CHAPTER THREE
FORECAST OF AVIATION DEMAND

Notes to Aviation Activity Forecasts:

Sections 3.1 through 3.10 reflect forecasts prepared and published in June 2009. These forecasts were approved by the FAA on August 27, 2009.

Appendix A reflects a sensitivity analysis conducted in November 2009 and published in final in August 2010. The June 2009 forecasts were re-approved by the FAA on September 27, 2010 pursuant to FAA review of the sensitivity analysis.

INTRODUCTION

This chapter presents comprehensive forecasts of aviation demand for the Lambert-St. Louis International Airport (STL or Lambert Airport) Master Plan Update for the years 2013, 2018, 2023, and 2028. The aviation activity forecast is a critical component in the master planning process. Future activity levels were projected for annual passenger enplanements, air cargo volumes, and aircraft operations. In addition, peak period (monthly, daily, and hourly) forecasts were also prepared to guide the planning process.

Forecasts of aviation demand for the purpose of planning future facilities were last prepared in 1996 when STL functioned as a major hub for Trans World Airlines (TWA). At the turn of the decade, TWA succumbed to financial difficulties and was purchased by American Airlines. American has since reduced the size of the hub considerably resulting in a significant reduction in connecting traffic at the airport. As a result, STL has changed from being a predominantly connecting hub to an airport primarily servicing demand for travel to and from the St. Louis metropolitan area. As the passenger base has changed, the mix of carriers and mix of aircraft has also changed. Indeed, in contrast to the reduction in service by American, the presence of Low Cost Carriers (LCCs) has increased. As a result of the many changes at STL in the past 12 years, new forecasts are needed.

Three enplaned passenger forecast scenarios were developed for the Master Plan: baseline, high, and low. The high and low growth scenarios were developed to provide the Airport Authority with a range of information from which it will be able to anticipate the airport's future activity levels, and plan for facilities that might be needed to accommodate future air transportation demand. Understanding the potential range of future activity will allow the Authority to avoid being surprised by potential stronger growth or unexpected slowdowns in growth. The baseline forecast predicts passenger activity will grow from 7.2 million enplanements in 2008 to 9.9 million enplanements by 2028. The high and low scenarios result in 2028 enplanements that range from 8.3 to 10.9 million. The baseline forecast represents the most likely scenario and will be used for future planning.

Each of the forecast scenarios represents market-driven demand for air service. The forecasts are "unconstrained" and as such do not take facility constraints or other outside limiting factors into consideration. In other words, for purposes of estimating future demand, the forecast assumes facilities can be provided to meet the demand. After determining what facilities are needed to accommodate the forecast aviation activity, alternatives to provide any such facilities will be identified and evaluated.

The forecasts developed for this Master Plan provide the St. Louis Airport Authority with a customized, adaptive, and enduring framework to meet the needs of long-term facilities planning. Periodic updates of the aviation activity forecasts will be necessary to ensure the key Master Plan recommendations are consistent with the characteristics of the actual activity and reasonable expectations of future activity levels.

3.1 ECONOMIC BASE FOR AIR TRANSPORTATION

The intrinsic links between the level of aviation activity and economic growth are well documented. Simply put, growth in population, income, and business activity typically lead to increased demand for air travel. An individual's demand for air travel is often referred to as "underlying demand" in that it cannot be realized without the presence of air service at a price that results in the decision to fly. This section provides an overview of the global, national, and local economic factors that generate the underlying demand for air travel.

3.1.1 UNITED STATES ECONOMY

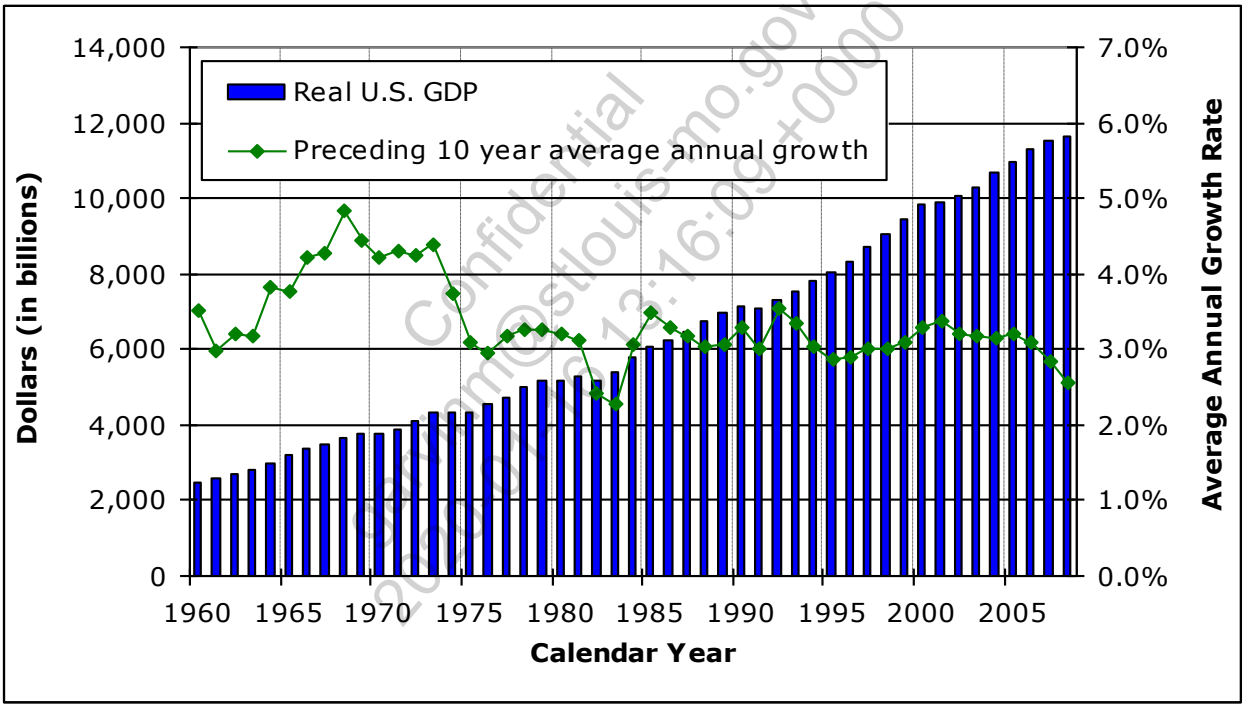
Historically the U.S. economy, as measured by Gross Domestic Product (GDP), has grown at a relatively steady rate; averaging 3.3 percent per year between 1960 and 2008 (*see* **Exhibit 3.1-1, *Historical Trends in U.S. Gross Domestic Product ($2000 Constant Dollars)***). The rate of growth, particularly since 1985, has been remarkably stable, reflecting both the size and maturation of the U.S. economy. Individual years have fluctuated around the long-term trend for a variety of reasons including pure macro-economic factors, fuel shocks, war, and terrorist attacks.

There have been two official economic recessions in the U.S. thus far in the 21st century. The first occurred between March and November 2001, and it was compounded by the September 11, 2001 terrorist attacks. The deleterious impact of these events on the airline industry is well documented. The recession itself was short-lived by historical standards and the economy returned to more normal growth rates quite quickly, fueled in large part by a gradual but prolonged reduction in interest rates.

The second official economic recession in the U.S. started in 2007 when the economy had begun to slow again and currently (as of 2011) finds itself in the midst of the worst financial crisis to affect the United States since the Great Depression. According to the National Bureau of Economic Research, the U.S. has been in a recession since December of 2007 (already 16 months long at the writing

of this report and the longest recession since airline deregulation[1] in 1978). The U.S. and other industrialized western countries are faced with an increasing credit crisis. Twenty-five banks failed in 2008 and 25 more failed in the first four months of 2009.[2] Numerous financial institutions, the U.S. auto industry, and homeowners facing foreclosure have received 'bail-out' funds from the U.S. government. Corporate profits from current production were down 1.6 percent in 2007 and down another 10.1 percent in 2008.[3] Approximately 5.1 million jobs have been shed in the U.S. from December 2007 through March 2009. The unemployment rate rose to 8.5 percent in March 2009 (compared to 4.4 percent in March 2007).[4]

Exhibit 3.1-1
HISTORICAL TRENDS IN U.S. GROSS DOMESTIC PRODUCT
($2000 Constant Dollars)
Lambert-St. Louis International Airport



Sources: Bureau of Economic Analysis; Landrum & Brown analysis, 2011

According to projections published by the Federal Reserve in February 2009, U.S. real GDP is expected to decline by 0.5 to 1.3 percent in 2009 before returning to positive growth in 2010 (*see* **Table 3.1-1, *Forecast of U.S. Real Gross Domestic Product***). Annual growth is then expected to reach 3.8 to 5.0 percent in 2011 before slowing down to between 2.5 and 2.7 percent annual growth in the long-term.

1 Deregulation refers to the Airline Deregulation Act of 1978 which reduced government control over commercial aviation.
2 Federal Deposit Insurance Corporation (FDIC) Failure Bank List, April 20, 2009
3 Bureau of Economic Analysis (BEA) News Release: Gross Domestic Product and Corporate Profits
4 Bureau of Labor Statistics, Employment Situation Summary, March 2009

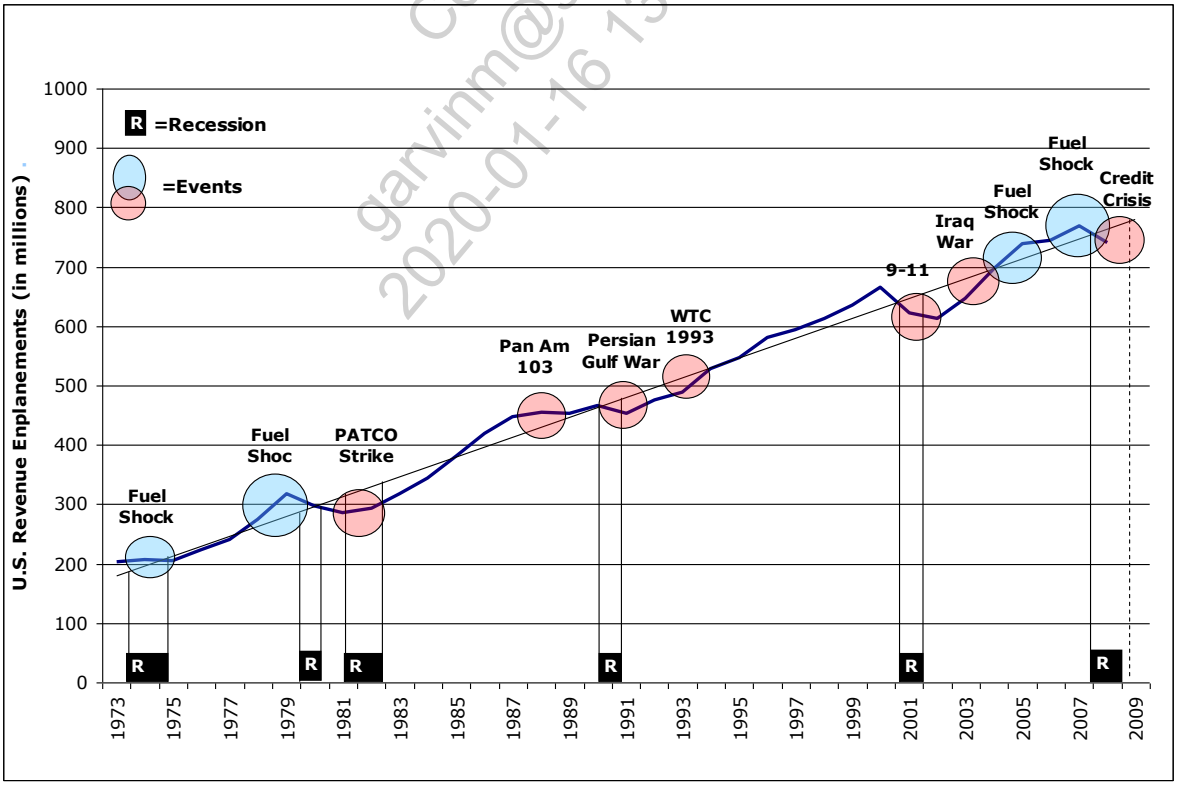
Demand for air travel in the U.S. correlates strongly with fluctuations in the economy. As shown in **Exhibit 3.1-2, *Aviation System Shocks and Recoveries (1973-2008)***), passenger traffic has typically declined during economic contractions and returned to positive growth during subsequent economic expansions. Indeed, in 2008, the combined impact of a slowing economy and rapidly rising fuel prices resulted in a 3.7 percent decline in U.S. revenue enplanements.[5] Positive growth in airline traffic is expected to return as the economy recovers.

Table 3.1-1
FORECAST OF U.S. REAL GROSS DOMESTIC PRODUCT
Lambert-St. Louis International Airport

Year	Lower End	Upper End
2009	-1.3%	-0.5%
2010	2.5%	3.3%
2011	3.8%	5.0%
Longer Run	2.5%	2.7%

Sources: Federal Reserve projections as of February 2009; Landrum & Brown analysis, 2011

Exhibit 3.1-2
AVIATION SYSTEM SHOCKS AND RECOVERIES (1973-2008)
Lambert-St. Louis International Airport



Sources: Air Transport Association of America; Landrum & Brown analysis, 2011

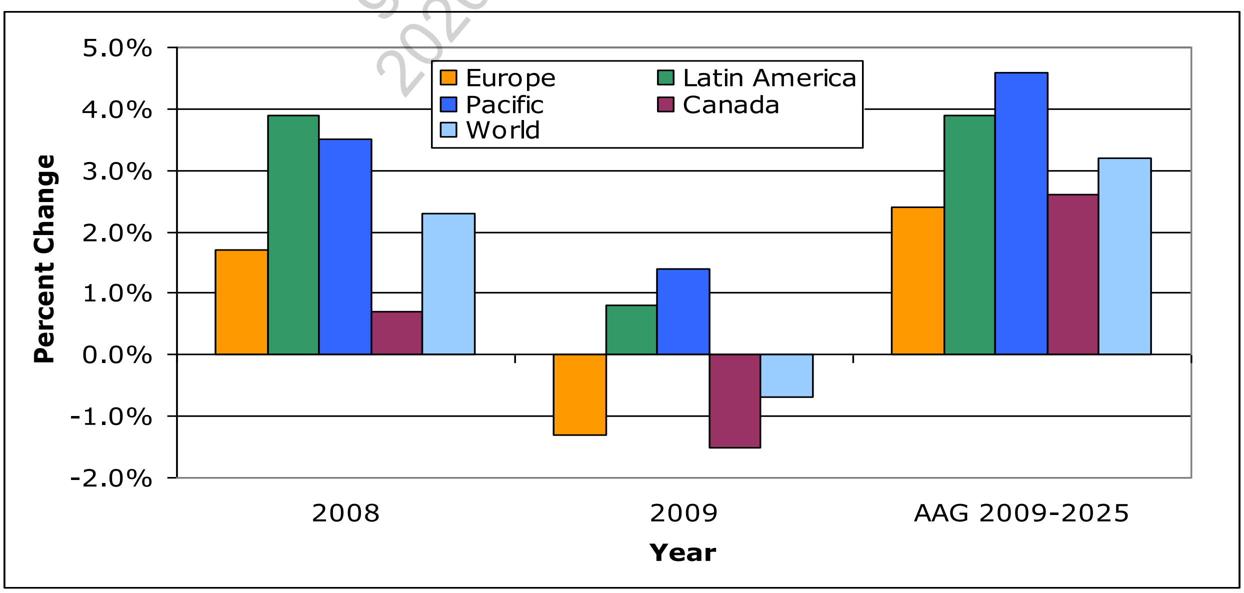
[5] U.S. Department of Transportation, Bureau of Transportation Statistics.

3.1.2 WORLD ECONOMY

The current economic and financial crisis is not unique to the United States; in fact, the effects are being experienced around the globe. Japan, the United Kingdom, the 16-country Eurozone, and numerous other countries have all declared recessions. Global Insight predicts world GDP will contract by 0.7 percent in 2009 – the first such contraction since the Great Depression. Similar to the U.S., China and some European governments have initiated 'bail-out' or economic stimulus packages to help revive sluggish economies and improve consumer confidence.

While the near-term economic picture is certainly weak, history suggests that the world economy will return to positive growth over the long-term, which will be fundamental to the potential expansion of international air service at STL. Economic forecasts published in the FAA's March 2009 Aerospace Forecasts for the years 2009 through 2025 call for the world economy to begin to recover in 2010 with positive growth of 2.4 percent (*see* **Exhibit 3.1-3, *Summary of International GDP Forecasts by Travel Region***). The FAA feels that economic stimulus packages in China and the U.S. will fuel the recovery. Europe is expected to recover slower than the U.S. because the housing market corrections have occurred later there and the policy actions are more cautious. After 2010, world economic growth is forecast to average 3.3 percent annually. The Latin America and Asia/Pacific regions are expected to experience the highest growth rates (3.9 and 4.6 percent average annual growth respectively), while the more mature economies of Canada and Europe are expected to experience slower growth rates of 2.4 and 2.6 percent per year, respectively. These positive growth rates in the world economy will support the demand for air travel.

Exhibit 3.1-3
SUMMARY OF INTERNATIONAL GDP FORECASTS BY TRAVEL REGION
Lambert-St. Louis International Airport



AAG=Average Annual Growth

Source: FAA Aerospace Forecast, Fiscal Years 2009-2025

3.1.3 STL CATCHMENT AREA

The U.S. Census Bureau defines the St. Louis Metropolitan Statistical Area (MSA) as the independent city of St. Louis plus a contiguous sixteen county area.[6] Nine of the St. Louis MSA counties are in Missouri (the City of St. Louis, St. Louis County, Jefferson County, St. Charles County, Franklin County, Crawford County, Washington County, Warren County, and Lincoln County) and eight are in Illinois (Madison County, St. Clair County, Monroe County, Clinton County, Bond County, Macoupin County, Jersey County, and Calhoun County). An estimated 2.8 million people reside in the MSA, making it the 19th largest MSA in the United States.

A more geographically concentrated eight-county definition is used by the local East-West Gateway Council of Governments comprising St. Charles County, City of St. Louis, St. Louis County, Jefferson County, and Franklin County in Missouri and Madison County, St. Clair County, and Monroe County in Illinois. The East-West Gateway Region accounts for just over half of the physical area of the broader MSA but over 90 percent of the population and employment of the larger MSA.

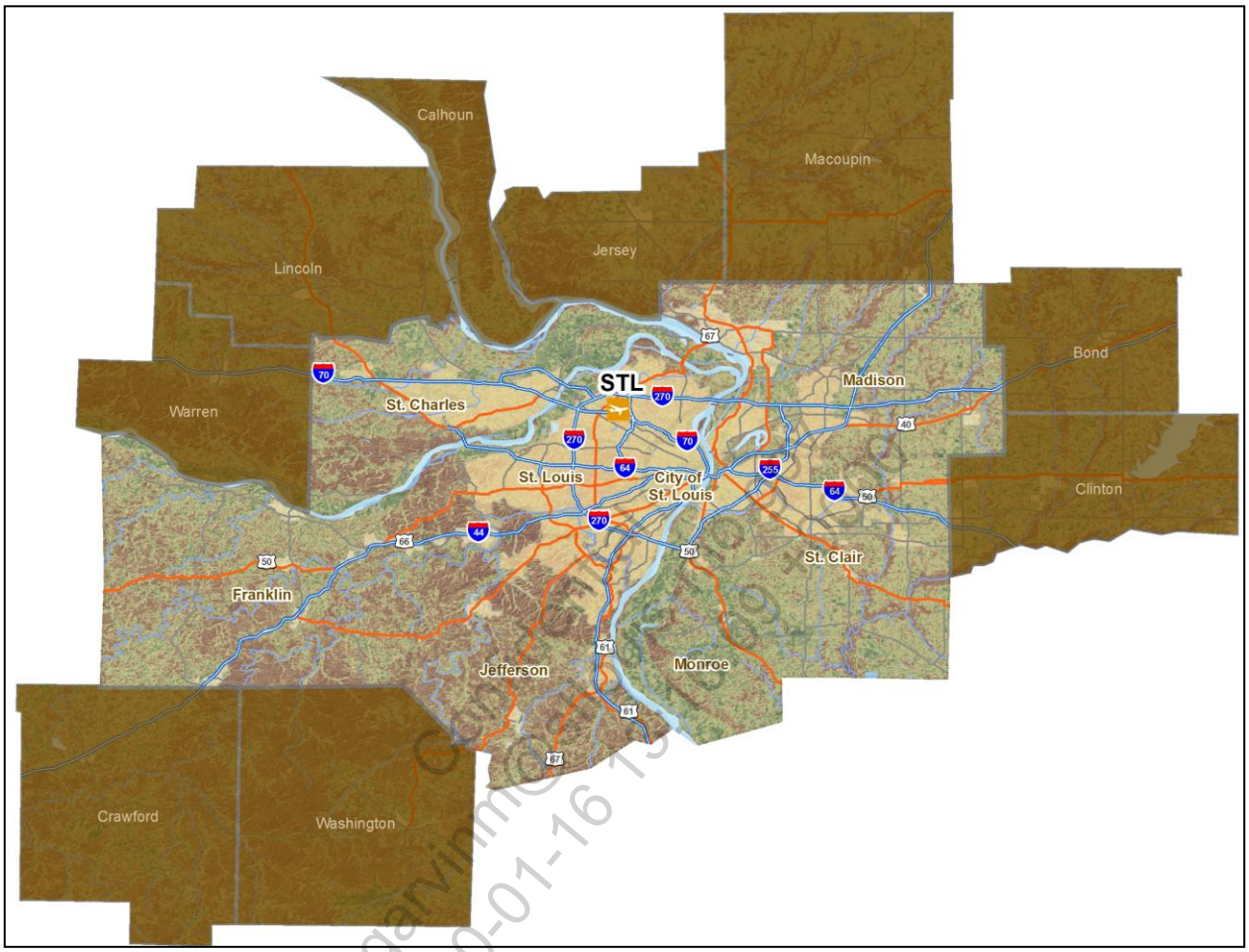
Exhibit 3.1-4, *St. Louis Metropolitan Statistical Area (MSA)*, provides a geographical depiction of the St. Louis MSA compared to the East-West Gateway Region. The nine counties located outside of the East-West Gateway Region but included in the MSA definition are shaded in brown.

STL is the primary airport serving both passenger and cargo traffic in the region. There are a number of other smaller airports in the region that are predominantly used by general aviation and military aircraft; none of those airports currently has scheduled passenger air service. Allegiant Air had offered limited scheduled passenger service from MidAmerica Airport since February 2006 but discontinued the service effective January 2009.

There are no other major commercial service airports located within 200 statute miles of STL. The closest major commercial service airports are: Indianapolis International Airport (229 miles), Kansas City International Airport (237 miles), Memphis International Airport (257 miles), Chicago O'Hare International Airport (258 miles), Chicago Midway International Airport (251 miles), Des Moines International Airport (259 miles), and Nashville International Airport (272 miles).

[6] The St. Louis Metropolitan Statistical Area (MSA) definition obtained from the U.S. Census Bureau, data released in November 2007.

Exhibit 3.1-4
ST. LOUIS METROPOLITAN STATISTICAL AREA (MSA)
Lambert-St. Louis International Airport



Sources: U.S. Census Bureau; Landrum & Brown analysis, 2011

3.1.4 ST. LOUIS MSA SOCIO-ECONOMIC TRENDS

This section summarizes recent trends and future forecasts of population, Per Capita Personal Income (PCPI), employment, and Gross Regional Product (GRP) for the St. Louis region. Comparisons with the states of Illinois and Missouri and the U.S. as a whole are presented, where appropriate, for reference and benchmarking purposes. The socio-economic data used in this analysis was obtained from: Woods and Poole Economics, Inc. of Washington, D.C; U.S. Bureau of Economic Analysis (BEA); U.S. Bureau of the Census; East-West Gateway Council of Governments; St. Louis Regional Chamber & Growth Association (RCGA); Missouri Economic Research and Information Center (MERIC); University of Missouri Office of Social and Economic Data Analysis (OSEDA); St. Louis County; the Missouri and Illinois Departments of Employment Security; and the St. Louis Convention & Visitors Commission (CVC). Economic variables are presented in constant dollars where appropriate to eliminate distortions resulting from inflation.

3.1.4.1 Population

The states of Illinois and Missouri are home to almost 19 million people, representing six percent of the total population in the United States. At 2.8 million residents, the St. Louis MSA accounts for 15 percent of the combined population of both states. Three quarters of the St. Louis MSA population resides in Missouri, with Illinois home to the remaining quarter (*see* **Table 3.1-2, *Population by County (2007)***).

Table 3.1-2
POPULATION BY COUNTY (2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport

State	County	Population	% of Total
Missouri	St. Louis*	1,001,951	35.4%
	St. Charles*	346,148	12.2%
	City of St. Louis*	343,895	12.1%
	Jefferson*	220,543	7.8%
	Franklin*	101,355	3.6%
	Lincoln	50,697	1.8%
	Warren	30,122	1.1%
	Washington	24,452	0.9%
	Crawford	24,331	0.9%
	Subtotal	**2,143,494**	**75.6%**
Illinois	Madison*	265,743	9.4%
	St. Clair*	260,663	9.2%
	Macoupin	48,906	1.7%
	Clinton	36,800	1.3%
	Monroe*	32,527	1.1%
	Jersey	22,648	0.8%
	Bond	18,154	0.6%
	Calhoun	5,162	0.2%
	Subtotal	**690,603**	**24.4%**
TOTAL MSA		**2,834,097**	**100.0%**
East-West Gateway Region Counties		**2,572,825**	**90.8%**

*Counties included in East-West Gateway Region definition

Source: Woods & Poole Economics 2007; Landrum & Brown analysis, 2011

Population growth in the St. Louis MSA has generally been lower than in the states of Illinois and Missouri and the U.S. as a whole (*see* **Table 3.1-3, *Summary of Historical and Forecast Population (in Thousands)***). This trend is projected to continue through 2030. According to Woods & Poole Economics, an estimated 3.1 million people are expected to reside in the STL catchment area in 2030, an increase of approximately 240,000 people over current levels (0.4 percent average annual growth). These projected growth rates are in line with those published by the East-West Gateway Council of Governments in its June 2004 *"Long Range Population and Employment Projections"* which called for long-term growth of 0.5 percent per year for the core Gateway region.

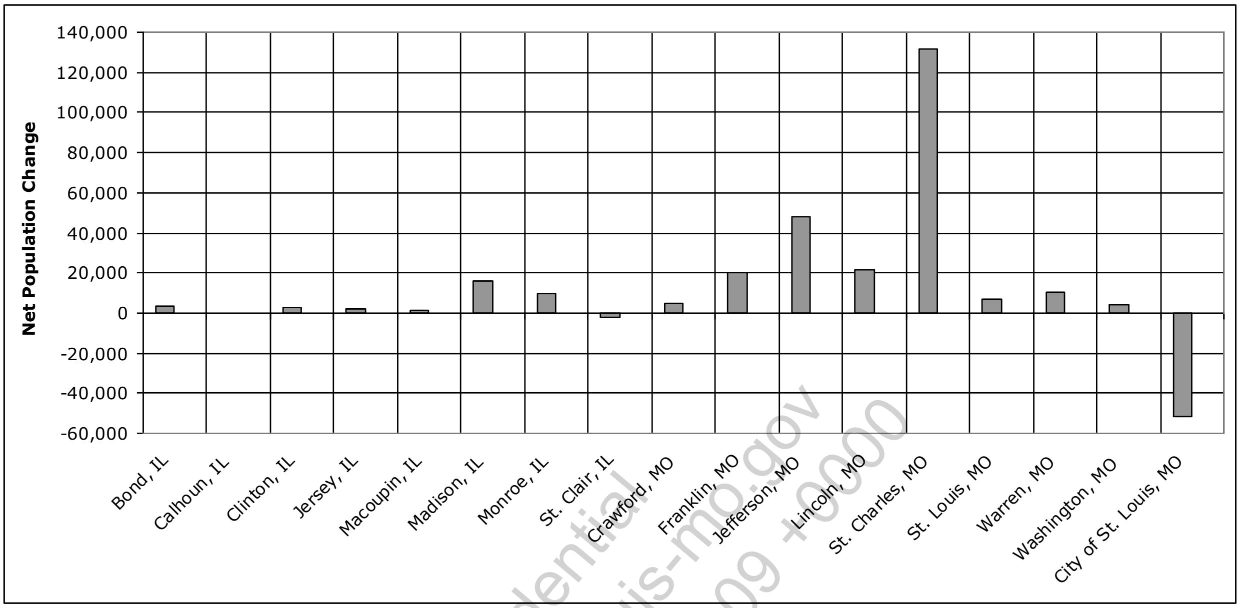
Table 3.1-3
SUMMARY OF HISTORICAL AND FORECAST POPULATION (in Thousands)
Lambert-St. Louis International Airport

Calendar Year	STL MSA	State of Illinois	State of Missouri	United States
Actual				
1990	2,605	11,453	5,129	249,623
1991	2,618	11,562	5,178	252,868
1992	2,632	11,672	5,227	256,156
1993	2,645	11,783	5,277	259,487
1994	2,659	11,895	5,327	262,861
1995	2,673	12,008	5,378	266,278
1996	2,683	12,094	5,423	269,392
1997	2,693	12,180	5,468	272,543
1998	2,704	12,266	5,514	275,730
1999	2,714	12,353	5,560	278,955
2000	2,725	12,441	5,607	282,217
2001	2,744	12,525	5,643	285,226
2002	2,760	12,595	5,680	288,126
2003	2,774	12,650	5,712	290,796
2004	2,790	12,714	5,753	293,638
2005	2,806	12,765	5,798	296,507
2006	2,820	12,832	5,843	299,398
2007	2,834	12,940	5,897	303,097
Forecast				
2010	2,854	13,166	6,017	311,884
2015	2,897	13,581	6,233	327,311
2020	2,946	14,025	6,462	343,360
2025	3,004	14,505	6,707	360,202
2030	3,072	15,037	6,976	378,317
Average Annual Growth Rate:				
1990-07	0.5%	0.7%	0.8%	1.1%
2007-15	0.3%	0.6%	0.7%	1.0%
2015-30	0.4%	0.7%	0.8%	1.0%
2007-30	0.4%	0.7%	0.7%	1.0%

Sources: Woods & Poole Economics 2007; Landrum & Brown analysis, 2011

Between 1990 and 2007, the MSA experienced a net gain of almost 230,000 residents. However, growth has not been evenly distributed at the county and city level. The City of St. Louis lost approximately 13 percent of its population over this 18-year period, which is equivalent to 52,000 residents (*see* **Exhibit 3.1-5, *Absolute Change in Population by County (1990-2007)***). In contrast, St. Charles County gained 132,000 residents.

Exhibit 3.1-5
ABSOLUTE CHANGE IN POPULATION BY COUNTY (1990-2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport



Sources: Woods & Poole Economics 2007; Landrum & Brown analysis, 2011

3.1.4.2 Income Trends

This subsection presents trends in median household income and PCPI. Household income represents the average income per housing unit, while per capita personal income corresponds to the average income per inhabitant (total income divided by total population). Income statistics are broad indicators of the relative earning power and wealth of the region and inferences can be made related to resident's ability to purchase air travel.

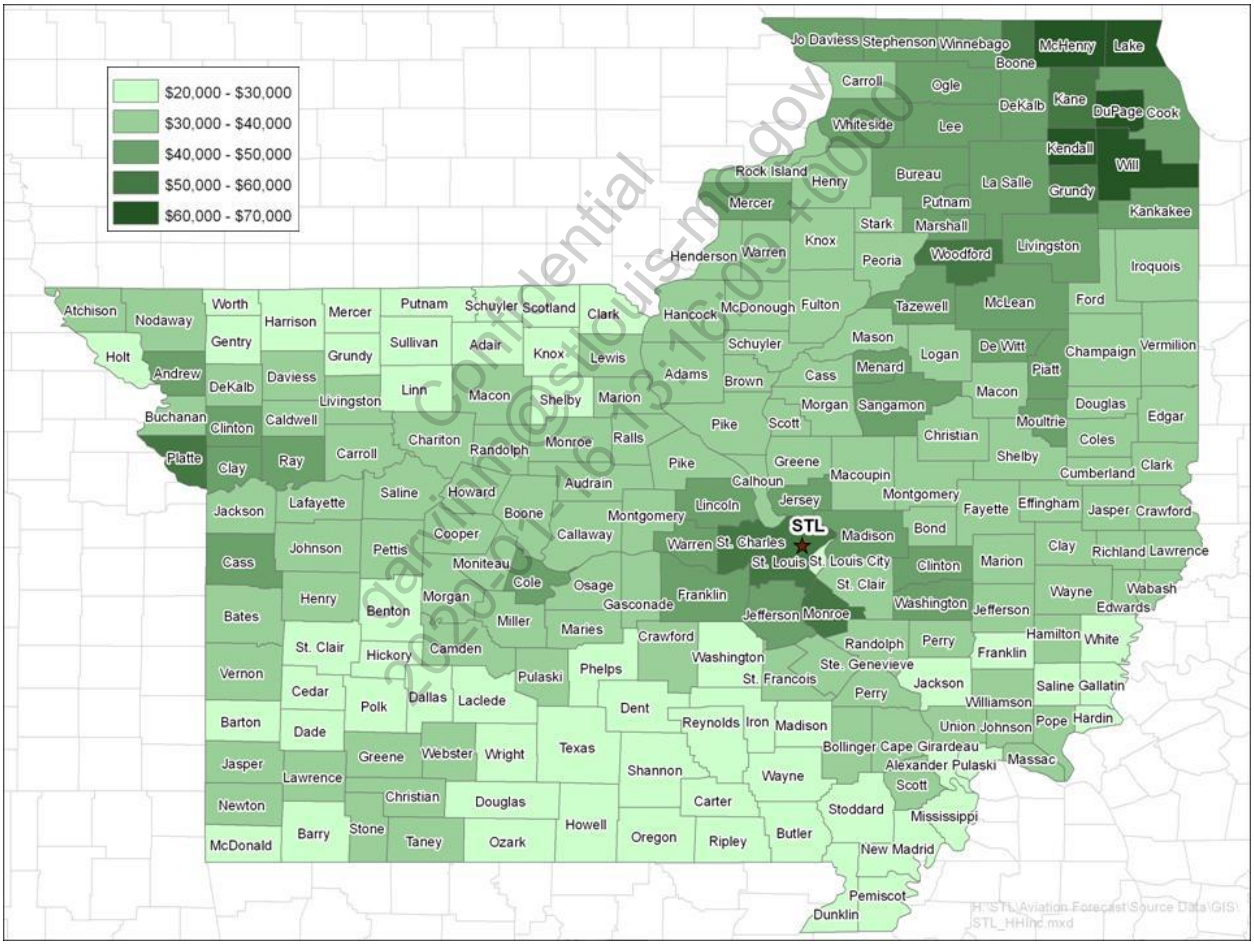
In the first quarter of 2008, Missouri and Illinois were ranked, respectively, the 5th and 24th states with the lowest cost of living of the United States. For this period, St. Louis MSA had a cost of living index 10 percent lower than the U.S. on average. In addition to affordable living conditions, the St. Louis MSA provides a competitive market for employers, which drives somewhat higher than average wages when compared to national benchmarks.[7] As a result, the St. Louis market ranks 23rd in the U.S. in terms of effective buying income, which is commonly known as disposable personal income.[8]

[7] U.S. Bureau of Labor Statistics and the St. Louis Regional Chamber & Growth Association
[8] *St. Louis Air Service Assessment*, December 2008

HOUSEHOLD INCOME

Median household income at the county level was used to understand the distribution of wealth in the St. Louis MSA and more broadly in the states of Missouri and Illinois. The strong urban areas of both states around St. Louis, Kansas City, and Chicago are the regions with the highest median household incomes as they provide the core employment base. Rural regions typically have the lowest household incomes (*see* **Exhibit 3.1-6, *Median Household Income by County ($1999)***).

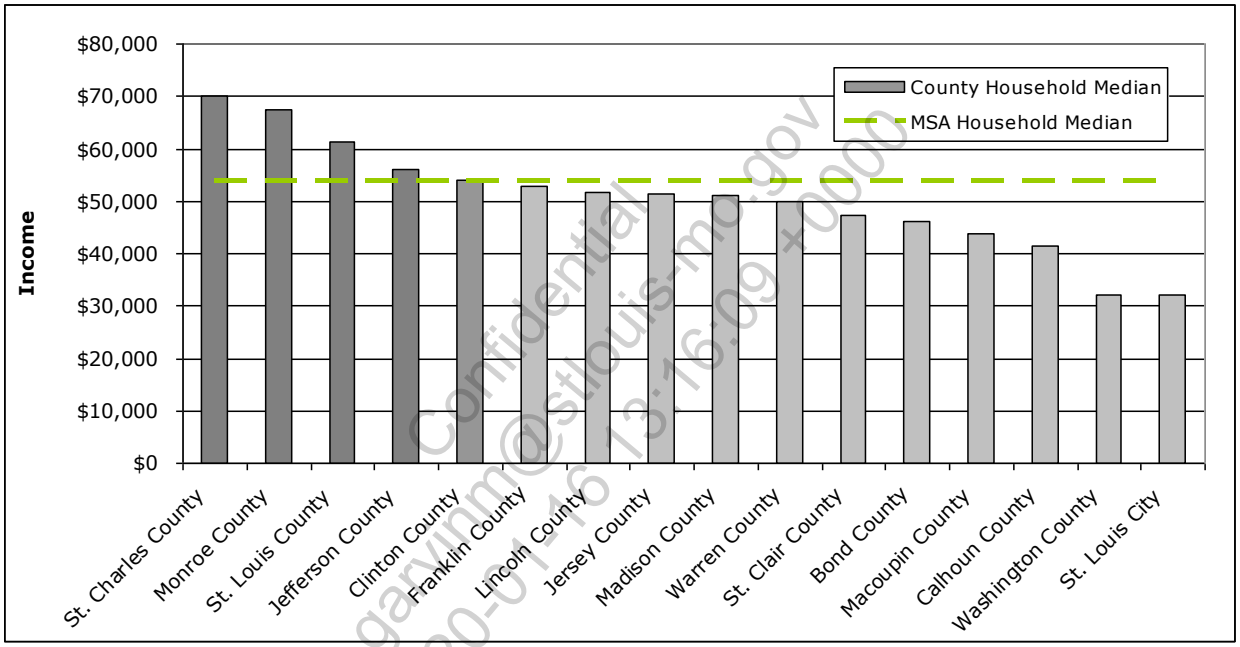
Exhibit 3.1-6
MEDIAN HOUSEHOLD INCOME BY COUNTY ($1999)
Lambert-St. Louis International Airport



Sources: U.S. Census Bureau; Landrum & Brown analysis, 2011

The St. Louis MSA had a median household income of almost $54,000 in 2007 according to data published by the St. Louis Regional Chamber & Growth Association. Notably, counties such as Monroe and Jefferson, which have accounted for a significant share of the overall population growth, are also among the highest income counties in the MSA. The City of St. Louis and Washington County have the lowest median household incomes in the MSA (*see* **Exhibit 3.1-7, *Median Household Income by County ($2007)***).

Exhibit 3.1-7
MEDIAN HOUSEHOLD INCOME BY COUNTY ($2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport



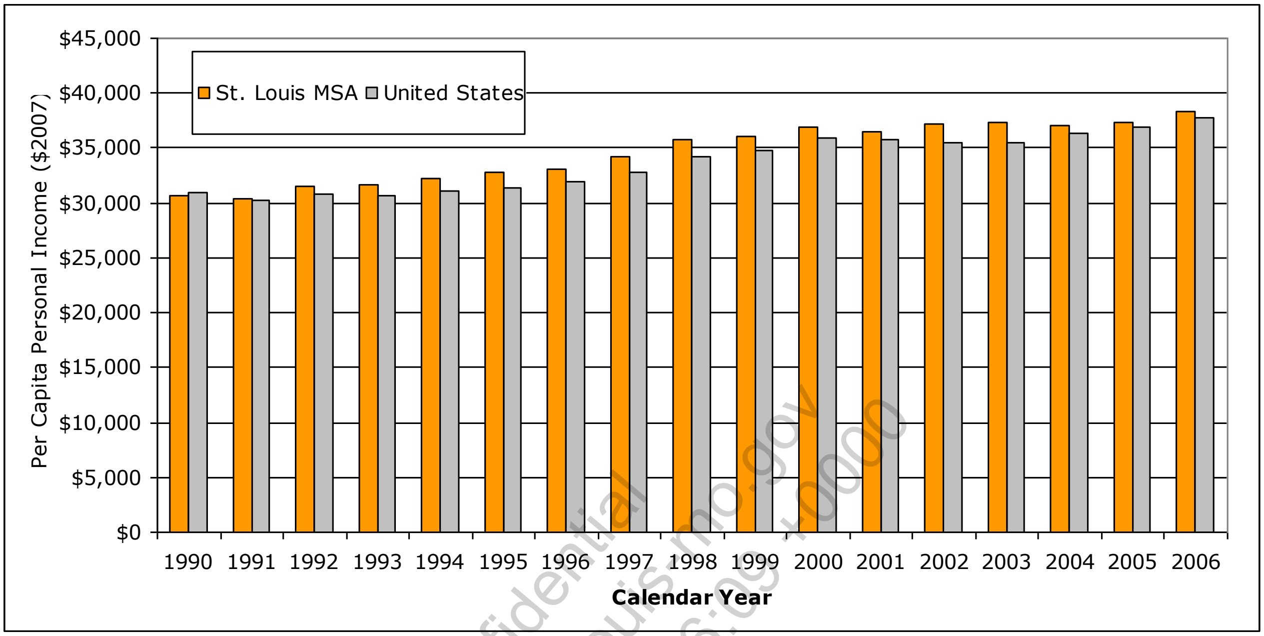
Sources: St. Louis Regional Chamber & Growth Association; Landrum & Brown analysis, 2011

PER CAPITA PERSONAL INCOME (PCPI)

PCPI for the St. Louis MSA has tracked between 2 and 5 percent above the national average since the early 1990s (*see* **Exhibit 3.1-8, *Historical Trends in Per Capita Personal Income ($2007)***).[9] Lower inflation experienced in the St. Louis MSA versus the U.S. average has also been a positive contributor to real PCPI growing at a marginally faster rate than the national benchmark since 1990. The historical rate of real PCPI growth for the St. Louis MSA is expected to continue in the future, with Woods & Poole Economics projecting long-term growth of 1.6 percent per annum through 2030.

[9] The data presented in Exhibit 2.2-8 are BEA values for per capita personal income for the St. Louis MSA and the United States. BEA measures of per capita personal income are higher than those produced by the U.S. Census Bureau as the definition of personal income is broader than the Census definition which is limited to cash and its equivalents received by individuals.

Exhibit 3.1-8
HISTORICAL TRENDS IN PER CAPITA PERSONAL INCOME ($2007)
ST. LOUIS MSA vs. UNITED STATES
Lambert-St. Louis International Airport



Sources: Bureau of Economic Analysis; Bureau of Labor Statistics; Landrum & Brown analysis, 2011

3.1.4.3 Employment

Growth in employment is an important indicator of the overall health of the local economy. Population changes and employment changes tend to be closely correlated as people migrate in and out of areas largely depending on their ability to find work in the local economy.

MAJOR EMPLOYERS

St. Louis boasts a diverse business base and is home to nine Fortune 500 companies. There are also a number of the largest privately held companies located in St. Louis such as Enterprise Rent-A-Car, Graybar Electric, and Edward Jones. [10] A list of the St. Louis MSA's top 10 largest employers is provided in **Table 3.1-4, *Top 10 Largest Employers (2007)***).

[10] St. Louis Regional Chamber & Growth Association

Table 3.1-4
TOP 10 LARGEST EMPLOYERS (2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport

Company	Industry	Employment
BJC Healthcare	Health	23,378
Boeing	Aerospace	16,000
Scott Air Force Base	Military	14,150
Wal-Mart	Retail	13,400
U.S. Postal Service	Government	12,700
Washington University	Education	12,390
SSM Health Care	Health	12,102
Schnucks Markets	Grocery	10,500
AT&T	Telecom	8,990
St. John's Mercy Health Care	Health	8,876

Source: St. Louis Regional Chamber & Growth Association

EMPLOYMENT GROWTH

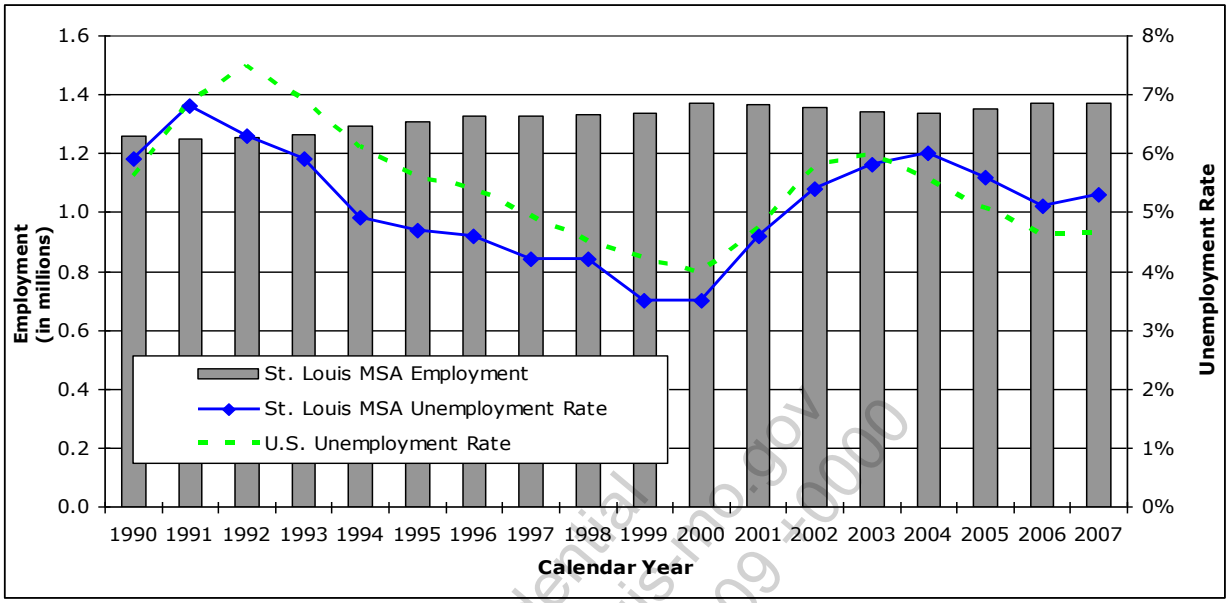
Employment has grown at a similar rate as the population of the St. Louis MSA, averaging 0.5 percent per year since 1990. The unemployment rate tracked below the national average through 2004 but in more recent years has somewhat exceeded the national average (*see* **Exhibit 3.1-9, *Trends in Employment and Unemployment (2007)***). Over the years, the St. Louis MSA's share of the states of Illinois and Missouri employment has decreased.

Historically the St. Louis MSA has had lower unemployment rates than the U.S. However, that trend was reversed beginning in 2004. In 2007, the unemployment rate in the St. Louis MSA averaged 5.3 percent of the total labor force versus 4.5 percent, 4.8 percent, and 4.6 percent for the states of Illinois and Missouri, and the U.S. respectively.[11]

Projections made by the East-West Gateway Council of Governments call for positive long-term employment growth of 0.4 percent per year through 2030 for the smaller Gateway Region, however, these projections should be indicative of the broader St. Louis MSA.

[11] St. Louis Regional Chamber & Growth Association

Exhibit 3.1-9
TRENDS IN EMPLOYMENT AND UNEMPLOYMENT (2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport



Source: Bureau of Labor Statistics

EMPLOYMENT & INDUSTRY CLUSTERS

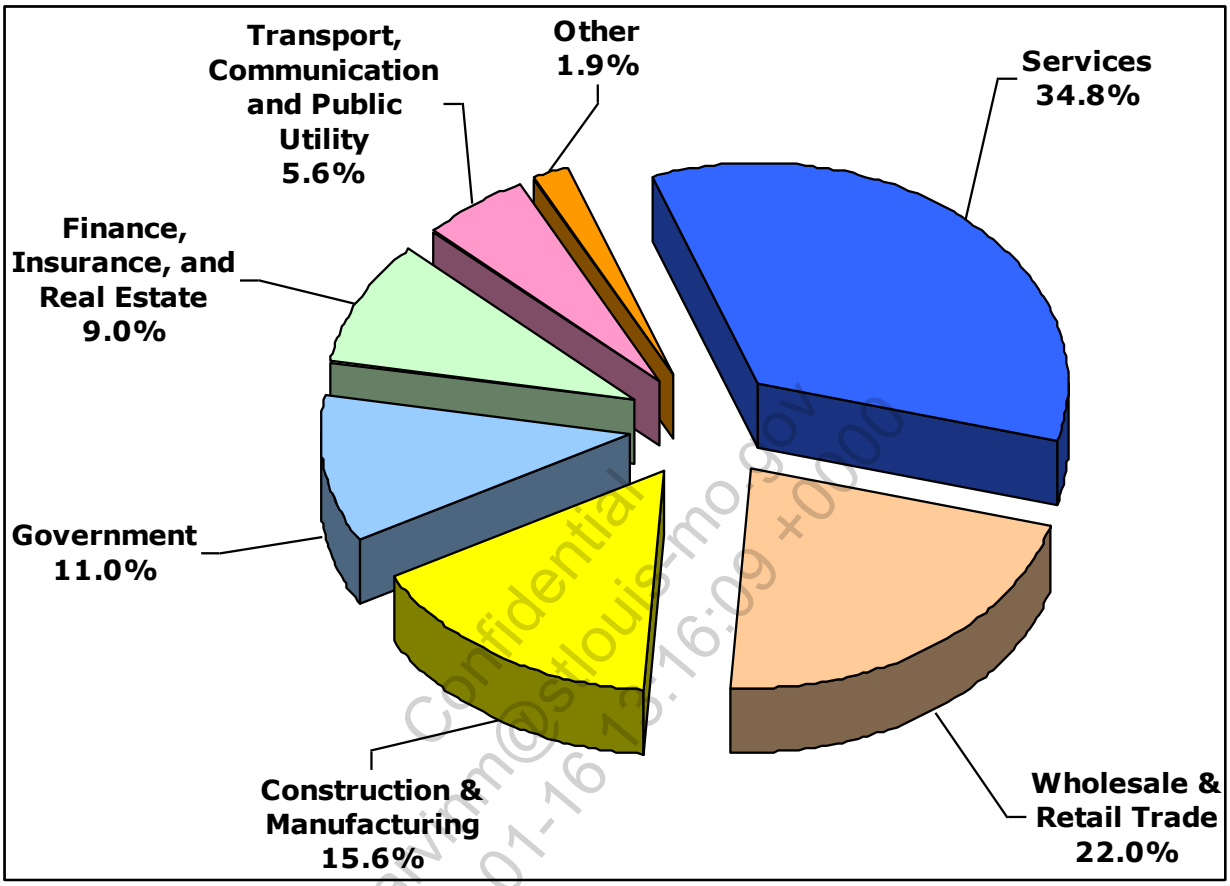
The St. Louis MSA is an important market for companies specializing in medical sciences, information technology, and advanced manufacturing. **Exhibit 3.1-10, *Employment by Industry (2007)*** provides an overview of the key industry sectors. The St. Louis Regional Chamber & Growth Association has identified five clusters as part of its ongoing economic and employment development strategy for the region:

- Plant and Medical Sciences
- Advanced Manufacturing
- Information Technology
- Transportation and Distribution
- Financial Services

These clusters already account for approximately one quarter of total employment but over 40 percent of the total dollar output for the MSA. Additionally, average income for persons employed in these clusters was almost 40 percent higher than the MSA average.[12] The strategic targeting of high wage clusters ripples across the entire local economy and also into the air travel market as people with higher incomes tend to fly more often.

[12] *Economic Development Strategy in St. Louis: An Assessment of Key Industry Clusters*, Region Wise, February 2004. Table 1: Year 2000 St. Louis MSA Economy – Cluster Comparison.

Exhibit 3.1-10
EMPLOYMENT BY INDUSTRY (2007)
ST. LOUIS MSA
Lambert-St. Louis International Airport



Sources: Woods & Poole Economics 2007; Landrum & Brown analysis, 2011

3.1.4.4 Gross Regional Product (GRP)

Gross Regional Product is a measure of the value of goods and services produced in a state or county. Historically, GRP for the St. Louis MSA has experienced positive growth albeit at a somewhat slower pace than the states of Illinois and Missouri and the U.S. as a whole, averaging 2.3 percent annually. Through 2030, the GRP of the region is expected to continue to grow, averaging 2.1 percent per annum (see **Table 3.1-5, *Summary of Historical and Future Gross Regional Product (Millions of $2004)***).

Table 3.1-5
SUMMARY OF HISTORICAL AND FUTURE GROSS REGIONAL PRODUCT
(Millions of $2004)
Lambert-St. Louis International Airport

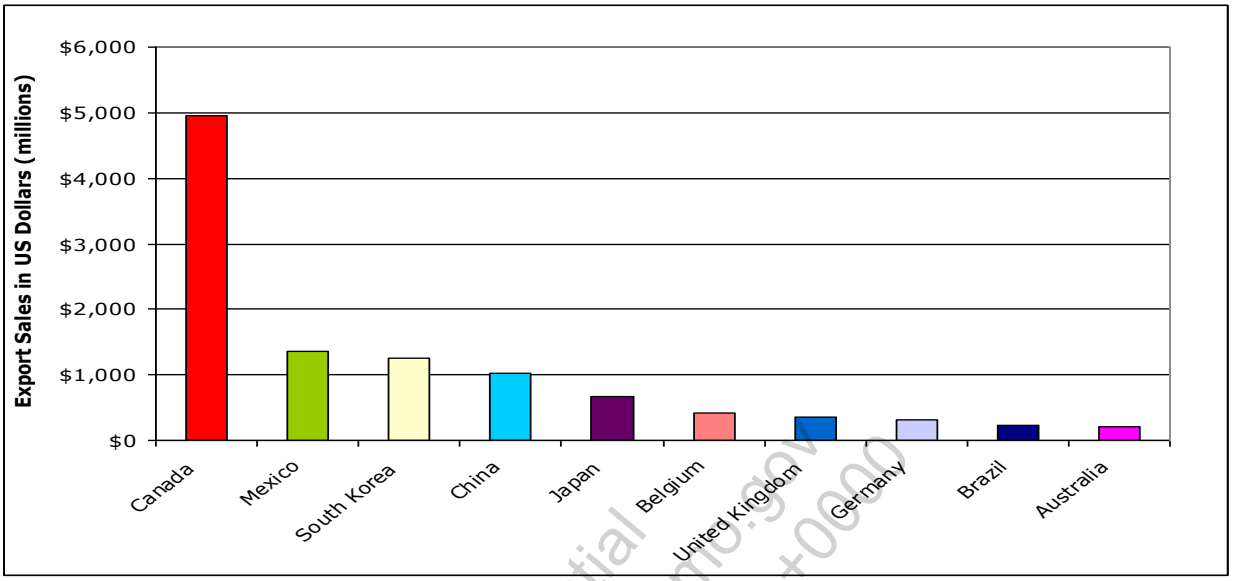
Calendar Year	STL MSA	State of Illinois	State of Missouri	United States
Actual				
1990	$81,869	$375,956	$143,541	$7,693,521
1995	$91,824	$428,792	$166,697	$8,629,633
1996	$94,167	$442,712	$171,387	$8,986,095
1997	$96,571	$457,084	$176,209	$9,357,282
1998	$99,036	$471,923	$181,166	$9,743,801
1999	$101,564	$487,243	$186,263	$10,146,286
2000	$104,156	$503,061	$191,504	$10,565,396
2005	$112,995	$540,051	$209,054	$12,026,607
2006	$117,513	$561,699	$217,927	$12,285,328
2007	$119,750	$573,965	$222,200	$12,564,662
Forecast				
2010	$126,890	$612,954	$235,814	$13,452,132
2015	$140,106	$684,820	$260,969	$15,088,265
2020	$155,071	$765,969	$289,387	$16,936,569
2025	$172,004	$857,620	$321,476	$19,025,830
2030	$191,160	$961,158	$357,706	$21,388,808
Average Annual Growth Rate:				
1990-07	2.3%	2.5%	2.6%	2.9%
2007-15	2.0%	2.2%	2.0%	2.3%
2015-30	2.1%	2.3%	2.1%	2.4%
2007-30	2.1%	2.3%	2.1%	2.3%

Sources: Woods & Poole Economics 2007; Landrum & Brown analysis, 2011

3.1.4.5 International Trade

The St. Louis economy is an integral cog in the state of Missouri's international trade. According to the Missouri Economic Research & Information Center, Missouri set a record in 2007 with $13.4 billion in exports to 194 countries, a five percent increase over the previous year. Transportation equipment, chemicals, and machinery are the primary exported items from the state. Canada is Missouri's primary export partner, importing almost five billion dollars of goods in 2007 (*see* **Exhibit 3.1-11*, State of Missouri – Top Ten Export Partners (2007)***).

Exhibit 3.1-11
STATE OF MISSOURI – TOP TEN EXPORT PARTNERS (2007)
Lambert-St. Louis International Airport



Source: Missouri Economic Research & Information Center, *Missouri Economic Report 2008.*

3.1.4.5 Tourism & Attractions

St. Louis is located on the eastern border of Missouri along the Mississippi River and is often referred to as the 'Gateway to the West.' According to the St. Louis CVC *Fiscal Year 2007 Annual Report*, the St. Louis area has over 22 million visitors annually, 21 percent of whom arrive via air transportation. According to the December 2008 *St. Louis Air Service Assessment*, 44 percent of STL air travelers are visitors to the St. Louis area. Visitor spending was estimated to be over four billion dollars in 2006 with 4.4 percent, or $179 million, being attributed to air transportation.[13]

Among the many attractions that bring visitors to St. Louis is the Gateway Arch which was constructed in 1963 as a commemoration of the westward expansion of the United States. In addition to the Arch, other attractions in the area include the St. Louis Zoo, museums, Anheuser-Busch Brewery, Six Flags, riverboat tours, the St. Louis Rams (National Football League), the Cardinals (Major League Baseball), and the Blues (National Hockey League).

The St. Louis area has over 36,000 hotel rooms and obtained 60 percent occupancy in 2006. The City of St. Louis has excellent conference and meeting facilities. The America's Center, St. Louis' largest convention center, incorporates over 500,000 square feet of open floor space in six exhibit halls, 83 meeting rooms, the 66,000-seat Edward Jones Dome, the 1,411-seat Ferrara Theater, a 28,000 square-foot ballroom, and the St. Louis Executive Conference Center.[14]

[13] St. Louis Convention & Visitors Commission *Fiscal Year 2007 Annual Report*
[14] St. Louis Convention & Visitors Commission

3.2 HISTORICAL AVIATION ACTIVITY

This section provides a discussion of STL's role, a summary of historical activity levels, and an overview of current domestic and international air service offered at STL. The purpose of this section is to start building a context for the forecast. It answers questions such as who does STL serve and why? The past is not always a good predictor of the future; however, an analysis of historical data provides the opportunity to understand those factors that have caused traffic to increase or decrease and how those factors may change in the future, thus influencing the forecast. While the socioeconomic base is one of the fundamental underpinnings of the forecast, demand cannot be realized without air service at a price that induces demand. Ultimately, understanding the historical relationships between the economy and aviation activity at STL will form the building blocks of the forecast.

3.2.1 AIRPORT ROLE

STL is among the busiest airports in the U.S. and is a critical component in the St. Louis transportation infrastructure. The Airport generates an estimated $5.1 billion annual economic impact for the St. Louis region.[15] STL is one of 37 U.S. airports which enplane between 0.25 and 1.0 percent of total U.S. enplanements annually. As a result it is designated as a "Medium Hub Primary Commercial Service Airport" by the Federal Aviation Administration (FAA).[16] In 2008, STL ranked 29th among U.S. airports in terms of total domestic originating enplanements[17] and 31st in North America in terms of total passengers.[18] The airport caters to a diverse customer base including cargo operators, fractional jet operators, private pilots, and the military; however, it is scheduled passenger airlines that account for the majority of the operational activity at STL.

Up until 2000, TWA operated its largest U.S. domestic hubbing operation at STL, with an average of over 450 passenger flight departures per day. In April 2001, under considerable financial pressure, TWA agreed to be purchased by American Airlines and promptly declared bankruptcy for the third time in a decade. With domestic hubbing operations at nearby Chicago O'Hare and Dallas Ft. Worth coupled with its own financial problems that ensued following the 2001 economic recession and 9-11 terrorist attacks, American has progressively drawn down the hub at STL to approximately a third of its former size. As a result, the profile of traffic has changed quite dramatically and STL has become an airport serving predominantly originating passengers with a much smaller percentage of connecting traffic than historically has been the case. STL has an increasingly strong LCC presence. Southwest Airlines initiated service at STL in 1985 and has progressively increased its presence. Other LCCs have also established service at the airport, albeit on a smaller scale than Southwest.

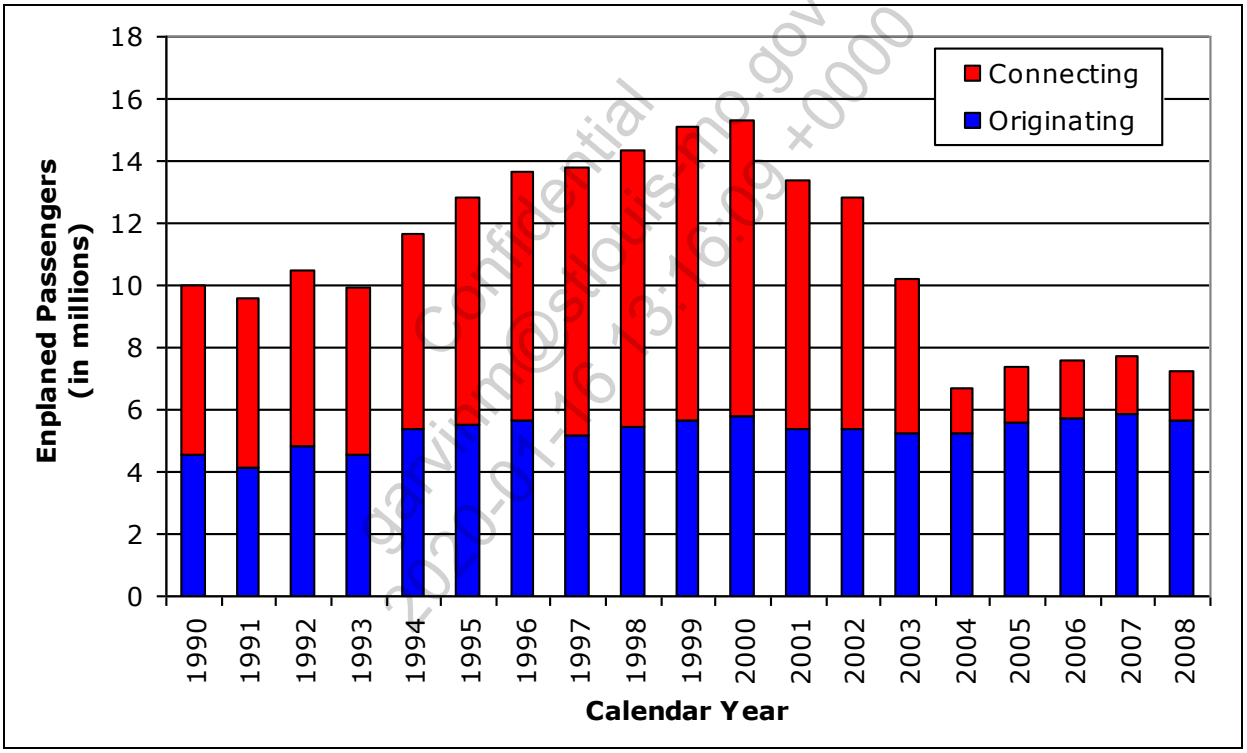
---

15 *See* Internet website: http://www.flystl.com/flystl/about-lambert/facts/
16 2009-2013 *National Plan of Integrated Airport Systems* (NPIAS)
17 USDOT, *Air Passenger Origin-Destination Survey*
18 Airports Council International –North America (ACI-NA)

3.2.2 HISTORICAL ENPLANED PASSENGERS

During the 1990s, growth in enplanements at STL owed much to the continued expansion of TWA's connecting hub at the airport. Growth was particularly robust from 1994 onward after TWA transferred capacity back to STL following its attempt to build a hubbing operation at Atlanta-Hartsfield and an organizational restructuring after two successive bankruptcies in 1992 and 1995. Between 1990 and 2000, passenger traffic at STL increased from 10.0 million to 15.3 million, averaging growth of 4.4 percent per year (*see* **Exhibit 3.2-1, *Historical Enplaned Passengers***). During this ten year period, connecting traffic accounted for approximately three quarters of the net increase in enplanements at the airport.

Exhibit 3.2-1
HISTORICAL ENPLANED PASSENGERS
Lambert-St. Louis International Airport



Note: Excludes non-revenue, charter, and other enplanements.

Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

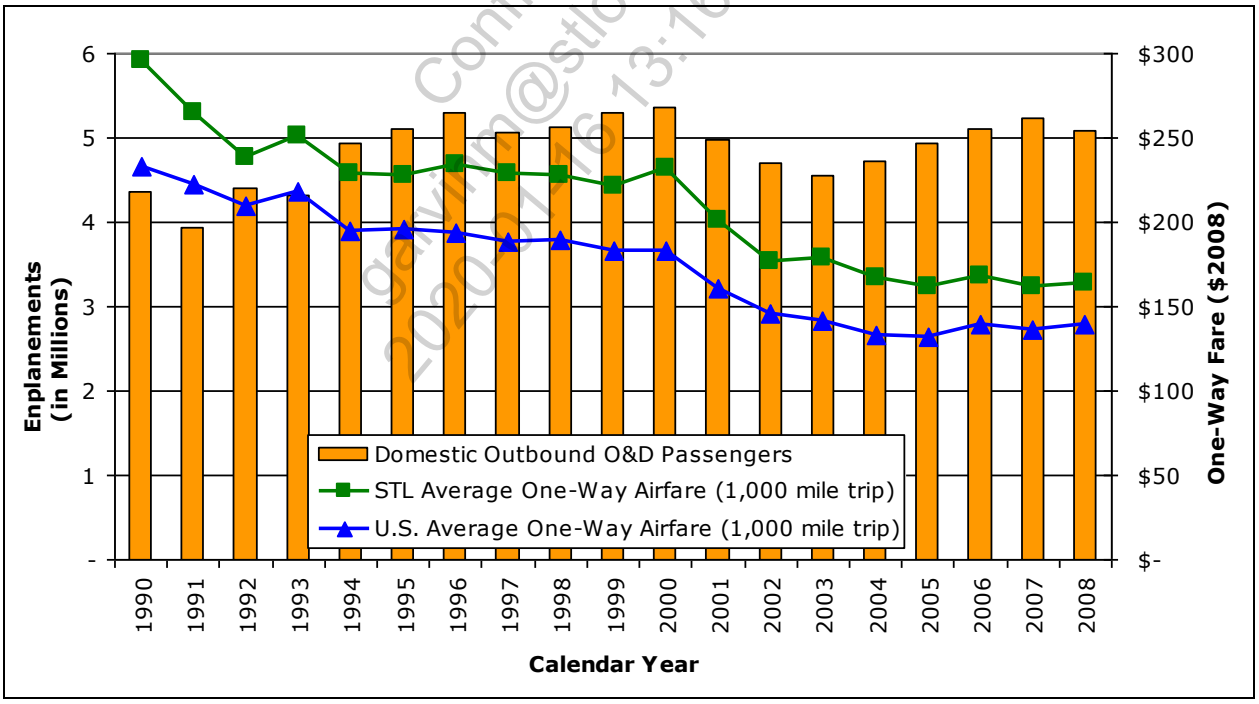
The financial problems that troubled TWA in the first half of the 1990s re-emerged in 2000. In April 2001, American Airlines acquired the airline assets of TWA and TWA declared bankruptcy for a third time subsequent to the purchase agreement. The transition of TWA into the American Airlines operation was completed on December 1, 2001. As discussed in the preceding section, American has drawn down the hub at St. Louis since acquiring TWA. Between 2003 and 2004, American reduced its operation at STL by almost half. The impact on connecting passenger traffic at STL has been dramatic. According to DOT statistics, 9.5 million enplaned passengers connected with flights at STL in 2000 versus just 1.5 million today.

Although total enplanements at STL reached a two-decade low of 6.7 million in 2004, passenger traffic grew each year through 2007, driven primarily by increased originating traffic (traffic is down in 2008 due to the economic recession).

3.2.2.1 Domestic O&D Traffic and Average Passenger Air Fares

As the TWA/American hub has contracted in size at STL, domestic originating traffic has become the largest passenger segment at the airport. In 2008, originating passengers traveling on purely domestic itineraries accounted for 70.5 percent of total enplanements at STL. Growth in domestic origin and destination (O&D) traffic has generally tracked with changes in the local and national economy and has been less impacted by the strategic decisions of TWA and American. Between 1990 and 2007, pure domestic O&D traffic at STL averaged growth of 1.1 percent per year, increasing from 4.4 million enplanements to 5.2 million enplanements (*see* **Exhibit 3.2-2, *Domestic O&D Traffic & Average One-Way Fare Paid (Inflation Adjusted $2008)***). Domestic originating enplanements were down 3.1 percent in 2008 as the airlines cut service.

Exhibit 3.2-2
DOMESTIC O&D TRAFFIC & AVERAGE ONE-WAY FARE PAID
(Inflation Adjusted $2008)
Lambert-St. Louis International Airport



Notes: 1 CPI data published by the Bureau of Labor Statistics was used to adjust fares published in nominal dollars to account for the effects of inflation.
2 Excludes non-revenue, charter, and other enplanements.

Sources: USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

While difficult to prove definitively, the sheer scale of the hubbing operation historically at STL has likely been to the detriment of growth of other passenger airlines. As the hub has contracted in size, airlines, and in particular LCCs, have begun to expand or introduce new point-to-point service at STL, stimulating domestic originating traffic. Indeed domestic originating traffic jumped 15 percent at STL from 2003 to 2007, fueled by 70 percent growth in domestic originating traffic handled by LCC carriers. In spite of the fact that total domestic originating traffic was down 3.1 percent in 2008, LCC domestic originating enplanements were up 8.7 percent in 2008 over 2007.

Since deregulation, air travel has become increasingly affordable throughout the United States. At STL, inflation-adjusted airfares have declined almost uninterrupted since 1990. In 2008, the average fare paid for a 1,000 mile trip at STL was 45 percent lower than in 1990. However, domestic airfares at STL have typically been higher than the national average, in large part due to the historical dominance of activity by a single carrier. The data suggests that fares are diverging with national benchmarks as LCCs account for an increasing share of the domestic originating traffic at STL. In 2007, the average one-way fare paid for a 1,000 mile trip was 18 percent higher at STL than the U.S. average, compared with 25 to 26 percent higher at the peak of TWA's hubbing operation in 2000 and 2001.

3.2.2.2 International Origin and Destination Traffic

International travel has historically been a relatively small component of the overall passenger base at STL. International O&D traffic at STL can be divided into two main categories:

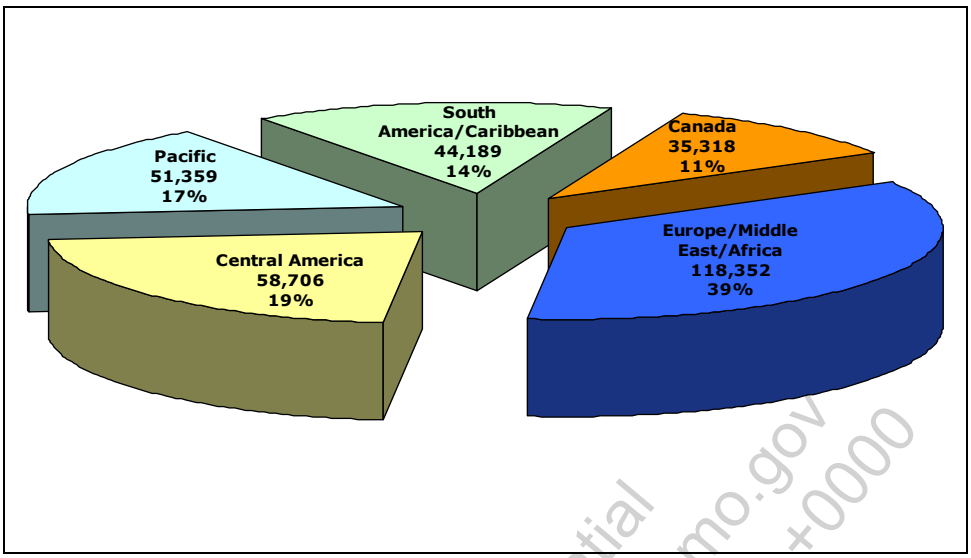
1. **Bound for International Destinations**:
   Passengers bound for international destinations that enplane a *domestic* flight at STL and connect with an international flight at another U.S. gateway.

2. **Pure International O&D Enplanements**:
   Passengers that enplane an *international* flight at STL.

BOUND FOR INTERNATIONAL DESTINATIONS

In 2008, an estimated 317,132 passengers enplaned domestic flights at STL and flew through another U.S. gateway to an international destination. This traffic segment has been growing at an average annual rate of 4.2 percent since 1990. Europe, Central America (including Mexico), and the Pacific are the key regions for passengers bound for international destinations from STL (*see* **Exhibit 3.2-3, *Enplaned Passengers Bound for International Destinations (2008)***).

Exhibit 3.2-3
ENPLANED PASSENGERS BOUND FOR INTERNATIONAL DESTINATIONS (2008)
Lambert-St. Louis International Airport



Sources: USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

Table 3.2-1, *Enplaned Passengers Bound for International Destinations (2008)*, shows the primary U.S. gateways and the corresponding destination regions for passengers originating travel from STL. Chicago O'Hare is the primary gateway for European, Pacific, and Canadian traffic; Dallas-Ft. Worth for Central American traffic; and Miami for South American traffic.

Table 3.2-1
ENPLANED PASSENGERS BOUND FOR INTERNATIONAL DESTINATIONS (2008)
Lambert-St. Louis International Airport

				Region as % of Gateway Total				
Rank	Gateway	STL Enpax	% of Total	Europe/Middle East/Africa	Central America	Pacific	South America/ Caribbean	Canada
1	ORD	80,818	25.5%	51.4%	6.4%	24.0%	2.0%	16.2%
2	DFW	37,146	11.7%	6.5%	74.2%	3.2%	9.6%	6.6%
3	ATL	34,984	11.0%	40.7%	25.2%	8.5%	24.9%	0.8%
4	MIA	33,536	10.6%	0.8%	27.0%	0.0%	72.2%	0.0%
5	DTW	16,525	5.2%	52.9%	0.4%	31.2%	1.0%	14.6%
6	JFK	14,471	4.6%	72.4%	0.0%	19.9%	6.3%	1.4%
7	IAH	13,028	4.1%	4.3%	78.4%	2.3%	13.1%	2.0%
8	MSP	12,060	3.8%	20.2%	0.9%	21.3%	0.0%	57.6%
9	EWR	12,009	3.8%	73.5%	0.6%	19.8%	3.8%	2.3%
10	LAX	11,780	3.7%	0.2%	3.1%	94.7%	0.5%	1.4%
11	IAD	9,195	2.9%	86.4%	0.5%	5.5%	3.7%	3.9%
12	DEN	6,249	2.0%	0.3%	32.1%	0.0%	0.0%	67.6%
13	PHL	5,187	1.6%	89.8%	0.4%	2.2%	1.4%	6.1%
14	CLT	5,057	1.6%	18.5%	15.9%	1.1%	59.6%	4.8%
15	PHX	4,676	1.5%	0.0%	90.3%	0.0%	0.2%	9.5%
16	CVG	3,862	1.2%	73.1%	2.0%	1.0%	0.0%	23.9%
17	MEM	3,818	1.2%	26.4%	19.9%	4.5%	49.2%	0.0%
	Other	12,731	4.0%	34.2%	3.1%	29.4%	16.1%	17.1%
	Total	**317,132**	**100.0%**	**35.1%**	**22.0%**	**16.6%**	**15.4%**	**11.0%**

Sources: USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

PURE INTERNATIONAL O&D ENPLANEMENTS

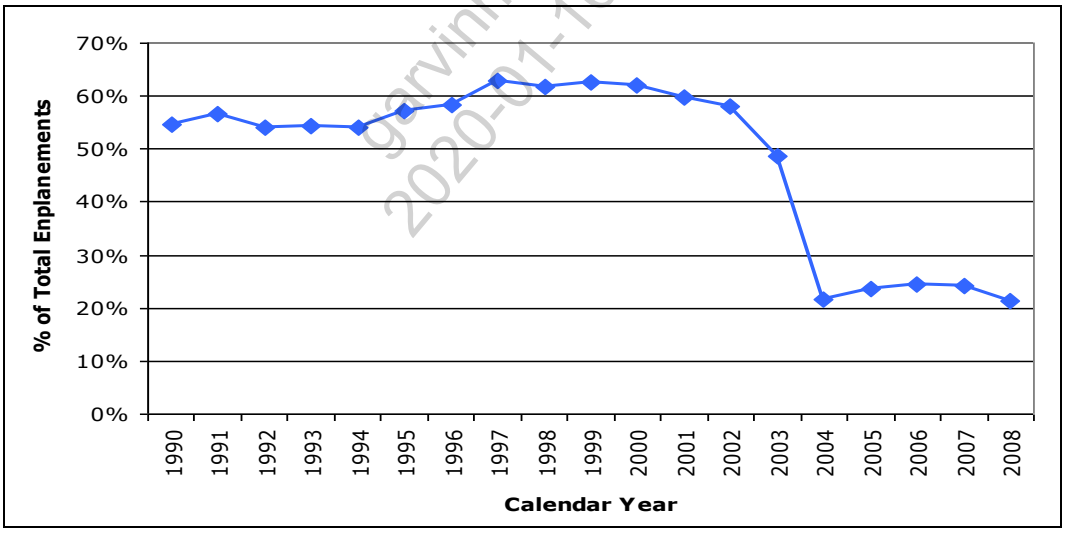
In 2008, 95,945 passengers boarded international flights at STL, of which 99 percent were originating passengers. Destinations in Mexico such as Cancun accounted for over 60 percent of international O&D enplanements at STL. The Caribbean (20 percent) and Canada (17 percent) were the next largest markets.[19]

3.2.2.3 Connecting Traffic

St. Louis' central position in the United States makes it an ideal geographic location for a connecting hub. At the peak of TWA's hub, connecting traffic accounted for almost 63 percent of total enplanements at STL. As American has drawn down the hub at STL, connecting traffic has declined; however, connecting traffic still continues to account for 20 to 25 percent of total enplanements at the airport. Indeed, the share of connecting traffic has remained relatively stable at STL since 2004 (*see* **Exhibit 3.2-4, *Connecting Enplanements Share of Total Enplanements***).

In 2008, 1.5 million connecting enplanements were reported at STL. American and its regional affiliates account for almost 80 percent of connecting traffic at the airport, while Southwest accounted for almost all the remaining connections.

Exhibit 3.2-4
CONNECTING ENPLANEMENTS SHARE OF TOTAL ENPLANEMENTS
Lambert-St. Louis International Airport



Sources: USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

[19] Based on T-100 data for the 12 months ending October 2008.

3.2.3 HISTORICAL AIR CARGO TRAFFIC

Air cargo (freight and mail) is shipped between airports by two modes: (1) either in the cargo compartment, or belly, of passenger aircraft or (2) aboard all-cargo or dedicated freighter aircraft.

The majority of cargo shipped through STL is handled by all-cargo carriers such as FedEx and UPS. Since 2000, the share of air cargo handled by dedicated freighters has increased from 66.9 percent of total air cargo tonnage to almost 89 percent by 2008 (*see* **Table 3.2-2, *Historical Air Cargo Volumes (in metric tonnes)***). While this is a trend seen at many airports around the U.S. a specific contributing factor at STL is the increased deployment of regional jets in passenger service which limit available space for air cargo in the belly of passenger aircraft.

Table 3.2-2
HISTORICAL AIR CARGO VOLUMES (in metric tonnes)
Lambert-St. Louis International Airport

Calendar Year	Belly Total	All Cargo Total	Total Cargo	Percent All Cargo
1999	45,461	85,596	131,057	65.3%
2000	43,045	87,122	130,167	66.9%
2001	33,666	87,794	121,460	72.3%
2002	51,942	82,925	134,868	61.5%
2003	32,657	85,843	118,500	72.4%
2004	17,289	87,669	104,958	83.5%
2005	12,400	88,793	101,192	87.7%
2006	10,692	78,190	88,883	88.0%
2007	8,760	74,491	83,251	89.5%
2008	9,155	71,924	81,080	88.7%
Average Annual Growth Rate:				
2000-08	-17.6%	-2.4%	-5.7%	

Note: Includes enplaned and deplaned mail and freight.

Sources: Airport Records; Landrum & Brown analysis, 2011

The volume of air cargo handled at STL has steadily declined from 130,000 metric tons in 2000 to 81,080 tons in 2008. Notably, air cargo handled by all-cargo carriers has declined less than cargo handled by passenger airlines. The overall decline in air cargo at STL is likely less indicative of local market forces than broader national trends in the movement of domestic cargo. The shipping industry has moved away from "Next Day" to time definite second and third day delivery which has shifted a proportion of air cargo to trucks. The higher price of fuel has also caused shippers to use ground shipment of cargo whenever possible. The geographic location of STL may also be a factor in the decline of air cargo at the airport as so many major markets are within reasonable driving distance. It is worth noting that the decline in belly cargo volumes at STL leveled off in 2008, with volumes up slightly from 2007.

Table 3.2-3, *2008 Air Cargo Carrier Market Share (in metric tonnes)*, provides a summary of air cargo tonnages by carrier. In 2008, FedEx handled 47.8 percent of total air cargo tonnage at STL. UPS was the second ranked carrier in terms of cargo tonnage, handling 23.0 percent of air cargo at STL.

Table 3.2-3
2008 AIR CARGO CARRIER MARKET SHARE (in metric tonnes)
Lambert-St. Louis International Airport

Airline	Freight	Mail	Tons of Air Cargo	Percent of Total
All Cargo				
Fedex	38,730	-	38,730	47.8%
UPS	1,604	17,071	18,675	23.0%
Capital Cargo	9,629	-	9,629	11.9%
ASTAR	4,890	-	4,890	6.0%
Total	**54,853**	**17,071**	**71,924**	**88.7%**
Passenger				
American	757	3,062	3,819	4.7%
Southwest	3,109	-	3,109	3.8%
Other	1,032	1,195	2,228	2.7%
Total	**4,898**	**4,258**	**9,155**	**11.3%**
Total Cargo	**59,751**	**21,328**	**81,080**	**100.0%**

Sources: Airport Records; Landrum & Brown analysis, 2011

3.2.4 HISTORICAL AIRCRAFT OPERATIONS

Almost 250,000 operations (arrivals and departures) were recorded at STL in 2008. Commercial passenger operations have historically accounted for between 86 and 92 percent of total annual operations at the airport (*see* **Table 3.2-4, *Historical Aircraft Operations***).

The current level of passenger operations is almost half the number operated at STL during the second half of the 1990s, reflecting the draw-down of the TWA/American hub.

All-cargo operations have typically accounted for between one and two percent of total operations at STL. In 2008, all cargo carriers averaged approximately 11 operations a day, assuming a typical 5.5 day cargo week. While all cargo operations have trended downward at STL since 1995, in the first seven months of 2008 all-cargo operations increased 3.7 percent.

In 2008, air taxi and general aviation operations accounted for 8.4 percent of total aircraft operations. STL has a single FBO, Signature Flight Support, which provides fuel, aircraft parking, and passenger and pilot terminal lounges.

The 131st Fight Wing of the Missouri Air National Guard is located at STL and has historically been a key component of the military activity at the airport. As part of the 2005 Base Realignment and Closures (BRAC), the 131st Fighter Wing was put on the list of closings and in July 2009 the wing will be transitioned to Whiteman Air Force Base, Missouri. Boeing also completes final production of the F15 and F18 fighter jets and often flies test flights from STL runways. In 2008, military operations accounted for 1.2 percent of total aircraft operations at STL.

TABLE 3.2-4
HISTORICAL AIRCRAFT OPERATIONS
Lambert-St. Louis International Airport

Calendar Year	Passenger	All-Cargo	Air Taxi & GA	Military	Total
1995	452,586	9,218	49,123	7,034	517,961
1996	456,704	8,096	43,212	5,837	513,849
1997	464,096	8,304	39,427	5,057	516,884
1998	457,032	7,948	33,794	4,899	503,673
1999	455,230	8,402	33,300	4,307	501,239
2000	438,122	7,614	34,404	4,084	484,224
2001	438,658	7,462	28,711	4,116	478,947
2002	400,790	5,620	42,842	2,552	451,804
2003	349,326	5,942	35,565	3,630	394,463
2004	247,966	5,852	30,213	5,676	289,707
2005	258,102	5,466	25,322	8,114	297,004
2006	245,844	3,432	14,351	18,226	281,853
2007	228,520	3,278	16,228	8,902	256,928
2008	221,410	3,186	20,860	2,941	248,397
Average Annual Growth Rates:					
1995-00	-0.6%	-3.8%	-6.9%	-10.3%	-1.3%
2000-08	-8.2%	-10.3%	-6.1%	-4.0%	-8.0%
1995-08	-5.4%	-7.8%	-6.4%	-6.5%	-5.5%

Sources: Airport Records; FAA ATADS; Landrum & Brown analysis, 2011

3.2.5 COMMERCIAL PASSENGER AIR SERVICE

The base year for the Master Plan is 2008 so airline schedules from the Official Airline Guide (OAG) for August 2008 were analyzed to determine the level and type of air service being offered at STL during a typical busy month. Unless otherwise noted, the air service data in this section is based on the August 2008 airline schedules. Changes that have occurred in 2009 are noted as appropriate throughout the section.

A total of 15 airlines provided scheduled passenger air service at STL in August 2008. Ryan International Airlines stopped operating at STL in April 2008 and Midwest Airlines ceased operations in September.

The STL airlines operated a total of 310 average daily flight departures to 70 domestic airports and 3 international airports in August 2008. STL lost service to St. Petersburg, Florida (PIE) in September 2008 and to Santa Ana, California (SNA) and Springfield, Illinois (SPI) in December 2008. In addition to dropping service to these 3 markets, the airlines have been cutting back service and decreasing frequency on some markets. As a result, scheduled domestic seats are down 12.8 percent in 2009 over 2008. Domestic scheduled seats for American are down 22.8 percent while Southwest is down only 3.8 percent. Scheduled international seats are down 13.9 percent in 2009 over 2008.

3.2.5.1 Domestic Air Service

Domestic air service accounts for 99 percent of scheduled passenger operations at STL. This subsection provides an analysis of trends in airline market shares, destinations served, and changes in the type of passenger aircraft deployed to domestic destinations from STL.

AIRLINE MARKET SHARES

American continues to be the largest carrier at STL, accounting for 40 percent of scheduled domestic capacity (*see* **Table 3.2-5, *Airline Domestic Market Shares (August 2008)***) and providing service to 40 U.S. markets in August 2008. Southwest is the second largest carrier at STL accounting for almost 35 percent of domestic capacity and offering service to 24 destinations. No other airline accounts for more than six percent of domestic capacity at the airport. While the two largest carriers still dominate the market with a 75 percent market share, this is down from a 90 percent market share in 2000.

LCCs have accounted for an increasing share of traffic at STL (*see* **Exhibit 3.2-5, *LCC Share of Scheduled Seats on Domestic Departing Flights***). In part this has been due to a reduction in the size of TWA's operation (and subsequently American's operation) at STL. LCC capacity has increased sharply since 2004, coinciding with American's decision to draw down the hub. In 2008, scheduled seats on departing LCC flights were up 25 percent over 2004 levels. Although Southwest continues to be the dominant LCC at STL (*see* **Exhibit 3.2-6, *Domestic Airline Market Shares***), Frontier, USA 3000, and AirTran also currently provide LCC service from the airport.

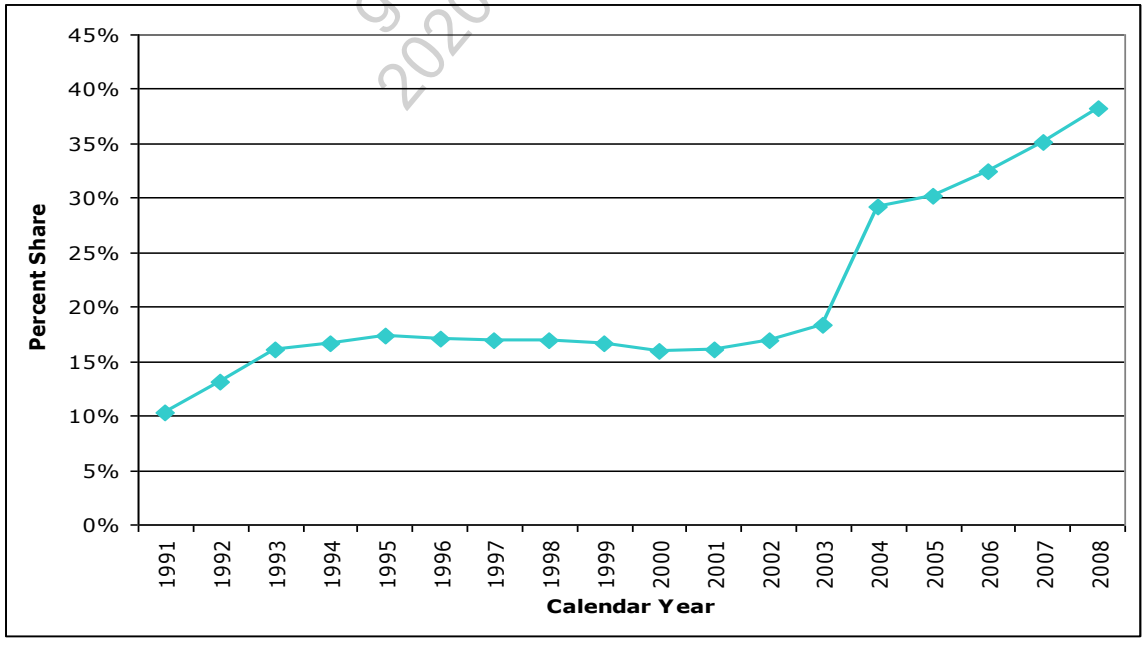
Table 3.2-5
AIRLINE DOMESTIC MARKET SHARES (AUGUST 2008)
Lambert-St. Louis International Airport

Airline [1]	Markets [2] Served	Departing Flights		Departing Seats		Seats Per Departure
		Avg. Daily	% of Total	Avg. Daily	% of Total	
American	40	133	43.1%	11,531	40.2%	87
Southwest	24	73	23.8%	9,976	34.8%	136
Northwest	3	14	4.6%	1,347	4.7%	95
Delta	4	17	5.6%	1,332	4.6%	77
US Airways	4	14	4.6%	1,189	4.1%	83
United	3	18	5.8%	1,131	3.9%	63
Continental	3	15	4.8%	738	2.6%	50
AirTran	2	4	1.4%	513	1.8%	117
Frontier	1	3	1.0%	399	1.4%	133
Great Lakes	5	13	4.2%	245	0.9%	19
USA 3000	2	1	0.3%	130	0.5%	168
Midwest	1	2	0.5%	82	0.3%	50
GoJet	1	1	0.3%	66	0.2%	66
Total	**62**	**308**	**100.0%**	**28,679**	**100.0%**	**93**
Legacy	49	211	68.5%	17,268	60.2%	82
LCC	27	82	26.8%	11,084	38.6%	134
Other	7	15	4.7%	327	1.1%	23
Total	**62**	**308**	**100.0%**	**28,679**	**100.0%**	**93**

Notes: 1 "Airline" includes regional partners.
2 Multi-airport markets such as Chicago with Chicago-O'Hare and Chicago-Midway airports are grouped together.

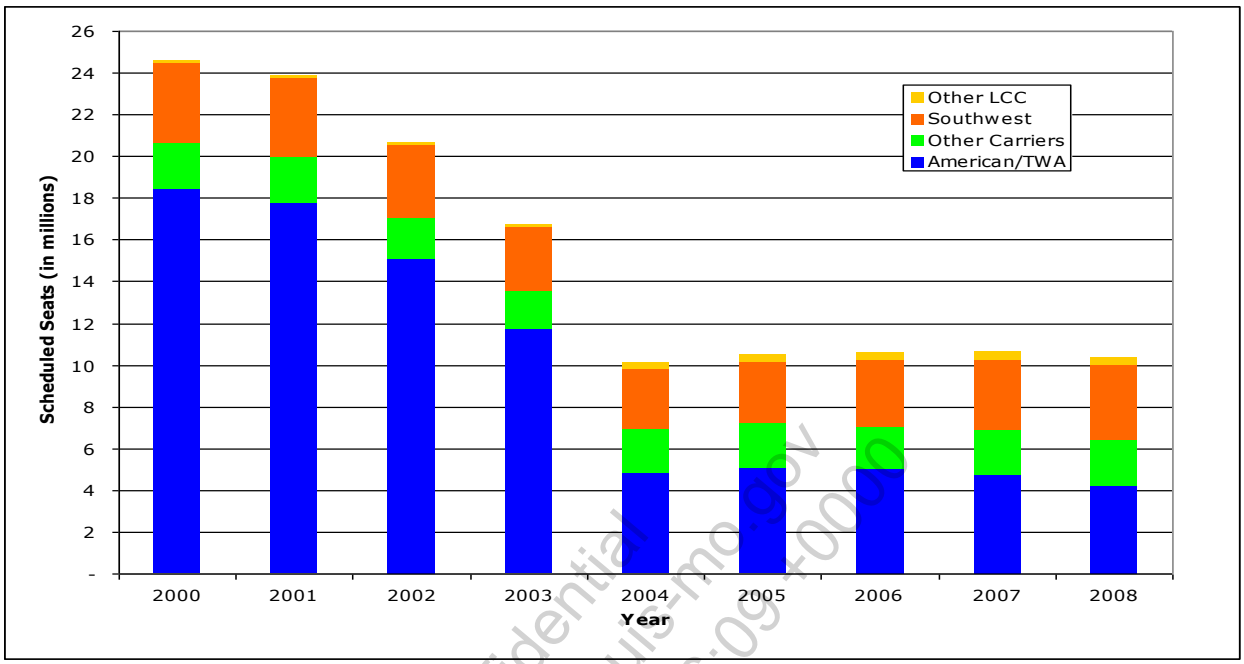
Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

Exhibit 3.2-5
LCC SHARE OF SCHEDULED SEATS ON DOMESTIC DEPARTING FLIGHTS
Lambert-St. Louis International Airport



Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

Exhibit 3.2-6
DOMESTIC AIRLINE MARKET SHARES
Lambert-St. Louis International Airport



Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

DESTINATIONS SERVED

The airlines provided service to 62 domestic markets (70 airports) in August 2008. All of STL's 25 top domestic O&D markets had non-stop service from STL (*see* **Table 3.2-6, *Air Service in Top 25 Domestic O&D Markets***). Of the top 50 domestic O&D markets, only Portland, Sacramento, Honolulu, and Manchester were without non-stop service in 2008. The O&D data also indicates the potential for increased service to a number of existing non-stop markets such as Ft. Lauderdale, San Diego, Austin, Hartford, and Jacksonville because these markets have high load factors.

Table 3.2-6
AIR SERVICE IN TOP 25 DOMESTIC O&D MARKETS
Lambert-St. Louis International Airport

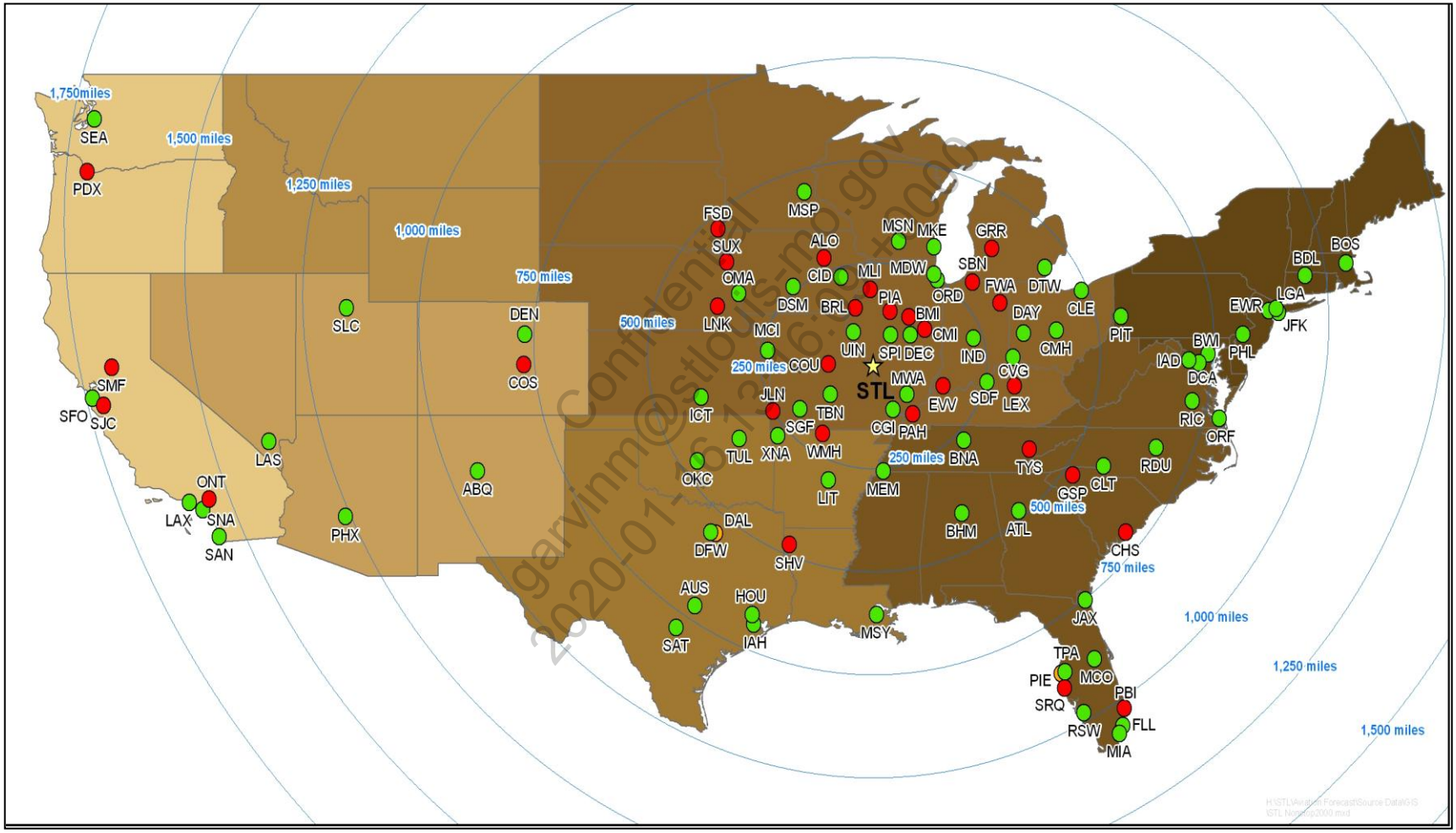
Rank	Market	2007 Annual Enplanements	Aug 08 Daily Dep Flts	Aug 08 Daily Dep Sts.
1	Chicago [1]	335,180	32	3,681
2	Washington [2]	281,070	13	1,382
3	Dallas/Ft. Worth [3]	275,210	17	2,513
4	New York [4]	253,720	17	1,222
5	Los Angeles [5]	249,380	6	847
6	Orlando	183,480	7	924
7	Denver	163,870	13	1,322
8	Atlanta	155,820	15	1,425
9	Phoenix	154,330	8	1,010
10	Las Vegas	148,190	5	667
11	Detroit [6]	143,860	7	868
12	Houston [7]	143,520	10	823
13	San Francisco [8]	130,280	2	380
14	Minneapolis-St Paul	106,990	13	883
15	Philadelphia	104,450	9	702
16	Kansas City	89,430	4	610
17	Seattle	89,280	2	380
18	Tampa	88,430	3	414
19	Boston	85,420	3	393
20	Cleveland	84,310	5	424
21	Fort Myers	77,920	2	228
22	San Diego	75,190	1	140
23	Ft. Lauderdale	74,210	1	137
24	Omaha	71,600	3	374
25	Miami	64,410	2	380
	Top 25 Markets	3,629,550	201	22,131
	Other	1,614,090	107	6,548
	Total	**5,243,640**	**308**	**28,679**

Notes:
1 Includes O'Hare and Midway airports
2 Includes Ronald Reagan National, Baltimore-Washington, and Washington Dulles airports
3 Includes Dallas/Ft. Worth and Love Field airports
4 Includes John F Kennedy, La Guardia, and Newark airports
5 Includes Los Angeles, John Wayne, Ontario, Long Beach, and Burbank airports
6 Includes Detroit and Wayne County Airports
7 Includes Bush-Intercontinental and Hobby airports
8 Includes Oakland, San Jose, and San Francisco airports

Sources: *Official Airline Guide*; USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

The number of destinations served at STL has declined from 101 airports in August 2000 to 70 airports in August 2008. **Exhibit 3.2-7, *Destinations Served Non-Stop (August 2008 Versus August 2000)***, provides a graphical depiction of how the number of destination served non-stop from STL has changed in the past eight years. It is interesting to note that many of the destinations that have lost service are small and non-hub airports within 500 miles of STL. Historically, these airports functioned as spokes on the connecting hub when TWA and American had a large hubbing operation at STL. TWA and American flowed passengers from smaller communities over STL, primarily connecting them to larger mainline aircraft destined for major cities. As the hub has contracted in size, the economics of serving these small relatively short-haul spoke markets has deteriorated. Airlines operating at STL have retained service to the majority of large metropolitan areas in the United States as these markets provide greater densities of passengers that can be more readily supported with demand for air travel to and from the St. Louis area (i.e. originating traffic). Since August 2008, STL has lost service to SNA, SPI, and PIE (the only new market shown on the map).

Exhibit 3.2-7
DESTINATIONS SERVED NON-STOP (AUGUST 2008 VERSUS AUGUST 2000)
Lambert-St. Louis International Airport



Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

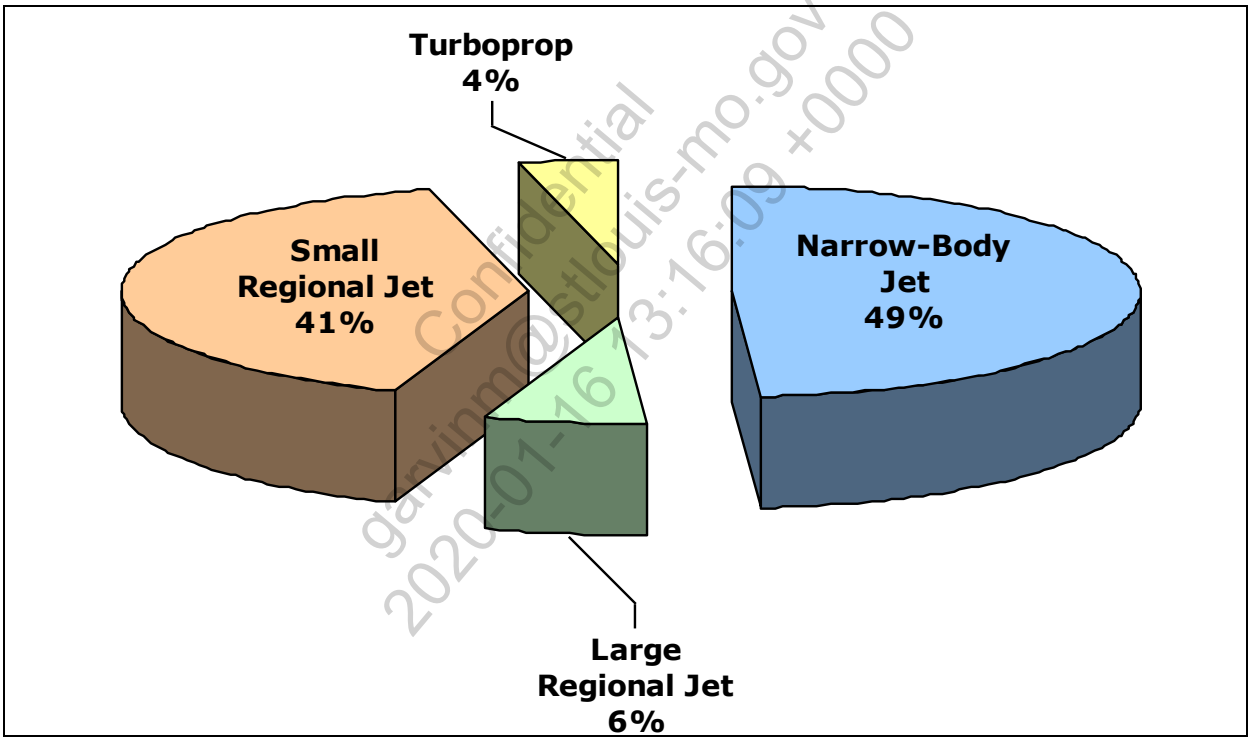
THIS PAGE INTENTIONALLY LEFT BLANK

PASSENGER AIRCRAFT FLEET MIX

A variety of aircraft are deployed by the airlines operating at STL, reflecting the different aircraft fleets of the incumbent airlines and the range of market densities in which those aircraft are flown.

In terms of aircraft groups, narrow-body jet aircraft accounted for the largest share of commercial passenger operations at STL in 2008 (*see* **Exhibit 3.2-8, *Passenger Aircraft Fleet Mix (2008)***). Key aircraft within the narrow-body group are the 737-300 and 737-700 deployed by Southwest and the MD80 aircraft deployed by American.

Exhibit 3.2-8
PASSENGER AIRCRAFT FLEET MIX (2008)
Lambert-St. Louis International Airport



Sources: Airport Records; *Official Airline Guide*; Landrum & Brown analysis, 2011

Small regional jets, categorized as those with 50 seats or less, accounted for 41 percent of scheduled commercial passenger operations in 2008. The regional partners of American Airlines accounted for 66 percent of the small regional jet service at STL. Since 2004, American has increasingly relied on its regional partners to provide service at STL, often to maintain frequency using smaller aircraft in markets where it has reduced mainline capacity.

Large regional jets accounted for seven percent of commercial passenger operations at STL in 2008. These aircraft range from 50 to 90 seats. At STL, the main types of large regional jet are the Bombardier CRJ-700 and CRJ-900. The deployment of large regional jets is increasing throughout the United States primarily due to the improved economics and higher levels of comfort they provide compared with smaller 35 to 50-seat variants. However, American Airlines' pilot scope clause currently limits the use of large regional jet aircraft. As a result, this may also limit the deployment of large regional jet aircraft at STL in the future.

3.2.6 INTERNATIONAL PASSENGER AIR SERVICE

Four airlines provided international service to five destinations from STL in 2008 (*see* **Table 3.2-7, *International Air Service (2008 & 2009)***). Air Canada provides year-round service to Toronto, Canada on Canadair regional jets. USA 3000 Airlines serves Cancun, Mexico and the Dominican Republic on a year-round basis with Airbus 320s. All other international service from STL was seasonal (winter/spring) and does not appear to be scheduled to resume in the winter of 2009.

Table 3.2-7
INTERNATIONAL AIR SERVICE (2008 & 2009)
Lambert-St. Louis International Airport

Airline	Aircraft	2008 & 2009 Scheduled Service	
		Destination	Months
Air Canada	CRJ	Toronto, Canada	year-round
USA 3000	A320	Cancun, Mexico	year-round
	A320	Dominican Republic	year-round
	A320	Jamaica	November 2008-April 2009; no service scheduled for winter of 2009
	A320	Puerto Vallarta, Mexico	January 2009-April 2009; no service scheduled for winter of 2009
Frontier	A319	Cancun, Mexico	January 2008-April 2008; no service scheduled in 2009
Ryan International	B737-400	Cancun, Mexico	February 2008-April 2008; no service scheduled in 2009
	B737-400	Jamaica	February 2008-April 2008; no service scheduled in 2009
	B737-400	Puerto Vallarta, Mexico	January 2008-April 2008; no service scheduled in 2009

Sources: *Official Airline Guide*, 2008 and 2009; Landrum & Brown analysis, 2011

STL previously had transatlantic service to London and Paris as well as destinations in the Caribbean, Mexico, and Canada. The forecast will take into account current airport initiatives underway for expanded international services. In the future, the projected level of international originating passengers will likely be a key determinant in the potential for expanded international service at STL, more so than the volume of connecting traffic.

3.3 FORECAST IMPACT FACTORS

Forecasting future aviation activity is an inexact science and there are many factors that influence future aviation trends. Compounding this is the fact that the commercial passenger aviation industry is currently in an unprecedented period of uncertainty. Oil prices surged to historically high levels in 2006 through 2008, just as the U.S. airline industry as a whole returned to profitability following the most recent economic downturn and the aftermath of the September 11, 2001 terrorist attacks. The U.S. (and much of the world) is in the midst of the worst economic downturn since the Great Depression. While the recession has led to decreased demand for oil and prices have come down in the 4th quarter of 2008 and thus far in 2009, crude oil prices are still above historical prices and are expected to go up in the future. This section discusses the impact of the above events and other factors that affect aviation demand.

3.3.1 ECONOMIC CYCLES

Demand for air travel in the United States correlates closely with the health of the economy. Aviation activity typically contracts during recessions and expands during subsequent economic expansions. In fact, enplanements at STL were down 6.6 percent in 2008 over 2007 and airline schedule filings for STL indicate a further decline of 10-13 percent in scheduled seats for 2009. The STL Master Plan forecast focuses on long-term trends but does take into consideration the impact of the current economic recession. Over the 20-year forecast horizon, fluctuations should be expected around the long-term trend.

3.3.2 FUEL PRICES

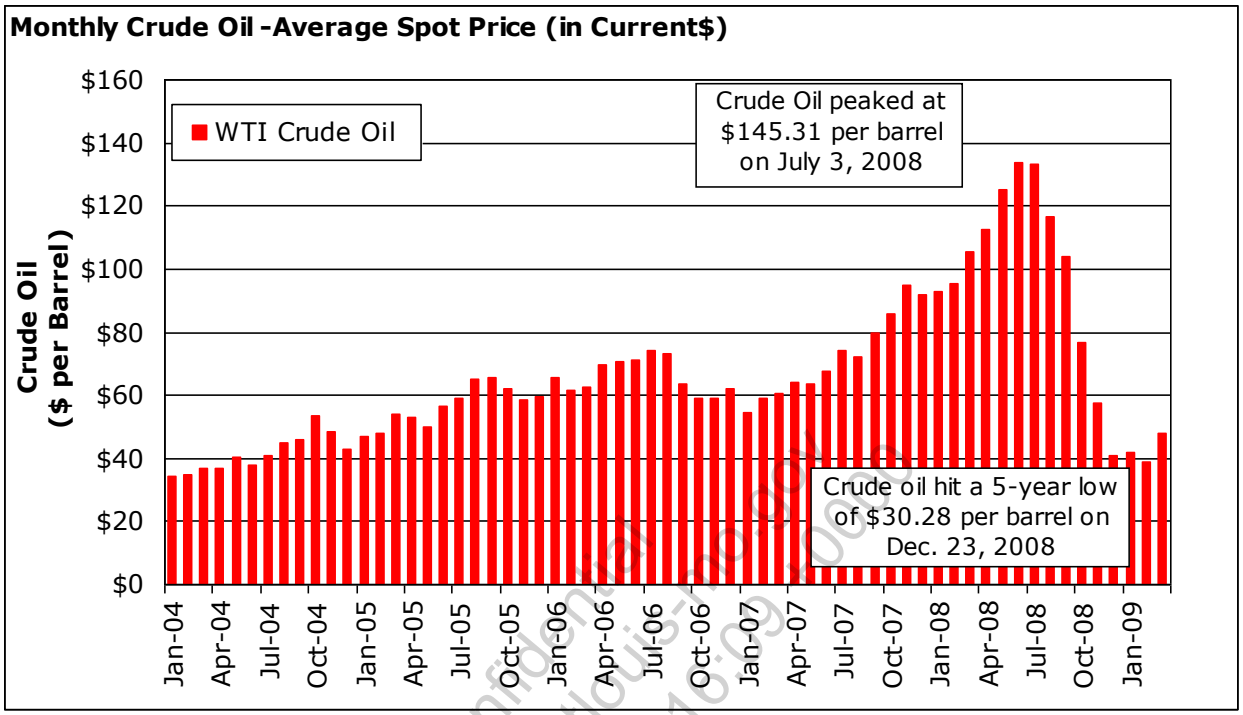
The price of fuel is one of the biggest costs to the airlines. The price of West Texas Intermediate (WTI) crude oil increased dramatically in the 2006 to 2008 time period, posting a 290 percent increase in June 2008 vs. January 2004 (*see* **Exhibit 3.3-1, *Crude Oil Prices***). After averaging $20 to $30 per barrel in the 2000 to 2003 time period, spot crude oil prices surged to $145.31 per barrel on July 3, 2008. Several factors drove the increase, such as strong global demand particularly in China and India, a weak U.S. dollar, commodity speculation, political unrest, and a reticence to materially increase supply.

Because of the surge in the price of oil, airlines experienced significant increases in their jet fuel costs. Fuel has historically accounted for 10 to 15 percent of U.S. passenger airlines' operating expenses. In the 4th quarter of 2008, fuel expenses had increased to a third of airline costs, representing the airlines' largest expense.[20]

Due to the recession, demand for oil decreased which led to a decline in crude oil prices beginning in August of 2008. Spot crude oil prices fell to a five-year low of $30.28 on December 23, 2008. Falling oil prices have provided relief to the struggling airline industry and may well help a number of U.S. airlines be profitable in 2009 despite the weak economic climate.

[20] Air Transport Association (ATA)

Exhibit 3.3-1
CRUDE OIL PRICES
Lambert-St. Louis International Airport



Sources: Energy Information Administration (EIA); Landrum & Brown analysis, 2011

While it is doubtful that crude oil prices will return to the highs seen during the summer of 2008, the low prices currently being experienced are not likely to be sustainable either. The Energy Information Administration (EIA) projects the price per barrel (in $2007) will be $49 in 2010 before increasing to $115 in 2020 and to $124 by 2030.[21]

One factor to consider in the price of oil is the potential for legislation to regulate greenhouse gases. In recent years there has been an increasing interest in global warming and increases in the production of man-made greenhouse gases. As a result, some countries have taken steps to reduce greenhouse gas emissions by enacting legislation to regulate those greenhouse gases. Currently the largest program is the European Union's Emission Trading Scheme (EU ETS). This system is called a "cap and trade" system as the government puts a limit on the total allowable emissions for a given time period and participants must remain within their limits or trade allowances with those who have not exceeded their limit.

Aside from the EU, other countries have adopted either a similar cap and trade system or are in the process of creating one. The U.S. Congress has tried to enact such a system in the past but has not been successful thus far. If a cap and trade system is enacted in the U.S. it would increase fuel prices, which without concomitant reductions in airline operating costs, could increase airfares.

[21] EIA *Annual Energy Outlook 2009*, Updated in April 2009

3.3.3 AIRLINE INDUSTRY CHANGES

The financial health of the airlines will play a major role in the determination of future forecasts for STL. This section contains a summary of the airline industry factors that were considered in the STL Master Plan forecast.

3.3.3.1 Low Cost Carriers (LCCs)

When LCCs enter air markets prices tend to decline and travel (especially leisure travel) increases. LCCs enjoy a 38.3 percent market share of scheduled seats at STL (up from just 10 percent in the early 1990s). Southwest Airlines, the largest LCC in the United States, is the second largest airline at STL, accounting for 35.1 percent of scheduled seats in 2008. Due to the increasing presence of LCCs at STL, the average fare paid for a 1,000-mile trip at STL in 2008 was 45 percent lower than in 1990. The LCC presence at STL is expected to remain strong throughout the forecast period.

3.3.3.2 Airline Costs

Since 2004 and in the first half of 2008 in particular, airlines have been faced with significant upward pressure on costs due to the price of fuel. At the same time, the airlines are limited in their ability to extract further unit cost savings from labor, which provided significant concessions in the last round of restructuring following September 11, 2001. With fuel cost largely beyond their control, airlines increased fares, cut traditional amenities, and began charging for checked bags, among other measures to balance the variables of supply and demand. Oil prices have declined rapidly in the 4th quarter of 2008 and thus far in 2009 as worldwide demand for commodities declined under the weight of the recession. However, oil prices are still above historical levels.

Until now, the post-deregulation environment has been characterized by a period of declining fares, causing passenger traffic to reach record levels. As the industry is now collectively faced with significantly higher costs and the traveling public with higher fares, there is the very real possibility that fewer people will fly. In the current weak consumer environment, increases in airfares are likely to have a much greater negative effect on demand. Airlines are recognizing this and are reducing capacity, parking aircraft, and restructuring route networks. The new higher cost industry will affect each airport differently, depending upon the mix of airlines, aircraft, and air services offered.

3.3.3.3 Airline Bankruptcies and Consolidations

There have been dramatic changes to the financial health of the airline industry in the 21st century. Numerous airlines have declared Chapter 11 bankruptcy at least once, including four of the legacy[22] carriers. There was a rash of bankruptcies between 2001 and 2005, and another more recent round in 2008 resulting from the

[22] Legacy carriers include United, American, Delta, US Airways, Continental, and Northwest. US Airways, United, Northwest, and Delta Air Lines have all filed bankruptcy since 2000.

current economic recession. As shown in **Table 3.3-1, *STL Airlines Filing Bankruptcy***, six of the STL airlines have declared bankruptcy this century, but only one (Frontier) is part of the most recent round in 2008. STL's two largest carriers (American and Southwest) have not had to declare bankruptcy. The STL Master Plan forecast assumes the airlines will weather the current financial crisis.

Table 3.3-1
STL AIRLINES FILING BANKRUPTCY
Lambert-St. Louis International Airport

Airline	Bankruptcy Status
TWA	Filed Chapter 11 in Jan. 2001 as part of an acquisition by American
United Airlines	Filed Chapter 11 in Dec. 2002
Air Canada	Filed in April 2003
US Airways	Filed Chapter 11 in Aug. 2002 and again in Sept. 2004; emerged in Sept. 2005 in conjunction with acquisition by America West
Delta Air Lines	Filed Chapter 11 in Sept. 2005
Northwest Airlines	Filed Chapter 11 in Sept. 2005
Frontier Airlines	Filed Chapter 11 in April 2008

Sources: Official Airline Guide; Air Transport Association, Landrum & Brown analysis, 2011

Airline mergers and alliances can also affect the airline industry. In particular, STL was dramatically affected by the purchase of TWA by American Airlines in 2001. American has progressively drawn down the hub at STL to approximately a third of its former size. As a result, the profile of traffic has changed dramatically and STL has become an airport serving predominantly originating passengers with a much smaller percentage of connecting traffic than historically had been the case.

3.3.3.4 Domestic Capacity

After five years of negative earnings, the U.S. airline industry collectively returned to profitability in 2006 after savings from labor cuts, salary concessions, and removal of many flight perquisites were realized. The success of restructuring has produced an industry that is already relatively streamlined with very little fat left to trim. The surge in oil prices in 2008 pushed airlines to start raising fares and cutting capacity. To survive and be profitable, the airlines have had to reduce domestic capacity to avoid losing money on unprofitable routes and excessive frequencies that are not supported with sufficient demand. As evidence of this, a capacity reduction of 12.9 percent (in terms of scheduled seats) at STL is scheduled for 2009. In addition, two carriers (Midwest Airlines and Ryan International Airlines) ceased operating at STL in 2008.

The efforts that the airlines are making to reduce losses by cutting the number of flight options comes with additional infrastructure costs that require the retirement of less fuel-efficient aircraft and the furlough of thousands of airline employees. Although costly, higher capacity provides choices to air travelers and has an impact on the resulting demand for air travel. The short-haul market in particular is likely to suffer when air travelers are faced with fewer flight options and have the ability

to simply get in their cars and drive. In the near-term, flight options are expected to decrease, and will continue to do so until the airlines find a new capacity equilibrium that works with the price of fuel, acceptable air fares, and passenger demand. However, over the long-term, airlines are projected to increase service offerings as the U.S. economy returns to growth.

3.3.4 AIRCRAFT TRENDS

Variable fuel costs, aircraft type, and aircraft age have an impact on which aircraft the airlines choose to fly. The next-generation Boeing 737s and Airbus 320/321s have among the best fuel economy in the industry. The airlines have designated certain aircraft for retirement that have poor fuel economy compared to newer models. The MD-80/90, DC-9, and B737-300,400,500 have all been marked for reduction of use or retirement by many domestic airlines. Small regional jets like the EMB-135/140 and the CRJ-100/200, as well as the EMB-120 turboprop are also under much scrutiny and going through reductions. The current fleet mix is changing fast and bringing many new challenges to airlines that are forced to cut capacity, aircraft, and labor in an effort just to survive.

3.3.5 AIRPORT INITIATIVES

The STL Airport Authority has implemented a variety of initiatives to attract more passengers and new carriers to STL. The Lambert Advantage program, which began in 2007, focuses on new and improved amenities and services at the airport in order to make the passenger experience more pleasant. The Airport Authority actively attempts to attract new carriers to STL in order to improve the level of air service offered.

Additionally, the Foreign Trade Zone (FTZ) around STL was expanded from 11 acres to 820 acres in February 2009. This is a key step in the development of international air cargo service at STL. Lambert is part of the Midwest China Hub Commission (the China Group). This group, which represents local business and government interests, has been working "to establish the St. Louis region as a multi-state commercial hub for China."[23]

[23] February 17, 2009 Lambert-St. Louis International Airport News Release

3.4 COMMERCIAL PASSENGER FORECAST

The enplanement forecast facilitates the planning process in that it allows for the evaluation of the airside, terminal, landside, and access roadways. The enplanement forecast provides the critical path for the commercial passenger operations forecast that is derived from assumptions related to the average aircraft size and load factor. The passenger forecasts presented in this section are annual volumes through 2030 for the purpose of demonstrating the long-term trends. Throughout the rest of the forecast chapter, results are presented for the horizon years of 2013, 2018, 2023, and 2028, coinciding with 5-, 10-, 15-, and 20-year milestones from the 2008 base year.

The baseline commercial passenger forecast is presented in Sections 2.5.1 through 2.5.6. Alternative scenarios were also developed to understand the full range of potential demand. These forecasts are presented in Section 2.5.7.

3.4.1 PASSENGER FORECAST METHODOLOGY

Passenger traffic at STL was divided into five segments for purposes of developing the forecast:

(1) Domestic O&D passengers that travel on purely domestic itineraries

(2) O&D passengers that board domestic flights at STL and travel to another U.S. gateway to connect with international flights

(3) O&D passengers that board international flights at STL on purely international itineraries

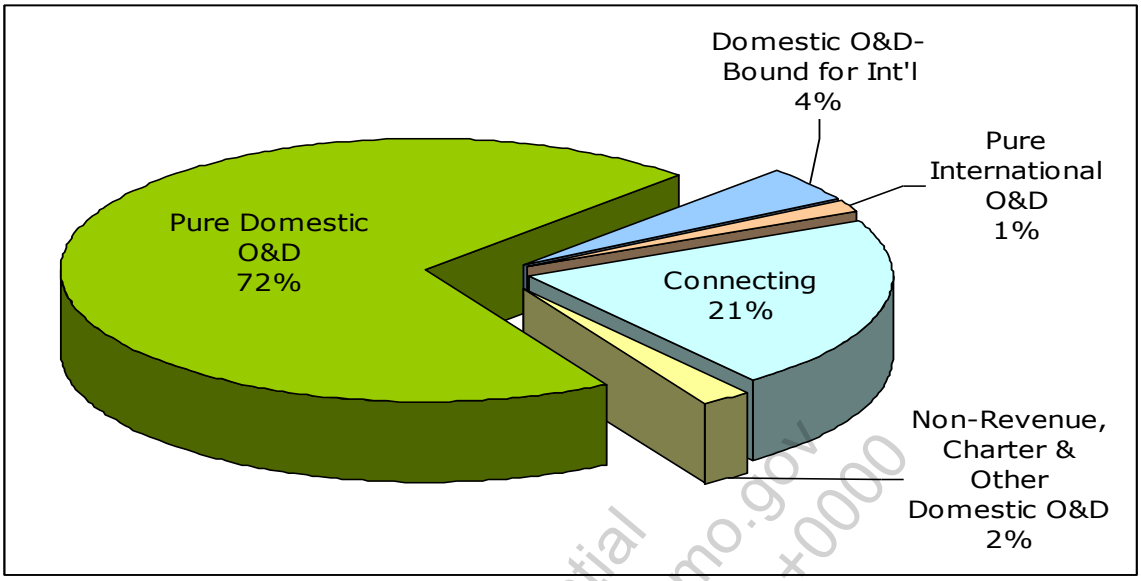
(4) Connecting passengers

(5) Non-revenue, charter, and other domestic O&D passengers

Exhibit 3.4-1, *2008 Passenger Enplanements by Segment*, provides the estimated market share for each key passenger segment for 2008. The level of originating passengers, both domestic and international, reflects the attractiveness of the St. Louis Metropolitan Area as a place to visit, and as a place to work and conduct business. Passengers traveling to or from the St. Louis metro area accounted for almost 80 percent of traffic at STL in 2008. The originating passenger forecast is a critical input to assess future demand for terminal and landside facilities such as ticketing, baggage claim, automobile parking, and access roadways.

In 2008, connecting traffic represented approximately 21 percent of the total enplanements at STL. The volume of connecting passengers reflects the quality and quantity of air service offered by domestic hubbing airlines and international gateway carriers, and is typically gauged by the frequency of departures and the number of destinations served.

Exhibit 3.4-1
2008 PASSENGER ENPLANEMENTS BY SEGMENT
Lambert-St. Louis International Airport



Notes: The connecting passenger portion includes non-revenue, charter & other connections. The non-revenue, charter and other O&D segment is shown separately.

Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

Exhibit 3.4-2, *Baseline Enplanement Forecast Approach and Methodology*, summarizes the overall approach and methodology used to develop the baseline forecasts. The baseline forecasts for O&D traffic (segments 1-3) were developed using an econometric approach that ties traffic volumes to historical and forecast economic data for the St. Louis region. The baseline connecting traffic forecast was derived in part from the resulting domestic O&D enplanements forecast and input from American Airlines, the primary connecting carrier at STL.

Exhibit 3.4-2
BASELINE ENPLANEMENT FORECAST APPROACH AND METHODOLOGY
Lambert-St. Louis International Airport

Traffic Segment	Short-Term (2009-2013)	Long-Term (2014-2030)
Domestic Originating	* Incorporate recession impact and subsequent recovery	* Based on statistical relationship between historical traffic and personal income
Bound for Int'l Destinations	* Initial decline, reflecting the state of the world economy	* Based on statistical relationship between historical traffic and world GDP
International O&D	* Initial decline, reflecting the state of the world economy	* Reflects growth in bound for international destinations segment and new nonstop destinations
Connections	* Incorporate recession impact and subsequent recovery	* Based on airline network management strategies

Source: Landrum & Brown analysis, 2011

3.4.2 BASELINE DOMESTIC O&D ENPLANEMENTS FORECAST

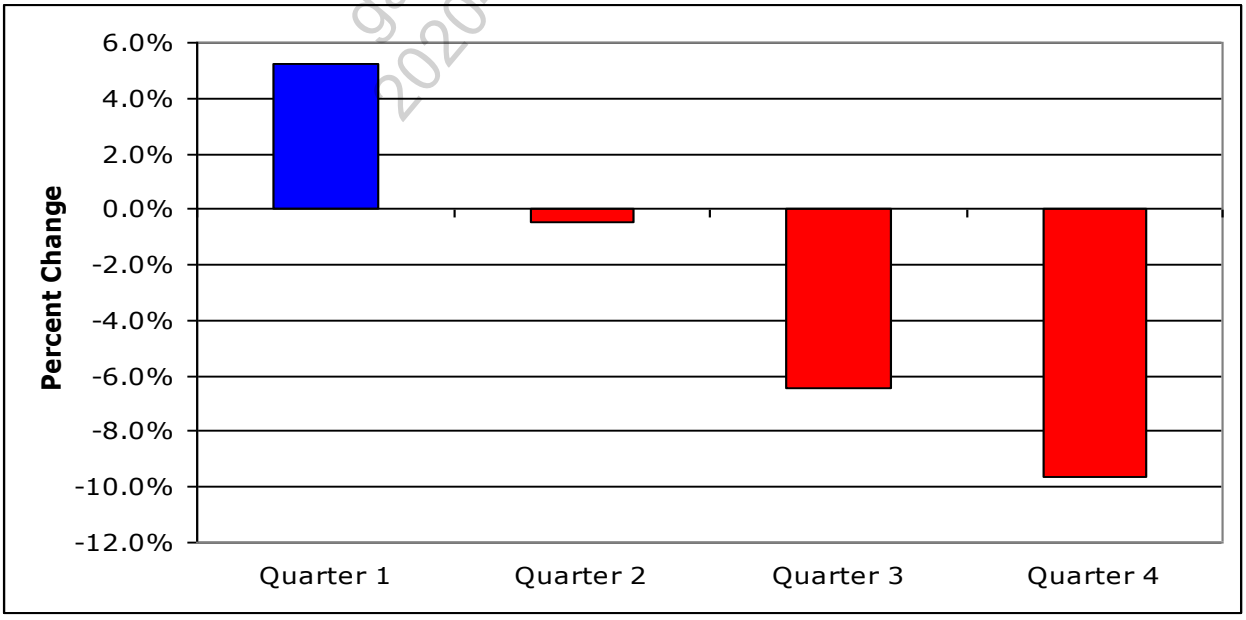
This section presents the forecast for pure domestic originating enplanements (those passengers who travel on a purely domestic itinerary). A two-step process was used to develop a blended domestic O&D enplanement forecast:

- A short-term 5-year forecast (2009 through 2013) was developed. This approach provided the opportunity to incorporate a more appropriate year-to-year estimate of the impact of the current economic crisis and subsequent recovery on passenger traffic levels. The short-term forecast takes into account current airline schedule filings for 2009, which are important indicators of anticipated near-term demand levels, as well as annual economic forecasts promulgated by the Federal Reserve Board through 2011.
- A long-term forecast (2013 through 2030) was developed based on statistical relationships between historical demographic and economic activity in the St. Louis MSA and domestic originating passenger traffic.

3.4.2.1 Short-Term Domestic O&D Forecast

In 2008, STL domestic O&D traffic declined 3.1 percent year-over-year. On a quarterly basis, first quarter 2008 gains (+5.2 percent) gave way to quarterly declines as demand for air travel contracted at STL in response to the continued deterioration in the local and national economy (*see* **Exhibit 3.5-3, *2008 Quarterly Domestic Originating Passengers***).

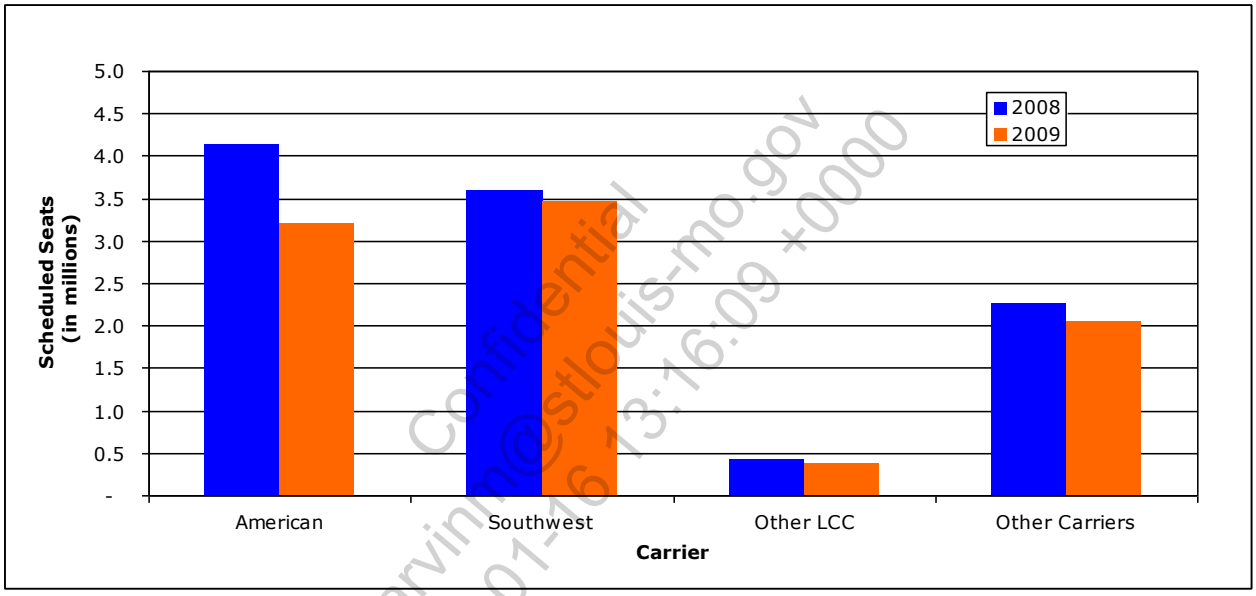
Exhibit 3.4-3
2008 QUARTERLY DOMESTIC ORIGINATING PASSENGERS
Lambert-St. Louis International Airport



Sources: USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

Domestic O&D traffic is expected decline further in 2009 both nationally and at STL as the national economy contracts and unemployment continues to rise. In anticipation of the continued erosion in passenger demand, the airlines operating at STL have collectively reduced the supply of seats on scheduled domestic departing flights in the St. Louis market by almost 13 percent in 2009 versus 2008 (equivalent to 1.3 million seats). **Exhibit 3.4-4, *Change in Domestic Capacity 2008 v 2009***, provides a summary of the absolute and percentage reduction in domestic airline capacity planned for 2009 for key carriers.

Exhibit 3.4-4
CHANGE IN DOMESTIC CAPACITY 2008 v 2009
Lambert-St. Louis International Airport

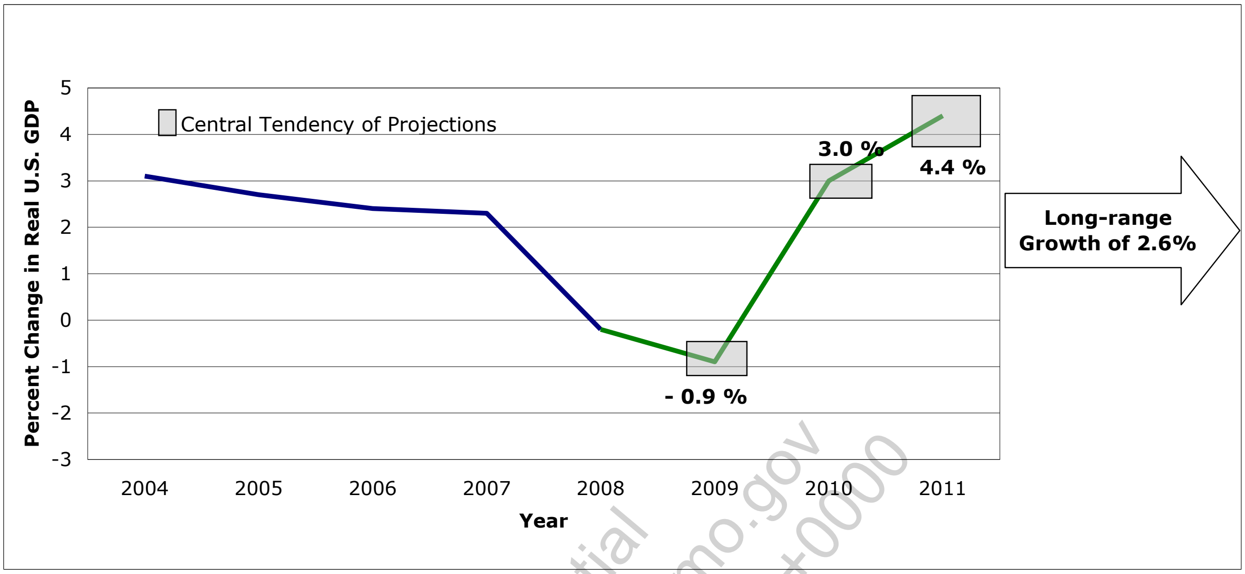


Sources: Official Airline Guide; Landrum & Brown analysis, 2011

Airline schedule filings indicate that domestic O&D traffic will likely be less impacted, in percentage terms, than connecting traffic in 2009. American Airlines, STL's primary hubbing carrier, is reducing capacity by 23 percent in 2009, removing close to 1.0 million seats from the St. Louis market. The remaining carriers at STL predominantly handle originating traffic and are reducing capacity by just six percent, year-over-year. It was assumed that the airlines will attempt to make more efficient use of their aircraft assets during the current downturn and operate at somewhat higher load factors than in 2008. As a result of the foregoing analysis, domestic O&D enplanements at STL are projected to decline a further 7.5 percent in 2009.

The year 2009 is assumed to represent the floor in the current cycle for both economic activity and passenger traffic. Economic forecasts released in February 2009 by the Federal Reserve project that the economy will shrink 0.5 to 1.3 percent in 2009 (*see* **Exhibit 3.4-5, *U.S. Economic Forecasts***). Economic recovery is expected to begin, albeit gradually, in 2010, with growth expectations in the 2.5 to 3.3 percent range.

Exhibit 3.4-5
U.S. ECONOMIC FORECASTS
Lambert-St. Louis International Airport



Sources: Federal Reserve projections as of February 2009; Landrum & Brown analysis, 2011

The recovery is expected to gather pace in 2011 with growth rates reaching 3.8 to 5.0 percent, temporarily exceeding longer-term estimates.

The shape of the economic recovery will influence the recovery in passenger traffic, both in terms of national demand levels and at STL. The airline industry is generally considered to be a lagging economic indicator. As a result, a relatively modest gain in domestic O&D traffic of 1.5 percent is projected for 2010 at STL, followed by growth of 4.0 percent in 2011, 4.0 percent in 2012, and 2.2 percent in 2013. The growth rates forecast for 2011 through 2013 are above long-term trends which is indicative of acceleration from the trough of the current economic cycle. In absolute terms, domestic O&D traffic at STL is projected to recover to 2007 levels (5.2 million domestic O&D enplanements) by 2013.

3.4.2.2 Long-Term Forecast

The long-term forecast was guided by an econometric approach that quantified the relationship between local domestic passengers and independent demographic and economic variables. The forecast models were developed using multi-linear regression techniques, with the dependent variable (domestic O&D enplanements) computed using a linear function. The methodology for preparing the O&D forecasts recognizes that key parameters such as population and per capita personal income will change over time. However, it assumes that the fundamental mathematical relationships between the independent variables and domestic O&D passenger traffic will persist and will support the development of realistic forecasts.

Multi-linear regressions were developed based on an 18-year history from 1990 to 2007.[24] A longer history, dating back to 1985, was also considered but rejected as this methodology was overestimating the domestic O&D traffic due to the unbalanced number of growth years versus economic downturns (the average growth rate was 2.6 percent from 1985 to 2007 versus 1.1 percent from 1990 to 2007). Independent variables considered for use in the regression included population, employment, personal income, gross regional product, and yield.[25]

Several regressions of various combinations of independent variables were tested but ultimately rejected for various reasons, such as:

- Inadequate test statistics (i.e. low r-squared values or other inadequate regression statistics) which indicates the independent variables are not good predictors of STL traffic.
- Poor forecast results (Regression models produce "forecasts" of historical data called residuals. A satisfactory model will generate estimates that are close to actual values.)
- Theoretical contradictions (e.g. the model indicates that GDP growth is negatively correlated with traffic growth).
- Overly aggressive or low forecast results that are incompatible with historical averages.

In the evaluation of the various regressions, personal income, which is the product of total population and per capita income for the STL MSA, proved to correlate well with domestic O&D traffic at STL. Yield and other pricing variables did not appear to correlate with the STL domestic O&D traffic and therefore were not used in the econometric model.

The regression models usually include dummy variables to consider unusual events that do not correlate to underlying socioeconomic trends and airline yields. The only unusual event that had a noticeable impact on STL traffic was the September 11, 2001 terrorist attacks. This event had the effect of depressing traffic at U.S. airports and throughout the world for several years. The use of a dummy variable corrects for the downturn in traffic that is not reflected in the standard socioeconomic variables used to forecast future aviation activity.

A regional model was used to evaluate domestic O&D traffic to the different regions of the country independently. The regional model selected for this forecast differentiates the Midwest from the other regions. Indeed, Midwest domestic O&D enplanements have decreased substantially since 1990 due to the region's short-haul characteristics (predominantly markets within 500 miles of STL). The strategic draw down of the TWA/AA hub at STL, new security requirements and

[24] Full calendar year 2008 statistics were not available at the time of this analysis.

[25] Yield is defined as the average revenue an airline obtains from carrying a passenger one mile. It reflects fare, length of haul, the level of competition, carrier costs, and other factors. Yield is a commonly accepted measure of the price of air travel.

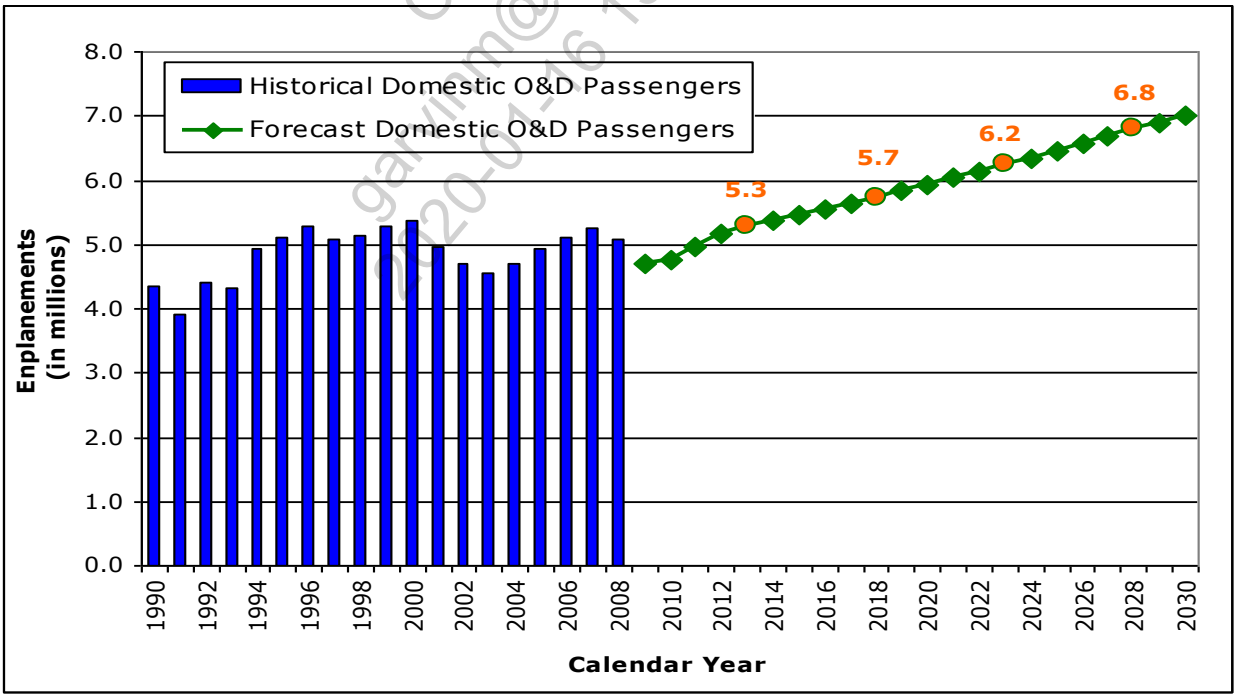
related wait times, and increases in fares made short-haul air travel less attractive than other modes of transportation and particularly impacted intra-Midwest O&D travel.

Ultimately, the chosen regression model considered STL traffic for all regions except the Midwest against its service area's personal income and a dummy variable to take into account the September 11, 2001 terrorist attacks. Despite the fact that the Midwest region has seen its domestic O&D traffic decrease over the past decade, its traffic has leveled out at about 1.0 to 1.1 million enplanements since 2003. It was assumed that Midwest would respond positively to future growth in the STL service area economy and therefore grow at half the growth rate of the service area's economy. This regression analysis results in a long-term growth rate of 1.7 percent per annum from 2014 to 2030.

3.4.2.3 Final Domestic O&D Enplanements Forecast

Based on the short-term and long-term forecasts discussed above, domestic O&D enplanements are expected to grow at an average annual rate of 1.5 percent over the forecast period to 7.0 million enplanements by 2030 (*see* **Exhibit 3.4-6, *Domestic O&D Enplanements Forecast***).

Exhibit 3.4-6
DOMESTIC O&D ENPLANEMENTS FORECAST
Lambert-St. Louis International Airport



Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

3.4.3 BASELINE ENPLANED PASSENGERS WITH INTERNATIONAL ITINERARIES FORECAST

Forecasts were created for two categories of international O&D enplanements:

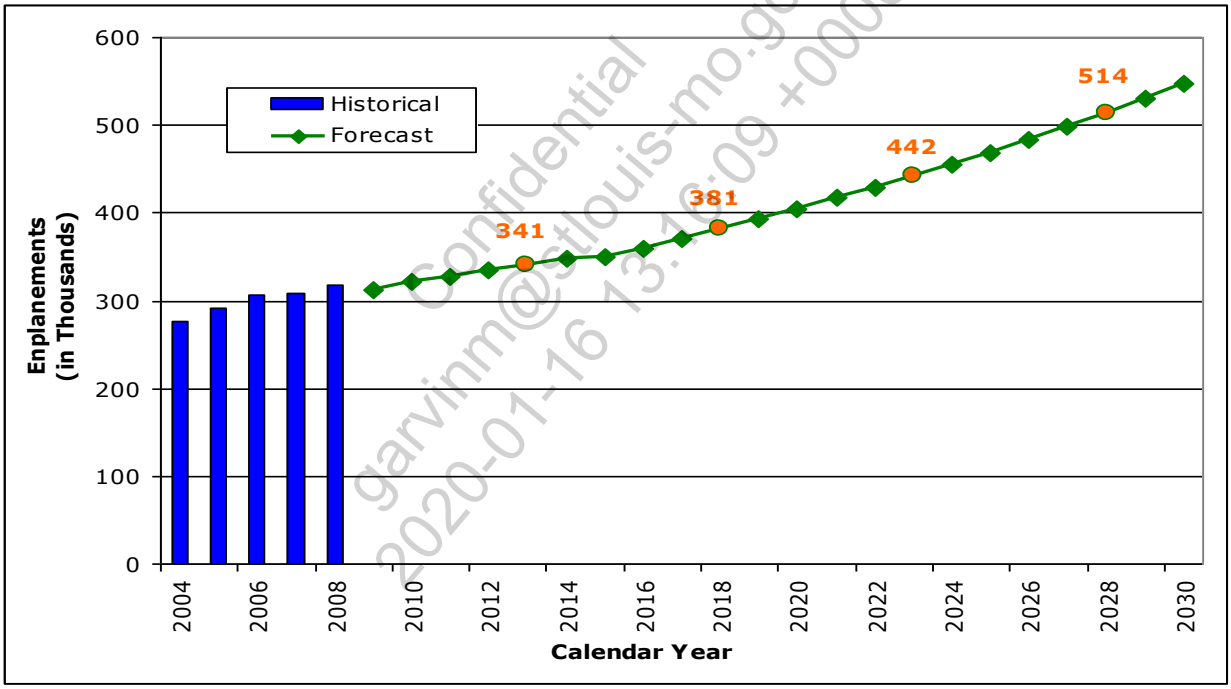
- Bound for International Destinations: this category refers to passengers traveling to or from the STL metro area that board a domestic flight at STL and fly to another U.S. gateway airport in order to make a connection to an international destination;
- International O&D Enplanements: this category refers to passengers traveling to or from the STL metro area that board an international flight at STL and fly to an international destination.

Over 411,000 STL O&D enplaned passengers had an international itinerary in 2008. Seventy-seven percent of these passengers flew through another U.S. gateway prior to arriving at their final international destination (i.e. bound for an international destination). The forecast for the "bound for international destinations" category was developed using an econometric approach that correlated this traffic segment with anticipated growth in the world economy. The "international O&D enplanements" forecast was developed based on assumptions regarding growth in existing international services at the airport and the potential for airlines to add new international service to certain international markets as demand reaches a critical mass to be served non-stop from STL.

3.4.3.1 Bound for International Destinations Forecast

A number of regression analyses were developed that correlated growth in passengers bound for international destinations with world economic growth at the aggregate level and by world region. The world economic growth rates were weighted to take into account historical market share of specific world regions for this traffic segment in the St. Louis market. Based on this approach, traffic is expected to grow 2.5 percent annually from 317,132 enplanements in 2008 to 547,500 enplanements in 2030 (*see* **Exhibit 3.4-7, *Forecast of Enplanements Bound for International Destinations***). Latin America, the Pacific, and Europe are expected to be the fastest growing segments.

Exhibit 3.4-7
FORECAST OF ENPLANEMENTS BOUND FOR INTERNATIONAL DESTINATIONS
Lambert-St. Louis International Airport



Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; USDOT, Schedule T-100; FAA Aerospace Forecasts various years; Landrum & Brown analysis, 2011

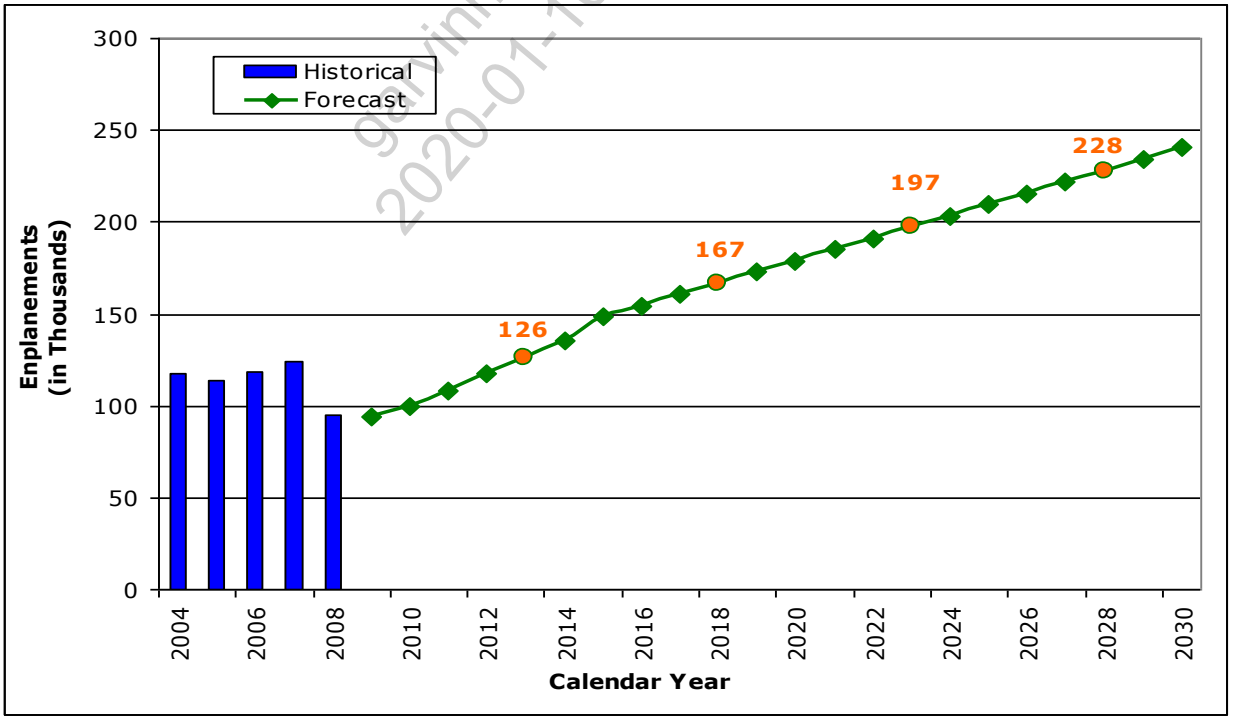
3.4.3.2 International O&D Forecast

The level of international O&D enplanements were derived in part from the "bound for international destinations" enplanements. Indeed, the higher the level of "bound for international destinations" enplanements in a particular region, the greater the potential for non-stop service. Therefore, the forecast of international O&D enplanements was based on the following key considerations:

- Latin America: Additional daily non-stop service is forecast to be in place by 2014 using narrow-body jet aircraft (150 seats) with an average load factor of 75 percent. This service is projected to increase to two daily flights by 2030.
- Europe: Seasonal service is expected by 2015 using B767 aircraft (230 seats) with an average load factor of 75 percent. This service is expected to increase to year round daily service by 2030.

International O&D enplanements are expected to decline initially, reflecting the state of the world economy. International O&D enplanements are expected to return to positive growth rates in 2010. Based on these assumptions, international O&D enplanements are forecast to grow by 4.3 percent per year from 94,795 enplanements in 2008 to 240,000 enplanements by 2030 (*see* **Exhibit 3.4-8, *International O&D Enplanements Forecast***).

Exhibit 3.4-8
INTERNATIONAL O&D ENPLANEMENTS FORECAST
Lambert-St. Louis International Airport

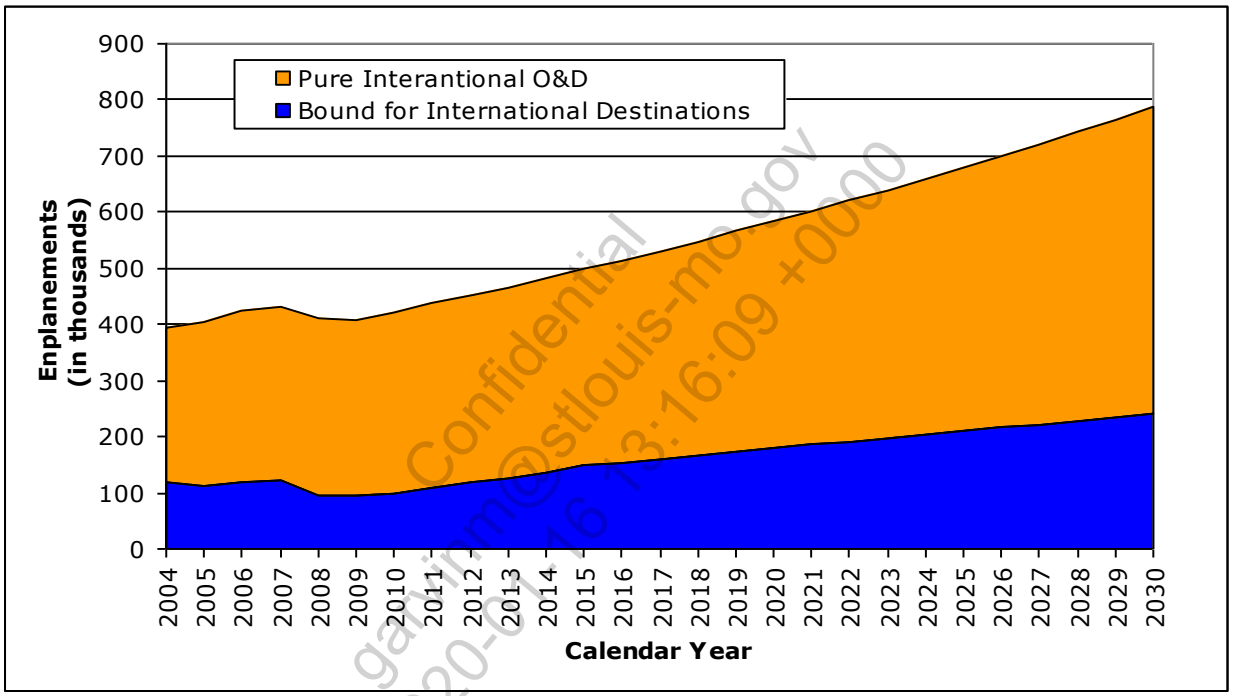


Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; USDOT, Schedule T-100; FAA Aerospace Forecasts various years; Landrum & Brown analysis, 2011

3.4.3.2 International O&D Forecast Summary

By 2028, the number of originating passengers with international itineraries is forecast to reach 742,300. The share of passengers that connect through another U.S. gateway to reach their international destination is forecast to decline from 77 percent in 2008 to 69 percent by 2028 (*see* **Exhibit 3.4-9, *International O&D Forecast***) as more non-stop international destinations are added from STL.

Exhibit 3.4-9
INTERNATIONAL O&D FORECAST
Lambert-St. Louis International Airport



Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; USDOT, Schedule T-100; FAA Aerospace Forecasts various years; Landrum & Brown analysis, 2011

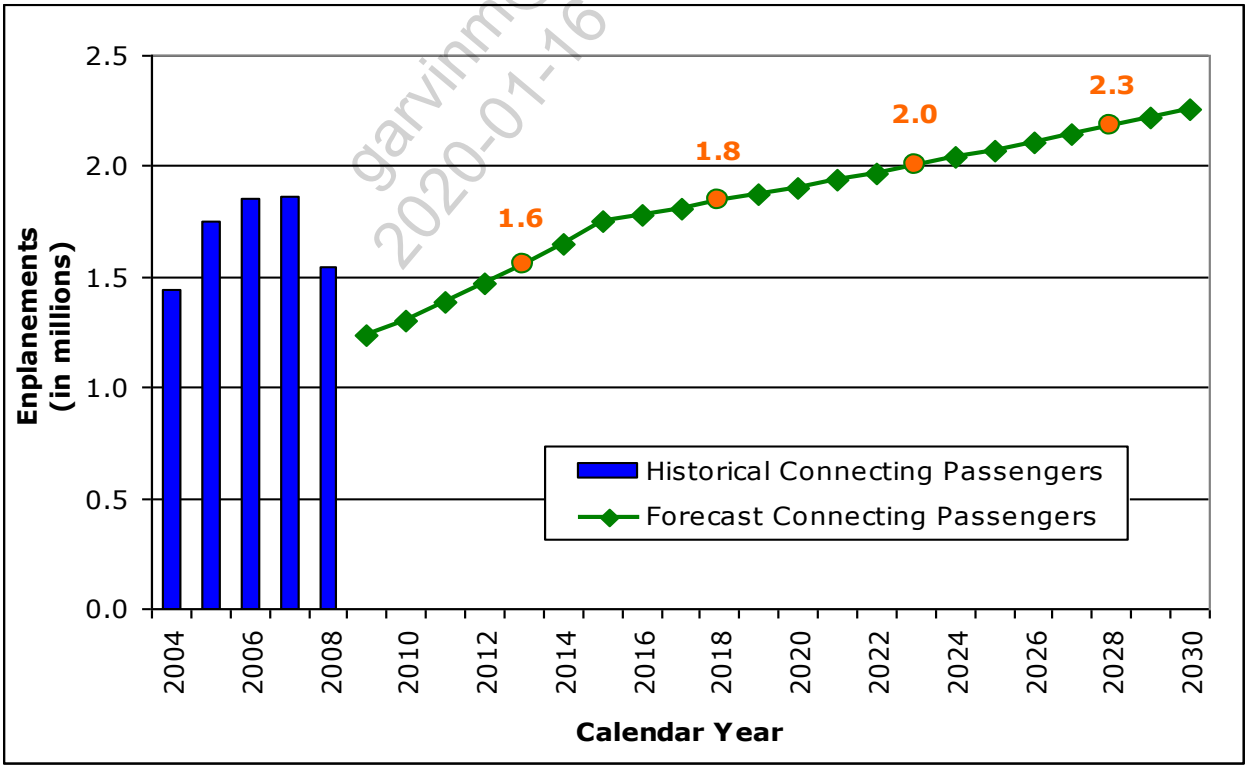
3.4.4 CONNECTING ENPLANEMENTS FORECAST

The airport reported total enplanements in 2008 that were 7.6 percent higher than the number of enplanements reported by airlines to the U.S. DOT. This difference reflects non-scheduled charter and non-revenue traffic that is not reported to U.S. DOT. Non-revenue traffic includes airline employees and crew commuting to/from their assigned routes. The number of non-revenue connections is relatively high at hub airports like STL. It is estimated that 20 percent of the 1.5 million connecting enplanements reported at STL in 2008 were non-revenue. As a result, the discussion of connecting enplanements in this section includes both revenue and non-revenue connections and reflects the assumption that the O&D/connecting split of the charter/non-revenue category averages a 30/70 split throughout the forecast period.

Connecting enplanements have accounted for a declining share of total enplanements at STL over the historical period. In the late 1990s, at the height of the TWA hub, connections accounted for over 60 percent of total enplanements. In 2008, connecting passengers represented 21 of total enplanements. The volume of connecting passengers occurs largely due to the airline network management strategies. American continues to account for 70 percent of the connecting traffic at STL while Southwest accounts for 23 percent.

In 2008, connecting traffic at STL declined 17 percent compared to the year prior and is projected to decline a further 20 percent in 2009. Based on airline schedule filings, American plans to remove close to one million seats from the STL market in 2009. Almost half of the capacity reduction is aimed at American's regional partners, which currently handle 80 percent of American's connecting traffic at STL. Connecting traffic is expected to stabilize at approximately 22 percent of STL total enplanements by 2014, and maintain this share thereafter, essentially growing in proportion with originating traffic. It is assumed that American will continue to operate a hub at the airport over the forecast period, connecting between 35-40 percent of its total enplanements at STL. Southwest is also expected to increase its connecting passenger volumes at the airport. As shown in **Exhibit 3.4-10, *Connecting Enplanements Forecast***, connecting enplanements are forecast to reach 2.3 million in 2030.

Exhibit 3.4-10
CONNECTING ENPLANEMENTS FORECAST
Lambert-St. Louis International Airport



Sources: Airport Records; USDOT, *Air Passenger Origin-Destination Survey*; Landrum & Brown analysis, 2011

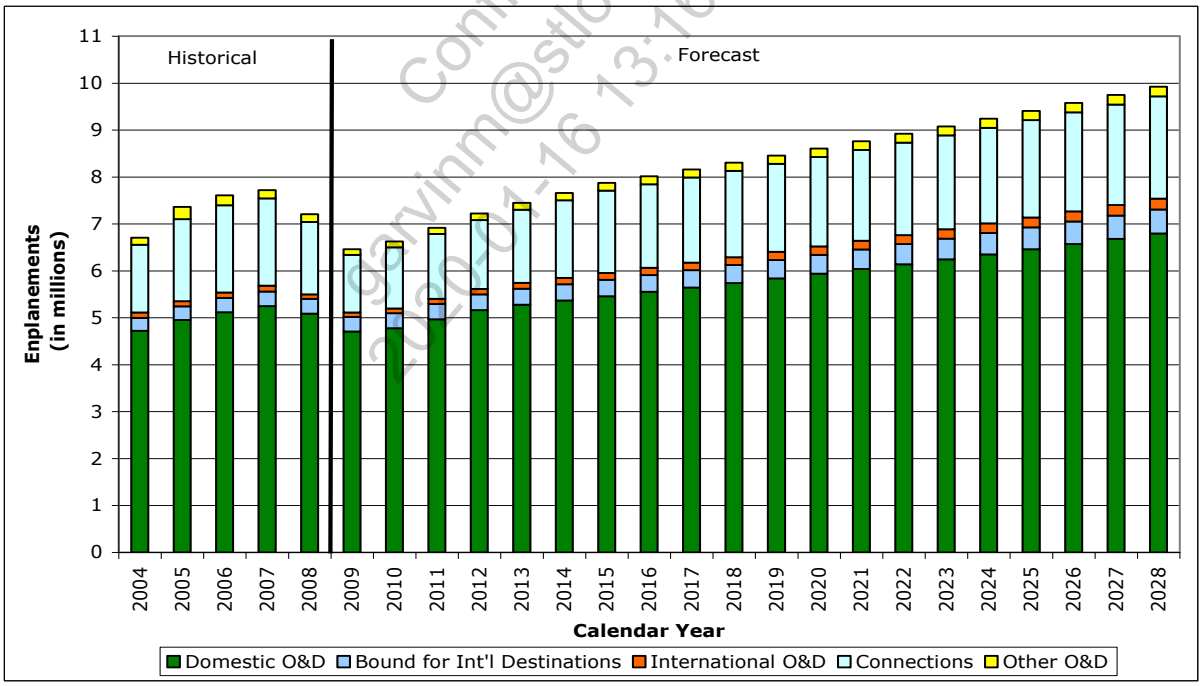
3.4.5 BASELINE OTHER O&D ENPLANEMENTS FORECAST

A small proportion of the O&D traffic reported at STL is unaccounted for in the DOT statistics. Historically, this traffic has accounted for two to four percent of total enplanements at STL. This category of traffic is forecast to grow at the same rate as total domestic enplanements.

3.4.6 BASELINE ENPLANEMENTS FORECAST SUMMARY

A summary of the enplaned passenger forecast is shown on **Exhibit 3.4-11, *Enplanements Forecast Summary***. Total enplanements are forecast to increase from 7.2 million enplanements in 2008 to 9.9 million enplanements by 2028, an average annual growth rate of 1.6 percent. Domestic O&D enplanements are expected to continue to account for the largest share of passenger traffic throughout the forecast period, making up 68 percent of total enplanements in 2028. Passengers with international itineraries (either connecting through another gateway or flying non-stop from STL) will increase in share from 5.7 percent of total enplanements in 2008 to 7.5 percent in 2028.

Exhibit 3.4-11
ENPLANEMENTS FORECAST SUMMARY
Lambert-St. Louis International Airport



Source: Landrum & Brown analysis, 2011

For purposes of forecasting aircraft operations, the enplaned passenger forecast was segmented into air carrier and commuter categories for domestic and international traffic (*see* **Table 3.4-1, *Enplanements Forecast by Air Carrier and Commuter***). The "bound for international destinations" segment is included in the domestic category because the immediate down line city on departure or up line city on arrival is in the continental U.S., Alaska, Hawaii, or a U.S. territory.

The forecast calls for domestic air carrier enplanements to grow at a rate of 1.6 percent annually over the forecast period versus 1.5 percent for domestic commuter enplanements. Air carrier enplanements made up 74 percent of domestic activity in 2008 and this split is expected to remain relatively unchanged through 2028.

Air carrier activity made up the vast majority (82 percent) of international activity in 2008. International air carrier enplanements are forecast to grow at a rate of 4.7 percent per annum through 2028 due to the expected introduction of new non-stop service to Latin America and Europe. The air carrier segment will make up 87 percent of international activity in 2028. International commuter enplanements are expected to average growth of 2.8 percent annually between 2008 and 2028.

Table 3.4-1
ENPLANEMENTS FORECAST BY AIR CARRIER AND COMMUTER
Lambert-St. Louis International Airport

Calendar Year	Domestic		International		Total
	Air Carrier	Commuter	Air Carrier	Commuter	
History					
1995	12,028,657	733,439	82,928	2,753	12,847,777
2000	14,199,805	903,873	160,031	37,869	15,301,578
2005	5,144,441	2,097,474	101,118	19,885	7,362,918
2006	5,322,701	2,161,513	100,423	20,261	7,604,898
2007	5,543,893	2,045,408	105,074	20,959	7,715,334
2008	5,231,273	1,880,672	78,856	17,089	7,207,890
Forecast					
2009	4,718,800	1,646,200	75,400	18,300	6,458,700
2010	4,837,600	1,688,400	80,600	19,000	6,625,600
2011	5,046,900	1,762,200	88,200	20,300	6,917,600
2012	5,265,900	1,839,500	95,900	21,500	7,222,800
2013	5,425,900	1,896,200	103,600	22,700	7,448,400
2018	6,027,100	2,111,100	139,700	27,000	8,304,900
2023	6,573,000	2,307,400	168,600	28,800	9,077,800
2028	7,171,500	2,523,200	198,100	29,900	9,922,700
Average Annual Growth Rates					
95-08	-6.2%	7.5%	-0.4%	15.1%	-4.3%
08-28	1.6%	1.5%	4.7%	2.8%	1.6%

Sources: Airport Records; USDOT, Schedule T-100; *Official Airline Guide*; Landrum & Brown analysis, 2011

3.4.7 ALTERNATIVE ACTIVITY SCENARIOS

The preceding sections provided a description of the baseline enplaned passenger forecast. This is the forecast that will be used to plan the facilities needed at STL over the 20-year planning horizon. In addition to the baseline forecast, high and low scenarios were also developed; these forecasts are described in this section. **Table 3.4-2, *Scenario Assumptions***, provides a summary of the potential factors driving the high and low scenarios.

Table 3.4-2
SCENARIO ASSUMPTIONS
Lambert-St. Louis International Airport

HIGH SCENARIO		
	Passenger Traffic Segment	
	Originating	**Connecting**
Near-Term Forecast	* Recovery from recession more favorable than in base case * Enplanements return to pre-recession levels by 2011-2012	* AA adds back 2009 capacity cuts in 3-5 year time frame
Long-Term Forecast	* Economic growth rates modeled at 25% above base forecast * New entrant LCC establishes mini-focus city	* AA re-emphasizes STL hub * Connections account for 30% of total enplanements

LOW SCENARIO		
	Passenger Traffic Segment	
	Originating	**Connecting**
Near-Term Forecast	* Protracted economic recession * Enplanements return to pre-recession levels by 2014-2015	* Continued de-emphasis of AA connecting hub * AA connecting hub eliminated by 2013
Long-Term Forecast	* Economic growth rates modeled at 75% of base forecast	* No other airline establishes a hub at STL

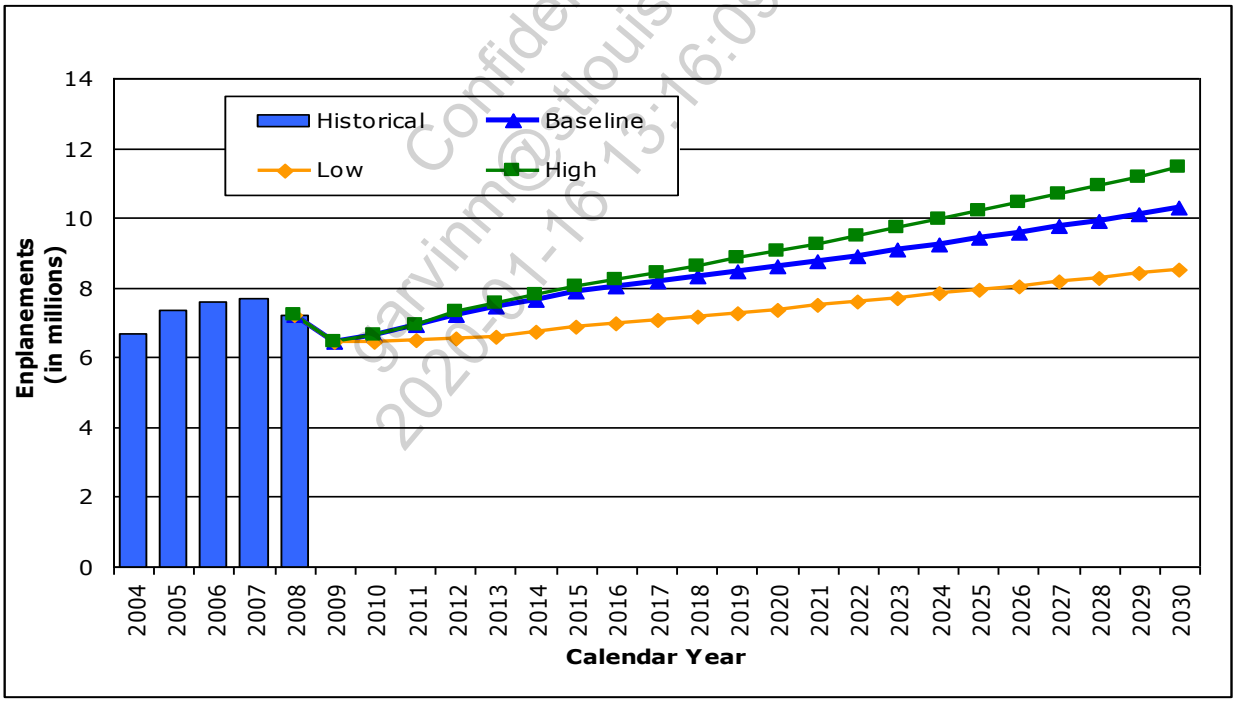
Source: Landrum & Brown analysis, 2011

The high scenario assumes that STL can recover from the recession faster than expected in the base case and that the economy continues to grow faster than the base case through 2028. The high scenario also assumes a new entrant LCC makes STL a mini-focus city. This scenario reflects higher connections levels due to the new entrant LCC and a re-emphasis of the STL hub by American.

The low scenario reflects a protracted economic recession and lower economic growth in the long-term than in the baseline forecast. The low scenario also reflects the abandonment of the American Airlines hub in 2013.

Exhibit 3.4-12, *Enplanements Forecast Comparison*, shows a comparison of the two scenarios and the baseline forecast. The high scenario results in STL enplanements increasing to 10.9 million by 2028, which represents an average annual growth rate of 2.1 percent (versus 1.6 percent in the base case). The low scenario results in 8.3 million passengers in 2028 (less than one percent average annual growth).

Exhibit 3.4-12
ENPLANEMENTS FORECAST COMPARISON
Lambert-St. Louis International Airport



Source: Landrum & Brown analysis, 2011

3.5 AIR CARGO TONNAGE FORECAST

This chapter presents an overview of the air cargo industry, historical trends in air cargo at STL, and air cargo tonnage forecasts for the Master Plan years of 2013, 2018, 2023, and 2028.

3.5.1 AIR CARGO INDUSTRY

This section presents background on the air cargo industry and the factors that are needed for an airport to have a successful air cargo operation.

3.5.1.1 Air Cargo Business Partners

A successful air cargo operation is predicated upon the efficient interaction of a number of businesses with different operating requirements and facility needs. These firms have different levels of involvement based on the nature of the cargo and the markets through which it moves. In an ideal environment, most of these operations would be co-located on the airport, creating an efficient, integrated, air cargo community. Operating costs would be lower, economies of scale could be achieved, and international goods could be cleared faster and with fewer problems. The realities of limited on-airport space and higher leasing costs have required businesses to situate operations off-airport that do not require more immediate ramp access.

Freight Forwarders are exporters that serve as travel agents for a shipper's freight. These firms control the routing of about 70 percent of the international freight, and about ten percent of the domestic. A forwarder facility will typically involve a small amount of office space and about 5,000 square feet of warehouse, although some larger forwarder operations may require as much as 100,000 square feet. Still, they do not need to be on the airport nor are they usually prepared to pay higher airport leasing rates.

Customs Brokers facilitate the clearance of international cargo through local federal customs. Like forwarders, they usually maintain a small amount of office space but typically have little need for warehouse space. Customs brokers prefer instead to form alliances with trucking companies to handle any large storage requirements. They do not need to be on-airport and handle most of their business with the federal clearance agencies electronically. Like their forwarder counterparts, customs brokers are located off-airport.

Federal Agencies have dual responsibility for interdiction and facilitation. The bulk of the cargo activity involves U.S. Customs and Border Protection (CBP). Law enforcement agencies at the federal, state, and local levels all provide assistance as required. At an airport with a substantial international presence, it is absolutely, critical that these agencies have ready access to the cargo. A centralized facility where all the agencies are located together is ideal. Such an arrangement allows for rapid coordination on clearance issues and minimizes ground traffic by shippers and consignees.

Consolidators work with freight forwarders to provide assembly points for cargo prior to its delivery to a carrier on the airport. Consolidation is critical in that it creates economies of scale and reduces the shipping cost per pound to specific destinations. The ability to consolidate shipments and the frequency of flights to such a broad range of destinations are important to an airport's success in air cargo. Consolidators do not have to be on the airport, but as with forwarders and brokers, relatively easy access is important to allow for delivery of the cargo to the carriers on the airport. These operations are typically located in larger shipping regions.

Container Freight Stations are typically located off-airport and handle the breakdown of inbound international freight. Their function is similar to a consolidator in that they provide relatively inexpensive space for redistribution to a number of clients. In many instances, these operations are bonded to allow for the rapid movement of inbound cargo through the customs process. These operations are typically located in larger shipping regions.

Freighter Airlines are those carriers that specialize in heavy freight as opposed to small packages or mail. Polar, Cargolux, and Nippon Cargo Airlines are examples of such carriers. Recently, throughout the industry, there has been substantial growth in "wet leases." This kind of leasing arrangement provides carriers with an option of leasing aircraft, crew, maintenance, and insurance (ACMI) through such carriers as Atlas and Gemini. This provides additional capacity and flexibility to carriers enabling them to consider expansion to new markets.

Integrators are those carriers that operate a trucking component as well as aircraft and offer point-to-point as opposed to airport-to-airport delivery. They specialize in overnight express. Examples include FedEx, UPS, and DHL. Their business is driven by time definite delivery. Proximity to regional business districts is important to their operation. Depending on their level of activity at an airport, they tend to require substantial amounts of aircraft parking although they may not require a large amount of building space. They also frequently require large amounts of truck parking, and because they are labor intensive, they have a higher demand for employee parking.

Combination Carriers are defined as airlines that fly freighters and passenger aircraft. These carriers prefer to process both belly and freighter cargo in the same facility when possible. In rare instances, a carrier will split their belly cargo and freighter operations between airports when capacity becomes a factor.

Cargo Handling Companies operate on a contract basis providing service to carriers on the apron where they load and unload the aircraft and/or in the warehouse where they assemble or breakdown the freight. Their business is best conducted on the airport. Their revenue is generated on a fee for services basis.

Trucking Companies make up the ground component of air cargo operations. While these companies rarely lease space on an airport, it is very important that air cargo facilities be designed to accommodate trucking, including frontage, access, and roadway geometry. The trucking industry will typically service the air cargo

market on a priority basis given the value of cargo. However, the trucking industry is facing substantial driver shortages in the future. It is unclear what future impacts will be.

3.5.1.2 The Nature of Air Cargo

The FAA classifies air cargo as either freight or mail. It is also typically categorized as either international or domestic. It can move in the belly of passenger aircraft or aboard all-cargo (freighter) aircraft. Most passenger airlines accommodate air cargo as a by-product to the primary activity of carrying passengers. They fill belly space in their aircraft that would otherwise be empty. The incremental costs of carrying cargo in a passenger aircraft have traditionally been negligible, and include only ground handling expenses and an increase in fuel consumption.

It is important to remember that virtually all air cargo begins or ends its journey on a truck making the ground distribution system equally critical. The design and location of airports and their cargo facilities must take this into consideration and be capable of accommodating growth in the landside component of the operation commensurate with growth on the airside.

Freight forwarders, who effectively function as booking links between manufacturers, shippers and logistics operations, along with the non-integrated carriers, control about 70 percent of international cargo. Typically, to keep costs down, they book blocks of space with carriers in the belly of passenger aircraft. The other 30 percent of air cargo is carried by the integrators who will accept shipments directly from shippers, and upon occasion, will take bookings from a forwarder. On international shipments, integrators may compete directly with airline/forwarder alliances for business but overnight delivery does not necessarily play as vital a role in international shipping as it does in domestic. Forwarders and shippers will also utilize freighters operated either independently or by the passenger carriers. In certain instances, carriers may lease freighter aircraft from a company such as Atlas or Gemini, but the numbers of such operations and their impact on airport handling requirements and infrastructure are not typically significant. One of the keys to successful international goods movement is clearance by the federal agencies. Easy and timely access for inspection is vital. If the federal agencies do not have the staffing to accommodate timely inspection and clearance, the best facilities and location in the world will not move international cargo effectively.

Domestic cargo differs dramatically from international. Domestic cargo is not regulated by customs clearance, it is dominated by the integrators with very little influence by forwarders, it has an enormous trucking component, and it creates substantial demands on the airport's aeronautical infrastructure. Integrators carry 90 percent of domestic cargo. Competition among the integrated carriers is driven by guaranteed overnight (or other time definite) delivery to almost any location. Integrators operate with a very tight shipping window to their Midwest distribution hubs; this creates a concentration of ground traffic within a region as trucks bring the packages to the airport at the last possible minute. Large volumes of domestic

freight also move in the bellies of passenger aircraft. The goods are not typically as time sensitive and arrive at the cargo facilities in smaller concentrations, with much greater frequency, and without well-defined shipping windows.

In combination, these segments of the cargo business create pressure on airports to provide more a) passenger terminal capacity and proximate aircraft apron, b) expanded warehousing, Ground Service Equipment (GSE), and office space, c) a more extensive network of restricted service roads, d) more remote apron and accessing taxiways, e) building frontage, customer and employee parking, and f) improved roadway access and geometry. Very few airports are positioned to deal effectively with the future requirements of both the passenger and cargo segments of their business.

In an ideal environment, space for the on-airport cargo community would be expansive enough to include a full complement of the supporting and ancillary businesses that are important components of an air cargo operation. Geographic proximity to the carriers allows these other businesses to realize operational and financial benefits, while providing a higher level of service to their customers.

3.5.1.3 Critical Cargo Variables

A number of critical variables of goods movement by air are described below. All of these variables impact STL to some degree. Although some of the variables are not air cargo specific, they reflect changes that will eventually affect air cargo volumes and its long-term compatibility with industry needs.

Growth in the passenger markets - Global forecasts by the FAA and Boeing predict that the world passenger market could double over the next 20 years. Airports will be challenged to provide the resources to achieve targeted levels of service for both passenger and cargo growth. In instances where the capacity of an airport is exhausted, choices must be made in the allocation of resources. As a result, there may be pressure to shift the most easily relocated business segment – in most cases, cargo – to the nearest, most viable alternative airport. Over the next 5 years, cargo growth will be constrained by the airports' ability to develop new facilities and accommodate aircraft parking.

Growth in the cargo markets – Although world air cargo traffic was down more than 10 percent for the 12 months ended April 2009,[26] over the long term global forecasts call for a tripling of air cargo volumes within the next 20 years. The corollary of this air cargo growth is the potential for issues with roadway access and truck parking and the need for planning to prevent massive queuing, maneuvering, and loading problems. When combined with anticipated long term passenger growth, particularly at major gateways, the constraints of the land envelope warrant business strategies, lease management practices, and physical planning that will optimize airport access and airport property and the ability to serve customers. In many cases, airports will be unable to create additional capacity, despite their best efforts.

[26] ACI, *Freight Flash Summary,* April 2009

Key shipping windows - Two of the great myths in the industry are that air cargo aircraft operate around the clock, or only at night; this is not the case. Integrators typically schedule departures from the West Coast between 8:00 p.m. and 11:00 p.m. to reach Midwest sort facilities by midnight. Sortation occurs between 3:00 a.m. and 6:00 a.m. While not as time specific as the integrated carriers, freight carriers must also operate out of shipping windows to allow for a) coordinated pickup and delivery at local and regional destinations, b) integration of transshipments, and c) restrictive overseas airport and government controls. The result is a clustering of operations and aircraft parking requirements. This causes a peaking of demand in the early evening for aircraft parking on a daily basis.

Aircraft parking - Shipment tracking, reliability of delivery, and cost have accelerated the utilization of freighter traffic in general, and integrated carrier traffic in particular. With the increased utilization of freighters, there is a correlating need to expand apron space. Cargo carriers operate as transient commercial traffic at many airports and utilize apron space within specified windows. The result is peak demand for space followed by down time. Airports are shifting from exclusive ramp space per carrier to a common use operation and rate structure. The increased use of freighters results in flight routes focused on the main gateways. This is due to the increased volume that freighters carry and the limited number of airports that have the infrastructure to accommodate them. Freight is collected at main gateways by trucking in goods or flying small shipments on small planes known as "feeders." The feeder service brings cargo from smaller markets to the gateway airports essentially "feeding" the freighter. The increasing feeder service is creating opportunities for smaller alternate airports, known as secondary and reliever airports, to fit into the network needs of the integrators, which may lead to increased cargo volumes. On the other hand, feeder service increases airport operations and creates unique scenarios for apron use of both large aircraft and small planes.

The growth of truck substitution - One of the most difficult variables to evaluate in air cargo is the truck substitution component. Trucks have nearly replaced regional air freight service due to the cost savings and increased efficient service. Their services have expanded to provide the transport of freight to gateway airports for consolidation: a number of carriers transport cargo by truck to build their own volumes. Many air cargo facilities are operating to a greater extent than in the past as truck terminals, yet requirements to report truck-to-truck traffic are scarce.

Airports cannot realistically evaluate comprehensive space demands, effectively plan for and phase new development, or fully capture business opportunities without careful consideration of the truck substitution component. Additionally, as truck substitution continues to play a greater role, airports must address the fact that an air cargo facility is an intermodal facility, and it must be designed to accommodate trucks as well as aircraft. At some point, airports must make a determination as to whether or not the value of the trucking component outweighs the value of the land.

E-Commerce - Many of the shipments generated by home shopping networks, catalog shopping, and most recently e-commerce, require specialized facilities for efficient processing and expedited delivery. Repair of electronic equipment, computers, and telephones is a particularly active growth area. Accordingly, these shipments have a greater tendency to move by air or expedited trucking. This has accelerated demand for air cargo operations in general and freighter operations in particular. Much of this business has gone to the integrators, although there is spillover that impacts domestic belly cargo and to a greater extent, domestic trucking.

Manufacturing creep - Manufacturing facilities, particularly those focused on time sensitive products, in response to demand for faster delivery, are moving and/or locating key warehouse facilities closer to airports, or onto airports. This reduces inventory, trucking costs, and staffing requirements while increasing levels of customer service. There is also a growing tendency for industry to decentralize, or regionalize distribution.

High-speed logistics - The changes in manufacturing and shipping are giving rise to the design of new high-speed logistics facilities that can effectively integrate a number of diverse industry segments. The facilities can handle throughput and sortation, kitting (minor assembly), and returns, as well as traditional operations. These value-added distribution centers can be major job generators, in some cases approaching the employment levels of traditional manufacturing operations. However, the size of these buildings, often exceeding 500,000 square feet, makes them unlikely to occur on most airports.

Building technology – Due to the escalating cost of storing goods, and the general shortage of on-airport property, modern cargo facilities are being designed to emphasize speed of transition rather than warehousing. The result is taller buildings to handle highly mechanized equipment with sufficient depth and adequate airside and landside doors. It should be noted, however that not every air cargo operation requires sophisticated equipment. The demand is a function of the size of the operation, the nature of the cargo, the scheduling needs of the shippers and forwarders, and budget. New security requirements will necessitate facility modifications that could reduce existing floor capacity and require more internal storage at traditional gateways, creating pressure for new warehousing that cannot be met.

Aircraft technology - Modern passenger and freighter aircraft are more fuel-efficient, have greater range, and carry larger payloads than older aircraft. This trend, most clearly illustrated by the number of deliveries and orders for the passenger version of the A-380 and the Boeing 747-800F, will continue the evolution of global shipping patterns. (Airbus has delivered 13 passenger A-380s and has 198 orders as of December 31, 2008.[27] Boeing currently has orders for 78 B-747-800Fs, with the first delivery expected in the third quarter of 2010.[28]) The ability of new aircraft to over-fly traditional points of entry, as well as the

---

27 *Airbus 2008 Annual Review* (*see* Internet website: www.airbus.com)
28 *See* Internet website: www.boeing.com

inability of many airports to accommodate the new aircraft will affect the selection of origin and destination airports. A 747-800 will carry 120 tons while a 767 carries less than half that amount. The A380 freighter program was suspended in March 2007 and currently has no customers and had been designed to off load up to 152 tons of air cargo. It is not anticipated however that the belly component of the A-380 passenger aircraft will deliver cargo volumes in excess of what is typically handled in today's routine shipments given the anticipated volumes of luggage.

Belly cargo capacity - While strong growth is expected in the passenger airline industry in the long-term, most recently the passenger airlines have decreased the number of flights they operate and have reduced the size of aircraft on many remaining flights. This has reduced the aircraft belly capacity available for cargo, which has consequently forced the diversion of cargo to trucking and dedicated freighter/integrator aircraft. Additionally, because of the more stringent application of the "known shipper rule,"[29] passenger carriers are either reluctant to, or are constrained from, accepting some freight. As a result, more freight flows through to freight forwarders, who make use of multiple modes of cargo shipment. Security requirements for cargo shipped on passenger aircraft are becoming even more stringent; The *Improving America's Security Act of 2007* was signed into law by President Bush on August 3, 2007. This law requires that 50 percent of cargo on passenger aircraft be screened by February 2009, and 100 percent be screened by August 2010. According to the FAA, "…the law will lead to increased cost and time requirements for shipment of cargo on passenger air carriers."[30] This law is very likely to result in lower belly cargo shipments.

3.5.1.4 Air Cargo Success Factors

As the industry undergoes major changes, the basic ingredients of an airport's successful air cargo operation have remained essentially intact:

Substantial passenger market - In order to accommodate high belly cargo volumes, an airport must be served by aircraft of sufficient size to accommodate cargo in the belly compartment. The regional jets used by American Airlines at STL have limited capacity for belly cargo volumes. Southwest Airlines uses Boeing 737s which can accommodate reasonable belly cargo volumes. STL is geographically well positioned to experience growth in passenger traffic but will need to have larger gauge aircraft operations to affect an impact on belly cargo.

Regional production and consumption - The large and growing population of the region, along with the City of St. Louis and the State of Missouri's promotion of logistics and related jobs could generate sufficient volumes of outbound cargo to further enhance STL's positioning as a potential commerce center. Achieving the critical mass of outbound cargo can provide the balance that is essential to the

[29] On October 8, 2001, the FAA issued the "known shipper rule" (Emergency Amendment EA 109-01-01A). This rule requires freight forwarders to verify the legitimacy of their customers unless they had done business with the customer before September 1, 1999, and have booked at least 24 shipments with the shipper.

[30] FAA Aerospace Forecast, Fiscal Years 2008-2025

financial success of an air cargo operation. One of the keys to success will be the ability to expand the airport's catchment region to capture surrounding cargo traffic.

Lift to a large number of markets - A substantial number of operations to diverse domestic markets and sufficient volumes of cargo to each destination enables shippers to consolidate shipments, reducing overall shipping rates. STL's user base could enable efficient interlining between domestic passenger and international cargo aircraft. STL has 300 daily passenger flights including 112 on American Airlines. In addition, STL is served by two of the largest integrators (FedEx and UPS), offering immediate cargo connections to the global market.

Roadway infrastructure and an effective highway distribution system – One of the side effects of air cargo growth is a corresponding increase in truck traffic and its impact on regional traffic patterns and flows. The overall growth of passenger traffic and cargo traffic has brought about the problem of congestion at many major gateways. This is not the case with STL. The airport is strategically located in the central U.S. at a major intersection of north-south and east-west highways with excellent access to the surrounding region and to the cargo areas themselves.

Physical capacity to accommodate growth - The most obvious criterion for the future success of an air cargo program is the physical capacity to accommodate the airside and landside requirements of both tenants and users. This includes aeronautical infrastructure, physical facilities, landside parking, and roadways. These will ensure that the airport functions as an intermodal facility. The airport is finalizing negotiations for the development of new cargo facilities. This new world-class infrastructure will both accommodate immediate demand and position the airport for long-term growth.

Geographic positioning - STL is well positioned in the middle of the U.S. to serve as a transshipment hub for both domestic and international cargo. The Airport can function effectively as a consolidation and distribution center for both north-south and east-west movement of goods. The roadway catchment area is nearly 400,000 square miles and includes all of the mid-western states. New technology and longer-range aircraft broaden the ability of STL to serve international markets. Asian carriers are beginning to seek entry to more destinations in the central U.S. to take advantage of the ground transportation network. The Airport's location also creates a potential for interlining provided it can attract an Asian or South American carrier. The multi-continental potential combined with the existing huge domestic distribution capability is a major strength.

Bi-lateral agreements - The use of U.S. airports by foreign flag carriers is based on international trade agreements which formally grant nations and carriers access. STL will typically not be one of the first markets which international carriers seek, however, with the liberalization of cargo bi-laterals, opportunities could increase over the next five years. There is a strong economic and political will to expand the international outreach of the region.

Supporting business infrastructure - Almost 90 percent of the domestic cargo in the U.S. is controlled by the integrated carriers. Conversely, the integrators' role in international shipping is much smaller with freight forwarders and customs brokers controlling approximately 70 percent of that market. These segments of the industry typically position facilities on or near the transportation facility they wish to utilize. There are over fifty freight forwarders and customs brokers located in the St. Louis MSA, including international forwarders BAX Global, Schenkers International, Eagle, Expeditors International, Nippon Express, and Panalpina. There are also more than 250 trucking firms in the same area, offering competitively priced distribution and consolidation to virtually every location in North America.

3.5.2 AIR CARGO INDUSTRY TRENDS

The cargo industry has become a nearly seamless global operation connecting nations. Countries like China and India are changing the manufacturing supply chain network and effecting business markets. Their influences have led to new products being brought to the market, new carriers emerging, new route development, and the development of cargo operations at airports that previously were not heavily involved in that segment of the aviation industry. The actual process of moving products around the world, known as logistics, is evolving rapidly, causing the industry to experience growing pains. Leading this expansion is the sense of urgency created from increasing e-commerce shipping and high speed logistics. Airports will be forced to re-evaluate how they do business to adapt to the influences of the dynamic freight industry. Airports are a point of service for both passenger and cargo traffic. These services have changed over the past five years due to terrorist attacks, the severe acute respiratory syndrome (SARS) virus, wars, labor issues, and a steady increase in fuel prices. The carrier-driven operational changes are causing airports to revise their strategic goals, market priorities, and cargo capacity. The air cargo community, made up of freight forwarders, custom brokers and truckers, is changing as a result of mergers, acquisitions, global manufacturing expansion, and security issues.

The FAA, Boeing, and Airbus publish cargo forecasts on a regular basis. These forecasts were consulted to provide an understanding of historical and future cargo trends at a national and international level.

3.5.2.1 Historical Trends

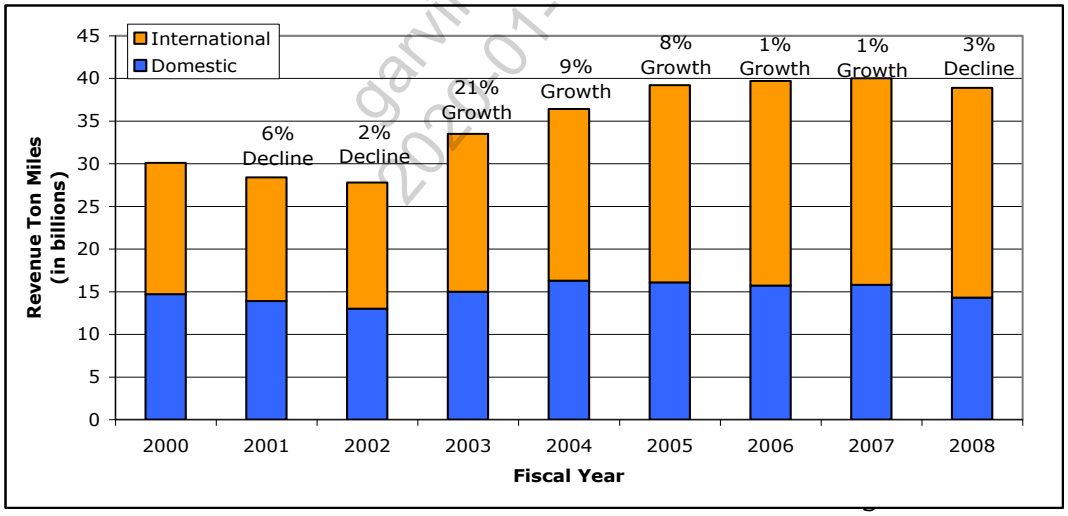
The air cargo industry has experienced many changes in the last decade. The general U.S. economic downturn that began in 2000 adversely affected U.S. air cargo activity. After the terrorist attacks of September 11, 2001, cargo activity in the U.S. was immediately impacted. Critical impacts included the increased use of trucks, an escalation of insurance costs, consolidation among smaller firms, the failure of many small cargo airlines and smaller support firms, higher security costs, longer processing time because of security, and increased available freighter capacity which drove down rates. The cargo industry recovered by 2003 and posted strong growth for several years.

Growth in U.S. air cargo activity began to slow down in 2006 as the price of oil surged to record high levels (ultimately peaking at almost $147 per barrel in July 2008), causing shipping by other modes to become more attractive. While oil prices declined significantly in the fourth quarter of 2008, economic activity deteriorated in late 2008 and the resulting global recession limited the positive impact of the lower oil prices. In fact, the 2 largest cargo carriers at STL (FedEx and UPS) both experienced a decrease in domestic volumes in 2008:

- FedEx reports on a fiscal year ending May 31. FedEx Express average daily domestic volumes were down two percent and three percent in the third[31] and fourth[32] quarters of fiscal year 2008, respectively, compared to the same period in fiscal year 2007. Domestic volumes fell further through November of 2008 compared to the same period in 2007 (a decline of five percent and eight percent in the first[33] and second[34] quarters of fiscal year 2009).[35]
- UPS saw a shift away from its premium air products to ground in calendar year 2008. UPS average daily domestic air volumes fell 5.2 percent in 2008 over 2007. Next day domestic air volumes were down 7.1 percent in 2008 while deferred domestic air volumes were down 2.8 percent in 2008. Conversely, UPS international volumes were up 3.7 percent in 2008.[36]

Exhibit 3.5-1, *Historical Revenue Ton Miles* illustrates the historical growth by U.S. cargo carriers as measured in revenue ton miles (RTMs).

Exhibit 3.5-1
HISTORICAL REVENUE TON MILES (Revenue Ton Miles)
U.S. COMMERCIAL CARGO CARRIERS
Lambert-St. Louis International Airport



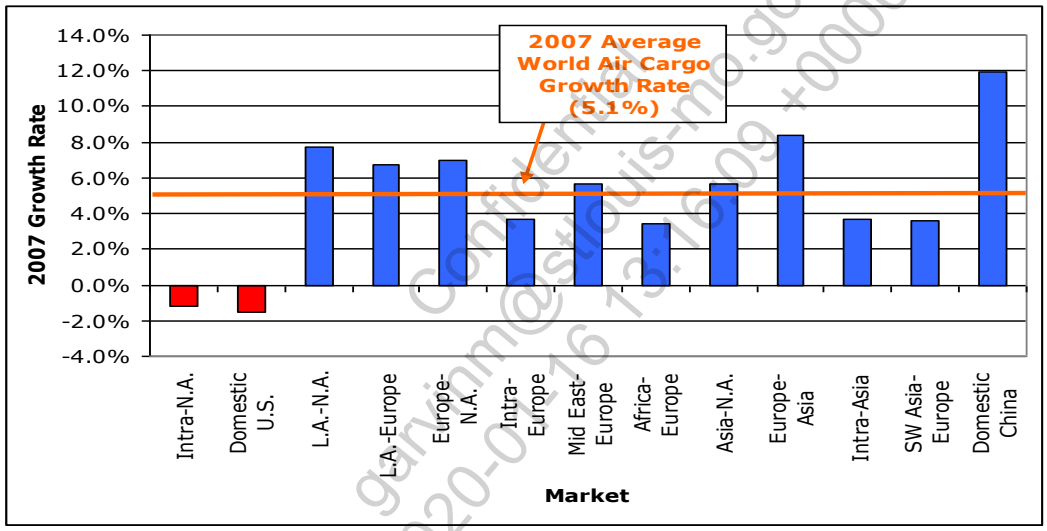
Sources: *FAA Aerospace Forecast*, Fiscal Years 2006-2017 and 2009–2025; Landrum & Brown analysis, 2011

[31] December 1, 2007 – February 29, 2008
[32] March 1, 2008 – May 31, 2008
[33] June 1, 2008 – August 31, 2008
[34] September 1, 2008 – November 30, 2008
[35] *See* Internet website: http://ir.fedex.com/releases.cfm
[36] *UPS 2008 Annual Report*

In contrast, intra-North America cargo traffic shrunk by 1.2 percent and the domestic U.S. market declined by 1.5 percent in 2007 (*see* **Exhibit 3.5-2, *2007 Air Cargo Growth by Major Market***). International shipments to and from the U.S. increased as the Latin America-North America, Europe-North America, and Asia-North America markets all experienced growth in 2007 that exceeded the world average. The highest growth market in 2007 was the domestic China market (almost 12 percent growth over 2006).

Worldwide cargo activity for 2008 was not available at the time of this analysis, however, early reports from the carriers "point to either continuing weak or negative growth."[37]

Exhibit 3.5-2
2007 AIR CARGO GROWTH BY MAJOR MARKET
(Revenue Tonne Kilometers)
Lambert-St. Louis International Airport



Source: *Boeing World Air Cargo Forecast 2008-2009*

3.5.2.3 Forecast Trends

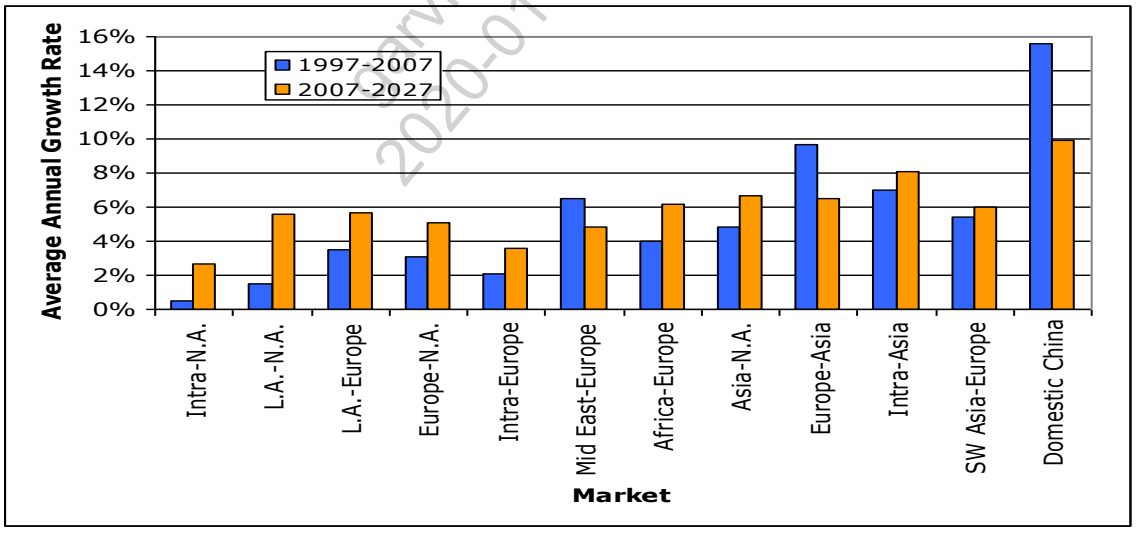
In spite of the current downturn, the Airbus, Boeing, and FAA forecasts all predict positive growth in the future:

- The 2007-2026 Airbus forecast is based on 2006 data. Airbus expects world cargo, measured in freight tonne kilometers (FTK), to grow at an average annual rate of 5.8 percent from 2007 to 2026. The U.S. domestic cargo market is expected to grow at an annual rate of 2.8 percent from 2007 to 2026, with faster growth of 3.0 percent annually occurring from 2007 to 2016.[38]

[37] Boeing *World Air Cargo Forecast 2008-2009*, Introduction
[38] *Airbus Global Market Forecast, 2007-2026*

- Boeing's 2008-2009 base forecast predicts world air cargo traffic (measured in RTKs) will grow at a rate of 5.8 percent annually from 2007 to 2027, with most of the growth in Asian markets (*see* **Exhibit 3.5-3, *Boeing Average Annual Air Cargo Growth Rates by Major Market***). Boeing's high forecast predicts world growth of 6.7 percent annually while the low forecast calls for 4.8 percent average annual growth. Boeing's base forecast predicts the domestic U.S. market will grow at an average annual rate of 2.6 percent through 2027. Boeing's high forecast for the U.S. domestic market calls for 2.7 percent average annual growth while the low forecast predicts 2.4 percent average annual growth from 2007 to 2027.[39] The Boeing forecast acknowledges the current economic crisis. In spite of the global recession, the Boeing forecast anticipates that world air cargo growth will return to historic levels based on "the continuing globalization of the industry, increasing adoption of inventory-reduction strategies, and anticipated operating cost reductions in the freighter fleet…"[40]
- The FAA's most recent forecast was published in early 2009. The FAA forecasts domestic U.S. cargo RTMs will drop by 8.3 percent in 2009, grow by 2.5 percent in 2010, and then increase at an annual rate of 2.4 percent from 2010 to 2025. The resulting annual growth rate for the 2008 through 2025 period is 1.8 percent. The FAA expects the all-cargo (freighter) share of domestic cargo to increase to 88.4 percent by 2025, from 85 percent in 2008.[41]

Exhibit 3.5-3
BOEING AVERAGE ANNUAL AIR CARGO GROWTH RATES BY MAJOR MARKET
(Revenue Tonne Kilometers)
Lambert-St. Louis International Airport



Source: Boeing *World Air Cargo Forecast 2008-2009*

[39] *Boeing World Air Cargo Forecast 2008-2009*
[40] *Boeing World Air Cargo Forecast* 2008-2009
[41] *FAA Aerospace Forecasts, Fiscal Years 2009-2025*

In addition to the industry forecasts, the 2008 Annual Reports for FedEx and UPS (STL's largest cargo carriers) were also reviewed in order to estimate the impact of the global recession on cargo volumes in 2009. FedEx does not anticipate "significant improvement in the U.S. economy" in fiscal year 2009 and expects "…U.S. domestic shipping volumes to remain at the pre-2000 levels experienced in the fourth quarter of (fiscal year) 2008."[42] In fact, FedEx Express domestic shipments in the second half of calendar year 2008 decreased even further than FedEx had projected in June of 2008. UPS expects continued declines in volumes in calendar year 2009 and believes "…2009 will be even more difficult than 2008." [43]

3.5.3 AIR CARGO AT STL

STL's existing role in the cargo logistics chain is to facilitate the shipment of freight to and from the St. Louis metro area (i.e. it does not function as a cargo hub for an airline). **Table 3.5-1, *2008 Air Cargo Market Share Summary (in metric tonnes)***, shows the air cargo volumes by carrier type at STL in 2008. According to airport records, almost 89 percent of air cargo at STL was carried by all-cargo operators while the remainder was transported in the belly compartments of passenger aircraft.

Table 3.5-1
2008 AIR CARGO MARKET SHARE SUMMARY (in metric tonnes)
Lambert-St. Louis International Airport

Airline	Freight	Mail	Total Air Cargo	Percent of Total
All Cargo				
Fedex	38,730	-	38,730	47.8%
UPS	1,604	17,071	18,675	23.0%
Capital Cargo	9,629	-	9,629	11.9%
ASTAR	4,890	-	4,890	6.0%
Total	**54,853**	**17,071**	**71,924**	**88.7%**
Passenger				
American	757	3,062	3,819	4.7%
Southwest	3,109	-	3,109	3.8%
Other	1,032	1,195	2,228	2.7%
Total	**4,898**	**4,258**	**9,155**	**11.3%**
Total Cargo	**59,751**	**21,328**	**81,080**	**100.0%**

Sources: Airport Records; Landrum & Brown analysis, 2011

[42] *FedEx Corporation Annual Report 2008*, June 24, 2008 (*see* Internet website: http://ir.fedex.com/annuals.cfm)

[43] UPS *2008 Annual Report*, Letter to Shareholders (*see* Internet website: http://investor.shareholder.com/ups/index.cfm)

The all-cargo carriers serving STL include:

- **FedEx** – FedEx accounted for the largest share of air cargo (47.8 percent of total air cargo) in 2008. Virtually all of the cargo processed by FedEx (over 99 percent) at STL is loaded or unloaded from flights to its hubs in Indianapolis and Memphis.
- **UPS** - UPS is the second largest cargo carrier at STL with a 23.0 percent market share in 2008. As with FedEx, over 99 percent of the cargo transported at STL is on flights to and from its Louisville, Kentucky and Rockford, Illinois hubs.
- **Other Cargo Airlines** - In 2008, STL was also served by Capital Cargo (which was acquired by ABX in November of 2007) and ASTAR Air Cargo. Together, these carriers accounted for almost 18 percent of the cargo volumes at STL in 2008. ABX's main customer is DHL. ASTAR's target customers are DHL Worldwide Express and the U.S. Air Force. DHL ceased all U.S. ground and air cargo services in 2008.

In 2008, approximately 9,160 metric tons of air cargo was transported in the belly compartments of passenger airlines at STL. American and Southwest Airlines together accounted for almost 76 percent of the STL belly cargo in 2008.

3.5.4 STL CHINA INITIATIVE

As discussed in Section 2.6.2, much of the growth in the cargo industry over the next 20 years will be in the international markets. The domestic U.S. market is relatively more mature and, while domestic growth is expected to be positive, international markets, especially China, are expected to grow the fastest. As a result, the State of Missouri, the City of St. Louis, STL, and private firms within the region have formed the China Hub Exploratory Group (the China Group). The China Group has been exploring the feasibility of creating a Chinese center for logistics and trade development in the central U.S. The China Group envisions commercial development with a Chinese air cargo operator with direct service to China at its core. This concept would capitalize on the major strengths of the airport and the region and would integrate both air cargo and logistics facility development. This would position the region to accommodate the transshipment of international goods and the creation and growth of an origin and destination base for products shipped by air. Such an operation would allow the region to extend interconnectivity to Europe and Latin America. If successful, this would solidify St. Louis as a full-scale consolidation and distribution center.

In order for this type of development to occur, the success factors discussed in Section 2.6.1.4 must be addressed. Any international air carrier that initiates direct service at STL will consider costs, profits, and a balance of inbound and outbound volumes in its decision.

Regional competition for international air cargo service must also be considered. Air China has an established operation in Chicago O'Hare (ORD) – a major gateway. This represents a competitive challenge for efforts to redirect or expand operations to STL. In spite of the competition at Chicago O'Hare, nearby MidAmerica Airport is

expanding its international cargo service. MidAmerica recently announced the initiation of connecting goods movement between China and South America. Under the proposed operating scenario, China will send a plane carrying electronics and computer goods to ORD, from which the cargo will then be trucked to MidAmerica. From MidAmerica, the cargo will be flown to Miami International Airport (MIA) for subsequent transport and distribution throughout South America. On October 30, 2008, flowers from South America (Bogotá, Colombia) were flown to MidAmerica, stored in the on-airport refrigerated warehouse, and distributed to floral wholesalers completing the first international delivery to the airport. These flights are now scheduled to occur on a weekly basis. It is contemplated that International Harvester and Caterpillar equipment parts will also be flown to MIA for shipment to Latin America. This new service at MidAmerica Airport confirms that the international air cargo industry sees some market potential in the region and that there are potential initiatives that could help create changes in logistics operations to help STL succeed.

As an initial component of the planning by the China Group, a survey of the major freight forwarders in the region was conducted as part of this Master Plan Update to develop a strategic context from which potential issues and next steps could be identified. The survey found that STL could easily accommodate three B-747 flights per week. Increased frequencies and low costs would not only attract a new market but also help retain it. However, two major obstacles were identified:

- The headquarters of most major forwarders control the routing and selection of gateway city from which all international traffic is exported. Unless there is some extraordinary change in the regional shipping dynamic it would appear that displacing ORD would be challenging.
- Trucking to STL rather than to ORD could result in higher shipping costs. Currently truckers can maximize shipments to ORD because of the multiple destinations and flights. Without this diversity at STL, there will be less demand for truck capacity, less trucked volumes, and higher costs.

Because of the uncertainty of this initiative, the forecast for the Master Plan will be based on a continuation of the current role of STL without any new international service. The Master Plan will however consider the potential impacts of the China Initiative.

3.5.5 AIR CARGO TONNAGE FORECAST

The forecast is predicated on the assumption that the structural changes to the air cargo industry discussed in this chapter are permanent and that emerging trends for air cargo security will continue. Additionally, it is assumed that long-term economic growth in the STL Air Service Area and the broader U.S. economy will increase the demand for the shipment of goods and services over the forecast period. The air cargo tonnage forecast also reflects the current global economic recession in the short-term.

The forecast represents a continuation of the airport's current role. Virtually all the air cargo tonnage at STL leaves on domestic flights. The forecast assumes STL will continue to act as a spoke airport serving the integrators' hubs and the majority of air cargo will be domestic in nature. As a result, the higher growth rates that industry analysts have projected for the international markets are not expected to apply at STL. The FAA, Boeing, and Airbus forecasts expect domestic growth to range from 2.6 percent to 3.0 percent annually. The Boeing forecast was deemed the most appropriate forecast to use for STL as it aligned more closely with the anticipated economic growth in the St. Louis economy. The Boeing forecast predicts the U.S. domestic market will grow at a rate of 2.6 percent annually through 2027. Boeing forecasts faster growth in the first 10 years (2.9 percent annually) than in the 2017 to 2027 period (2.3 percent per year).

Before applying the long-term growth rates from the Boeing forecast, the short-term effects of the global recession on STL cargo volumes were analyzed. Total cargo volumes for the year 2008 were down 2.6 percent over 2007 based on airport traffic reports. STL cargo volumes in the first quarter of 2008 were actually

up 5.6 percent over 2007. However, cargo volumes fell by 2.8 percent in the second quarter and by 3.2 percent in the third quarter. Cargo volumes fell significantly in the fourth quarter of 2008 – by 10.6 percent.

Both FedEx and UPS expect calendar year 2009 to be challenging, especially for domestic shipments. As a result, due to STL's role of major feeder to FedEx and UPS hub, cargo volumes are forecast to decline by 10 percent in 2009. The economy is expected to rebound and STL cargo volumes are forecast to experience positive growth during the recovery period estimated to occur from 2010 to 2012 (2.0, 4.0, and 4.0 percent, respectively). The Boeing forecast growth rates (2.9 percent per annum through 2017; 2.3 percent annually thereafter) were applied beginning in 2013; resulting in total STL cargo volumes increasing to 119,270 metric tons in 2028 (*see* **Table 3.5-2, *Air Cargo Tonnage Forecast (in metric tonnes)***).

Belly cargo volumes have declined at STL since 2002 due to the downsizing of the American Airlines' fleet from narrow-body aircraft to regional jets that have less belly cargo capacity. The share of belly cargo at STL has declined from a high of 38.5 percent in 2002 to 11.3 percent in 2008. This reduction in belly cargo share is consistent with national trends. According to FAA statistics, the domestic U.S. all-cargo share has increased from 65.4 percent in 1997 to 85 percent in 2008. The FAA predicts that the all-cargo share for the U.S. as a whole will increase to 88.4 percent by 2025 due to increases in the capacity of cargo aircraft and new security regulations.[44]

As a result of the new security regulations, belly cargo volumes at STL are forecast to drop by more than half by 2012. The cargo that in the past has been transported in the belly of passenger aircraft is expected to shift to all-cargo aircraft. This results in the all-cargo share at STL increasing to 95.5 percent in

[44] *FAA Aerospace Forecasts, Fiscal Years 2009-2025*, page 39

2012. The all-cargo share is forecast to remain at this level through 2028. As a result, all-cargo volumes are forecast to increase from 71,924 metric tons in 2008 to 113,870 metric tons by 2028. Belly cargo volumes will decrease from 9,155 metric tons in 2008 to 5,400 tons in 2028.

Table 3.5-2
AIR CARGO TONNAGE FORECAST (in metric tonnes)
Lambert-St. Louis International Airport

Calendar Year	Belly	All-Cargo	Total	Percent All-Cargo
History				
2008	9,155	71,924	81,080	88.7%
Forecast				
2013	3,750	79,090	82,840	95.5%
2018	4,300	90,710	95,010	95.5%
2023	4,820	101,640	106,460	95.5%
2028	5,400	113,870	119,270	95.5%
Average Annual Growth Rate:				
08-13	-16.3%	1.9%	0.4%	
13-18	2.8%	2.8%	2.8%	
18-28	2.3%	2.3%	2.3%	
08-28	-2.6%	2.3%	1.9%	

Source: Landrum & Brown analysis, 2011

3.6 AIRCRAFT OPERATIONS FORECAST

Aircraft operations, defined as arrivals plus departures, were forecast separately for the four major categories of users at STL: commercial passenger airlines, commercial all-cargo carriers, civil aviation, and military.

3.6.1 COMMERCIAL PASSENGER OPERATIONS

Passenger aircraft operations were derived from the enplaned passenger forecasts. The aggregate number of commercial operations at an airport depends on three factors: total passengers, average aircraft size, and average load factor (percent of seats occupied). The relationship is shown in the equation below.

$$\text{Operations} = \frac{\text{Total Passengers}}{\text{Average Load Factor x Average Aircraft Size}}$$

This relationship permits literally infinite combinations of load factors, average aircraft size, and operations to accommodate a given number of passengers. In order to develop reasonable load factor and aircraft gauge assumptions, commercial passenger operations were disaggregated into the same broad categories of activity as in the enplaned passenger forecast. Passenger operations were first segmented into domestic and international operations. Domestic operations consist of all scheduled and non-scheduled activity by passenger airlines in which the immediate down line city on departure or up line city on arrival is in the continental U.S., Alaska, Hawaii, or a U.S. territory.

Domestic passenger operations were further divided into domestic air carrier operations and domestic commuter operations. The breakout of domestic commuter service is based on the individual carrier's mode of operation (i.e., providing regional feed to its major airline partners, generally within 300 miles) and certification with the FAA. These commuter carriers typically operate turboprop and regional jet aircraft.

The fundamental approach to deriving the passenger operations forecast is essentially the same at all airports. However, the underlying assumptions at each airport are inherently different due to differences in how airlines choose to serve the demand for air travel to, from, and over each airport. These differences may result, for example, from a strategic focus on unit revenues versus unit costs, or an emphasis on a hub-and-spoke system versus a point-to-point operation.

A number of sources were used to develop the historical passenger operations, load factor, and aircraft gauge data. The Official Airline Guide (OAG); the FAA Air Traffic Activity System (ATADS); and U.S. Department of Transportation (USDOT) Schedule T-100 data were all used to develop total departures and the number of departing seats for each segment. Average seats per departure (ASPD or gauge) for each of the major groups of passenger activity were calculated from total departures and total departing seats. Aircraft load factors were calculated for each

group of passenger operations by dividing total enplaned passengers by total departing seats. To calculate total operations, the total number of departures was multiplied by a factor of two.

3.6.1.1 Gauge and Load Factor Assumptions

Table 3.6-1, *Gauge and Load Factor Assumptions*, presents the ASPD and load factor assumptions for each segment of passenger activity.

DOMESTIC AIR CARRIER GAUGE AND LOAD FACTOR ASSUMPTIONS

Domestic air carrier gauge increased from 125 in 1995 to 142 seats per departure in 2002. Thereafter, ASPD for domestic air carrier flights fluctuated within a relatively narrow band between 134 and 142 seats per departure. This reflects the historical deployment of narrow-body jet aircraft at STL in the 135-seat to 145-seat range, such as the Boeing 737-300/700 by Southwest and MD80 aircraft operated by TWA and then American. Southwest Airlines, which accounts for the largest proportion of the domestic air carrier operations at STL, currently operates only three sizes of B737 aircraft and has no stated plans to diversify its fleet in the future. Similarly, the second largest air carrier airline at STL (American) currently operates only two aircraft types (MD80s and Boeing 757s) at the airport. Indeed, the assumed evolution of the domestic air carrier fleet at STL is primarily towards similarly sized, next generation replacement aircraft (e.g. Boeing 737-700 replacing Boeing 737-300 aircraft or Boeing 737-800 replacing MD80 aircraft) rather than wholesale fleet changes. The following assumptions were made as a basis for the domestic air carrier commercial passenger operations forecast:

- Southwest will continue to replace its B737-300s and B737-500s with B737-700s.
- By 2013, MD-80 and MD-90 aircraft will be replaced by more fuel efficient B737-800 aircraft (American, Delta).
- By 2013, American will have phased out its B757s and replaced them with B737-800s.
- Other airlines at STL will focus their fleet on A319s and A320s (Delta/Northwest, Frontier, United and US Airways), as well as B737-700s (AirTran).
- There will be a shift from small regional jets (less than 60-seat aircraft according to the FAA definition) to larger regional jet aircraft (more than 60-seat aircraft) over the forecast period as major domestic commuter airlines upgauge their fleet).[45]

As a result of these assumptions, the domestic air carrier gauge is forecast to decrease from 139 seats in 2008 to 137 seats in 2009. Over the forecast period, the domestic air carrier fleet is projected to average about 139 seats per flight.

[45] Scope clauses limit the ability of American to operate larger regional jets.

Table 3.6-1
GAUGE AND LOAD FACTOR ASSUMPTIONS
Lambert-St. Louis International Airport

Calendar Year	Average Seats Per Departure				
	Domestic		International		
	Air Carrier	Commuter	Air Carrier	Commuter	Total
History					
1995	124.8	27.6	227.3	50.0	102.0
2000	134.1	35.4	151.7	50.0	112.2
2001	132.4	37.6	169.2	49.9	108.0
2002	141.9	39.3	193.3	48.8	108.8
2003	141.5	40.4	196.6	50.0	96.7
2004	134.4	41.7	190.0	50.0	82.6
2005	138.9	42.5	162.2	50.0	82.9
2006	139.3	45.3	159.8	50.0	86.5
2007	139.0	49.0	150.7	50.0	92.9
2008	139.3	48.5	165.0	50.0	93.0
Forecast					
2013	139.1	49.8	162.9	50.0	94.4
2018	139.6	50.4	168.6	50.0	95.3
2023	139.1	51.0	170.3	50.0	95.8
2028	139.1	51.7	174.0	50.0	96.6
Average Annual Growth Rates					
95-08	0.8%	4.4%	-2.4%	0.0%	-0.7%
08-28	0.0%	0.3%	0.3%	0.0%	0.2%

Calendar Year	Load Factor				
	Domestic		International		
	Air Carrier	Commuter	Air Carrier	Commuter	Total
History					
1995	56.1%	49.5%	56.1%	49.6%	55.7%
2000	62.7%	53.3%	88.7%	69.3%	62.3%
2001	56.5%	52.2%	71.3%	67.7%	56.3%
2002	58.7%	60.5%	62.8%	48.9%	58.9%
2003	59.8%	61.3%	67.7%	96.9%	60.4%
2004	66.9%	62.2%	63.4%	51.8%	65.5%
2005	69.9%	66.1%	72.8%	67.3%	68.8%
2006	72.4%	69.5%	74.1%	68.3%	71.5%
2007	72.9%	72.0%	76.3%	65.2%	72.7%
2008	70.2%	69.2%	88.0%	55.0%	70.0%
Forecast					
2013	71.0%	68.6%	84.1%	55.8%	70.5%
2018	71.6%	69.6%	81.5%	57.0%	71.2%
2023	72.2%	70.6%	80.3%	58.3%	71.8%
2028	72.8%	71.6%	79.5%	59.5%	72.5%
Average Annual Growth Rates					
95-08	1.7%	2.6%	3.5%	0.8%	1.8%
08-28	0.2%	0.2%	-0.5%	0.4%	0.2%

Sources: Airport Records; *Official Airline Guide*; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

Domestic air carrier load factors have increased from about 56 percent in 1995 to 73 percent in 2007. The average domestic air carrier load factor decreased to 70 percent in 2008, reflecting the sharp decline in air travel demand in the latter half of 2008. The average domestic air carrier load factor is expected to increase to 72 percent in 2009, reflecting a continued tightening of airline capacity. During the recovery period (2010-2013) domestic air carrier load factors are forecast to decrease slightly as the airlines increase capacity back to 2008 levels. Domestic air carrier load factors are forecast to range between 71 percent in 2013 to 73 percent in 2028.

DOMESTIC COMMUTER GAUGE AND LOAD FACTOR ASSUMPTIONS

The domestic commuter ASPD grew from 28 seats per departure in 1995 to 49 seats per departure in 2008 due to increased deployment of regional jets at STL. In the mid-1990s, airlines used mainly small turboprop equipment (19-seat to 30-seat aircraft) such as Jetstream 31 and Embraer 120. By the beginning of the 21st century, the airlines had shifted from these small turboprop aircraft to larger 30-seat to 50-seat regional jet aircraft. During this period, domestic commuter load factors increased drastically from 50 percent in 1995 to 72 percent in 2007 before declining to 69 percent in 2008.

Larger regional jets in the 70-90 seats range are increasingly used by airlines in the United States. However, American Airlines has one of the stricter mainline pilot scope clauses that limit the size and number of aircraft regional partners can operate. Consequently, it is assumed that while upgauging to larger regional jet aircraft will occur at STL, 34-seat to 50-seat regional jets will continue to be an important component of the commercial passenger fleet at the airport.

Based on these assumptions, the average domestic commuter aircraft gauge is expected to increase to 52 seats per departure by 2028. Over the forecast period, it is assumed that the average load factor for domestic commuter activity will increase to 72 percent by 2028.

INTERNATIONAL AIR CARRIER GAUGE AND LOAD FACTOR ASSUMPTIONS

Since 1995, the international air carrier ASPD has varied significantly depending on the service offerings. International gauge has fallen from 227 seats per departure in 1995 to 165 in 2008. This reflects the use of B767 and MD80 aircraft by TWA in the late 1990s, followed by a greater use of A320s and B737s in the 21st century by USA3000 and Ryan International Airlines.

International air carrier load factors have also varied significantly depending on the airline(s) offering the international service. Load factors have increased from a low of 56 percent in 1995 to 88 percent in 2008.

Frontier and Ryan International dropped scheduled international service from STL in 2008, leaving USA 3000 as the sole provider of scheduled international air carrier service in 2009. The enplaned passenger forecast assumes travel to Latin America will develop by 2014 with a mix of A319 and A320 aircraft, and European

destinations will be introduced by 2015 with B763s. As a result, STL will see its international air carrier fleet focus mainly on A319/A320 aircraft and partially upgauge to wide-body aircraft after 2015. As a result, the international air carrier ASPD ratio is expected to increase to 174 seats per departure by 2028. International load factors are expected to decrease over the forecast period from 88 percent in 2008 to 80 percent in 2028 as new service is added.

INTERNATIONAL COMMUTER GAUGE AND LOAD FACTOR ASSUMPTIONS

Air Canada Jazz currently provides the only international commuter service from STL and exclusively serves Canada using 50-seat regional jets. TWA/AA operated some international commuter flights to Canada from 2001 to 2003 using 44-seat to 50-seat regional jets. Over the forecast period, it is assumed that Air Canada Jazz will be the only international commuter airline at STL. As a result, the international commuter ASPD is expected to remain at 50 through 2028. International commuter load factors are expected to increase from 55 percent in 2007 to 60 percent by 2028.

3.6.1.2 Commercial Passenger Operations Forecast

The result of the foregoing assumptions regarding load factor and ASPD is that domestic air carrier operations are forecast to grow from 107,030 operations in 2008 to 141,800 operations by 2028, representing average annual growth of 1.4 percent (*see* **Table 3.6-2, *Commercial Passenger Operations Forecast***). Domestic commuter operations are expected to increase from 112,052 operations in 2008 to 136,400 operations by 2028 (average annual growth rate of 1.0 percent).

Table 3.6-2
COMMERCIAL PASSENGER OPERATIONS FORECAST
Lambert-St. Louis International Airport

Calendar Year	Commercial Passenger				
	Domestic		International		
	Air Carrier	Commuter	Air Carrier	Commuter	Total
History					
1995	343,578	107,486	1,300	222	452,586
2000	337,774	95,784	2,378	2,186	438,122
2005	106,002	149,206	1,712	1,182	258,102
2006	105,626	137,336	1,696	1,186	245,844
2007	109,418	115,988	1,828	1,286	228,520
2008	107,030	112,052	1,086	1,242	221,410
Forecast					
2013	109,800	111,000	1,520	1,620	223,940
2018	120,600	120,400	2,040	1,900	244,940
2019	122,600	121,800	2,120	1,920	248,440
2023	131,000	128,200	2,460	1,980	263,640
2028	141,800	136,400	2,860	2,020	283,080
Average Annual Growth Rates					
95-08	-8.6%	0.3%	-1.4%	14.2%	-5.4%
08-28	1.4%	1.0%	5.0%	2.5%	1.2%

Sources: Airport Records; *Official Airline Guide*; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

International air carrier operations are expected to grow 5.0 percent per year from a relatively low base to reach 2,860 operations by 2028. International commuter operations are forecast to grow from 1,242 operations in 2008 to 2,020 operations by 2028 (2.5 percent growth annually).

3.6.1.3 Commercial Passenger Fleet Mix

Once the operations forecast was developed for domestic air carrier, domestic commuter, international air carrier, and international commuter activity, a top-down approach was employed to allocate these operations to aircraft groups and specific aircraft types. The fleet mix was developed to match the ASPD targets for each of the four components of commercial passenger demand presented in the previous subsections. The process of developing the fleet mix allowed for the calibration of those assumptions and, where appropriate, modifications were made prior to finalizing the assumptions presented in the preceding subsections.

The allocation of domestic commercial passenger operations by aircraft type is shown in **Table 3.6-3, *Domestic Commercial Passenger Operations Fleet Mix***. The primary assumptions underpinning the fleet mix forecast for the three scenarios are:

- Narrow-body jet activity is expected to continue to account for the predominant share of domestic passenger operations at STL. The continued expansion of Southwest Airlines operations is assumed to account for much of the increase in narrow-body jet activity. As a result, narrow-body aircraft are expected to make up 51 percent of domestic passenger operations by 2028.
- By 2013, there will be a shift in the fleet of the legacy airlines (American and Delta mainly), retiring all MD80s and MD90s and replacing these aircraft with more fuel-efficient aircraft such as B737-800s.
- By 2013, B757s will be retired and replaced by B737-800s (American).
- By 2014, all B737-300s and B737-500s will have been replaced by B737-700s (Southwest).
- Large regional jet aircraft will continue to account for an increasing share of passenger operations. It is assumed that the operating advantages of these aircraft over smaller regional jets will make large regional jets increasingly attractive to commuter airlines and their mainline partners. The population of large regional jets is expected to increase its share of passenger operations, reaching 13.7 percent in 2028 vs. 6.4 percent in 2008.
- Smaller regional jets will continue to account for an important component of the passenger fleet due to American's continued hubbing operation at STL and limitations on large regional jets for to its mainline pilot scope clause.
- Turboprop aircraft are expected to remain a small part of the STL domestic commercial aircraft fleet through 2028, operated exclusively by Great Lakes.

Table 3.6-3
DOMESTIC COMMERCIAL PASSENGER OPERATIONS FLEET MIX
Lambert-St. Louis International Airport

		Aircraft Operations						Percent of Total Aircraft Operations					
Aircraft Type	**Gauge**	**2008**	**2009**	**2013**	**2018**	**2023**	**2028**	**2008**	**2009**	**2013**	**2018**	**2023**	**2028**
Wide Body Jet		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Narrow Body Jet													
757	190	6,834	2,753	-	-	-	-	6.4%	2.9%	-	-	-	-
320	168	1,679	460	1,000	1,000	1,000	1,000	1.6%	0.5%	0.9%	0.8%	0.8%	0.7%
738	148	109	-	35,200	39,800	43,000	46,600	0.1%	-	32.2%	33.0%	32.8%	32.9%
M80/M83/M88	140	31,944	29,326	-	-	-	-	29.8%	31.1%	-	-	-	-
73G	137	21,228	21,611	47,600	67,200	72,400	78,000	19.8%	22.9%	43.5%	55.7%	55.3%	55.0%
733	137	28,126	25,154	11,600	-	-	-	26.3%	26.7%	10.6%	-	-	-
319	129	3,034	3,539	11,000	10,600	11,800	12,600	2.8%	3.8%	10.1%	8.8%	9.0%	8.9%
DC9	125	5,346	3,487	-	-	-	-	5.0%	3.7%	-	-	-	-
735	122	4,624	4,430	-	-	-	-	4.3%	4.7%	-	-	-	-
318	120	436	686	-	-	-	-	0.4%	0.7%	-	-	-	-
717	117	3,185	2,664	1,800	-	-	-	3.0%	2.8%	1.6%	-	-	-
E90	100	294	-	1,200	2,000	2,800	3,600	0.3%	-	1.1%	1.7%	2.1%	2.5%
Other		191	90	-	-	-	-	0.2%	0.1%	-	-	-	-
Total		**107,030**	**94,200**	**109,400**	**120,600**	**131,000**	**141,800**	**48.9%**	**49.3%**	**49.7%**	**50.0%**	**50.5%**	**51.0%**
Large Regional Jet													
E75	86	1,364	1,586	1,800	2,000	2,200	2,400	9.7%	9.4%	9.2%	7.9%	7.2%	6.3%
CR9	80	3,136	5,252	3,400	4,000	4,600	5,200	22.4%	31.2%	17.3%	15.9%	15.0%	13.7%
E70	75	929	464	400	600	600	600	6.6%	2.8%	2.0%	2.4%	2.0%	1.6%
CR7	67	8,584	9,531	14,000	18,600	23,200	29,800	61.3%	56.6%	71.4%	73.8%	75.8%	78.4%
Total		**14,013**	**16,833**	**19,600**	**25,200**	**30,600**	**38,000**	**6.4%**	**8.8%**	**8.9%**	**10.5%**	**11.8%**	**13.7%**
Small Regional Jet													
CRJ/ERJ/ER4	50	57,639	37,853	51,000	50,800	53,200	55,200	64.5%	52.9%	61.7%	59.1%	60.6%	62.7%
ERD	44	29,492	33,721	31,600	35,200	34,600	32,800	33.0%	47.1%	38.3%	40.9%	39.4%	37.3%
ER3	37	1,871	-	-	-	-	-	2.1%	-	-	-	-	-
FRJ	32	300	-	-	-	-	-	0.3%	-	-	-	-	-
Total		**89,302**	**71,574**	**82,600**	**86,000**	**87,800**	**88,000**	**40.8%**	**37.4%**	**37.5%**	**35.7%**	**33.9%**	**31.6%**
Turboprop	**19**	**8,737**	**8,593**	**8,400**	**9,200**	**9,800**	**10,400**	**4.0%**	**4.5%**	**3.8%**	**3.8%**	**3.8%**	**3.7%**
Total		**219,082**	**191,200**	**220,000**	**241,000**	**259,200**	**278,200**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Airport Records; *Official Airline Guide*; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

THIS PAGE INTENTIONALLY LEFT BLANK

The international commercial passenger operation fleet mix is presented in **Table 3.6-4, *International Commercial Passenger Operations Fleet Mix***, and is based on the following assumptions:

- New wide-body traffic in 2015 due to the introduction of traffic to Europe utilizing B767-300s. The share of wide-body aircraft is expected to reach 11.9 percent in 2028.
- B737-400 aircraft will be replaced by A320s aircraft by 2010. International airlines will make use of A319 and A320 aircraft over the forecast period as new Latin American destinations are introduced starting in 2014.

Table 3.6-4
INTERNATIONAL COMMERCIAL PASSENGER OPERATIONS FLEET MIX
Lambert-St. Louis International Airport

		Aircraft Operations					
Aircraft Type	**Gauge**	**2008**	**2009**	**2013**	**2018**	**2023**	**2028**
Wide Body Jet	**233**	**-**	**-**	**-**	**240**	**400**	**580**
Narrow Body Jet							
319	136	117	-	240	450	640	650
320	168	715	510	1,280	1,350	1,420	1,630
734	170	254	510	-	-	-	-
Total		**1,086**	**1,020**	**1,520**	**1,800**	**2,060**	**2,280**
Large Regional Jet	**70**	**-**	**-**	**-**	**-**	**-**	**-**
Small Regional Jet	**50**	**1,242**	**1,340**	**1,620**	**1,900**	**1,980**	**2,020**
Total		**2,328**	**2,360**	**3,140**	**3,940**	**4,440**	**4,880**

		Percent of Total Aircraft Operations					
Aircraft Type	**Gauge**	**2008**	**2009**	**2013**	**2018**	**2023**	**2028**
Wide Body Jet	**233**	**-**	**-**	**-**	**6.1%**	**9.0%**	**11.9%**
Narrow Body Jet							
319	136	10.8%	-	15.8%	25.0%	31.1%	28.5%
320	168	65.8%	50.0%	84.2%	75.0%	68.9%	71.5%
734	170	23.4%	50.0%	-	-	-	-
Total		**34.0%**	**43.2%**	**48.4%**	**45.7%**	**46.4%**	**46.7%**
Large Regional Jet	**70**	**-**	**-**	**-**	**-**	**-**	**-**
Small Regional Jet	**50**	**66.0%**	**56.8%**	**51.6%**	**48.2%**	**44.6%**	**41.4%**
Total		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Airport Records; *Official Airline Guide*; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

3.6.2 ALL-CARGO OPERATIONS FORECAST

The air cargo tonnage forecast for the all-cargo operators was used to derive the all-cargo operations forecast, based on assumptions regarding the amount of air cargo tonnage handled per flight. Historical all-cargo operations by aircraft type were analyzed to better understand the fleet mix for the all-cargo carriers at STL. Additionally, aircraft orders for the largest all-cargo carriers (FedEx and UPS) were

analyzed to evaluate how the cargo fleet mix might evolve in the future. Ultimately, these analyses allowed for the projection of all-cargo operations by aircraft type.

3.6.2.1 Capacity and Utilization Assumptions

Average cargo capacity was in the 24 to 25 tonnes per aircraft range from 2003 to 2005 (*see* **Table 3.6-5, *All-Cargo Capacity and Load Factor Assumptions***). Cargo capacity increased to above 32 tonnes per operation in 2006 through 2008 as FedEx (DC10s and A300s) and UPS (A300 and B757s) increased their presence at STL. Cargo load factors went up as well beginning in 2006, resulting in the actual tonnes per operation ratio increasing from about 16 in 2005 to above 22 through 2008.

Table 3.6-5
ALL-CARGO CAPACITY AND LOAD FACTOR ASSUMPTIONS
Lambert-St. Louis International Airport

Calendar Year	Estimated Capacity (tons/op.)	Estimated Utilzation Factor	Actual Volumes (tons/op.)
History			
2003	23.8	60.6%	14.4
2004	23.8	63.0%	15.0
2005	24.8	65.5%	16.2
2006	32.5	70.1%	22.8
2007	33.7	67.5%	22.7
2008	34.6	65.3%	22.6
Forecast			
2013	36.2	68.6%	24.8
2018	38.4	70.9%	27.2
2028	41.2	74.2%	30.5
Average Annual Growth Rates			
03-08	7.7%	1.5%	9.3%
08-28	0.9%	0.6%	1.5%

Source: Airport Records; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

In 2008, FedEx was the largest carrier at STL with a 48 percent share of total cargo handled at STL. UPS was the second largest carrier with a 23 percent share. STL was also served by Capital Cargo (which was acquired by ABX in November of 2007) and ASTAR Air Cargo in 2008. ABX and ASTAR primarily served DHL, who decided to exit the U.S. domestic market in 2008. As a result, FedEx and UPS are expected to pick up an increasing portion of the cargo formerly carried for DHL while new cargo carriers are forecast to serve the remainder. FedEx and DHL operate larger aircraft than ASTAR and Capital so the average cargo aircraft capacity is expected to increase over the forecast period.

Load factors are expected to increase through 2013 as FedEx and DHL begin to serve more and more of the cargo formerly carried by Capital and ASTAR. Cargo load factors are expected to increase to 74 percent by 2028.

These assumptions result in the average amount of cargo per aircraft increasing from 22.6 tonnes per operation in 2008 to 30.5 tonnes per operation in 2028.

3.6.2.2 All-Cargo Operations and Fleet Mix Forecast

Once the capacity and load factor assumptions were developed for the all-cargo operators, a top-down approach was used to determine the forecast fleet mix. The process of developing the fleet mix allowed for the calibration of those assumptions and, where appropriate, modifications were made prior to finalizing the assumptions presented in the preceding subsection.

As shown in **Table 3.6-6, *All-Cargo Fleet Mix and Operations Forecast***, the 2008 all-cargo fleet at STL consisted of 47 percent wide-body aircraft, 52 percent narrow-body aircraft, and one percent turboprops. These aircraft carried an average of 22.6 tonnes per operation and it is estimated these flights were, on average, 65 percent full by weight.

Table 3.6-6
ALL-CARGO FLEET MIX AND OPERATIONS FORECAST
Lambert-St. Louis International Airport

Aircraft Type	Average Capacity (tonnes)	Percent of Total All-Cargo Operations 2008	2013	2018	2028
Wide-Body		**46.9%**	**47.4%**	**47.5%**	**47.0%**
DC-10/MD-10	113,000-114,000	53.7%	54.4%	53.4%	52.6%
A300 Series	85,600-110,000	35.0%	34.5%	34.0%	32.1%
MD-11	207,000	9.2%	9.3%	9.9%	10.9%
A310	61,900	1.2%	1.3%	1.5%	1.7%
B767 Series	132,200	0.9%	0.6%	1.2%	2.6%
Narrow-Body		**52.0%**	**52.4%**	**52.2%**	**52.6%**
B727 Series	27,700-46,000	76.8%	69.4%	47.4%	21.2%
B757 Series	45,800-88,000	17.1%	30.6%	52.6%	78.8%
DC-8 Series	100,000	3.5%	0.0%	0.0%	0.0%
DC-9 Series	22,400	2.5%	0.0%	0.0%	0.0%
B737-200C	45,000	0.1%	0.0%	0.0%	0.0%
Turboprop	1,600-2,500	**1.1%**	**0.3%**	**0.3%**	**0.3%**
Total		**100.0%**	**100.0%**	**100.0%**	**100.0%**
All-Cargo Tonnage		71,924	79,090	90,710	113,870
Capacity (tons/op.)		34.6	36.2	38.4	41.2
Load Factor		65.3%	68.6%	70.9%	74.2%
All-Cargo Operations		3,186	3,190	3,330	3,730

Source: Airport Records; USDOT, Schedule T-100; Landrum & Brown analysis, 2011

FedEx, the dominant carrier at STL, currently operates mainly DC/MD10s and A300s. FedEx does not currently have plans to replace any of the other aircraft it operates at STL, however, within its broader network it plans to replace its fleet of Boeing 727 aircraft with Boeing 757s.

UPS mainly operates A300s and B757s at STL and is expected to use an increasing share of B757s over the forecast period. UPS operates a small number of DC8s at STL which will be phased out by 2013. In response to the state of the economy and the resulting decrease in demand, sources at UPS indicated in April 2009 that the carrier will drop service to Rockford in 2009 and consolidate services to their Louisville hub using MD-11 aircraft. As the economy recovers, UPS expects the Rockford service will be reinstated, accompanied by a return to A300/B757 aircraft. The forecast assumes this occurs by 2013.

The amount of cargo transported by carriers other than FedEx and UPS is expected to decline from 43 percent in 2008 to 25 percent in 2028. STL cargo transported by these other cargo carriers in the future is assumed to be on B757 or similar capacity aircraft.

Based on these fleet assumptions, the share of wide-body aircraft is forecast to remain stable at between 47 and 48 percent through 2018. The share of widebody aircraft is expected to decline slightly between 2018 and 2028, mainly due to the deployment of B757s by FedEx and UPS as well as other cargo carriers after 2018. As a result, narrow-body aircraft are predicted to increase slightly to 52.6 percent share by 2028. Turboprop operations are expected to decline somewhat in share, to 0.3 percent in 2013 and remain stable thereafter.

Resulting all-cargo operations are forecast to increase from 3,186 in 2008 to 3,730 in 2028. This represents a 1.9 percent average annual growth rate.

3.6.3 CIVIL OPERATIONS

Civil activity includes all operations that are not composed of commercial, cargo, or military operations. For purposes of this analysis, the term "civil" includes two types of activity: non-commercial air taxi and general aviation (GA). Air taxi activity typically includes "for hire" aircraft chartered for specific trips on an on-demand basis. Air taxi operations are usually made up of larger GA aircraft, such as large turboprop aircraft and an array of corporate jets. GA activity includes diverse uses that can range from recreational flying, flight training activities, business travel, news reporting, traffic observation, police patrol, emergency medical flights, and even crop dusting.

Civil operations can be subdivided into two major subcategories: "itinerant" and "local" based on FAA classifications. Local operations are defined by the FAA as "operations remaining in the local traffic pattern, simulated instrument approaches at the airport…and operations to or from the airport and a practice area within a 20-mile radius of the tower."[46] Itinerant operations are all operations not classified as "local."

[46] FAA Order 7210.3, Facility Operation and Administration, Section 2, Airport Operations Count

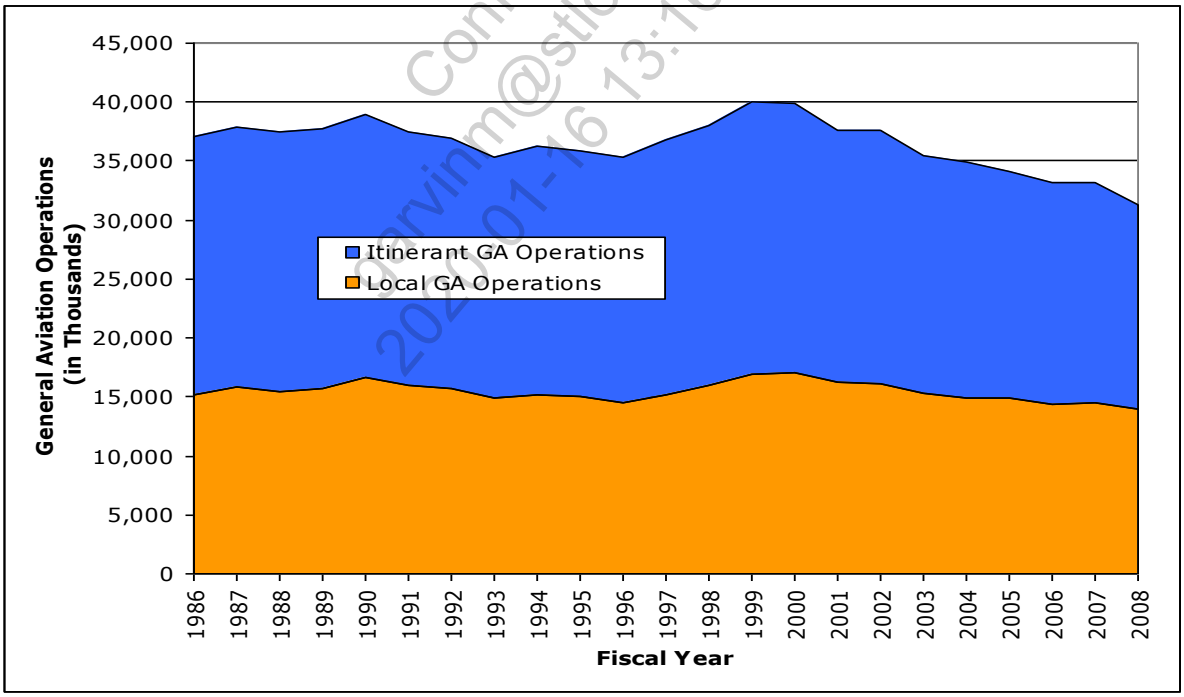
3.6.3.1 National Trends in Civil Operations

Understanding the history and current state of the civil aviation industry can help predict future aviation demand. This section discusses nationwide historical, emerging, and forecast trends in air taxi and general aviation activity.

HISTORICAL NATIONAL TRENDS

The civil aviation industry in the U.S. has experienced major changes over the last 30 years. GA activity levels were at their highest in the late 1970s through 1981. GA activity levels and new aircraft production reached all-time lows in the early 1990s due to a number of factors including increasing fuel prices, increased product liability stemming from litigation concerns, and the resulting higher cost of new aircraft. The passage of the 1994 General Aviation Revitalization Act (GARA)[47] combined with reduced new aircraft prices, lower fuel prices, resumed production of single-engine aircraft, continued strength in the production and sale of business jets, and a recovered economy led to growth in the general aviation industry in the latter half of the 1990s (*see* **Exhibit 3.6-1, *U.S. General Aviation Operations***).[48]

Exhibit 3.6-1
U.S. GENERAL AVIATION OPERATIONS
Lambert-St. Louis International Airport



Note: Represents operations at U.S. airports with Air Traffic Control Service.

Source: FAA Aviation Forecasts, Fiscal Years 1991-2002 and 1995-2006; FAA Aerospace Forecasts, Fiscal Years 2009-2025; FAA Air Traffic Activity Data System (ATADS); Landrum & Brown analysis, 2011

[47] GARA imposes an 18-year statute of repose on product liability lawsuits for general aviation aircraft.
[48] Based on information from the General Aviation Manufacturers Association (GAMA).

The rebound in the U.S. general aviation industry that began with GARA started to subside by Fiscal Year (FY) 2000. General aviation traffic at airports with air traffic control service slowed considerably in FY 2001 due largely to a U.S. economic recession and to some extent the terrorist attacks of September 11, 2001. General aviation traffic at airports with air traffic control service continued to decline through FY 2006 as spikes in fuel costs occurred and the economy grew at a relatively even pace. For the first time since FY 1999, general aviation traffic at airports with air traffic control service increased in FY 2007, but just slightly (0.04 percent over FY 2006). However, general aviation operations declined by 5.6 percent at airports with air traffic control service in FY 2008.[49]

FAA NATIONAL FORECAST

The FAA annually publishes forecasts of the U.S. aviation industry. The GAMA *2007 General Aviation Statistical Databook & Industry Outlook* uses the FAA Aerospace Forecasts for its projections and is considered to be one of the most complete and reliable forecast available for civil activity in the U.S. The FAA forecasts[50] project the following trends in the U.S. general aviation industry from 2008 to 2025:

- The number of active general aviation aircraft is forecast to increase by 3.2 percent annually.
- Growth of 3.6 percent annually is expected in the number of general aviation hours flown.
- The number of student pilots is expected to decline by 5.7 percent per annum through 2010 and then increase at a rate of 1.2 percent annually through 2025.
- General aviation operations at airports with air traffic control service are forecast to decline by 3.1 percent annually through 2010 before increasing by 1.1 percent annually through 2025.
- Business use of general aviation aircraft has experienced historically high growth rates and will continue to grow more rapidly than recreational use.

EMERGING AIRCRAFT OWNERSHIP TRENDS

The concept of purchasing hours of jet time began to emerge in the 1990s with the fractional ownership of business jets gaining popularity. Fractional ownership, as it suggests, involves purchasing a share in a general aviation aircraft. The user also typically pays an hourly usage fee and a monthly management fee. The fractional owner will usually purchase the share from one of several operators that can also offer a variety of jet types that the potential purchaser can consider. Companies such as NetJets, FlexJet, Citation Shares, and others provide these types of services. The fractional ownership concept began with jets but has also begun to expand to all types of aircraft including single-engine piston aircraft. Fractional ownership has significantly contributed to the revitalization of the general aviation manufacturing industry in the 21st century. For example, NetJets alone

[49] *FAA Aerospace Forecasts, Fiscal Years 2009-2025*, Table 31
[50] *FAA Aerospace Forecast, Fiscal Years 2009-2025*

has purchased hundreds of corporate jet aircraft of varying sizes ranging up to the Boeing BBJ (typically a derivative of the Boeing 737 aircraft). Projected increases in fractional ownership activity levels are a large part of the FAA's projected growth in GA operations through 2025.

FLEET DIVERSIFICATION

A new category of personal jets, Very Light Jets (VLJs), has been introduced to the GA market in the 21st century. These jets are aimed chiefly at owners of twin-engine piston and turboprop aircraft. They are smaller than traditional entry-level jets, and achieve high performance at significantly lower ownership and operating costs. The cost for a VLJ is highly competitive with a number of twin-engine piston aircraft types and the more popular turboprop GA aircraft. A VLJ is defined as a small jet that seats four to eight people, is certified for single-pilot operation, and has a maximum takeoff weight of less than 10,000 pounds.

Initially, some aviation analysts believed the VLJs could lead to more travelers choosing general aviation over commercial air travel, particularly if delays at major airports lead to significant increases in missed flight connections, increased travel times, lost productivity, and cancelled flights. As a result, the 2008 FAA Aerospace Forecasts predicted a delivery rate of 400 to 500 VLJs per year to reach around 8,145 active aircraft by 2025. However, one of the major manufacturers of VLJs, Eclipse Aviation, declared bankruptcy in 2008 and DayJet (one of the largest users of VLJs) ceased VLJ operations in 2008. VLJ deliveries reached only 282 in 2008. In spite of the state of the economy and the uncertainty of the VLJ market, the FAA still predicts that a total of 200 VLJs will enter the active fleet in 2009 and 2010. The FAA believes up to 300 VLJs will enter the market each year through 2025, reaching 4,875 aircraft in 2025 (40 percent lower than the 2008 forecast).[51]

While VLJs are at the small end of the aircraft spectrum, new versions of corporate jets have also entered at the large aircraft spectrum expanding the range of options available to users and the need to consider the requirements of these aircraft in planning.

FUEL PRICES

Fuel prices increased to record highs over a four-year period ending in the summer of 2008. Decreased demand and the worldwide recession led to fuel prices subsequently dropping in the fourth quarter of 2008. Changes in fuel prices impact the economic relationships between modes of transportation and price differentials between different segments of the aviation market. Although fuel prices are a major problem for the commercial airlines, corporate general aviation users are relatively less sensitive to changes in fuel prices. Given the cost to own and operate a corporate aircraft or to charter a business jet, the incremental cost of fuel is typically a secondary consideration. Conversely, fuel prices have in many cases reduced recreational flying activity.

51 *FAA Aerospace Forecast, Fiscal Years 2009-2025*

3.6.3.2 St. Louis Area Airports

STL is primarily a commercial service airport, serving over 250,000 total annual operations in 2008. Civil activity made up 8.4 percent of the total operations at STL in 2008. Civil activity makes up a relatively small percentage of the operations at STL because GA pilots often prefer not to operate at commercial service airports due to the congestion that typically occurs at these airports, the differences in approach speeds between small general aviation aircraft and commercial aircraft, and wake turbulence issues.[52] As a result, the FAA has "encouraged the development of high-capacity general aviation airports in major metropolitan areas. These specialized airports, called relievers, provide pilots with attractive alternatives to using congested hub airports." In order to be classified as a reliever, an airport "must have 100 or more based aircraft or 25,000 annual itinerant operations."[53]

There are 6 such reliever airports in the St. Louis 8-county region as defined by the East-West Gateway Council of Governments (St. Charles County, City of St. Louis, St. Louis County, Jefferson County, and Franklin County in Missouri and Madison County, St. Clair County, and Monroe County in Illinois). These airports, shown on **Exhibit 3.6-2, *St. Louis Area Airports***, include the Spirit of St. Louis Airport (SUS), St. Louis Downtown Airport (CPS), St. Louis Regional Airport (ALN), St. Charles County Smartt Airport (SET), St. Charles Airport (3SQ), and Creve Coeur Airport (1H0). Each of these relievers is located within approximately 30 miles of downtown St. Louis.

In addition to the six reliever airports, Scott Air Force Base/MidAmerica Airport (BLV), and St. Louis Metro-East Airport/Shafer Field (3K6) are also located within 30 miles of downtown St. Louis. BLV primarily serves military aircraft in addition to having scheduled air service. St. Louis Metro Airport used to have reliever status, but it is now classified by the FAA as a "General Aviation" airport.

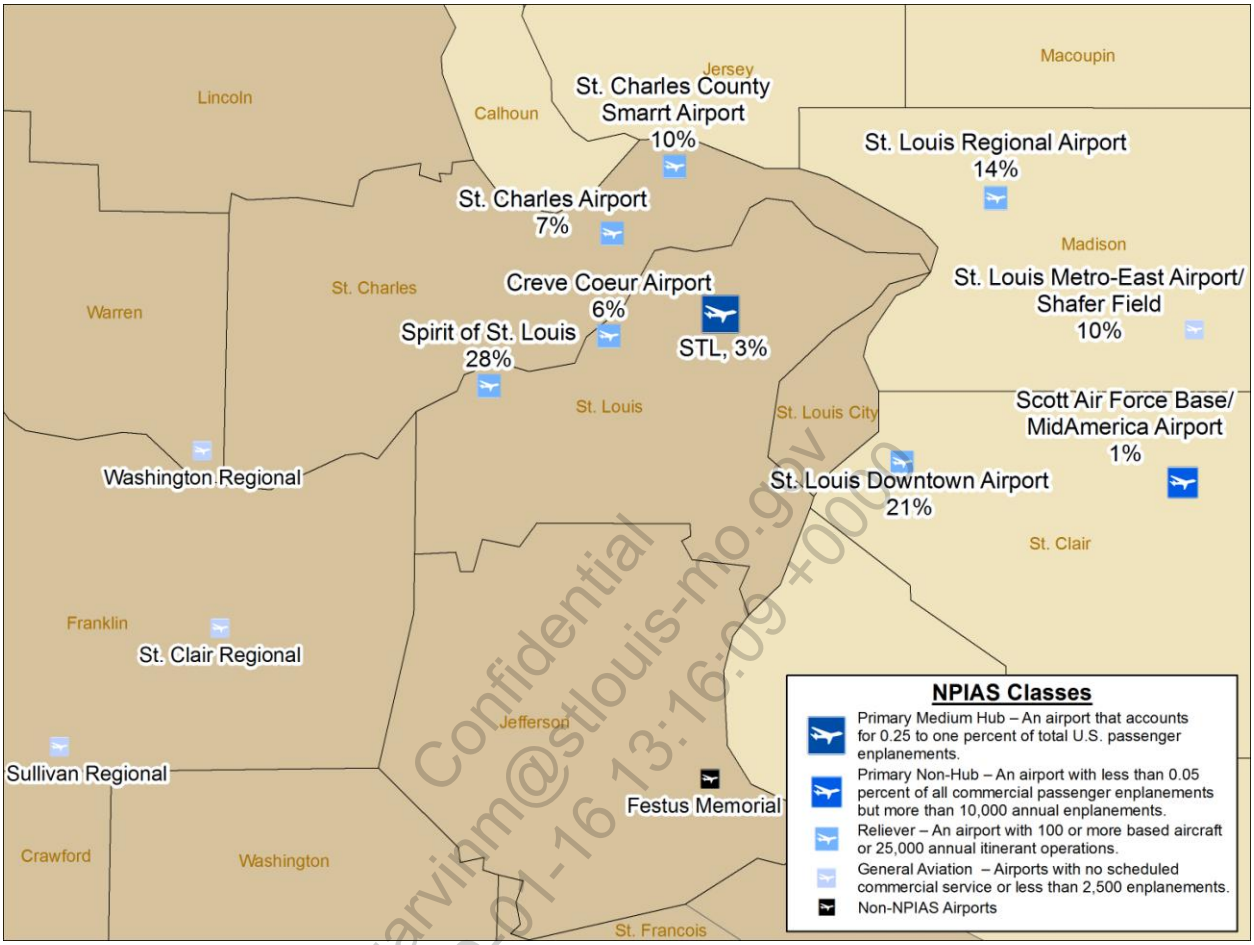
There are four other public-use airports shown on the map. Three are in the East-West Gateway Region (St. Clair Regional, Sullivan Regional, and Festus Memorial) and one is just outside the region in Warren County (Washington Regional Airport). These airports are located more than 30 miles from downtown St. Louis and are very small facilities with less than 20,000 aircraft operations annually. Therefore, these airports are not included in this analysis.

---

[52] Wake turbulence is the turbulence that is formed behind an aircraft as it passes through the air, similar to the wake created by a boat passing through the water.

[53] FAA National Plan of Integrated Airport Systems (NPIAS), 2009-2013 Report to Congress, page 8.

Exhibit 3.6-2
ST. LOUIS AREA AIRPORTS
Lambert-St. Louis International Airport

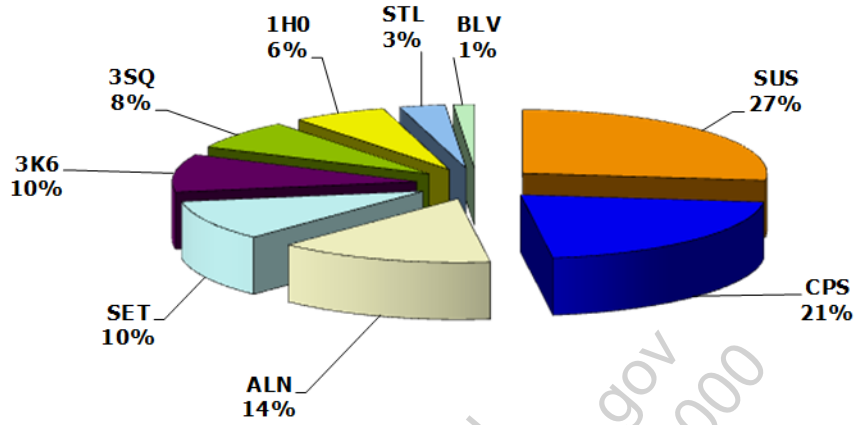


Sources: Internet website: airnav.com; FAA 2008 Terminal Area Forecast (TAF); FAA National Plan of Integrated Airport Systems (NPIAS), 2009-2013 Report to Congress; Landrum & Brown analysis, 2011

Almost 48 percent of the region's civil activity occurs at the Spirit of St. Louis Airport and the St. Louis Downtown Airport (*see* **Exhibit 3.6-3, *St. Louis Area Civil Aviation Activity (Fiscal Year 2007)***). Most of the region's business traffic occurs at these two airports and they serve most of the region's corporate jet and multi-engine aircraft activity. SUS and CPS accommodated almost 52 percent of the region's based aircraft in 2007. STL accounted for only three percent of the region's civil activity in 2007.

The majority of the civil activity at the other area airports (ALN, SET, 3SQ, 1H0, BLV, and 3SQ) is leisure or flight training activity. The vast majority (82 percent) of aircraft based at these airports are single-engine aircraft.

Exhibit 3.6-3
ST. LOUIS AREA CIVIL AVIATION ACTIVITY
(Fiscal Year 2007)
Lambert-St. Louis International Airport



Airport	Airport Code	FAA NPIAS Classification [1]	2007 Air Taxi & GA Ops.	2007 Based Aircraft
Spirit of St. Louis	SUS	Reliever	145,018	314
Cahokia/St. Louis Downtown Airport	CPS	Reliever	114,023	210
St. Louis Regional Airport	ALN	Reliever	77,108	107
St. Charles County Smartt Airport	SET	Reliever	55,200	95
St. Louis Metro-East Airport/ Shafer Field	3K6	GA	52,000	42
St. Charles Airport	3SQ	Reliever	40,260	77
Creve Coeur Airport	1H0	Reliever	33,600	103
Lambert-St. Louis International Airport	STL	Primary Medium Hub	16,228	35
Scott AFB/ MidAmerica	BLV	Primary Non-Hub	7,419	34
TOTAL			**540,856**	**1,017**

Notes: 1 FAA NPIAS Classification based on FAA National Plan of Integrated Airport Systems (NPIAS), 2009-2013 Report to Congress definitions:
- Primary Medium Hub – An airport that accounts for 0.25 to one percent of total U.S. passenger enplanements.
- Primary Non-Hub – An airport with less than 0.05 percent of all commercial passenger enplanements but more than 10,000 annual enplanements.
- Reliever – An airport with 100 or more based aircraft or 25,000 annual itinerant operations.
- GA – Airports with no scheduled commercial service or less than 2,500 enplanements.

Note: STL statistics are on a calendar year basis. The other airports are shown on a fiscal year basis.

Sources: Internet website: airnav.com; FAA 2008 Terminal Area Forecast (TAF); FAA National Plan of Integrated Airport Systems (NPIAS), 2009-2013 Report to Congress; Landrum & Brown analysis, 2011

3.6.3.3 STL Historical Trends in Civil Activity

Civil activity has historically made up between 5.1 and 10.4 percent of total operations at STL since 1995. STL civil operations declined from 49,123 in 1995 to 14,351 in 2006 (*see* **Table 3.6-7, *Historical Civil Operations***). This represents an average decline of 10.6 percent annually. However, civil operations have rebounded in the last two years, increasing by 13.1 percent in 2007 and by 28.5 percent in 2008.

Table 3.6-7
HISTORICAL CIVIL OPERATIONS
Lambert-St. Louis International Airport

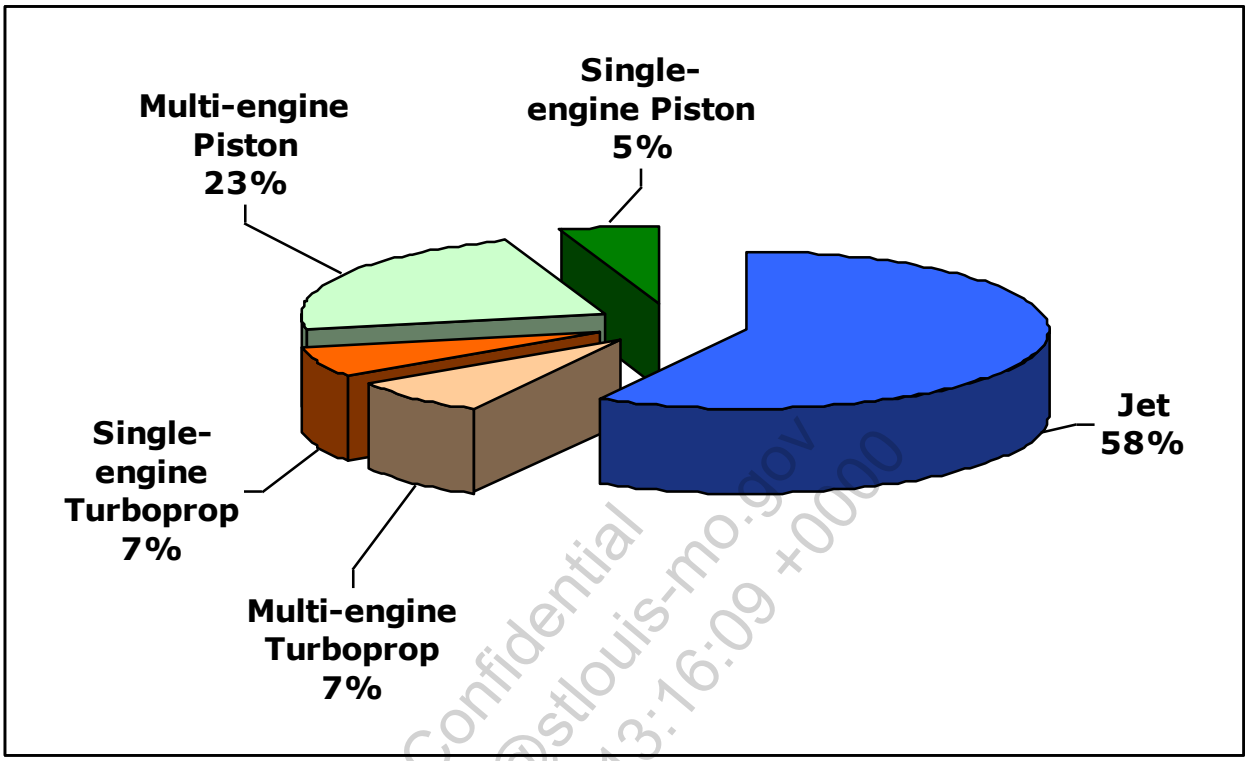
Calendar Year	Itinerant	Local	Total
1995	49,123	-	49,123
1996	43,212	-	43,212
1997	39,427	-	39,427
1998	33,794	-	33,794
1999	33,300	-	33,300
2000	33,902	502	34,404
2001	28,209	502	28,711
2002	42,565	277	42,842
2003	34,920	645	35,565
2004	29,273	940	30,213
2005	24,767	555	25,322
2006	13,634	717	14,351
2007	15,967	261	16,228
2008	20,691	169	20,860
Average Annual Growth Rates			
95-00	-7.1%	n.a.	-6.9%
00-08	-6.0%	-12.7%	-6.1%
95-08	-6.4%	n.a.	-6.4%

Sources: FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

Civil operations at STL are almost exclusively itinerant in nature. There were no local operations recorded by the Air Traffic Control Tower (ATCT) prior to 2000. After 2000, local operations made up anywhere from less than one percent of total civil operations to just over five percent.

Radar data for the one-year period ending August 2008 was analyzed to determine the types of civil aircraft that operate at STL (*see* **Exhibit 3.6-4, *2007-2008 Civil Aviation Fleet Mix***). Over 58 percent of the operations at STL in the 2007-2008 time period were jets and 14 percent were turboprop aircraft. The remaining 28 percent of operations were piston aircraft.

Exhibit 3.6-4
2007-2008 CIVIL AVIATION FLEET MIX
Lambert-St. Louis International Airport



Sources: Airport radar data, September 2007 to August 2008; Landrum & Brown analysis, 2011

There were 18 non-military aircraft based at STL in 2008 according to FAA records. A number of Fortune 500 companies base their corporate aircraft at STL. Corporate aircraft tend to be jets or large turboprops. As a result, almost 56 percent of the civil based aircraft were jets in 2008 and 39 percent were multi-engine aircraft (*see* **Table 3.6-8, *Historical Based Aircraft Fleet Mix***). There was only one single-engine aircraft based at STL in 2008.

TABLE 3.6-8
HISTORICAL BASED AIRCRAFT FLEET MIX
Lambert-St. Louis International Airport

Fiscal Year	Jet	Multi-Engine	Single-Engine	Civil Total	Military	Total
2003	10	1	1	12	16	28
2004	11	1	1	13	17	30
2005	9	7	1	17	18	35
2006	9	7	1	17	18	35
2007	9	7	1	17	18	35
2008	10	7	1	18	17	35

Source FAA 2008 Terminal Area Forecast (TAF); FAA Form 5010; Landrum & Brown analysis

3.6.3.4 STL Trends Compared to Region and U.S.

Historical operations data for the period 1995 to 2007 was obtained from the 2008 FAA Terminal Area Forecast (TAF) for each airport in the region, with the exception of STL. STL's civil operations totals are based on airport records and ATADS data. Reliable operations data for 2008 was not available from the TAF at the time of this analysis so the region's total traffic for 2008 was estimated. Based on FAA ATADS data for calendar year 2008, civil operations at STL, ALN, CPS, and SUS (the airports with ATCTs) collectively were down 12.6 percent versus 2007. It was assumed that this drop in civil operations is representative of all nine airports in the region. Therefore, civil operations at the region's airports were estimated at about 472,700 operations in 2008.

Civil operations at STL have decreased much faster than the other airports in the region (*see* **Table 3.6-9, *St. Louis Area Historical Civil Operations (STL, SUS, CPS, ALN, SET, 3K6, 3SQ, 1H0, BLV)***). Civil activity at the other airports grew at an annual rate of 2.0 percent from 1995 to 2000 while STL civil operations declined by 6.9 percent annually during the same time period. Civil activity at the other regional airports declined by 1.3 percent annually from 2000 to 2008 compared to an annual decline of 6.1 percent at STL. STL's civil operations share of the region's total has declined from 9.0 percent in 1995 to 4.4 percent in 2008.

Table 3.6-9
ST. LOUIS AREA HISTORICAL CIVIL OPERATIONS
(STL, SUS, CPS, ALN, SET, 3K6, 3SQ, 1H0, BLV)
Lambert-St. Louis International Airport

Fiscal Year	STL	Other Airports	Total	STL % of Total
1995	49,123	495,649	544,772	9.0%
1996	43,212	427,593	470,805	9.2%
1997	39,427	459,116	498,543	7.9%
1998	33,794	499,779	533,573	6.3%
1999	33,300	528,318	561,618	5.9%
2000	34,404	546,178	580,582	5.9%
2001	28,711	578,453	607,164	4.7%
2002	42,842	566,893	609,735	7.0%
2003	35,565	523,047	558,612	6.4%
2004	30,213	531,700	561,913	5.4%
2005	25,322	525,854	551,176	4.6%
2006	14,351	516,141	530,492	2.7%
2007	16,228	524,628	540,856	3.0%
2008	20,860	451,840	472,700	4.4%
Average Annual Growth Rates				
95-00	-6.9%	2.0%	1.3%	
00-08	-6.1%	-2.3%	-2.5%	
95-08	-6.4%	-0.7%	-1.1%	

Note: STL statistics are calendar year. The other airports are shown on a fiscal year basis.

Sources: FAA Terminal Area Forecast; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

Nationwide, the number of active piston aircraft has declined since 2000 while the number of turboprops and turbojets has increased. In spite of the fact that over 70 percent of the 2007-2008 operations at STL were on turboprops and turbojets, the general trend in operations at STL has been downward. In fact, STL civil operations have declined two times faster than general aviation operations in the U.S. as a whole since 2000 (*see* **Table 3.6-10, *Historical Civil Operations Comparison STL vs. U.S.***). Additionally, STL's share of the nation's GA operations has been cut in half since 1995, although it has increased in the last 2 years.

Table 3.6-10
HISTORICAL CIVIL OPERATIONS COMPARISON
STL vs. U.S.
Lambert-St. Louis International Airport

Year	U.S. GA Operations	STL Civil Operations	STL Share of U.S.
1995	35,926,600	49,123	0.14%
1996	35,298,300	43,212	0.12%
1997	36,833,300	39,427	0.11%
1998	38,046,600	33,794	0.09%
1999	39,999,600	33,300	0.08%
2000	39,878,500	34,404	0.09%
2001	37,627,000	28,711	0.08%
2002	37,623,225	42,842	0.11%
2003	35,524,020	35,565	0.10%
2004	34,967,596	30,213	0.09%
2005	34,160,953	25,322	0.07%
2006	33,119,952	14,351	0.04%
2007	33,134,500	16,228	0.05%
2008	31,289,300	20,860	0.07%
Average Annual Growth Rate			
95-00	2.1%	-6.9%	
00-08	-3.0%	-6.1%	
95-08	-1.1%	-6.4%	

Note: STL statistics are calendar year. U.S. airports are shown on a fiscal year basis.

Sources: FAA Aerospace Forecasts, Fiscal Years 2009-2025; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

3.6.3.5 STL Civil Aviation Operations Forecast

A regional approach was used to develop a forecast of civil operations at STL. The historical relationship between the MSA population and operations at the nine area airports was analyzed in order to forecast future civil operations for the region. Future civil activity at STL was subsequently calculated based on a market share analysis of the forecast traffic for the region.

The operations/population ratio for the nine regional airports has remained fairly steady over the last 14 years, hovering around 0.2. This ratio fell to a 14-year low in 2008 (0.166), reflecting the state of the economy. It is forecast that this ratio

will dip further in 2009 to 0.150 and then gradually return to the historical average level of 0.2 by 2015. The operations/population ratio for the nine regional airports is expected to remain at 0.2 for the remainder of the forecast period. This results in the region's civil traffic increasing from an estimated 472,708 operations in 2008 to 609,400 in 2028 (*see* **Table 3.6-11, *Civil Operations Forecast – Market Share Analysis***).

Table 3.6-11
CIVIL OPERATIONS FORECAST – MARKET SHARE ANALYSIS
Lambert-St. Louis International Airport

Year	STL MSA Population	Regional Apts. Civil Operations	Ops/Pop. Ratio	STL Civil Operations	STL Mkt Share
History					
1995	2,672,661	544,772	0.204	49,123	9.0%
1996	2,682,225	470,805	0.176	43,212	9.2%
1997	2,692,211	498,543	0.185	39,427	7.9%
1998	2,702,626	533,573	0.197	33,794	6.3%
1999	2,713,480	561,618	0.207	33,300	5.9%
2000	2,724,783	580,582	0.213	34,404	5.9%
2001	2,743,703	607,164	0.221	28,711	4.7%
2002	2,759,993	609,735	0.221	42,842	7.0%
2003	2,773,605	558,612	0.201	35,565	6.4%
2004	2,789,698	561,913	0.201	30,213	5.4%
2005	2,806,221	551,176	0.196	25,322	4.6%
2006	2,820,377	530,492	0.188	14,351	2.7%
2007	2,834,097	540,856	0.191	16,228	3.0%
2008	2,840,862	472,708	0.166	20,860	4.4%
Forecast					
2013	2,878,723	523,400	0.182	23,800	4.5%
2018	2,925,695	585,700	0.200	27,500	4.7%
2023	2,979,977	596,500	0.200	28,900	4.8%
2028	3,043,967	609,400	0.200	30,500	5.0%
Average Annual Growth Rates					
95-08	0.5%	-1.1%	-1.5%	-6.4%	-5.3%
08-13	0.3%	2.1%	1.8%	2.7%	0.6%
13-18	0.3%	2.3%	1.9%	2.9%	0.6%
18-28	0.4%	0.4%	0.0%	1.0%	0.6%
08-28	0.3%	1.3%	0.9%	1.9%	0.6%

Note: STL statistics are calendar year. The other airports are shown on a fiscal year basis.

Sources: FAA, Air Traffic Activity Data System (ATADS); Airport Records; FAA Aerospace Forecasts Fiscal Years 2009-2025; Landrum & Brown analysis, 2011

STL's share of the region's civil traffic declined from a high of 9.2 percent in 1996 to a low of 2.7 percent in 2006. STL's share has since increased to 3.0 percent in 2007 and to 4.4 percent in 2008. It appears that the loss in market share for STL has bottomed out. Therefore, it is assumed that STL's market share will increase back to 5.0 percent by 2028. This results in STL civil operations increasing from 20,860 in 2008 to 30,500 in 2028 (1.9 percent average annual growth).

Table 3.6-12, *Forecast Civil Operations*, presents the STL civil operations forecast by itinerant and local categories. Local civil operations were estimated to remain stable at 200 operations over the forecast period. Itinerant operations will remain the major portion of the civil traffic at STL, accounting for approximately 99 percent of total civil operations in each year.

TABLE 3.6-12
FORECAST CIVIL OPERATIONS
Lambert-St. Louis International Airport

Calendar Year	Itinerant	Local	Total
History			
1998	33,794	-	33,794
2003	34,920	645	35,565
2004	29,273	940	30,213
2005	24,767	555	25,322
2006	13,634	717	14,351
2007	15,967	261	16,228
2008	20,691	169	20,860
Forecast			
2013	23,600	200	23,800
2018	27,300	200	27,500
2023	28,700	200	28,900
2028	30,300	200	30,500
Average Annual Growth Rates			
98-08	-4.8%	n.a.	-4.7%
08-13	2.7%	3.4%	2.7%
13-18	3.0%	0.0%	2.9%
18-28	1.0%	0.0%	1.0%
08-28	1.9%	0.8%	1.9%

Sources: FAA, Air Traffic Activity Data System (ATADS); Airport Records; FAA Aerospace Forecasts Fiscal Years 2009-2025; Landrum & Brown analysis, 2011

Table 3.6-13, *Civil Operations Fleet Mix Forecast*, presents the civil aircraft operations fleet mix forecast through 2028. Currently, 58 percent of the civil operations at STL are on jet aircraft. The FAA projects that the majority of the growth in the future will be on jets. This trend is expected to be particularly true for STL. Based on this premise, jet aircraft operations are expected to increase to 70 percent of total operations by 2028. The percentage of operations on turboprop aircraft is expected to increase slightly, from almost 14 percent in 2008 to 15 percent in 2028. The proportion of piston aircraft civil operations is expected to decline from 28 percent of total operations in 2008 to 15 percent in 2028.

Table 3.6-13
CIVIL OPERATIONS FLEET MIX FORECAST
Lambert-St. Louis International Airport

Aircraft Category	Civil Aircraft Operations 2008	2013	2018	2023	2028	AAGR '08-'28
Jet	12,130	14,735	17,900	19,582	21,350	2.9%
Multi-engine Turboprop	1,518	1,773	2,098	2,258	2,440	2.4%
Single-engine Turboprop	1,380	1,597	1,871	1,995	2,135	2.2%
Multi-engine Piston	4,734	4,606	4,538	4,067	3,660	-1.3%
Single-engine Piston	1,099	1,089	1,093	998	915	-0.9%
Total	**20,860**	**23,800**	**27,500**	**28,900**	**30,500**	**1.9%**
Aircraft Category	**Percent of Total Operations 2008**	**2013**	**2018**	**2023**	**2028**	
Jet	58.1%	61.9%	65.1%	67.8%	70.0%	
Multi-engine Turboprop	7.3%	7.4%	7.6%	7.8%	8.0%	
Single-engine Turboprop	6.6%	6.7%	6.8%	6.9%	7.0%	
Multi-engine Piston	22.7%	19.4%	16.5%	14.1%	12.0%	
Single-engine Piston	5.3%	4.6%	4.0%	3.5%	3.0%	
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	

Note: AAGR=Average Annual Growth Rate

Sources: Airport radar data, September 2007 to August 2008; FAA Aerospace Forecasts Fiscal Years 2009-2025; Landrum & Brown analysis, 2011

3.6.3.6 STL Civil Based Aircraft Forecast

In order to forecast future based aircraft, a number of factors must be taken into consideration including national trends and local demand. Nationally, the FAA Active Aircraft forecast in the *FAA Aerospace Forecasts, Fiscal Years 2009-2025* shows an initial decline of 0.6 percent annually in the number of active single-engine piston aircraft through 2010. The FAA expects single-engine piston aircraft to recover and grow at an average annual rate of 0.2 percent from 2010 to 2025. The number of multi-engine piston aircraft is expected to decline at an average annual rate of 0.9 percent from 2008 to 2025. Turboprops are forecast by the FAA to grow at rate of 1.4 percent annually while the number of jets is expected to grow the fastest at 4.8 percent annually.

Applying the FAA's national forecast to STL would result in the number of civil based aircraft doubling by 2028. This is out of line with the operations forecast which predicts modest growth in civil operations at STL. Given that civil operations at STL have declined faster than national and regional civil operations and that STL's share of national and regional civil aviation has been declining, a more modest based aircraft forecast is called for. As a result, it was assumed that the 2008 operations per based aircraft ratio would remain constant through 2028. This ratio is calculated by dividing the civil operations by the reported based aircraft at STL. In 2008, this ratio was determined to be 1,159 operations, reflecting a relatively high proportion of activity that is not physically based at STL. The based aircraft forecast results in a total of 26 civil based aircraft at STL in 2028 (*see* **Table 3.6-14, *Based Aircraft Forecast***).

TABLE 3.6-14
BASED AIRCRAFT FORECAST
Lambert-St. Louis International Airport

Fiscal Year	Number of Based Aircraft				Operations/ Based Aircraft
	Jet	Multi-Engine	Single-Engine	Civil Total	
History					
2008	10	7	1	18	1,159
Forecast					
2013	12	8	1	21	1,159
2018	14	9	1	24	1,159
2023	15	9	1	25	1,159
2028	17	9	1	26	1,159
Average Annual Growth Rates					
08-13	3.7%	2.7%	0.0%	3.1%	
13-18	3.1%	2.4%	0.0%	2.7%	
18-28	2.0%	0.0%	0.0%	0.8%	
08-28	2.7%	1.3%	0.0%	1.9%	

Sources: FAA 2008 Terminal Area Forecast (TAF); FAA Form 5010; Landrum & Brown analysis, 2011

3.6.4 MILITARY OPERATIONS

Military activity in 2008 totaled 2,941 operations. The 131st Fight Wing of the Missouri Air National Guard is located at STL and has historically been a key component of the military activity at the airport. The National Guard will be leaving STL in July 2009. Another key component of STL military activity is Boeing test flights of F15 and FA-18 fighter jets which are assembled at its plant in St. Louis. In 2008, it is estimated Boeing test flights accounted for 29 percent of the military activity at STL.

With the Air National Guard leaving STL in 2009, military operations are expected to almost exclusively consist of Boeing test flights through 2028. Boeing provided the expected number of monthly test flights for the years 2009 to 2012. These flights are expected to be scheduled during the weekdays. However, during bad weather conditions, some flights may be rescheduled for the weekends. Over the next five years, an average of two to three test flights is expected each weekday.

Based on the Boeing test flights information, the number of military operations is forecast to drop to 1,000 in 2009 and remain constant thereafter (*see* **Table 3.6-15, *Military Operations Forecast***).

The Air National Guard had 17 military aircraft based at STL in 2008. With the relocation of the Air National Guard Wing, no military aircraft are forecast to be based at STL through 2028.

Table 3.6-15
MILITARY OPERATIONS FORECAST
Lambert-St. Louis International Airport

Calendar Year	Military Operations
History	
1995	7,034
1996	5,837
1997	5,057
1998	4,899
1999	4,307
2000	4,084
2001	4,116
2002	2,552
2003	3,630
2004	5,676
2005	8,114
2006	18,226
2007	8,902
2008	2,941
Forecast	
2013	1,000
2018	1,000
2019	1,000
2023	1,000
2028	1,000
AAGR	
95-08	-6.5%
08-28	-5.3%

Sources: FAA Air Traffic Activity Data System (ATADS); Boeing; Landrum & Brown analysis, 2011

3.6.5 AIRCRAFT OPERATIONS SUMMARY

Table 3.6-16, *Total Aircraft Operations Forecast*, provides a summary of the operations forecast described in the previous sections for each of the primary components of aircraft operations at STL. Aircraft operations are forecast to grow from 248,397 in 2008 to 318,310 in 2028, representing average annual growth of 1.2 percent.

Table 3.6-16
TOTAL AIRCRAFT OPERATIONS FORECAST
Lambert-St. Louis International Airport

Calendar Year	Commercial Passenger					Cargo	Civil	Military	Total
	Domestic		International						
	Air Carrier	Commuter	Air Carrier	Commuter	Total				
History									
1995	343,578	107,486	1,300	222	452,586	9,218	49,123	7,034	517,961
2000	337,774	95,784	2,378	2,186	438,122	7,614	34,404	4,084	484,224
2005	106,002	149,206	1,712	1,182	258,102	5,466	25,322	8,114	297,004
2006	105,626	137,336	1,696	1,186	245,844	3,432	14,351	18,226	281,853
2007	109,418	115,988	1,828	1,286	228,520	3,278	16,228	8,902	256,928
2008	107,030	112,052	1,086	1,242	221,410	3,186	20,860	2,941	248,397
Forecast									
2013	109,800	111,000	1,520	1,620	223,940	3,190	23,800	1,000	251,930
2018	120,600	120,400	2,040	1,900	244,940	3,330	27,500	1,000	276,770
2019	122,600	121,800	2,120	1,920	248,440	3,360	27,800	1,000	280,600
2023	131,000	128,200	2,460	1,980	263,640	3,490	28,900	1,000	297,030
2028	141,800	136,400	2,860	2,020	283,080	3,730	30,500	1,000	318,310
Average Annual Growth Rates									
95-08	-8.6%	0.3%	-1.4%	14.2%	-5.4%	-7.8%	-6.4%	-6.5%	-5.5%
08-28	1.4%	1.0%	5.0%	2.5%	1.2%	0.8%	1.9%	-5.3%	1.2%

Sources: USDOT, Schedule T-100; *Official Airline Guide*; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

Table 3.6-17, *Total Aircraft Operations Forecast – Itinerant vs. Local Activity*, provides a summary of the operations forecast segmented into itinerant and local operations at the airport. Over the forecast period, almost all the activity at STL is expected to be itinerant in nature. The very small percentage of local activity is predominantly made up of local military test flights.

Table 3.6-17
TOTAL AIRCRAFT OPERATIONS FORECAST – ITINERANT VS. LOCAL ACTIVITY
Lambert-St. Louis International Airport

Calendar Year	Itinerant						Local			Total
	Commercial									
	Air Carrier	Commuter	Total	Civil	Military	Total	Civil	Military	Total	
History										
2008	125,315	99,281	224,596	20,691	2,352	247,639	169	589	758	248,397
Forecast										
2013	134,310	92,820	227,130	23,600	-	250,730	200	1,000	1,200	251,930
2018	151,170	97,100	248,270	27,300	-	275,570	200	1,000	1,200	276,770
2023	167,550	99,580	267,130	28,700	-	295,830	200	1,000	1,200	297,030
2028	186,390	100,420	286,810	30,300	-	317,110	200	1,000	1,200	318,310
Average Annual Growth Rates:										
08-28	2.0%	0.1%	1.2%	1.9%	-100.0%	1.2%	0.8%	2.7%	2.3%	1.2%

Note: Air carrier/commuter split based on the FAA 60-seat definition for comparison purposes with the FAA Terminal Area Forecasts; itinerant commercial operations include both passenger and all-cargo operations; itinerant civil operations include non-commercial air taxi and general aviation activity.

Sources: USDOT, Schedule T-100; *Official Airline Guide*; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

Table 3.6-18, *Total Aircraft Operations Forecast – IFR vs. VFR Activity*, provides a summary of the operations forecast segmented into flights operated under instrument versus visual flight rules at STL. Less than one percent of flights are operated under visual flight rules at STL reflecting its status as a primary commercial service airport. No significant change in VFR activity is expected at STL over the forecast period.

TABLE 3.6-18
TOTAL AIRCRAFT OPERATIONS FORECAST – IFR VS. VFR ACTIVITY
Lambert-St. Louis International Airport

Calendar Year	Instrument Operations	Visual Operations	Total Operations
History			
2008	246,040	2,357	248,397
Forecast			
2013	249,530	2,400	251,930
2018	274,370	2,400	276,770
2023	294,630	2,400	297,030
2028	315,910	2,400	318,310
Average Annual Growth Rates:			
08-28	1.3%	0.1%	1.2%

Sources: USDOT, Schedule T-100; *Official Airline Guide*; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

3.7 REVIEW OF PREVIOUS FORECASTS

Prior forecasts developed for STL were identified and reviewed to define their applicability to the Master Plan and to provide a base of comparison for the current forecast. Previous forecasts include the 1996 Master Plan (which was the basis of the EIS on the 3rd parallel runway), the 2007 bond issue, and the 2008 Federal Aviation Administration TAF.

3.7.1 1996 MASTER PLAN FORECAST

The 1996 Master Plan was developed when TWA still operated its primary domestic hubbing operation at STL. Three forecasts were prepared as part of the Master Plan. The first, the baseline forecast, assumed a continuation of the role of STL as a hub for TWA. A high scenario was developed based on increased growth of the existing carriers or a second airline establishing a hub at STL. The low scenario was based on the initial loss of the TWA hub and the subsequent establishment of another airline's hub later in the forecast period.

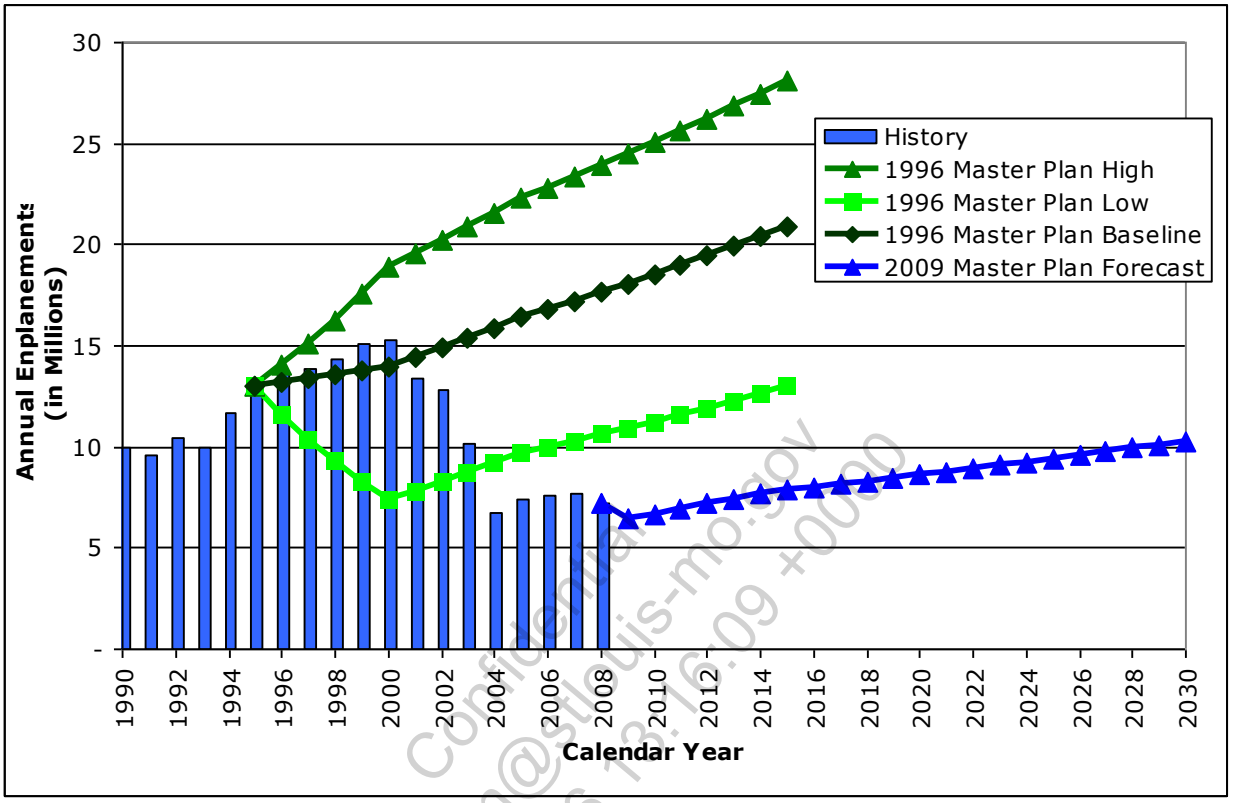
In 2001 TWA was purchased by American Airlines and STL became a secondary hub. The downgrading of the hub was compounded by the decline in air traffic nationwide after the terrorist attacks of September 11, 2001. As a result, the 1996 Master Plan overestimated future traffic levels.

3.7.1.1 Passenger Enplanements Forecast

The 1996 Master Plan baseline forecast resulted in 2.4 percent average annual growth in enplanements between 1995 and 2015. The high scenario resulted in enplanements growing at a rate of 3.9 percent annually from 1995 to 2015. The low scenario results in declining traffic levels from 1995 to 2000 due to the loss of the TWA hub. However, the low scenario assumed another airline would establish a hub operation at STL, allowing enplanements to recover to 1995 levels by 2015.

Actual traffic levels fell from a high of 15.3 million enplanements in 2000 to 6.7 million in 2004 after American downsized the STL hub. Due to this decrease in traffic, each of the three Master Plan forecast scenarios are much higher than actual traffic realized at the airport (*see* **Exhibit 3.7-1, *Comparison with 1996 Master Plan Forecast - Enplanements***). The 2009 Master Plan forecast reflects STL's current and anticipated future role and therefore results in lower enplanements levels than the 1996 Master Plan.

Exhibit 3.7-1
COMPARISON WITH 1996 MASTER PLAN FORECAST - ENPLANEMENTS
Lambert-St. Louis International Airport

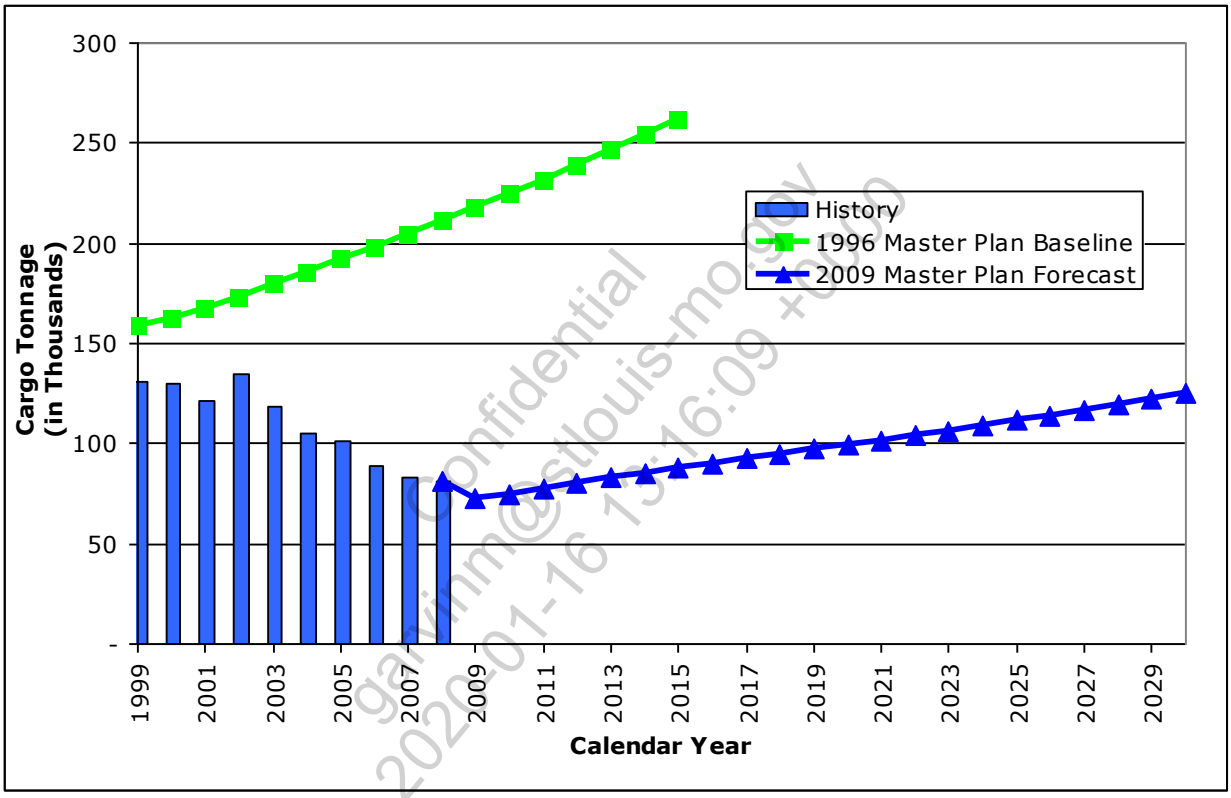


Sources: Lambert-St. Louis International Airport Master Plan Supplement Study, Final Report January 1996; Airport Records; Landrum & Brown analysis, 2011

3.7.1.2 Cargo Tonnage Forecast

The 1996 Master Plan predicted cargo tonnage would increase at a rate of three percent annually from 1994 to 2015 (*see* **Exhibit 3.7-2, *Comparison with 1996 Master Plan Forecast – Cargo Tonnage***). In fact, cargo volumes have fallen by 5.2 percent per annum since 1999.

Exhibit 3.7-2
COMPARISON WITH 1996 MASTER PLAN FORECAST – CARGO TONNAGE
Lambert-St. Louis International Airport

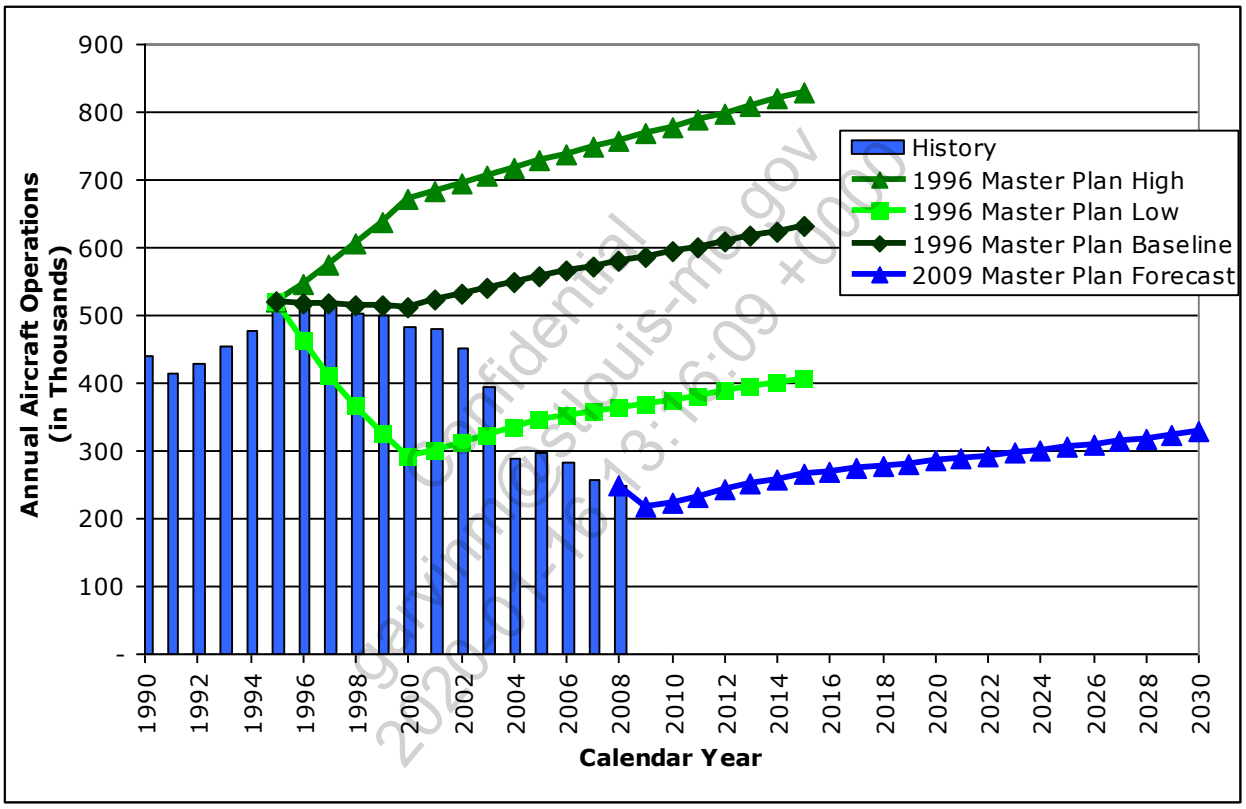


Sources: Lambert-St. Louis International Airport Master Plan Supplement Study, Final Report January 1996; Airport Records; Landrum & Brown analysis, 2011

3.7.1.3 Aircraft Operations Forecast

As with the enplaned passenger forecast, the baseline, high, and low operations forecasts developed for the 1996 Master Plan resulted in higher operations levels than actually occurred (*see* **Exhibit 3.7-3, *Comparison with 1996 Master Plan Forecast – Aircraft Operations***).

Exhibit 3.7-3
COMPARISON WITH 1996 MASTER PLAN FORECAST - AIRCRAFT OPERATIONS
Lambert-St. Louis International Airport



Sources: Lambert-St. Louis International Airport Master Plan Supplement Study, Final Report January 1996; Airport Records; Landrum & Brown analysis, 2011

3.7.2 2007 BOND ISSUE

An enplanements forecast was prepared as part of the City of St. Louis 2007 Bond Issue. This forecast predicted 7.01 million signatory[54] airline enplanements for Fiscal Year 2007, growing to 7.86 million in Fiscal Year 2011.[55] This represents average annual growth of 2.9 percent from 2007 to 2011 in line with the FAA 2007 TAF.

[54] A signatory airline is an air carrier that operates at the airport pursuant to a Use Agreement.
[55] Page 47 of the Official Statement Relating to the *$231,275,000 The City of St. Louis, Missouri Airport Revenue Refunding Bonds Series 2007A (Non-AMT) (Lambert-St. Louis International Airport)*

3.7.3 FEDERAL AVIATION ADMINISTRATION TERMINAL AREA FORECAST

The FAA develops the TAF on an annual basis for all active airports in the U.S. that are included in its National Plan of Integrated Airport Systems (NPIAS). The TAF is "prepared to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public."[56] The 2008 TAF was issued in December of 2008.

Table 3.7-1, *Aviation Forecasts Versus FAA 2008 TAF*, provides a comparison of this Master Plan forecasts with the FAA 2008 TAF for enplanements, commercial operations, and total aircraft operations for the 5, 10, and 15-year horizons. The Master Plan forecast is within 10 percent of the 2008 TAF in each planning horizon for both enplanements and aircraft operations. The Master Plan total based aircraft forecast is significantly lower than the current version of the FAA TAF, which does not reflect the reduction in military based aircraft due to the Air National Guard leaving STL in 2009.

Table 3.7-1
AVIATION FORECASTS VERSUS FAA 2008 TAF
Lambert-St. Louis International Airport

	Year	Master Plan Forecast	2008 TAF [4]	Percent Difference
Passenger Enplanements				
Base Yr.	2008	7,207,890	6,984,154	3.2%
Base Yr.+5 Yrs.	2013	7,448,400	7,080,612	5.2%
Base Yr.+10 Yrs.	2018	8,304,900	8,127,042	2.2%
Base Yr.+15 Yrs.	2023	9,077,800	9,331,255	-2.7%
Commercial Operations [1]				
Base Yr.	2008	224,596	241,314	-6.9%
Base Yr.+5 Yrs.	2013	227,130	224,860	1.0%
Base Yr.+10 Yrs.	2018	248,270	244,598	1.5%
Base Yr.+15 Yrs.	2023	267,130	266,084	0.4%
Total Operations [2]				
Base Yr.	2008	248,397	255,893	-2.9%
Base Yr.+5 Yrs.	2013	251,930	239,754	5.1%
Base Yr.+10 Yrs.	2018	276,770	260,447	6.3%
Base Yr.+15 Yrs.	2023	297,030	282,927	5.0%
Based Aircraft [3]				
Base Yr.	2008	35	35	0.0%
Base Yr.+5 Yrs.	2013	21	33	-36.4%
Base Yr.+10 Yrs.	2018	24	31	-22.6%
Base Yr.+15 Yrs.	2023	25	29	-13.8%

Notes:
1 Air taxi operations are included in the commercial operations totals for the TAF. The Master Plan forecast groups air taxi operations in the non-commercial category.
2 Excludes overflights.
3 Includes both civil and military based aircraft.
4 Data shown for the FAA 2008 TAF is presented on a fiscal year basis (12 months ended September).

Sources: FAA 2008 Terminal Area Forecast; Airport Records; Landrum & Brown analysis, 2011

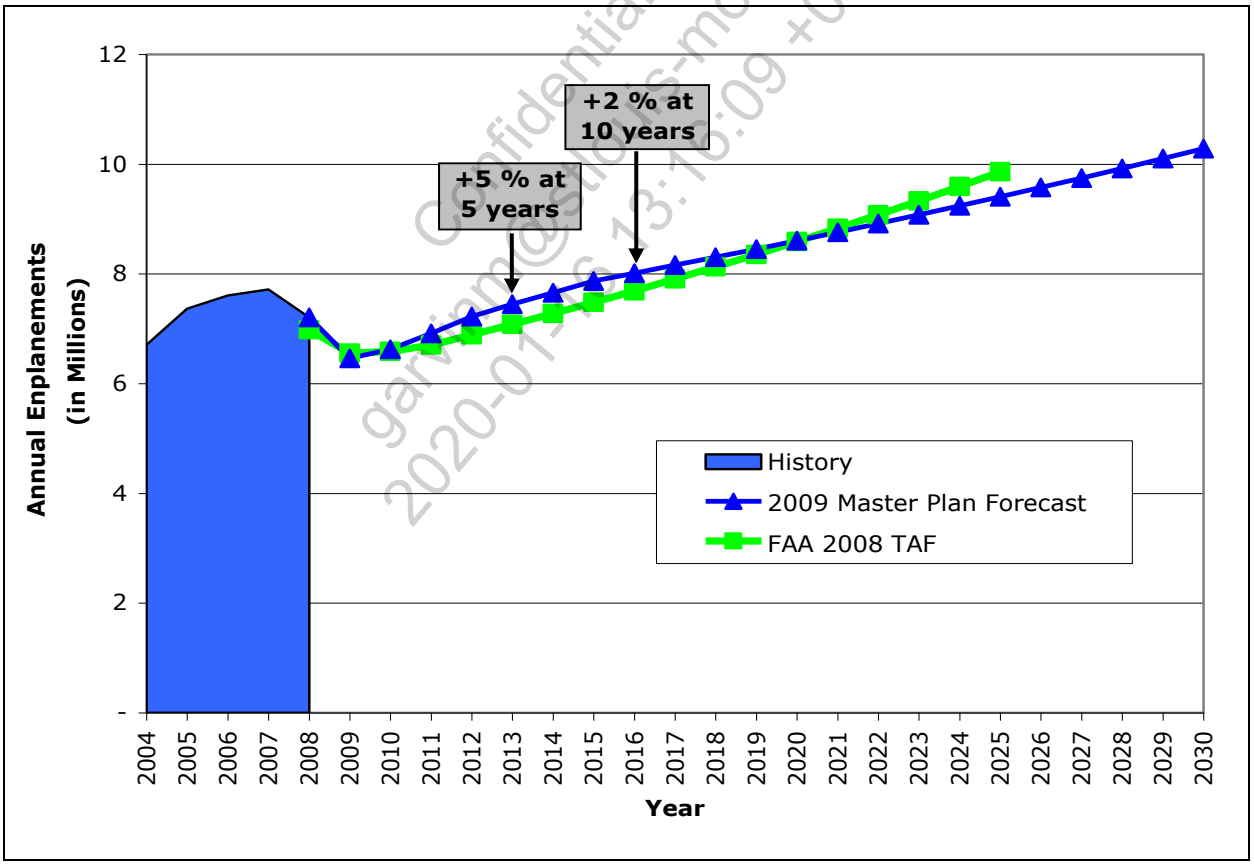
[56] *See* Internet website: http://aspm.faa.gov/main/taf.asp

3.7.3.1 Passenger Enplanements Forecast

The 2008 TAF shows declining traffic levels in 2008 and 2009 as a result of the economic recession and related decline in aviation activity. In spite of the current U.S. recession and the downgrading of the STL hub by American, it is important to note that the FAA expects passenger traffic growth at STL over the long term. The 2008 TAF predicts enplanements will increase at an average annual rate of 1.9 percent through 2025.

Exhibit 3.7-4, *Comparison with FAA 2008 TAF – Enplanements*, provides a comparison between the enplanements forecast for this Master Plan and the FAA 2008 TAF for STL. The difference in growth assumptions results in a 5.2 percent difference in enplanements in 2013 and a 2.2 percent difference in enplanements by 2018.

Exhibit 3.7-4
COMPARISON WITH FAA 2008 TAF - ENPLANEMENTS
Lambert-St. Louis International Airport

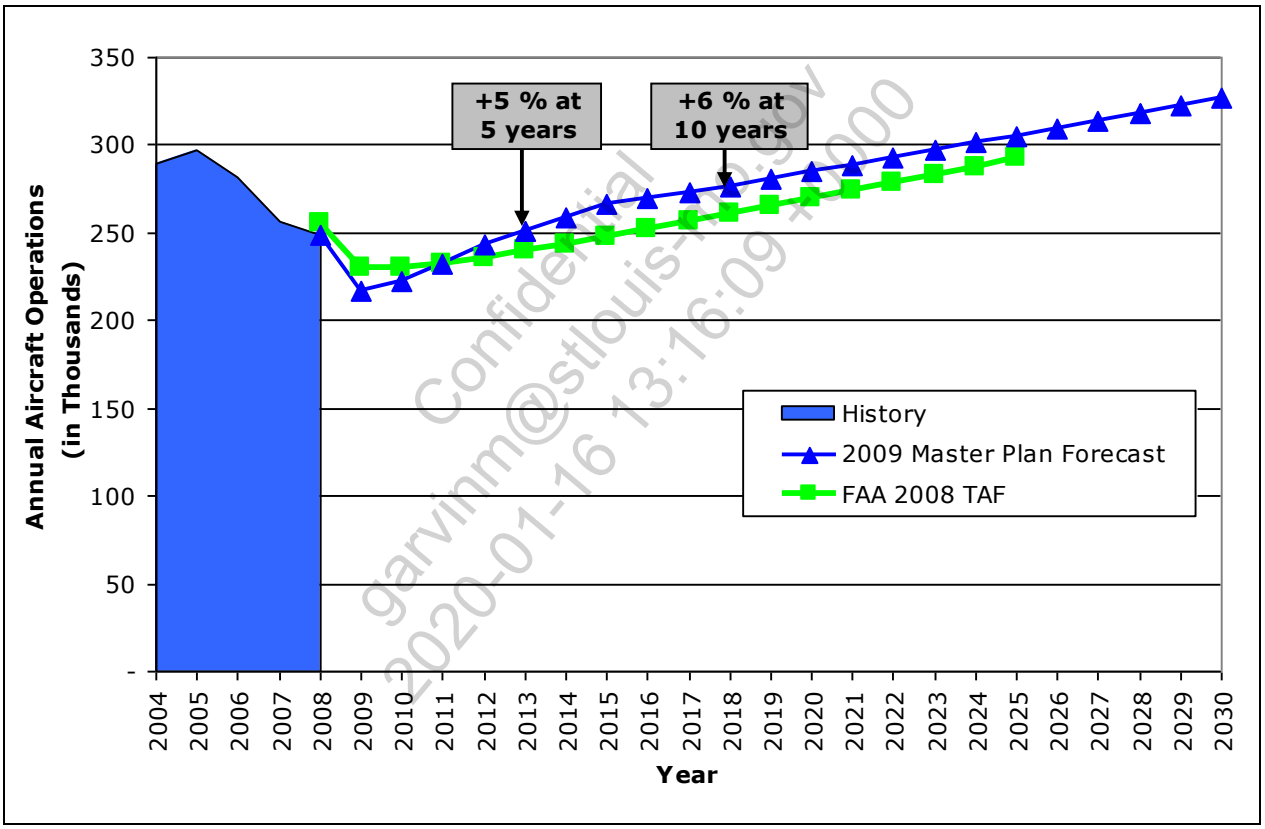


Sources: Federal Aviation Administration 2008 Terminal Area Forecast; Airport Records; Landrum & Brown analysis, 2011

3.7.3.2 Aircraft Operations Forecast

The FAA 2008 TAF predicts STL aircraft operations to reverse the decline experienced since the late 1990s. The FAA expects total aircraft operations at STL to grow 0.7 percent through 2025. The Master Plan aircraft operations forecast assumes an average annual growth rate of 1.2 percent through 2028. Total aircraft operations levels in the baseline forecast are 4.7 percent higher than the TAF in 2013 and 6.3 percent higher in 2018 (*see* **Exhibit 3.7 -5, *Comparison with FAA 2008 TAF – Aircraft Operations***).

Exhibit 3.7-5
COMPARISON WITH FAA 2008 TAF - AIRCRAFT OPERATIONS
Lambert-St. Louis International Airport



Sources: Federal Aviation Administration 2008 Terminal Area Forecast; Airport Records; Landrum & Brown analysis, 2011

3.8 DERIVATIVE FORECASTS

The traffic demand patterns imposed upon an airport are subject to seasonal, monthly, daily, and hourly variations. These variations result in peak periods when the greatest amount of demand is placed upon facilities required to accommodate passenger and aircraft movements. Peaking characteristics are critical in the assessment of existing facilities to determine their ability to accommodate forecast increases in passenger and operational activity throughout the study period. The objective of developing peak period forecasts is to provide a design level that sizes facilities so they are neither underutilized nor overcrowded too often.

In order to evaluate the peaking patterns at an airport, the annual enplanements and aircraft operations forecasts are converted to monthly, daily, and hourly equivalents. The STL design day is based on the activity levels that occur on an average weekday in the peak month (PMAWD).

Peak month, PMAWD, and peak hour factors were developed for the following categories:

- Commercial passenger activity
  - Domestic air carrier
  - Domestic commuter
  - International air carrier
  - International commuter
- Air cargo operations
- Civil operations
- Military operations

The peaking factors were used to create design day flight schedules. PMAWD schedules were created for use in the development of passenger terminal requirements. Average day flight schedules were also developed for use in the environmental analysis.

3.8.1 COMMERCIAL PASSENGERS

OAG scheduled seats data was used to determine the passenger peaking patterns at STL. OAG seat data was used as a proxy for passengers because historical passenger data was not available in the level of detail needed for this analysis. The seats peaking factors were used to develop the peak month, PMAWD, and peak hour passenger forecasts.

3.8.1.1 Peak Month Passengers

OAG data for three years (2007, 2008, and 2009) was analyzed. The month-to-month traffic patterns for 2008 and 2009 are skewed because the airlines reduced their schedules significantly in the last quarter of 2008 and for most of 2009.

Scheduled seats were down 14.1 percent in November 2008 and 12.9 percent in December of 2008 compared to the same months in 2007. The number of scheduled seats for January through October of 2009 is at least 10 percent lower for each month compared to 2008. The monthly factors in 2008 and 2009 are not considered indicative of future activity patterns. As a result, the peak month was selected based on 2007 patterns.

Based on the scheduled seats data for 2007, August was the peak month for domestic air carrier seats, domestic commuter seats, and total seats (*see* **Table 3.8-1, *2007 Monthly Scheduled Seats Factors***). June was the peak month for international commuter seats. While there are monthly variations in the number of scheduled seats for these segments of activity, the differences are not extreme. Conversely, the international air carrier segment has more pronounced seasonal variations. March was the peak month for international air carrier activity in 2007 while August was one of the lowest activity months for this segment of activity.

Table 3.8-1
2007 MONTHLY SCHEDULED SEATS FACTORS
Lambert-St. Louis International Airport

	Domestic		International		
Month	**Air Carrier**	**Commuter**	**Air Carrier**	**Commuter**	**Total**
January	8.2%	8.9%	10.6%	7.8%	8.4%
February	7.4%	8.0%	12.5%	7.3%	7.6%
March	8.3%	8.7%	**14.8%**	8.1%	8.5%
April	8.2%	8.1%	11.0%	7.8%	8.2%
May	8.6%	8.2%	6.3%	8.2%	8.5%
June	8.5%	8.1%	9.8%	**10.2%**	8.4%
July	8.7%	8.5%	9.2%	9.4%	8.7%
August	**8.8%**	**8.7%**	5.9%	9.3%	**8.7%**
September	8.2%	7.8%	4.3%	8.7%	8.1%
October	8.6%	8.5%	5.0%	8.7%	8.5%
November	8.3%	8.1%	4.6%	7.6%	8.2%
December	8.2%	8.5%	6.0%	7.0%	8.3%

Sources: *Official Airline Guide*, 2007; Landrum & Brown analysis, 2011

In order to most accurately develop future terminal requirements for both domestic and international activity, a composite PMAWD was created that reflects the seasonal aspect of the international air carrier service. Because August is the peak month for total seats, the monthly profiles were developed based on August data for all segments of activity except the international air carrier segment. The international air carrier profiles are based on March data. This results in a slightly higher overall monthly number of passengers than would result from applying the August ratios for all activity segments. However, this method provides the most accurate information for future planning.

It was assumed that the monthly seasonality patterns for the domestic segments and the international commuter segment would not change materially over the forecast period. As a result, the peak month seats factors for these segments are forecast to return to 2007 levels in 2010 and remain at those levels through 2028. The monthly seasonality in international air carrier service is expected to continue throughout the planning period but will be offset as new daily service to Latin America and Europe is added. As a result, the international air carrier peak month enplanement factor is expected to decrease from over 14 percent in 2007 to less than 11 percent by 2028.

3.8.1.2 PMAWD Passengers

Based on an analysis of OAG data, it was determined that Wednesdays represent typical average weekday activity for both domestic and international activity. Therefore, the following days were chosen as representative of the PMAWD for 2007, 2008, and 2009:

- Wednesday, August 15, 2007
- Wednesday, August 13, 2008
- Wednesday, August 12, 2009

The August design day was supplemented with international air carrier activity from the following days in March:

- Wednesday, March 14, 2007
- Wednesday, March 12, 2008
- Wednesday, March 11, 2009

The composite of the August activity and the additional March international air carrier activity results in the PMAWD schedule for each year.

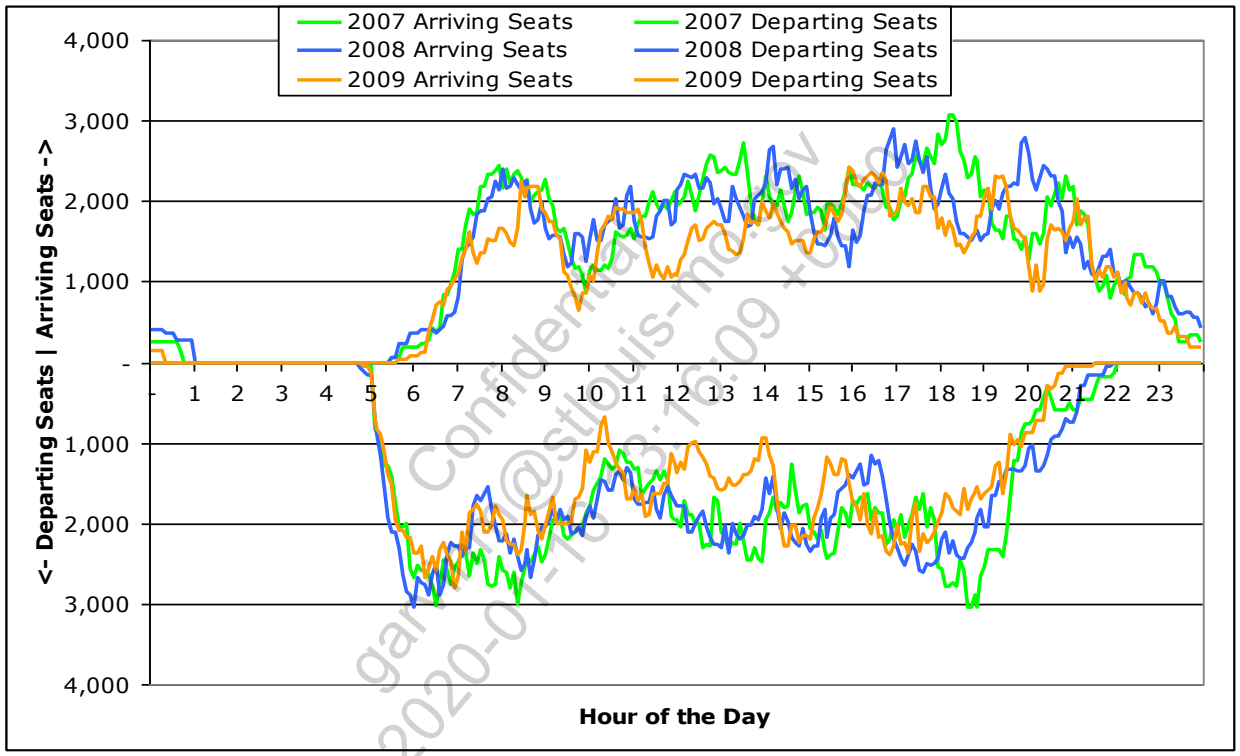
While the month-to-month variations in 2008 and 2009 are not indicative of future peaking patterns, the relationship of daily to monthly activity was fairly constant in 2007, 2008, and 2009. The domestic PMAWD represents 3.4 percent of August domestic seats in 2007, 2008, and 2009. The international commuter PMAWD factor was 3.3 percent in 2007 and 2008 and is scheduled to be 3.2 percent in 2009. International air carrier PMAWD seats represented 3.1 percent of March seats in 2007, 3.2 percent in 2008, and 3.1 percent in 2009. It is assumed that the 2009 PMAWD factors will continue through 2028.

3.8.1.3 Peak Hour Passengers

Peak hour enplanements and deplanements were derived from the OAG composite design day schedules discussed in Section 2.9.1.2. Peak hour load factors for each segment of activity are assumed to reach 85 percent for all types of activity for 2008 and all forecast years.

The hourly peaking patterns for the 2007, 2008, and 2009 design days are compared in **Exhibit 3.8-1, *Design Day Scheduled Seats Profile (2007 vs. 2008 vs. 2009)***. The daily activity is shown in five-minute increments on a rolling 60-minute basis. The peak hour of activity has shifted since 2007. Additionally, the number of seats in the peak hour is lower in 2009 than it was in 2007 due to service cutbacks.

Exhibit 3.8-1
DESIGN DAY SCHEDULED SEATS PROFILE
(2007 vs. 2008 vs. 2009)
Lambert-St. Louis International Airport

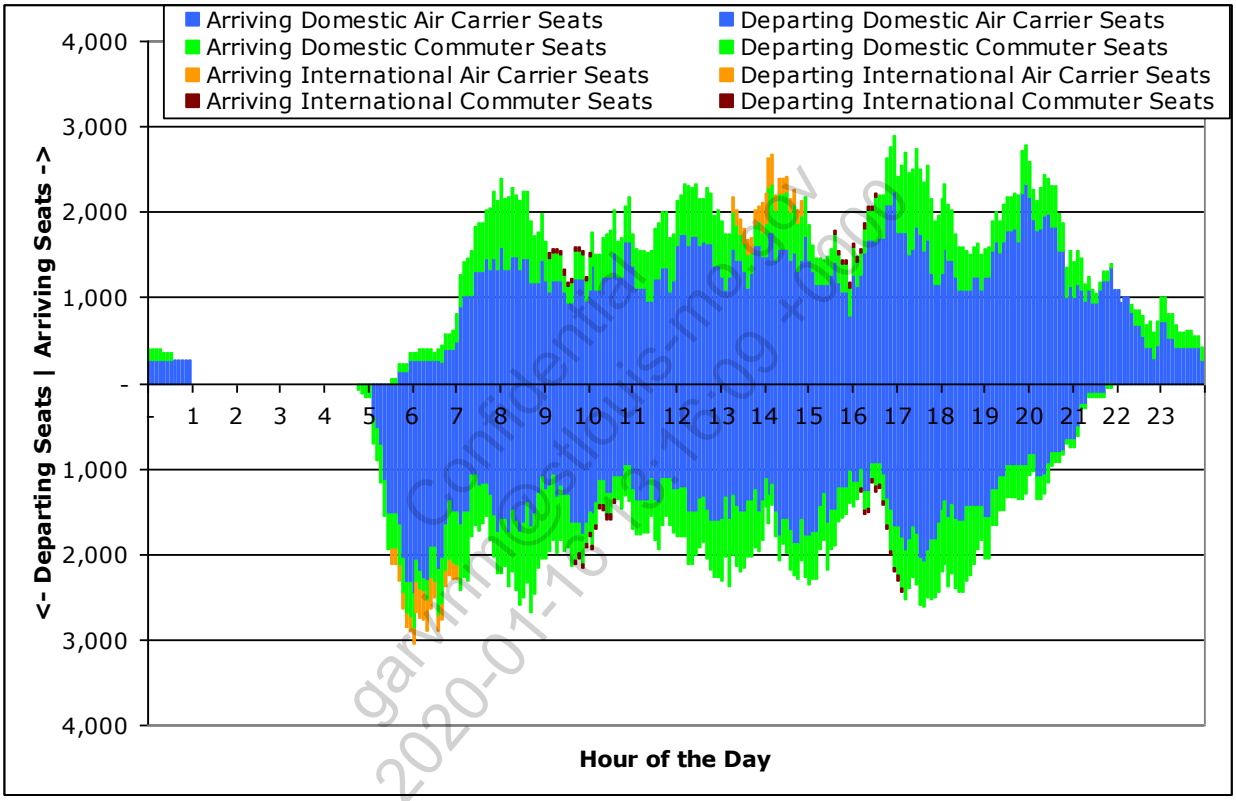


Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

The 2008 hourly profile was deemed to be the most reliable for developing factors to forecast future peak hour passengers. The August 2008 schedule reflects conditions before the cutbacks occurred in the fourth quarter of 2008 and in 2009. The base year 2008 design day scheduled seats profile is presented in **Exhibit 3.8-2, *Rolling 60-Minute Scheduled Seats Profile (August 13, 2008)***, in five-minute increments on a rolling 60-minute basis for each segment of activity. The 2008 total seats peak hour occurred between 17:10 and 18:10. The departing seats peak hour occurred between 06:00 and 07:00 while arriving seats peaked between 16:55 and 17:55 in 2008.

It is assumed that the peak hour factors from 2008 will continue through 2028 for domestic flights. The international air carrier and commuter peak hour factors are expected to fluctuate over the forecast horizon because there are a small number of international flights in the PMAWD schedule. As new flights are added, the peak hour factor is expected to decrease. A similar pattern exists for the international commuters.

Exhibit 3.8-2
ROLLING 60-MINUTE SCHEDULED SEATS PROFILE (August 13, 2008)
Lambert-St. Louis International Airport



Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

3.8.1.4 Peak Period Passenger Summary

Table 3.8-2, *Derivative Forecasts – Passenger Enplanements*, presents the results of the peak period activity forecasts for enplanements for the 2013, 2018, 2023, and 2028 planning horizons.

The table shows the peak hour totals for the individual components of activity. The peak hour for each of the various segments of activity does not necessarily occur in the same hour so the peak hour enplanements for the various categories of traffic cannot be aggregated across categories.

Peak hour enplanements, which were at 2,584 for the 2008 design day, are projected to increase to 3,423 by 2028.

Table 3.8-2
DERIVATIVE FORECASTS – PASSENGER ENPLANEMENTS
Lambert-St. Louis International Airport

Annual

		Domestic Passenger		International Passenger		Commercial
	Calendar Year	Air Carrier Enplanements	Commuter Enplanements	Air Carrier Enplanements	Commuter Enplanements	Passenger Enplanements
Base	2008	5,231,273	1,880,672	78,856	17,089	7,207,890
Forecast	2013	5,425,900	1,896,200	103,600	22,700	7,448,400
	2018	6,027,100	2,111,100	139,700	27,000	8,304,900
	2023	6,573,000	2,307,400	168,600	28,800	9,077,800
	2028	7,171,500	2,523,200	198,100	29,900	9,922,700

Peak Month

		Domestic Passenger		International Passenger		Commercial
	Calendar Year	Air Carrier Enplanements	Commuter Enplanements	Air Carrier Enplanements	Commuter Enplanements	Passenger Enplanements
Base	2008	463,275	152,528	15,677	1,630	633,110
Forecast	2013	478,237	164,170	15,357	2,108	659,872
	2018	531,227	182,776	18,711	2,507	735,221
	2023	579,342	199,771	20,404	2,674	802,191
	2028	632,094	218,455	21,662	2,776	874,987

Peak Month Average Week Day

		Domestic Passenger		International Passenger		Commercial
	Calendar Year	Air Carrier Enplanements	Commuter Enplanements	Air Carrier Enplanements	Commuter Enplanements	Passenger Enplanements
Base	2008	15,859	5,181	297	55	21,392
Forecast	2013	16,323	5,559	538	56	22,476
	2018	18,131	6,188	522	86	24,927
	2023	19,774	6,764	638	86	27,262
	2028	21,574	7,396	694	89	29,753

Peak Hour

		Domestic Passenger		International Passenger		Commercial
	Calendar Year	Air Carrier Enplanements	Commuter Enplanements	Air Carrier Enplanements	Commuter Enplanements	Passenger Enplanements
Base	2008	2,094	852	287	43	2,584
Forecast	2013	2,120	886	286	43	2,655
	2018	2,336	972	286	43	2,930
	2023	2,526	1,047	313	43	3,167
	2028	2,734	1,129	341	43	3,423

Note: Peak hour enplanements for each segment of activity represent the peak hour for that component of activity. The peak hours for the various types of activity do not necessarily occur at the same hour.

Source: Landrum & Brown analysis, 2011

3.8.2 AIRCRAFT OPERATIONS

Peak period operations factors were developed using FAA, ATADS; FAA, Enhanced Traffic Management System Counts (ETMSC); U.S. DOT, Schedule T-100 data; passenger airline schedules published in the OAG; and radar data. As with the peak period passenger forecasts, the passenger operations data was developed for domestic air carrier, domestic commuter, international air carrier, and international commuter operations. Additionally, peak period forecasts were developed for air cargo, civil, and military operations.

3.8.2.1 Commercial Passenger Operations

PEAK MONTH OPERATIONS

As with peak month seats, the 2007 factors were used because the cutbacks in airline schedules in 2008 and 2009 skewed the monthly profiles in these years. The 2007 peak month factors were 8.8 percent for domestic air carrier operations, 8.4 percent for domestic commuter operations, 15.2 percent for international air carrier operations, and 9.3 percent for international commuter operations.

It was assumed that the monthly patterns of activity for the domestic segments and the international commuter segment would not change materially over the forecast period. As a result, the peak month seats factors for these segments are forecast to return to their 2007 levels in 2010 and remain at those levels through 2028. The monthly seasonality in international air carrier service is expected to continue through 2028 but will be offset as new daily service to Latin America and Europe is added. As a result, the international air carrier peak month operations factor is expected to decrease from 15 percent in 2007 to 11 percent by 2028.

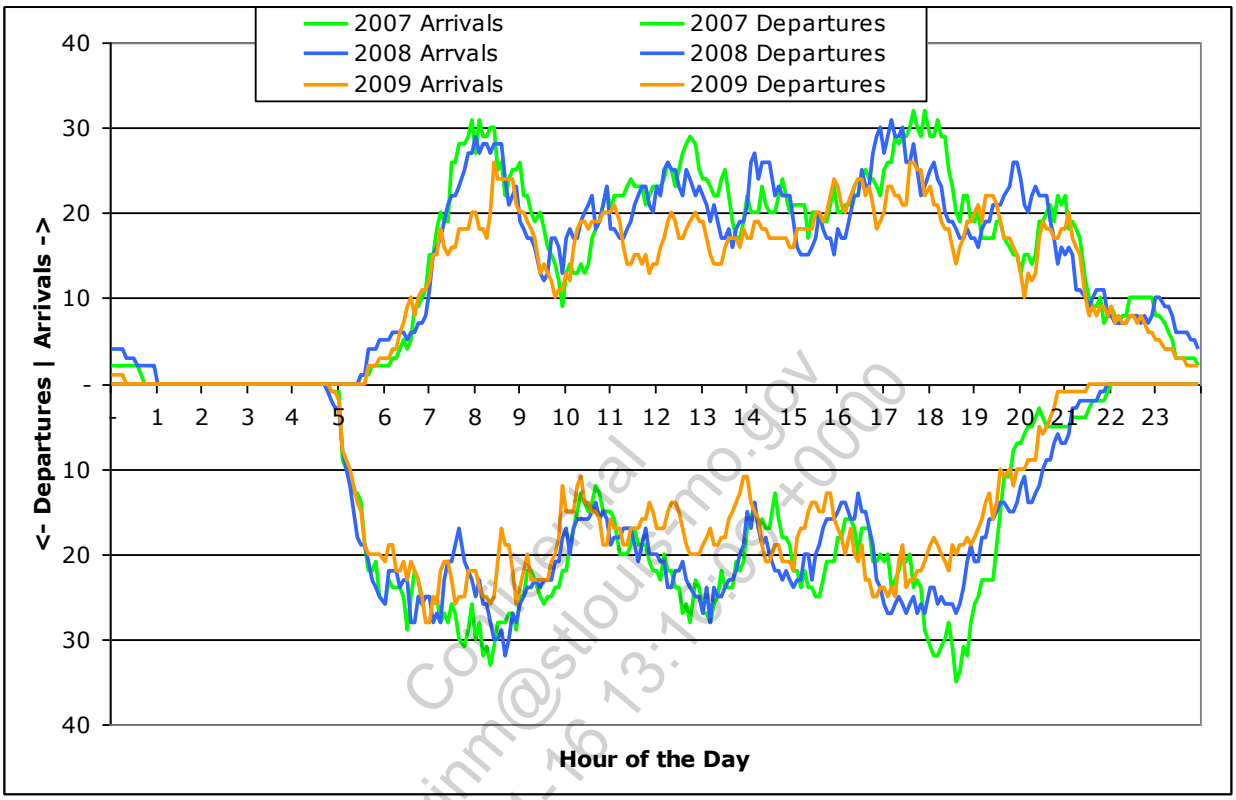
PMAWD OPERATIONS

The relationship of daily to monthly commercial aircraft operations was fairly constant in 2007, 2008, and 2009. PMAWD domestic operations have consistently made up 3.4 percent of peak month operations in each year. PMAWD international air carrier operations made up 3.2 percent of the peak month operations in 2007 and 3.1 percent in 2008 and 2009. PMAWD international commuter operations made up 3.3 percent of the peak month operations in 2007 and 2008, and 3.2 percent in 2009. It is assumed that the 2009 factors will continue through 2028.

PEAK HOUR OPERATIONS

The hourly peaking patterns for the 2007, 2008, and 2009 design days are compared on **Exhibit 3.8-3, *Design Day Scheduled Passenger Aircraft Operations Profiles Comparison (2007 vs 2008 vs. 2009)***. The daily activity is shown in five-minute increments on a rolling 60-minute basis. The peak hour of activity has shifted since 2007. Additionally, the number of operations in the peak hour is lower in 2009 than it was in 2007 due to service cutbacks.

Exhibit 3.8-3
DESIGN DAY SCHEDULED PASSENGER AIRCRAFT OPERATIONS PROFILES COMPARISON
(2007 vs. 2008 vs. 2009)
Lambert-St. Louis International Airport

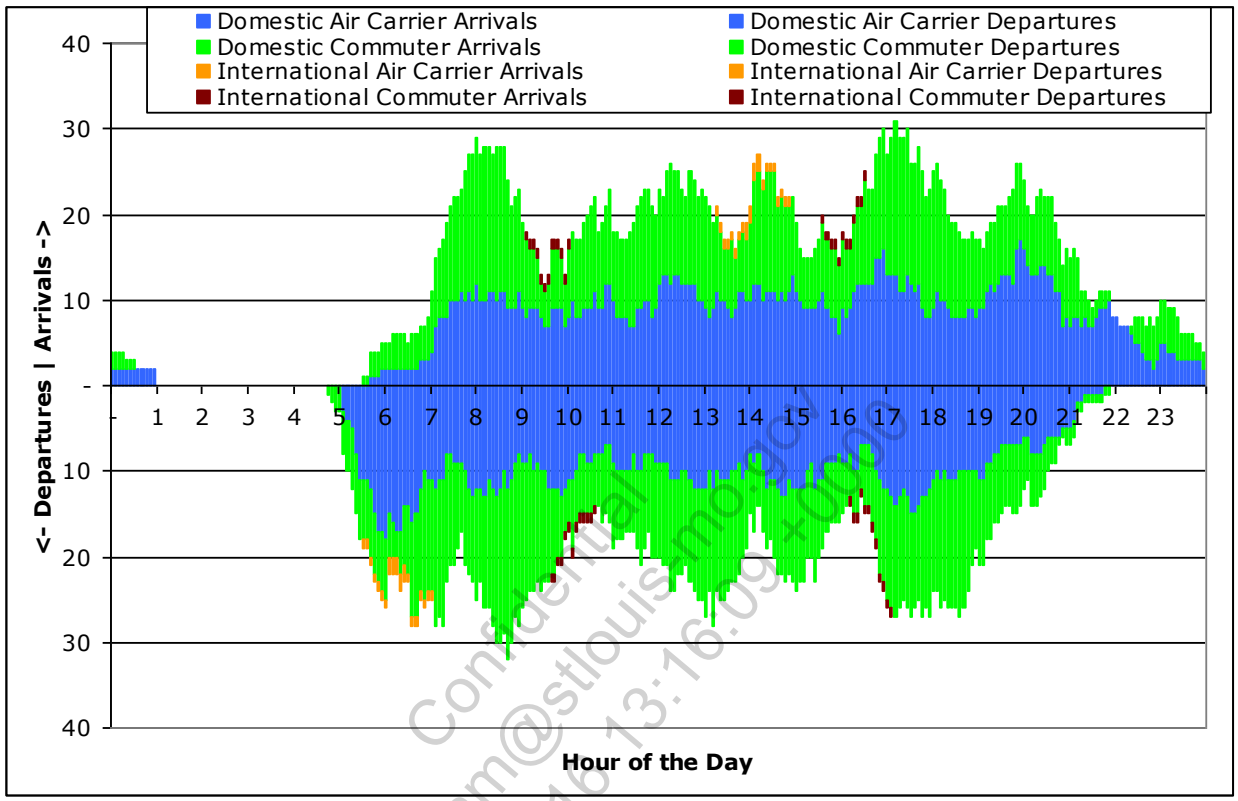


Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

Exhibit 3.8-4, *Rolling 60-Minute Schedule Passenger Aircraft Operations Profile (August 13, 2008)*, illustrates the 2008 base year baseline design day operations profile in five-minute increments on a rolling 60-minute basis for each segment of activity. The commercial passenger arrival operations peak hour occurred between 17:10 and 18:10 in 2008, consisting of 31 arrivals. The departures peak hour for total commercial passengers occurred between 08:40 and 09:40 in 2008 with 32 departures. Commercial passenger total operations peaked at three times through the day: 08:25 to 09:25, 08:30 to 09:30, and 17:10 to 18:10 (58 total commercial passenger operations in each of these three time periods). The 2008 daily profile was used to forecast future peak hour operations.

It is assumed that the domestic peak hour factors from 2008 will continue through 2028. As with the international peak hour seats factors, it is assumed that as new international service is added to different regions of the world, the international operations peak hour factors will decrease accordingly.

Exhibit 3.8-4
ROLLING 60-MINUTE SCHEDULED PASSENGER AIRCRAFT OPERATIONS PROFILE (August 13, 2008)
Lambert-St. Louis International Airport



Sources: *Official Airline Guide*; Landrum & Brown analysis, 2011

3.8.2.2 All-Cargo Operations

Radar data for the one-year period ending August 2008 was analyzed to determine the peaking patterns for all-cargo operations. The cargo carriers at STL operated between five and seven daily arrivals on Mondays through Fridays in August of 2008. The cargo carriers typically operated between three and five daily arrivals on Saturdays with the same number of corresponding departures on Mondays. There were no cargo flights on Sundays. This results in a PMAWD factor of 4.5 percent.

The hourly pattern of the cargo operations does not vary much on a day-to-day basis. In a typical day there would be one arrival in the midnight hour with the remainder of arrivals occurring between 04:00 and 07:00. There is typically one departure in the midnight hour, another between 06:00 and 08:00, with the remainder departing between 22:00 and 23:59.

The cargo monthly, daily, and hourly factors are not expected to change materially during the planning horizon.

3.8.2.3 Civil Operations

Based on an analysis of the radar data, August civil operations represented 8.8 percent of annual civil operations. The number of daily operations varies, with the number of operations being higher on weekdays than weekends. This is consistent with the business nature of the civil traffic at STL. August 2008 PMAWD operations made up 3.8 percent of monthly operations.

The hourly distribution of civil activity varies on a day-to-day basis with no distinct pattern. As a result, August 13, 2008 (the same design day used for the commercial passenger traffic) was used to determine hourly peaking patterns. This analysis shows that the civil aviation arrivals peak hour occurs at 19:45 and represents 15.6 percent of daily civil arrivals. The civil aviation departures peak hour is at 07:00 with 18.5 percent of the design day's departures. The civil aviation total operations peak hour occurs at 07:00, 13:40, 17:55, 19:50, and 20:15, with each of these 60-minute periods consisting of 10.2 percent of the design day's civil operations.

The civil operations monthly, daily, and hourly factors are not expected to change materially during the planning horizon.

3.8.2.4 Military Operations

Based on an analysis of the radar data, August military operations represented 8.9 percent of annual military operations. The Air National Guard is leaving STL in 2009. The vast majority of the remaining military activity will consist of fighter jet test flights by Boeing. Boeing provided monthly projections of activity through 2012. Based on these projections, August military operations are expected to represent 9.3 percent of annual in 2009, 9.0 percent in 2010, and 8.8 percent in 2011. The peak month factor is then expected to hold constant at 8.8 percent through 2028.

According to sources at Boeing, the test flights will primarily occur on weekdays unless there is a need to postpone the flights to the weekend due to weather. This results in a projected PMAWD ratio of four percent through 2028.

According to sources at Boeing, the fighter jet test flights are most likely to occur at 10:00 and 14:00. It is unlikely that there will be more than one military operation in any given time period throughout the planning horizon.

3.8.2.5 Peak Period Operations Summary

Table 3.8-3, *Derivative Forecasts – Aircraft Operations* provides a summary of the annual, monthly, PMAWD, and peak hour aircraft operations forecasts.

The total operations peak hour will grow from 66 operations in 2008 to 78 operations in 2028, mainly driven by the domestic passenger operations peak. The cargo operations peak hour will increase from four movements in 2008 to five

in 2028. Civil operations are expected gain an additional three operations in the peak hour by 2028. Military peak hour operations will drop to one in 2009 and remain at this level in through 2028.

It is worth noting that the peak hour for individual categories of aircraft operations does not necessarily occur in the same hour. As a result, the peak hour operations for the various categories of operations cannot be aggregated across categories.

Table 3.8-3
DERIVATIVE FORECASTS – AIRCRAFT OPERATIONS
Lambert-St. Louis International Airport

Annual

		Domestic Passenger		International Passenger		Commercial				
	Calendar Year	Air Carrier Operations	Commuter Operations	Air Carrier Operations	Commuter Operations	Passenger Operations	All-Cargo Operations	Civil Operations	Military Operations	Total Operations
Base	2008	107,030	112,052	1,086	1,242	221,410	3,186	20,860	2,941	248,397
Forecast	2013	109,800	111,000	1,520	1,620	223,940	3,190	23,800	1,000	251,930
	2018	120,600	120,400	2,040	1,900	244,940	3,330	27,500	1,000	276,770
	2023	131,000	128,200	2,460	1,980	263,640	3,490	28,900	1,000	297,030
	2028	141,800	136,400	2,860	2,020	283,080	3,730	30,500	1,000	318,310

Peak Month

		Domestic Passenger		International Passenger		Commercial				
	Calendar Year	Air Carrier Operations	Commuter Operations	Air Carrier Operations	Commuter Operations	Passenger Operations	All-Cargo Operations	Civil Operations	Military Operations	Total Operations
Base	2008	9,558	9,548	218	120	19,444	238	1,836	260	21,778
Forecast	2013	9,662	9,330	230	150	19,372	238	2,094	88	21,792
	2018	10,612	10,120	278	176	21,186	248	2,420	88	23,942
	2023	11,526	10,774	300	184	22,784	260	2,544	88	25,676
	2028	12,476	11,464	314	188	24,442	278	2,684	88	27,492

Peak Month Average Week Day

		Domestic Passenger		International Passenger		Commercial				
	Calendar Year	Air Carrier Operations	Commuter Operations	Air Carrier Operations	Commuter Operations	Passenger Operations	All-Cargo Operations	Civil Operations	Military Operations	Total Operations
Base	2008	330	326	6	4	666	10	70	10	756
Forecast	2013	328	318	8	4	658	10	80	4	752
	2018	362	344	8	6	720	12	92	4	828
	2023	394	366	10	6	776	12	96	4	888
	2028	426	388	10	6	830	12	102	4	948

Peak Hour

		Domestic Passenger		International Passenger		Commercial				
	Calendar Year	Air Carrier Operations	Commuter Operations	Air Carrier Operations	Commuter Operations	Passenger Operations	All-Cargo Operations	Civil Operations	Military Operations	Total Operations
Base	2008	28	36	2	2	58	4	7	4	66
Forecast	2013	28	35	2	2	57	4	8	1	62
	2018	31	38	2	2	63	4	9	1	68
	2023	33	40	2	2	68	5	10	1	73
	2028	36	43	3	2	73	5	10	1	78

Note: Peak hour operations for each segment of activity represent the peak hour for that component of activity. The peak hours for the various types of activity do not necessarily occur at the same hour.

Source: Landrum & Brown analysis, 2011

3.9 FAA FORECAST REVIEW TABLES

In order to facilitate the forecast review process the FAA has developed template tables to compare the forecasts developed for the Master Plan Update with the FAA's Terminal Area Forecast. As discussed in section 2.8, the FAA publishes a Terminal Area Forecast annually for STL. At the time of developing the forecasts for the Master Plan Update the 2008 FAA Terminal Area Forecast served as the basis for comparison.

Table 3.9-1, *Aviation Forecasts Versus FAA 2008 TAF* provides a comparison of this Master Plan forecasts with the FAA 2008 TAF for enplanements, commercial operations, and total aircraft operations for the 5, 10, and 15-year horizons. The Master Plan forecast is within 10 percent of the 2008 TAF in each planning horizon for both enplanements and aircraft operations. The Master Plan total based aircraft forecast is significantly lower than the current version of the FAA TAF which does not reflect the reduction in military based aircraft due to the Air National Guard leaving STL in 2009.

Table 3.9-2, *Master Plan Update Forecast Summary* provides a more detailed summary of the forecast developed for the Master Plan Update using the FAA's Appendix B template. Also added to the template are existing and forecast annual operations for the existing/current design aircraft and future design aircraft. The data shown in the FAA template is for the 15-year period from the 2008 base year through 2023. The full forecast horizon for the Master Plan is the twenty year period ended 2028. The existing critical design aircraft (McDonald Douglas DC-10-30/40) currently exceeds 500 or more annual itinerant operations a year. Recognizing the Airport's role in facilitating economic growth, the critical design aircraft for future planning purposes of this Master Plan is the Boeing 747-400, which will align with ongoing discussions between civic leaders in the greater St. Louis area and business leaders and freight operators from the People's Republic of China.

Table 3.9-1
AVIATION FORECASTS VERSUS FAA 2008 TAF
Lambert-St. Louis International Airport

	Year	Master Plan Forecast	2008 TAF [4]	Percent Difference
Passenger Enplanements				
Base Yr.	2008	7,207,890	6,984,154	3.2%
Base Yr.+5 Yrs.	2013	7,448,400	7,080,612	5.2%
Base Yr.+10 Yrs.	2018	8,304,900	8,127,042	2.2%
Base Yr.+15 Yrs.	2023	9,077,800	9,331,255	-2.7%
Commercial Operations [1]				
Base Yr.	2008	224,596	241,314	-6.9%
Base Yr.+5 Yrs.	2013	227,130	224,860	1.0%
Base Yr.+10 Yrs.	2018	248,270	244,598	1.5%
Base Yr.+15 Yrs.	2023	267,130	266,084	0.4%
Total Operations [2]				
Base Yr.	2008	248,397	255,893	-2.9%
Base Yr.+5 Yrs.	2013	251,930	239,754	5.1%
Base Yr.+10 Yrs.	2018	276,770	260,447	6.3%
Base Yr.+15 Yrs.	2023	297,030	282,927	5.0%
Based Aircraft [3]				
Base Yr.	2008	35	35	0.0%
Base Yr.+5 Yrs.	2013	21	33	-36.4%
Base Yr.+10 Yrs.	2018	24	31	-22.6%
Base Yr.+15 Yrs.	2023	25	29	-13.8%

Notes:
1 Air taxi operations are included in the commercial operations totals for the TAF. The Master Plan forecast groups air taxi operations in the non-commercial category.
2 Excludes overflights.
3 Includes both civil and military based aircraft.
4 Data shown for the FAA 2008 TAF is presented on a fiscal year basis (12 months ended September).

Sources: FAA 2008 Terminal Area Forecast; Airport Records; Landrum & Brown analysis, 2011

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE 3.9-2
MASTER PLAN UPDATE FORECAST SUMMARY
Lambert-St. Louis International Airport

	2008	2009	2013	2018	2023	CAGR			
	Base Yr. Level	Base Yr.+1 Yr.	Base Yr.+5 Yrs.	Base Yr.+10 Yrs.	Base Yr.+15 Yrs.	Base Yr. to +1	Base Yr. to +5	Base Yr. to +10	Base Yr. to +15
Passenger Enplanements									
Air Carrier	5,715,390	5,150,100	5,983,700	6,794,200	7,506,900	-9.9%	0.9%	1.7%	1.8%
Commuter	1,492,500	1,225,500	1,429,000	1,510,700	1,570,900	-17.9%	-0.9%	0.1%	0.3%
Total	7,207,890	6,375,600	7,412,700	8,304,900	9,077,800	-11.5%	0.6%	1.4%	1.5%
Operations [1/]									
Itinerant									
Air Carrier	125,315	114,913	133,710	151,170	167,550	-8.3%	1.3%	1.9%	2.0%
Commuter	99,281	81,507	92,620	97,100	99,580	-17.9%	-1.4%	-0.2%	0.0%
Total Commercial Operations	224,596	196,420	226,330	248,270	267,130	-12.5%	0.2%	1.0%	1.2%
Air Taxi/General Aviation	20,691	18,800	23,600	27,300	28,700	-9.1%	2.7%	2.8%	2.2%
Military	2,352	500	-	-	-	n.a.	n.a.	n.a.	n.a.
Local									
General Aviation	169	200	200	200	200	18.3%	3.4%	1.7%	1.1%
Military	589	1,000	1,000	1,000	1,000	69.8%	11.2%	5.4%	3.6%
Total Operations	248,397	216,920	251,130	276,770	297,030	-12.7%	0.2%	1.1%	1.2%
Operations by Design Aircraft									
Existing Design (DC-10)	801	805	822	846	884	n.a.	n.a.	n.a.	n.a.
Future Design (B747-400)[2]	-	-	-	-	-	n.a.	n.a.	n.a.	n.a.
Instrument Operations	246,040	214,862	248,730	274,370	294,630	-12.7%	0.2%	1.1%	1.2%
Peak Hour Operations	66	53	62	68	73	-19.7%	-1.2%	0.3%	0.7%
Cargo/Mail (enplaned+deplaned tonnes)	81,080	72,970	82,840	95,010	106,460	-10.0%	0.4%	1.6%	1.8%
Based Aircraft									
Single Engine (non-jet)	1	1	1	1	1	0.0%	0.0%	0.0%	0.0%
Multi Engine (non-jet)	7	7	8	9	9	0.0%	2.7%	2.5%	1.7%
Jet Engine	10	9	12	14	15	-10.0%	3.7%	3.4%	2.7%
Helicopter	-	-	-	-	-	n.a.	n.a.	n.a.	n.a.
Air National Guard	17	-	-	-	-	n.a.	n.a.	n.a.	n.a.
Total	35	17	21	24	25	-51.4%	-9.7%	-3.7%	-2.2%

B. Operational Factors

	2008	2009	2013	2018	2023
	Base Yr. Level	Base Yr.+1 Yr.	Base Yr.+5 Yrs.	Base Yr.+10 Yrs.	Base Yr.+15 Yrs.
Average Aircraft Size (seats)					
Air Carrier	133.1	128.1	129.2	128.4	126.8
Commuter	43.6	44.2	45.1	44.9	44.9
Average Enplaning Load Factors					
Air Carrier	70.3%	71.7%	71.0%	71.6%	72.2%
Commuter	68.9%	68.0%	68.4%	69.3%	70.3%
GA Ops. per Based Aircraft (exc. Military)	1,159	1,159	1,159	1,159	1,159

Note: 1 The air carrier/commuter split based on the FAA 60-seat definition for comparison purposes with the FAA Terminal Area Forecasts; itinerant commercial operations include both passenger and all-cargo operations; itinerant civil operations include non-commercial air taxi and general aviation activity. All design aircraft operations are assumed to be itinerant. Excludes overflights.

2 The critical design aircraft for future planning purposes of this Master Plan is the Boeing 747-400, which aligns with ongoing discussions between civic leaders in the greater St. Louis area and business leaders and freight operators from the People's Republic of China.

Sources: USDOT, Schedule T-100; *Official Airline Guide*; FAA Air Traffic Activity Data System (ATADS); Airport Records; Landrum & Brown analysis, 2011

THIS PAGE INTENTIONALLY LEFT BLANK