ST. LOUIS LAMBERT INTERNATIONAL AIRPORT®

# AIRPORT MASTER PLAN

## CHAPTER 3 - AVIATION ACTIVITY ANALYSIS AND FORECASTS

**FEBRUARY 2023 - FINAL DRAFT**

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Notes:

The 2020 STL forecast was reviewed in September 2022 and was largely found to remain valid.

The forecast adjustments were completed after the master plan and are therefore not reflected in the STL Master Plan analyses; however, they will be reflected in the STL Terminal Program Advanced Planning effort.

A memo summarizing the proposed forecast adjustments is included at the end of Appendix 3C, *Forecast Approval Letter and 2022 Review*.

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# 3 AVIATION ACTIVITY ANALYSIS AND FORECASTS

## 3.1 INTRODUCTION

Aviation activity forecasts serve as the basis for determining future airport capacity needs and formulating facility development plans. This chapter presents unconstrained forecasts for the different types of aviation activity at St. Louis Lambert International Airport (STL or the Airport): commercial activity, which includes passenger and air cargo traffic, and noncommercial activity, which includes air taxi, general aviation and military operations.

Forecast development is a comprehensive process that involves the following steps:

- Assessment of socio-economic trends in the Airport's air service area
- Analysis of historical trends in aviation activity at the Airport
- Assessment of air service development initiatives
- Statistical analyses to determine long-term trends

This chapter documents this comprehensive forecast development process. The resulting forecasts are subject to approval from the Federal Aviation Administration (FAA), and the FAA's evaluation is based on a comparison with the FAA's Terminal Area Forecasts (TAF), among other considerations. The chapter ends with a summary of the ALPU forecasts and a comparison with the TAF.

## 3.2 SOCIO-ECONOMIC TRENDS

Demographic and economic trends influence the demand for air travel through STL, which serves both origin and destination (O&D) and connecting passenger traffic.[1] Trends in both the region and the nation are equally important in determining the level of passenger traffic at a particular airport. Regional trends contribute to the area's potential to generate local demand for air travel and draw visitors. National trends determine demand for air travel nationwide, and also influence regional air travel demand through effects on the regional economy.

STL's primary air service area is the St. Louis, MO-IL metropolitan statistical area (St. Louis MSA). This section discusses relevant demographic and economic trends in the Airport service area. Where relevant, the trends in the St. Louis MSA are compared with trends in the state of Missouri, where the large majority

[1] O&D passenger traffic refers to passenger trips originating or ending in the area. In FY2019, approximately 77 percent of STL traffic was O&D, with 23 percent of traffic being connections primarily on Southwest Airlines.

of the MSA population reside, and trends in the U.S., as the Airport draws most of its visitor traffic from all over the country.

### 3.2.1 AIR SERVICE AREA

The St. Louis MSA straddles the Mississippi River, covering parts of Illinois on the east and Missouri on the west. Based on the current MSA delineation, the St. Louis MSA comprises eight counties in southern Illinois, six counties in eastern Missouri, and the City of St. Louis (**Table 3.2-1**). The City of St. Louis is the principal city of the St. Louis MSA; it is a consolidated city-county merged into one unified jurisdiction.[2]

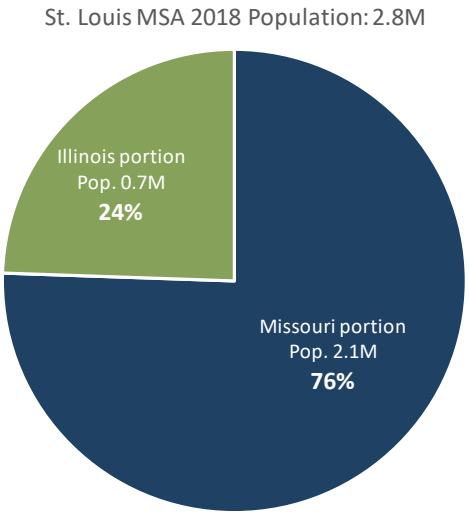
**Table 3.2-1: Counties in the St. Louis MSA**

| Illinois Counties | | Missouri Counties | |
|---|---|---|---|
| • Bond County | • Macoupin County | • Franklin County | • St. Louis City |
| • Calhoun County | • Madison County | • Jefferson County | • St. Louis County |
| • Clinton County | • Monroe County | • Lincoln County | • Warren County |
| • Jersey County | • St. Clair County | • St. Charles County | |

Source: Office of Management and Budget, *Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineations in These Areas,* OMB Bulletin No. 18-04, September 14, 2018.

The Missouri portion of the St. Louis MSA accounts for 76 percent of the MSA population, and almost 35 percent of the Missouri state population (**Figure 3.2-1**). Although the MSA covers approximately the same geographic area across the two states, the MSA's counties in Missouri are more densely populated compared with its counties in Illinois (**Figure 3.2-2**).

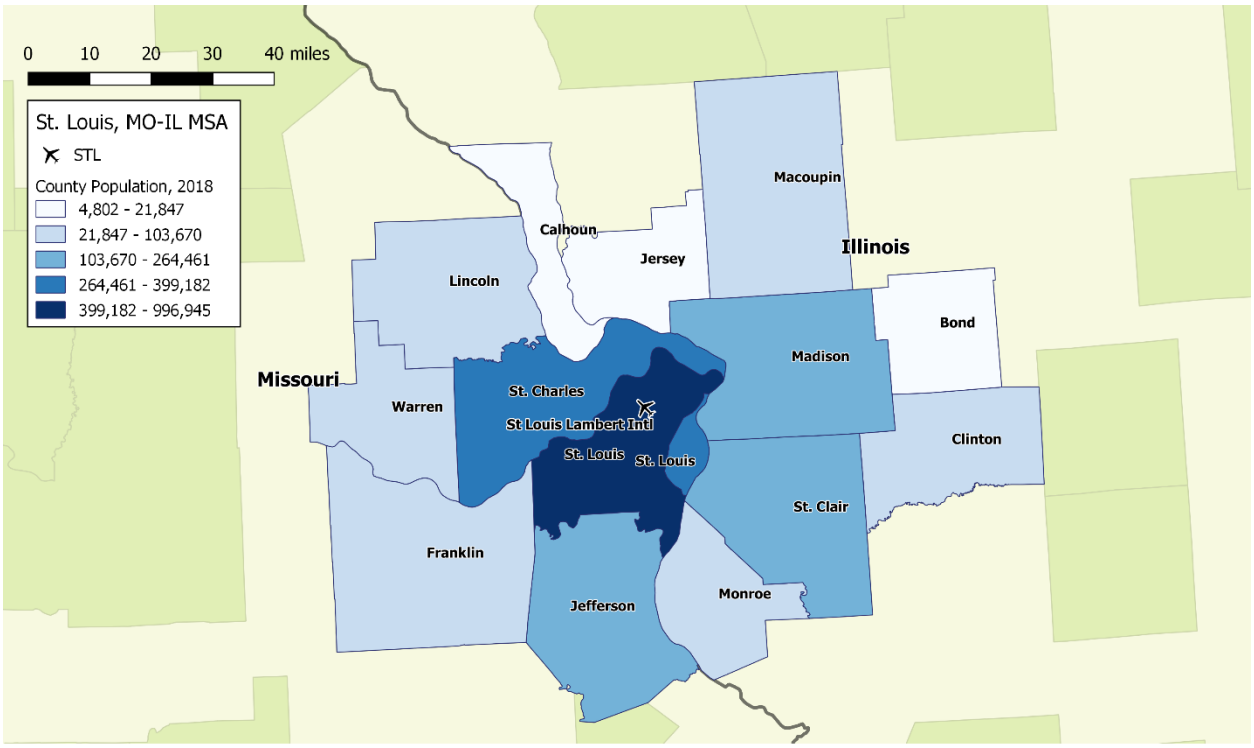
**Figure 3.2-1: Distribution of the St. Louis MSA Population by State**




[2] St. Louis City Government official website.

Sources: U.S. Census Bureau mid-year population estimates; Unison Consulting, Inc., June 2020.

**Figure 3.2-2: St. Louis MSA County Population Map, 2018**

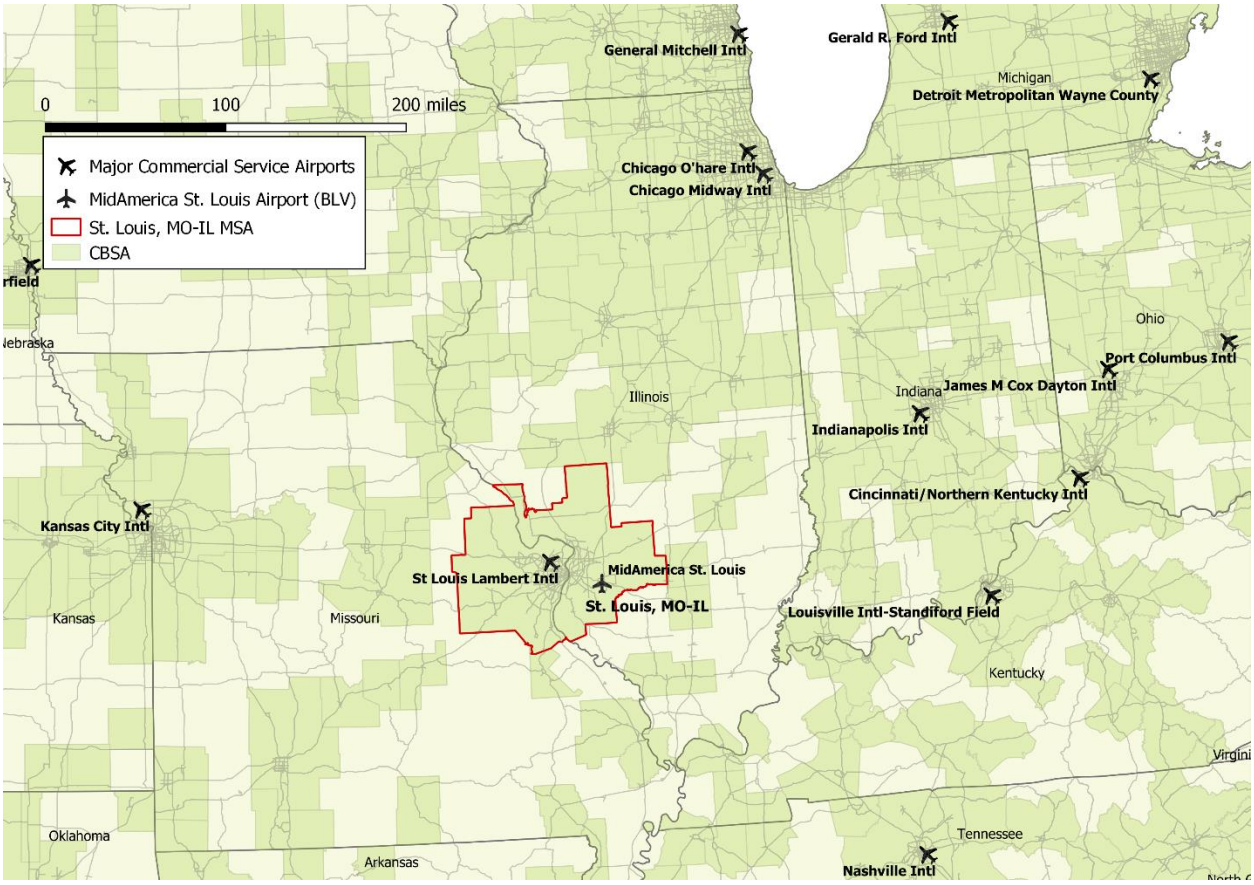



Sources: U.S. Census Bureau, Mid-Year Population Estimates; Unison Consulting, Inc., June 2020.

STL is the only major commercial service airport serving the St. Louis MSA and adjacent areas in Missouri and Illinois. As shown in **Figure 3.2-3**, the two major commercial service airports closest to STL are Indianapolis International Airport and Kansas City International Airport, both more than 200 miles away and more than a 3 ½ hour drive. The figure also shows other commercial airports with more than 1 million annual enplanements.

Located less than 40 miles from STL in St. Clair County, Illinois, is the MidAmerica St. Louis Airport (BLV), a public/military joint use airport adjacent to Scott Air Force Base, also serving the St. Louis MSA and surrounding areas. BLV is a primary non-hub commercial service airport with annual passenger enplanements around 150,000 from seasonal service provided by Allegiant Airlines. BLV also serves air cargo operations.

**Figure 3.2-3: Commercial Service Airports Nearest STL**



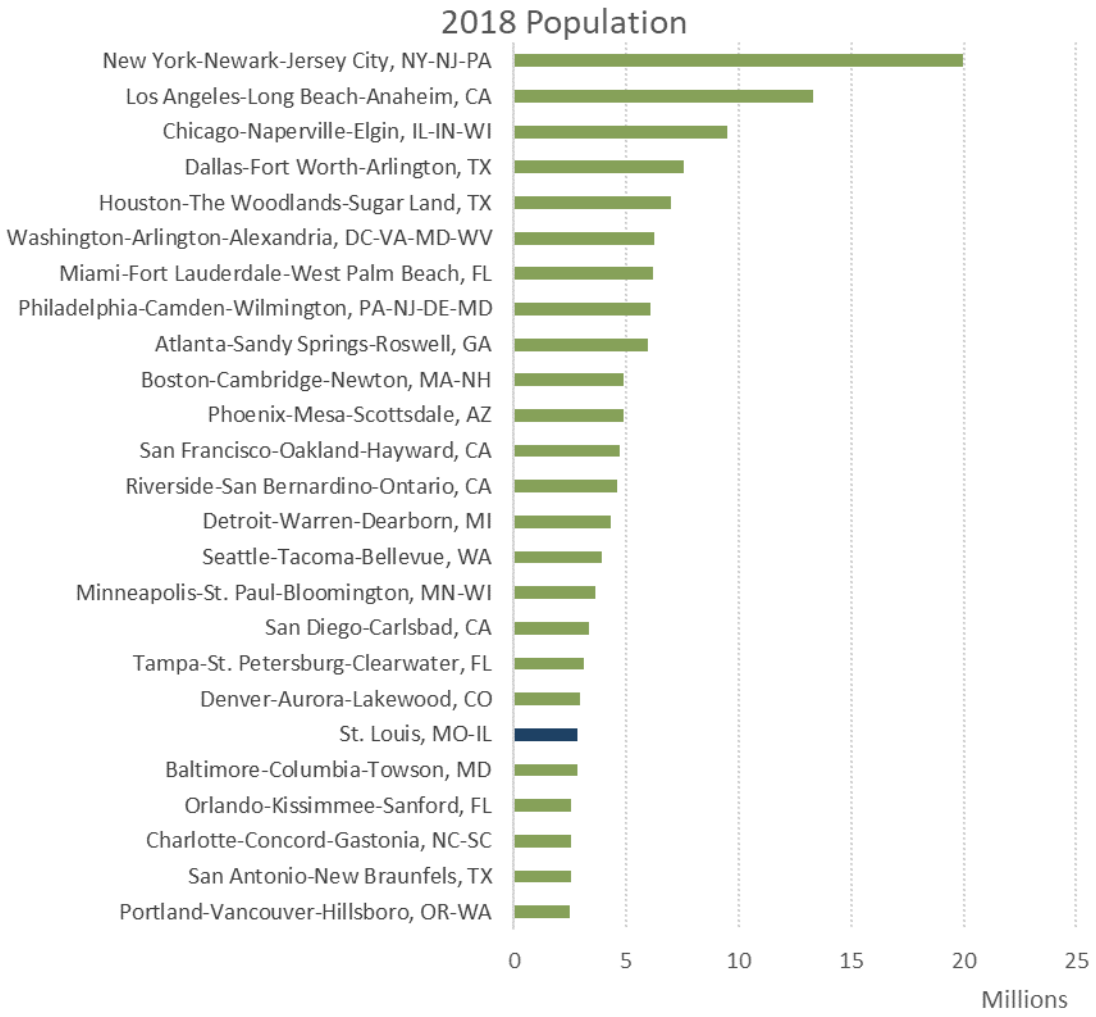

Note:
MidAmerica St. Louis Airport (BLV) also serves the St. Louis, MO-IL MSA for domestic flights operated by Allegiant Air. BLV enplaned just over 150,000 passengers in CY2018.

Sources: U.S. Department of Transportation, *National Transportation Atlas Database (NTAD),* 2017; Unison Consulting, Inc., June 2020.

## *3.2.2 POPULATION*

The St. Louis MSA offers a large, stable market for air travel. With a population of 2.9 million in 2018, St. Louis MSA is the 20th largest metropolitan area in the country—following the metropolitan areas of San Diego, Tampa, and Denver (**Figure 3.2-4**). The St. Louis MSA is the largest metropolitan area in Missouri and the second largest in Illinois.

**Figure 3.2-4: Top 25 U.S. Metropolitan Statistical Areas by Population**



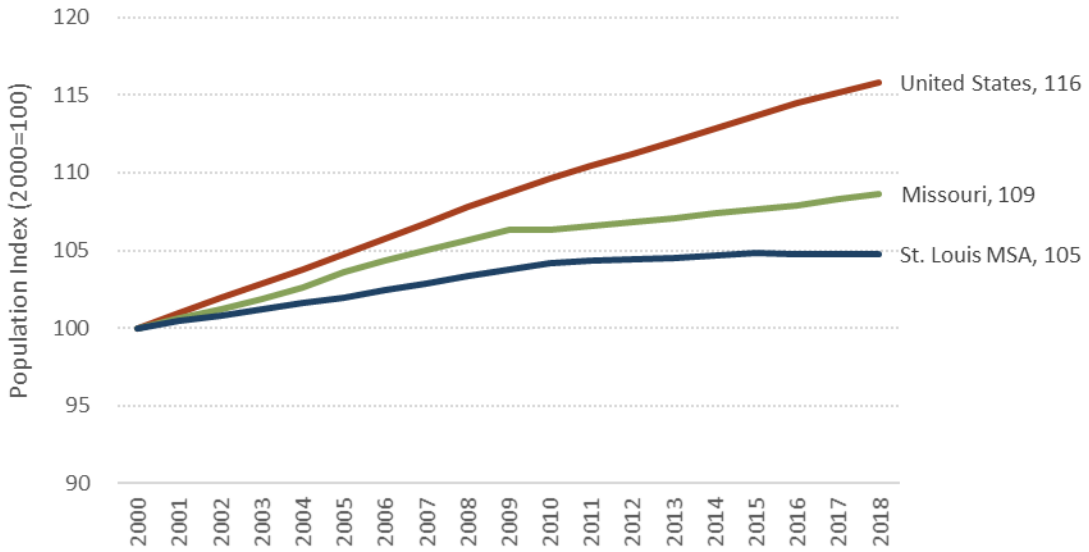

Sources: U.S. Census Bureau, Mid-Year Population Estimates; Unison Consulting, Inc., June 2020.

The St. Louis MSA's population has been slow growing. Since 2000, it has grown only 5 percent (averaging 0.3 percent per year), slower than the population growth in both the state of Missouri (cumulative growth of 8 percent, averaging 0.5 percent per year) and the nation (cumulative growth of 16 percent, averaging 0.8 percent per year) (**Figure 3.2-5**).

The St. Louis MSA's population growth in the last two decades, albeit slow, is a positive trend, reversing population losses in the 1970s and early 1980s. The pace of population growth, however, has slowed since

2010 to an average of 0.1 percent a year, from an average of 0.4 percent a year in the previous decade. The slow population growth in the St. Louis MSA is driven by outmigration, rather than slow net birth rates.[3]

**Figure 3.2-5: Population Growth**




| Period | Compound Annual Growth Rate | | |
|---|---|---|---|
| | St. Louis MSA | Missouri | United States |
| 2000-2010 | 0.4% | 0.6% | 0.9% |
| 2010-2018 | 0.1% | 0.3% | 0.7% |
| 2000-2018 | 0.3% | 0.5% | 0.8% |

Sources: U.S. Census Bureau, Mid-Year Population Estimates; Unison Consulting, Inc., June 2020.

## *3.2.3 EDUCATIONAL ATTAINMENT*

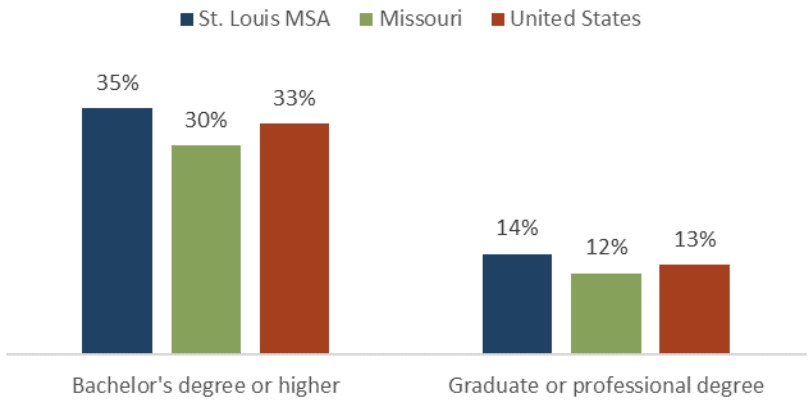
An educated population is important for economic diversification and long-term economic growth for many reasons. Places with a more educated workforce add jobs and population faster, because these places are more attractive to businesses seeking highly skilled workers. These places are also more resilient to economic recessions and transformations, as an educated workforce can adapt better to changes in skills required by businesses. Workers with higher education levels typically earn higher wages and receive larger wage increases than less educated workers.

Overall, the St. Louis MSA's population has a higher level of educational attainment than the Missouri and U.S. populations. The St. Louis MSA has greater shares with bachelor's degree or higher and with graduate or professional degrees within its population age 25 years or older (**Figure 3.2-6**). The University of

[3] Charles S. Gascon, "Why is the St. Louis Metro Area Population Growing So Slowly?" Federal Reserve Bank of St. Louis *Economic Synopses*, No. 14, 2019.

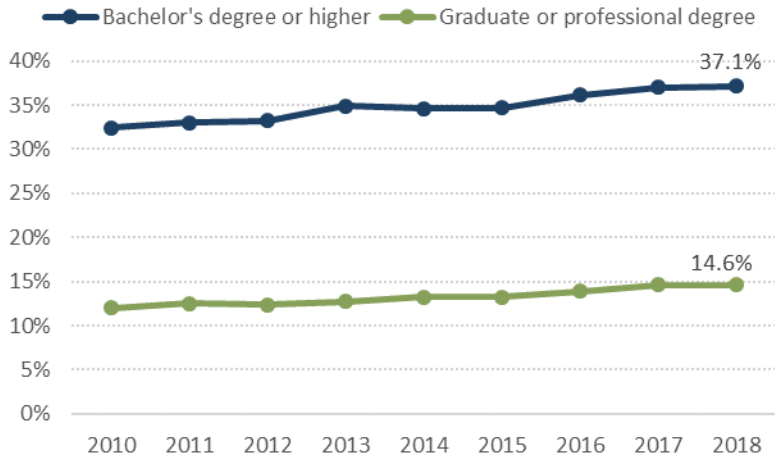
Missouri–St. Louis (UMSL), one of the four universities in the University of Missouri System, is located in St. Louis County. According to the UMSL website, more than 16,000 students were enrolled at UMSL in Fall 2019. **Figure 3.2-7** shows the shares within the St. Louis MSA working age (25-64 years) population of those with bachelor's degree or better and with graduate or professional degree. These shares have been increasing over time.

**Figure 3.2-6: Population 25 Years and Older – Higher Educational Attainment (2018)**




Sources: U.S. Census Bureau, A*merican Community Survey 2018 1-Year Estimate*; Unison Consulting, Inc., June 2020.

**Figure 3.2-7: Higher Educational Attainment of Working Age (25-64 Years) Population in the St. Louis Metropolitan Statistical Area**




Sources: U.S. Census Bureau, *American Community Survey 1-Year Estimates for 2010-2018;* Unison Consulting, Inc., June 2020.

In a Brookings Institution study of 70 older industrial cities, St. Louis figured among those with stronger economies making progress toward renewal and reinvention. The study attributes St. Louis' progress in transitioning from an industrial-manufacturing-based economy to a knowledge-based economy with a

strong talent pool, among other factors.[4] The St. Louis MSA has 12 universities that offer post-graduate degrees.

### *3.2.4 LABOR MARKET*

Trends in the labor market reflect business conditions and overall economic well-being—factors that influence the demand for air travel. Employment growth reflects the pace of economic growth. Employment tends to decrease during an economic recession and increase during recovery and expansion. Employment needs to grow to raise living standards, boost consumer confidence, and increase consumer spending.

There are several key labor market indicators—number of business establishments, employment in all business establishments, civilian labor force, employed civilian labor force, and unemployment rate. All of these indicators pointed to a strong labor market and an improving economy in the St. Louis MSA, before the novel coronavirus (COVID-19) pandemic reached the United States in the first quarter of 2020 and triggered a severe economic downturn—the sharpest economic downturn since the 1940s. As of the date of this report, the COVID-19 pandemic continues to spread across the globe. The U.S. economy faces a deep recession caused by the COVID-19 pandemic, and the extreme social distancing measures taken to contain it. Notwithstanding the dramatic turn in the nation's and the St. Louis MSA's economic climate, it is still important to review long-term historical trends and recent trends before the COVID-19 pandemic to have a sense of how the St. Louis economy and the national economy would perform in recovery and growth over the long term.

#### 3.2.4.1 NUMBER OF BUSINESS ESTABLISHMENTS

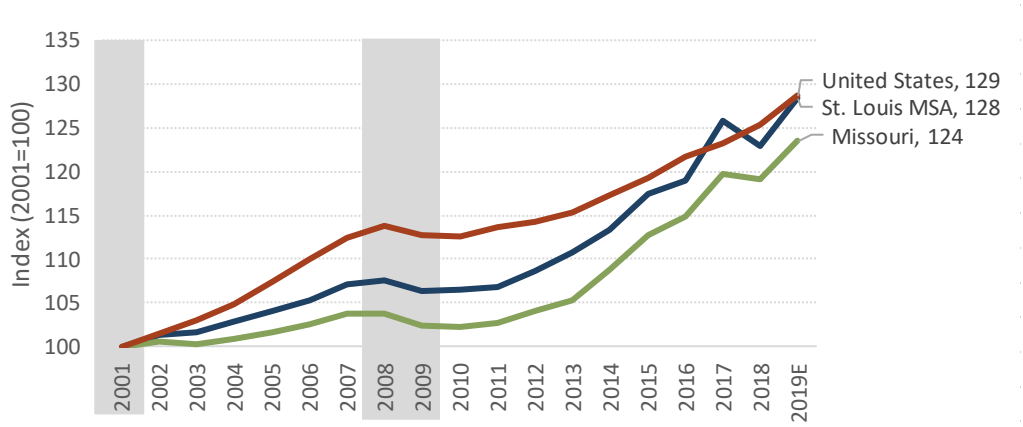
Job creation begins with business development, which has been progressing at a healthy pace in the St. Louis MSA. Over the years, the St. Louis MSA has been recognized for creating a favorable environment for start-ups. An economic commentary published online in 2016 referred to St. Louis as "the new startup frontier," because the St. Louis MSA was second among metro areas with the fastest growth rate of new startups from 2009 to 2014.[5] A 2017 article in the *St. Louis Construction News and Review* cited the St. Louis MSA's "vibrant start-up incubator environment" as a factor driving long-term economic growth in the regional economy.[6] In 2018, Forbes named St. Louis City as one of the top 10 rising cities for start-ups.[7]

Since 2001, the number of business establishments in the St. Louis MSA has increased 28 percent, closely matching national gains (29 percent) (**Figure 3.2-8**). Much of the growth in the number of business establishments in the St. Louis MSA occurred in the past decade. The St. Louis MSA enjoyed decade-long steady growth in number of business establishments, interrupted only in 2018, although the decrease in 2018 appears to be a data anomaly correcting a spike in the previous year. Research of business news articles about St. Louis in 2018 did not point to anything unusual about the St. Louis business community

[4] Alan Berube and Cecile Murray, Renewing America's Economic Promise Through Older Industrial Cities, Metropolitan Policy Program at Brookings, April 2018.
[5] Ben Casselman, "St Louis is the New Startup Frontier," FiveThirtyEight, September 12, 2016.
[6] "Vibrant Start-Up Incubator Environment Boosting Long-Term Growth for St. Louis Regional Economy," *St. Louis Construction News and Review*, June 1, 2017.
[7] Kurt Badenhausen, The Top 10 Rising Cities for Start-ups, *Forbes Daily Cover*, October 1, 2018.

that year. The number of business establishments in the St. Louis MSA quickly rebounded in 2019 to exceed its previous peak level in 2017. In 2020, however, the positive trend has taken a sharp downturn, as the social distancing measures to contain the COVID-19 pandemic have forced many business closures. Some of the small businesses forced to close may no longer have the financial resources to reopen when the orders to close are lifted.

**Figure 3.2-8: Growth in Number of Business Establishments**




| | Compound Annual Growth Rate | | |
|---|---|---|---|
| **Period** | **St. Louis MSA** | **Missouri** | **United States** |
| 2001-2010 | 0.2% | 0.7% | 1.3% |
| 2010-2019 | 2.1% | 2.1% | 1.5% |
| 2001-2019 | 1.2% | 1.4% | 1.4% |

Notes:
Shaded areas on the chart indicate recession periods.
The 2019 estimates are based on data for the first three quarters of the year.

Sources: U.S. Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*; Unison Consulting, Inc., June 2020.

### 3.2.4.2 JOB CREATION

Job creation follows economic growth trends. Employment grows during periods of economic expansion and contracts during periods of economic recession.

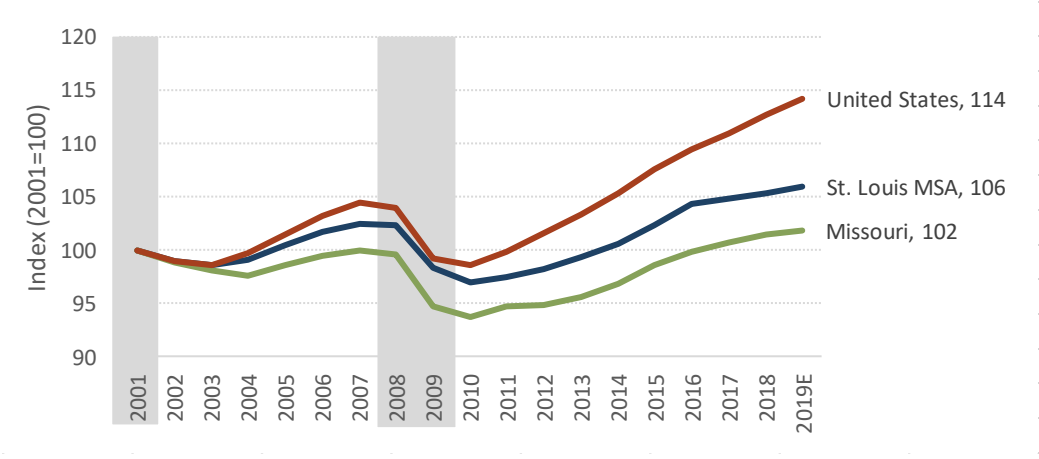
The cyclical pattern is apparent in **Figure 3.2-9** which tracks total employment since 2001. Employment losses typically lag the onset of a recession and continue for some period after the end of a recession, before turning around to grow with the economy during the recovery and expansion phase. During the Great Recession, jobs decreased more sharply and took much longer to recover, compared with the experience following the mild recession in 2001.

The St. Louis MSA outperformed the state of Missouri, but lagged behind the nation in net job gains from 2001. Through 2019, total employment increased 6 percent in the St. Louis MSA, compared with 2 percent in the entire state of Missouri and 14 percent nationwide. Like the number of business establishments, the employment growth accelerated after 2010.

As Figure 3.2-9 shows, the labor market was strong before the COVID-19 pandemic escalated and social distancing measures began in mid-March 2020. Labor market conditions have since quickly deteriorated. The widespread business closures resulted in massive layoffs. In only four weeks starting mid-March 2020, more than 20 million people have filed unemployment claims, according to the U.S. Department of Labor. Millions more are believed to have lost their jobs. The job losses in four weeks alone reversed the job gains over more than 10 years since the Great Recession ended in 2009.[8]

While the Missouri statewide stay-at-home mandate took effect only on April 16, 2020, many counties and cities, including St. Louis County and St. Louis City, issued stay-at-home directives weeks earlier.[9] Companies across the St. Louis MSA have also had to lay off or furlough employees.[10]

**Figure 3.2-9: Growth in Total Employment**




| | Compound Annual Growth Rate | | |
|---|---|---|---|
| **Period** | **St. Louis MSA** | **Missouri** | **United States** |
| 2001-2010 | -0.7% | -0.3% | -0.2% |
| 2010-2019 | 0.9% | 1.0% | 1.6% |
| 2001-2019 | 0.1% | 0.3% | 0.7% |

Notes:
Shaded areas on the chart indicate recession periods.
The 2019 estimates are based on data for the first three quarters of the year.

Sources: U.S. Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*; Unison Consulting, Inc., June 2020.

[8] Sylvan Lane, "Economy faces grueling road to recovery from coronavirus," *The Hill*, April 19, 2020.

[9] Kaitlyn Schallhorn, "Coronavirus in Missouri: Which counties have implemented 'stay at home' rules?" *The Missouri Times*, April 29, 2020.

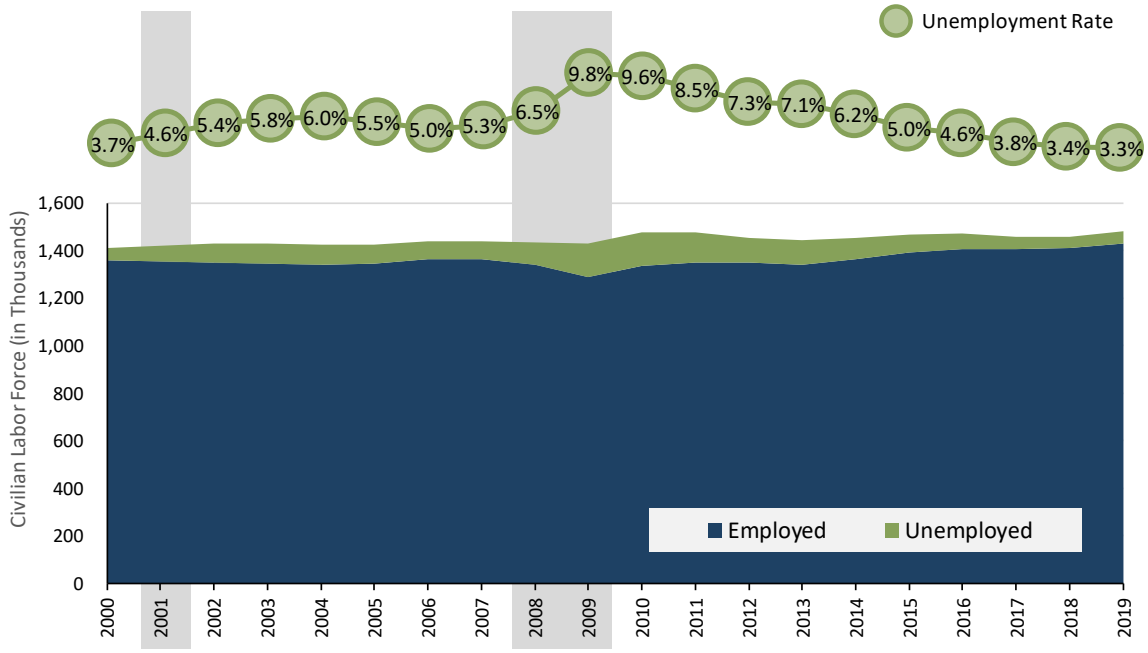
[10] Vince Brennan, "Coronavirus: These St. Louis companies have laid off or furloughed workers," *St. Louis Business Journal*, April 10, 2020.

### 3.2.4.3 CIVILIAN LABOR FORCE TRENDS

**Figure 3.2-10** shows the trends in the civilian labor force, which reflect the improvements in the St. Louis MSA labor market. The civilian labor force consists of nearly 1.5 million residents of working age (16 years and older), who are either employed, or unemployed but actively seeking employment. Employment counts include all types of civilian employment, including agricultural, non-agricultural, and self- employment. The unemployment rate refers to the unemployed as a percentage of the labor force.

The size of the St. Louis MSA's civilian labor force grew 4.9 percent (0.3 percent annually) over the past 20 years. The number of those employed grew slightly more, pushing the unemployment rate to a very low level of 3.3 percent in 2019— lower than the U.S. unemployment rate of 3.7 percent in the same year, and lower than the range that the Federal Reserve estimates as the natural rate of unemployment (4.5 to 5 percent). The unemployment rate in the St. Louis MSA fell below 4 percent beginning in 2017.

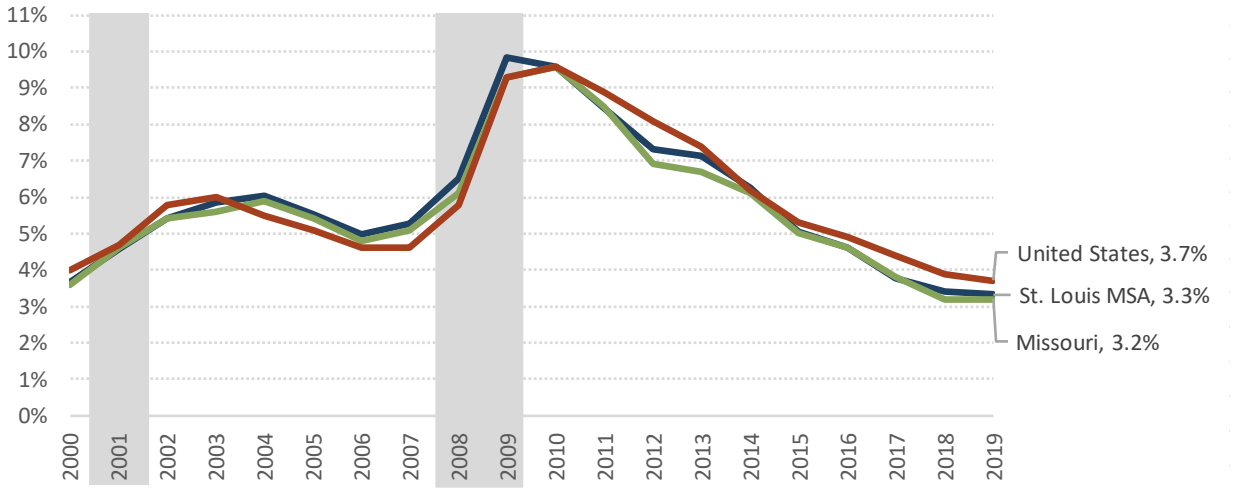
**Figure 3.2-10: St. Louis Metropolitan Statistical Area Civilian Labor Force Trends**




Note: Shaded areas indicate recession periods.
Sources: U.S. Bureau of Labor Statistics, *Local Area Unemployment Statistics*; Unison Consulting, Inc., June 2020.

Overall, the St. Louis MSA and the Missouri state unemployment rates have followed national trends—rising during economic recessions and falling during economic expansions (**Figure 3.2-11**). During most of the past nine years, the St. Louis MSA's unemployment rate was lower than the national average.

**Figure 3.2-11: Unemployment Rate**




Note: Shaded areas indicate recession periods.
Sources: U.S. Bureau of Labor Statistics; Unison Consulting, Inc., June 2020.

In 2020, unemployment rates remained low through March. In April, the mandated business closures and the sharp decline in consumer demand due to social distancing measures to contain the spread of COVID-19 caused the unemployment rate to rise to double-digit levels: approximately 11 percent in the St. Louis MSA, 10 percent in Missouri, and 15 percent in the United States, according to data from the U.S. Bureau of Labor Statistics.

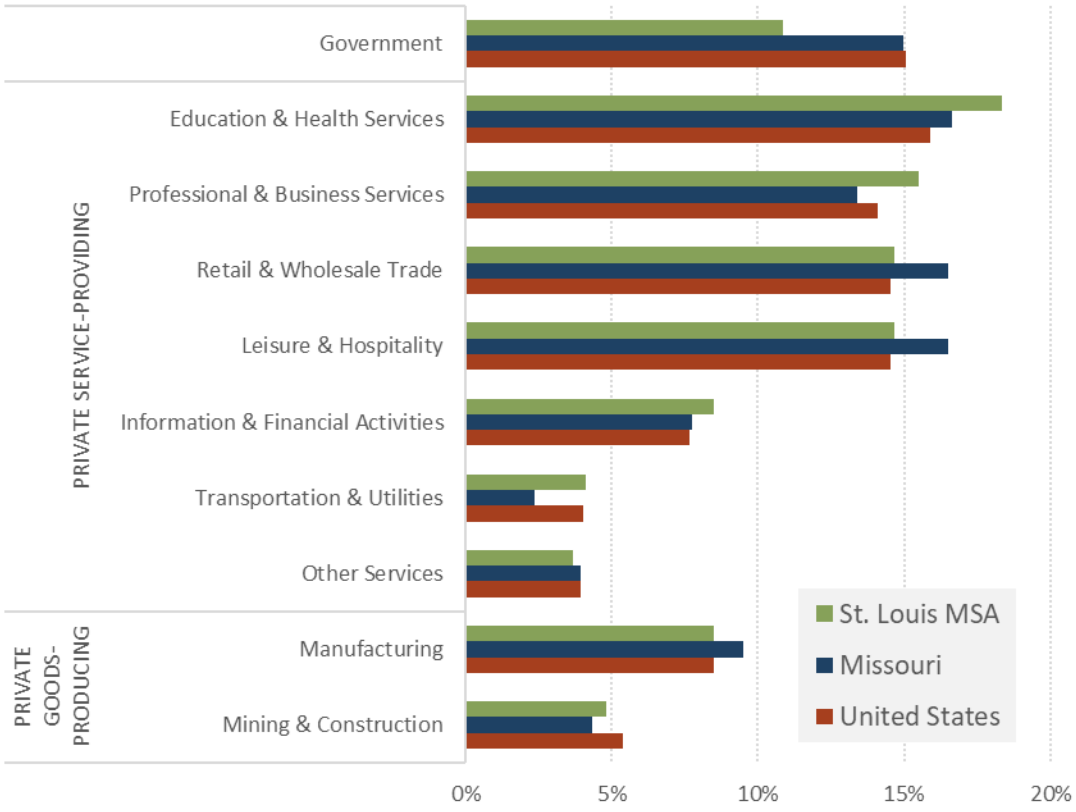
### 3.2.4.4 NONFARM EMPLOYMENT BY INDUSTRY

Once a major industrial center known for manufacturing automobiles, shoes, and beer, St. Louis MSA has successfully transformed into a diversified economy led by the private service-providing sectors of *education and health services, professional and business services*, and *retail and wholesale trade* (**Figure 3.2-12**). These sectors account for 18.4 percent, 15.5 percent, and 14.7 percent, respectively, of total employment in the St. Louis MSA in 2018. The St. Louis MSA economy reflects the diversity of the U.S. economy, although the MSA has significantly higher employment concentrations in knowledge-based sectors, namely, *education and health services, professional and business services*, *information and financial activities,* compared with the U.S. economy as a whole.

According to the Brookings study of older industrial cities, the emergence of education and health service businesses, and the continued presence of strong agriculture businesses, combine to make St. Louis a

prominent center of agriculture technology and bio sciences, giving the MSA a competitive advantage not only in the United States, but also globally.[11]

**Figure 3.2-12: Employment Share by Industry (2018)**

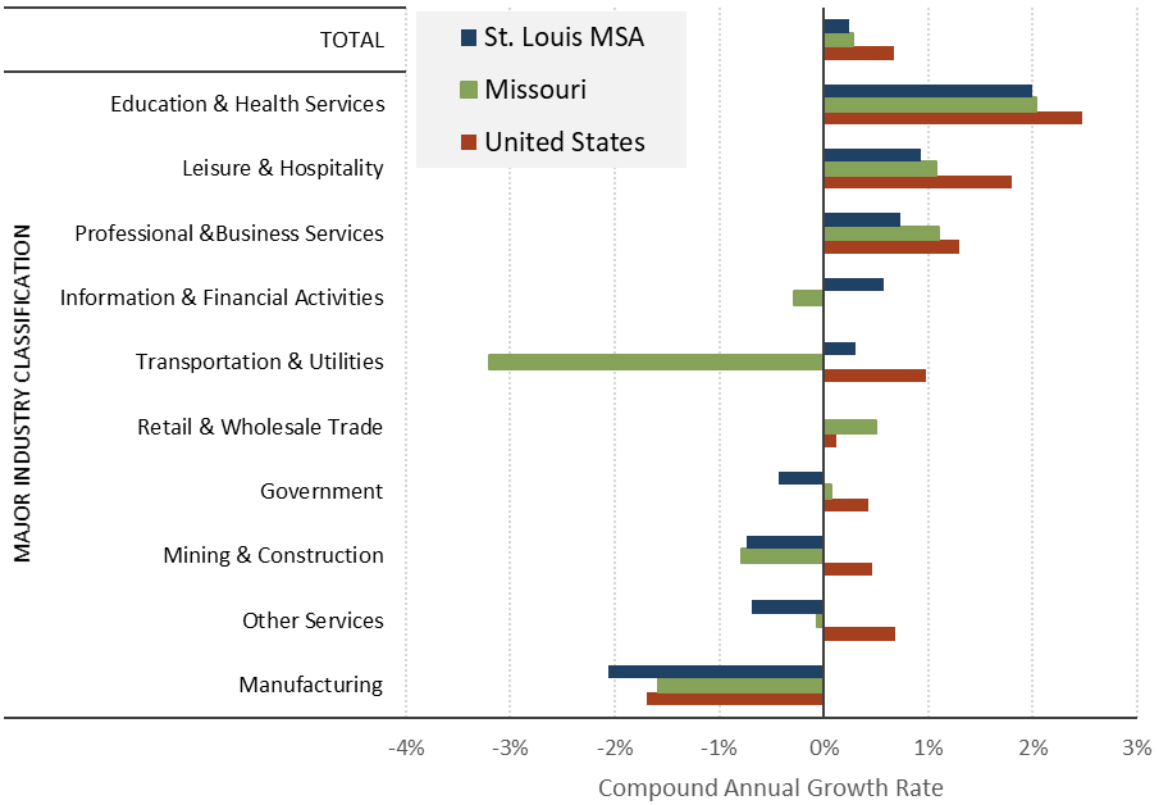



Sources: U.S. Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*; Unison Consulting, Inc., June 2020.

[11] Alan Berube and Cecile Murray, *Renewing America's Economic Promise Through Older Industrial Cities*, Metropolitan Policy Program at Brookings, April 2018.

As in the state and the nation, the three fastest growing industry sectors in the St. Louis MSA from 2000 to 2018 are: education and health services, leisure and hospitality, and professional and business services (**Figure 3.2-13**). Information and financial activities and transportation and utilities also posted employment gains, while the five other industry sectors posted employment losses in the St. Louis MSA.

**Figure 3.2-13: Employment Growth by Industry (2000-2018)**




Sources: U.S. Bureau of Labor Statistics; *Quarterly Census of Employment and Wages*; Unison Consulting, Inc., June 2020.Major Employers and Large Company Headquarters

**Table 3.2-2** lists the 50 largest employers in the St. Louis MSA. Nineteen do business in education and health services, now the largest industry sector in the St. Louis MSA. Thirty have business locations in St. Louis County, 15 in the City of St. Louis, two in St. Charles County, two in Madison County, and one in St. Clair County. Thirty-two have headquarters in the St. Louis MSA.

## Table 3.2-2: Top 50 Employers in the St. Louis Metropolitan Statistical Area

| Company | Headquarters | MSA Location | Industry Description | MSA Employees |
|---|---|---|---|---|
| BJC HealthCare | St. Louis MSA | City of St. Louis | Health Care & Social Assistance | 28,975 |
| Wal-Mart Stores Inc. | Bentonville, AR | St. Louis County | Retail Trade | 22,290 |
| Washington University in St. Louis | St. Louis MSA | St. Louis County | Educational Services | 16,903 |
| SSM Health Care | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 16,140 |
| Mercy Health | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 15,174 |
| Boeing Defense, Space & Security | Washington, DC | St. Louis County | Manufacturing | 13,707 |
| Scott Air Force Base | St. Louis MSA | St. Clair County | Government | 12,600 |
| U.S. Postal Service | Washington, DC | City of St. Louis | Government | 12,000 |
| Schnuck Markets Inc. | St. Louis MSA | St. Louis County | Retail Trade | 9,510 |
| Mercy Clinic | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 9,305 |
| Archdiocese of St. Louis | St. Louis MSA | City of St. Louis | Educational Services | 8,800 |
| McDonald's | Oak Brook, IL | St. Louis County | Accommodation & Food Services | 7,550 |
| Saint Louis University | St. Louis MSA | City of St. Louis | Educational Services | 7,400 |
| City of Saint Louis | St. Louis MSA | City of St. Louis | Government | 7,077 |
| Washington University Physicians | St. Louis MSA | City of St. Louis | Health Care & Social Assistance | 6,261 |
| Edward Jones | St. Louis MSA | St. Louis County | Finance & Insurance | 6,200 |
| Special School District of St. Louis County | St. Louis MSA | St. Louis County | Educational Services | 6,126 |
| AT&T Communications Inc. | Dallas, TX | City of St. Louis | Information | 6,000 |
| Enterprise Holdings | St. Louis MSA | St. Louis County | Real Estate & Rental & Leasing | 5,600 |
| Imo's Pizza | St. Louis MSA | St. Louis County | Accommodation & Food Services | 5,540 |
| Bayer Crop Science | Durham, NC | St. Louis County | Manufacturing | 5,400 |
| Wells Fargo Advisors | St. Louis MSA | City of St. Louis | Finance & Insurance | 5,000 |
| Walgreens | Springfield, IL | St. Louis County | Retail Trade | 4,740 |
| Target Corp | Minneapolis, MN | St. Louis County | Retail Trade | 4,675 |
| University of Missouri – St. Louis | St. Louis MSA | St. Louis County | Educational Services | 4,633 |
| Ameren Corporation | St. Louis MSA | City of St. Louis | Utilities | 4,594 |
| St. Luke's Hospital | St. Louis MSA | St. Louis County | Health | 4,529 |
| U.S. Bank | Minneapolis, MN | City of St. Louis | Finance & Insurance | 4,500 |
| St. Louis Public Schools | St. Louis MSA | City of St. Louis | Educational Services | 4,329 |
| St. Louis County Government | St. Louis MSA | St. Louis County | Government | 4,216 |
| Express Scripts Inc. | St. Louis MSA | St. Louis County | Wholesale Trade | 4,100 |
| Amazon Inc. | Seattle, WA | Madison County | Retail Trade | 4,100 |
| General Motors | Detroit, MI | St. Charles County | Manufacturing | 4,035 |
| Dierbergs Markets | St. Louis MSA | St. Louis County | Retail Trade | 4,000 |
| Spectrum | Stanford, CT | St. Louis County | Information | 4,000 |
| Home Depot USA Inc | Atlanta, GA | City of St. Louis | Retail Trade | 3,972 |
| CitiMortgage | St. Louis MSA | St. Charles County | Finance & Insurance | 3,800 |
| St. Anthony's Medical Center | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 3,723 |
| Southern Illinois University Edwardsville | St. Louis MSA | Madison County | Educational Services | 3,500 |
| St. Louis Community College District | St. Louis MSA | City of St. Louis | Educational Services | 3,450 |
| Rockwood School District | St. Louis MSA | St. Louis County | Educational Services | 3,328 |
| Human Resource Staffing | St. Louis MSA | St. Louis County | Professional Services | 3,315 |
| Anheuser-Busch InBev | New York, NY | City of St. Louis | Manufacturing | 3,300 |
| United Parcel Service | Atlanta, GA | St. Louis County | Transportation & Warehousing | 3,142 |
| National Geospatial-Intelligence Agency | Washington, D.C. | St. Louis County | Government | 3,100 |
| Lodging Hospitality Management | St. Louis MSA | St. Louis County | Accommodation & Food Services | 3,000 |
| Veterans Health Administration | Washington, D.C. | City of St. Louis | Health Care & Social Assistance | 3,000 |
| Lutheran Senior Services | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 2,947 |
| Lowe's Home Centers Inc | Mooresville, NC | St. Louis County | Retail Trade | 2,753 |
| Delmar Gardens Enterprises | St. Louis MSA | St. Louis County | Health Care & Social Assistance | 2,711 |

Note: Although not listed, Trans States Holdings, owner and operator of GoJet Airlines, has been headquartered at STL for over 40 years.

Sources: St. Louis Business Journal and St. Louis Post-Dispatch, compiled by the St. Louis Regional Chamber.

**Table 3.2-3** lists Fortune 500 companies with headquarters in the St. Louis MSA. **Table 3.2-4** lists the Forbes' America's Largest Private Companies with headquarters in the St. Louis MSA.

**Table 3.2-3: Fortune 500 Companies with St. Louis Metropolitan Statistical Area Headquarters**

| Rank in 2020 | Fortune 500 Company | Industry | Annual Revenue |
|---|---|---|---|
| 42 | Centene | Health Insurance | 74.6 B |
| 176 | Emerson Electric | Electrical Engineering | 18.4 B |
| 415 | Graybar Electric | Electric and Gas Utilities | 7.5 B |
| 488 | Ameren | Electric and Gas Utilities | 5.9 B |
| 499 | Post Holdings | Food | 5.7 B |

Source: Fortune, *Fortune 500 Companies*, 2020 Ranking.

**Table 3.2-4: Forbes America's Largest Private Companies with Headquarters in the St. Louis Metropolitan Statistical Area**

| Rank in 2019 | Company | Industry | Annual Revenue |
|---|---|---|---|
| 13 | Enterprise Holdings | Transportation Services | 25.9 B |
| 30 | World Wide Technology | Technology Hardware & Equipment | 11.2 B |
| 47 | Edward Jones | Financial Services | 8.5 B |
| 57 | Graybar Electric | Capital Goods | 7.5 B |
| 102 | Apex Oil | Oil & Natural Gas | 4.4 B |
| 117 | McCarthy Holdings | Construction | 3.7 B |
| 156 | Schnuck Markets | Retail | 2.7 B |
| 214 | Alberici | Construction | 2.1 B |

Source: Forbes, *America's Largest Private Companies*, 2019.

### *3.2.5 TOURISM*

Tourism is essential to the St. Louis MSA and the Missouri state economies. It drives demand for air transportation and contributes to overall economic health by generating business revenues and supporting employment. Visitors spend on airfare, ground transportation, restaurants, lodging, attractions, entertainment venues, retail shopping, and other services.

St. Louis' premier attraction is the 630-foot Gateway Arch. Museums, such as the Magic House, the St. Louis Museum of Transportation, the City Museum, and the Saint Louis Science Center, also attract millions of visitors throughout the year. Moreover, visitors enjoy live theater and music at the Fabulous Fox, the Repertory Theater and the Opera Theatre of St. Louis.[12]

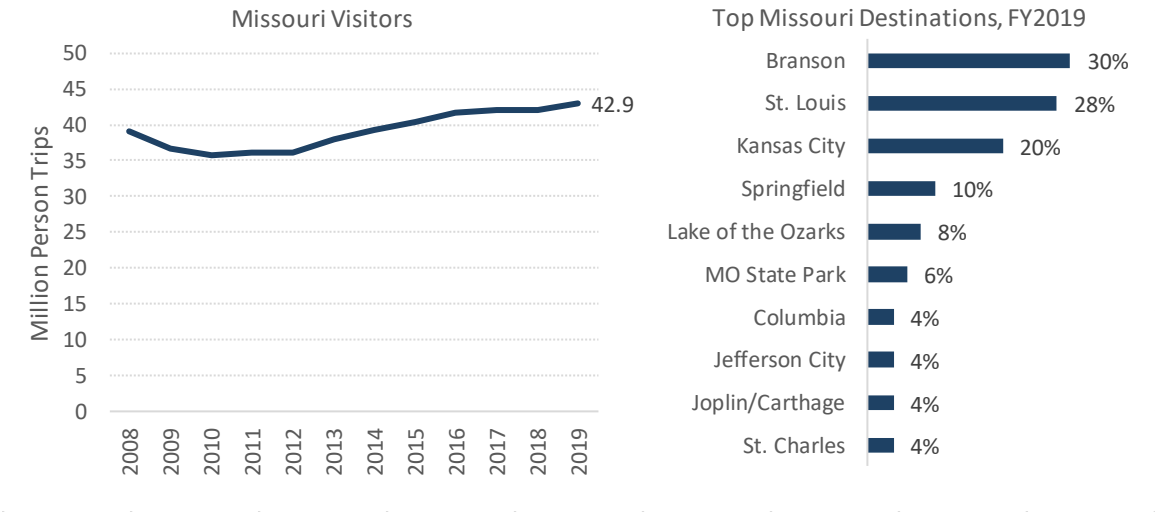
[12] Explore St. Louis, 25 Things to Do.

Other tourist attractions in the St. Louis MSA include:

- Outdoor recreation within parks, such as City Gardens and Forest Park
- Amusement parks, such as Six Flags St. Louis
- Sporting events, featuring the St. Louis Cardinals and the Saint Louis Blues
- Dozens of museums and several contemporary art galleries

In 2019, Missouri had 42.9 million visitors. Twenty-eight percent visited the St. Louis MSA (**Figure 3.2-14**). The number of visitors increased nearly 20 percent from the post-recession low of 35.8 million in FY2010. In 2020, the number of visitors is expected to decrease sharply due to the COVID-19 pandemic. Tourism travel has been one of the industry sectors most impacted by the COVID-19 pandemic in 2020. Amusement parks have closed, and sporting events and concerts have been cancelled due to public health safety concerns. Air travel at U.S. airports, including STL, decreased to less than 10 percent of pre-COVID-19 levels in April 2020.

**Figure 3.2-14: Missouri Visitors and Top Destinations**




Sources: Missouri Division of Tourism, *Annual Reports*; Unison Consulting, Inc., June 2020.

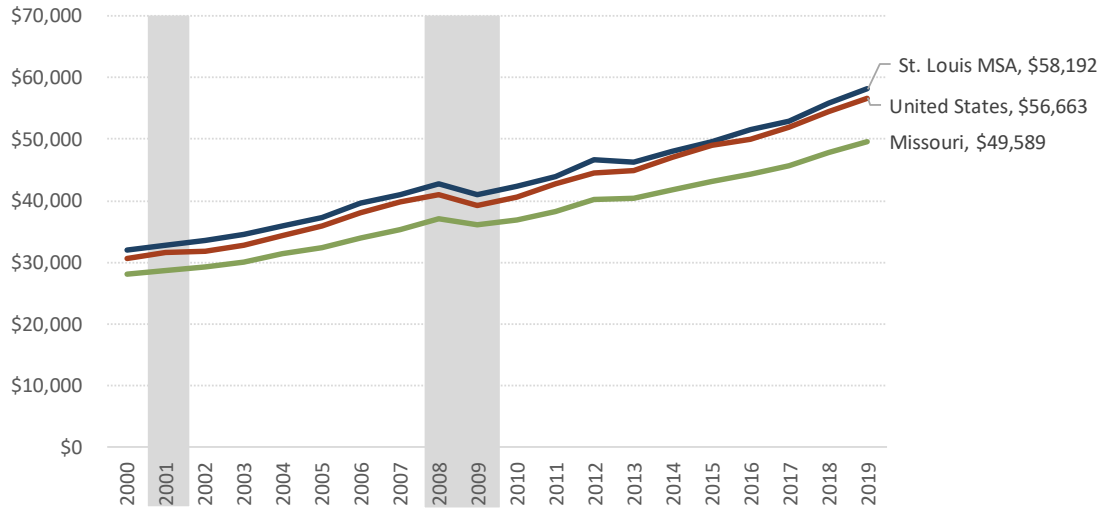
## *3.2.6 PERSONAL INCOME*

Personal income measures the income people receive from all sources—employment, proprietorship, government transfers, rental properties, and other assets. It determines consumers' ability to spend—on air travel, among other things—and build wealth. Growth in personal income boosts demand for air travel.

The residents of the St. Louis MSA enjoy a higher per capita personal income, compared with national and Missouri state averages (**Figure 3.2-15**). Growth in per capita personal income in the St. Louis MSA follows national growth trends. From 2000 through 2019, real per capita income increased at an average annual rate of 3.2 percent in the St. Louis MSA, comparable to the average annual rate of increase nationwide (3.3

percent). A component of gross domestic product (GDP), personal income follows the same cyclical pattern: increasing during economic expansion and decreasing during economic recession. Per capita personal income is expected to decrease in 2020, due to the deep recession and unprecedented layoffs caused by the COVID-19 pandemic and the social distancing containment measures.

**Figure 3.2-15: Per Capita Personal Income**




| | Compound Annual Growth Rate | | |
|---|---|---|---|
| Period | St. Louis MSA | Missouri | United States |
| 2000-2010 | 2.9% | 2.8% | 2.8% |
| 2010-2019 | 3.6% | 3.4% | 3.8% |
| 2000-2019 | 3.2% | 1.6% | 3.3% |

Notes:
Shaded areas on the chart indicate recession periods.
The chart shows per capita personal income in current dollars.
The 2019 data for the St. Louis MSA is an estimate based on regional economic forecasts from Moody's Analytics.

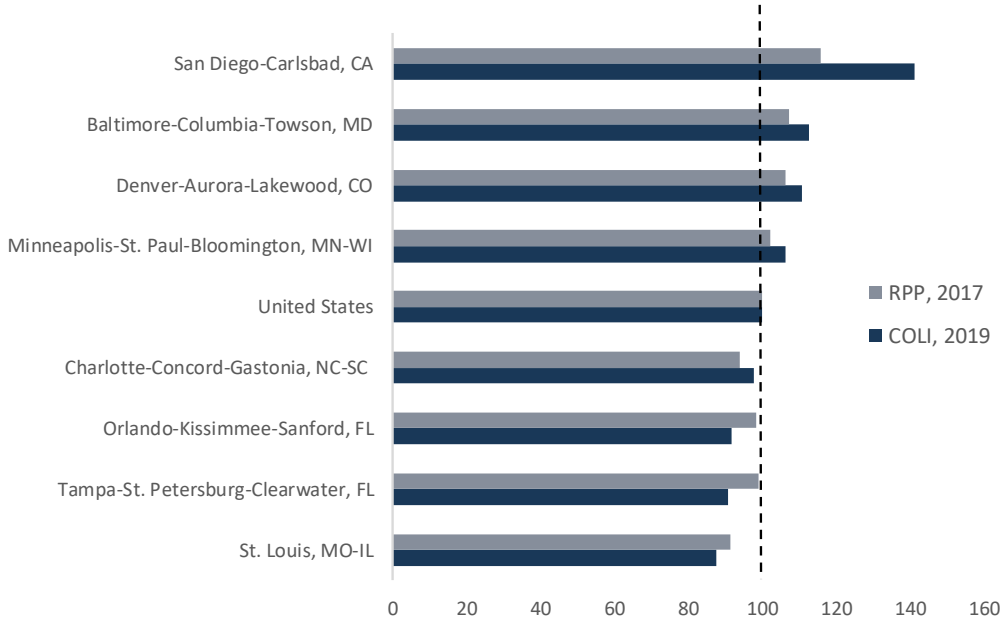
Sources: U.S. Bureau of Economic Analysis; Moody's Analytics; Unison Consulting, Inc., June 2020).

## *3.2.7 COST OF LIVING*

A low cost of living attracts new workers and businesses into the area. The St. Louis MSA residents enjoy low cost of living as indicated by the two measures shown in **Figure 3.2-16**: (1) the Cost of Living Index (COLI), published by the Council for Community and Economic Research (C2ER), and (2) the Regional Price Parity (RPP), published by the U.S. Bureau of Economic Analysis (BEA). The cost of living in the St. Louis MSA is lower than the U.S. average—by more than 12 percent according to the COLI in 2019 or by more than 8 percent according to the RPP in 2017. The cost of living in the St. Louis MSA is lower than the cost of living in the other seven metropolitan areas shown on the chart. These seven metropolitan areas are close to the St. Louis MSA in population size (Figure 3.2-4)**.**

Despite having a slow-growing regional economy, the St. Louis MSA residents enjoy high living standards, because they pay prices that are lower than the U.S. average, while earning per capital personal income higher than the U.S. average. When its below-U.S. average prices are accounted for, the St. Louis MSA ranks in the top 6 percent of MSAs based on real per capita personal income, and in the top 16 percent based on real median household income, according to a study by economists at the Federal Reserve Bank of St. Louis.[13]

**Figure 3.2-16: Cost of Living in the St. Louis and Comparable Metropolitan Statistical Areas**




Note: The chart shows two measures of cost of living: (1) Regional Price Parities (RPP) and (2) Cost of Living Index (COLI).

Sources: U.S. Bureau of Economic Analysis (Regional Price Parity); Council for Community and Economic Research (Cost of Living Index); Unison Consulting, Inc., June 2020.

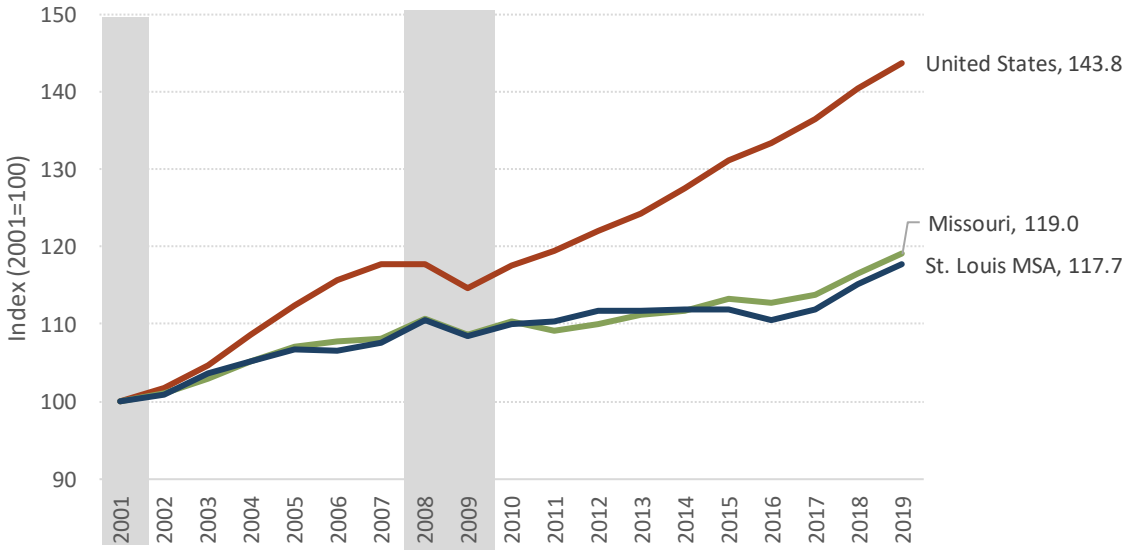
## *3.2.8 ECONOMIC OUTPUT*

Economic trends drive airport passenger traffic. The most comprehensive economic indicator is GDP, which measures the value of all goods and services produced in an area. Growth in inflation-adjusted (real) GDP indicates an economic expansion, while a steady decline over two or more quarters indicates a recession. An economic expansion increases employment and income, boosts consumer and business confidence, and increases the demand for air travel. In contrast, an economic recession dampens business activity, causes job losses, reduces income, weakens consumer and business confidence, and decreases the demand for air travel.

[13] Cletus C. Coughlin, Charles S. Gascon, and Kevin L. Kliesen, "Living Standards in St. Louis and the Eighth Federal Reserve District: Let's Get Real," Federal Reserve Bank of St. Louis *Review*, Fourth Quarter 2017, pp. 377-94.

The St. Louis MSA's real GDP, the comprehensive measure of regional economic output, has been growing steadily since 2016 (**Figure 3.2-17**). The pace of regional economic growth has been much slower than the pace of national economic growth. During the Great Recession of 2009, however, the St. Louis MSA experienced a milder economic downturn than the United States as a whole, but it also experienced a more gradual expansion following the recession. The economic trends in the St. Louis MSA compare closely to the economic trends in the entire state of Missouri.

**Figure 3.2-17: Growth in Real Gross Domestic Product**




| | Compound Annual Growth Rate | | |
|---|---|---|---|
| Period | St. Louis MSA | Missouri | United States |
| 2001-2019 | 1.1% | 1.1% | 1.8% |
| 2010-2019 | 0.8% | 0.8% | 2.3% |
| 2001-2019 | 0.9% | 1.0% | 2.0% |

Notes:
Shaded areas on the chart indicate recession periods.
The 2019 data for the St. Louis MSA is an estimate based on regional economic forecasts from Moody's Analytics.

Sources: U.S. Bureau of Economic Analysis; Moody's Analytics; Unison Consulting, Inc. (June 2020).

From 2001 to 2019, the St. Louis MSA's real GDP grew nearly 18 percent, or 0.9 percent annually. By comparison, the U.S. real GDP grew nearly 44 percent, or 2 percent annually, over the same period.

In 2020, the St. Louis MSA economy was poised to continue growing. However, the outbreak of COVID-19 turned into a global pandemic, reaching the United States in the first quarter of 2020, and triggered a severe downturn in the U.S. and the global economies. The adverse economic impacts of the COVID-19 pandemic are far-reaching, affecting both supply and demand. The COVID-19 pandemic initially disrupted manufacturing and retail supply chains with links to China. With the arrival of COVID-19 in the United States, social distancing measures and shelter-in-place orders to contain the spread of the disease, it halted nearly all economic activities across the nation, including in the St. Louis MSA. Consumer demand fell sharply,

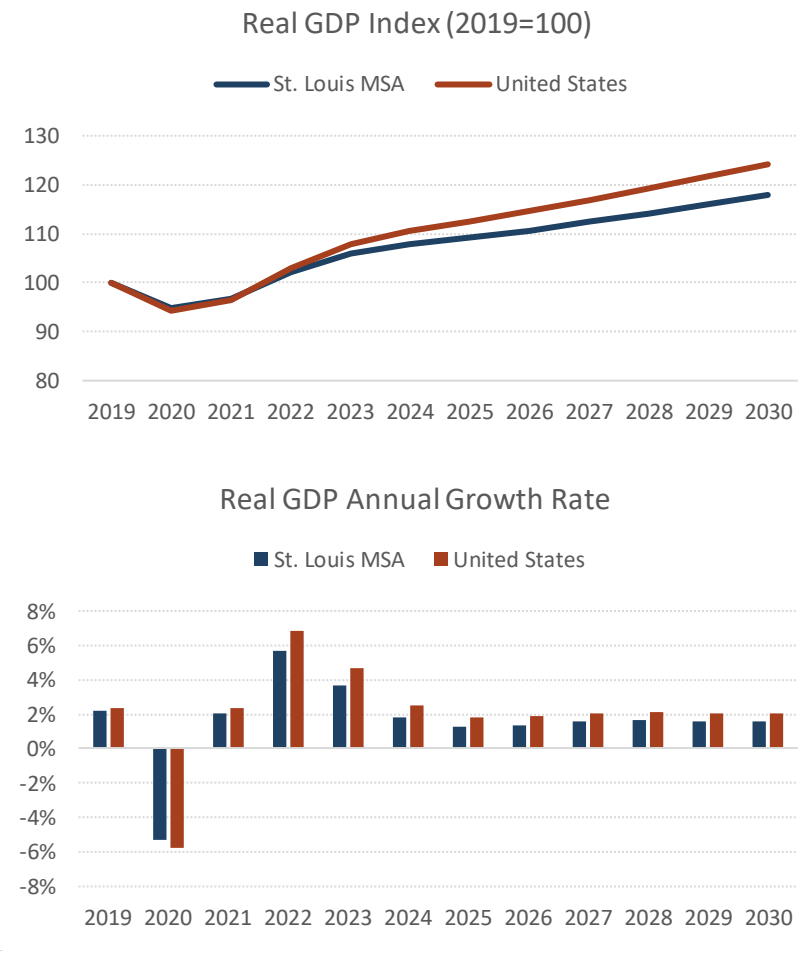
forcing many businesses to either reduce or shut down operations. For the entire year in 2020, the St. Louis MSA's real GDP is projected to decrease 5.3 percent and the U.S. real GDP is projected to decrease 5.8 percent, according to Moody's Analytics' economic forecasts as of April 27, 2020.

### *3.2.9 ECONOMIC OUTLOOK*

Before the onset of the recession induced by the COVID-19 pandemic in March 2020, the St. Louis MSA economy had been expanding with the U.S. economy at a slow but steady pace for more than 10 years straight. Trends in key indicators pointed to a healthy regional economy. The number of business establishments was rising and employment was growing. The unemployment rate in the St. Louis MSA fell to record low levels—lower than the U.S. unemployment rate. Wages were rising, and the per capita personal income in the St. Louis MSA, which was higher than the U.S. average, was rising. The slow-growing MSA population, however, restrained growth in the labor force, causing tightness in the labor market. All the positive trends were poised to continue when the economy was abruptly upended by the COVID-19 pandemic, and widespread shelter-in-place orders were imposed to contain the pandemic.

In May 2020, many parts of the United States, including the St. Louis MSA, began to take steps to ease social distancing policies and resume economic activities. Nonfarm employment increased from the previous month, causing the U.S. unemployment rate to fall from 14.7 percent in April 2020 to 13.3 percent in May 2020, according to preliminary data from the U.S. Bureau of Labor Statistics. In the June 2020, independent economic forecasts by Moody's Analytics, economic recovery was expected to begin in the third quarter of 2020, with real GDP returning to the 2019 level by 2022 in the St Louis MSA and the United States (**Figure 3.2-18**). The forecast recovery is predicated upon the following: (1) the easing of social distancing and the reopening of the economy do not trigger a flare-up in COVID-19 cases; and (2) a vaccine or a treatment for COVID-19 is successfully developed, tested, mass-produced, and administered widely.

**Figure 3.2-18: Forecast Trends in Real Gross Domestic Product in the St. Louis Metropolitan Statistical Area and the United States**




Sources: Moody's Analytics, *Economic Forecasts*, April 27, 2020; Unison Consulting, Inc., June 2020.

## 3.3 COMMERCIAL PASSENGER TRAFFIC

Commercial passenger traffic accounts for more than 98 percent of commercial aircraft operations at STL. This section reviews the historical trends in commercial passenger traffic at the Airport and presents forecasts of commercial passenger enplanements, aircraft operations, and landed weight, which serve as important inputs to different aspects of the ALPU. The discussion is organized around three topics:

- Historical trends and underlying drivers
- Forecast methodology, assumptions, and results
- Forecast risk and uncertainty factors

Historical data are presented on either calendar year or the Airport fiscal year basis, depending on the source data. The forecasts are presented on the Airport fiscal year basis to facilitate use in other aspects of the ALPU, particularly financial planning. The Airport's fiscal year ends on June 30. The comparison with the FAA Terminal Area Forecasts (TAF) is done on federal fiscal year basis. The federal fiscal year ends on September 30.

### *3.3.1 HISTORICAL TRENDS*

STL is classified as a medium hub commercial service airport by the FAA. A medium hub is defined as an airport enplaning at least 0.25 percent but less than 1 percent of total U.S. enplanements. Based on calendar year (CY) 2018 enplanements, STL ranked as the fourth largest among medium hub airports—just behind Austin-Bergstrom International Airport—and the 34th largest among all U.S. commercial service airports.[14]

In FY2020, STL received scheduled service from 25 passenger airlines, consisting of eight mainline carriers and 17 regional carriers (**Table 3.3-1**). Of the 17 regional carriers, 16 operate for mainline carriers under capacity purchase agreements. STL receives service from nine of the 13 U.S. major passenger carriers—those air carriers posting more than $1 billion in revenue in one fiscal year, as defined by the U.S. Department of Transportation (DOT). Trans States Holdings, headquartered at St. Louis Lambert International Airport, was the owner of Trans States Airlines, Compass Airlines, and GoJet Airlines. Both Trans States and Compass were shuttered in April 2020 amid the COVID-19 pandemic crisis.

[14] Source: Federal Aviation Administration CY 2018 Passenger Boarding Data.

**Table 3.3-1: Airlines with Scheduled Passenger Service at STL in FY2020**

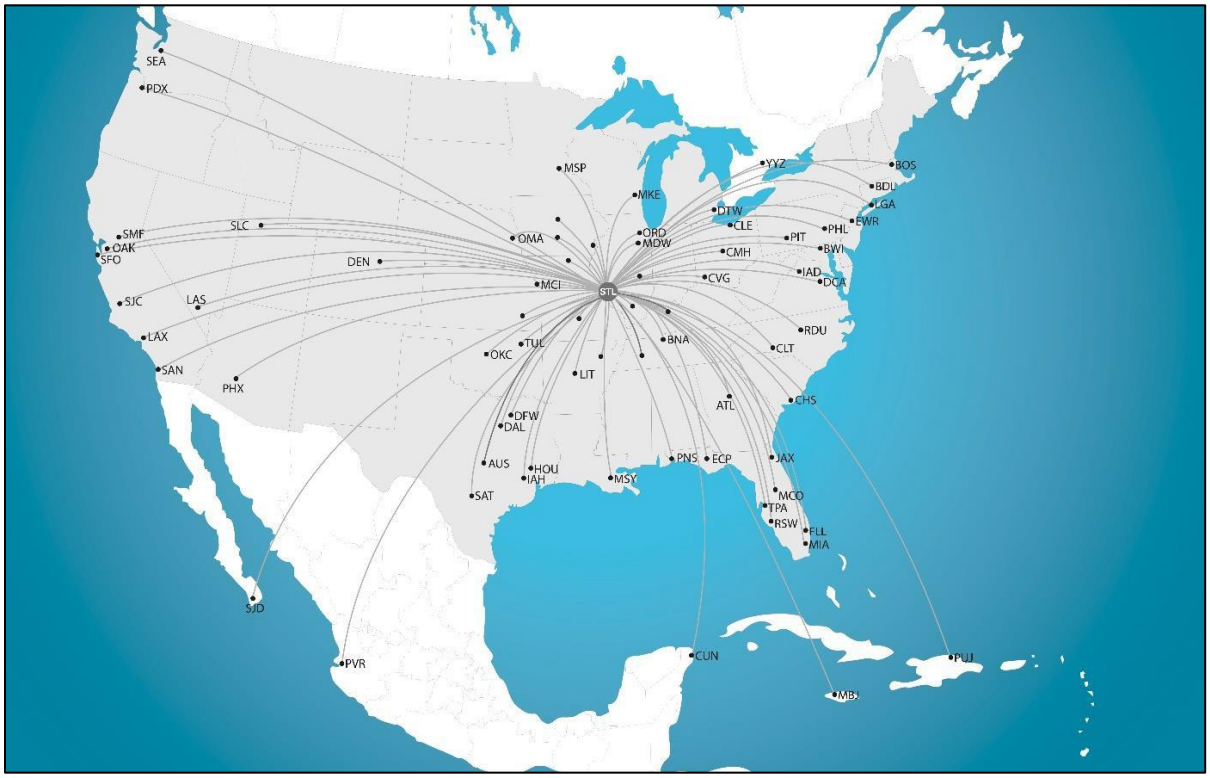
| Carrier Type | Mainline | Regional |
|---|---|---|
| U.S. Major Carriers | Alaska Airlines (AS) | Envoy Air (MQ) (Operates for AA)[1] |
| | American Airlines (AA) | Republic Airways (YX) (Operates for AA, DL and UA) |
| | Delta Air Lines (DL) | SkyWest Airlines (OO) (Operates for AA, DL, and UA) |
| | Frontier Airlines (F9) | |
| | Southwest Airlines (WN) | |
| | United Airlines (UA) | |
| Other U.S. Carriers | Sun Country Airlines (SY) | Air Choice One (3E) |
| | | Air Wisconsin (ZW) (Operates for UA) |
| | | Cape Air (9K) (Codeshares with AA and UA) |
| | | Compass (CP) (Operates for DL)[2] |
| | | CommutAir (C5) (Operates for UA) |
| | | Contour Airlines (LF) (Interlines with AA) |
| | | Endeavor Air (9E) (Operates for DL)[3] |
| | | ExpressJet Airways (EV) (Operates for UA) |
| | | GoJet Airlines (G7) (Operates for DL and UA) |
| | | Horizon Air (QX) (Operates for AS)[4] |
| | | Mesa Airlines (YV) (Operates for AA and UA) |
| | | PSA Airlines (OH) (Operates for AA)[1] |
| | | Trans States Airlines (AX) (Operates for UA)[2] |
| Foreign Flag Carriers | Air Canada (QK) | Air Georgian (ZX) (Operates for QK) |

Notes:
[1] Wholly-owned subsidiary of American Airlines.
[2] Trans States ceased all operations on April 1, 2020.
[3] Wholly owned subsidiary of Delta Air Lines.
[4] Alaska Airlines' sister carrier.

Sources: OAG, *Schedules Analyzer*; April 2020; Airline websites (April 2020).

In July 2019, the peak month of travel at STL in FY2020, STL had scheduled nonstop service to 63 U.S. airports and six international destinations (**Figure 3.3-1**).

**Figure 3.3-1: Nonstop Passenger Service Destinations (July 2019)**

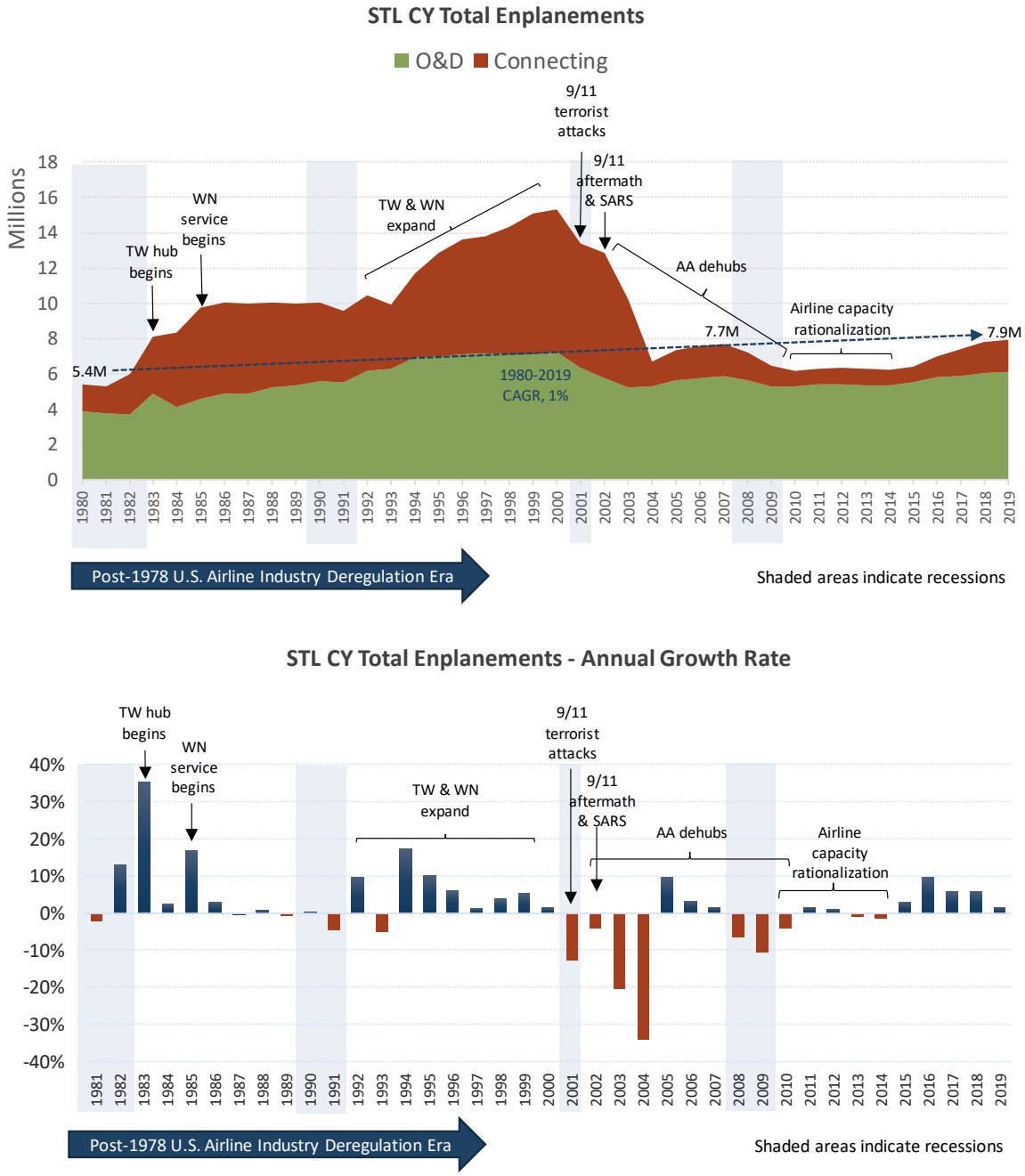



Source: St. Louis Lambert International Airport, Official Website, July 2019.

### 3.3.1.1 LONG-TERM HISTORICAL ENPLANEMENT TRENDS

Over the years, the Airport experienced changes in its passenger traffic levels more dramatic than those experienced at the national level (**Figure 3.3-2**). Fundamentally, passenger traffic is driven by economic trends—the demand for air travel grows during periods of economic expansion and declines during periods of economic recession. Prior to 2020, the Airport experienced recession-induced declines in passenger traffic during the Great Recession of 2009.

**Figure 3.3-2: Long-Term Historical Trends in Commercial Passenger Enplanements (CY1980-2019)**




Sources: St. Louis Airport Authority, *Airport Traffic Reports,* March 2020; Unison Consulting, Inc., June 2020.

At STL, significant structural changes in air service prompted dramatic changes in passenger traffic levels, both positively and negatively. STL enjoyed significant growth in passenger traffic following the establishment of a large connecting hub at the Airport in November 1982 by Trans World Airlines (acquired by American Airlines in 2001[15]), the introduction service by Southwest Airlines in 1985, and subsequent expansion by both Trans World Airlines and Southwest Airlines through 2000. STL reached its highest level of passenger traffic with total enplanements of 15.3 million, consisting of 53 percent connecting traffic and 47 percent O&D traffic, in CY2000. Similarly, STL suffered sharp declines in passenger traffic following its dehubbing by American Airlines in the aftermath of the events of September 11, 2001.

Apart from changes in the business cycle and changes in air service, negative shocks, such as the events of September 11, 2001, and, to a lesser extent, the outbreak of severe acute respiratory syndrome (SARS) in 2003, also caused passenger traffic at STL to fall in the past. The aftermath of the events of September 11, 2001, resulted in both temporary and lasting changes in demand and supply in the air travel industry.

#### 3.3.1.1.1 MAJOR EVENTS IN THE PAST 19 YEARS AND CONSEQUENCES TO STL

The past 19 years were particularly eventful for STL, beginning with 2001. In April 2001, Trans World Airlines, then the long-time dominant hub carrier at STL, was acquired by AMR Corporation, parent company of American Airlines, and merged into American Airlines.[16] The acquisition took place as a U.S. economic recession was developing, and, five months later, the events of September 11, 2001 occurred.

The events of September 11, 2001, caused passenger traffic at STL to fall sharply, exacerbating year-over-year declines that began in November 2000, as the U.S. economy slowed and eventually entered a recession period from March through November 2001. STL passenger traffic continued to fall through 2004. The traffic declines at STL resulting from a three-day shutdown of the aviation system and slow recovery of air travel demand after the events of September 11, 2001, were not unique to STL. However, STL suffered disproportionately from actions taken by American Airlines to stem financial losses and return to profitability. As a reaction to the events of September 11, 2001, American Airlines reduced flights by approximately 20 percent systemwide. Not long after, American Airlines began to scale down the connecting hub it took over from Trans World Airlines at STL, to consolidate its mid-continental hub operations at Chicago O'Hare International Airport and Dallas-Fort Worth International Airport, a key element in its parent company AMR Corporation's Turnaround Plan.

American Airlines completed its hub restructuring in November 2003. STL emerged from dehubbing by American Airlines with a "new normal" — with annual enplanements at less than half of pre-2001 levels and connecting traffic shrinking to a minority share. STL's annual enplanements decreased from a peak 15.3 million in CY2000 to 6.7 million in CY2004. Connecting traffic decreased in share from 53 percent in CY2000 to 21 percent in CY2004. The significant decrease in STL's enplanements to less than a 1 percent share

[15] On April 9, 2001, American purchased substantially all of the assets and assumed certain liabilities of Trans World Airlines, Inc.—then the eighth largest U.S. carrier, the operator of a major system hub at STL, and the largest provider of air service at STL.

[16] Trans World Airlines flew its last flight on December 1, 2001, before its assets and operations were completely absorbed by American Airlines.

of U.S. total enplanements resulted in a change in FAA's classification of STL from a large to a medium hub airport.

The 2001 economic recession ended a 10-year period of U.S. economic expansion and growth in the U.S. aviation industry. And the aftermath of the events of September 11, 2001, dealt huge financial losses to American Airlines and United Airlines, exacerbated the declining trend in passenger traffic from the economic slowdown and eventual recession, and slowed U.S. recovery from the 2001 economic recession. Meanwhile, jet fuel cost began to rise with oil prices, increasing financial pressures on airlines. Jet fuel cost per gallon quadrupled from 2000 to 2008, and remained at record high levels through 2014. Amid record fuel prices, the U.S. economy entered the Great Recession from December 2007 to June 2009, upending the recovery of the U.S. aviation industry from previous shocks. The Great Recession held the record for both the longest and the deepest U.S. economic recession after the Great Depression. The recovery from the Great Recession was also the slowest of all recession recoveries in the post-Great Depression era.

The series of major shocks to the U.S. aviation industry set in motion significant structural changes. Mounting financial difficulties led to airline bankruptcies and mergers that left the U.S. airline industry with four major airlines—American Airlines, Delta Air Lines, Southwest Airlines, and United Airlines. These four major airlines controlled 80 percent of the U.S. domestic passenger traffic. Surviving airlines embarked on major business restructuring and network consolidations. The U.S. airline industry cut domestic seat capacity to increase load factors, retrofitted existing aircraft with additional seats to increase capacity on each flight, changed route networks, retired high maintenance and fuel inefficient older aircraft, implemented various other cost-cutting measures, and unbundled services and changed pricing to create new revenue sources.

The cuts in domestic seat capacity—approximately 20 percent between 2005 and 2014—fell disproportionately on small and medium hub airports, including STL. American Airlines continued to cut scheduled capacity at STL through the Great Recession, as other airlines also cut scheduled capacity to operate efficiently amid weak air travel demand and high fuel prices. STL's enplanements decreased further to 6.2 million in CY2010, the lowest level reached since 1982, and the connecting traffic share decreased further to 14 percent, the smallest connecting traffic share on record at STL. This reduction of enplaned passengers coincided with American Airlines' abandonment of the STL hub in CY2010. When air travel demand began to strengthen with the U.S. economic recovery from the Great Recession, U.S. airlines continued to rein in domestic capacity through 2014—a period that has become known for the U.S. airline industry as capacity rationalization. STL's annual enplanement levels stayed flat during this period.

The U.S. economic recovery from the Great Recession, albeit slow, proceeded to become the longest economic expansion in U.S. history. U.S. airlines reaped the benefits by turning industry profits for nearly 11 years straight, boosted by strengthening air travel demand beginning in 2010 and falling jet fuel prices beginning in late 2014. The benefits to STL came later when airlines began to restore service and increase scheduled capacity at STL in 2015. STL began to see growth in enplanements, which accelerated in 2016, 2017 and 2018. During these three years, STL's annual enplanement growth, on a calendar year basis, averaged 7.1 percent, and annual enplanements exceeded pre-Great Recession levels in 2018. In 2019, enplanement growth at STL began to slow with the grounding of the Boeing 737 MAX—a recent addition to the U.S. airline industry fleet—constraining growth in scheduled airline capacity. STL's enplanements

grew 1.6 percent to 7.9 million for the calendar year—the highest level since dehubbing by American Airlines.

The FAA ordered the grounding of Boeing 737 MAX airplanes effective March 13, 2019, following the crash of an Ethiopian Airlines 737 MAX 8 flight three days earlier. As of March 2019, there were 34 Boeing 737 MAX in Southwest Airlines' fleet, 24 in American Airlines' fleet, and 14 in United Airlines' fleet. The grounding of this aircraft has limited the ability of these airlines to increase scheduled capacity.

American Airlines' dehubbing of STL clearly hurt the Airport, but it also led to beneficial changes. It resulted in a fundamental change in the Airport's role from a major connecting hub to a predominantly O&D airport. The change in the mix of traffic toward more O&D reduced the Airport's vulnerability to airline network consolidation. However, a largely O&D traffic base tends to tie passenger growth trends more closely to regional economic growth trends, which for STL have historically lagged national economic growth trends. The decrease in American Airlines' capacity at STL gave way to other airlines increasing capacity at STL. Southwest Airlines gradually emerged as the Airport's largest carrier. Having pressed American Airlines for enplanement market share as early as CY2009, in CY2011, following the American Airlines' hub departure, Southwest Airlines seized 44 percent of the enplanements at STL. Delta Air Lines and United Airlines also moved up in share of STL passenger traffic. New airlines also entered the STL market. Today, STL has a more diversified mix of air service providers, even though Southwest Airlines' share of STL enplanements has grown to around 60 percent—still smaller than the 80 percent share Trans World Airlines and its affiliates used to hold.

#### 3.3.1.1.2 LONG-TERM ANNUAL GROWTH RATES IN STL ENPLANEMENTS (1980-2019)

**Figure 3.3-3** shows the different phases in the evolution of commercial passenger traffic at STL in terms of average annual growth rates over nearly four decades. Through the years, a common theme emerges connecting traffic drove growth and decline, as O&D traffic held relatively steady.

Following the deregulation of the U.S. airline industry in late 1978, STL's enplanements grew rapidly during the 1980s, as Trans World Airlines, then the 8th largest U.S. passenger carrier, established its largest connecting hub at STL, and Southwest Airlines began providing low-fare service at the Airport. From CY1980 to CY1990, total enplanements grew an average of 6.3 percent annually, driven by connecting enplanements growing at an average rate of 11 percent annually. O&D enplanements grew at an average annual rate of 3.8 percent during this period.

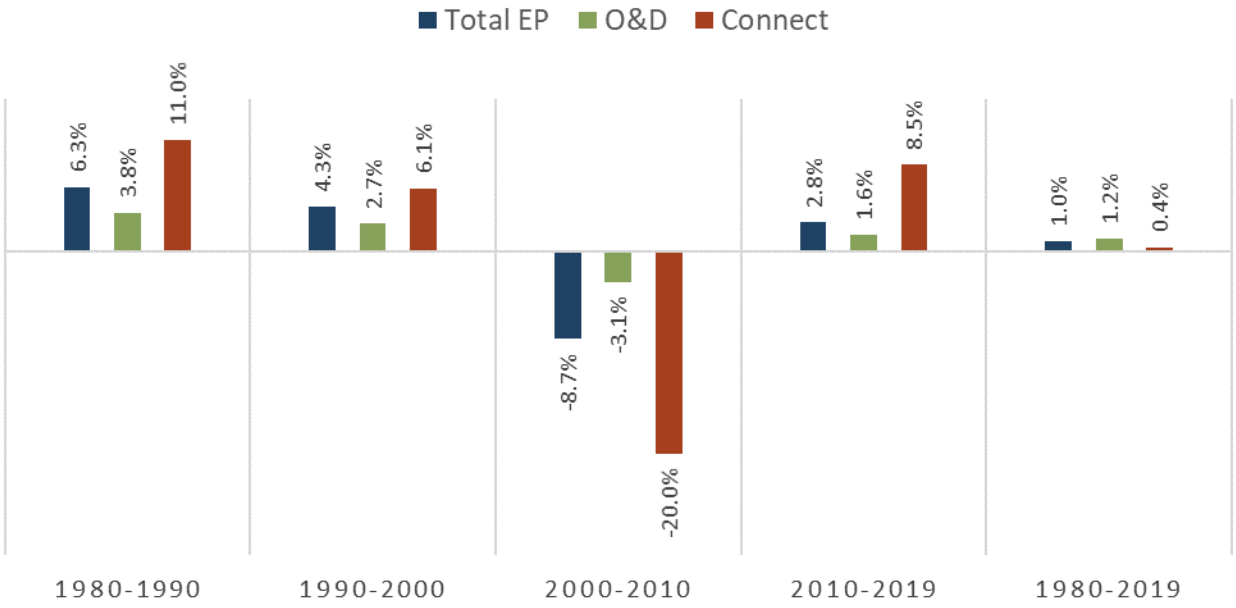
Strong growth continued in the 1990s as both Trans World Airlines and Southwest Airlines expanded STL operations amid a decade-long U.S. economic expansion. However, as expected of a maturing market, total enplanement growth slowed to an average rate of 4.3 percent annually from 1990 to 2000. The strong growth in total enplanements was still driven by connecting traffic growing at an average rate of 6.1 percent annually. O&D enplanements grew at an average annual rate of 2.7 percent. During this period, Trans World Airlines filed for bankruptcy protection twice—in 1992 and 1995.

As shown in Figure 3.3-3, enplanement growth began to taper in 2000, as the long-running economic expansion of the 1990s approached its end. Adverse events during the 2000s caused STL passenger traffic

to fall sharply. On calendar year basis, from 2000 to 2010, STL's total enplanements decreased at an average annual rate of 8.7 percent. Connecting enplanements decreased at an average annual rate of 20 percent, and O&D enplanements decreased at an average annual rate of 3.1 percent.

The 2010s show the beginning of passenger traffic recovery at STL, from both the Great Recession and the dehubbing by American Airlines. On a calendar year basis, from 2010 to 2019, STL's total enplanements increased at an average annual rate of 2.8 percent. Connecting enplanements increased at an average annual rate of 8.5 percent, and O&D enplanements increased at an average annual rate of 1.6 percent. Over the entire period from 1980 to 2019, STL's total enplanements increased at an average annual rate of 1 percent. Connecting enplanements increased at an average annual rate of 0.4 percent, and O&D enplanements increased at an average annual rate of 1.2 percent.

**Figure 3.3-3: Compound Annual Growth Rates in STL Enplanements, CY Basis**



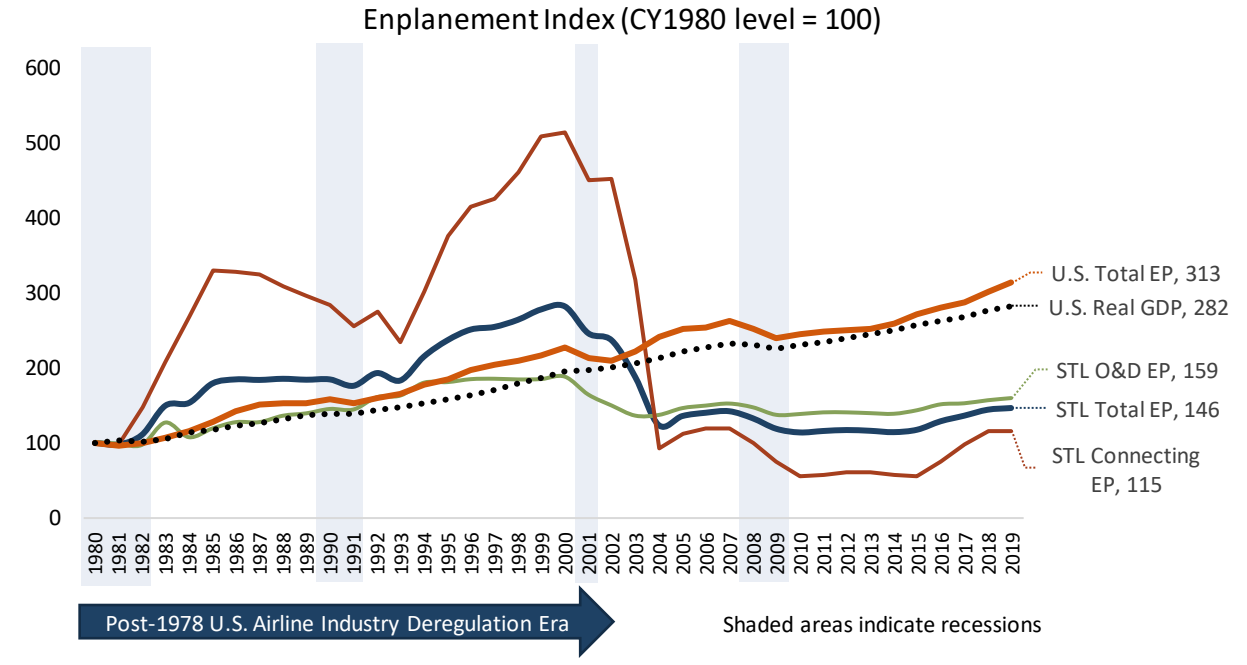

Notes:
EP – passenger enplanements
O&D: origin and destination passengers
Connect – connecting passengers

Sources: St. Louis Airport Authority, *Airport Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

### 3.3.1.1.3 COMPARISON OF STL AND U.S. PASSENGER TRAFFIC TRENDS

Over 39 years from 1980 to 2019, total enplanements at STL grew 46 percent in total (1 percent annually on average), less than one-quarter of the cumulative growth in U.S. total enplanements (186 percent over 39 years, or 3 percent annually on average), as shown in **Figure 3.3-4**. The figure also shows the trend in U.S. real GDP, which grew 182 percent over 39 years, or 2.7 percent annually on average. The growth in U.S. real GDP indicates U.S. economic growth. In general, passenger traffic growth tracks economic growth at the national level. Figure 3.3-4 shows volatility in STL enplanements due largely to sharp fluctuations in connecting traffic. O&D traffic has been relatively steady, reflecting a stable regional economy.

**Figure 3.3-4: Comparison of Cumulative Growth in STL Total Enplanements, U.S. Total Enplanements and U.S. Real Gross Domestic Product (CY1980-2019)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; U.S. Bureau of Transportation Statistics; U.S. Bureau of Economic Analysis; Unison Consulting, Inc., June 2020.

#### 3.3.1.1.4 THE 2020 COVID-19 GLOBAL PANDEMIC AND ECONOMIC RECESSION

On March 21, 2020, the World Health Organization declared the outbreak of COVID-19 a global pandemic. As of July 2020, the COVID-19 pandemic continues unabated, and its adverse economic impacts continue to be felt globally. While many pharmaceutical companies race to develop a vaccine, the timeline for the vaccine's successful testing, production, and widespread deployment remains uncertain. The pandemic, caused by novel coronavirus COVID-19, has disrupted the global supply chain. The drastic measures to contain the pandemic—travel bans, business closures, social distancing, and stay-at-home orders—have caused sharp declines in both business and consumer demand. The economic repercussions are severe and widespread, causing the United States and most of the rest of the world to fall into the deepest economic recession since the Great Depression.

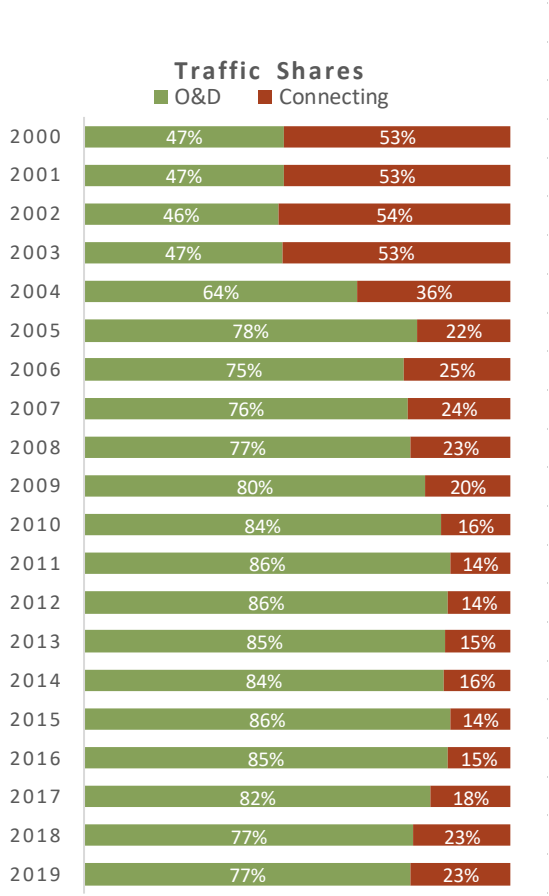
The air travel industry has been one of the economic sectors most adversely affected by the COVID-19 global pandemic. Passenger traffic has fallen across the board in proportions never before seen—even in the aftermath of the events of September 11, 2001, or the Great Recession. In April 2020, the Transportation Security Administration (TSA) reported at least 95 percent year-over-year decrease in passengers undergoing security screening at airports. Airlines and airports across the nation—large and small—reported the same magnitude of traffic decline. In May 2020, the TSA passenger screening data showed an 88 percent year-over-year decrease, an improvement from the previous month.

### 3.3.1.2 MIX OF TRAFFIC BETWEEN ORIGIN AND DESTINATION AND CONNECTING SEGMENTS

After American Airlines completed its hub restructuring in November 2003, the relative mix of passenger traffic at STL shifted toward a greater share of O&D passengers versus connecting passengers. **Figure 3.3-5** presents the distribution of O&D versus connecting passengers between FY2000 and FY2019. The O&D segment increased in share to approximately 85 percent between 2010 and 2016—the highest O&D traffic share on record since 1980. After 2016, the O&D traffic share began to decrease, reaching 77 percent in 2019, based on fiscal year data. The connecting segment, which decreased in share from a 54 percent in 2003 to a low of at or around 15 percent from 2011 to 2016, enjoyed a resurgence in recent years, mostly due to Southwest Airlines increasing its connecting traffic through STL. In FY2019, Southwest Airlines accounted for about 98 percent of connecting traffic at STL, and American Airlines accounted for remaining 2 percent. This trend continued in FY2020, O&D traffic accounting for 77 percent of total enplanements by all airlines. Most of the connecting traffic at STL is by Southwest Airlines, for whom the airport represents an important Midwest focus city. Approximately 60 percent of total enplanements are by Southwest Airlines.

**Figure 3.3-5: Origin and Destination and Connecting Enplanements (FY2000-2019)**

| Fiscal Year | Enplanements (000) O&D | Connecting | Total |
|---|---|---|---|
| 2000 | 7,193 | 8,066 | 15,259 |
| 2001 | 7,058 | 7,949 | 15,007 |
| 2002 | 5,780 | 6,840 | 12,619 |
| 2003 | 5,511 | 6,317 | 11,828 |
| 2004 | 5,160 | 2,858 | 8,018 |
| 2005 | 5,519 | 1,529 | 7,048 |
| 2006 | 5,724 | 1,899 | 7,623 |
| 2007 | 5,741 | 1,803 | 7,543 |
| 2008 | 5,849 | 1,762 | 7,611 |
| 2009 | 5,361 | 1,323 | 6,684 |
| 2010 | 5,260 | 1,016 | 6,277 |
| 2011 | 5,341 | 870 | 6,211 |
| 2012 | 5,430 | 920 | 6,351 |
| 2013 | 5,411 | 975 | 6,386 |
| 2014 | 5,294 | 973 | 6,267 |
| 2015 | 5,393 | 874 | 6,268 |
| 2016 | 5,696 | 976 | 6,673 |
| 2017 | 5,859 | 1,328 | 7,187 |
| 2018 | 5,894 | 1,719 | 7,612 |
| 2019 | 6,080 | 1,836 | 7,915 |




Note: O&D: origin and destination passengers

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

Connecting traffic accounted for 38 percent of Southwest Airlines' total enplanements at STL. Systemwide, during 2019, only 23 percent of Southwest Airlines' passengers had to make a connection to reach their final destination.[17] The point-to-point route system has distinguished Southwest Airlines from its top competitors: American Airlines, Delta Air Lines and United Airlines, all operating hub-and-spoke route systems. In its 2019 Annual Report, Southwest Airlines continued to highlight its point-to-point route structure as its key competitive distinction and one of the key elements in its low-cost strategy.[18]

[17] In its *2019 Annual Report to Shareholders*, Southwest Airlines reported that approximately 77 percent of its customers in 2019 flew nonstop to reach their final destination.

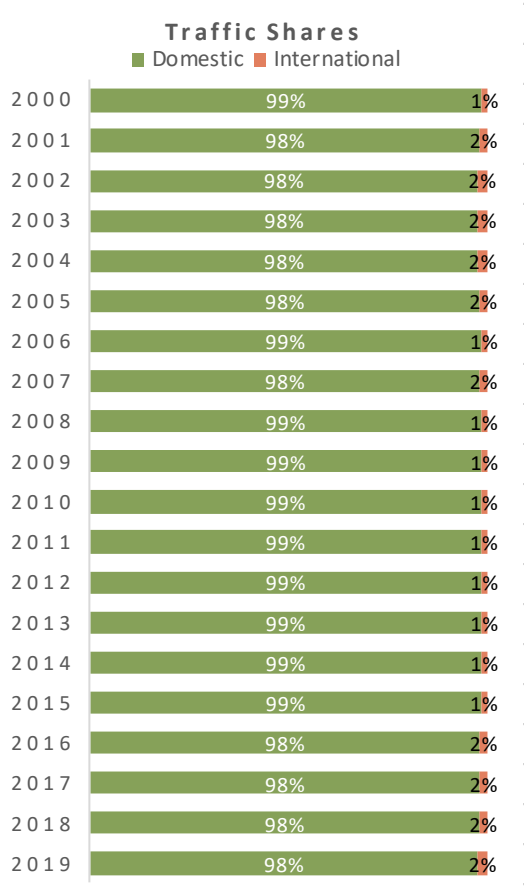
[18] Southwest Airlines Co., *2019 Annual Report to Shareholders*, Pages 2-3, April 2, 2020.

### 3.3.1.3 MIX OF TRAFFIC BETWEEN DOMESTIC AND INTERNATIONAL SEGMENTS

Passenger traffic at STL has historically been predominantly domestic. Over the 20-year history shown in **Figure 3.3-6**, domestic traffic consistently accounted for 98-99 percent of STL's total enplanements.

**Figure 3.3-6: Domestic and International Enplanements, FY2000-2019**

| Fiscal Year | Enplanements (000) Domestic | International | Total |
|---|---|---|---|
| 2000 | 15,080 | 179 | 15,259 |
| 2001 | 14,770 | 237 | 15,007 |
| 2002 | 12,339 | 280 | 12,619 |
| 2003 | 11,581 | 247 | 11,828 |
| 2004 | 7,849 | 168 | 8,018 |
| 2005 | 6,924 | 124 | 7,048 |
| 2006 | 7,509 | 114 | 7,623 |
| 2007 | 7,418 | 126 | 7,543 |
| 2008 | 7,505 | 106 | 7,611 |
| 2009 | 6,604 | 80 | 6,684 |
| 2010 | 6,189 | 87 | 6,277 |
| 2011 | 6,124 | 87 | 6,211 |
| 2012 | 6,269 | 82 | 6,351 |
| 2013 | 6,301 | 85 | 6,386 |
| 2014 | 6,097 | 80 | 6,177 |
| 2015 | 6,182 | 85 | 6,268 |
| 2016 | 6,565 | 108 | 6,673 |
| 2017 | 7,066 | 121 | 7,187 |
| 2018 | 7,477 | 136 | 7,612 |
| 2019 | 7,742 | 173 | 7,915 |

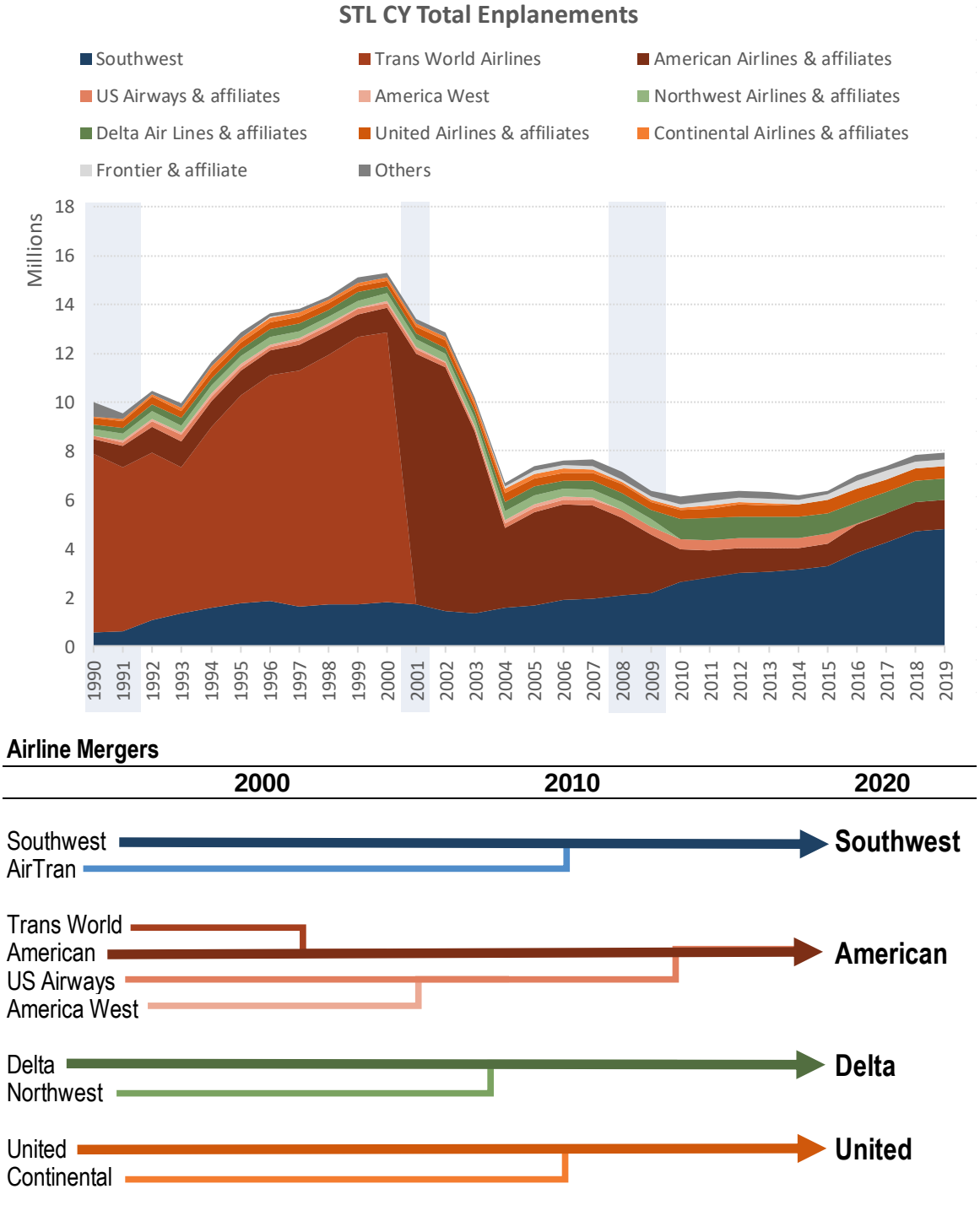



Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

### 3.3.1.4 AIRLINE PASSENGER TRAFFIC SHARES

**Figure 3.3-7** shows the airline composition of STL enplanements from 1990 through 2019 on a calendar year basis. STL has a long history of large traffic concentration—greater than 40 percent—on one airline: Trans World Airlines through 2000, American Airlines from 2001 through 2009, and Southwest Airlines from 2010 on. Figure 3.3-7 also shows the effect of airline mergers. The last wave left the industry with four major airlines controlling more than 80 percent of U.S. domestic passenger traffic: Southwest Airlines, American Airlines, Delta Airlines, and United Airlines. These four major airlines also control more than 80 percent of STL's total enplanements.

**Figure 3.3-7: Enplanements by Airline and Airline Mergers (CY2000-2019)**

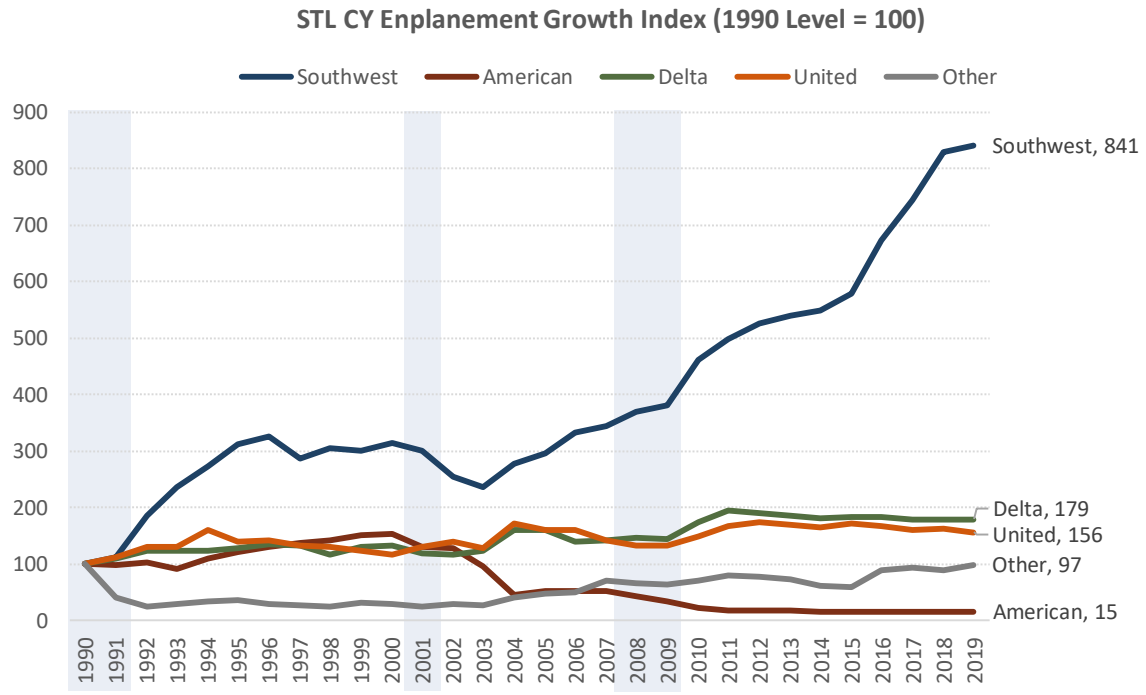



Notes:
Shaded areas on the chart indicate recessions.
Enplanements attributed to each airline include airline's mainline and regional affiliates' enplanements.

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; U.S. Bureau of Transportation Statistics; Unison Consulting, Inc., June 2020.

**Figure 3.3-8** shows each surviving major airline's long-term growth trend at STL in total enplanements by calendar year. The underlying enplanement data for each surviving major airline includes enplanements by the airlines merged into it. Figure 3.3-8 shows Southwest Airlines' exceptional growth at STL. Southwest Airlines' enplanements at STL have increased more than eight-fold since 1990, and nearly two-fold since 2010. This contrasts to the decrease in American Airlines' enplanements—an 85 percent decrease from 1990, counting combined enplanements by Trans World Airlines, US Airways, and American Airlines, and a 30 percent decrease since 2010.

### Figure 3.3-8: Growth in Enplanements by Airline (CY1990-2019)

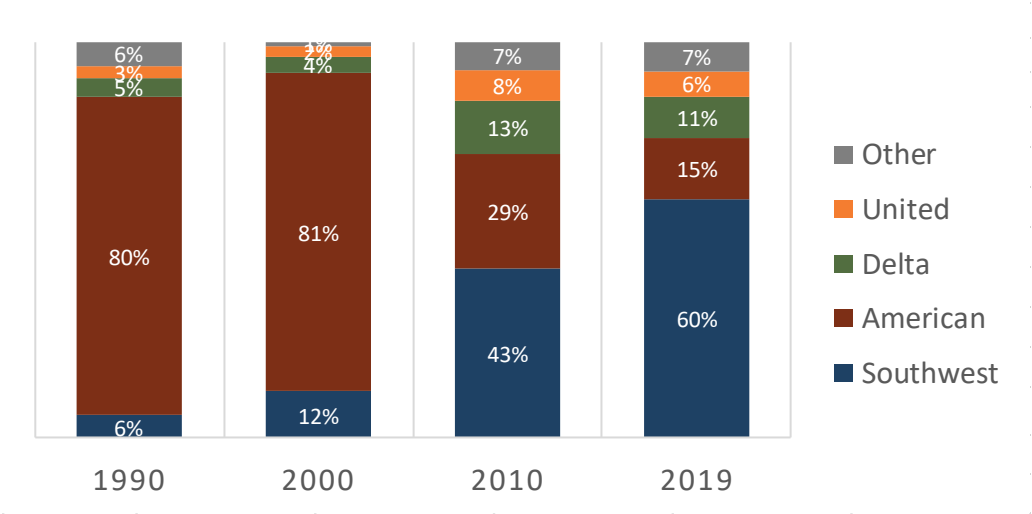



Notes:
Shaded areas indicate recessions.
Enplanements attributed to each airline include enplanements by regional affiliates and/or airlines absorbed through mergers.

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

**Figure 3.3-9** shows the changes in the four major airlines' relative shares of STL enplanements over nearly three decades. Southwest Airlines increased its share from 6 percent in CY1990 to 60 percent in CY2019, while American Airlines decreased its share from 80 percent in CY1990 (including shares of Trans World Airlines and US Airways) to 15 percent in CY2019. Delta Air Lines and United Airlines maintained relatively small shares, which have grown in the past 10 years with the decrease in American Airlines' share. Delta Air Lines increased its share from 5 percent in CY1990 (including Northwest Airlines' share) to 11 percent in CY2019. United Airlines increased its share from 3 percent in CY1990 (including Continental Airlines' share) to 6 percent in CY2019.

**Figure 3.3-9: Airline Shares of Enplanements (CY1990, 2000, 2010 and 2019)**




Note:
Enplanements attributed to each airline include enplanements by regional affiliates and/or airlines absorbed through mergers.

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

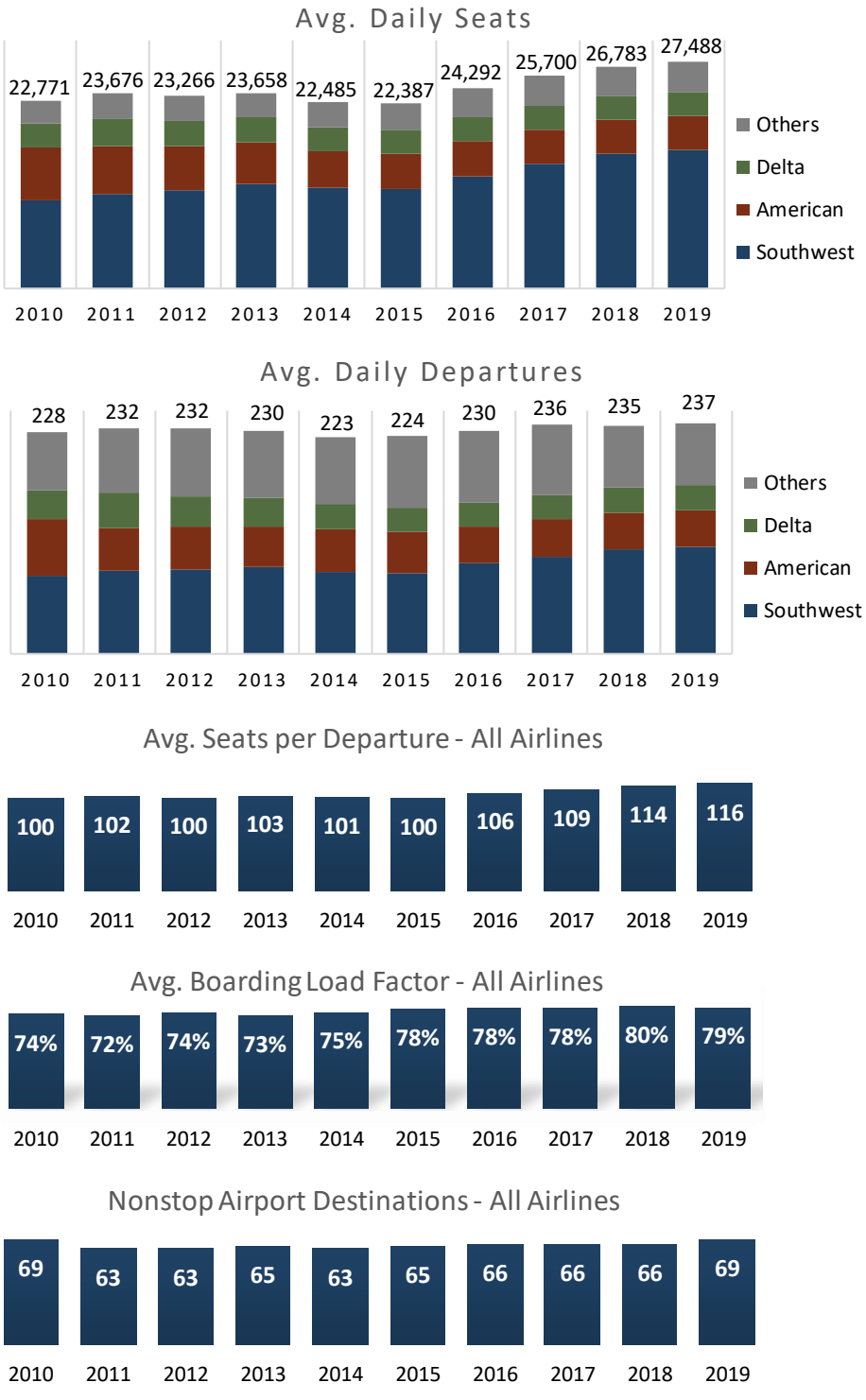
### 3.3.1.5 RECENT TRENDS IN SCHEDULED PASSENGER AIRLINE SERVICE

The key measures of scheduled passenger airline service include average daily seats, departures, boarding load factors, and the nonstop airport destinations served by carriers. **Figure 3.3-10** shows the trends in key measures of scheduled passenger airline service at STL from 2010 on a calendar year basis. After staying essentially flat during the first half of the decade, the period of airline capacity rationalization following the Great Recession, scheduled departures and seats at STL took an upturn beginning in 2016. From CY2015 through CY2019, seats increased 23 percent, nearly four times the increase (6 percent) in flight departures, as airlines upgauged aircraft fleets by adding seats to existing aircraft and by replacing smaller aircraft with larger aircraft to maximize financial returns on each flight. The average number of seats on each flight increased from 43 in CY2015 to 57 in CY2019[19]. Boarding load factors, which increased above 70 percent beginning in 2005, continued to increase. On average, boarding load factors reached 80 percent in CY2018 and decreased slightly to 79 percent in CY2019. The number of airports served nonstop from STL increased in the last five years to 69 in CY2019, returning to the same number served in CY2010.

The increase in scheduled capacity at STL is due largely to Southwest Airlines. From CY2015 to CY2019, Southwest increased scheduled seats at STL by 39 percent and scheduled flight departures by 34 percent. In CY2019, Southwest provided 16,737 seats a day on 111 flight departures a day, on average, at STL. That year, Southwest accounted for 61 percent of all scheduled seats and 47 percent of all scheduled flight departures from STL.

[19] Essential Air Service is provided by two airlines to 10 destinations from STL. This service is provided on smaller aircraft and accounted for approximately10 percent of total scheduled flights in CY2019, which impacts the average seats per departure at STL,

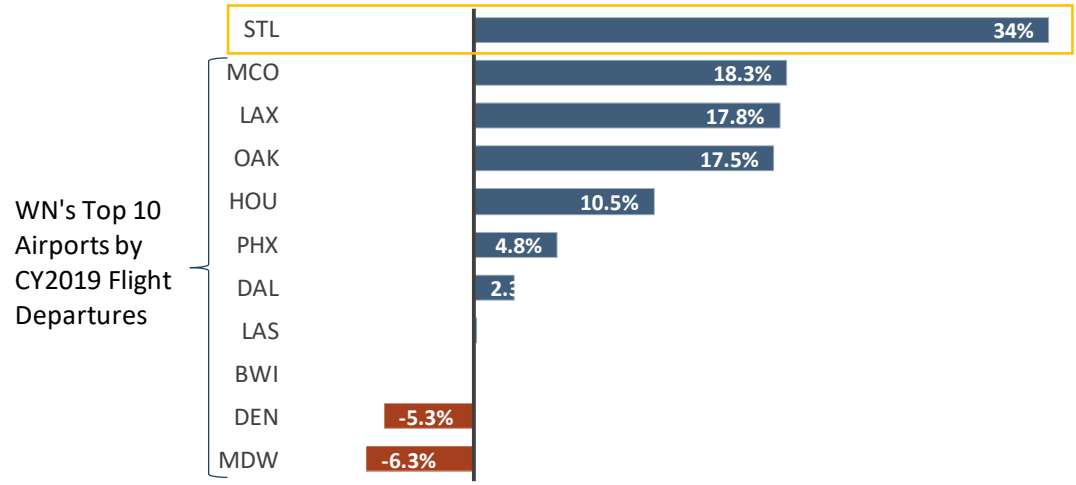
**Figure 3.3-10: Scheduled Passenger Service by the Top Three Carriers and Others – Key Measures (CY2010-2019)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

**Figure 3.3-11** compares the growth in Southwest Airlines' scheduled flight departures at STL from CY2015 to CY2019, with the growth in Southwest Airlines' scheduled flight departures over the same period at the airlines' top 10 airports by flight departures in CY2019. Southwest Airlines' growth at STL outpaced growth in all the airline's top 10 airports by a wide margin, placing STL close behind the 10th ranking airport (Orlando International Airport), in number of Southwest Airlines' flight departures in CY2019 (**Figure 3.3-12**).

**Figure 3.3-11: CY2015-2019 Change in Southwest Airlines' Flight Departures at STL and Southwest Airlines' Top 10 Airports**

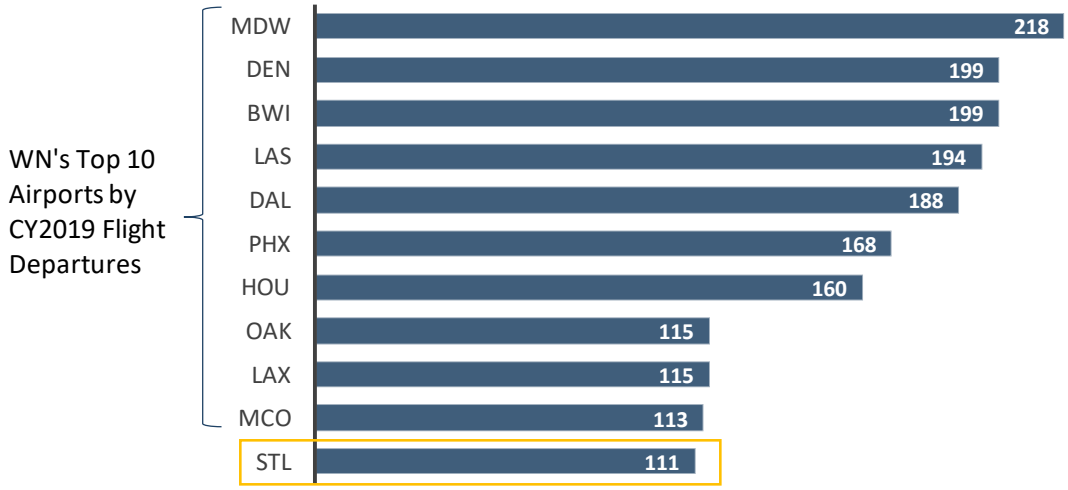



Airport Codes:
STL – St. Louis Lambert International Airport
WN's Top 10 Airports in CY2019:
MDW – Chicago Midway International Airport
DEN – Denver International Airport
BWI – Baltimore/Washington International Airport
LAS – McCarran International Airport
DAL – Dallas Love Field
PHX – Phoenix Sky Harbor International Airport
HOU – William P. Hobby Airport
OAK – Oakland International Airport
LAX – Los Angeles International Airport
MCO – Orlando International Airport

Note:
The number of Southwest Airlines' flight departures from MCO and BWI stayed flat.

Sources: OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

**Figure 3.3-12: Average Flight Departures per Day at STL and Southwest Airlines' Top 10 Airports (CY2019)**




Airport Codes:
STL – St. Louis Lambert International Airport
WN's Top 10 Airports in CY2019:
MDW – Chicago Midway International Airport
DEN – Denver International Airport
BWI – Baltimore/Washington International Airport
LAS – McCarran International Airport
DAL – Dallas Love Field
PHX – Phoenix Sky Harbor International Airport
HOU – William P. Hobby Airport
OAK – Oakland International Airport
LAX – Los Angeles International Airport
MCO – Orlando International Airport

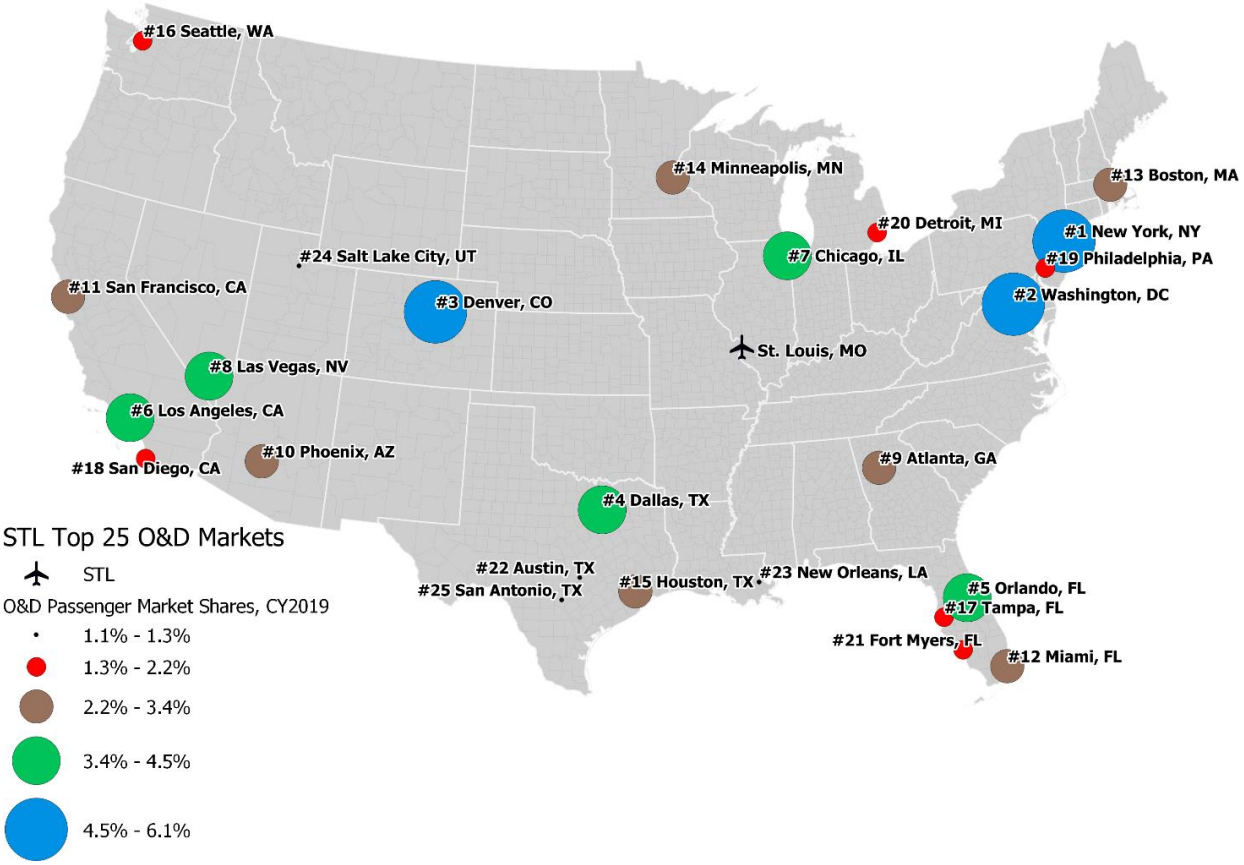
Note:
After MCO, two other airports (San Diego International Airport and Hartsfield-Jackson Atlanta International Airport) are ahead of STL in number of flight departures by Southwest Airlines in CY2019.

Sources: OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

### 3.3.1.6 TOP 25 DOMESTIC O&D MARKETS

O&D traffic accounted for approximately 77 percent of STL's passengers in CY2019. STL's top 25 O&D city markets, shown in **Figure 3.3-13**, accounted for approximately 74 percent of STL's O&D passengers in CY2019. The top three city markets are New York, NY; Denver, CO; and Washington, DC.

**Figure 3.3-13: STL's Top 25 O&D Markets in CY2019**




Sources: U.S. Department of Transportation DB1B; Unison Consulting, Inc., June 2020.

### 3.3.1.7 COMMERCIAL PASSENGER AIRCRAFT OPERATIONS AND LANDED WEIGHT

Passenger carriers account for 98 percent of commercial aircraft operations and 96 percent of commercial aircraft landed weight at STL.

Aircraft operations consist of landings (flight arrivals) and take-offs (flight departures). Each landing is typically followed by a take-off, so it is sufficient to depict the trends using either landings or take-offs. **Table 3.3-2** and **Figure 3.3-14** use landings, which are the basis for landed weight in **Table 3.3-3** and **Figure 3.3-15**.

The annual number of passenger aircraft landings increased in recent years since reaching a 10-year low in FY2014, but it remained lower than the level in FY2010. Total landed weight continued to increase as airlines began replacing smaller aircraft with larger models, evident in the increasing trend in the average aircraft landed weight (**Figure 3.3-16**).

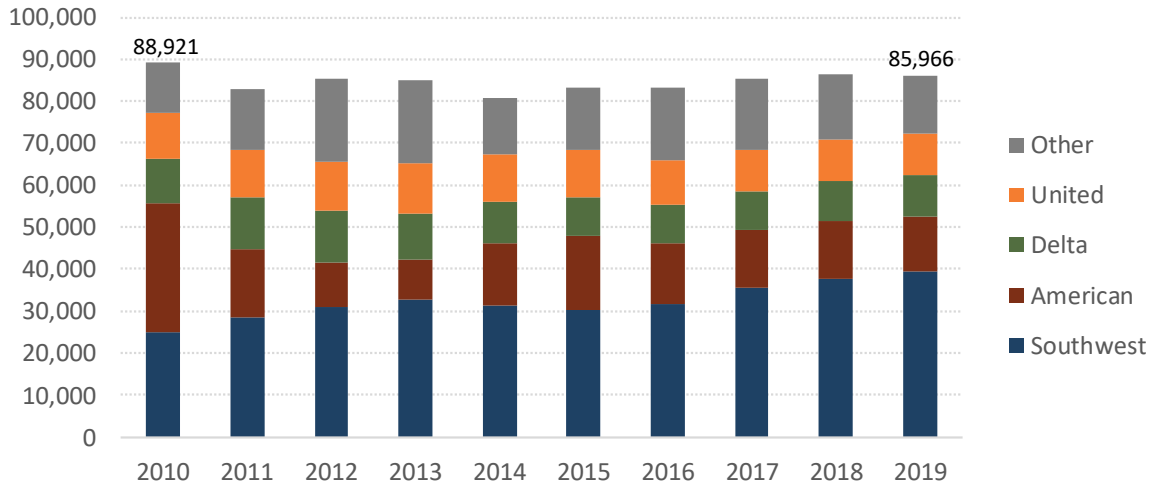
## Table 3.3-2: Commercial Passenger Aircraft Landings and Total Operations (FY2010-2019)

| | Fiscal Year | | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Passenger Carriers** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2010-2019** |
| **Landings (#)** | | | | | | | | | | | |
| Southwest[1] | 24,960 | 28,334 | 30,990 | 32,541 | 31,389 | 30,353 | 31,474 | 35,440 | 37,541 | 39,352 | 5.2% |
| American & affiliates[2] | 30,557 | 16,482 | 10,446 | 9,534 | 14,726 | 17,580 | 14,665 | 13,735 | 13,859 | 13,136 | -9.0% |
| Delta & affiliates | 10,575 | 12,136 | 12,362 | 10,988 | 9,867 | 9,249 | 9,151 | 9,286 | 9,421 | 9,806 | -0.8% |
| United & affiliates | 11,264 | 11,595 | 11,821 | 12,008 | 11,189 | 11,324 | 10,719 | 9,975 | 10,007 | 9,946 | -1.4% |
| Other | 11,565 | 14,241 | 19,293 | 19,950 | 13,522 | 14,500 | 16,707 | 16,368 | 15,319 | 13,370 | 1.6% |
| **Subtotal - Scheduled** | **88,921** | **82,788** | **84,912** | **85,021** | **80,693** | **83,006** | **82,716** | **84,804** | **86,147** | **85,610** | **-0.4%** |
| Charter | 187 | 213 | 293 | 77 | 80 | 42 | 369 | 545 | 414 | 356 | 7.4% |
| **Total Landings - Passenger Carriers** | **89,108** | **83,001** | **85,205** | **85,098** | **80,773** | **83,048** | **83,085** | **85,349** | **86,561** | **85,966** | **-0.4%** |
| **Total Operations - Passenger Carriers** | **178,200** | **166,000** | **170,400** | **170,200** | **161,500** | **166,100** | **166,200** | **170,700** | **173,100** | **171,900** | **-0.4%** |
| Annual Growth Rate | | -6.8% | 2.7% | -0.1% | -5.1% | 2.8% | 0.1% | 2.7% | 1.4% | -0.7% | |
| **Landings - Shares** | | | | | | | | | | | |
| Southwest[1] | 28.0% | 34.1% | 36.4% | 38.2% | 38.9% | 36.5% | 37.9% | 41.5% | 43.4% | 45.8% | |
| American & affiliates[2] | 34.3% | 19.9% | 12.3% | 11.2% | 18.2% | 21.2% | 17.7% | 16.1% | 16.0% | 15.3% | |
| Delta & affiliates | 11.9% | 14.6% | 14.5% | 12.9% | 12.2% | 11.1% | 11.0% | 10.9% | 10.9% | 11.4% | |
| United & affiliates | 12.6% | 14.0% | 13.9% | 14.1% | 13.9% | 13.6% | 12.9% | 11.7% | 11.6% | 11.6% | |
| Other | 13.0% | 17.2% | 22.6% | 23.4% | 16.7% | 17.5% | 20.1% | 19.2% | 17.7% | 15.6% | |
| **Subtotal - Scheduled** | **99.8%** | **99.7%** | **99.7%** | **99.9%** | **99.9%** | **99.9%** | **99.6%** | **99.4%** | **99.5%** | **99.6%** | |
| Charter | 0.2% | 0.3% | 0.3% | 0.1% | 0.1% | 0.1% | 0.4% | 0.6% | 0.5% | 0.4% | |
| **Total - Passenger Carriers** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | |

Notes:
[1] Includes AirTran Airways until full integration.
[2] Includes US Airways and affiliates until full integration.

Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; Unison Consulting, Inc., June 2020.

## Figure 3.3-14: Commercial Passenger Carriers - Landings by Airline (FY2010-2019)




Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; Unison Consulting, Inc., June 2020.

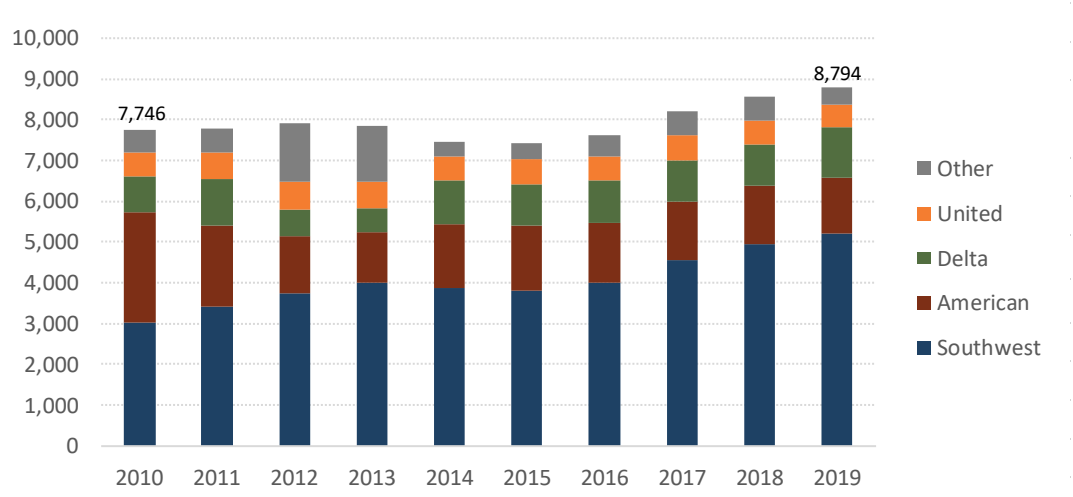
## Table 3.3-3: Commercial Passenger Carriers - Landed Weight (FY2010-2019)

| | Fiscal Year | | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Passenger Carriers** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2010-2019** |
| **Landed Weight (Million Pounds)** | | | | | | | | | | | |
| Southwest[1] | 3,006 | 3,422 | 3,746 | 3,990 | 3,871 | 3,816 | 3,997 | 4,545 | 4,951 | 5,202 | 6.3% |
| American & affiliates[2] | 2,706 | 1,969 | 1,399 | 1,238 | 1,577 | 1,572 | 1,475 | 1,430 | 1,417 | 1,376 | -7.2% |
| Delta & affiliates | 909 | 1,154 | 663 | 608 | 1,053 | 1,027 | 1,033 | 1,029 | 1,007 | 1,222 | 3.3% |
| United & affiliates | 577 | 645 | 669 | 637 | 595 | 608 | 605 | 623 | 590 | 584 | 0.1% |
| Other | 530 | 570 | 1,379 | 1,339 | 319 | 386 | 460 | 536 | 544 | 359 | -4.2% |
| **Subtotal - Scheduled** | **7,727** | **7,761** | **7,856** | **7,811** | **7,415** | **7,409** | **7,570** | **8,163** | **8,509** | **8,743** | **1.4%** |
| Charter | 19 | 18 | 43 | 43 | 26 | 9 | 40 | 51 | 56 | 51 | 11.7% |
| **Total - Passenger Carriers** | **7,746** | **7,779** | **7,899** | **7,854** | **7,441** | **7,418** | **7,610** | **8,214** | **8,566** | **8,794** | **1.4%** |
| Annual Growth Rate | | 0.4% | 1.5% | -0.6% | -5.3% | -0.3% | 2.6% | 7.9% | 4.3% | 2.7% | |
| **Avg. Aircraft Landed Weight (1,000 pounds)** | **86.9** | **93.7** | **92.7** | **92.3** | **92.1** | **89.3** | **91.6** | **96.2** | **99.0** | **102.3** | |
| **Landed Weight - Shares** | | | | | | | | | | | |
| Southwest[1] | 38.8% | 44.0% | 47.4% | 50.8% | 52.0% | 51.4% | 52.5% | 55.3% | 57.8% | 59.2% | |
| American & affiliates[2] | 34.9% | 25.3% | 17.7% | 15.8% | 21.2% | 21.2% | 19.4% | 17.4% | 16.5% | 15.6% | |
| Delta & affiliates | 11.7% | 14.8% | 8.4% | 7.7% | 14.2% | 13.8% | 13.6% | 12.5% | 11.8% | 13.9% | |
| United & affiliates | 7.4% | 8.3% | 8.5% | 8.1% | 8.0% | 8.2% | 8.0% | 7.6% | 6.9% | 6.6% | |
| Other | 6.8% | 7.3% | 17.5% | 17.0% | 4.3% | 5.2% | 6.0% | 6.5% | 6.3% | 4.1% | |
| **Subtotal - Scheduled** | **99.8%** | **99.8%** | **99.5%** | **99.5%** | **99.7%** | **99.9%** | **99.5%** | **99.4%** | **99.3%** | **99.4%** | |
| Charter | 0.2% | 0.2% | 0.5% | 0.5% | 0.3% | 0.1% | 0.5% | 0.6% | 0.7% | 0.6% | |
| **Total - Passenger Carriers** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | |

Notes:
[1] Includes AirTran Airways until full integration.
[2] Includes US Airways and affiliates until full integration.

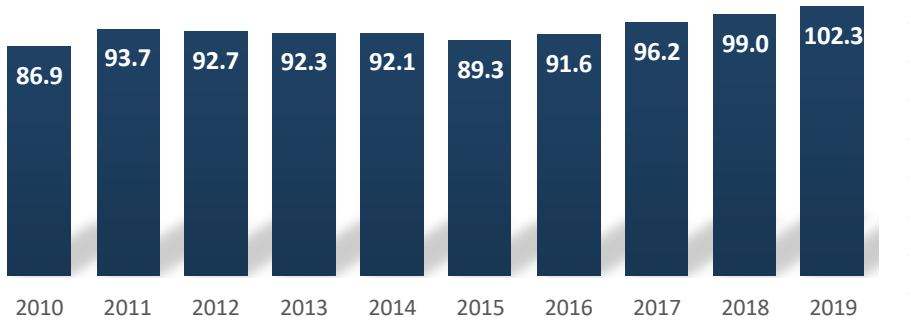
Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; Unison Consulting, Inc., June 2020.

**Figure 3.3-15: Commercial Passenger Carriers - Landed Weight (In Million Pounds) (FY2010-2019)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

**Figure 3.3-16: Average Aircraft Landed Weight (In Thousand Pounds) (FY2010-2020)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

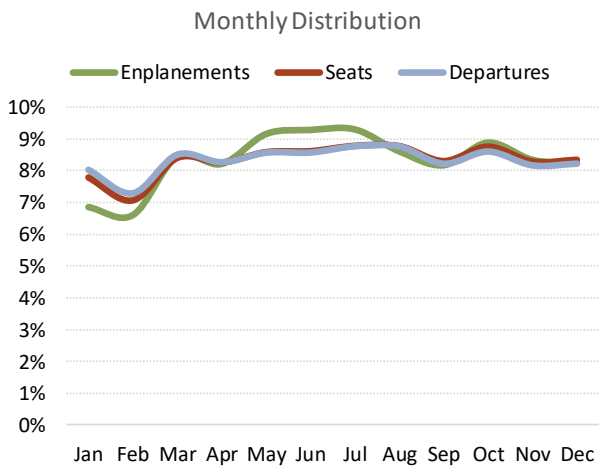
### 3.3.1.8 SEASONAL PATTERNS IN PASSENGER TRAFFIC

The demand for air travel is subject to seasonal patterns evident in different traffic measures: enplanements, seats, aircraft departures, and boarding load factor (**Figure 3.3-17**). Travel demand rises to the highest levels in the summer months during the long school summer break and decreases to the lowest levels during the winter months of January and February, after the year-end holidays. At STL, July sees the highest levels of monthly traffic in nearly all measures: 9.3 percent of annual total enplanements, 8.8 percent of the annual supply of airline seats, and 8.8 percent of annual total flights.

The distribution of seats and flights throughout the year is flatter than the distribution of enplanements, because of the largely fixed nature of supply. Airlines have a fixed number of airplanes that need to be flown a certain number of hours to maintain airworthiness, and airplanes have a fixed number of seats. The supply of flights and seats does not rise and fall in direct proportion with enplanements, so that the boarding load factor also varies seasonally. At STL, the monthly average boarding load factor varies from a low 70 percent in January to a high 85 percent in June, with an annual average of 79 percent, based on data for the last four calendar years, 2016-2019. In July, when enplanements, seats, and flights are at the highest monthly levels, the average boarding load factor is 84 percent.

**Figure 3.3-17: Seasonal Patterns in Commercial Passenger Traffic (CY2016-2019)**

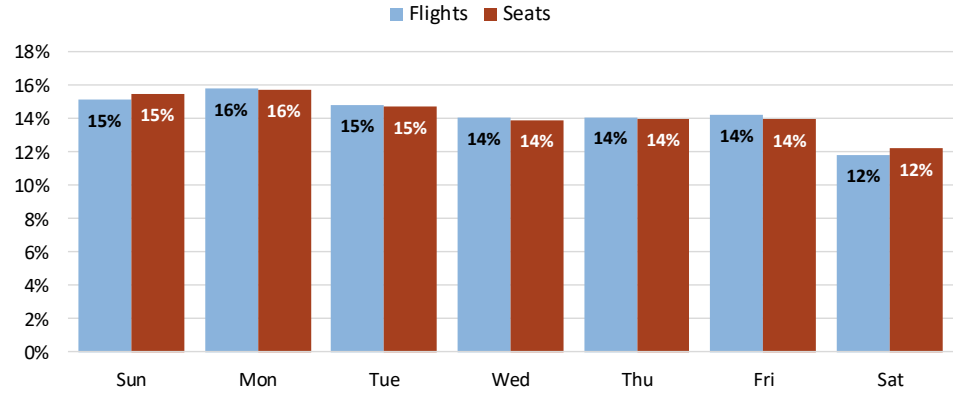
| | Monthly Distribution | | | Boarding |
|---|---|---|---|---|
| | Enplanements | Seats | Departures | Load Factor |
| **Jan** | 6.8% | 7.8% | 8.0% | 70% |
| **Feb** | 6.6% | 7.1% | 7.3% | 74% |
| **Mar** | 8.4% | 8.4% | 8.5% | 80% |
| **Apr** | 8.2% | 8.3% | 8.3% | 79% |
| **May** | 9.1% | 8.6% | 8.6% | 84% |
| **Jun** | 9.3% | 8.6% | 8.6% | 85% |
| **Jul** | 9.3% | 8.8% | 8.8% | 84% |
| **Aug** | 8.6% | 8.8% | 8.8% | 78% |
| **Sep** | 8.2% | 8.3% | 8.2% | 78% |
| **Oct** | 8.9% | 8.8% | 8.6% | 80% |
| **Nov** | 8.3% | 8.3% | 8.2% | 80% |
| **Dec** | 8.2% | 8.3% | 8.2% | 78% |
| Annual Average | | | | 79% |




Note: Based on CY2016-2019 data.
Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

Passenger demand for air travel varies not only by month, but also by day of week and by time of day. Enplanement data is not available by day of week and by time of day, but data on scheduled flights and seats provide an understanding of the variation of traffic by day of week and by time of day. **Figure 3.3-18** shows the distribution of flights and seats by day of week during the peak month (July), based on data for the last four calendar years, 2016-2019.

**Figure 3.3-18: Peak Month (July) Share of Flights and Seats by Day of Week (2016-2019)**

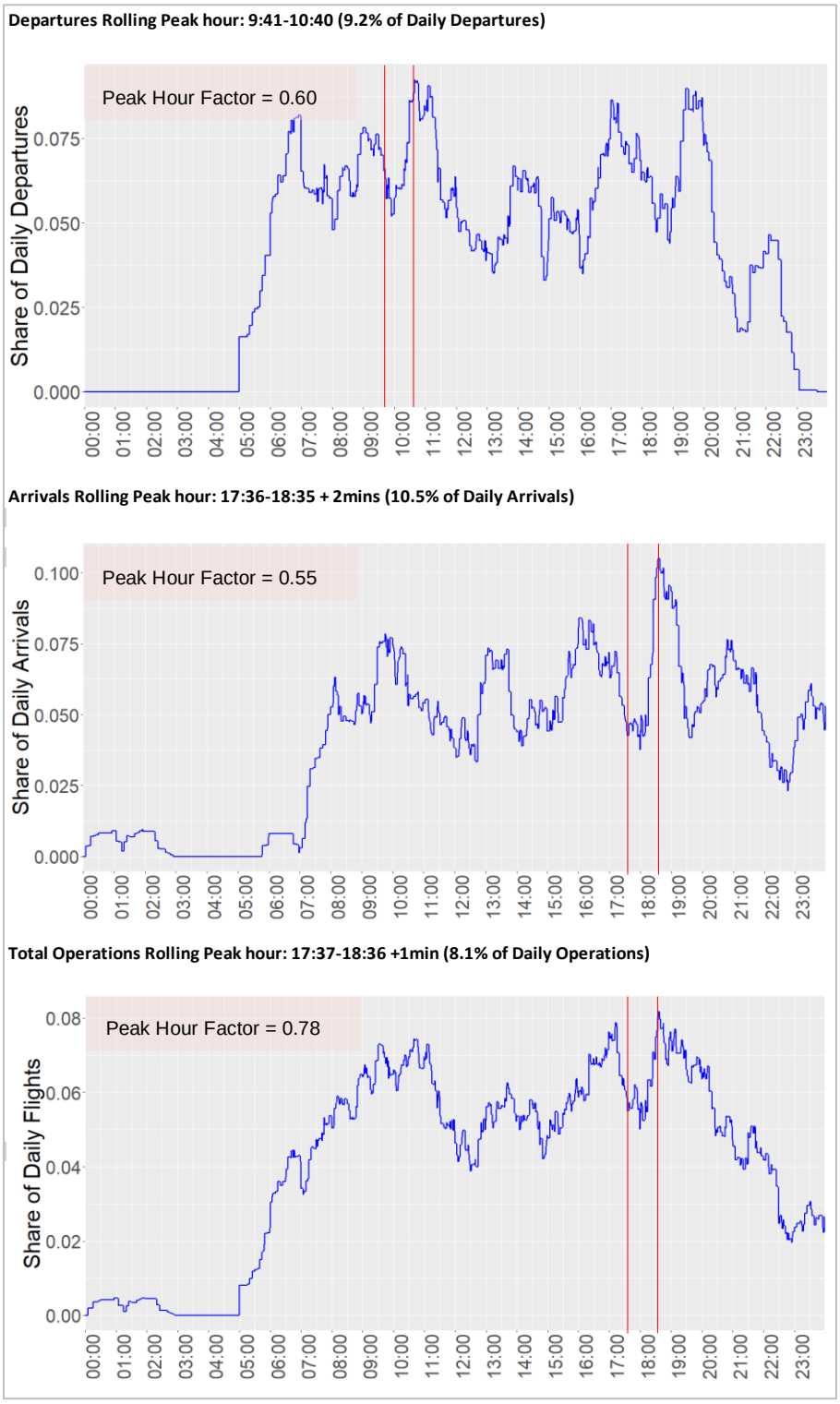



Sources: OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

**Figure 3.3-19** shows the distribution of commercial aircraft operations by time of day during the peak month average day (PMAD). Arrivals and departures are distributed differently throughout the day. The peak one-hour period for aircraft departures is from 9:41 a.m. to 10:40 a.m., while the peak one-hour period for aircraft arrivals is from 5:36 p.m. to 6:35 p.m. The peak one-hour period for total aircraft operations (departures and arrivals) is from 5:37 p.m. to 6:36 p.m., with 8.1 percent of the total PMAD commercial passenger aircraft operations.

Figure 3.3-19 also provides the peak hour factor (PHF), a measure adapted from ground traffic flow analysis. This measure is calculated by dividing the number of flights in the rolling peak hour by the flow rate within the peak 15-minute period of the peak 1-hour period. It provides a relative measure of how consistent aircraft operations are during the identified peak hour. A PHF approaching 1.0 suggests that there is a consistent flow of operations during the peak hour, such that the number of flights in every 15-minute interval of the peak one-hour period are nearly the same. A PHF approaching 0.0 indicates that there is high variability in the number of flights within the peak 15-minute period of the peak hour. STL's PHFs are 0.60 for flight departures, 0.55 for flight arrivals, and 0.78 for total operations.

**Figure 3.3-19: Commercial Passenger Aircraft Operations by Rolling Hour (Peak Month-July 2019)**




Sources: OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

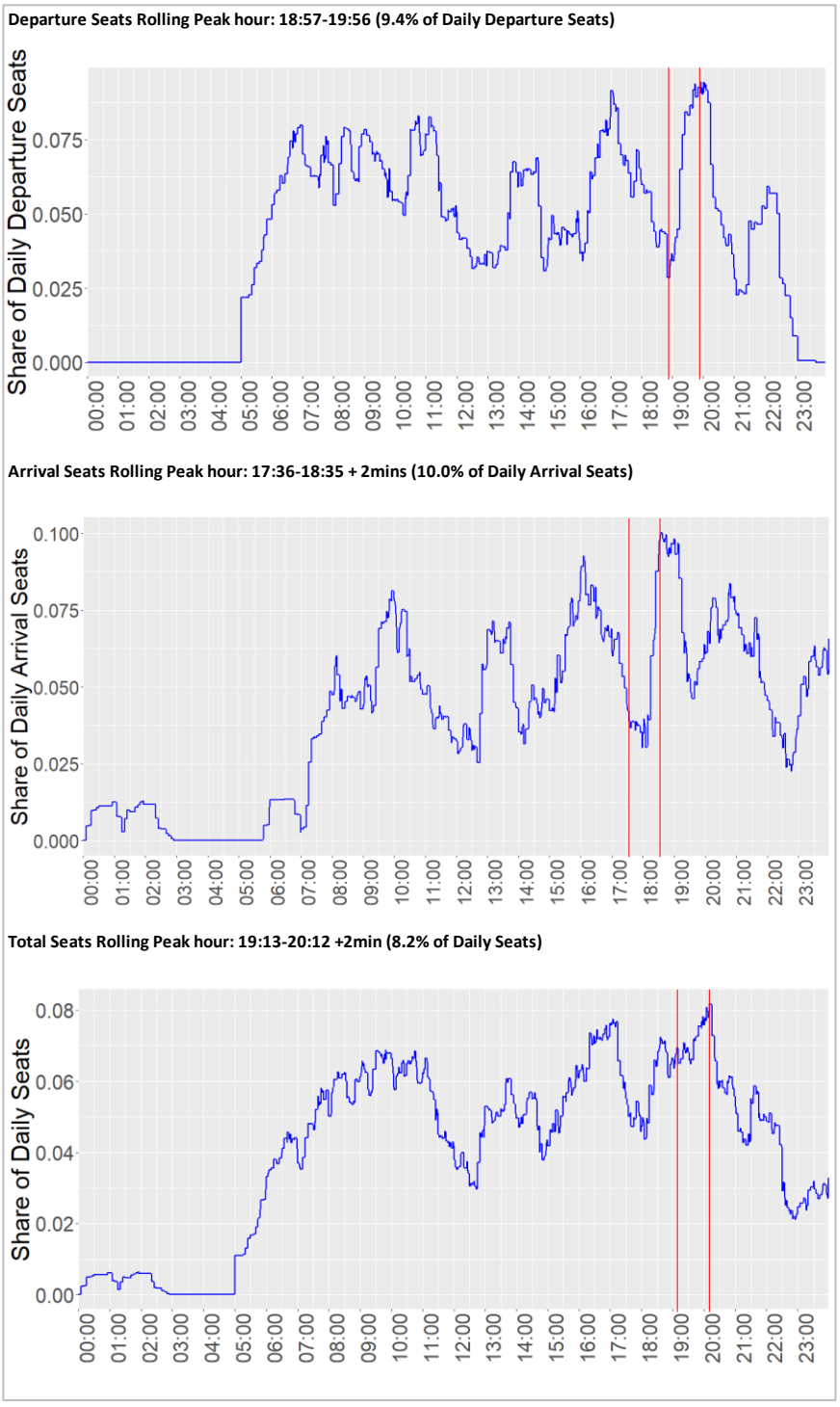
Also based on flight schedules, **Figure 3.3-20** shows the distribution of seats by time of day during the PMAD. The mix of aircraft with different seat capacities changes throughout the day. As a result, the distribution of total seats throughout the day is different from the distribution of aircraft operations in Figure 3.3-19. The peak one-hour period for total seats on departing flights is in the evening from 6:57 p.m. to 7:56 p.m., nearly 10 hours later than the peak one-hour period for the number of departing flights. The peak one-hour period for total seats on arriving flights, however, is the same as the peak one-hour period for arriving flights (from 5:36 p.m. to 6:35 p.m.). The peak one-hour period for total seats on both departing and arriving flights is also at the same time as the peak one-hour period for total aircraft operations (from 5:37 p.m. to 6:36 p.m.), with 8.1 percent of the total PMAD seats.

## *3.3.2 FORECAST METHODOLOGY AND ASSUMPTIONS*

This section presents forecasts of commercial passenger traffic at STL for a 20-year period. The forecasts, however, are presented with a major caveat: the forecasts were developed during a period of extraordinary uncertainty, amid the COVID-19 global pandemic that has resulted in nearly halting all passenger travel, and the developing pandemic-induced, deep U.S. and global economic recessions. The forecast assumptions are based on information available at the time of forecast development. The assumptions and resulting forecasts could get outdated quickly depending upon how long the COVID-19 pandemic would persist, how deep and how long the economic recession would go, and how quickly the economic recovery would progress.

The aviation industry, the nation, and the rest of the world faces unprecedented uncertainty. The best and feasible approach to aviation activity forecasting and airport planning under unprecedented uncertainty is through scenario development. The aviation industry faced major shocks in the past, and history shows that the aviation industry is resilient despite its vulnerability. Following declines, no matter how deep, the aviation industry recovers, and traffic returns to a long-term trend of growth. The question is when the declines would end and recovery would begin, how recovery would progress—fast or slow, and how long it would take to return to pre-crisis levels. Another equally important question is how the aviation industry would change as a result of the crisis. History has shown that major crises prompt significant structural changes in both demand and supply in the aviation industry.

**Figure 3.3-20: Commercial Passenger Aircraft Seats by Rolling Hour (Peak Month-July 2019)**




Sources: OAG, *Schedules Analyzer*; Unison Consulting, Inc., June 2020.

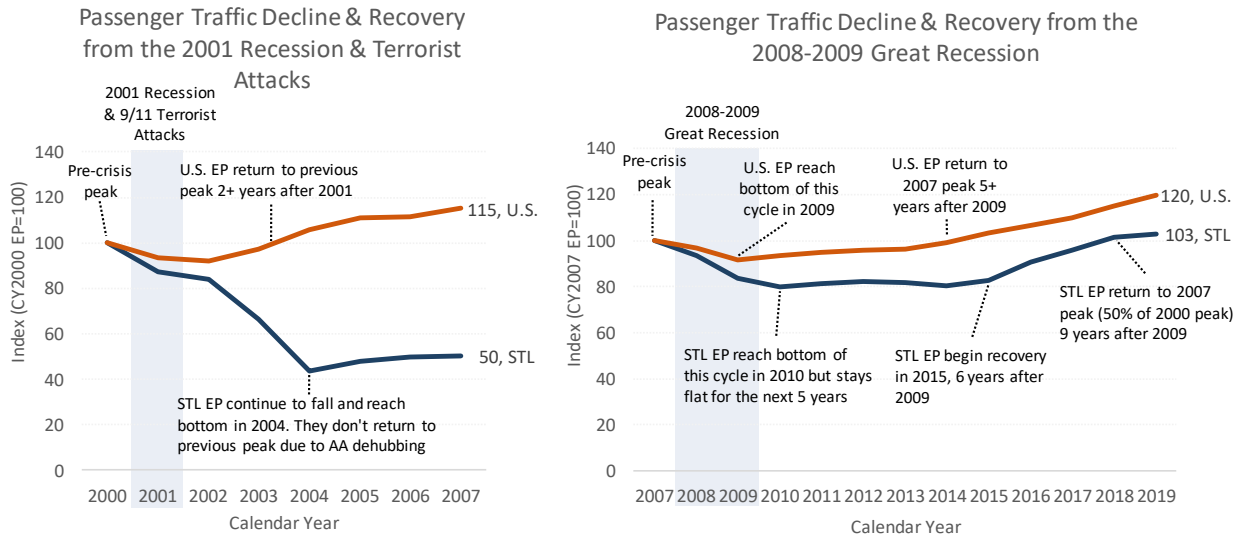
### 3.3.2.1 THE SHAPE OF RECOVERY

At the time of forecast development, the major sources of uncertainty—the COVID-19 pandemic and the resulting economic recession—were still developing, commercial passenger traffic was still declining rapidly, and actual traffic data reflecting the extent of the decline were not yet available. The situation called for assumptions regarding the extent of declines, the duration of the pandemic, the depth and duration of the resulting economic recession, and the shape—slope and duration—of traffic recovery.

**Figure 3.3-21** presents a visual analysis of recoveries from previous crises: the 2001 economic recession and the events of September 11, 2001, which were followed by the 2003 SARS outbreak, and the Great Recession. The analysis looks at trends in passenger traffic for STL alone and for the United States as a whole. The trends all took the shape of a long, flat-tailed check-mark—sharp declines continuing over more than one year, followed by slow recovery. The trends differed in how slow the pace of recovery was and how long it took for traffic to return to pre-crisis levels. At STL, traffic declines continued over a longer period, traffic stayed flat at the lowest levels longer, and recovery progressed much slower.

Following the 2001 economic recession and September 11, 2001, events, passenger traffic declined sharply nationwide and at STL. For the U.S. airline industry as a whole, traffic recovery began in the second year following the crisis year, and traffic returned to pre-crisis level in 2004, the third year following the crisis year. At STL, however, the 2001 events precipitated dehubbing of STL by American Airlines so that STL continued to lose traffic for a much longer period. All in all, STL lost more than one-half of its passenger traffic, mostly connecting traffic, and its traffic levels have never returned to the pre-crisis peak in 2000.

**Figure 3.3-21: Analysis of the Shape of Recovery from Previous Crises**




Sources: St. Louis Airport Authority, *Airport Traffic Reports*; U.S. Bureau of Traffic Statistics, *T-100 Data;* Unison Consulting, Inc., June 2020.

During the Great Recession, passenger traffic also declined sharply nationwide and at STL. For the U.S. airline industry as a whole, traffic recovery began with the start of the economic recovery. It was slow, reflecting the slow economic recovery from the Great Recession and the effect of airline industry capacity rationalization that continued for years after the Great Recession. Traffic returned to the 2007 pre-recession level in early 2015, the sixth year after the end of the Great Recession. At STL, passenger traffic continued to fall for a year longer than the recession and then flatlined over five years. Recovery began in the sixth year after the end of the Great Recession, and traffic returned to the 2007 pre-recession level in 2018, the ninth year after the end of the Great Recession. The 2007 pre-recession level was still only 50 percent of the all-time peak level reached in 2000.

These findings formed the basis for three scenarios for the shape of the recovery of STL passenger traffic from the 2020 COVID-19 pandemic and economic recession:

- **Scenario 1 – Three-Year Recovery**: Traffic returns to FY2019 peak in FY2024, three years after reaching a trough in FY2021, based on the recovery period for U.S. system traffic after the 2001 recession and September 11, 2001, events.
- **Scenario 2 – Five-Year Recovery**: Traffic returns to FY2019 peak in FY2026, five years after reaching a trough in FY2021, based on the recovery period for U.S. system traffic after the Great Recession
- **Scenario 3 – Nine-Year Recovery**: Traffic returns to FY2019 peak in FY2030, nine years after reaching a trough in FY2021, based on the recovery period for STL traffic after the Great Recession.

The Airport sponsor has designated **Scenario 1 – Three-Year Recovery** as the preferred planning scenario. Recognizing uncertainty, the Airport sponsor maintains that it is a better strategy to plan for the most aggressive recovery scenario while maintaining the flexibility to delay the timing of the implementation of capital projects to be identified in this ALPU should aviation demand recovery turn out slower and more aligned with the slower recovery scenarios. Based on experience, the Airport sponsor deems it easier to delay rather than ramp-up capital project planning and implementation. **Scenario 2 – Five-Year Recovery** and **Scenario 3 – Nine-Year Recovery** will provide the forecast inputs for contingency planning**.**

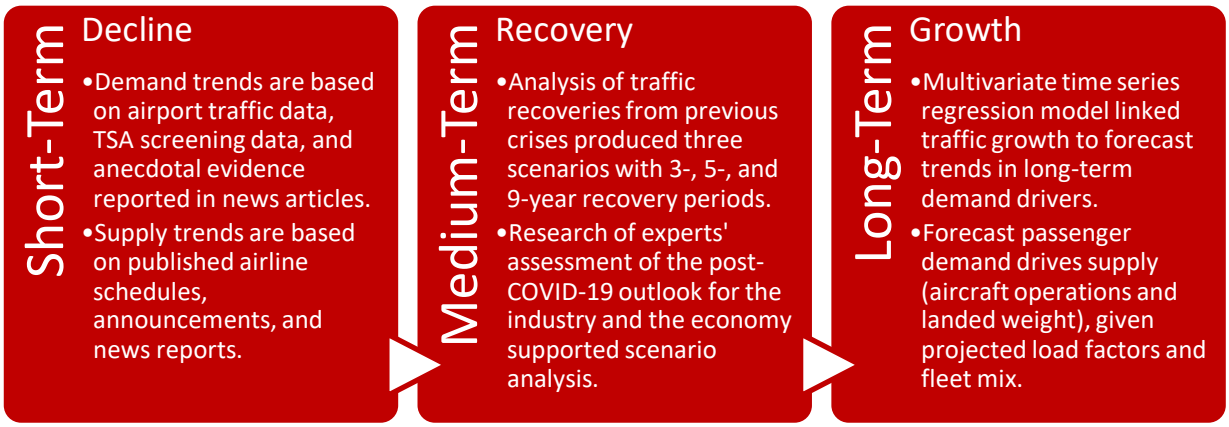
### 3.3.2.2 HYBRID FORECAST DEVELOPMENT FRAMEWORK

Forecast development takes a hybrid approach—combining different modeling techniques and available data from various sources to develop traffic forecasts at different phases in the evolution of traffic. The 20-year ALPU forecast period divides into three phases:

- Short-term traffic decline phase during the COVID-19 pandemic and economic recession – FY2020-2021
- Medium-term traffic recovery phase – FY2022 through the year of full recovery
- Long-term traffic growth phase – the years after full recovery through FY2040, the end of the ALPU planning period

**Figure 3.3-22** shows the different approaches to forecast development under each of the three phases. **Figure 3.3-23** lists the various sources of traffic and economic data used in forecast development. In addition, certain forecast assumptions were informed by various reports on the developing COVID-19 pandemic and its impacts on the economy and the aviation industry.

**Figure 3.3-22: Basis of Forecast Development by Phase of Growth**




Source: Unison Consulting, Inc., June 2020.

**Figure 3.3-23: Data Sources Used in Forecast Development**

| Traffic Data Sources | Economic Data Sources |
|---|---|
| •Airport sponsor<br>•Transportation Security Administration<br>•Published airline schedules<br>•U.S. Bureau of Transportation Statistics<br>•Federal Aviation Administration<br>•Various sources for industry outlook (airport and airline officials, aircraft manufacturers, industry analysts, and trade associations) | •U.S. Bureau of Economic Analysis<br>•U.S. Bureau of Labor Statistics<br>•U.S. Bureau of Census<br>•Moody's Analytics<br>•Various sources for economic outlook (economic policy makers, independent analysts and economic forecasters, and consumer and business surveys) |

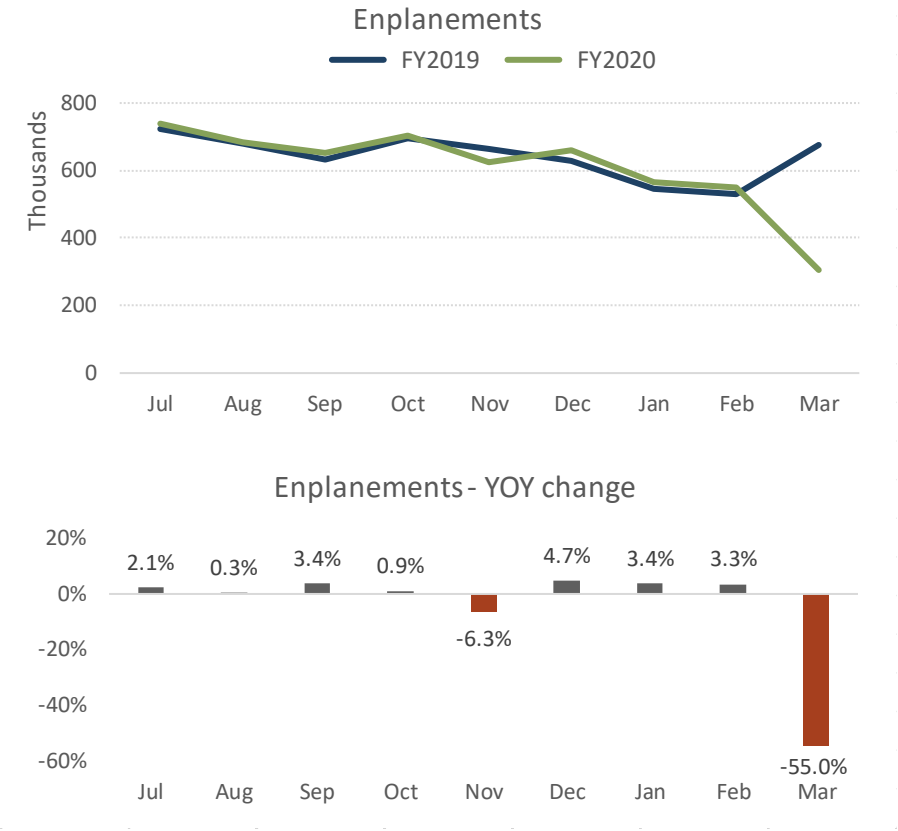
Source: Unison Consulting, Inc., June 2020.

## *3.3.3 SHORT-TERM TRAFFIC DECLINE PHASE*

Actual airport traffic data were available through March 31, 2020, at the time of forecast development. **Figure 3.3-24** shows monthly enplanement trends at STL from July through March in FY2020, compared with the same months in FY2019. Except in November 2019, monthly enplanements through February 2020 were trending higher than levels in FY2019. The COVID-19 pandemic and social distancing measures began to take a toll on STL traffic in March 2020—enplanements decreased 55 percent from the same month in the prior year.

In March 2020, STL passenger traffic began to fall rapidly, as shown by TSA passenger screening data in **Figure 3.3-25**. By the last week of March 2020, STL passenger traffic had fallen to less than 5 percent of previous year's levels. April data indicate the same trend. STL's experience is consistent with the experience at other airports around the country. For the remainder of FY2020, STL passenger traffic is projected to remain depressed at no more than 5 percent of previous year's levels for the comparable period. For FY2020, STL enplanements are projected to decrease almost 30 percent from FY2019 levels.

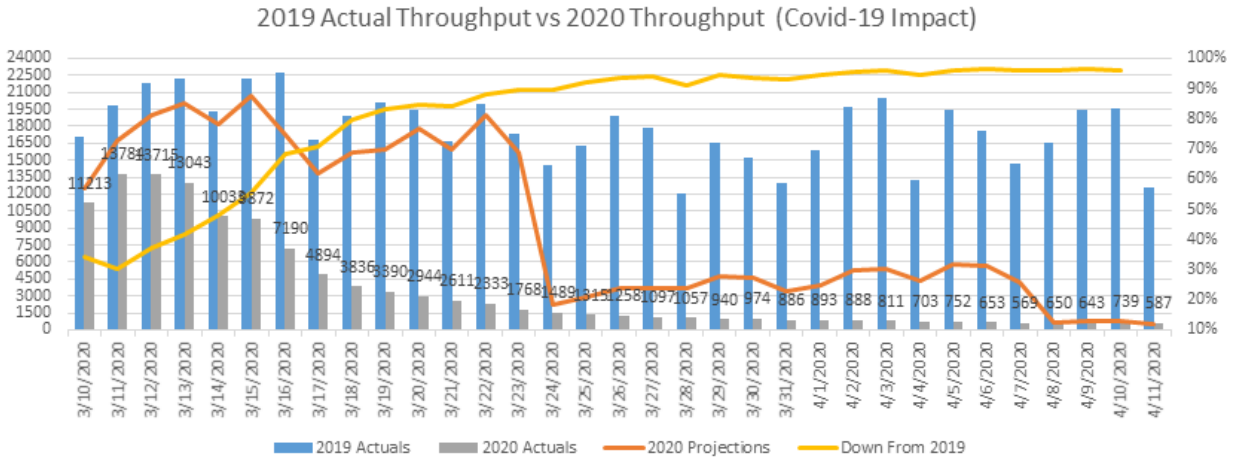
**Figure 3.3-24: Actual Enplanements - July-March FY2020 Compared with July-March FY2019**




Note:
YOY – Year Over Year

Sources: St. Louis Airport Authority, *STL Traffic Reports*; Unison Consulting, Inc., June 2020.

**Figure 3.3-25: Transportation Security Administration Daily Passenger Screening Data (March 10-April 11, 2020)**



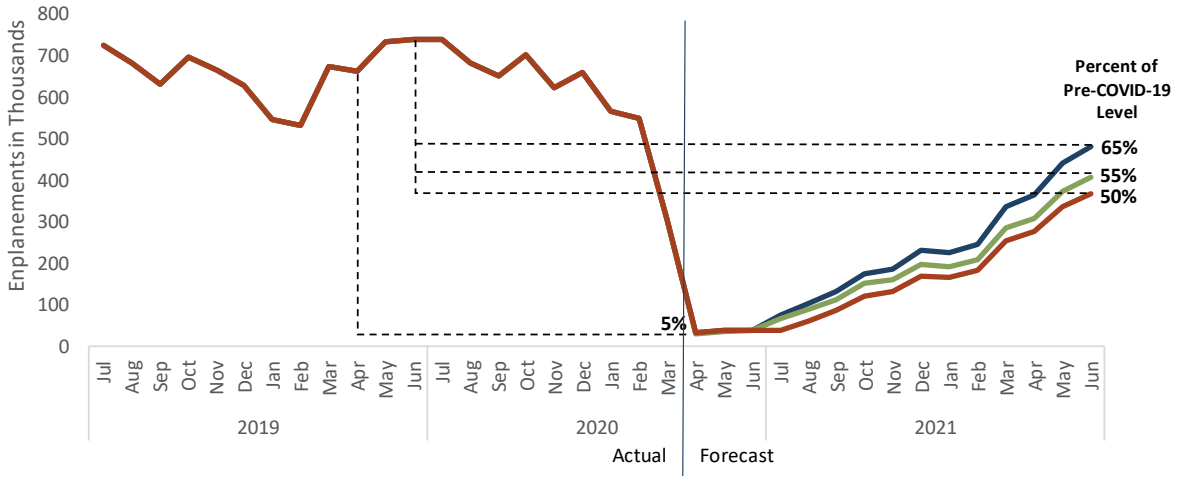

Source: Transportation Security Administration, St. Louis Lambert International Airport Statistics.

At the time of forecast development, stay-at-home orders and business closure orders around the U.S. were expected to be relaxed beginning in May.[20] Airlines and airports have begun planning and implementing measures to promote public health safety to prepare for the return of traffic. Consistent with widespread expectation in the aviation industry, STL passenger traffic is projected to begin increasing month-to-month in July 2020. However, traffic recovery is projected to progress slowly and lag economic recovery. By the last month of FY2021, STL enplanements would still remain significantly below pre-COVID-19 levels (**Figure 3.3-26**). On an annual basis, STL enplanements are projected to post an even bigger decline in FY2021:

- Under Scenario 1 – Three-Year Recovery, STL enplanements reach 65 percent of pre-COVID-19 level in June 2021 and reach nearly 3 million for the entire year FY2021, decreasing 46 percent from FY2020.
- Under Scenario 2 – Five-Year Recovery, STL enplanements reach 55 percent of pre-COVID-19 level in June 2021) and reach 2.5 million for the entire year FY2021, decreasing 55 percent from FY2020.
- Under Scenario 3 – Nine-Year Recovery, STL enplanements reach 50 percent of pre-COVID-19 level in June 2021 and reach 2.2 million for the entire year FY2021, decreasing 61 percent from FY2020.

[20] The City of St. Louis Health Commissioner Order No. 8 went into effect May 18th and allowed for reopening of certain businesses under strict guidance.

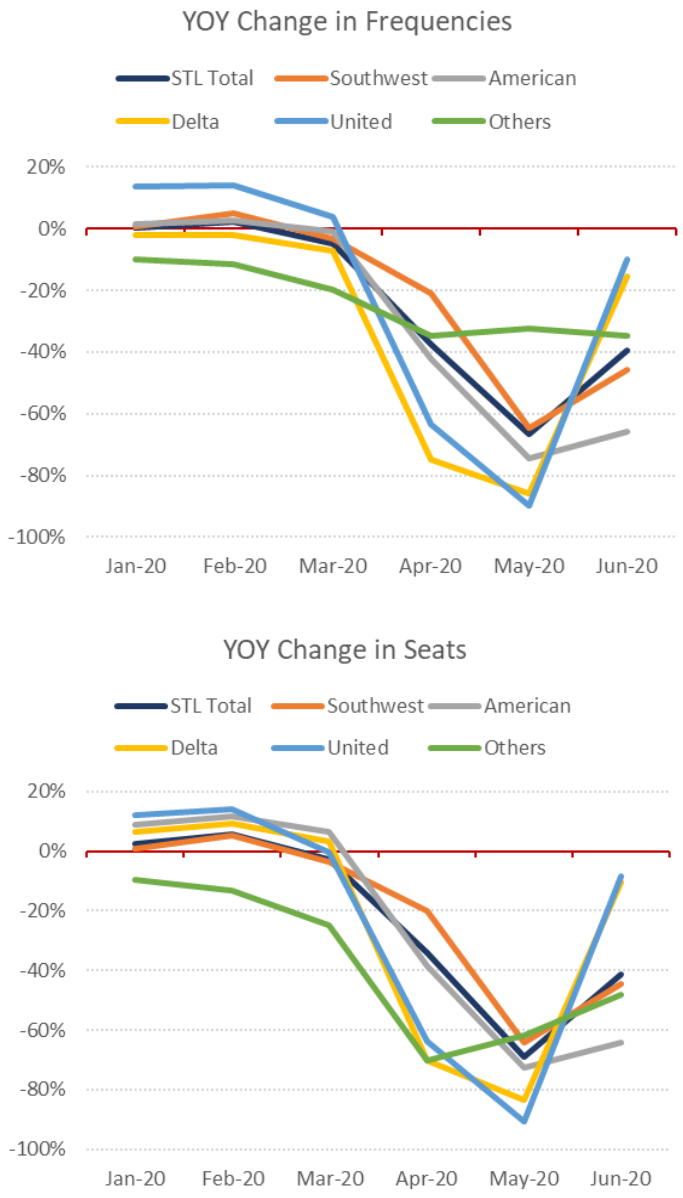
**Figure 3.3-26: Progress of STL Passenger Traffic Recovery by June 2021 Under Three Scenarios**




Sources: St. Louis Airport Authority, *STL Traffic Reports*; Transportation Security Administration (historical screening data), Unison Consulting, Inc., June 2020. (forecasts).

Airlines began cutting schedules in March (**Figure 3.3-27**). The airline schedules remain fluid, as airlines continue to make cuts and changes to schedules to reduce staggering operating losses. The cuts in scheduled flights and seats lagged declines in passenger traffic. The declines were also proportionally smaller than the declines in passenger traffic. Airlines are unable to cut capacity as much as the decrease in passenger traffic, because many aspects of airline fleets, networks and operations are fixed and complex. Airlines provide a critical service that requires operating flights even with less than 20 percent load to transport emergency medical personnel and supplies, and others who absolutely need to travel. Airlines also need to meet service requirements to access federal aid under the Coronavirus Aid, Relief, and Economic Security (CARES) Act.

**Figure 3.3-27: Year-Over-Year Change in Scheduled Flights (Frequencies) and Seats (January-June 2020)**




Note: YOY – Year Over Year

Sources: OAG, *Schedules Analyzer*, accessed on May 5, 2020; Unison Consulting, Inc., June 2020.

Airlines have also had to cancel scheduled flights. For example, in March 2020, airlines ended up cancelling more than 15 percent of scheduled flights from STL. According to the Airport's records of March 2020 traffic, actual passenger aircraft departures decreased 14 percent, while scheduled departures decreased only 5 percent. **Table 3.3-4** shows the scheduled flights and seats from STL for the months of January through June 2020. Note the airlines are on track to meet the scheduled flights through June 2020 and into the summer travel period.

**Table 3.3-4: Scheduled Flights (Frequencies) and Seats (January-June 2020)**

| | | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20 | Jun-20 |
|---|---|---|---|---|---|---|---|
| STL Total | Frequency | 7,029 | 6,438 | 7,087 | 4,560 | 2,515 | 4,449 |
| | YOY change | 0.1% | 2.1% | -4.9% | -37.4% | -66.7% | -39.4% |
| | Seats | 805,154 | 746,468 | 832,809 | 553,493 | 269,397 | 499,280 |
| | YOY change | 2.6% | 5.8% | -2.8% | -34.2% | -69.0% | -41.5% |
| Southwest | Frequency | 3,243 | 2,979 | 3,394 | 2,726 | 1,257 | 1,870 |
| | YOY change | 0.5% | 4.9% | -3.1% | -20.9% | -64.5% | -45.8% |
| | Seats | 491,589 | 451,309 | 515,358 | 417,626 | 191,175 | 287,314 |
| | YOY change | 1.0% | 5.2% | -3.6% | -20.0% | -64.3% | -44.6% |
| American | Frequency | 1,071 | 1,026 | 1,130 | 602 | 292 | 375 |
| | YOY change | 1.6% | 2.7% | -0.8% | -42.3% | -74.3% | -65.7% |
| | Seats | 123,827 | 119,707 | 130,175 | 72,523 | 34,671 | 43,810 |
| | YOY change | 8.7% | 11.6% | 6.3% | -38.3% | -72.7% | -64.1% |
| Delta | Frequency | 787 | 725 | 805 | 212 | 120 | 716 |
| | YOY change | -2.2% | -2.3% | -7.0% | -75.0% | -86.0% | -15.5% |
| | Seats | 89,003 | 85,014 | 93,308 | 27,414 | 15,209 | 81,423 |
| | YOY change | 6.5% | 9.1% | 3.1% | -70.1% | -83.4% | -10.2% |
| United | Frequency | 880 | 817 | 872 | 315 | 91 | 780 |
| | YOY change | 13.7% | 14.1% | 3.9% | -63.6% | -89.9% | -9.9% |
| | Seats | 50,266 | 46,210 | 48,394 | 18,406 | 5,060 | 54,176 |
| | YOY change | 12.0% | 14.0% | -0.3% | -63.8% | -90.7% | -8.5% |
| Others | Frequency | 1,048 | 891 | 886 | 705 | 755 | 708 |
| | YOY change | -10.0% | -11.7% | -19.7% | -34.9% | -32.5% | -34.6% |
| | Seats | 50,469 | 44,228 | 45,574 | 17,524 | 23,282 | 32,557 |
| | YOY change | -9.5% | -13.1% | -24.7% | -70.4% | -61.8% | -48.1% |

Sources: OAG, *Schedules Analyzer*, accessed on May 5, 2020; Unison Consulting, Inc., June 2020.

### *3.3.4 MEDIUM-TERM TRAFFIC RECOVERY PHASE*

Recovery toward pre-COVID-19 traffic levels continues during this phase. The pace and duration differ under the three scenarios. Month to month, passenger traffic is projected to ramp up gradually. On an annual basis, total enplanements would begin to increase in FY2022. STL would see very high annual growth rates during this phase, more than 100 percent in FY2022. The growth rates would decrease each year, as passenger traffic approach pre-COVID-19 levels.

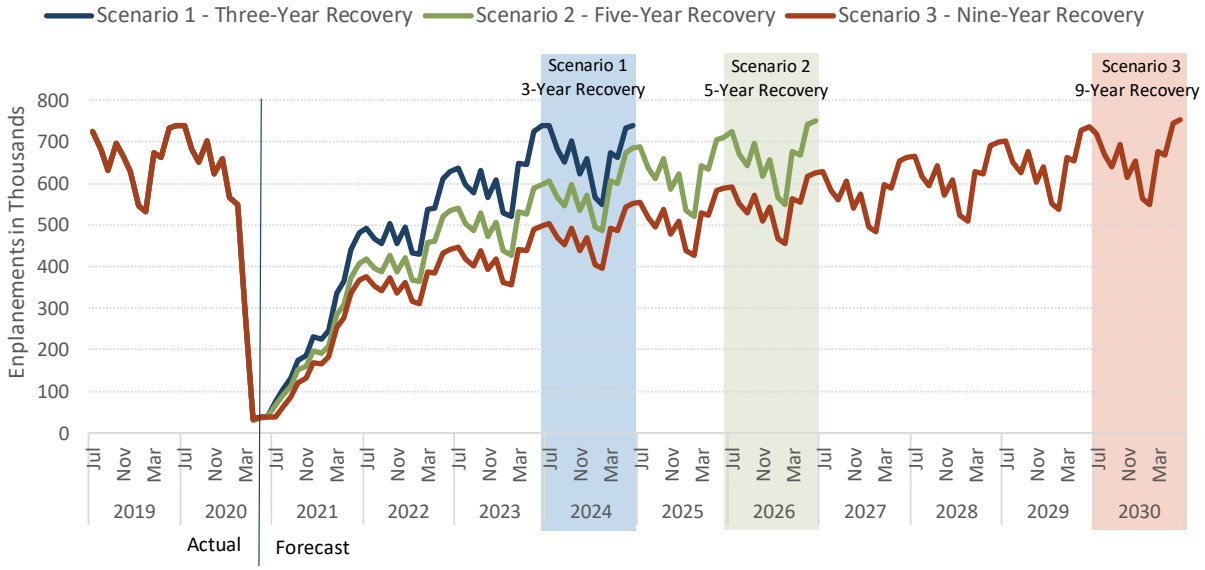
The key results under each scenario are summarized below:

- Under **Scenario 1 – Three-Year Recovery**, STL enplanements increase 102.1 percent from nearly 3 million in FY2021 to 6 million in FY2022. Growth continues at decreasing rates of 22.8 percent in FY2023 and 7.4 percent in FY2024. Enplanements returning to pre-COVID-19 levels by FY2024.

- Under **Scenario 2 – Five-Year Recovery**, STL enplanements increase 101.9 percent from 2.5 million in FY2021 to 5.1 million in FY2022. Growth continues at decreasing rates of 19.5 percent in FY2023, 13.3 percent in FY2024, 8.5 in FY2025, and 5.4 percent in FY2026. Enplanements returning to pre-COVID-19 levels by FY2026.
- Under **Scenario 3 – Nine-Year Recovery**, STL enplanements increase 101.4 percent from 2.2 million in FY2021 to 4.4 million in FY2022. Growth continues at decreasing rates of 15.6 percent in FY2023, 11.7 percent in FY2024, 8.6 percent in FY2025, 6.4 percent in FY2026, 6 percent in FY2027, 5.7 percent in FY2028, 5.4 percent in FY2029, and 2.3 percent in FY2030. Enplanements return to pre-COVID-19 levels in FY2030.

The three recovery scenarios are depicted in **Figure 3.3-28**.

**Figure 3.3-28: The Pace of STL Passenger Traffic Recovery Under Three Scenarios**




Sources: St. Louis Airport Authority, *STL Traffic Reports*; Transportation Security Administration (historical screening data), Unison Consulting, Inc., June 2020. (forecasts).

## *3.3.5 LONG-TERM TRAFFIC GROWTH PHASE*

The long-term growth phase begins after traffic returns to pre-COVID-19 levels: in FY2024 under Scenario 1, in FY2026 under Scenario 2, and in FY2030 under Scenario 3. From this point, the growth in air travel demand—and passenger traffic at STL—would be driven by trends in key determinants of market demand: income and price. Annual growth rates in STL enplanements would return to moderate levels, averaging around 1.8 percent, consistent with the long-term average annual growth in U.S. system enplanements over the past 20 years (1.8 percent).

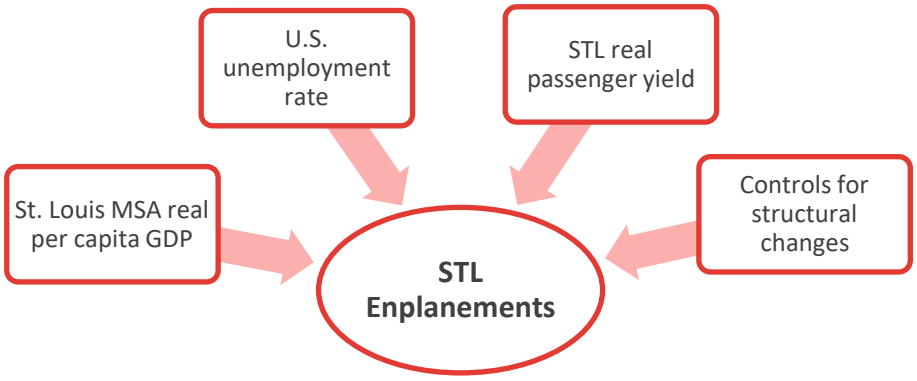
Multivariate regression analysis links growth in enplanements to trends in fundamental market demand drivers. It provides a systematic framework for quantifying how different factors contribute to growth in

enplanements and for generating enplanement forecasts based on the projected trends in key market demand factors. The regression model treats STL's O&D enplanements as the dependent variable to control for the wide fluctuations resulting from the loss of connecting traffic from dehubbing by American Airlines. O&D enplanements now account for the dominant share of STL's total enplanements, and growth in O&D enplanements is expected to drive long-term growth in STL's total enplanements.

As shown in **Figure 3.3-29**, the regression model's explanatory variables include real per capita GDP in the St. Louis MSA, U.S. unemployment rate, and the average real passenger yield for STL:

- Real per capita GDP in the St. Louis MSA indicates overall regional economic trends and per capita income trends. Holding all other factors constant, growth in regional per capita GDP promotes growth in enplanements. Conversely, decreases in regional per capita GDP decreases enplanements.
- U.S. unemployment rate indicates national economic trends, which determine demand for air travel nationwide, including regional demand in the St. Louis MSA. Falling unemployment rates indicate an expanding national economy, while rising unemployment rates indicate a slowing and contracting national economy. Passenger traffic trends track business cycles in the U.S. economy.
- Real passenger yield is calculated as total airline passenger revenues divided by revenue passenger miles and adjusted for inflation. Real passenger yield indicates the price of air travel.[21] The law of demand applies to demand for air travel: the quantity purchased varies inversely with price. Since the 1978 industry deregulation, real passenger yields have decreased over time, promoting growth in passenger traffic. In the long-term growth phase, we assume that real passenger yields would continue a long-term trend of decline at a diminishing rate.

**Figure 3.3-29: Long-Term Demand Drivers in Multivariate Time Series Regression Model**




Source: Unison Consulting, Inc., June 2020.

In addition to the three demand drivers, the regression model also includes control variables for events that precipitated significant structural changes in the aviation industry and the Airport market. These include the

[21] Real passenger yield is a better indicator of the price of air travel than average fare because it controls for trip distance.

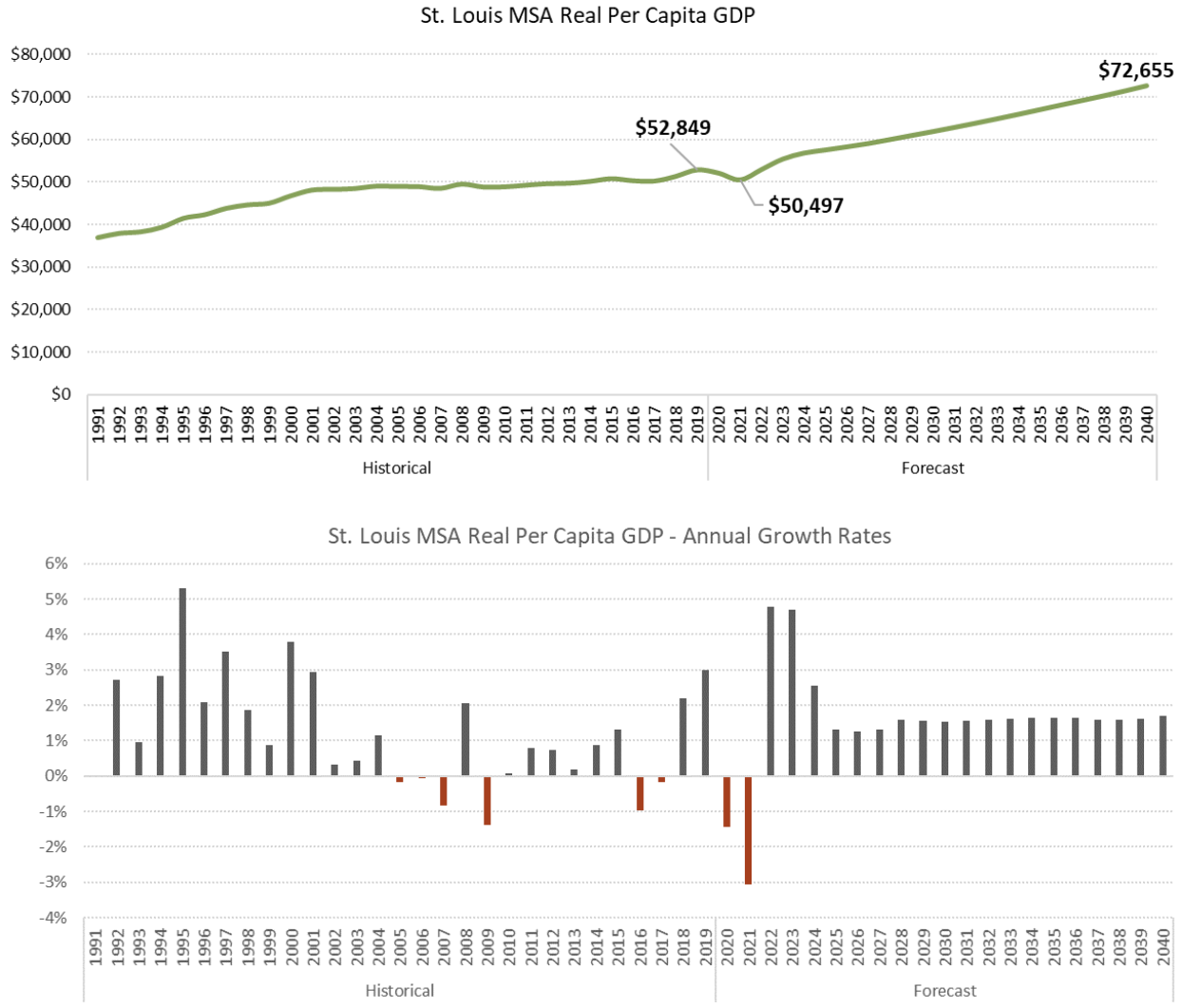
events of September 11, 2001; and American Airlines' service cuts beginning in November 2003 that culminated in the closing of the airline's connecting hub at STL.

Model estimation uses historical data from 1991. The data sources are as follows: U.S. Bureau of Economic Analysis for the St. Louis MSA real GDP, U.S. Bureau of Census for the St. Louis MSA population, U.S. Bureau of Labor Statistics for U.S. unemployment rate, and U.S. Bureau of Transportation Statistics DB1B for real passenger yield at STL. The model regression results produce an *Adjusted R-Squared* of 0.94—this means the model's explanatory variables explained 94 percent of the historical trends in STL O&D enplanements. The measured contributions (regression coefficient estimates) of the key explanatory variables are all statistically significant and consistent with theory and expectations. The coefficient estimate for per capita GDP has the expected positive sign, and the coefficient estimates for real passenger yield and unemployment rate have the expected negative signs.

Forecast development uses projections for the St. Louis MSA real GDP, the St. Louis MSA population, and the U.S. unemployment rate from Moody's Analytics' forecast updates as of April 2020. For STL real passenger yields, we assume continuing decline at a diminishing rate, following FAA's assumptions for the industry from the most recent national forecast update.

**Figure 3.3-30** shows the historical and forecast data for the St. Louis MSA real per capita GDP. Annual growth averaged 1.3 percent from 1991 through 2019. Given the developing economic recession caused by the COVID-19 pandemic, the St. Louis MSA real per capita GDP is projected to decrease in 2020 and 2021. Figure 3.3-30 shows Moody's Analytics' regional economic forecast as of April 2020. The economic recession has worsened since, and the resulting decreases in the St. Louis MSA real per capita GDP could be larger. According to the April 2020 regional economic forecast, the St. Louis MSA real per capita GDP would begin to turn around in 2022, initially at high growth rates (5 percent in FYs 2022 and 2023). Over the long-term, annual growth rates are projected to taper to under 2 percent.

**Figure 3.3-30: Real Per Capita GDP in the St. Louis Metropolitan Statistical Area**

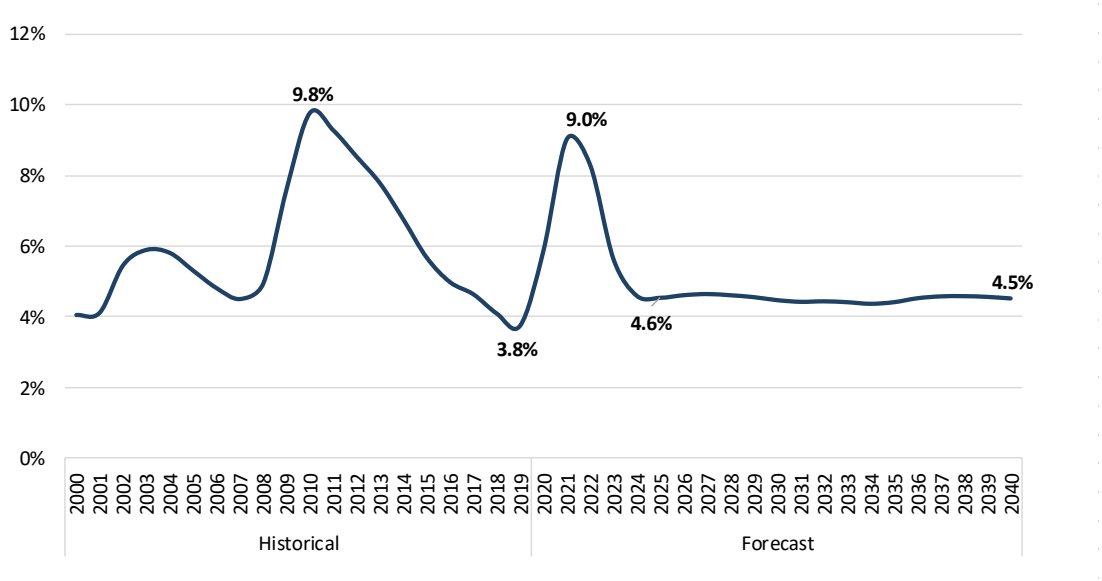



Notes:
MSA – Metropolitan Statistical Area
Values are in constant 2012 dollars.

Sources: U.S. Bureau of Economic Analysis (historical data on real GDP); U.S. Bureau of Census (historical data on population); Moody's Analytics (forecast data); Unison Consulting, Inc., June 2020.

**Figure 3.3-31** shows the historical and forecast data for the U.S. unemployment rate. Historically, the U.S. unemployment rate ranged from just under 4 percent to no more than 10 percent, rarely rising above 8 percent. Moody's Analytics' U.S. economic forecast as of April 2020 shows the U.S. annual average unemployment rate rising from 3.8 percent in 2019 to 9.0 percent in 2021, remaining above 8 percent in 2022. A more recent economic forecast from the Congressional Budget Office (CBO), a federal agency that provides budget and economic information to Congress, projects the U.S. unemployment rate to rise above 10 percent, on average, in 2020 and 2021, reaching 16 percent in the third quarter of 2020.[22] In the long run, the U.S. annual average unemployment rate is projected to fall below 5 percent and settle at around 4.5 percent.

### Figure 3.3-31: U.S. Annual Unemployment Rate

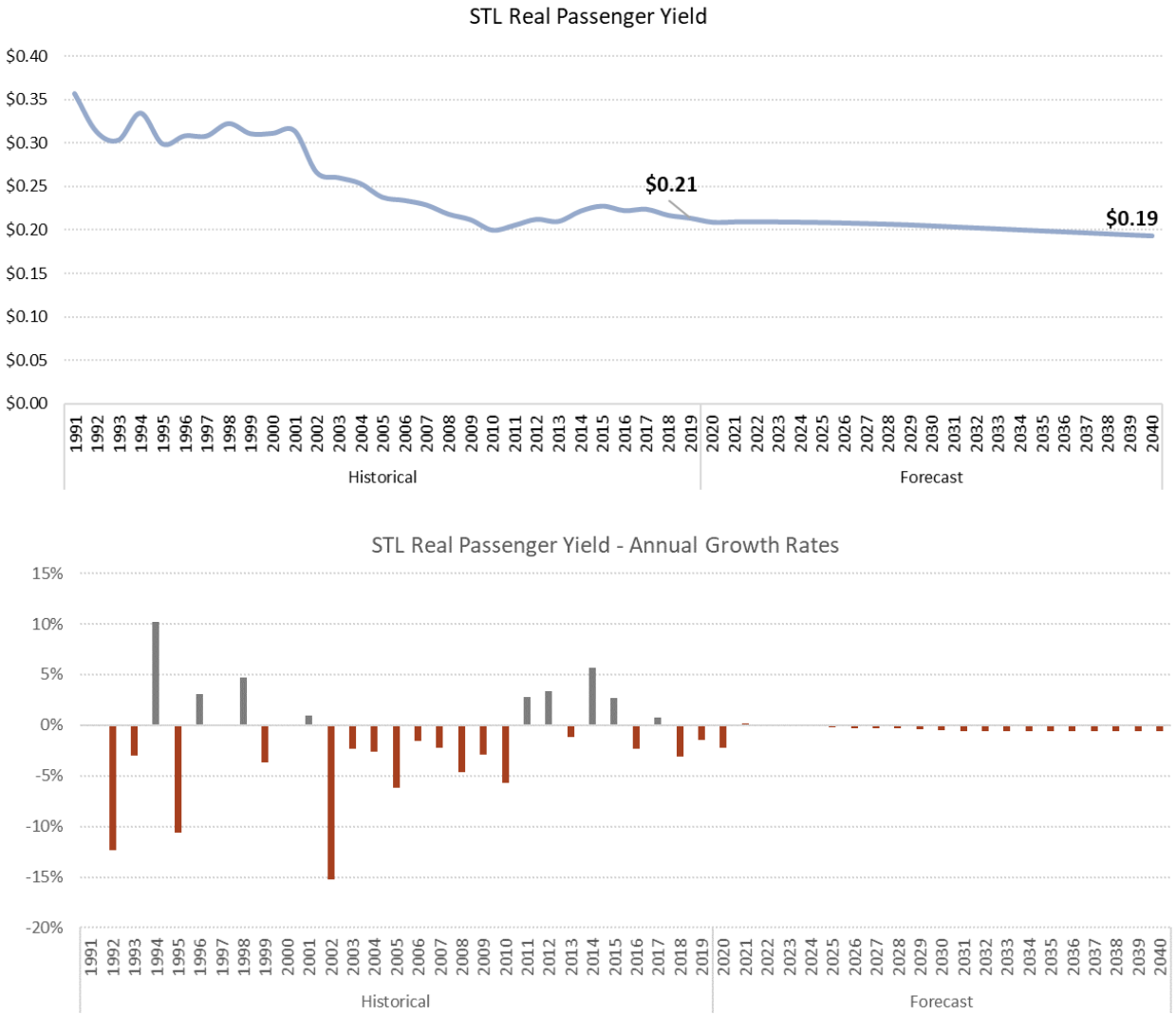



Sources: U.S. Bureau of Labor Statistics (historical data); Moody's Analytics (forecast data); Unison Consulting, Inc., June 2020.

[22] Phil Swagel, "CBO's Current Projections of Output, Employment, and Interest Rates and a Preliminary Look at Federal Deficits for 2020 and 2021," Congressional Budget Office *Blog*, April 24, 2020. (Phil Swagel is CBO's director.)

**Figure 3.3-32** shows the historical and forecast data for STL real passenger yield. Since the 1978 industry deregulation, real passenger yields have been decreasing as a result of increased competition, productivity improvements, and cost efficiency measures. The rate of change in real passenger yields has been decreasing over time as the industry has reached maturity. In the short term, the public health safety measures airlines are implementing will increase the cost of providing airline service. Airlines will be motivated to raise fares, but weak demand will limit airlines' ability to increase fares. In the long run, real passenger yields are projected to continue a long-term declining trend at rates around one-half percent.

### Figure 3.3-32: Real Passenger Yield (2012 Dollars)




Note: Values are in constant 2012 dollars.

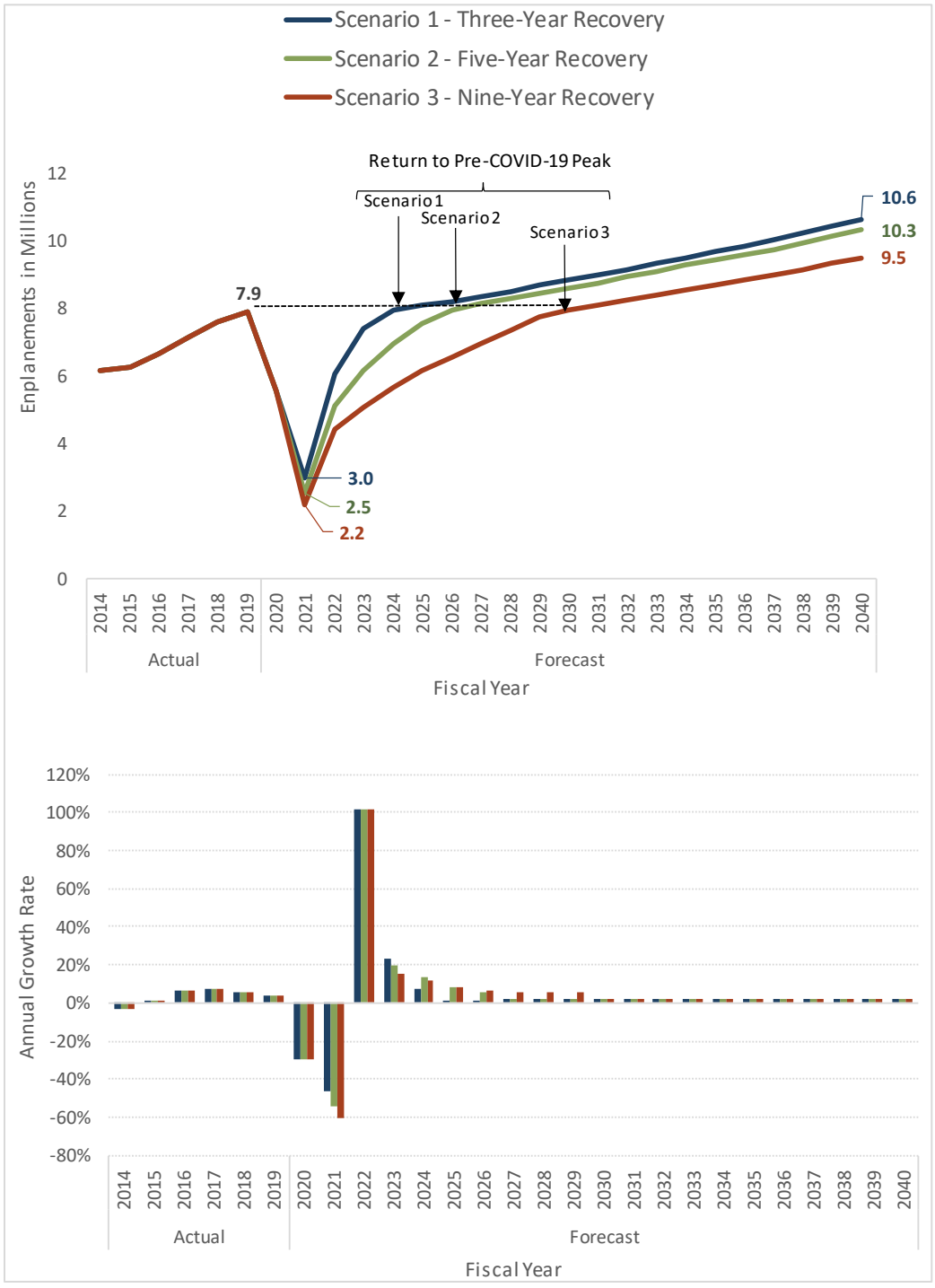
Sources: U.S. Bureau of Transportation Statistics (historical data); Unison Consulting (forecasts based on Federal Aviation Administration's industry projections for the most recent national forecast update), June 2020.

### *3.3.6 PASSENGER TRAFFIC FORECAST RESULTS*

This section presents the resulting forecasts of key measures of commercial passenger traffic under the three scenarios: **Scenario 1 – Three-Year Recovery**, **Scenario 2 – Five-Year Recovery**, and **Scenario 3 – Nine-Year Recovery**.

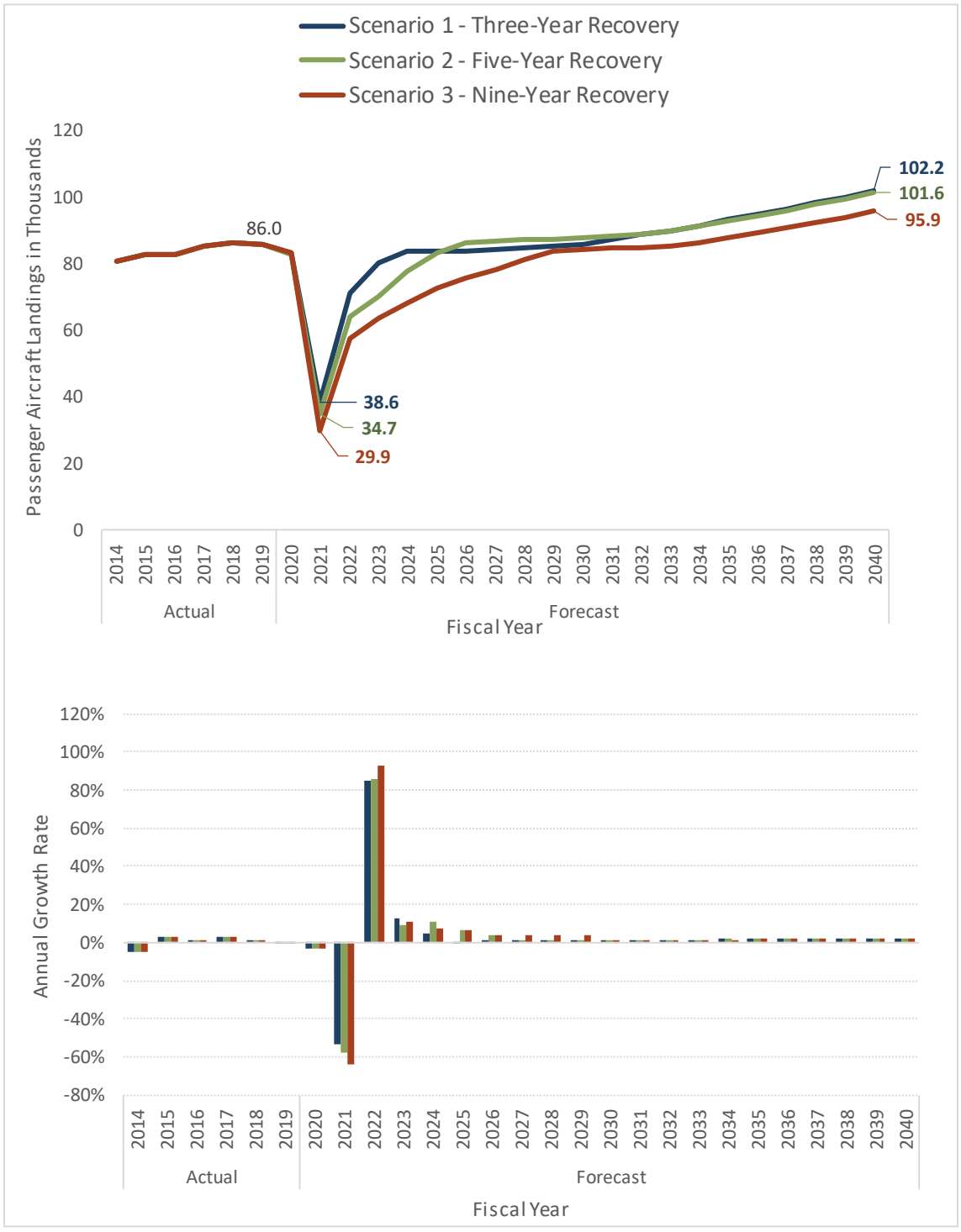
The multivariate time series regression model, along with the long-term projections for the key demand drivers, determines the long-term growth rates in STL enplanements after full recovery from the downturn caused by the COVID-19 pandemic and economic recession. **Figure 3.3-33** shows the long-term forecasts of STL enplanements under the three scenarios. Forecast enplanement levels, in turn, drive the supply of airline flights and seats, along with assumptions regarding trends in load factors and airline fleets. Forecasts of aircraft landings and changes in average aircraft landed weight resulting from projected fleet changes determine total aircraft landed weight. **Figure 3.3-34** and **Figure 3.3-35** shows the long-term forecasts of passenger aircraft landings and landed weight.

**Figure 3.3-33: Forecast STL Enplanements Under Three Scenarios**



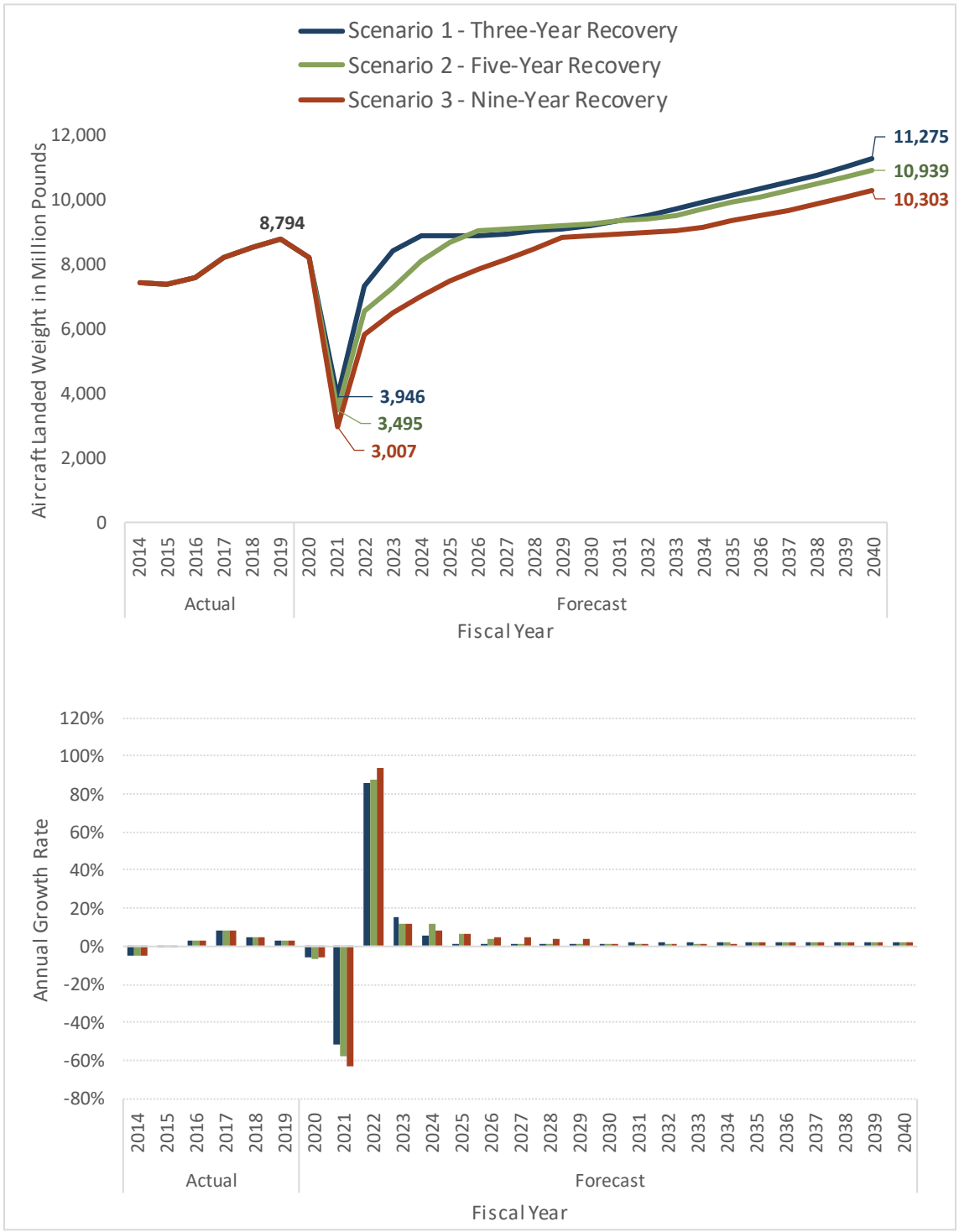

Sources: St. Louis Airport Authority (STL airport records); Transportation Security Administration (passenger screening data); Unison Consulting, Inc.(forecasts), June 2020.

**Figure 3.3-34: Forecast STL Passenger Aircraft Landings (Departures) Under Three Scenarios**




Sources: St. Louis Airport Authority (STL airport records); Unison Consulting, Inc.(forecasts), June 2020.

**Figure 3.3-35: Forecast STL Passenger Aircraft Landed Weight Under Three Scenarios**




Sources: St. Louis Airport Authority (STL airport records); Unison Consulting, Inc.(forecasts), June 2020.

**Table 3.3-5** shows the key measures of commercial passenger traffic for the last two years (FY2018-2019) and the forecast period (FY2020-2040) under the three scenarios. In all three scenarios, flights and seats do not decrease as much as enplanements during the decline phase due to complexities and rigidities in airline operations, networks, and fleets.

As a result, flights and seats also grow slower than enplanements during the recovery phase. In the long-term growth phase, flights and seats continue to grow slower than enplanements due to continued up-gauging of airline fleets and small improvements in boarding load factors. The upgauging of airline fleets, either by adding seats to existing aircraft or by replacing smaller aircraft with larger aircraft, result in an increase in the average aircraft landed weight per arrival, so that total landed weight grows faster than the number of aircraft landings. Below is a summary of key trends:

Scenario 1 – Three-Year Recovery (Airport Sponsor's Best-Case Planning Scenario):

- From 7.9 million in FY2019, enplanements fall to the lowest annual level at approximately 3 million in FY2021, return to the FY2019 level by FY2024, and reach 10.6 million by FY2040. Over the entire forecast period through FY2040, enplanements grow at an average annual rate of 1.4 percent.
- From 171,909 in FY2019, passenger aircraft operations fall to the lowest level at around 77,000 in FY2021. Boarding load factors and the average number of seats per aircraft also return to FY2019 level quickly, compared with the pace assumed in the other scenarios. As a result, passenger aircraft operations do not return to the FY2019 level until FY2029. Passenger aircraft operations continue to grow to reach approximately 204,500 by FY2040. Over the entire forecast period through FY2040, passenger aircraft operations grow at an average annual rate of 0.8 percent.
- From 8.79 billion pounds in FY2019, total passenger aircraft landed weight falls to its lowest level at around 3.95 billion pounds in FY2021, returns to the FY2019 level by FY2024, and grows to approximately 11.28 billion pounds by FY2040. Over the entire forecast period through FY2040, total passenger aircraft landed weight grows at an average annual rate of 1.1 percent.
- Scenario 1 includes a representative service to a European market beginning in FY2036. This service is projected to begin at one weekly flight in FY2036, increasing to daily service by FY2040. A Boeing 787-800 aircraft would be used for this service.

Scenario 2 – Five-Year Recovery:

- From 7.9 million in FY2019, enplanements fall to the lowest annual level of approximately 2.5 million in FY2021, return to the FY2019 level by FY2026, and reach 10.3 million by FY2040. Over the entire forecast period through FY2040, enplanements grow at an average annual rate of 1.3 percent.
- From 171,909 in FY2019, passenger aircraft operations fall to the lowest annual level of around 69,000 in FY2021, return to the FY2019 level by FY2026, and reach approximately 203,000 by FY2040. Over the entire forecast period through FY2040, passenger aircraft operations grow at an average annual rate of 0.8 percent.

- From 8.79 billion pounds in FY2019, total passenger aircraft landed weight falls to the lowest annual level at around 3.5 billion pounds in FY2021, returns to the FY2019 level by FY2025, and grows to approximately 10.94 billion pounds by FY2040. Over the entire forecast period through FY2040, total passenger aircraft landed weight grows at an average annual rate of 1 percent.

## Table 3.3-5: Forecast Commercial Passenger Traffic Under Three Scenarios

### Scenario 1 – Three-Year Recovery (Airport Sponsor's Best-Case Planning Scenario)

| | Historical | | Forecast | | | | | | | | | Compound Annual Growth Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2030** | **2030-2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,581,055 | 2,992,928 | 6,048,202 | 7,428,144 | 7,979,645 | 8,093,867 | 8,842,483 | 9,690,406 | 10,639,736 | 1.0% | 1.9% | 1.4% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,503 | 8,836 | 11,842 | 12,743 | 13,058 | 13,245 | 14,470 | 15,858 | 17,325 | 0.6% | 1.8% | 1.2% |
| **Seats** | 9,605,642 | 9,946,484 | 9,131,568 | 4,384,848 | 8,146,619 | 9,374,912 | 9,927,616 | 9,929,365 | 10,224,269 | 11,241,557 | 12,426,127 | 0.3% | 2.0% | 1.1% |
| **Landings** | 86,561 | 85,966 | 83,331 | 38,563 | 71,231 | 80,393 | 84,118 | 84,046 | 86,186 | 93,354 | 102,241 | 0.0% | 1.7% | 0.8% |
| **Avg. Seats Per Landing** | 111 | 116 | 110 | 114 | 114 | 117 | 118 | 118 | 119 | 120 | 122 | | | |
| **Boarding Load Factor** | 79.2% | 79.6% | 61.1% | 68.3% | 74.2% | 79.2% | 80.4% | 81.5% | 86.5% | 86.2% | 85.6% | | | |
| **Operations*** | 173,031 | 171,909 | 166,639 | 77,116 | 142,444 | 160,763 | 168,213 | 168,069 | 172,349 | 186,683 | 204,454 | 0.0% | 1.7% | 0.8% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,241 | 3,946 | 7,333 | 8,427 | 8,916 | 8,920 | 9,204 | 10,140 | 11,275 | 0.4% | 2.1% | 1.2% |

### Scenario 2 – Five-Year Recovery

| | Historical | | Forecast | | | | | | | | | Compound Annual Growth Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2030** | **2030-2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,579,101 | 2,547,804 | 5,145,131 | 6,149,009 | 6,967,636 | 7,558,379 | 8,622,476 | 9,449,302 | 10,323,905 | 0.8% | 1.8% | 1.3% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,501 | 8,377 | 11,223 | 11,953 | 12,483 | 12,836 | 13,903 | 15,236 | 16,646 | 0.3% | 1.8% | 1.0% |
| **Seats** | 9,605,642 | 9,946,484 | 9,296,655 | 3,929,268 | 7,365,513 | 8,217,009 | 9,160,271 | 9,778,663 | 10,385,477 | 10,998,467 | 12,014,960 | 0.4% | 1.5% | 0.9% |
| **Landings** | 86,561 | 85,966 | 82,878 | 34,725 | 64,427 | 70,455 | 78,101 | 83,236 | 88,121 | 93,009 | 101,593 | 0.2% | 1.4% | 0.8% |
| **Avg. Seats Per Landing** | 111 | 116 | 112 | 113 | 114 | 117 | 117 | 117 | 118 | 118 | 118 | | | |
| **Boarding Load Factor** | 79.2% | 79.6% | 60.0% | 64.8% | 69.9% | 74.8% | 76.1% | 77.3% | 83.0% | 85.9% | 85.9% | | | |
| **Operations*** | 173,031 | 171,909 | 165,735 | 69,440 | 128,837 | 140,892 | 156,181 | 166,450 | 176,219 | 185,994 | 203,160 | 0.2% | 1.4% | 0.8% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,235 | 3,495 | 6,559 | 7,311 | 8,153 | 8,710 | 9,290 | 9,930 | 10,939 | 0.5% | 1.6% | 1.0% |

### Scenario 3 – Nine-Year Recovery

| | Historical | | Forecast | | | | | | | | | Compound Annual Growth Rate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2030** | **2030-2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,581,162 | 2,191,950 | 4,414,203 | 5,102,591 | 5,698,994 | 6,188,762 | 7,948,580 | 8,710,784 | 9,517,032 | 0.0% | 1.8% | 0.9% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,503 | 8,010 | 10,717 | 11,274 | 11,714 | 12,049 | 13,117 | 14,375 | 15,705 | -0.3% | 1.8% | 0.7% |
| **Seats** | 9,605,642 | 9,946,484 | 9,297,668 | 3,380,393 | 6,554,304 | 7,305,162 | 7,876,988 | 8,410,546 | 9,975,678 | 10,369,837 | 11,320,610 | 0.0% | 1.3% | 0.6% |
| **Landings** | 86,561 | 85,966 | 83,290 | 29,883 | 57,589 | 63,755 | 68,339 | 72,604 | 84,627 | 87,822 | 95,876 | -0.1% | 1.3% | 0.5% |
| **Avg. Seats Per Landing** | 111 | 116 | 112 | 113 | 114 | 115 | 115 | 116 | 118 | 118 | 118 | | | |
| **Boarding Load Factor** | 79.2% | 79.6% | 60.0% | 64.8% | 67.3% | 69.8% | 72.3% | 73.6% | 79.7% | 84.0% | 84.1% | | | |
| **Operations*** | 173,031 | 171,909 | 166,558 | 59,759 | 115,162 | 127,493 | 136,659 | 145,189 | 169,230 | 175,621 | 191,726 | -0.1% | 1.3% | 0.5% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,241 | 3,007 | 5,839 | 6,513 | 7,027 | 7,505 | 8,920 | 9,358 | 10,303 | 0.1% | 1.5% | 0.8% |

Note:
*Operations include landings and departures.

Sources: St. Louis Airport Authority (STL historical data); Unison Consulting, Inc.(forecasts), June 2020.

Scenario 3 – Nine-Year Recovery:

- From 7.9 million in FY2019, enplanements fall to the lowest annual level of approximately 2.2 million in FY2021, return to the FY2019 level by FY2030, and reach 9.5 million by FY2040. Over the entire forecast period through FY2040, enplanements grow at an average annual rate of 0.9 percent.
- From 171,909 in FY2019, passenger aircraft operations fall to the lowest annual level of around 59,800 in FY2021, return to the FY2019 level by FY2033, and reach approximately 192,000 by FY2040. Over the entire forecast period through FY2040, passenger aircraft operations grow at an average annual rate of 0.5 percent.
- From 8.79 billion pounds in FY2019, total passenger aircraft landed weight falls to its lowest level at around 3 billion pounds in FY2021, returns to the FY2019 level by FY2029, and grows to approximately 10.30 billion pounds by FY2040. Over the entire forecast period through FY2040, total passenger aircraft landed weight grows at an average annual rate of 0.8 percent.

### *3.3.7 PEAK PERIOD FORECASTS*

**Table 3.3-6** presents the peak period forecasts for aircraft operations and passengers. The peak period forecasts are based on the pattern of commercial passenger traffic in FY2019, the fiscal year before the COVID-19 pandemic. As discussed in Section 3.3.1, July typically sees the highest level of monthly commercial passenger traffic at STL: 8.8 percent of annual passenger aircraft operations, 8.8 percent of the annual supply of airline seats, and 9.3 percent of annual enplanements. The peak one-hour period during the peak month average day (PMAD peak hour) accounts for 8.1 percent of the PMAD passenger aircraft operations and 8.2 percent of the PMAD total passengers.

**Table 3.3-6: Commercial Passenger Traffic Peak Period Forecasts**

## STL Peak Month Average Day Peak Hour Operations Forecast

| | Actual | Estimate | | Forecast | | |
|---|---|---|---|---|---|---|
| **Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** |
| **Master Plan Scenario 1** | **171,909** | **166,639** | **77,116** | **168,069** | **172,349** | **204,454** |
| Peak Month (8.8% of FY Total) | 15,100 | 14,700 | 6,800 | 14,800 | 15,200 | 18,000 |
| Peak Month Average Day (PMAD) | 487 | 474 | 219 | 477 | 490 | 581 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% |
| PMAD Peak Hour | 39 | 38 | 18 | 39 | 40 | 47 |
| **Master Plan Scenario 2** | **171,909** | **165,735** | **69,440** | **166,450** | **176,219** | **203,160** |
| Peak Month (8.8% of FY Total) | 15,100 | 14,600 | 6,100 | 14,600 | 15,500 | 17,900 |
| Peak Month Average Day (PMAD) | 487 | 471 | 197 | 471 | 500 | 577 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% |
| PMAD Peak Hour | 39 | 38 | 16 | 38 | 41 | 47 |
| **Master Plan Scenario 3** | **171,909** | **166,558** | **59,759** | **145,189** | **169,230** | **191,726** |
| Peak Month (8.8% of FY Total) | 15,100 | 14,700 | 5,300 | 12,800 | 14,900 | 16,900 |
| Peak Month Average Day (PMAD) | 487 | 474 | 171 | 413 | 481 | 545 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% | 8.1% |
| PMAD Peak Hour | 39 | 38 | 14 | 33 | 39 | 44 |

## STL Peak Month Average Day Peak Hour Passengers Forecast (Thousands)

| | Actual | Estimate | | Forecast | | |
|---|---|---|---|---|---|---|
| **Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** |
| **Master Plan Scenario 1** | **15,800** | **11,200** | **6,000** | **16,200** | **17,700** | **21,300** |
| Peak Month (9.2% of FY Total) | 1,500 | 1,000 | 600 | 1,500 | 1,600 | 2,000 |
| Peak Month Average Day (PMAD) | 48 | 32 | 19 | 48 | 52 | 65 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% |
| PMAD Peak Hour | 4 | 3 | 2 | 4 | 4 | 5 |
| **Master Plan Scenario 2** | **15,800** | **11,200** | **5,100** | **15,100** | **17,200** | **20,600** |
| Peak Month (9.2% of FY Total) | 1,500 | 1,000 | 500 | 1,400 | 1,600 | 1,900 |
| Peak Month Average Day (PMAD) | 48 | 32 | 16 | 45 | 52 | 61 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% |
| PMAD Peak Hour | 4 | 3 | 1 | 4 | 4 | 5 |
| **Master Plan Scenario 3** | **15,800** | **11,200** | **4,400** | **12,400** | **15,900** | **19,000** |
| Peak Month (9.2% of FY Total) | 1,500 | 1,000 | 400 | 1,100 | 1,500 | 1,700 |
| Peak Month Average Day (PMAD) | 48 | 32 | 13 | 35 | 48 | 55 |
| PMAD Peak Hour (% of PMAD Subtotal) | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% |
| PMAD Peak Hour | 4 | 3 | 1 | 3 | 4 | 4 |

Sources: St. Louis Airport Authority (STL airport records); OAG, *Schedules Analyzer*; Unison Consulting, Inc.(forecasts), June 2020.

# 3.4 COMMERCIAL AIR CARGO TRAFFIC

Located in proximity to both the geographic and population centers of the United States, the centrality of the Greater St. Louis region has attracted various establishments that support goods production and freight transportation. The region also enjoys other geographical advantages, such as access to both the Missouri and Mississippi rivers, making it attractive for logistics hubs and intermodal facilities. Although the St. Louis region's freight is primarily moved by rail and trucks, air cargo maintains a competitive advantage in the logistics of transporting time-sensitive, lightweight or value-dense products. As the only major cargo airport in the St. Louis region, STL plays a key role in the supply chains of industries that rely on air transport for the movement of goods.

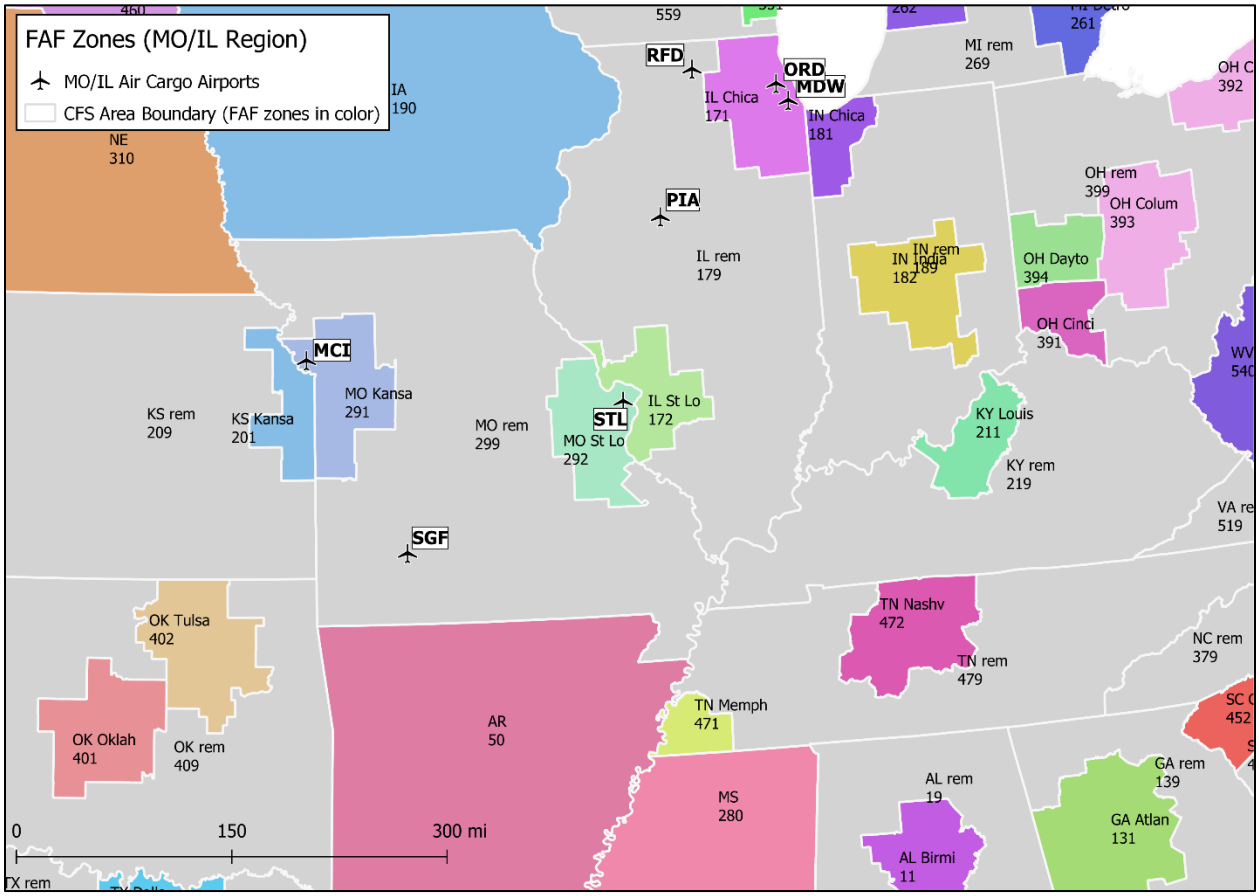
## *3.4.1 FREIGHT ANALYSIS FRAMEWORK*

Regional freight data obtained from the Freight Analysis Framework (FAF) database can be used to gain insights into the characteristics of goods transported by air in the St. Louis region. The FAF database is prepared by the U.S. Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA). The model's baseline data are constructed from the U.S. Census Bureau's international trade data and the BTS Commodity Flow Survey (CFS) data, which are based on surveys given to shippers every five years along with the Economic Census. The FAF database also integrates data from various industry sources–including agriculture, energy and utility, construction, extraction, service–to construct a comprehensive account of goods movement among states and metropolitan areas by all modes of transportation.[23]

**Figure 3.4-1** shows how the CFS and the FAF define freight zones in Missouri and neighboring states, following the Office of Management and Budget's delineation of core-based statistical areas (CBSA). The figure also plots airports in Missouri and Illinois, the two states straddled by the St. Louis, MO-IL MSA, where at least 10,000 tons cargo were transported as air cargo in CY2018. The following discussion on air cargo trends in the St. Louis region will focus on the Missouri side of the St. Louis, MO-IL MSA, because this FAF zone accounts for approximately 75 percent of the region's air cargo activity. This specific FAF zone will also be used to forecast the long-term air cargo traffic growth at STL, which is located within the Missouri side of the MSA.

[23] Based on macroeconomic, regional, inter-industry, and intra-state forecast models, FAF also provides forecasts of freight activity in 5-year intervals up to the year 2045. FAF's freight forecasts rely on inputs from IHS's U.S. Macro Model, Business Market Insights, Business Transactions Matrix, World Trade Service, and other U.S. national and regional economic forecasts.

**Figure 3.4-1: Missouri/Illinois Region Freight Analysis Framework Zones and Cargo Airports**



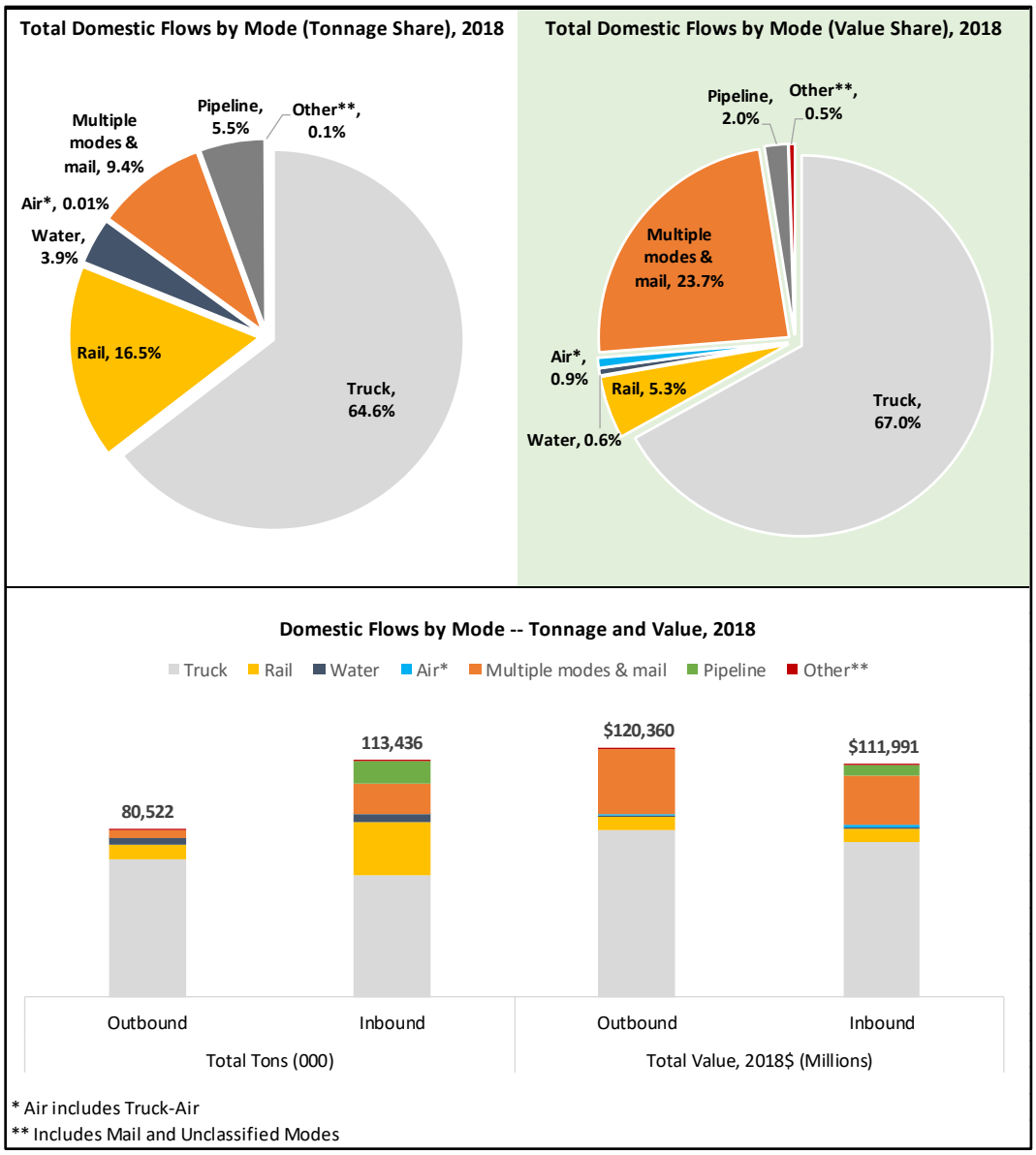

| Code | Airport Name | City, State | Air Cargo Tons (CY2018) |
|---|---|---|---|
| ORD | Chicago O'Hare International | Chicago, Illinois | 2,138,298 |
| RFD | Chicago Rockford International | Rockford, Illinois | 330,599 |
| MCI | Kansas City International | Kansas City, Missouri | 107,967 |
| STL | St. Louis Lambert International | St. Louis, Missouri | 81,043 |
| MDW | Chicago Midway International | Chicago, Illinois | 23,267 |
| SGF | Springfield-Branson National | Springfield, Missouri | 18,465 |
| PIA | General Downing-Peoria International | Peoria, Illinois | 15,771 |

Notes:
FAF: Freight Analysis Framework
Airports in Missouri and Illinois with at least 10,000 tons of enplaned and deplaned air cargo in CY2018.

Sources: Unison Consulting, Inc. using data from U.S. DOT National Transportation Atlas Database (NTAD) and U.S. DOT Data.

**Figure 3.4-2** shows the modal shares of goods transported to and from the St. Louis FAF zone (Missouri part). Although air cargo accounts for a very small share of the transported freight tonnage in the FAF zone, it accounts for approximately 1 percent of the total value of trade goods. The figure also shows the total tonnage of export and import goods by mode, highlighting the contribution of pipelines to the larger volume of the region's inbound flows relative to outbound traffic. This trade imbalance, however, is reversed for the total value of transported goods – the value of goods exported from the St. Louis FAF zone outweighs the value of imported goods to the region.

## Figure 3.4-2: St. Louis, MO-IL (MO Part) Freight Flows by Mode (2018 Estimates)

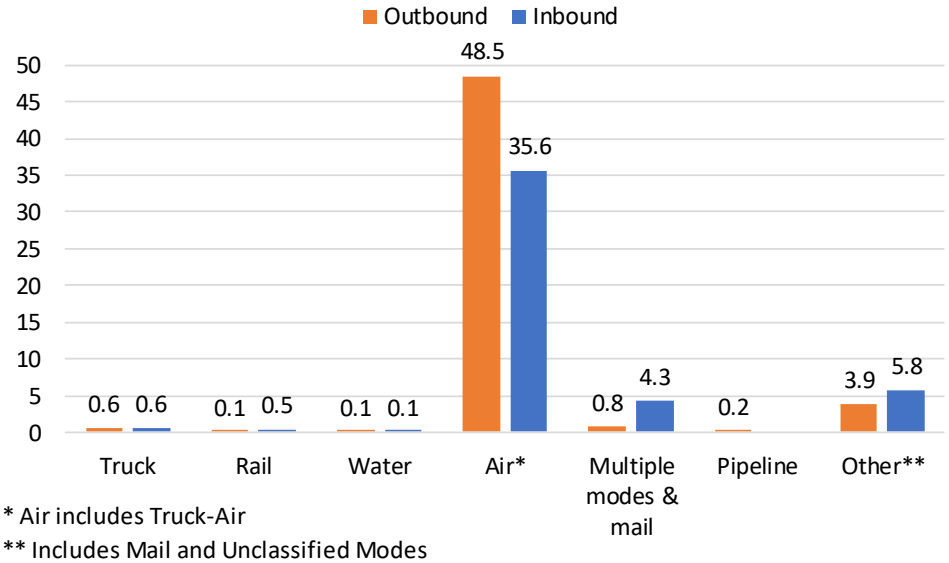



* Air includes Truck-Air
** Includes Mail and Unclassified Modes

Sources: U.S. Department of Transportation, *Freight Analysis Framework V.4 (FAF4)*; Unison Consulting, Inc., June 2020.

On a unit level, **Figure 3.4-3** shows that commodities transported by air are considerably more valuable than those transported by other modes (nearly 50 times the average per-pound value of commodities transported by other modes).

**Figure 3.4-3: St. Louis, MO-IL (MO Part) Freight Value per Pound (2018$) (2018 Estimates)**




* Air includes Truck-Air
** Includes Mail and Unclassified Modes

Sources: U.S. Department of Transportation, *Freight Analysis Framework V.4 (FAF4)*; Unison Consulting, Inc., June 2020.

Given the large disparity in the value of transported goods by the air mode, relative to other modes, **Table 3.4-1** provides a list of the top-10 commodities transported by air cargo. Electronics and precision instruments were the region's top two export and import air cargo commodity groups. The two groups accounted for 25 percent of the FAF zone's air cargo trade by weight and 40 percent of the zone's air cargo trade by value. Although air cargo exports in the Illinois counterpart of the St. Louis, MO-IL MSA (not shown) mostly mirrored the Missouri side of the air cargo traffic, machinery and transportation equipment accounted for the first- and second-largest shares of import tonnage, respectively.

## Table 3.4-1: St. Louis MO-IL (Missouri Portion) Import and Export Air Cargo: Top-10 Freight Commodities (2018 Estimates)

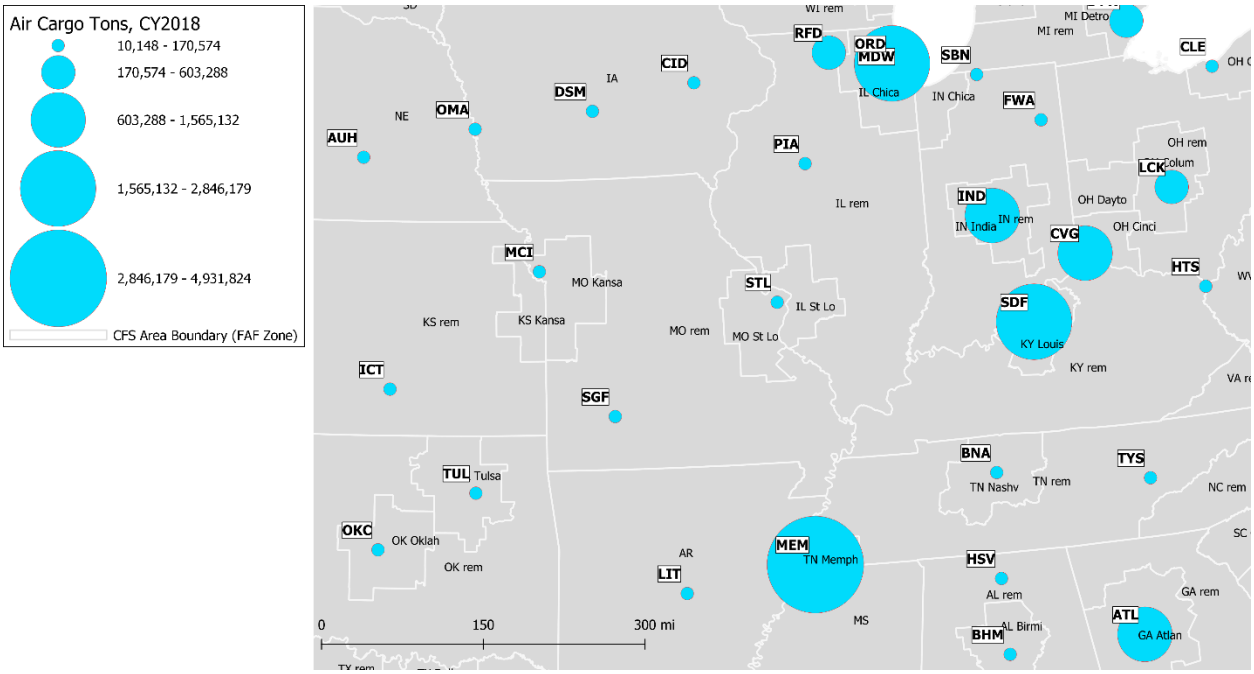
| Air Cargo Top-10 Commodities by Weight | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Outbound from St. Louis MO-IL (MO Part) | | | | | | Inbound to St. Louis MO-IL (MO Part) | | | | | |
| | | | | Share of Total | | | | | | Share of Total | |
| Rank | Commodity | Total Tons | Total Value, $ (Mil) | Total Tons | Total Value | Rank | Commodity | Total Tons | Total Value, $ (Mil) | Total Tons | Total Value |
| 1 | Electronics | 2,206 | 135 | 18% | 15% | 1 | Precision instruments | 1,609 | 270 | 14% | 24% |
| 2 | Transport equip. | 1,682 | 309 | 13% | 35% | 2 | Motorized vehicles | 1,434 | 63 | 13% | 6% |
| 3 | Basic chemicals | 1,389 | 57 | 11% | 6% | 3 | Transport equip. | 1,394 | 56 | 12% | 5% |
| 4 | Precision instruments | 944 | 101 | 8% | 11% | 4 | Electronics | 1,350 | 273 | 12% | 25% |
| 5 | Base metals | 930 | 9 | 7% | 1% | 5 | Misc. mfg. prods. | 1,169 | 80 | 10% | 7% |
| 6 | Furniture | 868 | 9 | 7% | 1% | 6 | Pharmaceuticals | 705 | 234 | 6% | 21% |
| 7 | Misc. mfg. prods. | 584 | 37 | 5% | 4% | 7 | Machinery | 692 | 42 | 6% | 4% |
| 8 | Articles-base metal | 578 | 58 | 5% | 7% | 8 | Textiles/leather | 558 | 8 | 5% | 1% |
| 9 | Machinery | 551 | 66 | 4% | 7% | 9 | Basic chemicals | 407 | 23 | 4% | 2% |
| 10 | Chemical prods. | 539 | 23 | 4% | 3% | 10 | Plastics/rubber | 336 | 7 | 3% | 1% |
| | *Other* | *2,240* | *52* | *18%* | *10%* | | *Other* | *1,725* | *49* | *15%* | *4%* |
| | **Total** | **12,512** | **855** | **100%** | **100%** | | **Total** | **11,378** | **1,104** | **100%** | **100%** |

Sources: U.S. Department of Transportation, *Freight Analysis Framework V.4 (FAF4)*; Unison Consulting, Inc., June 2020.

## 3.4.2 AIRPORT REGIONAL COMPETITION

Given its central location, STL faces strong regional competition from the international gateway Chicago O'Hare International Airport (ORD), and the central sorting hubs of the world's largest integrator carriers: UPS Airlines' hub Louisville International Airport (SDF), and FedEx Express' hub Memphis International Airport (MEM).[24] As shown in **Figure 3.4-4**, STL's air cargo throughput is dwarfed by the amount of air cargo moving through neighboring airports in the Midwest and Southern U.S. regions, which happen to be some of the busiest air cargo airports in the world.

**Figure 3.4-4: Departed and Landed Cargo Tonnage for Air Cargo Airports (CY2018)**




| Missouri & Illinois Air Cargo Airports | |
|---|---|
| **Code** | **Airport Name** |
| ORD | Chicago O'Hare International |
| RFD | Chicago Rockford International |
| MCI | Kansas City International |
| STL | St. Louis Lambert International |
| MDW | Chicago Midway International |
| SGF | Springfield-Branson National |
| PIA | General Downing-Peoria International |

Note:
Airports with at least 10,000 tons of enplaned and deplaned air cargo in CY2018.

Sources: U.S. Department of Transportation, *National Transportation Atlas Database and T100*; Unison Consulting, Inc., June 2020.

[24] Amazon Air established hub operations at Cincinnati/Northern Kentucky International Airport (CVG) in 2017.

Given that freight commodities are relatively insensitive to circuity and multimodal transport, airports can serve cargo demand from a much larger geographic area. Therefore, STL potentially shares an air cargo service area with at least three major cargo hubs within a 300-mile radius—including MEM, which consistently ranks as the busiest cargo airport in North America and is second only to Hong Kong International Airport (HKG) worldwide.[25]

The five largest trading partners of the St. Louis FAF zone for all transportation modes are listed in **Figure 3.4-2.** Trucks are the primary mode used to haul nearly half of the goods between St. Louis and its five largest trading states, followed by rail and water modes, each accounting for just over 20 percent of the transported tonnage. Given the small modal share of air cargo, **Table 3.4-3** shows the top-5 trading partners for air cargo only.

**Table 3.4-2: St. Louis, MO-IL (MO Part) Metropolitan Statistical Area Top Trading Partners by Origin State – All Modes (2018)**

| | Exports | | | Imports | |
|---|---|---|---|---|---|
| Rank | State | Tonnage Share* | Rank | State | Tonnage Share* |
| 1 | Louisiana | 12% | 1 | Wyoming | 32% |
| 2 | Texas | 11% | 2 | Louisiana | 8% |
| 3 | Indiana | 9% | 3 | North Dakota | 8% |
| 4 | California | 6% | 4 | Iowa | 7% |
| 5 | Minnesota | 5% | 5 | Minnesota | 5% |
| | **Subtotal** | **44%** | | **Subtotal** | **60%** |

Note:
* Excludes tonnage to/from Illinois.

Sources: U.S. Department of Transportation, *Freight Analysis Framework V.4 (FAF4)*; Unison Consulting, Inc., June 2020.

**Table 3.4-3: St. Louis, MO-IL (MO Part) Metropolitan Statistical Area Top Trading Partners by Origin State – Air Mode (2018)**

| | Exports | | | Imports | |
|---|---|---|---|---|---|
| Rank | State | Tonnage Share* | Rank | State | Tonnage Share* |
| 1 | Kentucky | 14% | 1 | California | 20% |
| 2 | Massachusetts | 10% | 2 | Kansas | 7% |
| 3 | New York | 8% | 3 | Kentucky | 6% |
| 4 | California | 7% | 4 | Florida | 6% |
| 5 | Florida | 6% | 5 | New York | 5% |
| | **Subtotal** | **45%** | | **Subtotal** | **44%** |

Note:
* Excludes tonnage to or from Illinois.

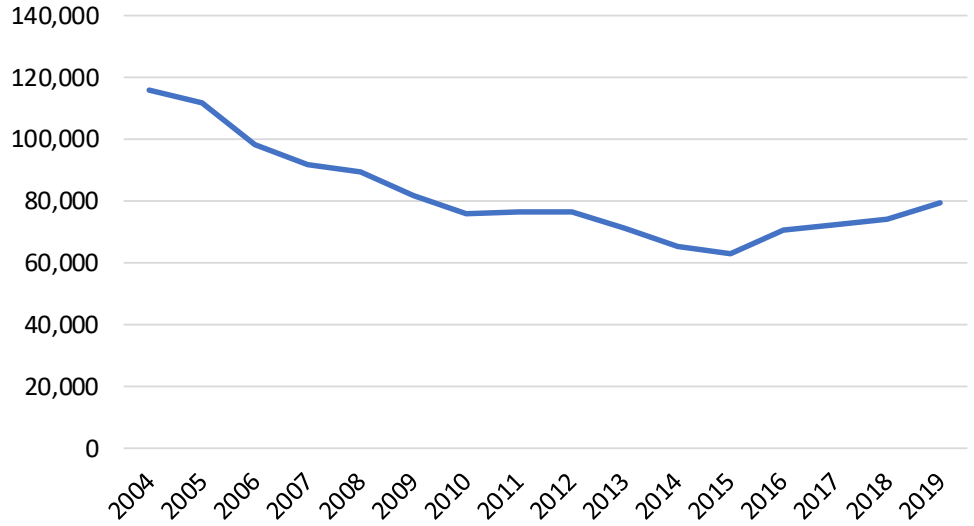
Sources: U.S. Department of Transportation, *Freight Analysis Framework V.4 (FAF4)*; Unison Consulting, Inc., June 2020.

[25] Rankings obtained from Airport Council International, North America, 2018 North American Airport Traffic Summary (Cargo).

### 3.4.3 HISTORICAL AIR CARGO TRENDS

**Figure 3.4-5** shows the historical trends in STL's air cargo tonnage, which declined steadily from 2004 through 2015. Following the dehubbing of American Airlines at STL, the Airport's cargo traffic continued to decline consistent with national trends during the Great Recession of 2008-2009. The slow recovery in air cargo traffic after the recession was hindered further by high fuel prices between 2011 and late 2014. After reaching its lowest point in 2015, STL's air cargo tonnage grew at an annual average rate of 6 percent through 2019. A new daily all-cargo flight by Amazon Air that began in September 2019 helped accelerate the growth in STL's air cargo.

**Figure 3.4-5: Historical Trends in Air Cargo Tonnage (Short Tons) (2004-2019)**

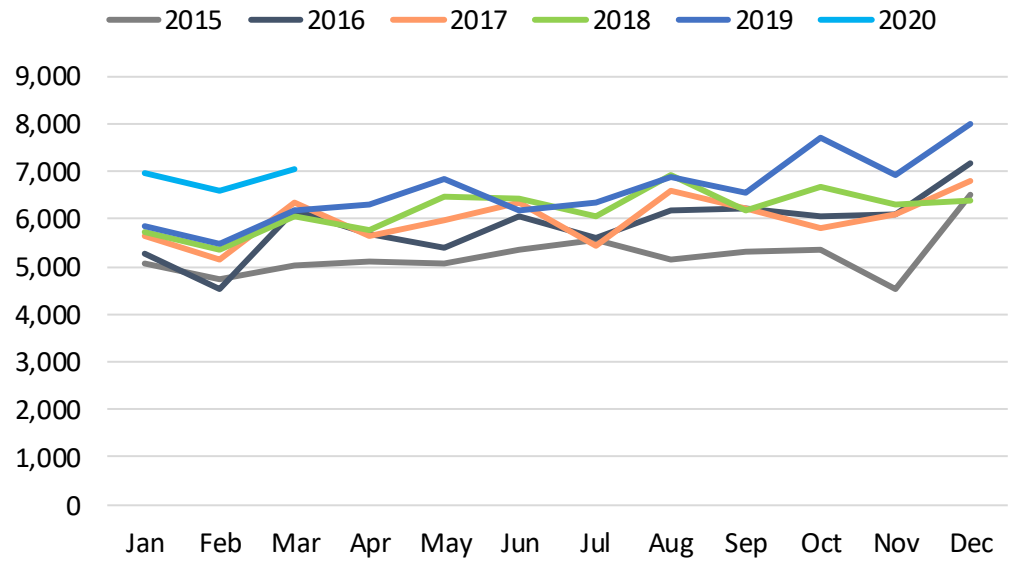



Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

In 2020, STL's cargo tonnage has increased considerably due to the new Amazon Air service at STL, and the surge in demand for medical equipment due to the COVID-19 pandemic. Air cargo tonnage in the first quarter of 2020 increased nearly 18 percent from the same period in 2019.

**Figure 3.4-6** shows the monthly trends in total cargo tonnage at STL for 2020 and the past five years. Although the Airport's market exhibits inconsistent peak seasons for air cargo tonnage, December accounts for the highest share of monthly traffic most frequently. For the STL ALPU, peak months are useful for gauging the adequacy of airport capacity.

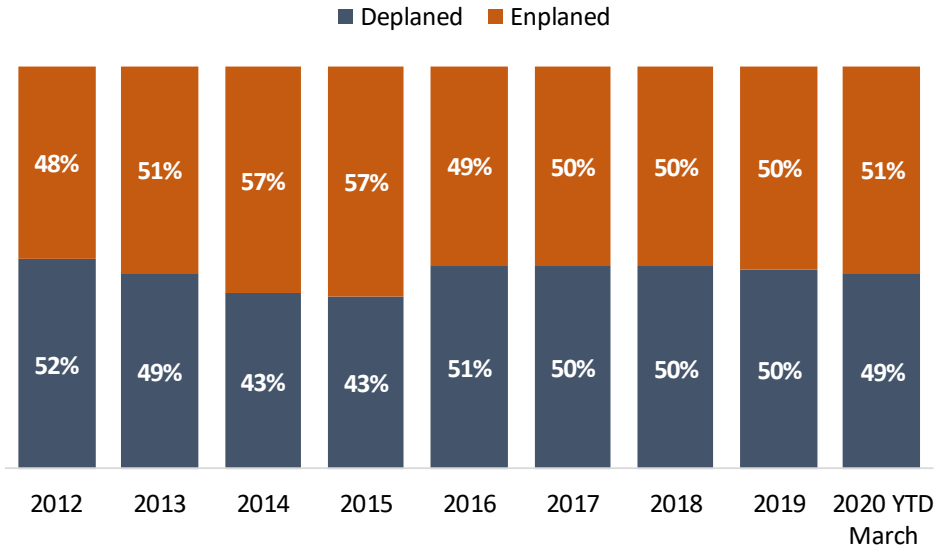
**Figure 3.4-6: Monthly Trends in Air Cargo (Tons)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

**Figure 3.4-7** provides the relative shares of enplaned and deplaned cargo over the past eight years. STL's outbound market was steadily outgrowing the Airport's inbound market through 2015, approaching a 60 percent/40 percent split. The rebound in total air cargo tonnage in 2016 was primarily driven by inbound air cargo, which jumped to a 51 percent share in 2016 after levelling off at 43 percent the previous year. The shares of outbound and inbound air cargo tonnage have remained relatively stable (around 50 percent) since 2016. Typically, all-cargo carriers make additional stops between STL and a cargo hub airport to resolve imbalances in inbound and outbound freight.

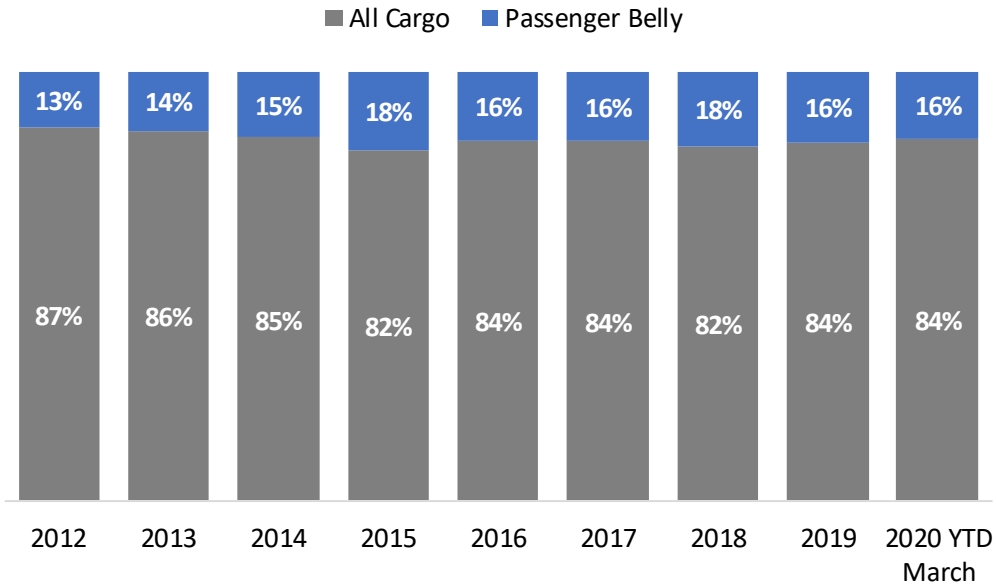
**Figure 3.4-7: Shares in Enplaned and Deplaned Air Cargo Tonnage (2009-2018)**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

**Figure 3.4-8** shows the annual trends in the shares of cargo carried by all-cargo carriers and passenger carriers. The vast majority of STL's freight traffic (over 80 percent) has historically been handled by all-cargo carriers. FedEx Express and UPS Airlines, the largest air cargo integrators, account for 50 percent and 30 percent of STL's annual cargo tonnage, respectively. Amazon Air's growing presence at STL has also contributed to the air cargo share of all-cargo operators at STL. Passenger carriers, which transport cargo belly holds, account for approximately 16 percent of STL's cargo traffic.

**Figure 3.4-8: All-Cargo and Passenger Carrier Shares of Cargo Tonnage**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

## *3.4.4 FORECAST AIR CARGO ACTIVITY*

The short-term forecast for air cargo activity captures the latest growth trends in air cargo tonnage at STL. In the nine-month period of FY2020 ending March 2020, air cargo tonnage increased 12.7 percent year-over-year. With passenger belly cargo traffic falling nearly 2 percent, the primary drivers of this growth are all-cargo carriers. Air cargo tonnage carried by all-cargo carriers grew nearly 16 percent over this period. Although the largest all-cargo carrier (FedEx Express) has seen its traffic decline 1.5 percent, UPS grew its cargo tonnage by 4.5 percent, and Amazon Air's new service has added nearly 7,000 tons of new air cargo traffic to STL since September 2019.

Due to increased demand for personal protective equipment (PPEs) during the COVID-19 pandemic, STL's air cargo tonnage increased 14 percent in March 2020, compared with March 2019. All-cargo carriers have driven growth in STL's air cargo in FY2020, compensating for the sharp decrease in belly cargo capacity resulting from cuts and groundings in passenger airline flights.

Although air cargo traffic is expected to continue growing in the short-term due to increased demand for health service supplies and equipment, the negative economic impacts of the COVID-19 pandemic have

already reduced global demand for air cargo transportation. International Air Transport Association (IATA), an airline trade organization, tracked the declining trends in air cargo demand early this year due to the pandemic, after reporting 2019 as the worst year for air cargo demand since 2009. IATA and the International Civil Aviation Organization (ICAO) also documented the slump in air cargo demand in March as the pandemic spread across the globe.[26], [27] Based on the latest global trade forecasts from the World Trade Organization (WTO), IATA expects air cargo activity to decrease significantly in the near term due to sharp declines in global economic activity across various sectors.[28]

Similar to the passenger demand forecasts, forecast development for air cargo activity at STL also follows a hybrid approach. Different modeling techniques and different data sources are used to develop traffic forecasts for the three phases of traffic growth in the 20-year ALPU forecast period:

#### 3.4.4.1 SHORT-TERM PHASE (DECLINE)

Reflecting year-to-date trends and the capacity crunch of belly cargo space, STL's air cargo traffic is forecast to grow 10 percent in FY2020, largely buoyed up by new service from Amazon Air and the increased demand for medical equipment needed for the pandemic's relief efforts. In FY2021, air cargo tonnages are forecast to decline at STL, consistent with the expected slowdown in global air cargo demand. The projected declines in tonnage are 23.2 percent (Scenario 1), 27.2 percent (Scenario 2) and 30.4 percent (Scenario 3). The three scenarios are modeled to be proportionate to the severity of the unfolding recession's impact on air transport demand at STL.

#### 3.4.4.2 MEDIUM-TERM PHASE (RECOVERY)

Air cargo traffic is projected to gradually return to pre-COVID-19 levels in the following recovery timelines:

- Under Scenario 1 – STL total air cargo increases from an estimated 64,000 tons at its lowest point in FY2021 to 80,000 tons, the pre-COVID-19 level, by FY2024. The average annual growth over this 3-year period is 7.6 percent.
- Under Scenario 2 – STL total air cargo decreases to 60,000 tons in FY2021 and then grows 5.6 percent annually to reach 80,000 tons by FY2027, achieving pre-COVID-19 levels within 5 years.
- Under Scenario 3 – STL total air cargo decreases to 58,000 tons in FY2021 and then grows 3.6 percent annually to reach almost 80,000 tons (pre-COVID-19 level) by FY2030.

[26] International Civil Aviation Organization, *Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis,* April 2020, http://www.capsca.org/Documentation/CoronaVirus/ICAO%20Coronavirus%202020%2004%2029%20Economic%20Impact.pdf

[27] International Air Transport Association, *Air Cargo Market Analysis*, March 2020, https://www.iata.org/en/iata-repository/publications/economic-reports/air-cargo-market-analysis---march-2020/.

[28] International Air Transport Association, *IATA Economics' Chart of the Week*, April 9, 2020, https://www.iata.org/en/iata-repository/publications/economic-reports/global-trade-forecast-points-to-a-steep-decline-in-air-cargo-volumes/#__prclt=aXpdmteF

### 3.4.4.3 LONG-TERM PHASE (GROWTH)

After the COVID-19 recovery period, the long-term growth of STL's air cargo tonnage is forecast using regional freight growth rates from FAF, a freight modeling database and tool developed through a partnership between BTS and FHWA. FAF provides detailed estimates of existing freight movement, including foreign trade and domestic goods, across and within freight regions and states in the United States. The current version of FAF (FAF4), which is calibrated with the 2012 Commodity Flow Survey (CFS) data and international trade data from the Census Bureau, combines a wide range of data sources to construct its database and freight flow estimates. Beyond the base year of 2012, FAF provides estimates of freight movement for 2013 through 2018, and forecasts through 2045 in 5-year intervals. The database also provides region-, commodity- and mode-specific freight-growth projections.

STL's air cargo activity is forecast at a regional level, while accounting for national goods-movement dynamics that impact local and regional cargo demand. Annual average growth rates from FAF for the St. Louis MO-IL (MO Part) FAF Zone for the forecast period are applied to the estimated air cargo tonnage at STL. Freight flows by air and alternate ground modes for transporting air freight (truck, rail and multiple modes) were first selected from the FAF database. This approach assumes that (1) the air mode will retain its share among the selected freight transport modes and (2) STL will maintain its share (100 percent) of the FAF zone's local air cargo activity over the ALPU forecast period.[29] FAF provides high, mid-, and low-range projections, which are applied to the three ALPU forecasting scenarios, Scenario 1, Scenario 2, and Scenario 3, respectively.

- Under Scenario 1 – After recovering to pre-COVID-19 levels in FY2024, STL total air cargo grows at an annual average rate of 1.6 percent through FY2040, reaching approximately 102,000 tons. The average annual growth rate over the 20-year period from FY2019 is 1.4 percent, while the annual average growth rate from the trough in FY2021 through FY2040 is 2.5 percent.
- Under Scenario 2 – STL total air cargo returns to pre-COVID-19 levels in FY2026 and then grows 1.3 percent each year to reach 94,000 tons by FY2040. The average annual growth rate over the 20-year period from FY2019 is 1.1 percent, while the annual average growth rate from the trough in FY2021 through FY2040 is 2.4 percent.
- Under Scenario 3 – STL total air cargo returns to pre-COVID-19 levels by FY2030 and then grows 0.9 percent each year to reach 87,000 tons by FY2040. The average annual growth rate over the 20-year period from FY2019 is 0.7 percent. The annual average growth rate from the trough in FY2021 through FY2040 is 2.2 percent.

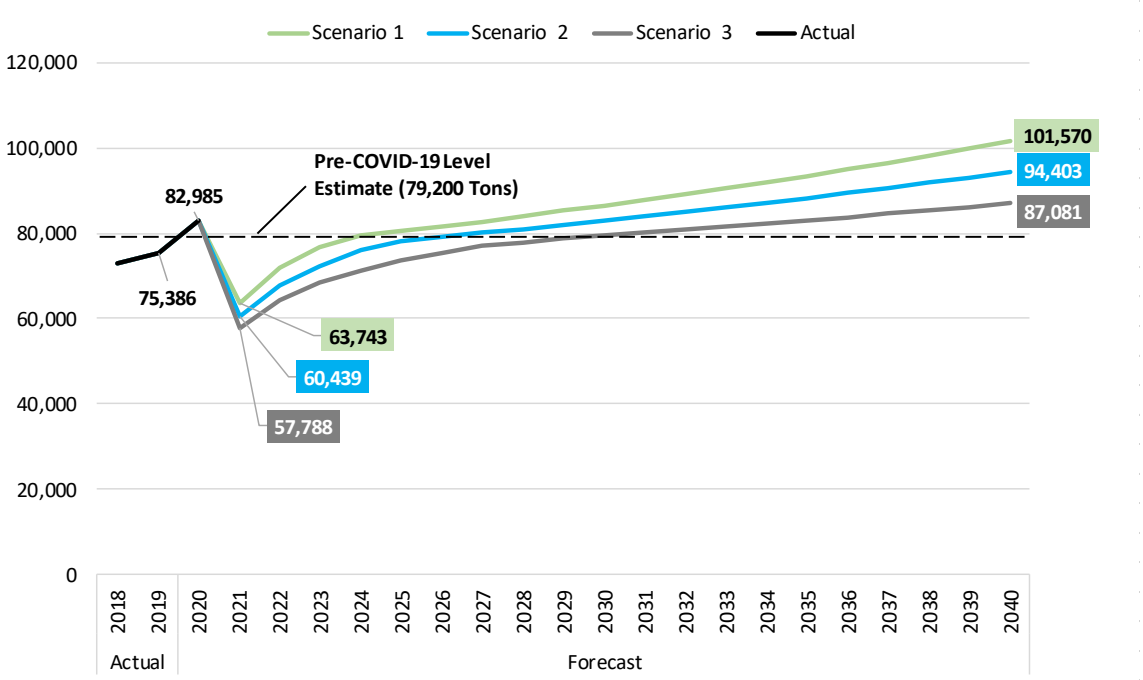
For ALPU planning purposes, the Airport sponsor also designates Scenario 1 as the preferred planning scenario for air cargo activity. The strategy is to plan for fast recovery and maintain flexibility to delay

[29] Note that FAF traffic flows are commodity based: regional truck flows that are not transporting FAF commodities are excluded (e.g., trucks transporting construction equipment and delivery-service trucks are not included). Commodities transported by Air may be recorded under the multiple modes & mail for shipments weighing 100 pounds or less (e.g., express freight/mail), even though the Air mode includes truck-air freight for shipments generally weighing more than 100 pounds.

planning and implementation of capital projects if actual recovery progresses slower as projected in either Scenario 2 or Scenario 3.

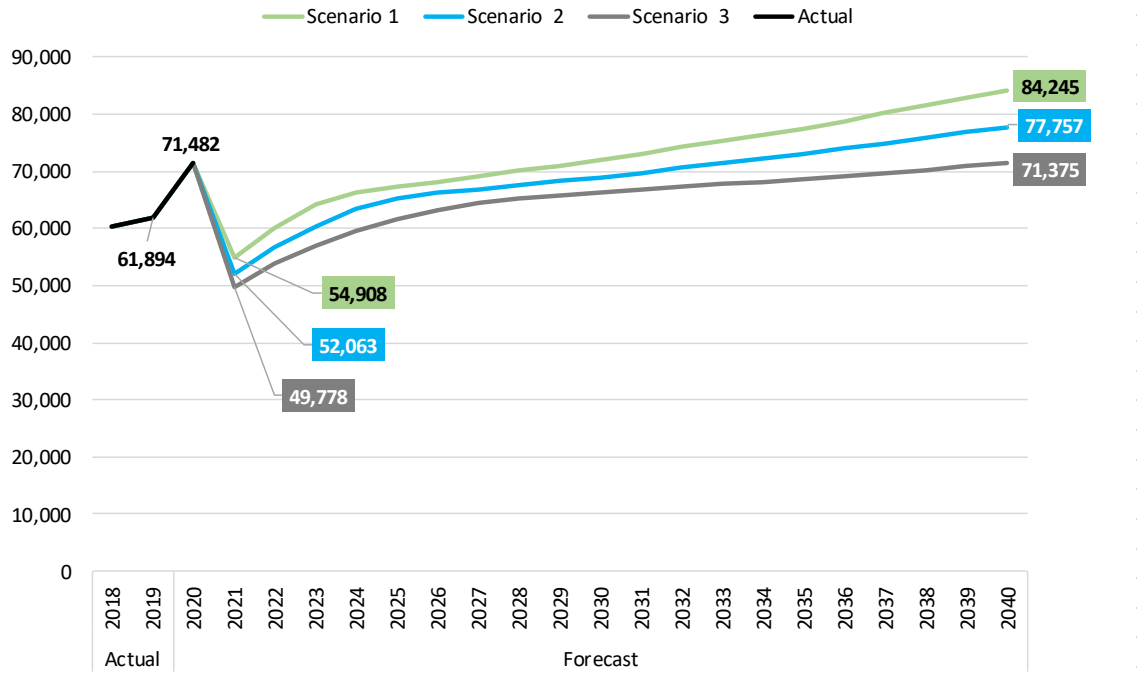
In all three scenarios, all-cargo carriers maintain a combined share of over 80 percent of air cargo traffic at STL. Within the all-cargo carrier group, FedEx Express takes the predominant share. All-cargo aircraft operations and landed weight by aircraft type remain constant at the FY2021 levels, because much of the growth in total cargo can be accommodated by increasing load factors on existing flights. Cargo load factors, which currently average just over 50 percent of payload capacity, are expected to decline to 37 percent by FY2021 and gradually return to an average of 50 percent before the end of the forecast period. **Figure 3.4-9**, **Figure 3.4-10**, and **Figure 3.4-11** show the three scenarios for forecast air cargo tonnage at STL for (1) all carriers, (2) all-cargo carriers, and (3) passenger carriers, respectively.

**Figure 3.4-9: Air Cargo Forecast Tonnage by Scenario – All Carriers (FY2018-FY2040)**



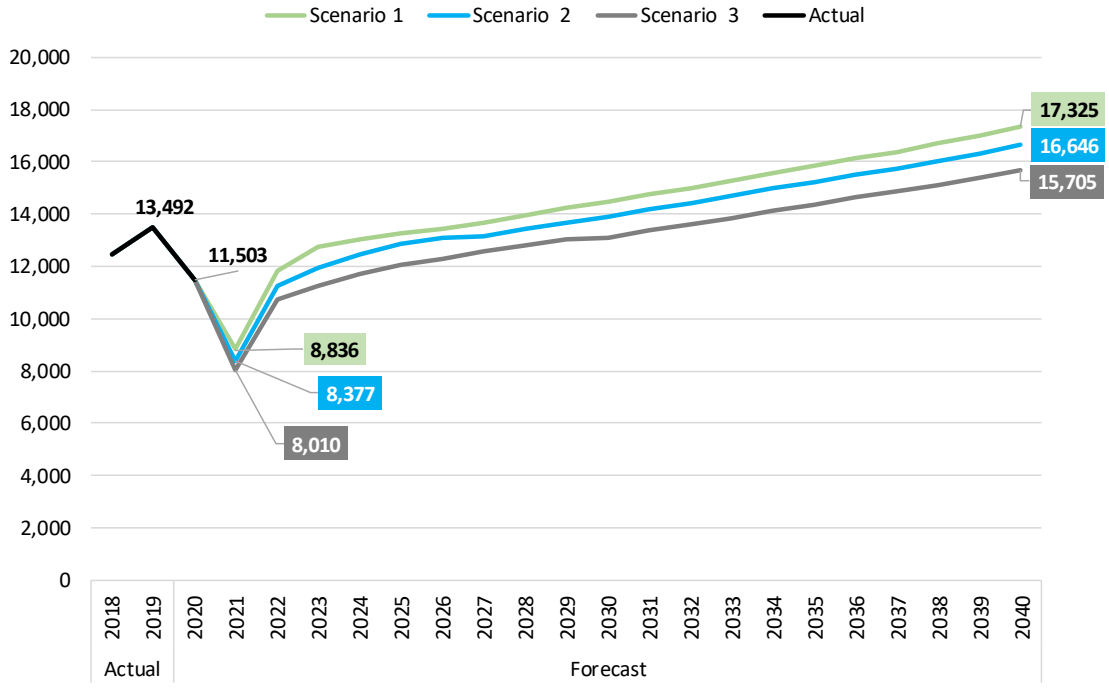

Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; U.S. Department of Transportation, Freight Analysis Framework V.4 (FAF4); Unison Consulting, Inc., June 2020.

## Figure 3.4-10: STL Air Cargo Forecast Tonnage by Scenario – All-Cargo Carriers, FY2018-FY2040




Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; U.S. Department of Transportation, Freight Analysis Framework V.4 (FAF4); Unison Consulting, Inc., June 2020.

## Figure 3.4-11: STL Air Cargo Forecast Tonnage by Scenario – Passenger Carriers, FY2018-FY2040




Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; U.S. Department of Transportation, Freight Analysis Framework V.4 (FAF4); Unison Consulting, Inc., June 2020.

**Table 3.4-4** summarizes the forecast cargo tonnage and corresponding annual average growth rates for key forecast years.

**Table 3.4-4: STL Forecast Air Cargo Tonnage by Scenario, FY2018-FY2040**

| STL Commercial Air cargo Tons - All Carriers | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Actual | | Forecast | | | | | Compund Annual Growth Rate | | |
| Scenario | 2018 | 2019 | 2020 | 2021 | 2025 | 2030 | 2040 | 2019-2040 | 2020-2040 | 2021-2040 |
| 1 | 72,810 | 75,386 | 82,985 | 63,743 | 80,438 | 86,496 | 101,570 | 1.4% | 1.0% | 2.5% |
| 2 | 72,810 | 75,386 | 82,983 | 60,439 | 78,106 | 82,867 | 94,403 | 1.1% | 0.6% | 2.4% |
| 3 | 72,810 | 75,386 | 82,985 | 57,788 | 73,624 | 79,443 | 87,081 | 0.7% | 0.2% | 2.2% |

| STL Commercial Air cargo Tons - All Cargo Carriers | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Actual | | Forecast | | | | | Compund Annual Growth Rate | | |
| Scenario | 2018 | 2019 | 2020 | 2021 | 2025 | 2030 | 2040 | 2019-2040 | 2020-2040 | 2021-2040 |
| 1 | 60,355 | 61,894 | 71,482 | 54,908 | 67,193 | 72,026 | 84,245 | 1.5% | 0.8% | 2.3% |
| 2 | 60,355 | 61,894 | 71,482 | 52,063 | 65,270 | 68,964 | 77,757 | 1.1% | 0.4% | 2.1% |
| 3 | 60,355 | 61,894 | 71,482 | 49,778 | 61,575 | 66,326 | 71,375 | 0.7% | 0.0% | 1.9% |

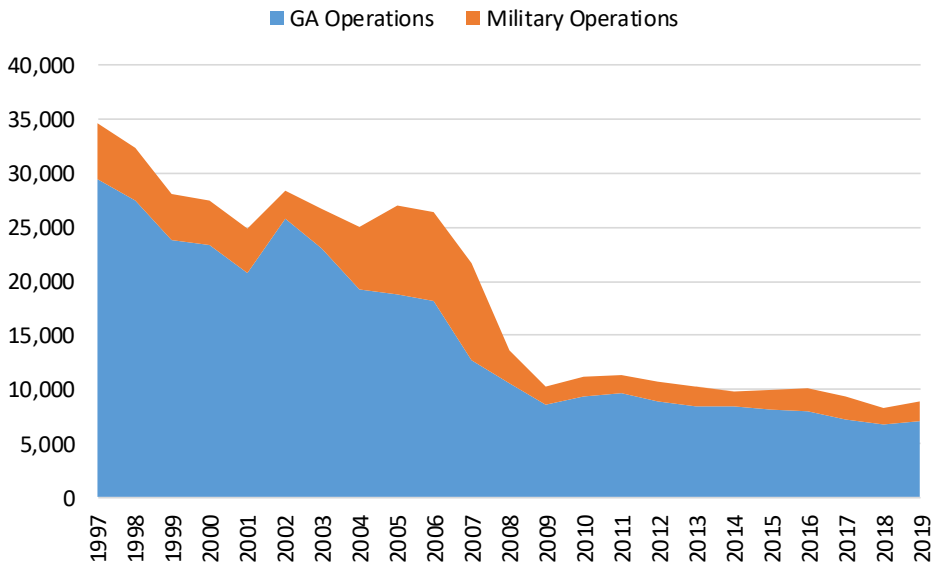
| STL Commercial Air cargo Tons - Passenger Carriers | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Actual | | Forecast | | | | | Compund Annual Growth Rate | | |
| Scenario | 2018 | 2019 | 2020 | 2021 | 2025 | 2030 | 2040 | 2019-2040 | 2020-2040 | 2021-2040 |
| 1 | 12,454 | 13,492 | 11,503 | 8,836 | 13,245 | 14,470 | 17,325 | 1.2% | 2.1% | 3.6% |
| 2 | 12,454 | 13,492 | 11,501 | 8,377 | 12,836 | 13,903 | 16,646 | 1.0% | 1.9% | 3.7% |
| 3 | 12,454 | 13,492 | 11,503 | 8,010 | 12,049 | 13,117 | 15,705 | 0.7% | 1.6% | 3.6% |

Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; U.S. Department of Transportation, Freight Analysis Framework V.4 (FAF4); Unison Consulting, Inc., June 2020.

## 3.5 NONCOMMERCIAL AVIATION ACTIVITY

Noncommercial aviation activity consists of general aviation (GA) and military operations. **Figure 3.5-1** shows the historical trends and shares of GA and military operations at STL from 1997. Both GA and military flights have declined at STL since the 1990s, with GA activity declining slightly faster. GA operations have maintained a share of total noncommercial operations higher than 80 percent for over two decades. Both categories of noncommercial operations declined significantly during the Great Recession. Noncommercial operations suffered a decline greater than 60 percent from levels reached in the mid-2000s. Since 2009, GA and military operations levelled off under 12,000 annual operations and have not recovered to historical levels. In total, GA and military operations have remained below 10,000 operations since 2016 and are expected to remain at the current levels over the 20-year ALPU forecast period.

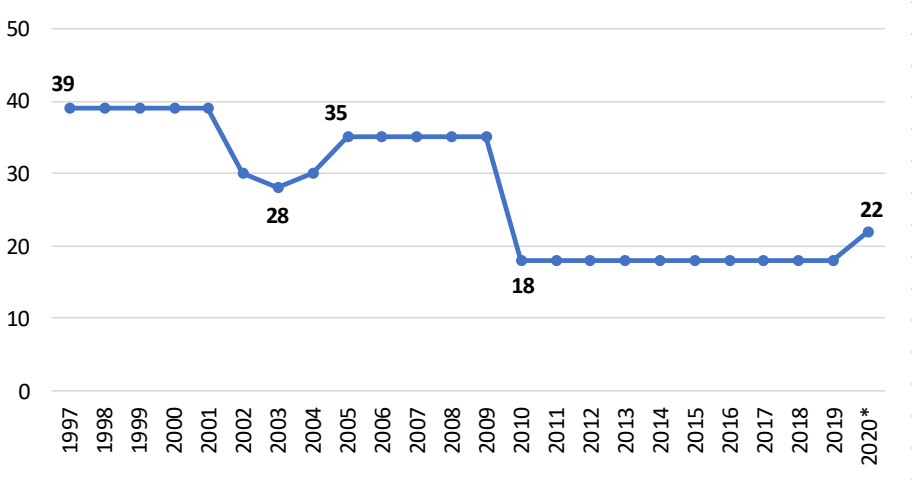
**Figure 3.5-1: Trends in Noncommercial Aviation Activity (CY1997-2019)**




Sources: Federal Aviation Administration, *Air Traffic Activity Data System*, 2020 (STL aircraft operations); Unison Consulting, Inc., June 2020.

**Figure 3.5-2** shows the number of based aircraft at STL, which ranged from 18 to 39 since 1997. The most recent number reported in the Airport Master Record filed with the FAA shows an increase from 18 to 22. The filing also indicates that 20 of the GA based aircraft are jet aircraft, two of which are Beech 1900 aircraft owned by Boeing and configured for military sensor research. These based aircraft are flown to cover a variety of commercial, GA and military service needs. Limited hangar space will keep the number of based aircraft at STL steady over the forecast period.

**Figure 3.5-2: Trends in Based Aircraft (Federal Fiscal Year 1997-2019)**




Note: * 2020 data obtained from Airport Master Record filed with the Federal Aviation Administration.

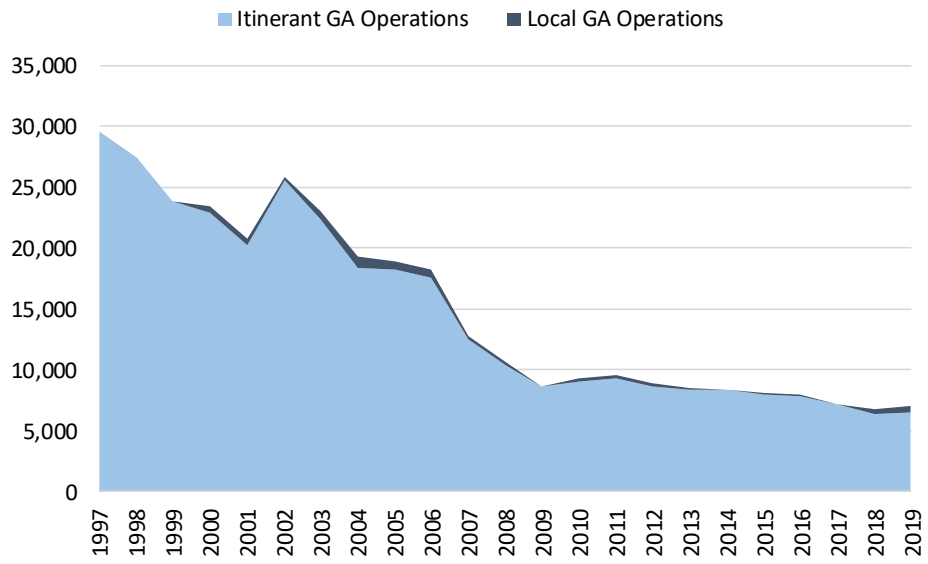
Sources: Federal Aviation Administration (FAA), Terminal Area Forecast (STL historical based aircraft between 1997-2019); FAA, *Airport Master Record - Form 5010*, June 2020 (2020 STL based aircraft); Unison Consulting, Inc., June 2020.

### 3.5.1 GENERAL AVIATION ACTIVITY – AIRPORT TRENDS

STL's GA activity, comprised of itinerant and local operations, covers noncommercial and non-military passenger or cargo services provided at the airport. GA activity typically satisfies regional demands for air transport, including business travel, emergency transport, flight instruction, and recreational flying. It is therefore sensitive to both local and national economic conditions. Itinerant operations are flights going to and coming from a different airport, while local GA operations include flights within the local traffic pattern of the airport.

As shown in **Figure 3.5-3,** itinerant operations historically accounted for nearly all GA operations at STL. Local operations have historically accounted for only around 2 percent of total GA operations. In 2019, however, local operations increased in share to 5.4 percent.

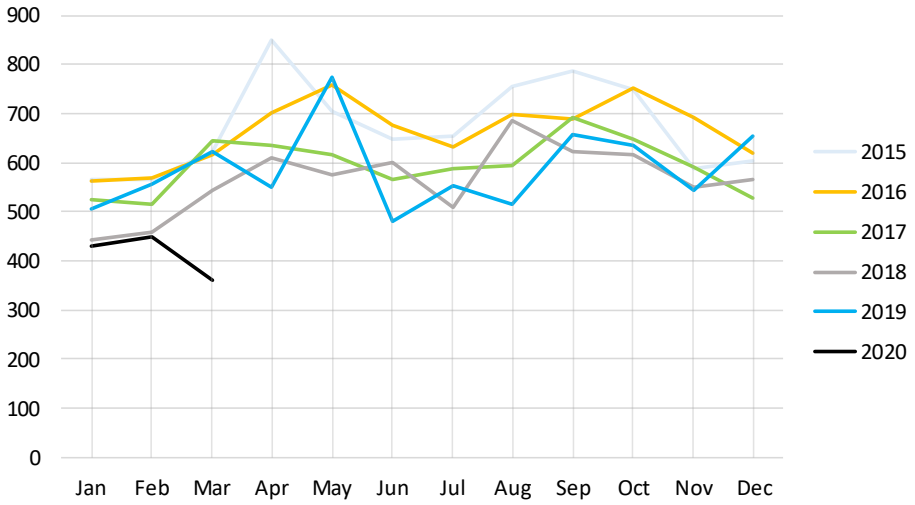
**Figure 3.5-3: Itinerant and Local General Aviation Operations (CY1997-2019)**




Sources: Federal Aviation Administration, *Air Traffic Activity Data System*, 2020 (STL aircraft operations); Unison Consulting, Inc., June 2020.

**Figure 3.5-4** provides the monthly trends of all GA operations at STL between January 2015 and March 2020. Similar to trends at other airports, STL's GA activity exhibits some seasonality, with peaks occurring most frequently in early spring and in the fall. The figure also shows that GA traffic declined significantly in 2020, likely reflecting the impacts of the COVID-19 pandemic on air travel. GA flights were down 27 percent year-to-date through March 2020, compared with the same three-month period in 2019. GA operations for March 2020 were down 42 percent, compared with March 2019.

**Figure 3.5-4: Monthly General Aviation Operations (Jan 2015 - Mar 2020)**

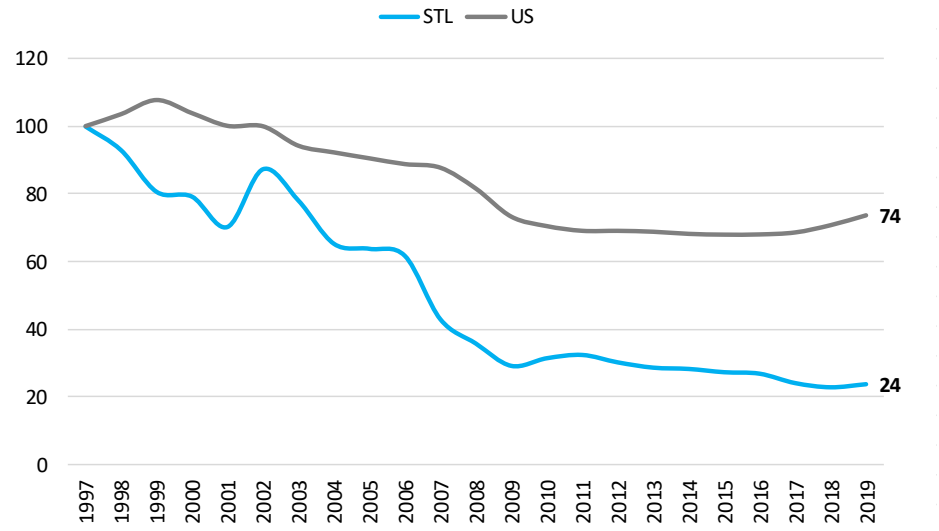



Sources: Federal Aviation Administration, *Air Traffic Activity Data System*, 2020 (STL aircraft operations); Unison Consulting, Inc., June 2020.

**Figure 3.5-5** shows the trends in GA operations at STL alongside national trends for over twenty years. GA operations at STL have mostly followed the declining trends in national GA activity, which began four decades ago. STL's GA activity, however, declined in the late 1990s and fell more precipitously during the Great Recession. The Airport's GA flights decreased 76 percent from 1997 through 2019, while U.S. GA operations decreased 26 percent from 1997 through 2019. The U.S. economic recessions, particularly the Great Recession and the subsequent slow economic recovery, depressed GA activity nationwide. Other factors also contributed to the decrease in GA activity. The pilot population has shrunk since reaching its peak in the 1980s. GA aircraft production has also decreased and has not kept up with the pace of aircraft retirement from the existing fleet. Finally, aviation fuel prices rose to record high levels before decreasing in 2014.

In 2020, U.S. GA operations posted a 1 percent year-over-year decrease during the period January through March and a 21 percent year-over-year decrease in March. The decreases in GA operations likely reflecting impacts from the COVID-19 pandemic.

**Figure 3.5-5: General Aviation Operations Comparison - Indexed (1997 Level = 100)**




Note:
STL – St. Louis Lambert International Airport

Sources: Federal Aviation Administration, *Air Traffic Activity Data System*, 2020 (aircraft operations); Unison Consulting, Inc., June 2020.

## 3.5.2 U.S. GENERAL AVIATION OUTLOOK

Nationally, GA operations are sensitive to overall economic conditions—decreasing during periods of economic recession and increasing during periods of economic expansion. Over the long-term, supply factors have dampened growth in GA activity. The pilot population has shrunk since reaching its peak in the 1980s. GA aircraft production has not kept up with the pace of aircraft retirement from the existing fleet. Finally, aviation fuel prices rose to record high levels before declining sharply in 2014.

The FAA Aerospace Forecast for FY2020-2040 presents a stable outlook for general aviation. The FAA projects changes in GA fleet mix driven by growth in turbine, experimental, and light sport fleets and decline in the fixed-wing piston fleet.

## 3.5.3 AIR TAXI OPERATIONS

Air Taxi operations are reported by individual operator and type of aircraft. Counts of air taxi operations are gleaned from the National Airspace System radar information and are reported together with commercial commuter operations in the FAA TAF. For the ALPU, the baseline number of air taxi operations at STL is estimated as the residual after subtracting total commercial aircraft operations (passenger and all-cargo) from the sum of air carrier and air taxi/commuter operations reported in the TAF. The ALPU forecast assumes air taxi operations grow at the same rates projected for total commercial aircraft operations.

### *3.5.4 FORECASTS OF GA, MILITARY, AND AIR TAXI OPERATIONS*

**Table 3.5-1** summarizes the forecasts for GA, military and air taxi operations. GA and military operations are expected to stay constant over the forecast period. Air taxi operations are projected grow at the same rates as commercial aircraft operations, maintaining a constant share of the sum of air carrier and air taxi/commuter operations in the TAF grouping.

## Table 3.5-1: Forecast GA, Military and Air Taxi Operations at STL, FY Basis

### *Noncommercial Aviation*

| | Historical | | | | | | Forecast | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***GA & Military*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** |
| **Operations - GA Itinerant** | 6,713 | 6,416 | 6,110 | 6,110 | 6,110 | 6,110 | 6,416 | 6,416 | 6,416 | 6,416 | 6,416 |
| **Operations - GA Local** | 160 | 621 | 318 | 318 | 318 | 318 | 621 | 621 | 621 | 621 | 621 |
| **Operations - GA Subtotal** | **6,873** | **7,037** | **6,428** | **6,428** | **6,428** | **6,428** | **7,037** | **7,037** | **7,037** | **7,037** | **7,037** |
| **Operations - Military** | 1,718 | 1,625 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 |
| **Operations - Noncommercial Total** | **8,591** | **8,662** | **8,208** | **8,208** | **8,208** | **8,208** | **8,816** | **8,816** | **8,816** | **8,816** | **8,816** |
| **Based Aircraft** | 18 | 18 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |

### *Air Taxi - Scenario 1*

| | Historical | | Forecast | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** |
| **Operations** | 10,495 | 11,643 | 11,286 | 5,223 | 9,647 | 10,888 | 11,393 | 11,383 | 11,673 | 12,644 | 13,847 |

### *Air Taxi - Scenario 2*

| | Historical | | Forecast | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** |
| **Operations** | 10,495 | 11,643 | 11,225 | 4,703 | 8,726 | 9,542 | 10,578 | 11,273 | 11,935 | 12,597 | 13,760 |

### *Air Taxi - Scenario 3*

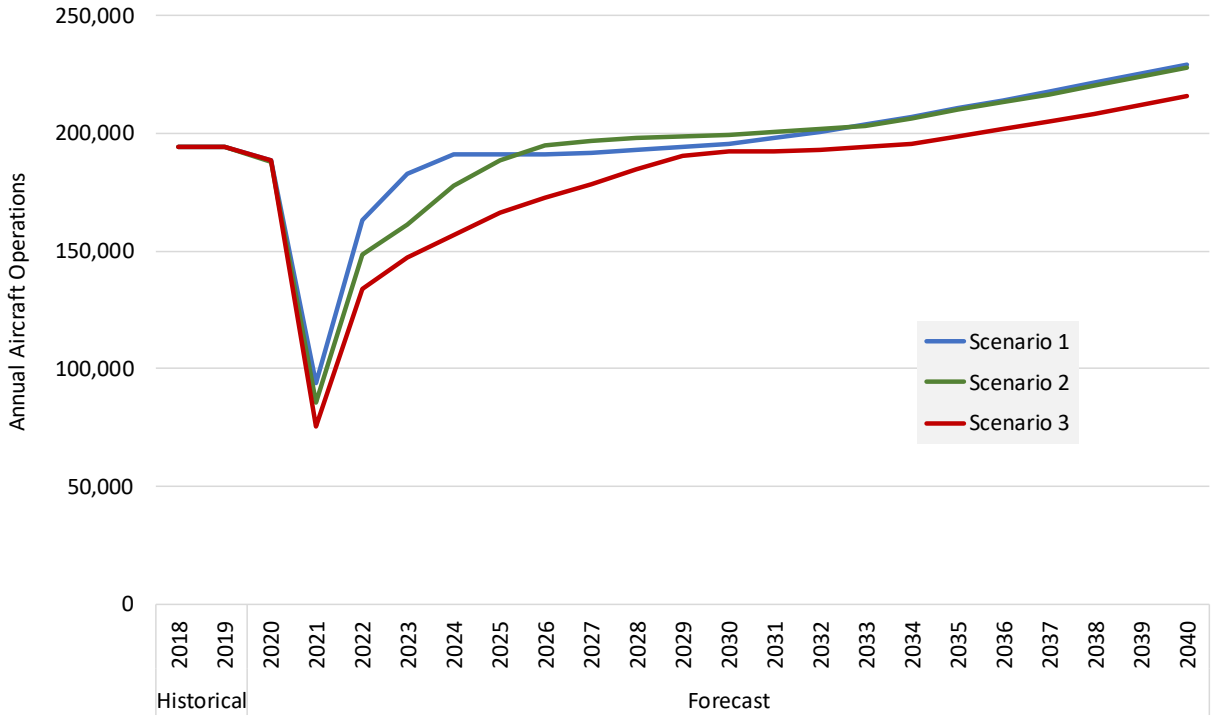
| | Historical | | Forecast | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** |
| **Operations** | 10,495 | 11,643 | 11,281 | 4,047 | 7,800 | 8,635 | 9,256 | 9,833 | 11,462 | 11,894 | 12,985 |

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; A, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

# 3.6 SUMMARY OF FORECASTS

This section provides a summary graph of forecast aircraft operations (**Figure 3.6-1**), as well as summary tables of the three ALPU forecast scenarios presented in the Airport sponsors' fiscal year ending June (**Table 3.6-1**, **Table 3.6-2**, and **Table 3.6-3**).

**Figure 3.6-1: Summary of Aircraft Operations Forecasts**




Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Unison Consulting, Inc., June 2020.

## Table 3.6-1: STL ALPU 2020 Forecast Summary, FY - Scenario 1 – Three-Year Recovery

### *Commercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,581,055 | 2,992,928 | 6,048,202 | 7,428,144 | 7,979,645 | 8,093,867 | 8,842,483 | 9,690,406 | 10,639,736 | 1.4% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,503 | 8,836 | 11,842 | 12,743 | 13,058 | 13,245 | 14,470 | 15,858 | 17,325 | 1.2% |
| **Seats** | 9,605,642 | 9,946,484 | 9,131,568 | 4,384,848 | 8,146,619 | 9,374,912 | 9,927,616 | 9,929,365 | 10,224,269 | 11,241,557 | 12,426,127 | 1.1% |
| **Landings** | 86,561 | 85,966 | 83,331 | 38,563 | 71,231 | 80,393 | 84,118 | 84,046 | 86,186 | 93,354 | 102,241 | 0.8% |
| **Avg. Seats Per Landing** | 111 | 116 | 110 | 114 | 114 | 117 | 118 | 118 | 119 | 120 | 122 | |
| **Boarding Load Factor** | 79.2% | 79.6% | 61.1% | 68.3% | 74.2% | 79.2% | 80.4% | 81.5% | 86.5% | 86.2% | 85.6% | |
| **Operations** | 173,031 | 171,909 | 166,639 | 77,116 | 142,444 | 160,763 | 168,213 | 168,069 | 172,349 | 186,683 | 204,454 | 0.8% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,241 | 3,946 | 7,333 | 8,427 | 8,916 | 8,920 | 9,204 | 10,140 | 11,275 | 1.2% |
| | **Historical** | | **Forecast** | | | | | | | | | **CAGR** |
| ***All-Cargo Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Cargo (short tons)** | 60,355 | 61,894 | 71,482 | 54,908 | 59,959 | 64,096 | 66,340 | 67,193 | 72,026 | 77,522 | 84,245 | 1.5% |
| **Landings** | 1,527 | 1,514 | 1,793 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 0.8% |
| **Operations** | 3,054 | 3,028 | 3,586 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 0.8% |
| **Landed Weight (million lbs.)** | 362 | 370 | 446 | 428 | 428 | 430 | 432 | 433 | 437 | 439 | 439 | 0.8% |

### *Air Taxi*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 10,495 | 11,643 | 11,286 | 5,223 | 9,647 | 10,888 | 11,393 | 11,383 | 11,673 | 12,644 | 13,847 | 0.8% |

### *Noncommercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***GA & Military*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations - GA Itinerant** | 6,713 | 6,416 | 6,110 | 6,110 | 6,110 | 6,110 | 6,416 | 6,416 | 6,416 | 6,416 | 6,416 | 0.0% |
| **Operations - GA Local** | 160 | 621 | 318 | 318 | 318 | 318 | 621 | 621 | 621 | 621 | 621 | 0.0% |
| **Operations - GA Subtotal** | **6,873** | **7,037** | **6,428** | **6,428** | **6,428** | **6,428** | **7,037** | **7,037** | **7,037** | **7,037** | **7,037** | 0.0% |
| **Operations - Military** | 1,718 | 1,625 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 0.4% |
| **Operations - Noncommercial Total** | **8,591** | **8,662** | **8,208** | **8,208** | **8,208** | **8,208** | **8,816** | **8,816** | **8,816** | **8,816** | **8,816** | 0.1% |
| **Based Aircraft** | 18 | 18 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 1.0% |

### *Commercial, Air Taxi & Noncommercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Total*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 195,171 | 195,242 | 189,718 | 94,103 | 163,855 | 183,415 | 191,977 | 191,824 | 196,394 | 211,699 | 230,673 | 0.8% |

Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; Federal Aviation Administration, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

## Table 3.6-2: STL Master Plan 2020 Forecast Summary, FY - Scenario 2 – Five-Year Recovery

### *Commercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,579,101 | 2,547,804 | 5,145,131 | 6,149,009 | 6,967,636 | 7,558,379 | 8,622,476 | 9,449,302 | 10,323,905 | 1.3% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,501 | 8,377 | 11,223 | 11,953 | 12,483 | 12,836 | 13,903 | 15,236 | 16,646 | 1.0% |
| **Seats** | 9,605,642 | 9,946,484 | 9,296,655 | 3,929,268 | 7,365,513 | 8,217,009 | 9,160,271 | 9,778,663 | 10,385,477 | 10,998,467 | 12,014,960 | 0.9% |
| **Landings** | 86,561 | 85,966 | 82,878 | 34,725 | 64,427 | 70,455 | 78,101 | 83,236 | 88,121 | 93,009 | 101,593 | 0.8% |
| **Avg. Seats Per Landing** | 111 | 116 | 112 | 113 | 114 | 117 | 117 | 117 | 118 | 118 | 118 | |
| **Boarding Load Factor** | 79.2% | 79.6% | 60.0% | 64.8% | 69.9% | 74.8% | 76.1% | 77.3% | 83.0% | 85.9% | 85.9% | |
| **Operations** | 173,031 | 171,909 | 165,735 | 69,440 | 128,837 | 140,892 | 156,181 | 166,450 | 176,219 | 185,994 | 203,160 | 0.8% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,235 | 3,495 | 6,559 | 7,311 | 8,153 | 8,710 | 9,290 | 9,930 | 10,939 | 1.0% |
| | **Historical** | | **Forecast** | | | | | | | | | **CAGR** |
| ***All-Cargo Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Cargo (short tons)** | 60,355 | 61,894 | 71,482 | 52,063 | 56,644 | 60,383 | 63,523 | 65,270 | 68,964 | 73,035 | 77,757 | 1.1% |
| **Landings** | 1,527 | 1,514 | 1,793 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 0.8% |
| **Operations** | 3,054 | 3,028 | 3,586 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 0.8% |
| **Landed Weight (million lbs.)** | 362 | 370 | 446 | 428 | 428 | 430 | 432 | 433 | 437 | 439 | 439 | 0.8% |

### *Air Taxi*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 10,495 | 11,643 | 11,225 | 4,703 | 8,726 | 9,542 | 10,578 | 11,273 | 11,935 | 12,597 | 13,760 | 0.8% |

### *Noncommercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***GA & Military*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations - GA Itinerant** | 6,713 | 6,416 | 6,110 | 6,110 | 6,110 | 6,110 | 6,416 | 6,416 | 6,416 | 6,416 | 6,416 | 0.0% |
| **Operations - GA Local** | 160 | 621 | 318 | 318 | 318 | 318 | 621 | 621 | 621 | 621 | 621 | 0.0% |
| **Operations - GA Subtotal** | **6,873** | **7,037** | **6,428** | **6,428** | **6,428** | **6,428** | **7,037** | **7,037** | **7,037** | **7,037** | **7,037** | 0.0% |
| **Operations - Military** | 1,718 | 1,625 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 0.4% |
| **Operations - Noncommercial Total** | **8,591** | **8,662** | **8,208** | **8,208** | **8,208** | **8,208** | **8,816** | **8,816** | **8,816** | **8,816** | **8,816** | 0.1% |
| **Based Aircraft** | 18 | 18 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 1.0% |

### *Commercial, Air Taxi & Noncommercial Aviation*

| | Historical | | | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Total*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 195,171 | 195,242 | 188,753 | 85,906 | 149,326 | 162,198 | 179,131 | 190,096 | 200,526 | 210,963 | 229,291 | 0.8% |

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Federal Aviation Administration, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

## Table 3.6-3: STL ALPU 2020 Forecast Summary, FY - Scenario 3 - Nine-Year Recovery

### *Commercial Aviation*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Passenger Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Enplanements** | 7,612,463 | 7,915,216 | 5,581,162 | 2,191,950 | 4,414,203 | 5,102,591 | 5,698,994 | 6,188,762 | 7,948,580 | 8,710,784 | 9,517,032 | 0.9% |
| **Cargo (short tons)** | 12,454 | 13,492 | 11,503 | 8,010 | 10,717 | 11,274 | 11,714 | 12,049 | 13,117 | 14,375 | 15,705 | 0.7% |
| **Seats** | 9,605,642 | 9,946,484 | 9,297,668 | 3,380,393 | 6,554,304 | 7,305,162 | 7,876,988 | 8,410,546 | 9,975,678 | 10,369,837 | 11,320,610 | 0.6% |
| **Landings** | 86,561 | 85,966 | 83,290 | 29,883 | 57,589 | 63,755 | 68,339 | 72,604 | 84,627 | 87,822 | 95,876 | 0.5% |
| **Avg. Seats Per Landing** | 111 | 116 | 112 | 113 | 114 | 115 | 115 | 116 | 118 | 118 | 118 | |
| **Boarding Load Factor** | 79.2% | 79.6% | 60.0% | 64.8% | 67.3% | 69.8% | 72.3% | 73.6% | 79.7% | 84.0% | 84.1% | |
| **Operations** | 173,031 | 171,909 | 166,558 | 59,759 | 115,162 | 127,493 | 136,659 | 145,189 | 169,230 | 175,621 | 191,726 | 0.5% |
| **Landed Weight (million lbs.)** | 8,566 | 8,794 | 8,241 | 3,007 | 5,839 | 6,513 | 7,027 | 7,505 | 8,920 | 9,358 | 10,303 | 0.8% |

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***All-Cargo Carriers*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Cargo (short tons)** | 60,355 | 61,894 | 71,482 | 49,778 | 53,760 | 57,040 | 59,492 | 61,575 | 66,326 | 68,675 | 71,375 | 0.7% |
| **Landings** | 1,527 | 1,514 | 1,793 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 1,778 | 0.8% |
| **Operations** | 3,054 | 3,028 | 3,586 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 3,556 | 0.8% |
| **Landed Weight (million lbs.)** | 362 | 370 | 446 | 428 | 428 | 430 | 432 | 433 | 437 | 439 | 439 | 0.8% |

### *Air Taxi*

| | Historical | | Forecast | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Air Taxi*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 10,495 | 11,643 | 11,281 | 4,047 | 7,800 | 8,635 | 9,256 | 9,833 | 11,462 | 11,894 | 12,985 | 0.5% |

### *Noncommercial Aviation*

| | Historical | | | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***GA & Military*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations - GA Itinerant** | 6,713 | 6,416 | 6,110 | 6,110 | 6,110 | 6,110 | 6,416 | 6,416 | 6,416 | 6,416 | 6,416 | 0.0% |
| **Operations - GA Local** | 160 | 621 | 318 | 318 | 318 | 318 | 621 | 621 | 621 | 621 | 621 | 0.0% |
| **Operations - GA Subtotal** | **6,873** | **7,037** | **6,428** | **6,428** | **6,428** | **6,428** | **7,037** | **7,037** | **7,037** | **7,037** | **7,037** | 0.0% |
| **Operations - Military** | 1,718 | 1,625 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 1,779 | 0.4% |
| **Operations - Noncommercial Total** | **8,591** | **8,662** | **8,208** | **8,208** | **8,208** | **8,208** | **8,816** | **8,816** | **8,816** | **8,816** | **8,816** | 0.1% |
| **Based Aircraft** | 18 | 18 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 1.0% |

### *Commercial, Air Taxi & Noncommercial Aviation*

| | Historical | | | | | | | | | | | CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Total*** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2030** | **2035** | **2040** | **2019-2040** |
| **Operations** | 195,171 | 195,242 | 189,632 | 75,570 | 134,725 | 147,891 | 158,287 | 167,394 | 193,064 | 199,887 | 217,083 | 0.5% |

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Federal Aviation Administration, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

## 3.7 COMPARISON WITH THE JANUARY 2020 TERMINAL AREA FORECAST

The ALPU forecast scenarios are compared with the TAF released in January 2020 (

Table **3.7-1** and **Table 3.7-2**). The ALPU forecast scenarios consider the impacts of the developing COVID-19 pandemic and the resulting deep economic recession, which are most severe in the short-term. As a result, the ALPU scenarios produce significantly lower forecasts than the TAF in the short-term. The ALPU forecasts, however, get closer to the TAF over time and meet the FAA Central Region approval thresholds as early as 2025 for certain measures and as early as 2030 in nearly all the key traffic measures.

Under normal circumstances, the FAA evaluates the consistency of airport sponsors' forecasts based on the following criteria:[30] The official FAA forms are included as **Appendix 3A** to this chapter.

> "For all classes of airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet the following criterion:
>
> - Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period"

The critical aircraft determination, which is an analysis of the current and projected fleet mix for STL is provided in **Appendix 3B.**

[30] Federal Aviation Administration, *Review and Approval of Aviation Forecasts*, June 2008.

## Table 3.7-1: Comparison of the Airport Layout Plan Update Forecasts with the 2020 Terminal Area Forecast (Federal Fiscal Year)

**Enplanements (1,000s)**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Master Plan Sc 1** | 7,953,517 | 5,608,062 | 3,007,410 | 8,133,033 | 8,885,271 | 10,691,221 | 0.4% | 1.8% | 1.9% | 1.4% |
| **Master Plan Sc 2** | 7,953,517 | 5,606,098 | 2,560,132 | 7,594,953 | 8,664,200 | 10,373,862 | -0.8% | 2.7% | 1.8% | 1.3% |
| **Master Plan Sc 3** | 7,953,517 | 5,608,169 | 2,202,556 | 6,218,709 | 7,987,042 | 9,563,084 | -4.0% | 5.1% | 1.8% | 0.9% |
| **TAF** | 7,772,673 | 8,122,778 | 8,262,654 | 8,775,587 | 9,545,175 | 11,380,265 | 2.0% | 1.7% | 1.8% | 1.8% |
| **Ratio MP Sc 1 - TAF** | 1.02 | 0.69 | 0.36 | 0.93 | 0.93 | 0.94 | | | | |
| **Ratio MP Sc 2 - TAF** | 1.02 | 0.69 | 0.31 | 0.87 | 0.91 | 0.91 | | | | |
| **Ratio MP Sc 3 - TAF** | 1.02 | 0.69 | 0.27 | 0.71 | 0.84 | 0.84 | | | | |

**Commercial Aircraft, Air Taxi and Commuter Operations**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Master Plan Sc 1** | 185,607 | 180,576 | 85,486 | 182,065 | 186,609 | 220,700 | -0.3% | 0.5% | 1.7% | 0.8% |
| **Master Plan Sc 2** | 185,607 | 179,616 | 77,335 | 180,345 | 190,718 | 219,325 | -0.5% | 1.1% | 1.4% | 0.8% |
| **Master Plan Sc 3** | 185,607 | 180,490 | 67,055 | 157,769 | 183,297 | 207,184 | -2.7% | 3.0% | 1.2% | 0.5% |
| **TAF** | 185,607 | 187,574 | 189,324 | 194,764 | 209,946 | 246,012 | 0.8% | 1.5% | 1.6% | 1.4% |
| **Ratio MP Sc 1 - TAF** | 1.00 | 0.96 | 0.45 | 0.93 | 0.89 | 0.90 | | | | |
| **Ratio MP Sc 2 - TAF** | 1.00 | 0.96 | 0.41 | 0.93 | 0.91 | 0.89 | | | | |
| **Ratio MP Sc 3 - TAF** | 1.00 | 0.96 | 0.35 | 0.81 | 0.87 | 0.84 | | | | |

**Noncommercial Aircraft Operations**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Master Plan Sc 1** | 8,691 | 8,256 | 8,256 | 8,857 | 8,857 | 8,857 | 0.3% | 0.0% | 0.0% | 0.1% |
| **Master Plan Sc 2** | 8,691 | 8,256 | 8,256 | 8,857 | 8,857 | 8,857 | 0.3% | 0.0% | 0.0% | 0.1% |
| **Master Plan Sc 3** | 8,691 | 8,256 | 8,256 | 8,857 | 8,857 | 8,857 | 0.3% | 0.0% | 0.0% | 0.1% |
| **TAF** | 8,691 | 8,679 | 8,679 | 8,679 | 8,679 | 8,679 | 0.0% | 0.0% | 0.0% | 0.0% |
| **Ratio MP Sc 1 - TAF** | 1.00 | 0.95 | 0.95 | 1.02 | 1.02 | 1.02 | | | | |
| **Ratio MP Sc 2 - TAF** | 1.00 | 0.95 | 0.95 | 1.02 | 1.02 | 1.02 | | | | |
| **Ratio MP Sc 3 - TAF** | 1.00 | 0.95 | 0.95 | 1.02 | 1.02 | 1.02 | | | | |

**Based Aircraft**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Master Plan Sc 1** | 18 | 22 | 22 | 22 | 22 | 22 | 3.4% | 0.0% | 0.0% | 1.0% |
| **Master Plan Sc 2** | 18 | 22 | 22 | 22 | 22 | 22 | 3.4% | 0.0% | 0.0% | 1.0% |
| **Master Plan Sc 3** | 18 | 22 | 22 | 22 | 22 | 22 | 3.4% | 0.0% | 0.0% | 1.0% |
| **TAF** | 18 | 18 | 18 | 18 | 18 | 18 | 0.0% | 0.0% | 0.0% | 0.0% |
| **Ratio MP Sc 1 - TAF** | 1.00 | 1.22 | 1.22 | 1.22 | 1.22 | 1.22 | | | | |
| **Ratio MP Sc 2 - TAF** | 1.00 | 1.22 | 1.22 | 1.22 | 1.22 | 1.22 | | | | |
| **Ratio MP Sc 3 - TAF** | 1.00 | 1.22 | 1.22 | 1.22 | 1.22 | 1.22 | | | | |

**Total Operations**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Master Plan Sc 1** | 194,298 | 188,832 | 93,742 | 190,921 | 195,465 | 229,556 | -0.3% | 0.5% | 1.6% | 0.8% |
| **Master Plan Sc 2** | 194,298 | 187,872 | 85,591 | 189,202 | 199,575 | 228,182 | -0.4% | 1.1% | 1.3% | 0.8% |
| **Master Plan Sc 3** | 194,298 | 188,746 | 75,311 | 166,626 | 192,154 | 216,040 | -2.5% | 2.9% | 1.2% | 0.5% |
| **TAF** | 194,298 | 196,253 | 198,003 | 203,443 | 218,625 | 254,691 | 0.8% | 1.4% | 1.5% | 1.3% |
| **Ratio MP Sc 1 - TAF** | 1.00 | 0.96 | 0.47 | 0.94 | 0.89 | 0.90 | | | | |
| **Ratio MP Sc 2 - TAF** | 1.00 | 0.96 | 0.43 | 0.93 | 0.91 | 0.90 | | | | |
| **Ratio MP Sc 3 - TAF** | 1.00 | 0.96 | 0.38 | 0.82 | 0.88 | 0.85 | | | | |

Notes:
MP – Master Plan (Airport Layout Plan Update)
TAF – terminal Area Forecast
Sc – Scenario
Est. - Estimated

Sources: St. Louis Airport Authority, *STL Traffic Reports,* 2020; Federal Aviation Administration, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

## Table 3.7-2: Breakdown of Commercial and Air Taxi/Commuter Operations (Federal Fiscal Year)

**Breakdown of Commercial Aircraft, Air Taxi and Commuter Operations - Scenario 1**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Passenger Carriers** | 171,984 | 166,711 | 77,150 | 168,143 | 172,424 | 204,543 | -0.4% | 0.5% | 1.7% | 0.8% |
| **All-Cargo Carriers** | 3,066 | 3,631 | 3,601 | 3,601 | 3,601 | 3,601 | 2.7% | 0.0% | 0.0% | 0.8% |
| **Air Taxi*** | 10,557 | 10,233 | 4,736 | 10,321 | 10,584 | 12,556 | -0.4% | 0.5% | 1.7% | 0.8% |
| **Master Plan Sc 1** | 185,607 | 180,576 | 85,486 | 182,065 | 186,609 | 220,700 | -0.3% | 0.5% | 1.7% | 0.8% |
| **TAF** | 185,607 | 187,574 | 189,324 | 194,764 | 209,946 | 246,012 | 0.8% | 1.5% | 1.6% | 1.4% |
| **Ratio MP Sc 1 - TAF** | 1.00 | 0.96 | 0.45 | 0.93 | 0.89 | 0.90 | | | | |

*Assumes air taxi operations maintain their share of total operations and grow at the same rate as commercial carrier operations (subtotal of passenger and all-cargo carriers).

**Breakdown of Commercial Aircraft, Air Taxi and Commuter Operations - Scenario 2**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Passenger Carriers** | 171,984 | 165,807 | 69,470 | 166,523 | 176,296 | 203,248 | -0.5% | 1.1% | 1.4% | 0.8% |
| **All-Cargo Carriers** | 3,066 | 3,631 | 3,601 | 3,601 | 3,601 | 3,601 | 2.7% | 0.0% | 0.0% | 0.8% |
| **Air Taxi*** | 10,557 | 10,178 | 4,264 | 10,222 | 10,822 | 12,476 | -0.5% | 1.1% | 1.4% | 0.8% |
| **Master Plan Sc 2** | 185,607 | 179,616 | 77,335 | 180,345 | 190,718 | 219,325 | -0.5% | 1.1% | 1.4% | 0.8% |
| **TAF** | 185,607 | 187,574 | 189,324 | 194,764 | 209,946 | 246,012 | 0.8% | 1.5% | 1.6% | 1.4% |
| **Ratio MP Sc 2 - TAF** | 1.00 | 0.96 | 0.41 | 0.93 | 0.91 | 0.89 | | | | |

*Assumes air taxi operations maintain their share of total operations and grow at the same rate as commercial carrier operations (subtotal of passenger and all-cargo carriers).

**Breakdown of Commercial Aircraft, Air Taxi and Commuter Operations - Scenario 3**

| | Actual | Est. | | Forecast | | | Compound Annual Growth Rate | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measure/Scenario** | **2019** | **2020** | **2021** | **2025** | **2030** | **2040** | **2019-2025** | **2025-2030** | **2030-2040** | **2019-2040** |
| **Passenger Carriers** | 171,984 | 166,631 | 59,785 | 145,252 | 169,304 | 191,809 | -2.8% | 3.1% | 1.3% | 0.5% |
| **All-Cargo Carriers** | 3,066 | 3,631 | 3,601 | 3,601 | 3,601 | 3,601 | 2.7% | 0.0% | 0.0% | 0.8% |
| **Air Taxi*** | 10,557 | 10,228 | 3,670 | 8,916 | 10,393 | 11,774 | -2.8% | 3.1% | 1.3% | 0.5% |
| **Master Plan Sc 3** | 185,607 | 180,490 | 67,055 | 157,769 | 183,297 | 207,184 | -2.7% | 3.0% | 1.2% | 0.5% |
| **TAF** | 185,607 | 187,574 | 189,324 | 194,764 | 209,946 | 246,012 | 0.8% | 1.5% | 1.6% | 1.4% |
| **Ratio MP Sc 3 - TAF** | 1.00 | 0.96 | 0.35 | 0.81 | 0.87 | 0.84 | | | | |

*Assumes air taxi operations maintain their share of total operations and grow at the same rate as commercial carrier operations (subtotal of passenger and all-cargo carriers).

Notes:
MP – Master Plan (Airport Layout Plan Update)
TAF – terminal Area Forecast
Sc – Scenario
Est. - Estimated

Sources: St. Louis Airport Authority, *STL Traffic Reports*, 2020; Federal Aviation Administration, Terminal Area Forecast (STL historical based aircraft between 1997-2019); Unison Consulting, Inc., June 2020.

# 3.8 SOURCES OF FORECAST RISKS

The forecasts are based on information available at the time of the study, measurable factors that drive air traffic, and assumptions about their future trends. Actual results could differ materially from the forecasts if any of the assumptions do not hold or if unexpected events cause traffic to decrease or increase significantly. The Airport operates in a dynamic business environment, in which a variety of factors affect the broad aviation industry. Many of these factors, often intertwined, are subject to uncertainty. How they develop in the future influences whether traffic would be restored to pre-COVID-19 levels sooner or later, and, upon full recovery, whether growth in forecast activity levels would proceed according to the timelines indicated in the three forecast scenarios.

## *3.8.1 COVID-19 SPREAD AND MITIGATION*

Successful containment and mitigation of COVID-19 is key to traffic recovery. As of July 2020, the spread of COVID-19 continues unabated, with the U.S. topping the world record in number of confirmed COVID-19 cases (4.16 million as of July 26, 2020, according to the U.S. Centers for Disease Control and Prevention).[31] Globally, nine pharmaceutical companies, including U.S. based Pfizer, Inc., race to develop a COVID-19 vaccine, and more than 100 vaccines under development.[32] On July 22, 2020, the U.S. Department of Health and Human Services and the Department of Defense (DoD) announced an agreement with Pfizer Inc. for large-scale production and nationwide delivery of 100 million doses of a COVID-19 vaccine in the United States following the vaccine's successful manufacture and approval by the U.S. Food and Drug Administration (FDA). The agreement also allows the U.S. government to acquire an additional 500 million doses.[33] However, the timetable for the completion of testing, FDA approval, mass production, distribution, and administration of the vaccine remains uncertain.

## *3.8.2 ECONOMIC CONDITIONS*

A major driver to air travel demand, the economy goes through cycles of expansion and recession. In times of economic expansion, consumer and business incomes grow, increasing overall demand, including for air travel. In times of economic recession, consumer and business incomes fall, causing overall demand and the demand for air travel to fall. The pace of economic recovery has a direct effect on the pace of traffic recovery.

Various factors can trigger an economic recession. The COVID-19 pandemic and the extreme mitigation measures triggered a global economic recession. In the United States, the recession began in February 2020. Economic data through June indicate that the recession had bottomed out in April and recovery had

[31] Centers for Disease Control and Prevention, *Coronavirus Disease 2019 (COVID-19) Cases in the U.S.*, accessed on July 26, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html.
[32] "9 Pharmaceutical Companies Racing for A COVID-19 Vaccine," *Forbes Money Show*, June 16, 2020, accessed on July 26, 2020, from https://www.forbes.com/sites/moneyshow/2020/06/16/9-pharmaceutical-companies-racing-for-a-covid-19-vaccine/.
[33] U.S. Department of Health and Human Services, "U.S. Government Engages Pfizer to Produce Millions of Doses of COVID-19 Vaccine, *Press Release*, July 22, 2020.

begun with the re-opening of economies in many states. The re-opening, however, had triggered a resurgence in COVID-19 cases prompting a roll-back. Until the spread of COVID-19 abates and a vaccine is successfully developed, approved by the FDA, produced, and administered widely, the nascent economic recovery remains very fragile.

In addition to COVID-19, the U.S. economy face other sources of economic risks, including federal policy uncertainty, international trade tensions, the high level of U.S. government and private debt, stock market volatility, slowing global economy, and continuing political tensions abroad. The federal aid recently provided to individuals and businesses to alleviate the recession impacts of COVID-19 added substantially to an already high level of federal debt.

### *3.8.3 FINANCIAL HEALTH OF THE U.S. AIRLINE INDUSTRY*

The U.S. airline industry is one of the most volatile industry sectors. It is vulnerable to many exogenous factors such as economic downturns, sharp increases in oil prices, adverse weather, disease outbreaks, travel restrictions, terrorism threats, geo-political tensions, among others. The COVID-19 pandemic and mitigation measures caused passenger air travel demand to fall to unprecedented low levels, costing all airlines huge losses. The airlines' financial recovery depends upon how quickly traffic recovers close to pre-COVID levels. The airlines' financial position greatly affects their ability to restore service at airports.

### *3.8.4 STRUCTURAL CHANGES IN BOTH SUPPLY AND DEMAND*

History has shown that major crises usher in lasting structural changes in both supply and demand in the aviation industry. There are many speculations about how the COVID-19 crisis will shape the aviation industry.

On the demand side, COVID-19 could usher in "a new normal" in consumer behavior, social interactions, and ways of conducting business that would permanently alter travel propensities and preferences. Public health safety concerns could cause consumers to favor ground transportation even for longer distances for which they previously preferred traveling by air. For vacation travel, consumers are adapting to the COVID-19 environment by favoring destinations accessible by ground transportation. The accelerated adoption of technology for virtual meetings and conferences could result in a permanent downshift in business travel demand. Such permanent shifts in air travel demand could delay recovery to pre-COVID traffic levels for many years beyond the recovery periods assumed in the ALPU recovery scenarios and slow post-recovery traffic growth.

On the supply side, U.S. airlines have already taken steps become smaller—accelerating retirement of old aircraft, deferring new aircraft orders, and cutting workforces. U.S. airlines could take many years to recover from the major financial setback from COVID-19 and to restore service to pre-COVID levels. The aviation industry could see another wave of airline capacity rationalization continuing long after traffic recovery as airlines take measures, including possibly raising fares, to return to profitability, slowing post-recovery traffic growth.

On the upside, airlines, airports, and the TSA are rolling no-touch technologies that would not only help allay public health safety concerns but could also speed up passenger processing. These technologies could help restore the competitiveness of air travel against ground transportation modes and help stimulate traffic recovery and growth.