



### 3. FORECAST

This chapter examines and projects several components of Missouri general aviation activity. Forecasts developed in the Missouri State Airport System Plan Update help verify airport roles and provide a framework to guide analysis for future system development. Projections of aviation activity for the state were prepared for the near-term (2022), mid-term (2027), and long-term (2037) time frames.

Projections of aviation demand developed for the system airports are documented in the following sections:

- Historical and Current Aviation Activity in Missouri
- General Aviation Industry Trends and Issues that May Impact Future Aviation Growth
- Socioeconomic Trends that May Impact Future Aviation Growth
- Projections of Aviation Demand
  - Based Aircraft
  - General Aviation Aircraft Operations

To ensure reasonable results, forecasts were developed using several forecasting scenarios. A preferred scenario was selected based on historical trends, industry trends, and socioeconomic factors. The projections presented here assume that system airports will be able to develop in an unconstrained condition, which means airport facilities have capacity to accommodate future based aircraft and general aviation operations. It should be recognized that there are constantly short- and long-term fluctuations in demand projections due to a variety of factors that cannot always be anticipated.

#### 3.1 Historical and Current General Aviation Activity in Missouri

Historical activity data for Missouri airports provides a baseline from which future activity can be projected. While historical trends are not always reflective of future activity, historical data does provide insight into how aviation-related trends may be tied to future growth. This section discusses how aviation activity has changed in Missouri since the 2002 Missouri State Airport System Plan was completed. Over the past 15 years, general aviation demand in Missouri and across the country has been impacted by declining general aviation usage and the economic downturn that began in 2008. These trends are discussed in a subsequent section.

According to the Federal Aviation Administration (FAA), a based aircraft is an operational and air worthy aircraft that is typically based at a facility for a majority of the year. In 2017, 3,233 aircraft were reported based at Missouri's 107<sup>1</sup> system airports. This is down 9.6 percent from 2002 or -0.7 percent per year, on average. This decline mirrors the decline in active general aviation aircraft experienced in the United States over the last decade.

Since the 2002 System Plan, the FAA changed the way airports report based aircraft. Prior to the new program, based aircraft were frequently double counted and assigned to more than one airport. Subsequently, it is possible that some of the reported decline of Missouri's based aircraft since the 2002 System Plan is a result of the FAA's new, more precise based aircraft counting program.

For this analysis, an operation is defined as either a takeoff or a landing. Current aircraft operational data for this system plan was derived from the airport manager's verification of the FAA's 5010 reports or from data

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<sup>1</sup> The System Plan included 107 study airports; these airports represent Missouri's public-use airports. It is important to note that there are many other airports in Missouri, but these airports are private-use and were therefore not included in the system planning analysis.



reported by an airport air traffic control tower (ATCT). For non-towered airports, annual operations reported on FAA Form 5010 are estimates only and are not verified through actual counts. Some airport operational counts were adjusted if they appeared to be overstated when compared to statewide and national trends.

Annual general aviation operations at Missouri system airports for 2017 were estimated to be 1.05 million. This total includes estimates and actual air traffic control tower counts from the 12 study airports with ATCTs<sup>2</sup>. Since 2002, total operations have declined 27.7 percent overall (-2.1 percent per year on average). At the time of the 2002 System Plan, a total of 1.45 million annual general aviation operations were reported. Since then, general aviation operations for the 12 airports with ATCTs have declined 39.2 percent, representing an average annual rate of decline of 3.3 percent.

While general aviation activity has decreased since the last System Plan was prepared, it is possible that some of the noted decrease could be from better demand estimates by airport managers at non-towered airports. In the last decade, airports have typically improved monitoring and tracking aviation activity. **Table 3-1** presents the change in based aircraft and general aviation operations at each Missouri system airport from 2002 to 2017.

TABLE 3-1: HISTORICAL BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS ESTIMATES AT MISSOURI AIRPORTS

| Associated City                    | Airport Name                      | Based Aircraft |      |                           | General Aviation Operations |        |                           |
|------------------------------------|-----------------------------------|----------------|------|---------------------------|-----------------------------|--------|---------------------------|
|                                    |                                   | 2002           | 2017 | CAGR <sup>A</sup> 2002-17 | 2002                        | 2017   | CAGR <sup>A</sup> 2002-17 |
| <b>Commercial Service Airports</b> |                                   |                |      |                           |                             |        |                           |
| Branson                            | Branson*                          | NA             | 5    | NA                        | NA                          | 5,080  | NA                        |
| Cape Girardeau                     | Cape Girardeau Regional           | 49             | 57   | 1.0%                      | 26,761                      | 24,371 | -0.6%                     |
| Columbia                           | Columbia Regional                 | 67             | 45   | -2.6%                     | 36,374                      | 16,882 | -5.0%                     |
| Fort Leonard Wood                  | Waynesville-St. Robert Regional   | 4              | 10   | 6.3%                      | 2,647                       | 8,202  | 7.8%                      |
| Joplin                             | Joplin Regional                   | 108            | 126  | 1.0%                      | 44,461                      | 21,317 | -4.1%                     |
| Kansas City                        | Kansas City International         | 0              | 2    | NA                        | 8,171                       | 12,184 | 2.7%                      |
| Kirksville                         | Kirksville Regional               | 39             | 24   | -3.2%                     | 13,487                      | 4,000  | -7.8%                     |
| Springfield                        | Springfield-Branson National      | 115            | 122  | 0.4%                      | 84,519                      | 34,374 | -5.8%                     |
| St. Louis                          | St. Louis Lambert International   | 30             | 18   | -3.3%                     | 25,809                      | 26,565 | 0.2%                      |
| <b>General Aviation Airports</b>   |                                   |                |      |                           |                             |        |                           |
| Albany                             | Albany Municipal                  | 9              | 8    | -0.8%                     | 5,000                       | 3,270  | -2.8%                     |
| Aurora                             | Jerry Sumners Sr Aurora Municipal | 29             | 26   | -0.7%                     | 8,500                       | 10,500 | 1.4%                      |
| Ava                                | Ava Bill Martin Memorial          | 5              | 6    | 1.2%                      | 2,000                       | 4,320  | 5.3%                      |
| Bethany                            | Bethany Memorial                  | 7              | 6    | -1.0%                     | 2,500                       | 144    | -17.3%                    |
| Bismarck                           | Bismarck Memorial                 | 15             | 8    | -4.1%                     | 3,000                       | 2,450  | -1.3%                     |
| Bolivar                            | Bolivar Municipal                 | 50             | 60   | 1.2%                      | 20,000                      | 11,648 | -3.5%                     |

<sup>2</sup> Towered airports in Missouri: Branson Airport\*, Cape Girardeau Regional Airport, Charles B. Wheeler-Downtown Airport, Columbia Regional Airport\*, Kansas City International Airport, Jefferson City Memorial Airport\*, Joplin Regional Airport\*, Rosecrans Memorial Airport\*, Spirit of St. Louis Airport, Springfield- Branson National Airport, and St. Louis Lambert International Airport. Note: \* Airports with federal contract towers. The U.S. military owns and operates the control tower at Waynesville-St. Robert Regional Airport.



TABLE 3-1: HISTORICAL BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS ESTIMATES AT MISSOURI AIRPORTS

| Associated City       | Airport Name                            | Based Aircraft |      |                           | General Aviation Operations |        |                           |
|-----------------------|---|----------------|------|---------------------------|-----------------------------|--------|---------------------------|
|                       |   | 2002           | 2017 | CAGR <sup>A</sup> 2002-17 | 2002                        | 2017   | CAGR <sup>A</sup> 2002-17 |
| Bonne Terre           | Bonne Terre Municipal**                 | NA             | 3    | NA                        | NA                          | 750    | NA                        |
| Boonville             | Jesse Viertel Memorial                  | 38             | 54   | 2.4%                      | 13,340                      | 9,800  | -2.0%                     |
| Bowling Green         | Bowling Green Municipal                 | 9              | 11   | 1.3%                      | 6,533                       | 1,875  | -8.0%                     |
| Branson               | M. Graham Clark - Downtown              | 55             | 68   | 1.4%                      | 37,300                      | 10,775 | -7.9%                     |
| Branson West          | Branson West Municipal - Emerson Field* | NA             | 25   | NA                        | NA                          | 2,904  | NA                        |
| Brookfield/ Marceline | North Central Missouri Regional         | 0              | 9    | 100.0%                    | 0                           | 1,750  | 100.0%                    |
| Buffalo               | Buffalo Municipal                       | 15             | 11   | -2.0%                     | 5,000                       | 2,918  | -3.5%                     |
| Butler                | Butler Memorial                         | 19             | 20   | 0.3%                      | 6,420                       | 6,700  | 0.3%                      |
| Cabool                | Cabool Memorial                         | 18             | 10   | -3.8%                     | 3,000                       | 3,486  | 1.0%                      |
| Camdenton             | Camdenton Memorial-Lake Regional        | 26             | 35   | 2.0%                      | 10,000                      | 9,900  | -0.1%                     |
| Cameron               | Cameron Memorial                        | 33             | 27   | -1.3%                     | 4,200                       | 6,700  | 3.2%                      |
| Campbell              | Campbell Municipal                      | 9              | 10   | 0.7%                      | 7,280                       | 4,000  | -3.9%                     |
| Carrollton            | Carrollton Memorial                     | 4              | 12   | 7.6%                      | 3,130                       | 4,350  | 2.2%                      |
| Caruthersville        | Caruthersville Memorial                 | 5              | 10   | 4.7%                      | 9,000                       | 3,640  | -5.9%                     |
| Cassville             | Cassville Municipal                     | 12             | 12   | 0.0%                      | 3,000                       | 2,495  | -1.2%                     |
| Charleston            | Mississippi County                      | 7              | 0    | -100.0%                   | 4,000                       | 1,200  | -7.7%                     |
| Chillicothe           | Chillicothe Municipal                   | 23             | 21   | -0.6%                     | 3,854                       | 6,000  | 3.0%                      |
| Clinton               | Clinton Regional                        | 39             | 28   | -2.2%                     | 13,590                      | 6,560  | -4.7%                     |
| Cuba                  | Cuba Municipal                          | 23             | 20   | -0.9%                     | 1,650                       | 3,700  | 5.5%                      |
| Dexter                | Dexter Municipal                        | 26             | 21   | -1.4%                     | 4,914                       | 8,110  | 3.4%                      |
| Doniphan              | Doniphan Municipal                      | 6              | 12   | 4.7%                      | 3,000                       | 2,050  | -2.5%                     |
| El Dorado Springs     | El Dorado Springs Memorial              | 11             | 15   | 2.1%                      | 3,600                       | 3,500  | -0.2%                     |
| Eldon                 | Eldon Model Airpark                     | 37             | 18   | -4.7%                     | 7,550                       | 10,240 | 2.1%                      |
| Excelsior Springs     | Excelsior Springs Memorial              | 28             | 18   | -2.9%                     | 8,000                       | 4,000  | -4.5%                     |
| Farmington            | Farmington Regional                     | 31             | 32   | 0.2%                      | 13,000                      | 10,750 | -1.3%                     |
| Fredericktown         | A. Paul Vance Fredericktown Regional    | 26             | 14   | -4.0%                     | 3,000                       | 2,400  | -1.5%                     |
| Fulton                | Elton Hensley Memorial                  | 51             | 36   | -2.3%                     | 16,000                      | 12,000 | -1.9%                     |
| Gainesville           | Gainesville Memorial                    | 3              | 5    | 3.5%                      | 1,000                       | 290    | -7.9%                     |
| Gideon                | Gideon Memorial                         | 1              | 4    | 9.7%                      | 2,200                       | 3,000  | 2.1%                      |
| Hannibal              | Hannibal Regional                       | 21             | 20   | -0.3%                     | 4,700                       | 6,204  | 1.9%                      |
| Harrisonville         | Lawrence Smith Memorial                 | 54             | 54   | 0.0%                      | 15,550                      | 7,000  | -5.2%                     |
| Hermann               | Hermann Municipal                       | 8              | 6    | -1.9%                     | 2,112                       | 1,350  | -2.9%                     |
| Higginsville          | Higginsville Industrial Municipal       | 23             | 20   | -0.9%                     | 2,400                       | 3,554  | 2.7%                      |
| Hornersville          | Hornersville Memorial                   | 2              | 2    | 0.0%                      | 2,000                       | 1,500  | -1.9%                     |



TABLE 3-1: HISTORICAL BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS ESTIMATES AT MISSOURI AIRPORTS

| Associated City   | Airport Name                        | Based Aircraft |      |                           | General Aviation Operations |        |                           |
|-------------------|-------------------------------------|----------------|------|---------------------------|-----------------------------|--------|---------------------------|
|                   |                                     | 2002           | 2017 | CAGR <sup>A</sup> 2002-17 | 2002                        | 2017   | CAGR <sup>A</sup> 2002-17 |
| Houston           | Houston Memorial                    | 23             | 19   | -1.3%                     | 7,000                       | 3,830  | -3.9%                     |
| Jefferson City    | Jefferson City Memorial             | 58             | 57   | -0.1%                     | 33,858                      | 27,652 | -1.3%                     |
| Kahoka            | Kahoka Municipal                    | 1              | 2    | 4.7%                      | 150                         | 880    | 12.5%                     |
| Kaiser/Lake Ozark | Lee C Fine Memorial                 | 2              | 9    | 10.5%                     | 7,320                       | 4,443  | -3.3%                     |
| Kansas City       | Charles B. Wheeler-Downtown         | 301            | 184  | -3.2%                     | 123,327                     | 72,990 | -3.4%                     |
| Kennett           | Kennett Memorial                    | 20             | 27   | 2.0%                      | 15,000                      | 16,500 | 0.6%                      |
| Lamar             | Lamar Municipal                     | 21             | 15   | -2.2%                     | 8,850                       | 5,000  | -3.7%                     |
| Lebanon           | Floyd W. Jones Lebanon              | 46             | 30   | -2.8%                     | 20,800                      | 11,950 | -3.6%                     |
| Lee's Summit      | Lee's Summit Municipal              | 173            | 148  | -1.0%                     | 102,300                     | 50,000 | -4.7%                     |
| Lincoln           | Lincoln Municipal                   | 5              | 6    | 1.2%                      | 2,775                       | 1,760  | -3.0%                     |
| Linn              | State Technical College of Missouri | 5              | 13   | 6.6%                      | 500                         | 1,450  | 7.4%                      |
| Macon             | Macon-Fower Memorial                | 15             | 12   | -1.5%                     | 8,000                       | 3,179  | -6.0%                     |
| Malden            | Malden Regional                     | 10             | 15   | 2.7%                      | 5,000                       | 8,500  | 3.6%                      |
| Mansfield         | Mansfield Municipal                 | 6              | 9    | 2.7%                      | 2,350                       | 1,022  | -5.4%                     |
| Marshall          | Marshall Memorial Municipal         | 21             | 22   | 0.3%                      | 5,133                       | 5,110  | 0.0%                      |
| Maryville         | Northwest Missouri Regional         | 17             | 17   | 0.0%                      | 6,000                       | 12,408 | 5.0%                      |
| Memphis           | Memphis Memorial                    | 9              | 10   | 0.7%                      | 3,980                       | 2,200  | -3.9%                     |
| Mexico            | Mexico Memorial                     | 31             | 33   | 0.4%                      | 12,000                      | 10,860 | -0.7%                     |
| Moberly           | Omar N Bradley                      | 16             | 30   | 4.3%                      | 5,000                       | 7,370  | 2.6%                      |
| Monett            | Monett Regional                     | 25             | 27   | 0.5%                      | 11,403                      | 14,400 | 1.6%                      |
| Monroe City       | Captain Ben Smith Airfield          | 9              | 2    | -9.5%                     | 4,905                       | 1,500  | -7.6%                     |
| Monticello        | Lewis County Regional               | 8              | 6    | -1.9%                     | 1,990                       | 1,750  | -0.9%                     |
| Mosby             | Midwest National Air Center         | 55             | 56   | 0.1%                      | 3,500                       | 11,030 | 8.0%                      |
| Mount Vernon      | Mount Vernon Municipal              | 8              | 8    | 0.0%                      | 5,102                       | 1,121  | -9.6%                     |
| Mountain Grove    | Mountain Grove Memorial             | 14             | 9    | -2.9%                     | 8,500                       | 2,780  | -7.2%                     |
| Mountain View     | Mountain View                       | 14             | 16   | 0.9%                      | 8,600                       | 730    | -15.2%                    |
| Neosho            | Neosho Hugh Robinson                | 27             | 27   | 0.0%                      | 2,625                       | 2,632  | 0.0%                      |
| Nevada            | Nevada Municipal                    | 12             | 21   | 3.8%                      | 4,478                       | 3,700  | -1.3%                     |
| New Madrid        | County Memorial                     | 12             | 13   | 0.5%                      | 3,600                       | 9,750  | 6.9%                      |
| Osage Beach       | Grand Glaize-Osage Beach            | 25             | 11   | -5.3%                     | 8,000                       | 6,480  | -1.4%                     |
| Perryville        | Perryville Regional                 | 23             | 13   | -3.7%                     | 10,350                      | 9,750  | -0.4%                     |
| Piedmont          | Piedmont Municipal                  | 7              | 6    | -1.0%                     | 2,000                       | 1,300  | -2.8%                     |
| Poplar Bluff      | Poplar Bluff Municipal              | 37             | 25   | -2.6%                     | 11,490                      | 15,000 | 1.8%                      |
| Potosi            | Washington County                   | 5              | 13   | 6.6%                      | 2,914                       | 3,620  | 1.5%                      |



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| Associated City                     | Airport Name                    | Based Aircraft |              |                           | General Aviation Operations |                  |                           |
|-------------------------------------|---------------------------------|----------------|--------------|---------------------------|-----------------------------|------------------|---------------------------|
|                                     |                                 | 2002           | 2017         | CAGR <sup>^</sup> 2002-17 | 2002                        | 2017             | CAGR <sup>^</sup> 2002-17 |
| Richland                            | Richland Municipal              | 3              | 0            | -100.0%                   | 758                         | 320              | -5.6%                     |
| Rolla/Vichy                         | Rolla National                  | 52             | 78           | 2.7%                      | 15,160                      | 31,000           | 4.9%                      |
| Salem                               | Salem Memorial                  | 13             | 13           | 0.0%                      | 4,780                       | 4,500            | -0.4%                     |
| Sedalia                             | Sedalia Regional                | 23             | 30           | 1.8%                      | 24,010                      | 8,250            | -6.9%                     |
| Shelbyville                         | Shelby County                   | 0              | 0            | 0.0%                      | 70                          | 125              | 3.9%                      |
| Sikeston                            | Sikeston Memorial Municipal     | 33             | 16           | -4.7%                     | 9,400                       | 5,000            | -4.1%                     |
| St Joseph                           | Rosecrans Memorial              | 91             | 62           | -2.5%                     | 18,490                      | 13,067           | -2.3%                     |
| St. Charles                         | St. Charles County Smartt Field | 92             | 146          | 3.1%                      | 55,100                      | 60,610           | 0.6%                      |
| St. Louis                           | Spirit of St. Louis             | 426            | 372          | -0.9%                     | 184,371                     | 96,077           | -4.3%                     |
| St. Louis                           | Creve Coeur                     | 331            | 167          | -4.5%                     | 33,000                      | 40,600           | 1.4%                      |
| Steele                              | Steele Municipal                | 5              | 10           | 4.7%                      | 2,650                       | 6,700            | 6.4%                      |
| Stockton                            | Stockton Municipal              | 8              | 7            | -0.9%                     | 2,329                       | 1,010            | -5.4%                     |
| Sullivan                            | Sullivan Regional               | 39             | 29           | -2.0%                     | 10,000                      | 18,290           | 4.1%                      |
| Tarkio                              | Gould Peterson Municipal        | 10             | 21           | 5.1%                      | 3,800                       | 4,900            | 1.7%                      |
| Thayer                              | Thayer Memorial                 | 5              | 5            | 0.0%                      | 2,600                       | 1,850            | -2.2%                     |
| Trenton                             | Trenton Municipal               | 8              | 11           | 2.1%                      | 2,900                       | 2,450            | -1.1%                     |
| Unionville                          | Unionville Municipal            | 6              | 8            | 1.9%                      | 1,700                       | 1,700            | 0.0%                      |
| Van Buren                           | Bollinger-Crass Memorial        | 0              | 0            | 0.0%                      | 1,040                       | 430              | -5.7%                     |
| Versailles                          | Roy Otten Memorial Airfield     | 26             | 25           | -0.3%                     | 5,550                       | 8,000            | 2.5%                      |
| Warrensburg                         | UCM-Skyhaven                    | 48             | 42           | -0.9%                     | 68,360                      | 29,400           | -5.5%                     |
| Warsaw                              | Warsaw Municipal                | 10             | 13           | 1.8%                      | 3,956                       | 3,200            | -1.4%                     |
| Washington                          | Washington Regional             | 34             | 33           | -0.2%                     | 26,648                      | 21,200           | -1.5%                     |
| West Plains                         | West Plains Regional            | 35             | 26           | -2.0%                     | 6,615                       | 2,502            | -6.3%                     |
| Willow Springs                      | Willow Springs Memorial         | 22             | 22           | 0.0%                      | 5,100                       | 3,950            | -1.7%                     |
| <b>Total: All Missouri Airports</b> |                                 | <b>3,571</b>   | <b>3,233</b> | <b>-0.7%</b>              | <b>1,450,739</b>            | <b>1,048,536</b> | <b>-2.1%</b>              |

Sources: FAA 5010, Airport Management Records, 2002 Missouri State Airport System Plan, FAA Air Traffic Activity Data System (ATADS)

Notes: ^CAGR=compound annual growth rate; NA=not available/applicable

\* Branson and Branson West Municipal Airports were built after the 2002 System Plan was completed.

\*\* Bonne Terre Municipal Airport was not included in the 2002 System Plan and data was not available.

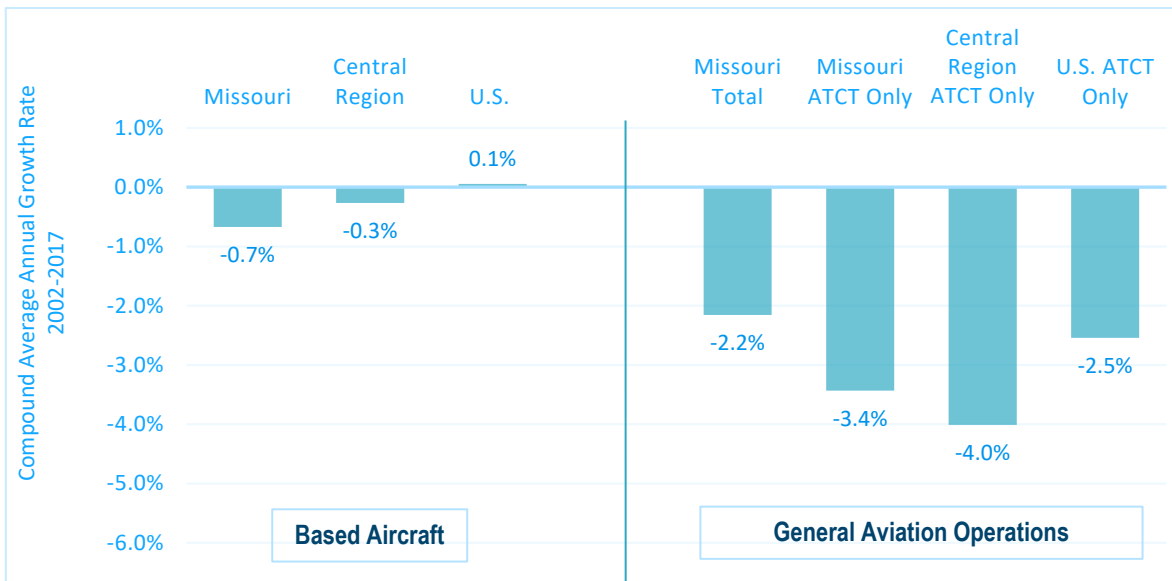


The recent downward trend in based general aviation aircraft and annual general aviation operations is not unique to Missouri airports. The trends reflect the decline in general aviation activity across the nation due to a weak economy, a declining pilot population, and high fuel prices over the last decade.

To better understand the state’s trends in based aircraft and general aviation operations, comparative information for the United States and FAA’s Central Region was reviewed. As shown in **Figure 3-1**, between 2002 and 2017, based aircraft in Missouri declined 0.7 percent per year on average. This compares to a decline of 0.3 percent in the region and minimal growth in based aircraft nationally of 0.1 percent. Reviewing operations at towered airports is the most accurate means for determining changes in general aviation operations. Missouri’s average annual decline in general aviation operations at towered airports (3.4 percent) was less than the rate of decline experienced by all towered airports in the region (4.0 percent) but more than the decline by all towered airports in the United States (2.5 percent). When Missouri towered airport actual operations and non-towered airport estimated operations are combined, general aviation operations fell at an average annual rate of 2.2 percent.

While the overall trend in based aircraft and general aviation operations for the state and region are similar, Missouri experienced slightly larger declines when compared to the United States overall. This helps substantiate that future aviation trends at Missouri system airports may be similar to national trends projected by FAA.

FIGURE 3-1: COMPARISON OF MISSOURI, FAA CENTRAL REGION, AND US GENERAL AVIATION ACTIVITY TRENDS 2002-2017



Sources: Missouri Airport Management, FAA 5010, FAA Terminal Area Forecast, FAA ATADS database, *FAA Aerospace Forecasts Fiscal Years 2018-2038*

Notes: ATCT = Airports with Air Traffic Control Towers that record general aviation operations. Central Region includes Missouri, Kansas, Iowa, and Nebraska.

Two key national events have attributed to the significant decline in overall general aviation operations in Missouri over the last 17 years: the events of September 11, 2001; and the economic recession that occurred between 2007 and 2009. As shown in **Figure 3-2**, general aviation operations at towered airports<sup>3</sup> in Missouri

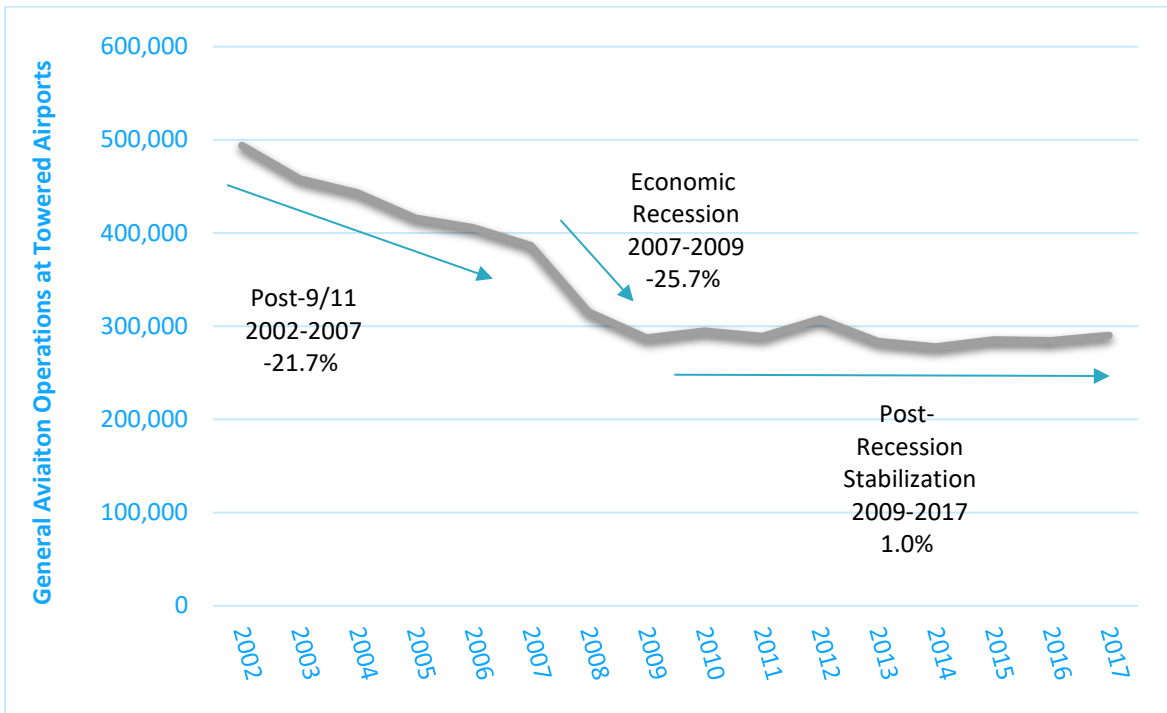
<sup>3</sup> A year-over-year comparison of general aviation operations in Missouri was only available for the larger airports with air traffic control towers that report operations by type to the FAA. In 2017, general aviation operations at towered airports accounted for 30 percent of the total general aviation operations in the state estimated as part of the System Plan.



fell 22 percent in the years following September 11 (2001-2006), and then fell another 26 percent during the economic recession. These specific events, combined with increases in fuel prices, rising cost of general aviation aircraft, declining numbers of pilots and flight training, and changes in how companies do business (such as the increased utilization of technology and how corporate aviation is used as a business strategy) help explain the decline in Missouri’s general aviation activity.

While general aviation operations have not rebounded since September 11 and the recession, they have stabilized beginning in 2009, as shown in **Figure 3-2**. These recent trends indicate that general aviation operations in Missouri may continue to experience some growth in the future.

FIGURE 3-2: CHANGE IN GENERAL AVIATION OPERATIONS AT TOWERED AIRPORTS IN MISSOURI



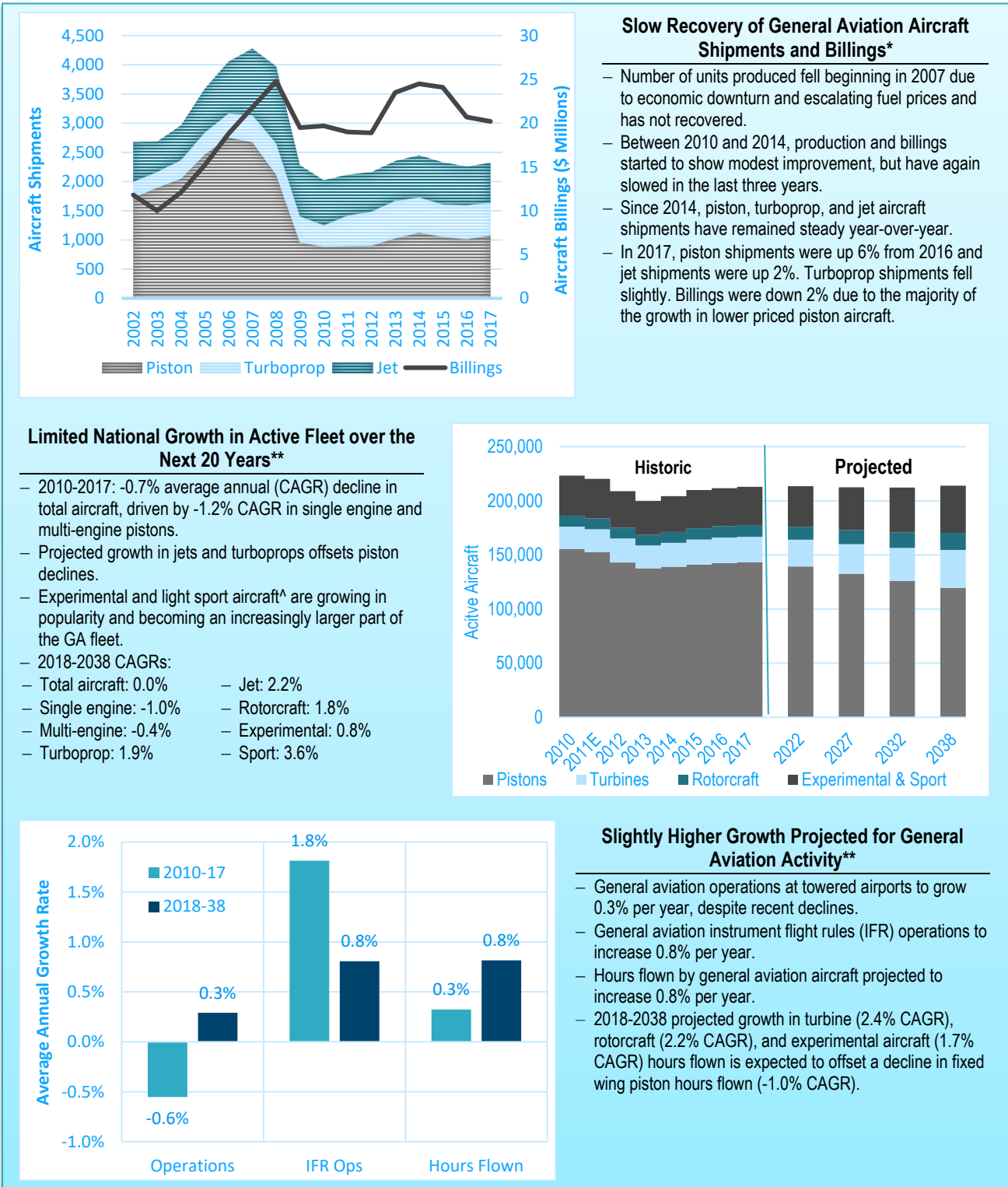
Source: FAA ATADS Database

### 3.2 General Aviation Industry Trends and Issues that May Impact Future Aviation Growth

At the national level, fluctuating trends regarding general aviation usage and economic upturns/downturns have impacted general aviation demand. Slow economic recovery and economic uncertainties have and will continue to impact general aviation demand over the next several years. Some of the national trends that will impact aviation demand at Missouri airports are shown and discussed here. **Figure 3-3** presents recent and projected trends in general aviation aircraft orders, active aircraft fleet, and operations.



FIGURE 3-3: GENERAL AVIATION TRENDS



Sources: \* GAMA Quarterly Shipments and Billings; \*\* FAA Aerospace Forecasts, Fiscal Year 2018-2038

Note: ^Light sport aircraft are defined as 1-2 person simple-to-operate, easy-to-fly aircraft that have a max weight of 1,320 lbs.





Table 3-2 presents several of the recent and projected national aviation trends as opportunities or threats for general aviation growth in the Missouri system; these trends have impacted Missouri in the past and will continue to impact future growth. National trends have been taken into consideration during the development of demand projections presented later in this chapter.

TABLE 3-2: NATIONAL TRENDS INFLUENCING GENERAL AVIATION GROWTH

| Opportunities for General Aviation Growth   | Threats to General Aviation Growth   |
|---|--|
| <p><b>Increased Delivery of Several Aircraft Types 2018-2038 (FAA):</b> Delivery of some types of GA aircraft is expected to increase:</p> <ul style="list-style-type: none"> <li>– Turbo Jet: 2.2% CAGR</li> <li>– Rotorcraft: 1.8% CAGR</li> <li>– Turboprop: 1.7% CAGR</li> </ul> <p>Because of lower entry and operating costs, industry growth is also projected for light sport and experimental aircraft.</p> <ul style="list-style-type: none"> <li>– Light Sport: 3.6% CAGR</li> <li>– Experimental Aircraft: 0.8% CAGR</li> </ul> | <p><b>Decline in Single-Engine Piston Fleet (FAA):</b> The single engine piston fleet makes up the largest percentage of GA fleet. FAA projects contraction of this portion of the fleet at a rate of -1.0% over the next 20 years.</p> <ul style="list-style-type: none"> <li>– 2010: 139,520</li> <li>– 2017: 130,330</li> <li>– 2038 Projected: 107,800</li> </ul> <p>According to GAMA, new piston airplane sales dropped dramatically following the economic recession and have not recovered.</p>  |
| <p><b>Increase in Business Flying:</b> Business use of general aviation aircraft as a tool to increase efficiency and productivity remains strong. The Tax Cuts and Jobs Act of 2017 provided tax savings on new and used aircraft for corporate use and oil prices remain low. Business aviation:</p> <ul style="list-style-type: none"> <li>– Provides time efficiencies for companies</li> <li>– Tends to purchase more fuel</li> <li>– Is a more consistent activity and higher revenue generator for airports</li> </ul>               | <p><b>Decline in Annual GA Operations at Towered Airports (FAA):</b> GA operations at all towered airports in the United States decreased -0.6% per year between 2010 and 2017. A small increase is expected over the next 20 years.</p> <ul style="list-style-type: none"> <li>– 2010: 26.6 million</li> <li>– 2017: 25.6 million</li> <li>– 2037 Projected: 27.4 million</li> </ul>  |
| <p><b>Uptick in On-Demand Charter Activity:</b> NetJets, FlexJet and other companies have experienced more aircraft share sales and an increase in flight hours due to the current economic climate. Companies are investing more often in a variety of products including fractional ownership, jet cards, and club membership programs. These items allow businesses of all sizes to utilize business aviation without purchasing an aircraft. Charter traffic grew 7% in 2017.</p>   | <p><b>Decline in Active Private Pilots (FAA):</b> The number of active private pilots in the United States has declined 2.3% on average since 2010 due to new medical requirements for certification and the cost to fly. The number of pilots is expected to remain flat over the next 20 years. The pilot shortage will impact business aviation operations as pilot salaries will rise due to high demand from commercial airlines, who are hiring more pilots than ever. Flight training around the country is again picking up as new pilots begin careers with the airlines and charter companies.</p> |
| <p><b>Reduction in Cities with Scheduled Airline Service and Increased Reliance on GA Travel:</b> As airlines have reduced or eliminated scheduled service to smaller markets, there is an opportunity for charter and air taxi flights on general aviation aircraft to backfill this void.</p>   | <p><b>Phase Out of 100 LL Fuel to Non-Leaded Fuel:</b> AvGas production was down 30% in 2016 compared to 10 years earlier. Plans to replace 100LL fuel with a non-leaded aviation fuel will result in further reduction in the piston GA fleet.</p>  |
| <p><b>Declining Used Aircraft Cost:</b> Used aircraft values, especially for jet aircraft, are at an all-time low, down 16% in 2017 from a year earlier. This has allowed more individuals and companies to venture into ownership for the first time. However, this has also slowed demand for new aircraft.</p>   | <p><b>Increase in Cost of New GA Aircraft:</b> The cost to purchase a new single-engine piston plane has increased significantly.</p> <ul style="list-style-type: none"> <li>– Piper Seneca: \$650,000 (2005) v. \$1 million (2018)</li> <li>– Cirrus SR22 GTS: \$335,000 (2005) v. \$760,000 (2018)</li> <li>– Cessna 172 Skyhawk: \$230,000 (2005) v. \$379,000 (2018)</li> </ul>  |

Sources: FAA Aerospace Forecast Fiscal Years 2018-2038, GAMA Quarterly Shipments and Billings, other industry sources

### 3.3 Socioeconomic Trends That May Impact Future Aviation Growth

Factors that may influence future aviation activity that are independent of historical airport activity include area socioeconomic and demographic trends. Socioeconomic characteristics are often examined to derive an understanding of the dynamics of projected aviation growth. As socioeconomic activity increases, general aviation activity also generally increases.



Missouri and many of its 114 counties have growing economies. The following highlights the business climate in Missouri:

- There are ten Fortune 500 companies headquartered in the state, including Express Scripts Holding (#22), Centene (#66), Emerson Electric (#139), Monsanto (#204), and Reinsurance Group of America (#246).
- According to the Missouri Department of Economic Development, the top industries are manufacturing, health care and social assistance, retail, financial and professional services, and agriculture and bioscience.
- The Missouri Partnership notes that Missouri is a global leader in advanced manufacturing, agtech, logistics, energy solutions, financial and professional services, food solutions, and the health innovation industries.
- The fastest growing firms are in the areas of construction, retail trade, scientific and technical services, and health care and social assistance according to the Missouri Department of Economic Development.
- Missouri's central location in the United States makes it a strategic location for companies looking to reach the world via air, river, rail, or road.
- The state offers numerous incentives and workforce training for business attraction and retention. The Missouri Works program has supported job creation and investment in the state by offering companies benefits for investing in the state. The BUILD program provides financial incentives for the location or expansion of large business projects in Missouri.

A summary of Missouri's historical and projected trends in population and employment are discussed below. These trends were considered in the development of aviation demand projections for each system airport.

**Population.** Between 1990 and 2015, statewide population grew at an average annual rate of 0.7 percent per year. In 2015, Missouri's estimated population was 6.1 million, up from 5.1 million in 1990 (see **Figure 3-4**). Over the last 10 years, statewide population grew at a slightly lower annual rate of 0.5 percent. Between 2015 and 2035, population is estimated to increase at 0.6 percent per year on average.<sup>4</sup>

The rates of historical and projected population growth experienced in Missouri are below those experienced in the United States overall. Between 1990 and 2015, U.S. population grew at an average annual rate of 1.0 percent, and it is projected that that the national population growth rate will be 0.9 percent per year over the next 20 years.

**Employment.** Between 1990 and 2015, employment in Missouri increased at an average annual rate of 0.8 percent per year. This compares to a 1.3 percent CAGR experienced overall in the United States. In 2015, it was estimated that state employment was 3.7 million, up from 3.0 million in 1990 (**Figure 3-4**). Over the last 10 years, statewide employment grew at a lower rate of 0.4 percent per year on average. Employment in Missouri is projected to grow at 1.0 percent per year on average between 2015 and 2035, slightly below the projected United States CAGR of 1.3 percent over the same period.<sup>5</sup>

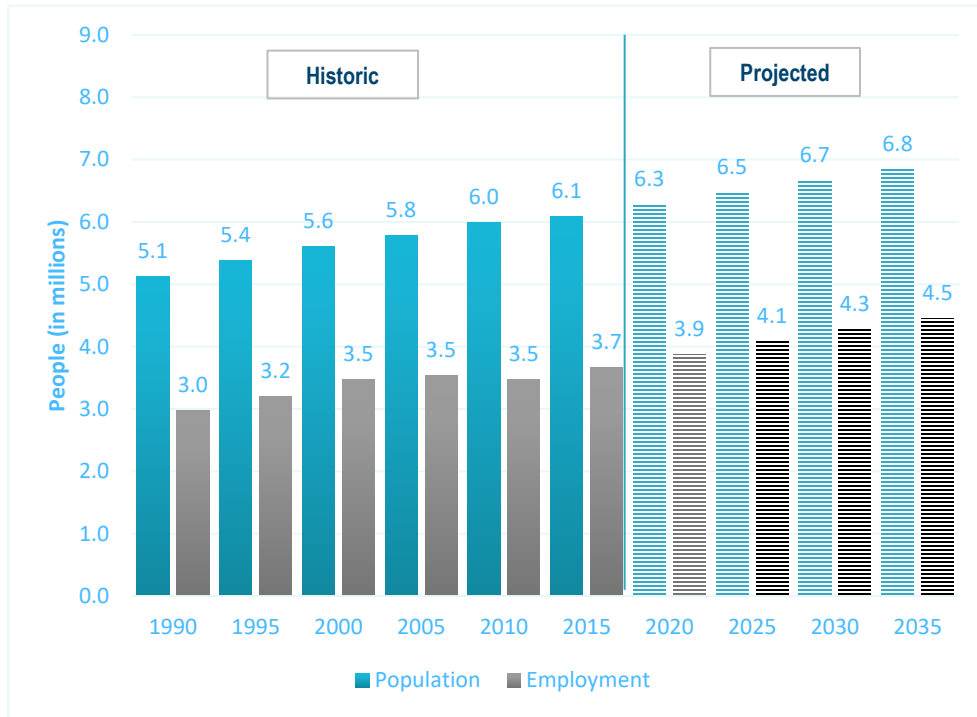
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<sup>4</sup> U.S. Census Bureau and Woods & Poole Economics, Inc.

<sup>5</sup> U.S. Department of Commerce and Woods & Poole Economics, Inc.



FIGURE 3-4: HISTORICAL AND PROJECTED MISSOURI POPULATION AND EMPLOYMENT



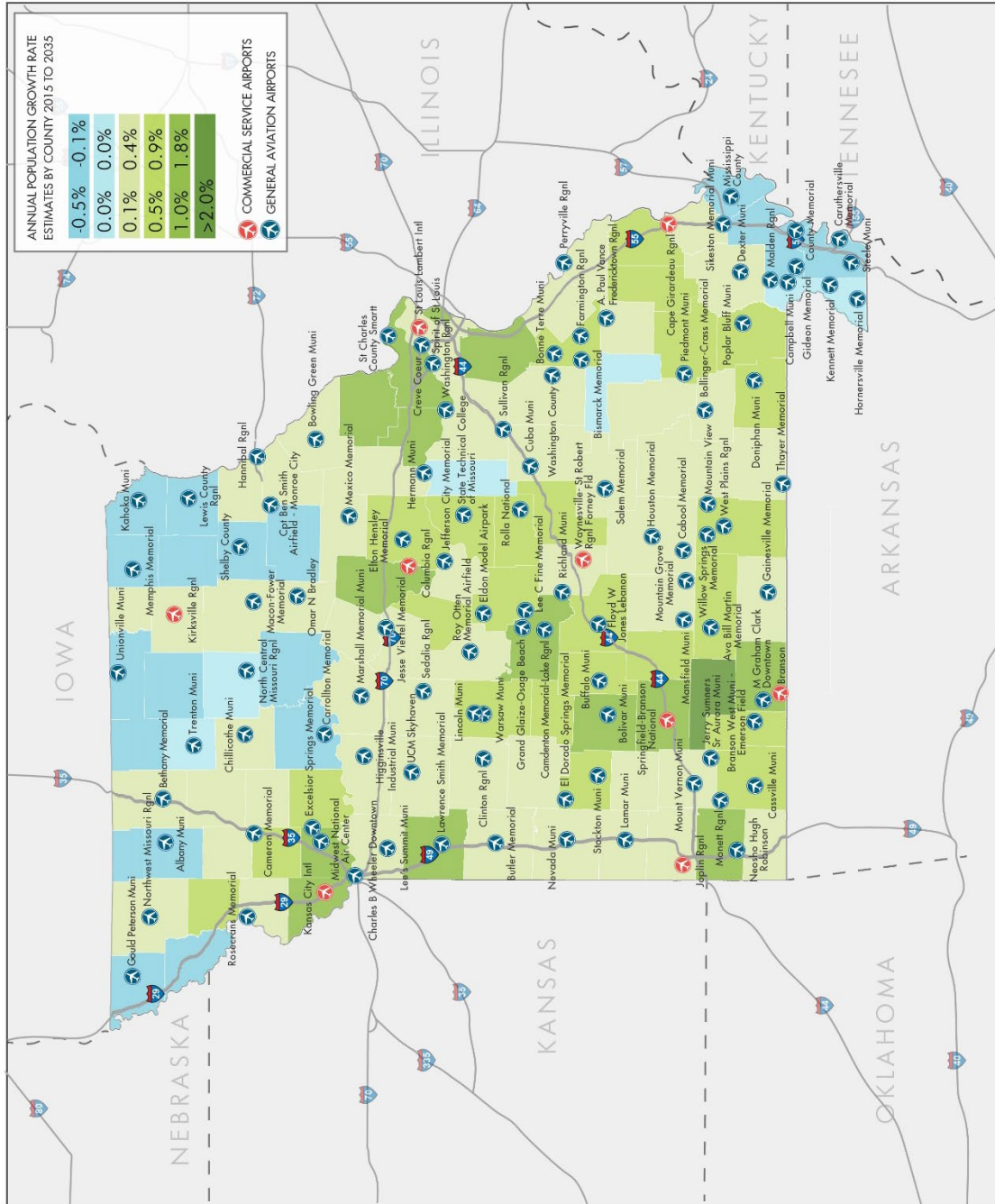
Sources: U.S. Census Bureau, U.S. Department of Commerce, Woods & Poole Economics, Inc.

Figure 3-5 presents projected rates of population increase by Missouri county. Much of the highest growth is projected to occur near Branson and in suburban counties in the metro areas of St. Louis, Kansas City, and Springfield. Christian County in the Springfield metropolitan statistical area (MSA) and Platte County in the Kansas City MSA are expected to experience the highest rates of population growth between 2015 and 2035. Population declines are anticipated in the southeast corner of the state and in several counties in northern Missouri.

Employment growth rates by county show a similar trend and are presented in Figure 3-6. Christian and Platte counties as well as Clay County (Kansas City MSA), St. Charles County (St. Louis MSA), and Newton County (Joplin MSA) are anticipated to see the highest rates of employment growth over the next two decades. Low employment growth is anticipated for the southeast corner of the state and many northern Missouri counties.



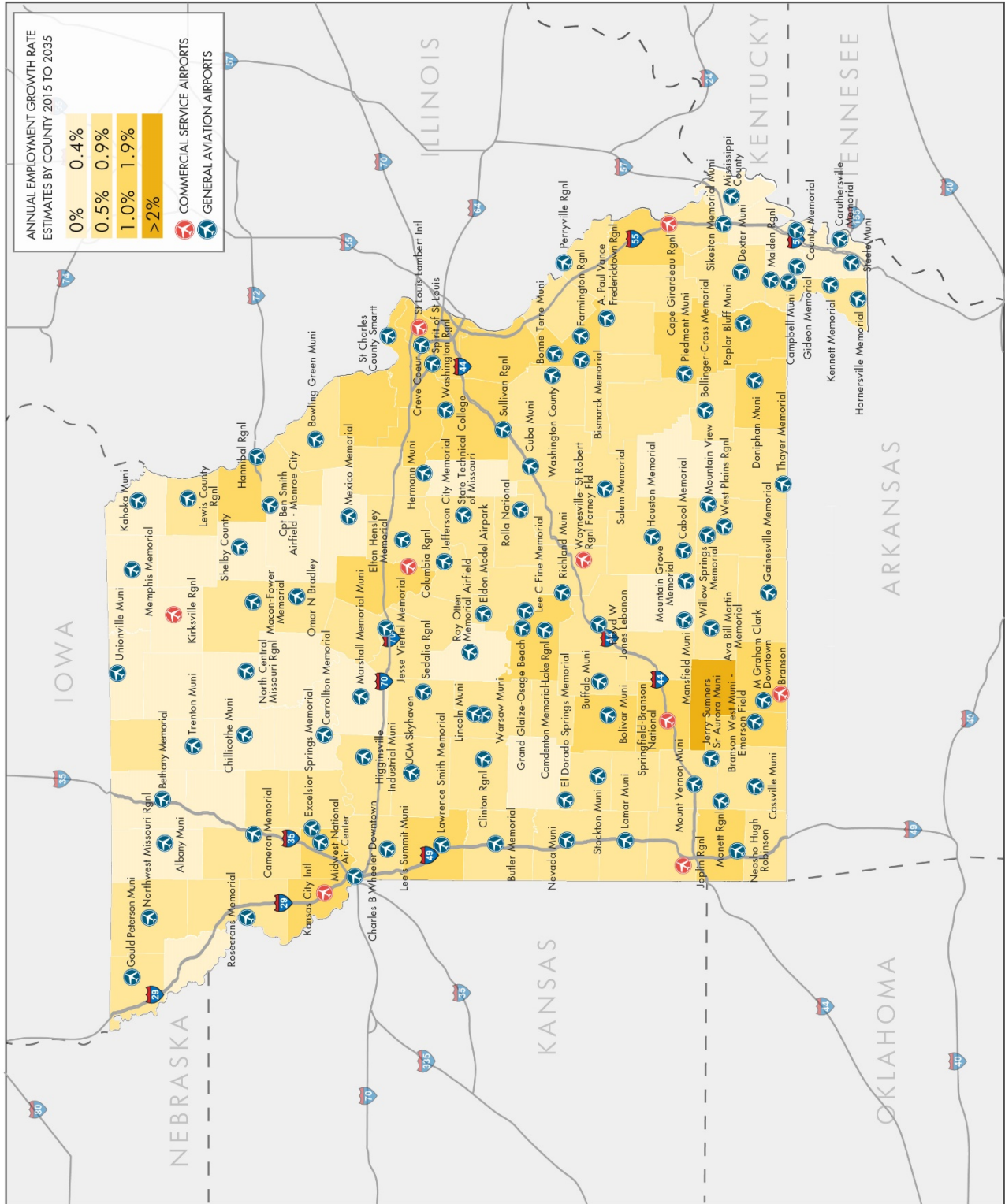
FIGURE 3-5: PROJECTED POPULATION GROWTH BY MISSOURI COUNTY (2015-2035)



Source: Woods & Poole Economics, Inc.



FIGURE 3-6 : PROJECTED EMPLOYMENT GROWTH RATE BY MISSOURI COUNTY (2015-2035)



Source: Woods & Poole Economics, Inc.



### 3.4 Projections of Aviation Demand

Projections of aviation demand were developed for based aircraft and general aviation operations using the following assumptions:

- In many instances, aviation activity at system airports will generally reflect the national aviation industry. The FAA projects low rates of growth for most aspects of aviation.
- Local economies may grow, and population and employment increase; changes in aviation demand will most likely not be directly related to, but may be supported by, these increases.
- Economic disturbances may cause year-to-year demand variations.
- Fuel prices will continue to fluctuate and the future availability of 100LL fuel (needed to fly piston aircraft) may further impact the general aviation projections.
- Projections are unconstrained with respect to facilities.

Several scenarios for projecting based aircraft and general aviation operations are discussed in this section. A preferred methodology was then chosen for each demand component. **Table 3-5** details the preferred projected based aircraft and general aviation operations.

#### 3.4.1 Based Aircraft

Estimating the number of aircraft anticipated to be based at system airports over the next 20 years impacts the planning for future facility and infrastructure needs. Initially, based aircraft were projected using four methodologies. The results of the forecasting scenarios were compared, and one methodology was chosen as the preferred based aircraft projection.

A summary of the four scenarios used to develop based aircraft projections are discussed below and shown in **Table 3-3** and **Figure 3-7**.

##### *Scenario 1: Historical Based Aircraft Growth and FAA Active General Aviation Fleet Growth*

This methodology considered historical based aircraft growth from 2002-2017 at each airport. A range of projected growth rates was then applied based on the FAA's projected growth rates for active general aviation aircraft. These growths were derived from the *FAA Aerospace Forecasts, Fiscal Years 2018-2038*. This methodology considered the fleet mix of aircraft at all airports and projected a slightly higher rate of growth for those airports that have aircraft types that are expected to see higher rates of future growth. This scenario produced a statewide 0.5 percent compound annual growth rate (CAGR) in statewide based aircraft through 2037. Using a top-down approach, this rate of growth was then applied to each airport to develop the projections by airport.

##### *Scenario 2: County Employment Growth and FAA Active General Aviation Fleet Growth*

In this scenario, a range of projected growth rates was applied based on the projected rate of employment growth for the county where the airport is located. A percentage of the FAA's projected growth rates of active general aviation aircraft from the *FAA Aerospace Forecasts, Fiscal Years 2018-2038* was applied to each airport's 2017 based aircraft to develop a 20-year projection. This scenario projects statewide based aircraft to grow at an average annual rate of 0.5 percent. This scenario resulted in projections very similar to those developed in Scenario 1. This shows the correlation that airports in counties with higher projected employment growth are often the same airports with based jets/historical growth.



### Scenario 3: County Population Growth Rate

This scenario assumes that the growth in based aircraft at each system airport will be equal to the rate of projected population growth for the county in which the airport is located. The population projections used to support this scenario were developed by Woods & Poole Economics, Inc. The statewide annual growth rate for based aircraft in this scenario is 0.6 percent.

### Scenario 4: Market Share: FAA’s Terminal Area Forecast Growth Rate

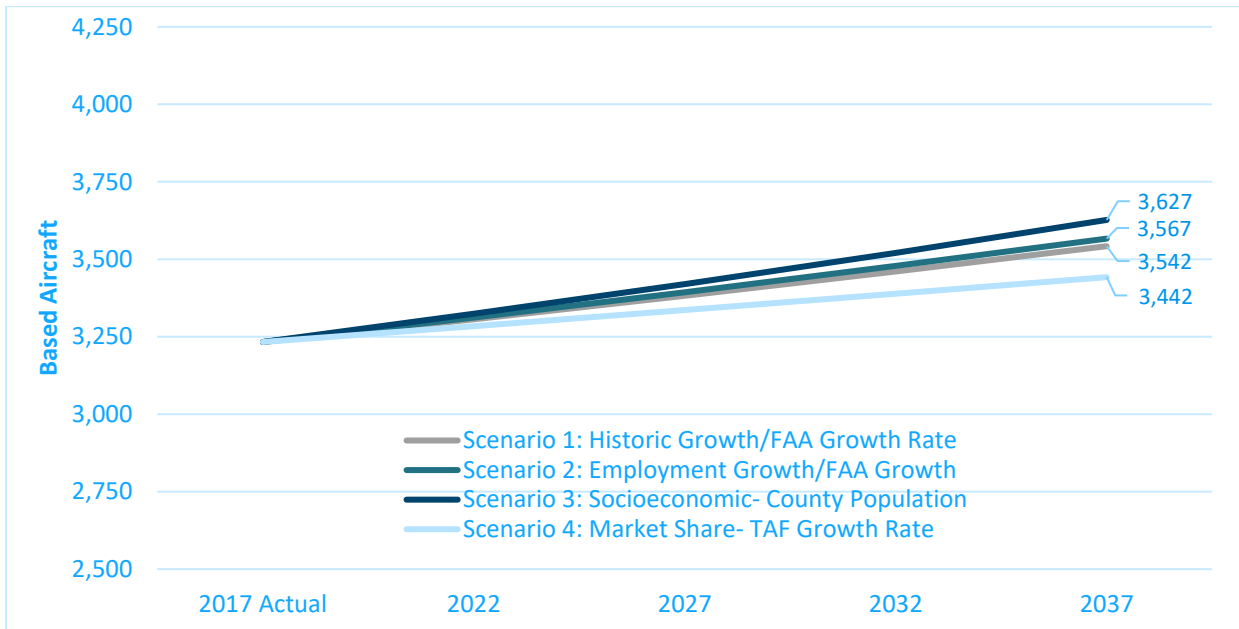
The FAA annually publishes its annual Terminal Area Forecast in which it projects operations and based aircraft for each airport included in the NPIAS. The TAF projects based aircraft at Missouri’s NPIAS airports to grow at an average annual rate of 0.3 percent between 2017 and 2037. This top-down scenario assumes that the system airports will maintain their share of the total Missouri based aircraft fleet through the forecast period.

TABLE 3-3: MISSOURI BASED AIRCRAFT FORECAST SCENARIOS

| Scenarios                                    | 2017 Actual | 2022  | 2027  | 2037  | CAGR 2017-37 |
|--|-------------|-------|-------|-------|--------------|
| Scenario 1: Historical Growth/FAA Growth     | 3,233       | 3,306 | 3,382 | 3,542 | 0.46%        |
| Scenario 2: Employment Growth/FAA Growth     | 3,233       | 3,312 | 3,393 | 3,567 | 0.49%        |
| Scenario 3: Socioeconomic- County Population | 3,233       | 3,324 | 3,420 | 3,627 | 0.58%        |
| Scenario 4: Market Share- TAF Growth         | 3,233       | 3,284 | 3,336 | 3,442 | 0.31%        |

Source: Marr Arnold Planning  
CAGR = compound annual growth rate

FIGURE 3-7: COMPARISON OF MISSOURI BASED AIRCRAFT FORECAST SCENARIOS



Source: Marr Arnold Planning



### *Preferred Based Aircraft Projection*

After comparing the results of the four forecast scenarios, the statewide growth rate produced by **Scenario 1: Historical Airport Growth/FAA Growth Rate** (0.46 percent) was selected as the preferred projection growth for based aircraft. This rate of growth was then applied to each system airport's 2017 based aircraft to determine their individual projections of based aircraft. Scenario 1 was selected as the preferred based aircraft projection since it takes historical growth trends into consideration, and it considers the modest growth projected by the FAA throughout the 20-year forecast period for business aircraft types. The results of this methodology for each airport are depicted in **Table 3-5**.

#### **3.4.1 General Aviation Aircraft Operations**

Different factors impact the number of operations at an airport. These factors include, but are not limited to:

- Total based aircraft
- Airport facilities and services such as a control tower, fuel, and an FBO
- Airport location
- Activity and facilities at neighboring or competing airports
- Area demographics including business density
- National trends

These factors were considered and four methodologies were used to develop projections of annual operations for each system airport. A summary of the scenarios used to develop the aircraft operations are shown in **Table 3-4** and **Figure 3-8**.

#### *Scenario 1: Operations Per Based Aircraft*

Operations Per Based Aircraft (OPBA) is calculated by dividing the number of total operations by the number of aircraft based at each airport. It is important to note that the OPBA ratio represents operations performed by both based and visiting aircraft. In Scenario 1, total operations at each system airport are projected by applying the airport's 2017 OPBA ratio to the preferred projection of based aircraft. Utilizing this methodology, it is projected that total operations at system airports will grow at a CAGR of 0.5 percent over the 20-year forecast period.

#### *Scenario 2: County Employment Growth*

Scenario 2 assumes that the growth of general aviation operations at each system airport will be equal to the rate of projected employment growth for the county in which the airport is located. The employment projections were developed by Woods & Poole Economics, Inc. The annual growth rate for annual general aviation operations in this scenario is 1.0 percent.

#### *Scenario 3: IFR Jet Operations and FAA Operations Projections*

This scenario analyzed FAA Instrument Flight Rule (IFR) data at each Missouri airport. Each airport was given a rating of high, medium, low, or none in terms of the number of jet operations that were captured by FAA's Traffic Flow Management System Counts last year. Each airport was then assigned a percentage of the *FAA Aerospace Forecasts, Fiscal Years 2018-2038* projections of general aviation operations, based on the number of jet operations they currently accommodate. This methodology considers that jet activity and business aviation are anticipated to be the fastest growing segments of aviation and applies a future rate of growth at





individual airports based on the level of jet activity. Under this scenario general aviation operations in Missouri are estimated to grow 0.6 percent per year on average over the next 20 years.

**Scenario 4: Market Share: FAA’s Operations Forecast**

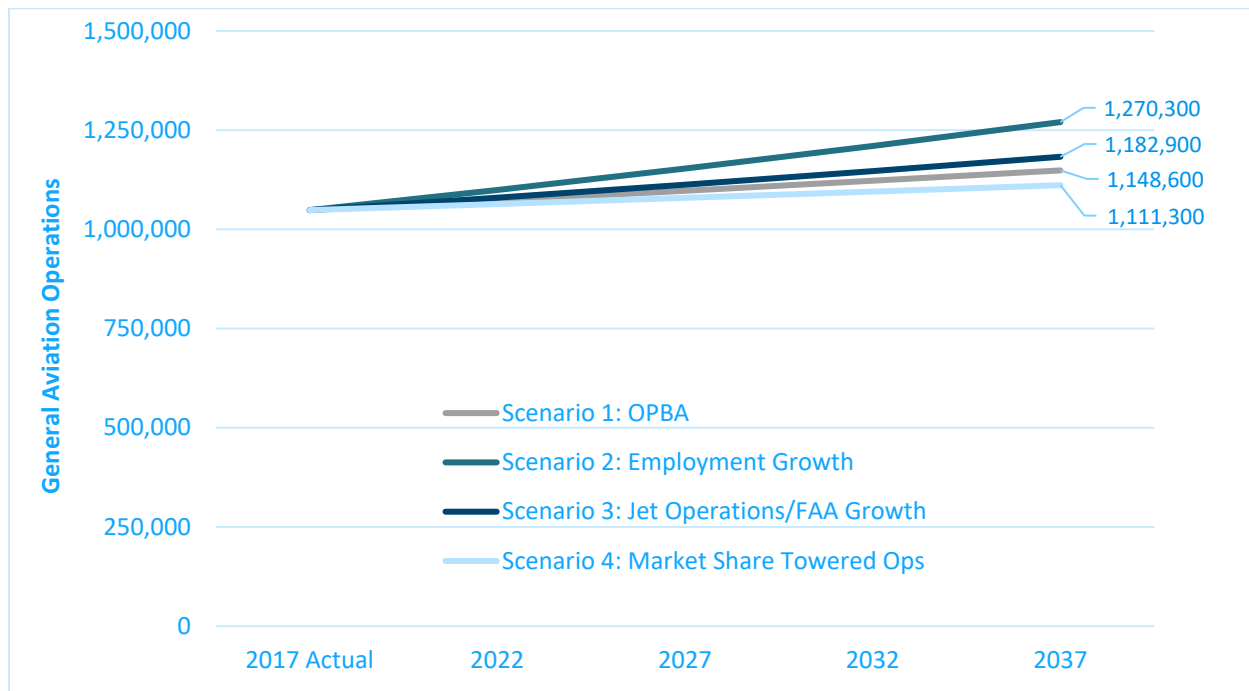
Scenario 4 applies the FAA’s projected rate of growth for general aviation operations at towered airports (derived from *FAA Aerospace Forecasts, Fiscal Years 2018-2038*) to the 2017 total operations for all airports. Each airport’s share of 2017 operations is then maintained through the forecast period and applied to the total to estimate operations for 2022, 2027, and 2037 by airport. The CAGR for total general aviation operations using this methodology is 0.3 percent.

TABLE 3-4 : MISSOURI GENERAL AVIATION OPERATIONS PROJECTION SCENARIOS

| Scenarios                             | 2017 Actual | 2022      | 2027      | 2037      | CAGR 2017-37 |
|---------------------------------------|-------------|-----------|-----------|-----------|--------------|
| Scenario 1: OPBA                      | 1,048,536   | 1,072,700 | 1,097,100 | 1,148,600 | 0.45%        |
| Scenario 2: Employment Growth         | 1,048,536   | 1,099,400 | 1,153,200 | 1,270,300 | 0.96%        |
| Scenario 3: Jet Operations/FAA Growth | 1,048,536   | 1,079,800 | 1,112,600 | 1,182,900 | 0.60%        |
| Scenario 4: Market Share Towered Ops  | 1,048,536   | 1,063,900 | 1,079,400 | 1,111,300 | 0.29%        |

Source: Marr Arnold Planning

FIGURE 3-8 : COMPARISON OF MISSOURI GENERAL AVIATION OPERATIONS PROJECTION SCENARIOS



Source: Marr Arnold Planning

**Preferred Operations Projection**

The results of the four projections of general aviation operational demand can be viewed as a range for future statewide takeoffs and landings. In the lowest scenario (Scenario 4), total annual general aviation operations could increase from their 2017 level of 1.05 million to 1.11 million at the end of the 20-year planning period. The mid-growth scenarios, Scenario 1 and Scenario 3, show annual operations for system airports reaching



1.15 and 1.18 million, respectively. The highest-growth scenario (Scenario 2, County Employment), presents a projection of general aviation operations demand that will reach 1.27 million operations at the end of the forecast period.

General aviation operations at Missouri system airports experienced large declines since the 2002 System Plan due largely to the fallout of September 11 and the economic recession of 2007-2009. However, operations over the last several years have stabilized, and operations at towered airports are growing slightly. These trends help support the preferred projections of general aviation operations at system airports developed as part of **Scenario 3: Jet Operations/FAA Growth**. This methodology produces conservative results, but also considers the current trends in growing jet activity.

As shown in **Table 3-4** and **Figure 3-8**, total annual general aviation operations for system airports are projected to reach 1.18 million in 2037. The average annual rate of growth implied in the preferred forecast is 0.60 percent.

### 3.5 Summary

This System Plan takes a conservative approach to projecting the future aviation demand for system airports and follows national aviation trends and Missouri-specific socioeconomic anticipated growth. **Table 3-5** presents based aircraft and general aviation operations projections for each system airport. These projections are developed on a system planning level of detail. Projections associated with comprehensive airport master plans and airport layout plans will guide actual individual airport development. Projections of demand presented in this chapter help establish future system-wide facility needs.



TABLE 3-5: PROJECTIONS OF MISSOURI BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

| Associated City                    | Airport Name                           | Based Aircraft |      |      |      | CAGR <sup>A</sup><br>2017-37 | General Aviation Operations |        |        |      | CAGR <sup>A</sup><br>2017-37 |
|------------------------------------|--|----------------|------|------|------|------------------------------|-----------------------------|--------|--------|------|------------------------------|
|                                    |  | 2017<br>Actual | 2022 | 2027 | 2037 |                              | 2017<br>Actual              | 2022   | 2027   | 2037 |                              |
| <b>Commercial Service Airports</b> |  |                |      |      |      |                              |                             |        |        |      |                              |
| Branson                            | Branson                                | 5              | 5    | 5    | 5    | 0.5%                         | 5,080                       | 5,700  | 6,400  | 1.2% |                              |
| Cape Girardeau                     | Cape Girardeau Regional                | 57             | 58   | 60   | 62   | 0.5%                         | 24,371                      | 27,360 | 30,720 | 1.2% |                              |
| Columbia                           | Columbia Regional                      | 45             | 46   | 47   | 49   | 0.5%                         | 16,882                      | 18,950 | 21,280 | 1.2% |                              |
| Fort Leonard Wood                  | Waynesville-St. Robert Regional        | 10             | 10   | 10   | 11   | 0.5%                         | 8,202                       | 8,440  | 8,690  | 0.3% |                              |
| Joplin                             | Joplin Regional                        | 126            | 129  | 132  | 138  | 0.5%                         | 21,317                      | 23,930 | 26,870 | 1.2% |                              |
| Kansas City                        | Kansas City International              | 2              | 2    | 2    | 2    | 0.5%                         | 12,184                      | 13,680 | 15,360 | 1.2% |                              |
| Kirkville                          | Kirkville Regional                     | 24             | 25   | 25   | 26   | 0.5%                         | 4,000                       | 4,300  | 4,620  | 0.7% |                              |
| Springfield                        | Springfield-Branson National           | 122            | 125  | 128  | 134  | 0.5%                         | 34,374                      | 38,590 | 43,330 | 1.2% |                              |
| St. Louis                          | St. Louis Lambert International        | 18             | 18   | 19   | 20   | 0.5%                         | 26,565                      | 29,820 | 33,480 | 1.2% |                              |
| <b>General Aviation Airports</b>   |  |                |      |      |      |                              |                             |        |        |      |                              |
| Albany                             | Albany Municipal                       | 8              | 8    | 8    | 9    | 0.5%                         | 3,270                       | 3,320  | 3,370  | 0.2% |                              |
| Aurora                             | Jerry Summers Sr Aurora Municipal      | 26             | 27   | 27   | 28   | 0.5%                         | 10,500                      | 10,650 | 10,810 | 0.1% |                              |
| Ava                                | Ava Bill Martin Memorial               | 6              | 6    | 6    | 7    | 0.5%                         | 4,320                       | 4,380  | 4,450  | 0.1% |                              |
| Bethany                            | Bethany Memorial                       | 6              | 6    | 6    | 7    | 0.5%                         | 144                         | 150    | 150    | 0.2% |                              |
| Bismarck                           | Bismarck Memorial                      | 8              | 8    | 8    | 9    | 0.5%                         | 2,450                       | 2,470  | 2,520  | 0.1% |                              |
| Bolivar                            | Bolivar Municipal                      | 60             | 61   | 63   | 66   | 0.5%                         | 11,648                      | 11,820 | 12,340 | 0.3% |                              |
| Bonne Terre                        | Bonne Terre Municipal                  | 3              | 3    | 3    | 3    | 0.5%                         | 750                         | 760    | 770    | 0.1% |                              |
| Boonville                          | Jesse Viertel Memorial                 | 54             | 55   | 57   | 59   | 0.5%                         | 9,800                       | 9,870  | 10,090 | 0.1% |                              |
| Bowling Green                      | Bowling Green Municipal                | 11             | 11   | 12   | 12   | 0.5%                         | 1,875                       | 1,890  | 1,930  | 0.1% |                              |
| Branson                            | M. Graham Clark - Downtown             | 68             | 70   | 71   | 75   | 0.5%                         | 10,775                      | 11,090 | 11,420 | 0.3% |                              |
| Branson West                       | Branson West Municipal - Emerson Field | 25             | 26   | 26   | 27   | 0.5%                         | 2,904                       | 3,010  | 3,120  | 0.7% |                              |
| Brookfield/ Marceline              | North Central Missouri Regional        | 9              | 9    | 9    | 10   | 0.5%                         | 1,750                       | 1,780  | 1,850  | 0.3% |                              |
| Buffalo                            | Buffalo Municipal                      | 11             | 11   | 12   | 12   | 0.5%                         | 2,918                       | 2,940  | 3,000  | 0.1% |                              |
| Butler                             | Butler Memorial                        | 20             | 20   | 21   | 22   | 0.5%                         | 6,700                       | 6,750  | 6,900  | 0.1% |                              |



TABLE 3-5: PROJECTIONS OF MISSOURI BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

| Associated City   | Airport Name                         | Based Aircraft |      |      |      | CAGR <sup>A</sup> 2017-37 | General Aviation Operations |        |        |        | CAGR <sup>A</sup> 2017-37 |
|-------------------|--------------------------------------|----------------|------|------|------|---------------------------|-----------------------------|--------|--------|--------|---------------------------|
|                   |                                      | 2017 Actual    | 2022 | 2027 | 2037 |                           | 2017 Actual                 | 2022   | 2027   | 2037   |                           |
| Cabool            | Cabool Memorial                      | 10             | 10   | 10   | 11   | 0.5%                      | 3,486                       | 3,510  | 3,540  | 3,590  | 0.1%                      |
| Camdenton         | Camdenton Memorial-Lake Regional     | 35             | 36   | 37   | 38   | 0.5%                      | 9,900                       | 9,970  | 10,040 | 10,190 | 0.1%                      |
| Cameron           | Cameron Memorial                     | 27             | 28   | 28   | 30   | 0.5%                      | 6,700                       | 6,750  | 6,800  | 6,900  | 0.1%                      |
| Campbell          | Campbell Municipal                   | 10             | 10   | 10   | 11   | 0.5%                      | 4,000                       | 4,030  | 4,060  | 4,120  | 0.1%                      |
| Carrollton        | Carrollton Memorial                  | 12             | 12   | 13   | 13   | 0.5%                      | 4,350                       | 4,380  | 4,410  | 4,480  | 0.1%                      |
| Caruthersville    | Caruthersville Memorial              | 10             | 10   | 10   | 11   | 0.5%                      | 3,640                       | 3,670  | 3,690  | 3,750  | 0.1%                      |
| Cassville         | Cassville Municipal                  | 12             | 12   | 13   | 13   | 0.5%                      | 2,495                       | 2,510  | 2,530  | 2,570  | 0.1%                      |
| Charleston        | Mississippi County                   | 0              | 0    | 0    | 0    | 0.0%                      | 1,200                       | 1,210  | 1,220  | 1,240  | 0.2%                      |
| Chillicothe       | Chillicothe Municipal                | 21             | 21   | 22   | 23   | 0.5%                      | 6,000                       | 6,040  | 6,090  | 6,180  | 0.1%                      |
| Clinton           | Clinton Regional                     | 28             | 29   | 29   | 31   | 0.5%                      | 6,560                       | 6,660  | 6,750  | 6,950  | 0.3%                      |
| Cuba              | Cuba Municipal                       | 20             | 20   | 21   | 22   | 0.5%                      | 3,700                       | 3,730  | 3,750  | 3,810  | 0.1%                      |
| Dexter            | Dexter Municipal                     | 21             | 21   | 22   | 23   | 0.5%                      | 8,110                       | 8,230  | 8,350  | 8,600  | 0.3%                      |
| Doniphan          | Doniphan Municipal                   | 12             | 12   | 13   | 13   | 0.5%                      | 2,050                       | 2,060  | 2,080  | 2,110  | 0.1%                      |
| El Dorado Springs | El Dorado Springs Memorial           | 15             | 15   | 16   | 16   | 0.5%                      | 3,500                       | 3,530  | 3,550  | 3,600  | 0.1%                      |
| Eldon             | Eldon Model Airpark                  | 18             | 18   | 19   | 20   | 0.5%                      | 10,240                      | 10,310 | 10,390 | 10,540 | 0.1%                      |
| Excelsior Springs | Excelsior Springs Memorial           | 18             | 18   | 19   | 20   | 0.5%                      | 4,000                       | 4,030  | 4,060  | 4,120  | 0.1%                      |
| Farmington        | Farmington Regional                  | 32             | 33   | 33   | 35   | 0.5%                      | 10,750                      | 10,910 | 11,070 | 11,390 | 0.3%                      |
| Fredericktown     | A. Paul Vance Fredericktown Regional | 14             | 14   | 15   | 15   | 0.5%                      | 2,400                       | 2,420  | 2,440  | 2,470  | 0.1%                      |
| Fulton            | Elton Hensley Memorial               | 36             | 37   | 38   | 39   | 0.5%                      | 12,000                      | 12,090 | 12,180 | 12,350 | 0.1%                      |
| Gainesville       | Gainesville Memorial                 | 5              | 5    | 5    | 5    | 0.5%                      | 290                         | 290    | 290    | 300    | 0.2%                      |
| Gideon            | Gideon Memorial                      | 4              | 4    | 4    | 4    | 0.5%                      | 3,000                       | 3,020  | 3,040  | 3,090  | 0.1%                      |
| Hannibal          | Hannibal Regional                    | 20             | 20   | 21   | 22   | 0.5%                      | 6,204                       | 6,290  | 6,390  | 6,580  | 0.3%                      |
| Harrisonville     | Lawrence Smith Memorial              | 54             | 55   | 57   | 59   | 0.5%                      | 7,000                       | 7,100  | 7,210  | 7,420  | 0.3%                      |
| Hermann           | Hermann Municipal                    | 6              | 6    | 6    | 7    | 0.5%                      | 1,350                       | 1,360  | 1,370  | 1,390  | 0.1%                      |
| Higginsville      | Higginsville Industrial Municipal    | 20             | 20   | 21   | 22   | 0.5%                      | 3,554                       | 3,580  | 3,610  | 3,660  | 0.1%                      |



TABLE 3-5: PROJECTIONS OF MISSOURI BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

| Associated City   | Airport Name                        | Based Aircraft |      |      |      | CAGR <sup>A</sup><br>2017-37 | General Aviation Operations |        |        |        | CAGR <sup>A</sup><br>2017-37 |
|-------------------|-------------------------------------|----------------|------|------|------|------------------------------|-----------------------------|--------|--------|--------|------------------------------|
|                   |                                     | 2017<br>Actual | 2022 | 2027 | 2037 |                              | 2017<br>Actual              | 2022   | 2027   | 2037   |                              |
| Horseshoe         | Horseshoe Memorial                  | 2              | 2    | 2    | 2    | 0.5%                         | 1,500                       | 1,520  | 1,540  | 1,540  | 0.1%                         |
| Houston           | Houston Memorial                    | 19             | 19   | 20   | 21   | 0.5%                         | 3,830                       | 3,890  | 3,940  | 3,940  | 0.1%                         |
| Jefferson City    | Jefferson City Memorial             | 57             | 58   | 60   | 62   | 0.5%                         | 27,652                      | 31,040 | 34,850 | 34,850 | 1.2%                         |
| Kahoka            | Kahoka Municipal                    | 2              | 2    | 2    | 2    | 0.5%                         | 880                         | 890    | 910    | 910    | 0.2%                         |
| Kaiser/Lake Ozark | Lee C Fine Memorial                 | 9              | 9    | 9    | 10   | 0.5%                         | 4,443                       | 4,990  | 5,600  | 5,600  | 1.2%                         |
| Kansas City       | Charles B. Wheeler-Downtown         | 184            | 188  | 193  | 202  | 0.5%                         | 72,990                      | 81,940 | 92,000 | 92,000 | 1.2%                         |
| Kennett           | Kennett Memorial                    | 27             | 28   | 28   | 30   | 0.5%                         | 16,500                      | 16,990 | 17,490 | 17,490 | 0.3%                         |
| Lamar             | Lamar Municipal                     | 15             | 15   | 16   | 16   | 0.5%                         | 5,000                       | 5,070  | 5,150  | 5,150  | 0.1%                         |
| Lebanon           | Floyd W. Jones Lebanon              | 30             | 31   | 31   | 33   | 0.5%                         | 11,950                      | 12,850 | 13,810 | 13,810 | 0.7%                         |
| Lee's Summit      | Lee's Summit Municipal              | 148            | 151  | 155  | 162  | 0.5%                         | 50,000                      | 51,470 | 52,990 | 52,990 | 0.3%                         |
| Lincoln           | Lincoln Municipal                   | 6              | 6    | 6    | 7    | 0.5%                         | 1,760                       | 1,790  | 1,810  | 1,810  | 0.1%                         |
| Linn              | State Technical College of Missouri | 13             | 13   | 14   | 14   | 0.5%                         | 1,450                       | 1,470  | 1,490  | 1,490  | 0.1%                         |
| Macon             | Macon-Fower Memorial                | 12             | 12   | 13   | 13   | 0.5%                         | 3,179                       | 3,270  | 3,370  | 3,370  | 0.3%                         |
| Malden            | Malden Regional                     | 15             | 15   | 16   | 16   | 0.5%                         | 8,500                       | 8,620  | 8,750  | 8,750  | 0.1%                         |
| Mansfield         | Mansfield Municipal                 | 9              | 9    | 9    | 10   | 0.5%                         | 1,022                       | 1,040  | 1,050  | 1,050  | 0.1%                         |
| Marshall          | Marshall Memorial Municipal         | 22             | 23   | 23   | 24   | 0.5%                         | 5,110                       | 5,260  | 5,420  | 5,420  | 0.3%                         |
| Maryville         | Northwest Missouri Regional         | 17             | 17   | 18   | 19   | 0.5%                         | 12,408                      | 12,770 | 13,150 | 13,150 | 0.3%                         |
| Memphis           | Memphis Memorial                    | 10             | 10   | 10   | 11   | 0.5%                         | 2,200                       | 2,230  | 2,260  | 2,260  | 0.1%                         |
| Mexico            | Mexico Memorial                     | 33             | 34   | 35   | 36   | 0.5%                         | 10,860                      | 11,180 | 11,510 | 11,510 | 0.3%                         |
| Moberly           | Omar N Bradley                      | 30             | 31   | 31   | 33   | 0.5%                         | 7,370                       | 7,920  | 8,520  | 8,520  | 0.7%                         |
| Monett            | Monett Regional                     | 27             | 28   | 28   | 30   | 0.5%                         | 14,400                      | 15,480 | 16,650 | 16,650 | 0.7%                         |
| Monroe City       | Captain Ben Smith Airfield          | 2              | 2    | 2    | 2    | 0.5%                         | 1,500                       | 1,520  | 1,540  | 1,540  | 0.1%                         |
| Monticello        | Lewis County Regional               | 6              | 6    | 6    | 7    | 0.5%                         | 1,750                       | 1,780  | 1,800  | 1,800  | 0.1%                         |
| Mosby             | Midwest National Air Center         | 56             | 57   | 59   | 61   | 0.5%                         | 11,030                      | 11,860 | 12,750 | 12,750 | 0.7%                         |
| Mount Vernon      | Mount Vernon Municipal              | 8              | 8    | 8    | 9    | 0.5%                         | 1,121                       | 1,140  | 1,150  | 1,150  | 0.1%                         |



TABLE 3-5: PROJECTIONS OF MISSOURI BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

| Associated City | Airport Name                    | Based Aircraft |      |      |      | CAGR <sup>A</sup><br>2017-37 | General Aviation Operations |         |         |         | CAGR <sup>A</sup><br>2017-37 |
|-----------------|---------------------------------|----------------|------|------|------|------------------------------|-----------------------------|---------|---------|---------|------------------------------|
|                 |                                 | 2017<br>Actual | 2022 | 2027 | 2037 |                              | 2017<br>Actual              | 2022    | 2027    | 2037    |                              |
| Mountain Grove  | Mountain Grove Memorial         | 9              | 9    | 9    | 10   | 0.5%                         | 2,780                       | 2,800   | 2,820   | 2,860   | 0.1%                         |
| Mountain View   | Mountain View                   | 16             | 16   | 17   | 18   | 0.5%                         | 730                         | 740     | 740     | 750     | 0.1%                         |
| Neesho          | Neesho Hugh Robinson            | 27             | 28   | 28   | 30   | 0.5%                         | 2,632                       | 2,670   | 2,710   | 2,790   | 0.3%                         |
| Nevada          | Nevada Municipal                | 21             | 21   | 22   | 23   | 0.5%                         | 3,700                       | 3,750   | 3,810   | 3,920   | 0.3%                         |
| New Madrid      | County Memorial                 | 13             | 13   | 14   | 14   | 0.5%                         | 9,750                       | 9,820   | 9,890   | 10,040  | 0.1%                         |
| Osage Beach     | Grand Glaize- Osage Beach       | 11             | 11   | 12   | 12   | 0.5%                         | 6,480                       | 6,530   | 6,570   | 6,670   | 0.1%                         |
| Perryville      | Perryville Regional             | 13             | 13   | 14   | 14   | 0.5%                         | 9,750                       | 9,820   | 9,890   | 10,040  | 0.1%                         |
| Piedmont        | Piedmont Municipal              | 6              | 6    | 6    | 7    | 0.5%                         | 1,300                       | 1,310   | 1,320   | 1,340   | 0.2%                         |
| Poplar Bluff    | Poplar Bluff Municipal          | 25             | 26   | 26   | 27   | 0.5%                         | 15,000                      | 15,550  | 16,130  | 17,340  | 0.7%                         |
| Potosi          | Washington County               | 13             | 13   | 14   | 14   | 0.5%                         | 3,620                       | 3,670   | 3,730   | 3,840   | 0.3%                         |
| Richland        | Richland Municipal              | 0              | 0    | 0    | 0    | 0.0%                         | 320                         | 320     | 320     | 330     | 0.2%                         |
| Rolla/Vichy     | Rolla National                  | 78             | 80   | 82   | 85   | 0.5%                         | 31,000                      | 31,450  | 31,910  | 32,850  | 0.3%                         |
| Salem           | Salem Memorial                  | 13             | 13   | 14   | 14   | 0.5%                         | 4,500                       | 4,530   | 4,570   | 4,630   | 0.1%                         |
| Sedalia         | Sedalia Regional                | 30             | 31   | 31   | 33   | 0.5%                         | 8,250                       | 8,550   | 8,870   | 9,540   | 0.7%                         |
| Shelbyville     | Shelby County                   | 0              | 0    | 0    | 0    | 0.0%                         | 125                         | 130     | 130     | 130     | 0.2%                         |
| Sikeston        | Sikeston Memorial Municipal     | 16             | 16   | 17   | 18   | 0.5%                         | 5,000                       | 5,070   | 5,150   | 5,300   | 0.3%                         |
| St Joseph       | Rosecrans Memorial              | 62             | 63   | 65   | 68   | 0.5%                         | 13,067                      | 13,850  | 14,670  | 16,470  | 1.2%                         |
| St. Charles     | St. Charles County Smartt Field | 146            | 149  | 153  | 160  | 0.5%                         | 60,610                      | 61,050  | 61,500  | 62,400  | 0.1%                         |
| St. Louis       | Spirit of St. Louis             | 372            | 381  | 389  | 408  | 0.5%                         | 96,077                      | 101,800 | 107,860 | 121,100 | 1.2%                         |
| St. Louis       | Creve Coeur                     | 167            | 171  | 175  | 183  | 0.5%                         | 40,600                      | 41,190  | 41,800  | 43,030  | 0.3%                         |
| Steele          | Steele Municipal                | 10             | 10   | 10   | 11   | 0.5%                         | 6,700                       | 6,750   | 6,800   | 6,900   | 0.1%                         |
| Stockton        | Stockton Municipal              | 7              | 7    | 7    | 8    | 0.5%                         | 1,010                       | 1,020   | 1,020   | 1,040   | 0.1%                         |
| Sullivan        | Sullivan Regional               | 29             | 30   | 30   | 32   | 0.5%                         | 18,290                      | 18,560  | 18,830  | 19,380  | 0.3%                         |
| Tarkio          | Gould Peterson Municipal        | 21             | 21   | 22   | 23   | 0.5%                         | 4,900                       | 4,940   | 4,970   | 5,040   | 0.1%                         |
| Thayer          | Thayer Memorial                 | 5              | 5    | 5    | 5    | 0.5%                         | 1,850                       | 1,860   | 1,880   | 1,900   | 0.1%                         |



TABLE 3-5: PROJECTIONS OF MISSOURI BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

| Associated City             | Airport Name                | Based Aircraft |              |              |              | CAGR <sup>^</sup><br>2017-37 | General Aviation Operations |                  |                  |                  | CAGR <sup>^</sup><br>2017-37 |
|-----------------------------|-----------------------------|----------------|--------------|--------------|--------------|------------------------------|-----------------------------|------------------|------------------|------------------|------------------------------|
|                             |                             | 2017<br>Actual | 2022         | 2027         | 2037         |                              | 2017<br>Actual              | 2022             | 2027             | 2037             |                              |
| Trenton                     | Trenton Municipal           | 11             | 11           | 12           | 12           | 0.5%                         | 2,450                       | 2,470            | 2,490            | 2,520            | 0.1%                         |
| Unionville                  | Unionville Municipal        | 8              | 8            | 8            | 9            | 0.5%                         | 1,700                       | 1,710            | 1,720            | 1,750            | 0.1%                         |
| Van Buren                   | Bollinger-Crass Memorial    | 0              | 0            | 0            | 0            | 0.0%                         | 430                         | 430              | 440              | 440              | 0.1%                         |
| Versailles                  | Roy Otten Memorial Airfield | 25             | 26           | 26           | 27           | 0.5%                         | 8,000                       | 8,060            | 8,120            | 8,240            | 0.1%                         |
| Warrensburg                 | UCM-Skyhaven                | 42             | 43           | 44           | 46           | 0.5%                         | 29,400                      | 29,830           | 30,270           | 31,160           | 0.3%                         |
| Warsaw                      | Warsaw Municipal            | 13             | 13           | 14           | 14           | 0.5%                         | 3,200                       | 3,220            | 3,250            | 3,290            | 0.1%                         |
| Washington                  | Washington Regional         | 33             | 34           | 35           | 36           | 0.5%                         | 21,200                      | 21,980           | 22,790           | 24,510           | 0.7%                         |
| West Plains                 | West Plains Regional        | 26             | 27           | 27           | 28           | 0.5%                         | 2,502                       | 2,540            | 2,580            | 2,650            | 0.3%                         |
| Willow Springs              | Willow Springs Memorial     | 22             | 23           | 23           | 24           | 0.5%                         | 3,950                       | 3,980            | 4,010            | 4,070            | 0.1%                         |
| <b>Total - All Airports</b> |                             | <b>3,233</b>   | <b>3,308</b> | <b>3,384</b> | <b>3,542</b> | <b>0.5%</b>                  | <b>1,048,536</b>            | <b>1,079,830</b> | <b>1,112,570</b> | <b>1,182,870</b> | <b>0.6%</b>                  |

Source: Marr Arnold Planning

Note: ^CAGR = compound annual growth rate; figures may not sum to totals due to rounding.



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