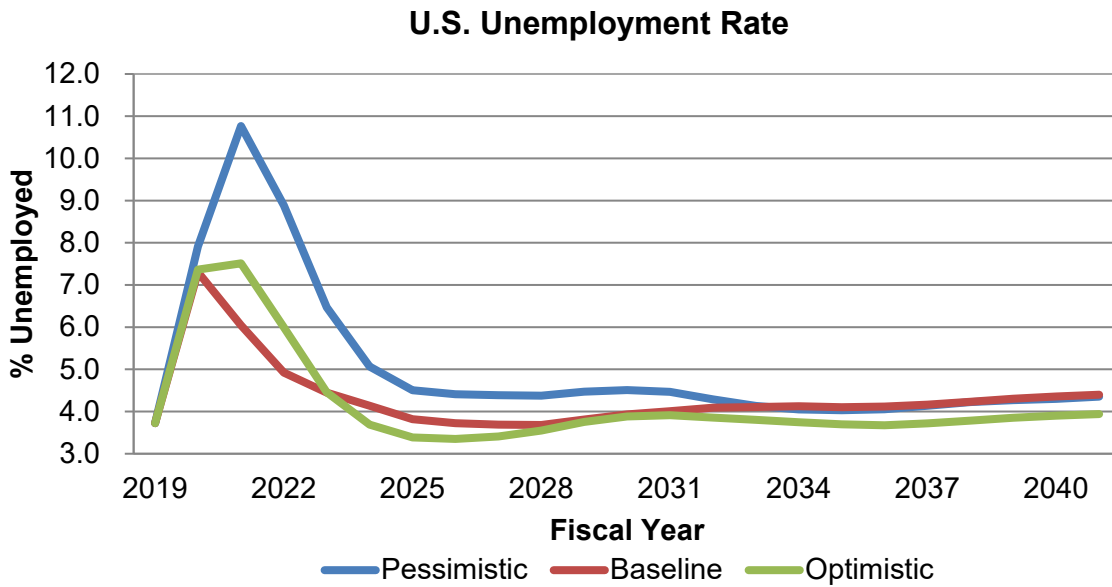
Oil prices rise faster than the baseline throughout the forecast and are \$63 per barrel higher by 2041. Real PCE per capita in this scenario grows 0.7 percentage points slower per year than in the baseline; and unemployment, on average, is 1.0 points higher on an annual basis than in the baseline.



<sup>40</sup> Real personal consumption expenditure per capita and unemployment are used as input variables to the FAA’s base, high and low forecasts of enplanements.

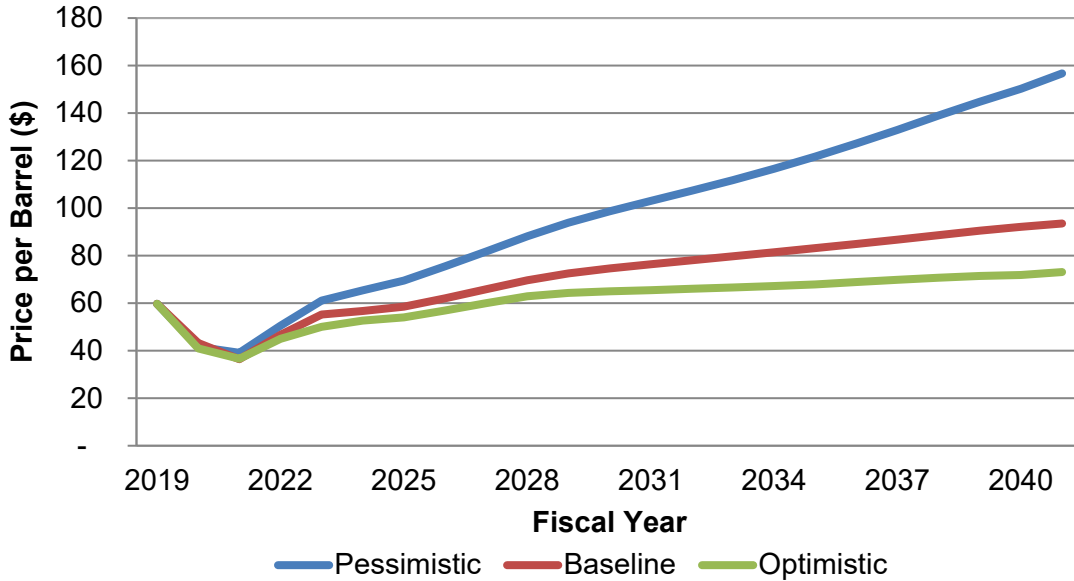


Source: IHS Markit



Source: IHS Markit

### U.S. Refiners' Acquisition Cost

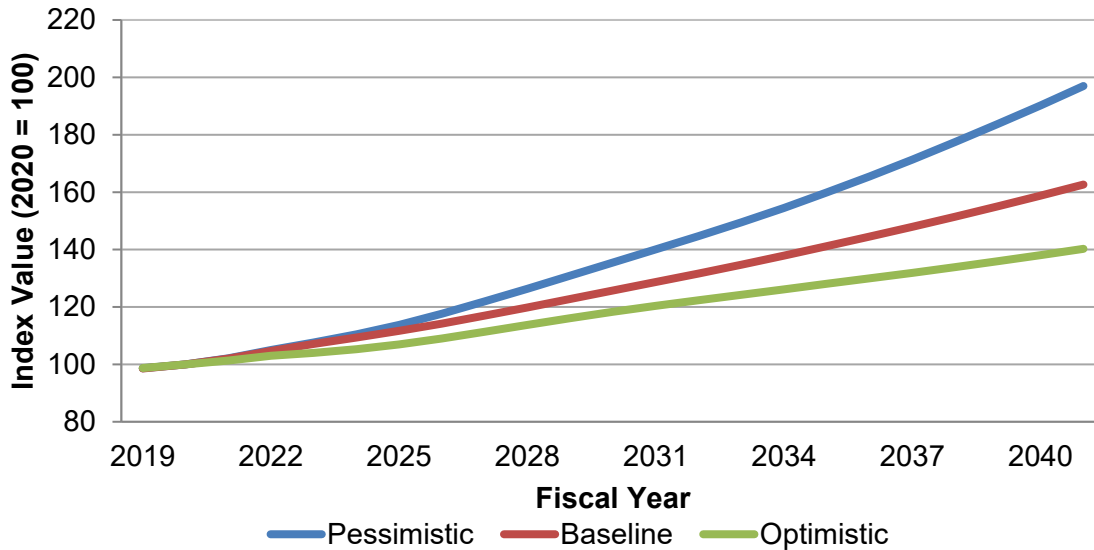


Source: IHS Markit

The price of energy is one of the drivers in the growth of consumer prices over the forecast period. In the optimistic case, slow growth of energy prices and import prices counteracts faster growth of other consumer

goods prices causing the optimistic CPI to rise somewhat slower than the baseline. In the pessimistic case, energy prices, wages and import prices all rise more rapidly compared to the baseline.

### Consumer Price Index - All Urban Consumers



Source: IHS Markit

## Alternative Forecasts

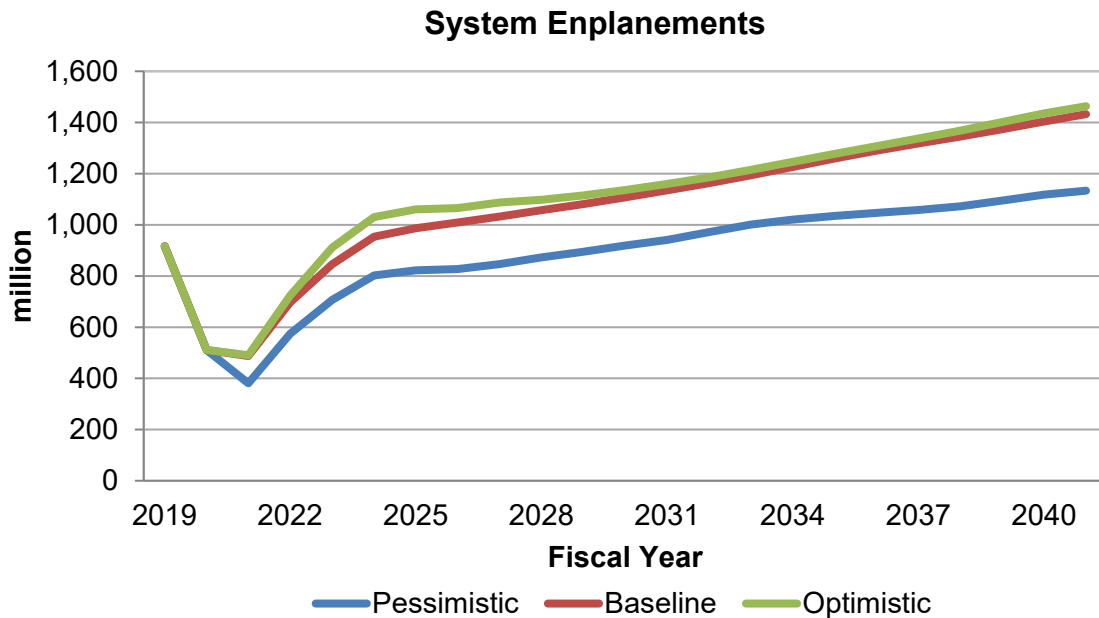
### Enplanements

In the baseline forecast, system enplanements are forecast to grow at an average annual rate of 5.0 percent a year over the forecast horizon of 2021-2041 (with domestic and international passengers increasing at rates of 4.9 and 6.3 percent, respectively).

In the optimistic case, enplanements grow at a slightly quicker pace, averaging 5.1 percent per year (up 5.0 percent domestically and 6.5 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 2041, system passengers in the optimistic case are 1.8

percent above the baseline, totaling 1.5 billion, 26 million greater than in the baseline.

The pessimistic case is characterized by a period of weakened personal income growth and consumer confidence combined with a contraction in financial asset markets, leading to higher interest rates, and curtailed investment and consumer spending. In this scenario, enplanements grow an average of 3.9 percent per year (domestic up 3.6 percent and international up 5.8 percent). In the pessimistic case, system passengers in 2041 are 21.2 percent below the baseline case, totaling 1.1 billion, or 303 million fewer than in the baseline.



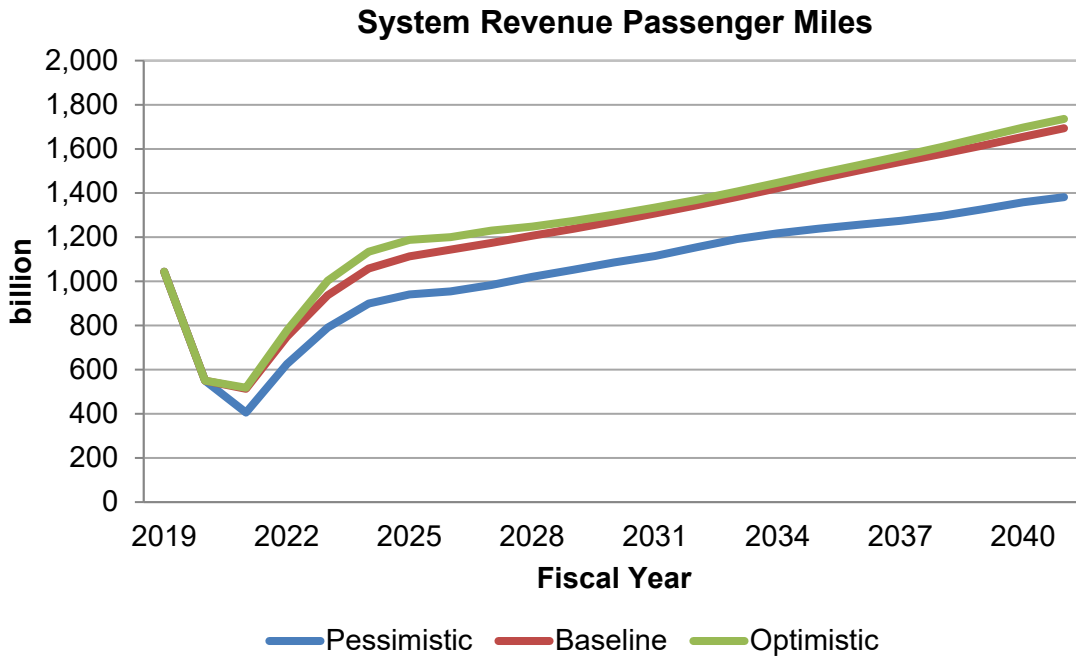
### Revenue Passenger Miles

In the baseline forecast, system RPMs grow at an average annual rate of 5.5 percent a year over the forecast horizon (2021-2041), with domestic RPMs increasing 5.1 percent annually and international RPMs growing 6.6 percent annually.

In the optimistic case, the faster growing economy coupled with lower energy prices drives RPMs higher than the baseline, with

growth averaging 5.6 percent per year (domestic and international RPMs up 5.2 and 6.8 percent, respectively).

In the pessimistic case, the combination of a slower growing economy and higher energy prices result in RPM growth averaging 4.5 percent annually with domestic markets growing 3.8 percent a year while international traffic grows 6.2 percent annually.



### Available Seat Miles

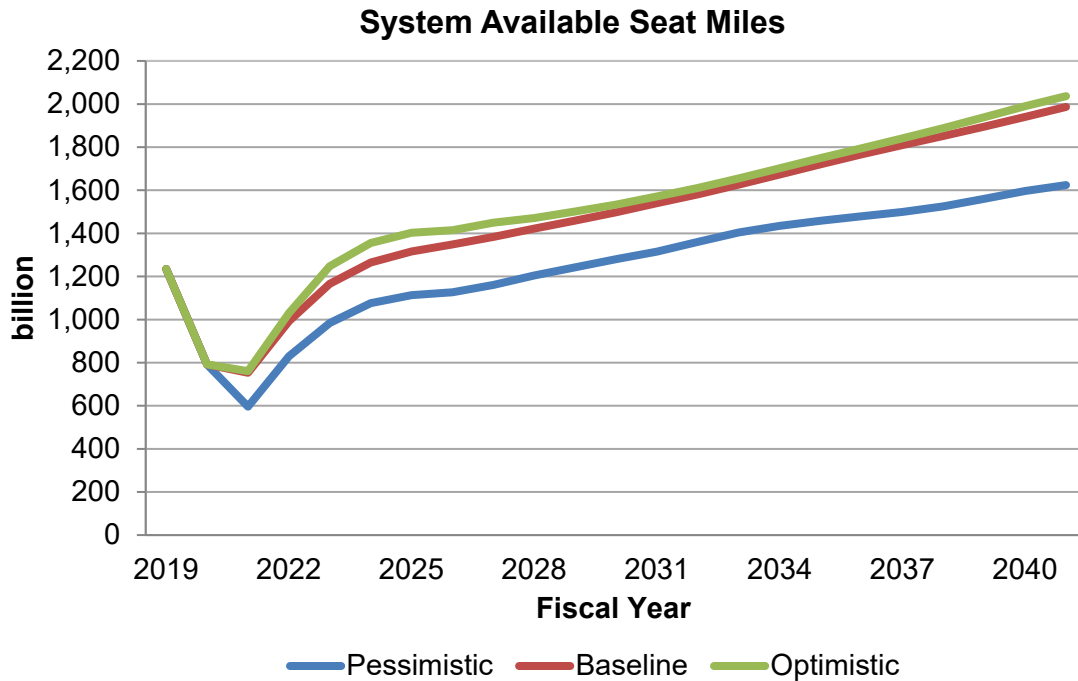
In the base case, system capacity is forecast to increase an average of 4.5 percent annually over the forecast horizon with growth averaging 4.0 percent annually in domestic markets and 6.0 percent a year in international markets.

In the optimistic case, capacity grows slightly faster than in the baseline forecast, averaging 4.6 percent annually system-wide (4.1 and 6.2 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 3.5 percent

annually (domestic growth of 2.7 percent annually and international up 5.5 percent annually).



**Load Factor**

System load factors over the 20-year forecast period are similar for all three forecast scenarios. System load factor rises from 69.5 percent in 2020 to 85.2 (optimistic), 85.1 (pessimistic), and 85.3 (baseline) percent in 2041.

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 68.7 percent to 86.6

percent in the baseline, optimistic and pessimistic scenarios.

The international load factor is forecast to rise to 82.1 throughout the period in the baseline and pessimistic scenarios and rise slightly to 82.2 percent in the optimistic scenario. 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 1.8 percent annually, rising from 11.54 cents in 2020 to 16.95 cents in 2041. In domestic markets, yield in the baseline forecast rises from 11.00 cents in 2020 to 16.15 cents in 2041. International yield rises from 13.33 cents in 2020 to 18.93 cents in 2041.

System yield rises in the optimistic case at a slower rate than in the baseline, up 1.2 percent annually to 14.92 cents by 2041. Domestic yield increases to 13.78 cents while international yield increases to 17.66 cents. The modest growth in yield in both cases is

due to advancements in technology, 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 2.7 percent annually, reaching 20.14 cents by 2041 (20.17 cents domestically and 20.09 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 2020-2041**

Variable	Scenario	Historical 2020E	FORECAST							PERCENT AVERAGE ANNUAL GROWTH				
			2021	2026	2031	2036	2041	2020-21	2021-26	2021-31	2021-36	2021-41		
<b><u>Economic Assumptions</u></b>														
Real Personal Consumption Expenditure per Capita (2012 \$)	Pessimistic	38,831	37,987	41,014	44,145	47,792	51,038	-2.2%	1.5%	1.5%	1.5%	1.5%	1.5%	
	Baseline	38,831	39,496	43,717	49,488	55,198	60,070	1.7%	2.1%	2.3%	2.3%	2.3%	2.1%	
	Optimistic	38,831	39,073	44,552	49,327	54,638	59,727	0.6%	2.7%	2.4%	2.3%	2.3%	2.1%	
Refiners Acquisition Cost - Average - \$ Per Barrel	Pessimistic	43.2	39.1	75.5	103.0	127.2	156.7	-9.5%	14.1%	10.2%	8.2%	7.2%	7.2%	
	Baseline	43.2	36.4	62.0	76.4	85.0	93.5	-15.7%	11.2%	7.7%	5.8%	4.8%	4.8%	
	Optimistic	43.2	36.6	56.9	65.5	68.9	73.1	-15.3%	9.2%	6.0%	4.3%	3.5%	3.5%	
Consumer Price Index All Urban, 1982-84 = 1.0	Pessimistic	2.58	2.63	3.04	3.62	4.27	5.08	2.1%	2.9%	3.2%	3.3%	3.3%	3.3%	
	Baseline	2.58	2.63	2.95	3.32	3.73	4.20	2.0%	2.3%	2.4%	2.4%	2.4%	2.4%	
	Optimistic	2.58	2.62	2.81	3.11	3.35	3.62	1.3%	1.5%	1.7%	1.7%	1.7%	1.6%	
Civilian Unemployment Rate (%)	Pessimistic	7.3	10.8	4.4	4.5	4.1	4.4	47.4%	-16.3%	-8.4%	-6.3%	-4.4%	-4.4%	
	Baseline	7.3	6.0	3.7	4.0	4.1	4.4	-17.2%	-9.2%	-4.0%	-2.5%	-1.6%	-1.6%	
	Optimistic	7.3	7.5	3.4	3.9	3.7	3.9	2.9%	-14.9%	-6.3%	-4.7%	-3.2%	-3.2%	

Source: IHS Markit

TABLE A-2  
**FAA FORECAST OF AVIATION ACTIVITY\***  
**FISCAL YEARS 2020-2041**

Variable	Scenario	Historical	FORECAST							PERCENT AVERAGE ANNUAL GROWTH								
		2020E	2021	2026	2031	2036	2041	2020-21	2021-26	2021-31	2021-36	2021-41						
<b>System Aviation Activity</b>																		
Available Seat Miles (BIL)	Pessimistic	791.4	595.9	1,126.4	1,315.1	1,479.5	1,623.9											
	Baseline	791.4	753.1	1,348.4	1,539.8	1,766.8	1,986.5											
	Optimistic	791.4	760.6	1,414.4	1,571.2	1,795.0	2,036.6											
Revenue Passenger Miles (BIL)	Pessimistic	550.3	405.5	954.5	1,114.9	1,256.5	1,381.5											
	Baseline	550.3	513.2	1,143.8	1,307.6	1,503.5	1,693.6											
	Optimistic	550.3	518.1	1,200.2	1,334.2	1,527.2	1,735.8											
Enplanements (MIL)	Pessimistic	511.0	380.9	827.2	941.1	1,046.8	1,133.5											
	Baseline	511.0	487.5	1,009.3	1,135.1	1,289.8	1,432.6											
	Optimistic	511.0	490.6	1,065.5	1,159.8	1,307.6	1,463.5											
Psgr Carrier Miles Flown (MIL)	Pessimistic	5,158.7	3,744.7	6,960.1	7,952.3	8,807.3	9,504.0											
	Baseline	5,158.7	4,761.9	8,407.4	9,442.2	10,674.7	11,806.6											
	Optimistic	5,158.7	4,801.0	8,846.1	9,640.3	10,835.4	12,086.6											
Psgr Carrier Departures (000s)	Pessimistic	6,443.7	4,609.5	8,010.5	8,895.2	9,635.6	10,142.9											
	Baseline	6,443.7	5,902.3	9,768.9	10,735.5	11,869.8	12,802.8											
	Optimistic	6,443.7	5,944.6	10,329.8	10,963.2	12,015.3	13,057.7											
Nominal Passenger Yield (cents)	Pessimistic	11.54	10.33	13.21	15.11	17.38	20.12											
	Baseline	11.54	10.21	12.93	14.24	15.52	16.95											
	Optimistic	11.54	10.24	12.51	13.56	14.22	14.92											

\* Includes domestic and international activity.

**TABLE A-3**  
**FAA FORECAST OF DOMESTIC AVIATION ACTIVITY**  
**FISCAL YEARS 2020-2041**

Variable	Scenario	Historical		FORECAST							PERCENT AVERAGE ANNUAL GROWTH				
		2020E	2021	2026	2031	2036	2041	2020-21	2021-26	2021-31	2021-36	2021-41			
<b><u>Domestic Aviation Activity</u></b>															
Available Seat Miles (BIL)	Pessimistic	613.8	442.4	778.6	887.0	991.3	1,076.2	-27.9%	12.0%	7.2%	5.5%	4.5%			
	Baseline	613.8	571.1	961.0	1,089.1	1,244.6	1,387.5	-7.0%	11.0%	6.7%	5.3%	4.5%			
	Optimistic	613.8	573.4	1,018.3	1,113.9	1,259.8	1,413.3	-6.6%	12.2%	6.9%	5.4%	4.6%			
Revenue Passenger Miles (BIL)	Pessimistic	421.8	307.7	669.9	763.5	855.8	931.9	-27.1%	16.8%	9.5%	7.1%	5.7%			
	Baseline	421.8	397.2	826.9	937.6	1,074.7	1,201.6	-5.8%	15.8%	9.0%	6.9%	5.7%			
	Optimistic	421.8	398.8	876.2	958.8	1,087.6	1,223.7	-5.5%	17.0%	9.2%	6.9%	5.8%			
Enplanements (MIL)	Pessimistic	462.6	340.4	730.7	821.7	908.9	976.5	-26.4%	16.5%	9.2%	6.8%	5.4%			
	Baseline	462.6	439.4	902.0	1,009.1	1,141.3	1,259.1	-5.0%	15.5%	8.7%	6.6%	5.4%			
	Optimistic	462.6	441.2	955.8	1,031.9	1,155.0	1,282.3	-4.6%	16.7%	8.9%	6.6%	5.5%			
Psgr Carrier Miles Flown (MIL)	Pessimistic	4,340.8	3,038.6	5,416.0	6,065.8	6,670.2	7,121.5	-30.0%	12.3%	7.2%	5.4%	4.4%			
	Baseline	4,340.8	3,924.7	6,688.7	7,454.2	8,383.1	9,190.8	-9.6%	11.3%	6.6%	5.2%	4.3%			
	Optimistic	4,340.8	3,940.0	7,088.6	7,623.5	8,484.3	9,361.1	-9.2%	12.5%	6.8%	5.2%	4.4%			
Psgr Carrier Departures (000s)	Pessimistic	6,066.9	4,257.3	7,365.8	8,105.6	8,732.8	9,125.4	-29.8%	11.6%	6.7%	4.9%	3.9%			
	Baseline	6,066.9	5,484.7	9,052.3	9,901.3	10,895.1	11,674.5	-9.6%	10.5%	6.1%	4.7%	3.8%			
	Optimistic	6,066.9	5,515.1	9,596.6	10,117.2	11,012.9	11,877.6	-9.1%	11.7%	6.3%	4.7%	3.9%			
Nominal Passenger Yield (cents)	Pessimistic	11.00	9.55	12.90	15.10	17.39	20.17	-13.1%	6.2%	4.7%	4.1%	3.8%			
	Baseline	11.00	9.44	12.31	13.58	14.80	16.15	-14.1%	5.4%	3.7%	3.0%	2.7%			
	Optimistic	11.00	9.45	11.69	12.59	13.17	13.78	-14.0%	4.3%	2.9%	2.2%	1.9%			

**TABLE A-4**  
**FAA FORECAST OF INTERNATIONAL AVIATION ACTIVITY\***  
**FISCAL YEARS 2020-2041**

Variable	Scenario	Historical	FORECAST					PERCENT AVERAGE ANNUAL GROWTH				
		2020E	2021	2026	2031	2036	2041	2020-21	2021-26	2021-31	2021-36	2021-41
<b>International Aviation Activity</b>												
Available Seat Miles (BIL)	Pessimistic	177.7	153.5	347.9	428.1	488.2	547.7	-13.6%	17.8%	10.8%	8.0%	6.6%
	Baseline	177.7	182.0	387.4	450.7	522.2	599.1	2.5%	16.3%	9.5%	7.3%	6.1%
	Optimistic	177.7	187.2	396.1	457.3	535.3	623.3	5.4%	16.2%	9.3%	7.3%	6.2%
Revenue Passenger Miles (BIL)	Pessimistic	128.5	97.8	284.6	351.4	400.7	449.6	-23.9%	23.8%	13.6%	9.9%	7.9%
	Baseline	128.5	116.0	316.9	370.0	428.8	492.0	-9.7%	22.3%	12.3%	9.1%	7.5%
	Optimistic	128.5	119.3	324.0	375.4	439.6	512.1	-7.2%	22.1%	12.1%	9.1%	7.6%
Enplanements (MIL)	Pessimistic	48.4	40.5	96.5	119.4	137.9	157.0	-16.3%	18.9%	11.4%	8.5%	7.0%
	Baseline	48.4	48.0	107.3	126.0	148.5	173.4	-0.8%	17.4%	10.1%	7.8%	6.6%
	Optimistic	48.4	49.4	109.8	127.8	152.6	181.2	2.0%	17.3%	10.0%	7.8%	6.7%
Psgr Carrier Miles Flown (MIL)	Pessimistic	817.9	706.1	1,544.1	1,886.5	2,137.2	2,382.5	-13.7%	16.9%	10.3%	7.7%	6.3%
	Baseline	817.9	837.2	1,718.7	1,988.0	2,291.6	2,615.7	2.4%	15.5%	9.0%	6.9%	5.9%
	Optimistic	817.9	861.0	1,757.5	2,016.8	2,351.1	2,725.5	5.3%	15.3%	8.9%	6.9%	5.9%
Psgr Carrier Departures (000s)	Pessimistic	376.8	352.2	644.7	789.6	902.9	1,017.5	-6.5%	12.9%	8.4%	6.5%	5.4%
	Baseline	376.8	417.6	716.5	834.2	974.7	1,128.3	10.8%	11.4%	7.2%	5.8%	5.1%
	Optimistic	376.8	429.5	733.3	846.0	1,002.5	1,180.1	14.0%	11.3%	7.0%	5.8%	5.2%
Nominal Passenger Yield (cents)	Pessimistic	13.33	12.79	13.96	15.13	17.34	20.03	-4.1%	1.8%	1.7%	2.0%	2.3%
	Baseline	13.33	12.84	14.56	15.89	17.33	18.93	-3.7%	2.5%	2.2%	2.0%	2.0%
	Optimistic	13.33	12.87	14.73	16.05	16.82	17.63	-3.5%	2.7%	2.2%	1.8%	1.6%

\*Includes mainline and regional carriers.