

### 3. Aviation Activity Forecasts

This section presents a discussion of historical aviation activity and trends at the Airport between 2002 and 2012 and summarizes the forecasts of aviation activity for the Airport from 2013 through 2032 (the end of the planning period for the Master Plan Update). Forecasts were developed for enplaned passengers, air carrier and regional/commuter aircraft operations, general aviation and based aircraft activity, and projections were developed for the aircraft fleet mix serving the Airport. The forecasts and projections provide the basis for determining facility requirements and for conducting the environmental, financial, and other analyses necessary in preparing the Airport Master Plan Update.

The forecasts were developed in 2013 using the City's Fiscal Year (FY) 2012 (October-September) as the base year, the latest fiscal year for which complete data were available at the time this Master Plan Update was initiated. The aviation activity forecasts presented in this section are based on assumptions about aviation activity in the Dallas-Fort Worth-Arlington MSA and other factors that may affect future aviation activity at the Airport, including:

- National aviation industry trends and factors affecting those trends, including events related to the economy, fuel cost changes, etc., over the past 10 years
- The changing role of the Airport in the Dallas -Fort Worth-Arlington MSA
- Historical activity and trends in airline and other services at the Airport, including comparisons with historical U.S. market shares
- Local socioeconomic and demographic trends compared with State of Texas and national trends

The forecasts represent potential activity at the Airport through the planning period. Actual activity may vary from the forecasts because of unforeseen events or changes in airline service at the Airport or competing airports. In addition, the way the airlines respond to changes in operating costs and demand adds further uncertainty to the forecasts. Therefore, the forecasts developed for this Master Plan Update, as described in this section, represent a range of possible, not necessarily actual, future airline and other activity at DAL.

The remainder of this section is organized as follows:

- Historical Aviation Activity and Trends
- Factors Affecting Aviation Activity

- Forecast Methodology Overview and Results
  - Enplaned passenger forecast
  - Aircraft operations and based aircraft forecast
  - Projected fleet mix
  - Peak activity forecast
  - Forecast comparisons

Southwest Airlines is the primary airline serving the Airport; Southwest Airlines considers Dallas one of its major focus cities. This Master Plan Update was developed as Airport management and the airlines serving DAL prepared for significant changes in air service enabled by the October 2014 repeal of the Wright Amendment, which placed significant restrictions on service from the Airport. Most restrictions, as discussed later in this section, were eliminated as of October 2014. Many of the characteristics of the Airport, from origin and destination (O&D) and connecting passenger flows to nonstop markets served and gate demand, are expected to change. These activity changes are reflected in the forecasts developed for this Master Plan Update, as discussed below.

## 3.1 Historical Aviation Activity and Trends

The Airport is classified as a medium-hub airport<sup>1</sup> by the FAA. As shown in **Table 3-1**, approximately 4.1 million passengers were enplaned and approximately 177,000 aircraft operations were conducted at the Airport in 2012.

Between 2002 and 2012, the number of enplaned passengers at DAL increased at a compound annual growth rate (CAGR) of 3.8 percent, including 6.8 percent average annual growth between 2002 and 2007. Between 2007 and 2012, the number of enplaned passengers increased at a CAGR of 0.8 percent. In comparison, the number of enplaned passengers at DFW increased at a CAGR of 1.0 percent between 2002 and 2012, but decreased at a CAGR of 0.5 percent between 2007 and 2012. **Table 3-2** shows historical enplaned passenger activity at the two Dallas commercial passenger airports between 2002 and 2012. The Airport's share of the region's total enplaned passengers decreased from 9.7 percent in 2002 to a low of 8.9 percent in 2004, but has accounted for more than 12.0 percent of the region's passengers since 2008.

<sup>1</sup> As defined by the FAA, a medium hub airport enplanes at least 0.25 percent but less than 1.0 percent of nationwide enplaned passengers during a calendar year. This percentage range of nationwide enplaned passengers equates to 1.9 million to 6.2 million enplaned passengers in Calendar Year 2013, the latest calendar year for which data are available to determine airport hub size.

**Table 3-1: Historical Enplaned Passengers and Aircraft Operations**

<b>FISCAL YEAR<sup>1/</sup></b>	<b>ENPLANED PASSENGERS<sup>2/</sup></b>	<b>AIRCRAFT OPERATIONS</b>
2002	2,819,117	239,732
2003	2,781,153	239,901
2004	2,902,942	253,442
2005	2,975,332	235,899
2006	3,244,374	241,990
2007	3,910,527	247,334
2008	4,068,268	231,348
2009	3,871,687	176,977
2010	3,949,122	168,373
2011	4,017,673	178,056
2012	4,074,167	177,067
<b>Compound Annual Growth Rate</b>		
2002 - 2007	6.8%	0.6%
2007 - 2012	0.8%	-6.5%
2002 - 2012	3.8%	-3.0%

## NOTES:

1/ For Fiscal Years ended September 30.

2/ Because of limited detailed data, the numbers of enplaned passengers in 2004 and 2005 were estimated from total passenger data.

SOURCE: City of Dallas Department of Aviation, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-2: Historical Enplaned Passenger Comparison - Dallas Region Airports

FISCAL YEAR <sup>1/</sup>	LOVE FIELD <sup>2/</sup>	DALLAS LOVE FIELD SHARE OF REGION	DFW <sup>3/</sup>	DFW SHARE OF REGION	REGION TOTAL	TOTAL ANNUAL GROWTH RATE
2002	2,819,117	9.7%	26,378,648	90.3%	29,197,765	-
2003	2,781,153	9.5%	26,589,585	90.5%	29,370,738	0.6%
2004	2,902,942	8.9%	29,682,274	91.1%	32,585,216	10.9%
2005	2,975,332	9.1%	29,547,553	90.9%	32,522,885	-0.2%
2006	3,244,374	9.7%	30,072,115	90.3%	33,316,489	2.4%
2007	3,910,527	11.6%	29,852,240	88.4%	33,762,767	1.3%
2008	4,068,268	12.3%	29,037,818	87.7%	33,106,086	-1.9%
2009	3,871,687	12.2%	27,749,259	87.8%	31,620,946	-4.5%
2010	3,949,122	12.3%	28,187,848	87.7%	32,136,970	1.6%
2011	4,017,673	12.3%	28,684,597	87.7%	32,702,270	1.8%
2012	4,074,167	12.3%	29,161,041	87.7%	33,235,208	1.6%
<b>Compound Annual Growth Rate</b>						
2002 - 2007	6.8%		2.5%		2.9%	
2007 - 2012	0.8%		-0.5%		-0.3%	
2002 - 2012	3.8%		1.0%		1.3%	

## NOTES:

DFW = DALLAS/FORT WORTH INTERNATIONAL AIRPORT

1/ For Fiscal Years ended September 30.

2/ Because of limited detailed data, the numbers of enplaned passengers at Dallas Love Field in 2004 and 2005 were estimated from total passenger data.

3/ Because of limited detailed data, the numbers of enplaned passengers at Dallas/Fort Worth International Airport in 2002 through 2006 and 2011 were estimated from total passenger data.

SOURCES: City of Dallas Department of Aviation; Dallas/Fort Worth International Airport records; March 2013.

PREPARED BY: Ricondo &amp; Associates, Inc., March 2013.

DAL's enplaned passenger market share of total U.S. enplaned passengers increased between 2002 and 2012, as shown in **Table 3-3**. As noted above, the number of enplaned passengers at DAL increased an average of 3.8 percent per year between 2002 and 2012; the number of enplaned passengers in the nation increased an average of 1.5 percent per year over the same period.

**Table 3-3: Historical Enplaned Passengers Comparison – Dallas Love Field and United States**

FISCAL YEAR <sup>1/</sup>	DALLAS LOVE FIELD ENPLANED PASSENGERS <sup>2/</sup>	ANNUAL GROWTH RATE	U.S. TOTAL ENPLANED PASSENGERS	ANNUAL GROWTH RATE	LOVE FIELD SHARE OF U.S. TOTAL
2002	2,819,117	-	627,651,689	-	0.00449%
2003	2,781,153	-1.3%	643,224,649	2.5%	0.00432%
2004	2,902,942	4.4%	690,967,755	7.4%	0.00420%
2005	2,975,332	2.5%	733,406,048	6.1%	0.00406%
2006	3,244,374	9.0%	732,886,414	-0.1%	0.00443%
2007	3,910,527	20.5%	756,525,465	3.2%	0.00517%
2008	4,068,268	4.0%	747,466,798	-1.2%	0.00544%
2009	3,871,687	-4.8%	695,488,533	-7.0%	0.00557%
2010	3,949,122	2.0%	702,818,621	1.1%	0.00562%
2011	4,017,673	1.7%	721,387,972	2.6%	0.00557%
2012	4,074,167	1.4%	725,202,832 <sup>3/</sup>	0.5%	0.00562%
<b>Compound Annual Growth Rate</b>					
2002 - 2007	6.8%		3.8%		
2007 - 2012	0.8%		-0.8%		
2002 - 2012	3.8%		1.5%		

NOTES:

1/ For Fiscal Years ended September 30.

2/ Because of limited detailed data, the numbers of enplaned passengers at Dallas Love Field in 2004 and 2005 were estimated from total passenger data.

3/ 2012 U.S. total enplaned passengers forecast.

SOURCES: City of Dallas Department of Aviation; FAA *Terminal Area Forecast FY 2012-2040*, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

As of July 2013, four commercial airlines served the Airport, including one mainline airline and three regional/commuter airlines. Regional/commuter airline passengers account for a small share of total passengers at the Airport – approximately 2.5 percent in 2012 – because of the dominance of Southwest Airlines, which does not affiliate with regional airlines.

**Table 3-4** presents enplaned passengers by the scheduled airlines serving the Airport between 2008 and 2012. Southwest Airlines' enplaned passenger share of Airport passengers increased from 94.7 percent in 2008 to 97.5 percent in 2012. No other airline or airline group accounted for more than 3.3 percent of enplaned passengers in the years shown in the table. As presented in **Table 3-5**, the passenger airlines serving the Airport provided nonstop service to 21 destinations in 2013 compared with 17 destinations in 2008.

Southwest Airlines has been the dominant airline at DAL since 1971 when the airline initiated service at the Airport. In July 2013, Southwest Airlines was scheduled to operate approximately 121 daily departures from the Airport to 18 nonstop destinations, as shown in Table 3-5.

Airlines operating at the Airport primarily serve O&D passengers (consisting of enplaned and deplaned passengers) traveling to and from short- and medium-haul destinations, although the number of connecting passengers has been increasing in recent years. O&D passengers consist of local residents and visitors who begin and end their trips at the Airport. As shown in **Table 3-6**, 850,296 O&D passengers – or nearly 15 percent of the Airport's O&D passengers – traveled between DAL and Houston in 2012. **Table 3-7** lists originating (i.e., enplaned passengers beginning their trips at Dallas Love Field) and connecting passenger percentages at the Airport in 2002 through 2012. According to the U.S. DOT's *Origin-Destination Passenger Survey*, in 2012, approximately 70 percent of the passengers at the Airport were classified as O&D, a decrease from approximately 81 percent O&D passengers in 2002. The number of originating passengers at the Airport increased from 2.3 million in 2002 to 2.8 million in 2012, at a CAGR of 2.0 percent. During the same period, the number of connecting passengers increased from 0.5 million to 1.3 million, at a CAGR of 9.1 percent.

**Table 3-4: Historical Enplaned Passengers at Dallas Love Field by Airline**

AIRLINE	FISCAL YEAR <sup>1/</sup>					2012 AIRPORT SHARE
	2008	2009	2010	2011	2012	
Southwest Airlines	3,853,325	3,722,812	3,823,138	3,916,851	3,973,171	97.5%
United Airlines Affiliates <sup>2/</sup>	135,146	102,828	90,891	61,905	68,715	1.7%
Delta Air Lines Affiliates	-	9,662	35,093	38,365	29,442	0.7%
SeaPort Airlines	-	-	-	552	2,839	0.1%
American Airlines Affiliates	79,797	36,385	-	-	-	-
<b>Total</b>	<b>4,068,268</b>	<b>3,871,687</b>	<b>3,949,122</b>	<b>4,017,673</b>	<b>4,074,167</b>	<b>100.0%</b>

NOTES:

1/ For Fiscal Years ended September 30.

2/ Continental Airlines merged with United Airlines and the FAA granted a single operating certificate to United on November 30, 2011. All data for United include data for Continental affiliates.

SOURCE: City of Dallas Department of Aviation, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-5: Scheduled Nonstop Passenger Service from Dallas Love Field in July 2013

MARKET	AVERAGE DAILY NONSTOP DEPARTURES	NUMBER OF AIRLINES	OPERATING AIRLINE
Albuquerque	7	1	Southwest
Amarillo	5	1	Southwest
Atlanta	5	1	Delta
Austin	11	1	Southwest
Birmingham	3	1	Southwest
Branson	1	1	Southwest
El Dorado	2	1	SeaPort
El Paso	6	1	Southwest
Harlingen	2	1	Southwest
Hot Springs	1	1	SeaPort
Houston <sup>1/</sup>	29	2	Southwest - 23 (HOU), United (SkyWest) - 6 (IAH)
Kansas City	8	1	Southwest
Little Rock	5	1	Southwest
Lubbock	6	1	Southwest
Midland	5	1	Southwest
New Orleans	8	1	Southwest
Oklahoma City	4	1	Southwest
San Antonio	12	1	Southwest
St. Louis	8	1	Southwest
Tulsa	5	1	Southwest
Wichita	2	1	Southwest
<b>Total</b>	<b>135</b>		

## NOTE:

1/ Includes William P. Hobby Airport (HOU) and Bush Intercontinental Airport/Houston (IAH).

SOURCE: Diao LLC, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-6: Top 20 Origin and Destination Passenger Markets for Dallas Love Field in 2012

RANK	MARKET	TOTAL O&D PASSENGERS	AVERAGE FARE	NONSTOP SERVICE <sup>1/</sup>
1	Houston <sup>2/</sup>	850,296	\$125	•
2	San Antonio	404,915	\$114	•
3	New Orleans	270,627	\$131	•
4	Austin	266,775	\$127	•
5	Kansas City	237,638	\$127	•
6	St. Louis	201,468	\$151	•
7	Midland	191,545	\$95	•
8	El Paso	181,840	\$144	•
9	Lubbock	176,219	\$100	•
10	Albuquerque	165,086	\$137	•
11	Amarillo	158,786	\$90	•
12	Chicago <sup>3/</sup>	148,984	\$131	
13	Las Vegas	145,929	\$152	
14	Tulsa	133,889	\$93	•
15	Little Rock	127,536	\$101	•
16	Denver	124,885	\$140	
17	Phoenix	120,359	\$163	
18	Los Angeles	115,344	\$139	
19	Orlando	107,865	\$143	
20	Baltimore	106,909	\$172	
Total Top 20 Markets		4,236,895		
Other O&D Markets		1,374,188		
Total O&D Passengers/Average Airfare		5,611,083	\$134	

## NOTES:

1/ Nonstop service as of July 2013.

2/ Includes William P. Hobby Airport (HOU) and Bush Intercontinental Airport/Houston (IAH).

3/ Includes Chicago Midway and Chicago O'Hare International Airports.

SOURCE: Diio LLC, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.



**Table 3-7: Historical Originating and Connecting Passengers at Dallas Love Field**

FISCAL YEAR <sup>1/</sup>	ORIGINATING	SHARE OF ORIGINATING	CONNECTING	SHARE OF CONNECTING	TOTAL <sup>2/</sup>
2002	2,287,729	81.2%	531,388	18.8%	2,819,117
2003	2,224,274	80.0%	556,879	20.0%	2,781,153
2004	2,209,793	76.1%	693,149	23.9%	2,902,942
2005	2,238,931	75.2%	736,401	24.8%	2,975,332
2006	2,578,851	79.5%	665,523	20.5%	3,244,374
2007	3,080,215	78.8%	830,312	21.2%	3,910,527
2008	3,143,116	77.3%	925,152	22.7%	4,068,268
2009	2,635,446	68.1%	1,236,241	31.9%	3,871,687
2010	2,664,002	67.5%	1,285,120	32.5%	3,949,122
2011	2,685,785	66.8%	1,331,888	33.2%	4,017,673
2012	2,802,275	68.8%	1,271,892	31.2%	4,074,167
<b>Compound Annual Growth Rate</b>					
2002 - 2007	6.1%		9.3%		6.8%
2007 - 2012	-1.9%		8.9%		0.8%
2002 - 2012	2.0%		9.1%		3.8%

## NOTES:

1/ For Fiscal Years ended September 30.

2/ The numbers of enplaned passengers in 2004 and 2005 were estimated from total passenger data.

SOURCE: Diiio LLC, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

It should be noted that the approximately 30 percent connecting passenger share at DAL in 2012 compares with an approximately 60 percent connecting passenger share at DFW. Numbers of connecting passengers are heavily influenced by airline scheduling and route strategies.

**Table 3-8** presents historical aircraft operations (landings and takeoffs) at the Airport in 2002 through 2012. Operations in each category of activity (mainline, regional/commuter, all-cargo, other air carrier/air taxi, general aviation, and military) fluctuated from year to year. Overall, the number of aircraft operations at the Airport decreased at a CAGR of 3.0 percent between 2002 and 2012. General aviation operations were the primary factor in the decrease in overall aircraft operations at DAL. The number of air carrier (mainline) passenger airline aircraft operations remained relatively flat between 2002 and 2012, with a low of 77,626 in 2005 and a high of 91,734 in 2008. The number of regional/commuter airline aircraft operations increased at a CAGR of 2.2 percent over the same period; however, operations by the regional/commuter airlines

fluctuated greatly over the historical period. Following the 2008 peak at DAL, the number of passenger airline aircraft operations decreased more than 13 percent overall.

**Table 3-8: Historical Aircraft Operations**

FISCAL YEAR	PASSENGER AIRLINES			ALL-CARGO	OTHER AIR CARRIER/AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
	MAINLINE (AIR CARRIER)	REGIONAL/COMMUTER	TOTAL					
2002	83,944	7,652	91,596	52	35,647	110,399	2,038	239,732
2003	82,480	6,416	88,896	1,540	35,877	111,984	1,604	239,901
2004	82,996	5,262	88,258	1,601	40,156	121,474	1,953	253,442
2005	77,626	6,538	84,164	1,632	39,861	107,774	2,468	235,899
2006	80,526	11,988	92,514	1,734	37,719	107,220	2,803	241,990
2007	87,768	17,990	105,758	1,111	39,976	97,991	2,498	247,334
2008	91,734	16,760	108,494	1,260	40,572	78,767	2,255	231,348
2009	88,488	9,116	97,604	208	22,276	55,420	1,469	176,977
2010	85,318	6,758	92,076	88	21,325	53,795	1,089	168,373
2011	84,110	7,398	91,508	82	23,801	61,578	1,087	178,056
2012	84,232	9,502	93,734	94	25,936	55,807	1,496	177,067
<b>Compound Annual Growth Rate</b>								
2002 - 2007	0.9%	18.6%	2.9%	84.5%	2.3%	-2.4%	4.2%	0.6%
2007 - 2012	-0.8%	-12.0%	-2.4%	-39.0%	-8.3%	-10.6%	-9.7%	-6.5%
2002 - 2012	0.0%	2.2%	0.2%	6.1%	-3.1%	-6.6%	-3.0%	-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

**Table 3-9** presents the passenger airline aircraft operations at DAL from 2008 through 2012. Overall, passenger airline aircraft operations decreased from 108,494 in 2008 to 93,734 in 2012. Southwest Airlines had an 89.7 percent share of the total, with 84,122 operations in 2012. United Airlines affiliates followed with a 6.5 percent market share in 2012. **Table 3-10** presents the passenger airline aircraft operations by mainline and regional/commuter airlines, with mainline operations accounting for approximately 90 percent of total passenger airline aircraft operations and total mainline and regional/commuter airline aircraft operations accounting for more than 50 percent of total aircraft operations at the Airport. The total passenger airline share of DAL aircraft operations increased from 38.2 percent in 2002 to 52.9 percent in 2012, primarily as a result of the significant decrease in general aviation aircraft operations at the Airport.

**Table 3-9: Historical Passenger Airline Aircraft Operations**

AIRLINE	FISCAL YEAR <sup>1/</sup>					2012 SHARE OF TOTAL
	2008	2009	2010	2011	2012	
Southwest Airlines	91,608	88,396	85,158	83,946	84,122	89.7%
United Airlines Affiliates <sup>2/</sup>	8,168	5,872	4,632	5,014	6,060	6.5%
SeaPort Airlines	-	-	-	394	1,830	2.0%
Delta Air Lines Affiliates	-	516	2,090	1,970	1,598	1.7%
American Airlines Affiliates	8,578	2,654	-	-	-	-
Other <sup>3/</sup>	140	166	196	184	124	0.1%
<b>Total</b>	<b>108,494</b>	<b>97,604</b>	<b>92,076</b>	<b>91,508</b>	<b>93,734</b>	<b>100.0%</b>

## NOTES:

1/ For Fiscal Years ended September 30.

2/ Continental merged with United and the FAA granted a single operating certificate to United on November 30, 2011. All data for United include data for Continental affiliates.

3/ Includes nonscheduled passenger airline aircraft operations.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo &amp; Associates, Inc., March 2013.

**Table 3-10: Historical Mainline and Regional/Commuter Passenger Airline Aircraft Operations**

FISCAL YEAR	PASSENGER AIRLINES						
	MAINLINE	SHARE OF PASSENGER AIRLINES	REGIONAL/COMMUTER	SHARE OF PASSENGER AIRLINES	TOTAL PASSENGER AIRLINES	SHARE OF AIRPORT TOTAL	AIRPORT TOTAL
2002	83,944	91.6%	7,652	8.4%	91,596	38.2%	239,732
2003	82,480	92.8%	6,416	7.2%	88,896	37.1%	239,901
2004	82,996	94.0%	5,262	6.0%	88,258	34.8%	253,442
2005	77,626	92.2%	6,538	7.8%	84,164	35.7%	235,899
2006	80,526	87.0%	11,988	13.0%	92,514	38.2%	241,990
2007	87,768	83.0%	17,990	17.0%	105,758	42.8%	247,334
2008	91,734	84.6%	16,760	15.4%	108,494	46.9%	231,348
2009	88,488	90.7%	9,116	9.3%	97,604	55.2%	176,977
2010	85,318	92.7%	6,758	7.3%	92,076	54.7%	168,373
2011	84,110	91.9%	7,398	8.1%	91,508	51.4%	178,056
2012	84,232	89.9%	9,502	10.1%	93,734	52.9%	177,067
<b>Compound Annual Growth Rate</b>							
2002 - 2007	0.9%		18.6%		2.9%		0.6%
2007 - 2012	-0.8%		-12.0%		-2.4%		-6.5%
2002 - 2012	0.0%		2.2%		0.2%		-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo &amp; Associates, Inc., March 2013.

All-cargo, other air carrier/air taxi, and general aviation aircraft operations at the Airport are shown in **Table 3-11**, **Table 3-12**, and **Table 3-13**, respectively. Historically, all-cargo aircraft operations at DAL have been provided by a number of nonscheduled all-cargo airlines. In 2003 through 2008, scheduled all-cargo airline service was provided by DHL (2003), Airborne Express (2003 – 2005), and ABX Air (2006 – 2008). Since ABX Air discontinued scheduled service, all-cargo aircraft operations at the Airport have been provided on a nonscheduled basis. Between 2002 and 2012, all-cargo airline aircraft operations increased at a CAGR of 6.1 percent and have historically accounted for less than 1.0 percent of total aircraft operations at the Airport. Other air carrier/air taxi operations include all operations flown for hire, not including scheduled commercial passenger airline aircraft operations. These operations decreased at a CAGR of 3.1 percent between 2002 and 2012. During that same period, nearly 100 percent of general aviation aircraft operations at the Airport were itinerant. Other air carrier/air taxi and general aviation operations accounted for nearly 15 percent and 32 percent, respectively, of total aircraft operations at the Airport in 2012. Military aircraft operations at the Airport decreased between 2002 and 2012, numbering 1,496 in 2012, and accounting for 0.8 percent of the Airport total (see **Table 3-14**).

**Table 3-11: Historical All-Cargo Airline Aircraft Operations**

FISCAL YEAR	ALL-CARGO AIRLINE AIRCRAFT OPERATIONS	SHARE OF AIRPORT TOTAL	AIRPORT TOTAL
2002	52	0.0%	239,732
2003	1,540	0.6%	239,901
2004	1,601	0.6%	253,442
2005	1,632	0.7%	235,899
2006	1,734	0.7%	241,990
2007	1,111	0.4%	247,334
2008	1,260	0.5%	231,348
2009	208	0.1%	176,977
2010	88	0.1%	168,373
2011	82	0.0%	178,056
2012	94	0.1%	177,067
<b>Compound Annual Growth Rate</b>			
2002 - 2007	84.5%		0.6%
2007 - 2012	-39.0%		-6.5%
2002 - 2012	6.1%		-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System, U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

**Table 3-12: Historical Other Air Carrier/Air Taxi Aircraft Operations**

<b>FISCAL YEAR</b>	<b>OTHER AIR CARRIER/ AIR TAXI AIRCRAFT OPERATIONS</b>	<b>SHARE OF AIRPORT TOTAL</b>	<b>AIRPORT TOTAL</b>
2002	35,647	14.9%	239,732
2003	35,877	15.0%	239,901
2004	40,156	15.8%	253,442
2005	39,861	16.9%	235,899
2006	37,719	15.6%	241,990
2007	39,976	16.2%	247,334
2008	40,572	17.5%	231,348
2009	22,276	12.6%	176,977
2010	21,325	12.7%	168,373
2011	23,801	13.4%	178,056
2012	25,936	14.6%	177,067
<b>Compound Annual Growth Rate</b>			
2002 - 2007	2.3%		0.6%
2007 - 2012	-8.3%		-6.5%
2002 - 2012	-3.1%		-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-13: Historical General Aviation Aircraft Operations

FISCAL YEAR	ITINERANT OPERATIONS	ITINERANT SHARE	LOCAL OPERATIONS	LOCAL SHARE	TOTAL	GENERAL AVIATION SHARE OF AIRPORT TOTAL	AIRPORT TOTAL
2002	110,251	99.9%	148	0.1%	110,399	46.1%	239,732
2003	111,984	100.0%	0	0.0%	111,984	46.7%	239,901
2004	121,474	100.0%	0	0.0%	121,474	47.9%	253,442
2005	107,740	100.0%	34	0.0%	107,774	45.7%	235,899
2006	107,219	100.0%	1	0.0%	107,220	44.3%	241,990
2007	97,731	99.7%	260	0.3%	97,991	39.6%	247,334
2008	78,761	100.0%	6	0.0%	78,767	34.0%	231,348
2009	55,420	100.0%	0	0.0%	55,420	31.3%	176,977
2010	53,795	100.0%	0	0.0%	53,795	31.9%	168,373
2011	61,576	100.0%	2	0.0%	61,578	34.6%	178,056
2012	55,807	100.0%	0	0.0%	55,807	31.5%	177,067
<b>Compound Annual Growth Rate</b>							
2002 - 2007	-2.4%		11.9%		-2.4%		0.6%
2007 - 2012	-10.6%		-100.0%		-10.6%		-6.5%
2002 - 2012	-6.6%		-100.0%		-6.6%		-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-14: Historical Military Aircraft Operations

FISCAL YEAR	ITINERANT OPERATIONS	ITINERANT SHARE	LOCAL OPERATIONS	LOCAL SHARE	TOTAL	MILITARY SHARE OF AIRPORT TOTAL	AIRPORT TOTAL
2002	1,981	97.2%	57	2.8%	2,038	0.9%	239,732
2003	1,604	100.0%	0	0.0%	1,604	0.7%	239,901
2004	1,953	100.0%	0	0.0%	1,953	0.8%	253,442
2005	2,468	100.0%	0	0.0%	2,468	1.0%	235,899
2006	2,803	100.0%	0	0.0%	2,803	1.2%	241,990
2007	2,491	99.7%	7	0.3%	2,498	1.0%	247,334
2008	2,255	100.0%	0	0.0%	2,255	1.0%	231,348
2009	1,469	100.0%	0	0.0%	1,469	0.8%	176,977
2010	1,089	100.0%	0	0.0%	1,089	0.6%	168,373
2011	1,087	100.0%	0	0.0%	1,087	0.6%	178,056
2012	1,495	99.9%	1	0.1%	1,496	0.8%	177,067
<b>Compound Annual Growth Rate</b>							
2002 - 2007	4.7%		-34.3%		4.2%		0.6%
2007 - 2012	-9.7%		-32.2%		-9.7%		-6.5%
2002 - 2012	-2.8%		-33.3%		-3.0%		-3.0%

NOTE: For Fiscal Years ended September 30.

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

In 2012, 778 aircraft were based at the Airport, as summarized in **Table 3-15**. Between 2002 and 2012, the number of based aircraft increased at a CAGR of 4.0 percent, led by an increase in single-engine and jet aircraft. Jet aircraft accounted for 745 of the 778 based aircraft at the Airport in 2012 (95.8 percent). The number of multi-engine (piston and turboprop) aircraft based at the Airport decreased by a CAGR of 18.2 percent between 2002 and 2012.

**Table 3-15: Historical Based Aircraft**

FISCAL YEAR <sup>1/</sup>	SINGLE-ENGINE	MULTI-ENGINE	JET <sup>2/</sup>	HELICOPTER	TOTAL
2002	16	30	472	7	525
2003	15	29	479	6	529
2004	11	62	522	7	602
2005	11	62	522	7	602
2006	20	24	577	6	627
2007	20	24	577	6	627
2008	32	53	649	6	740
2009	31	29	669	8	737
2010	31	29	669	8	737
2011	22	4	734	7	767
2012 <sup>3/</sup>	22	4	745	7	778
<b>Compound Annual Growth Rate</b>					
2002 - 2007	4.6%	-4.4%	4.1%	-3.0%	3.6%
2007 - 2012	1.9%	-30.1%	5.2%	3.1%	4.4%
2002 - 2012	3.2%	-18.2%	4.7%	0.0%	4.0%

NOTES:

1/ For Fiscal Years ended September 30.

2/ Figures sourced from FAA TAF. Jet aircraft total likely includes a portion, if not all of Southwest's fleet.

3/ 2012 numbers are forecast.

SOURCE: FAA Terminal Area Forecast FY 2012-2040, March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

**Table 3-16** presents a comparison of average annual growth rates in activity at the Airport and in the nation between 2002 and 2012. Except for general aviation and total aircraft operations, growth rates in Airport activity between 2002 and 2012 were higher (in some cases, less negative) than those for the United States as a whole. In particular, growth in the numbers of enplaned passengers at the Airport averaged 3.8 percent annually versus 1.5 percent annual growth nationwide. Air carrier and air taxi operations at the Airport decreased at a CAGR of 0.6 percent compared with a CAGR decrease of 1.0 percent for the nation.



**Table 3-16: Historical Dallas Love Field and National Growth Rate Comparisons**

CATEGORY	COMPOUND ANNUAL GROWTH RATE (2002 - 2012)	
	LOVE FIELD	UNITED STATES
Enplaned Passengers	3.8%	1.5%
Air Carrier and Air Taxi Operations	-0.6%	-1.0%
General Aviation Operations	-6.6%	-2.0%
Total Aircraft Operations	-3.0%	-1.7%
Based Aircraft	4.0%	-1.5%

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; FAA *Terminal Area Forecast FY 2012-2040*; U.S. DOT T-100 database; accessed March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

## 3.2 Factors Affecting Aviation Activity

A number of factors affect aviation activity. On a national basis, aviation activity is closely tied to the economy. Each segment of the industry (commercial passenger airlines, general aviation, and air cargo) is affected by the strength or weakness of the economy. Airport activity is also affected by changes in the economy, although the effects vary depending on the type and size of the airport and the type of activity accommodated at the airport. Changes in the industry itself – including the introduction of new aircraft, airline and aviation business practices, and federal aviation policy – also affect aviation activity. The following subsections describe some of the aviation industry factors and other factors that influence aviation activity at the Airport.

### 3.2.1 AVIATION INDUSTRY FACTORS

Significant national and international events since 2001 have affected aviation activity at the Airport and elsewhere. Of the several factors that continue to affect the aviation industry and add uncertainty to the forecasts, the cost of aviation fuel, economic conditions, airport security, and the threat of terrorism are among the most significant and are discussed below.

#### 3.2.1.1 Cost of Aviation Fuel

The cost of fuel is one of the most significant factors affecting the airline industry today. In 2000, aviation (jet) fuel accounted for nearly 14 percent of airline industry operating expenses, making it the industry's second largest operating expense after labor. In 2008, jet fuel surpassed labor as the largest operating expense for the airlines, accounting for 30.6 percent of an airline's total operating costs, according to the industry group Airlines for America (formerly, the Air Transport Association of America), while labor accounted for 20.3 percent of the total. As oil prices decreased in the first quarter of 2009, airline fuel costs decreased and

labor once again became the airline industry's largest operating expense, accounting for 25.8 percent of total operating expenses in that year, while fuel accounted for 21.3 percent.

The average cost of jet fuel was \$0.82 per gallon in 2000 compared with \$2.95 per gallon in 2012, an increase of 260 percent. According to Airlines for America, every one-cent increase in the cost per gallon of jet fuel increases annual airline operating expenses by approximately \$190 million to \$200 million.

In March 2015, the average price of jet fuel was \$2.03 per gallon; however, airlines do not generally base capacity decisions based on short-term jet fuel prices due to the overall volatility of jet fuel prices. If jet fuel prices approach or surpass their mid-2008 peak (July's average price was \$3.84), aviation activity nationwide may be negatively impacted due to route reductions the airlines might make or higher ticket prices the airlines might impose in an attempt to remain profitable.

### 3.2.1.2 Economic Conditions

In addition to airline cost factors, the overall state of the economy affects the propensity to travel and, therefore, airline revenue. Because economic conditions are typically cyclical over time (over longer periods, average changes are more regular and predictable), trends can be identified from the balance of strong and weak economic years. However, when combined with uneven growth in the industry and at the Airport since 2000 (DAL annual growth rates in numbers of passengers have varied from -4.8 percent to 20.5 percent since 2002), changing economic conditions can affect the reliability of forecasts of aviation activity by reducing the correlation between economic results and airport activity.

### 3.2.1.3 Airport Security

The requirements and uncertainties related to airport security and the processes and procedures of the Department of Homeland Security (DHS) can affect the decision to, and the mode choice for, travel. With enactment of the Aviation and Transportation Security Act (ATSA) in November 2001, the Transportation Security Administration was created, followed by the Homeland Security Act (which created the DHS) in November 2002. The ATSA stipulates certain passenger, cargo, and baggage screening requirements, mandates security awareness programs for airport personnel, and mandates deployment of explosives detection devices. These security requirements have increased the time passengers spend in the terminal to reach aircraft gates as well as baggage checking decisions. Wait time expectations at a particular airport may affect the travel mode choice of passengers.

### 3.2.1.4 Threat of Terrorism

As has been the case since September 11, 2001, terrorist incidents against either domestic or world aviation during the planning period remains a risk to achieving the activity forecasts presented later in this section. Tighter security measures have restored the public's confidence in the integrity of U.S. and world aviation. Any terrorist incident related to aviation could have an immediate and significant effect on the demand for aviation services.

### 3.2.1.5 Summary

The cost of aviation fuel, unpredictable economic conditions, increasing airport security measures, and threats of terrorism could affect the assumptions underlying the forecasts and skew the results of the Master Plan Update forecasts. Given how these circumstances, along with other unforeseen airline business decisions (such as starting or stopping service in different markets, changes in aircraft fleets, and growth or reduction in capacity at the Airport), could also affect forecast variables, the DAL planning forecasts indicate possible rather than predictable results.

It is expected that, in the long term, the Airport will maintain its role as a medium-hub airport, serve domestic passengers only (on a nonstop basis; international passengers can connect through other U.S. airports). Given the strength of its economic base and leading socioeconomic indicators, the Dallas-Fort Worth-Arlington MSA will be able to support long-term growth in passenger demand at the Airport, with regional demand continuing to be predominantly served at the Airport, including nonstop travel to major medium- and long-haul domestic markets.

### 3.2.2 SOUTHWEST AIRLINES

Southwest Airlines has traditionally provided point-to-point service from strategic markets, operating at less congested, secondary airports in large metropolitan regions. By offering lower fares and operating under a model that promotes efficient use of aircraft and minimizes overall operating costs (e.g., common aircraft fleet), the airline has successfully captured market share and competes head-to-head with other major airlines.

The introduction of service by Southwest Airlines and other low-fare airlines in the last four decades has made airline travel generally more affordable and available to a wider number of people. In recent years, Southwest Airlines has developed a network of focus airports in strategic locations, including Baltimore, Chicago (Midway), Dallas (Love Field), Denver, Houston (Hobby), and Las Vegas. Southwest Airlines operates more centralized connecting route structures out of these airports, accommodating a high number of direct connecting passengers in addition to local O&D passengers. As Southwest Airlines' fleet has expanded into long-range Boeing 737-800 aircraft, the airline's ability to serve coast-to-coast and long-haul markets has expanded. It is anticipated that certain airports will naturally become focus locations for the airline. With improved terminal facilities, the Airport is strategically positioned (in terms of facilities and geographic location) to remain a key mid-continent focus airport for Southwest Airlines.

The acquisition of AirTran Airways by Southwest Airlines in 2011 should be noted. AirTran has not operated at the Airport and the combination of these airlines is not likely to significantly affect Southwest Airlines' operations at the Airport. With the acquisition, Southwest Airlines gained access to the world's busiest airport and AirTran's primary hub, Hartsfield-Jackson Atlanta International Airport.

### 3.2.3 THE WRIGHT AMENDMENT

Since the development of DFW, flights from Dallas Love Field have been restricted to nonstop flights to states adjacent to Texas (Alabama, Kansas, Mississippi, and Missouri were added later). These restrictions were included in the Wright Amendment, passed by the U.S. Congress in 1979 (subsequently amended in 1997, 2005, and 2006). As a consequence, Southwest Airlines, the primary airline serving DAL, has served

passengers who want to fly to states beyond these limits by routing them through other airports, such as William P. Hobby Airport in Houston or El Paso International Airport. In October 2014, the Wright Amendment has been repealed by Congress. At that time, flight stage lengths from DAL to points in the United States will not be restricted. Passengers desiring to fly beyond the old limits will no longer need to fly to intermediate airports, such as William P. Hobby Airport in Houston or El Paso International Airport. However, certain restrictions will be maintained, as set forth in the Wright Amendment Reform Act of 2006, including restrictions on nonstop flights to points outside the 50 United States and the District of Columbia, and a limit on the number of available gates at the Airport.

### 3.2.4 AIRLINE AIRCRAFT FLEET MIX

With a 90 percent market share at the Airport, Southwest Airlines dominates the aircraft fleet mix. Therefore, it is expected that the Boeing 737 will be the primary aircraft serving the Airport during the planning period. For other airlines serving DAL, it is expected that regional jets will be used for a significant portion of aircraft operations. Regional jets with 30 to 90 seats can efficiently serve traditional turboprop and small markets previously served using narrowbody aircraft with the passenger comfort and convenience associated with jet aircraft. Although demand for these jets escalated in the last two decades, the smaller 30-to-50-seat models are being phased out. Larger regional jets operate on routes up to 1,700 miles, allowing airlines to serve lighter-demand markets with passenger-preferred aircraft.

### 3.2.5 GENERAL AVIATION AND BASED AIRCRAFT, AND OTHER AIR TAXI AND MILITARY OPERATIONS

In its *Aerospace Forecasts FY 2013-2033*, the FAA notes that general aviation activity at U.S. airports with FAA or contract ATCTs increased 0.6 percent in 2012, reversing a decade-long downward trend. The changes have taken place primarily in the single-engine and multi-engine (non-jet) portions of the fleet, where aircraft purchase and maintenance, insurance, and fuel costs depress discretionary flying. These trends in non-jet aircraft operations are not expected to change in the near future.

### 3.2.6 AIR CARGO

Based on the *FAA Aerospace Forecast Fiscal Years 2013-2033* for the United States, total domestic and international air cargo revenue-ton-miles (RTMs) increased at a CAGR of 1.6 percent between 2000 and 2012, led by a CAGR of 3.9 percent in international cargo RTMs. Domestic freight/express RTMs decreased at a CAGR of 1.6 percent during this period.

As relatively low volumes of cargo and mail are handled at the Airport, changes in the air cargo industry, particularly as a result of new security requirements, are not anticipated to have a large effect on the airlines serving the Airport.

### 3.2.7 POLICY ISSUES

Following the repeal of the Wright Amendment, the role of Dallas Love Field will be primarily defined by natural market forces rather than specific mandates. Two exceptions are: (1) all-cargo aircraft operations will be accommodated primarily at DFW and other area airports, such as Fort Worth Alliance Airport, and (2) some

artificial constraints will still apply at the Airport, including restrictions on international flights and the number of available gates.

This Master Plan Update documents the facilities and services necessary to accommodate unconstrained aviation activity at the Airport through 2032. Airport facilities must be adequate to accommodate narrowbody aircraft operations (up to Boeing 737-800) to all domestic markets.

It is anticipated that the Airport will continue to serve as the Central Business District airport that provides O&D service to numerous domestic markets, as well as storage and support services for corporate aviation and fractional ownership customers.

### 3.2.8 SOCIOECONOMIC AND DEMOGRAPHIC TRENDS

Airport activity is sensitive to changes in local and national socioeconomic conditions. Barring other circumstances that may influence aviation demand, the strength of the national and local economies – measured by growth in population, per capita income, per capita retail sales, employment, and other economic indicators – typically correlates with the level of aviation activity at an airport. An airport located in a region with a strong economy will typically experience positive growth in aviation activity. The following subsections describe the socioeconomic and demographic trends in the Dallas-Fort Worth-Arlington MSA, which served as the basis for the aviation activity forecasts developed for this Master Plan Update.

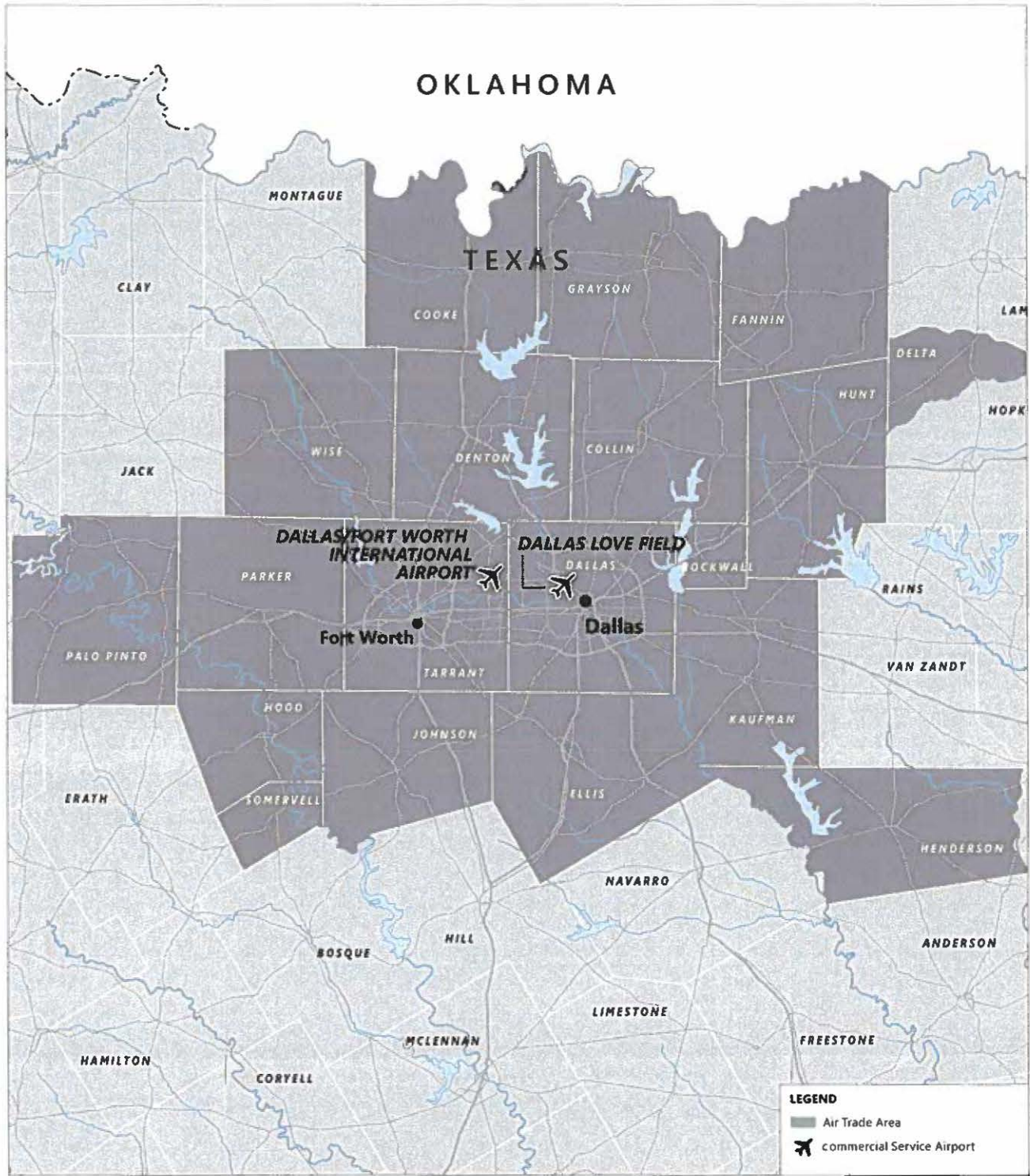
Data were included for the Dallas-Fort Worth-Arlington MSA, which includes Collin, Cooke, Dallas, Delta, Denton, Ellis, Fannin, Grayson, Henderson, Hood, Hunt, Johnson, Kaufman, Palo Pinto, Parker, Rockwall, Somervell, Tarrant, and Wise Counties. The City of Dallas lies in five counties: Collin, Dallas, Denton, Kaufman, and Rockwall. The Dallas-Fort Worth-Arlington MSA, which represents the air trade area – or the service region – for the Airport, is illustrated on **Exhibit 3-1**.

#### 3.2.8.1 Population and Household Trends

The population of the Dallas-Fort Worth-Arlington MSA increased at a faster rate than the population of the State of Texas and the nation, as shown in **Table 3-17**. With a population of 5.8 million in 2002, the MSA experienced 2.0 percent average annual growth through 2012, to 7.0 million. During the same period, the populations of Texas and the United States increased at averages of 1.9 percent and 0.9 percent per year, respectively. The fastest growing county during this period was Rockwall County, with 5.4 percent average annual growth, followed by Collin County, with 4.2 percent average annual growth, and Denton County, with 3.8 percent average annual growth. The population of the City of Dallas increased from 2.3 million in 2002 to 2.5 million in 2012, at a CAGR of 0.9 percent.

Table 3-17 summarizes population growth in the Dallas-Fort Worth-Arlington MSA from 2002 through 2012, and projections by Woods & Poole Economics, Inc. through 2032. The population of the Dallas-Fort Worth-Arlington MSA is projected to increase at a CAGR of 1.9 percent while the populations of Texas and the United States are projected to increase at CAGRs of 1.7 percent and 1.0 percent, respectively, between 2012 and 2032.

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Source: ESRI, Map Resources, 2007 (vector map graphics); Tricondo & Associates, Inc., November 2012; Woods and Poole, Inc. Prepared by Tricondo & Associates, Inc., March 2013

**Exhibit 3-1**



**Dallas-Forth Worth-Arlington Metropolitan Statistical Area**

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Table 3-17: Historical and Projected Dallas-Fort Worth-Arlington Metropolitan Statistical Area Population (in thousands)

CALENDAR YEAR	DALLAS-FORT WORTH-ARLINGTON MSA																UNITED STATES					
	COLLIN	COOKE	DALLAS	DELTA	DENTON	ELLIS	FANNIN	GRAYSON	HENDERSON	HOOD	HUNT	JOHNSON	KAUFMAN	PALO PINTO	PARMER	ROCKWALL		SOMERVELL	TARRANT	WISE	TEXAS	
2002	564	37	2,790	5	488	119	32	113	75	43	80	131	78	27	94	50	7	1,524	52	5,773	21,600	287,625
2003	589	38	2,246	5	510	123	32	114	76	44	81	136	81	27	97	53	7	1,553	54	5,869	22,031	290,108
2004	618	38	2,244	5	530	126	33	115	78	45	82	139	84	27	99	56	8	1,581	54	5,962	22,394	292,805
2005	647	38	2,251	5	554	130	33	116	78	46	83	141	87	28	102	60	8	1,612	56	6,074	22,778	295,517
2006	684	38	2,275	5	505	135	34	117	78	48	84	143	91	28	105	66	8	1,662	57	6,243	23,360	298,380
2007	714	38	2,292	5	609	140	34	118	78	49	84	145	96	28	109	71	8	1,707	57	6,383	23,832	301,231
2008	741	38	2,314	5	630	144	34	119	78	50	84	149	99	28	113	74	8	1,746	58	6,513	24,309	304,054
2009	766	38	2,346	5	650	147	34	120	78	51	85	151	102	28	116	77	8	1,784	59	6,646	24,802	306,772
2010	789	38	2,375	5	667	150	34	121	79	51	86	151	104	28	117	79	9	1,817	59	6,761	25,253	309,330
2011	812	38	2,416	5	686	153	34	123	79	52	87	153	105	28	118	81	8	1,850	60	6,887	25,675	311,592
2012	851	39	2,452	5	709	156	34	122	80	53	87	156	108	28	122	85	9	1,892	62	7,040	26,175	314,619
<b>Projected</b>																						
2017	1,047	41	2,635	5	803	174	35	127	85	59	89	175	132	28	140	103	9	2,049	72	7,819	28,727	330,673
2022	1,239	43	2,821	5	936	192	37	133	90	66	92	193	136	28	157	120	9	2,217	83	8,598	31,296	347,115
2032	1,629	47	3,199	5	1,165	224	39	148	100	79	96	231	165	29	193	156	10	2,558	108	10,170	36,491	380,231
<b>Compound Annual Growth Rate</b>																						
2002-2012	-4.7%	0.4%	0.9%	-0.3%	3.8%	2.8%	0.7%	0.8%	0.7%	2.0%	0.8%	1.6%	1.4%	0.4%	2.6%	3.4%	1.7%	2.1%	1.7%	2.0%	1.9%	0.9%
2012-2032	3.3%	0.9%	1.3%	0.0%	2.5%	1.9%	0.7%	0.8%	1.1%	2.0%	0.6%	2.0%	2.1%	0.2%	2.3%	3.1%	0.5%	1.5%	2.6%	1.9%	1.7%	1.0%

NOTES: Rows may not add to Dallas-Fort Worth-Arlington MSA total numbers shown because of rounding. Compounded annual growth rates are based on actual numbers and not based on rounded numbers shown. SOURCE: Woods & Poole-Economics, Inc., March 2013. PREPARED BY: Ricardo & Associates, Inc., March 2013.

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### 3.2.8.2 Employment and Income

The size and growth of its labor force are indications of the strength of a region's economic base. Between 2002 and 2012, employment increased significantly in the Dallas-Fort Worth-Arlington MSA, from 3.6 million to 4.2 million, at a CAGR of 1.8 percent, as shown in **Table 3-18**.

**Table 3-18: Historical and Projected Dallas-Fort Worth-Arlington Metropolitan Statistical Area Socioeconomic Factors**

CALENDAR YEAR	EMPLOYMENT (THOUSANDS)	INCOME (MILLIONS)	PER CAPITA PERSONAL INCOME
<b>Historical</b>			
2002	3,564	\$209,108	\$33,608
2003	3,564	\$210,824	\$34,002
2004	3,657	\$218,977	\$35,669
2005	3,773	\$230,017	\$37,867
2006	3,923	\$242,924	\$39,969
2007	4,065	\$252,599	\$41,749
2008	4,162	\$260,282	\$43,536
2009	4,082	\$242,714	\$39,811
2010	4,096	\$248,742	\$40,872
2011	4,176	\$259,471	\$42,869
2012	4,248	\$264,847	\$43,583
<b>Projected</b>			
2017	4,667	\$304,993	\$51,751
2022	5,126	\$356,838	\$64,661
2032	6,182	\$492,453	\$106,265
<b>Compound Annual Growth Rate</b>			
2002 - 2012	1.8%	2.4%	2.6%
2012 - 2032	1.9%	3.1%	4.6%

SOURCE: Woods & Poole Economics, Inc., March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Employment in the United States increased from 165.1 million jobs in 2002 to 177.1 million jobs in 2012, at a CAGR of 0.7 percent. Over the same period, employment in Texas increased from 12.3 million jobs to 14.8 million jobs, at a CAGR of 1.9 percent. Over the planning period, employment in the Dallas-Fort Worth-

Arlington MSA, Texas, and the United States is projected to increase at CAGRs of 1.9 percent, 1.8 percent, and 1.3 percent, respectively.

Per capita personal income in the Dallas-Fort Worth-Arlington MSA increased at a CAGR of 2.6 percent between 2002 and 2012 compared with CAGRs of 3.4 percent in Texas and 3.1 percent in the United States.

### 3.2.8.3 Dallas-Fort Worth-Arlington MSA Gross Domestic Product

Overall, the gross domestic product (GDP) in the Dallas-Fort Worth-Arlington MSA and Texas is projected to increase at a comparable rate as that of Texas throughout the planning period and to continue exceeding GDP growth in the United States, as shown in **Table 3-19**. Between 2002 and 2012, the Dallas-Fort Worth-Arlington MSA GDP increased at a CAGR of 1.9 percent, while the Texas GDP increased at a CAGR of 2.5 percent and the U.S. GDP increased at a CAGR of 1.3 percent. Through 2032, GDP is projected to increase at CAGRs of 2.9 percent in the Dallas-Fort Worth-Arlington MSA and Texas and 2.3 percent in the United States.

**Table 3-19: Historical and Projected Gross Domestic Product Comparison (in millions)**

CALENDAR YEAR	DALLAS-FORT WORTH-ARLINGTON MSA	TEXAS	UNITED STATES
<b>Historical</b>			
2002	\$276,268	\$843,713	\$11,395,361
2003	\$280,080	\$871,019	\$11,692,437
2004	\$298,038	\$930,467	\$12,123,442
2005	\$308,140	\$968,553	\$12,539,116
2006	\$323,684	\$1,026,463	\$12,936,968
2007	\$339,647	\$1,087,597	\$13,209,790
2008	\$338,168	\$1,110,000	\$13,028,025
2009	\$319,981	\$1,036,234	\$12,691,919
2010	\$321,772	\$1,042,006	\$12,666,042
2011	\$328,055	\$1,061,556	\$12,787,312
2012	\$333,620	\$1,082,392	\$12,911,575
<b>Projected</b>			
2017	\$385,644	\$1,270,449	\$14,539,930
2022	\$443,410	\$1,457,624	\$16,262,415
2032	\$585,608	\$1,918,776	\$20,351,419
<b>Compound Annual Growth Rate</b>			
2002 - 2012	1.9%	2.5%	1.3%
2012 - 2032	2.9%	2.9%	2.3%

SOURCE: Woods & Poole Economics, Inc., March 2013.  
PREPARED BY: Ricondo & Associates, Inc., March 2013.

### 3.3 Forecast Methodology Overview and Results

Several methodologies were used to develop forecasts of enplaned passengers, aircraft operations, and based aircraft and to project the fleet mix at the Airport. These methodologies are discussed below. The forecasts were developed for two time periods: the pre-Wright Amendment repeal period, referred to as the short-term forecasts (Fiscal Years 2013 and 2014), and the post-Wright Amendment period (Fiscal Years 2015 through 2032), referred to as the long-term forecasts.

#### 3.3.1 SHORT-TERM ENPLANED PASSENGER FORECASTS (FY 2013 AND FY 2014)

Published airline schedules for 2013 were analyzed, and individual market-level estimates of enplaned passengers were developed based on actual passenger data provided by the Department of Aviation for the first 4 months of FY 2013 (October through December 2012 and January 2013). Using the 2013 data, schedule capacity and growth in numbers of enplaned passengers were forecast using a combination of trend analysis and the FAA forecasts of domestic enplaned passengers between 2013 and 2014, as set forth in the *FAA Aerospace Forecast Fiscal Years 2013-2033*.

#### 3.3.2 LONG-TERM ENPLANED PASSENGER FORECASTS (FY 2015 THROUGH FY 2032)

It was assumed that the Airport's airline service profile will change significantly with the repeal of the Wright Amendment in October 2014. Nonstop flights into and out of the Airport on aircraft with 56 or more seats at the time of the Master Plan Update forecast development, were restricted to points within Texas and the nearby states of Alabama, Arkansas, Kansas, Louisiana, Mississippi, Missouri, New Mexico, and Oklahoma. In October 2014, these restrictions ended, and airlines are permitted to operate from the Airport to any market in the United States on a nonstop basis regardless of aircraft size. International nonstop service continues to be prohibited. In addition, the total number of available gates at the Airport is limited to 20, which are allocated to Southwest Airlines (16), American Airlines (2), and United Airlines (2). As of May 2015, American Airlines subleases its gates to Delta Air Lines.

##### 3.3.2.1 Estimated Base Demand (2013)

To forecast aviation demand at the Airport in the period after the Wright Amendment restrictions are repealed, a potential airline service profile was modeled to determine a potential network structure that could evolve. This modeling was accomplished using common airline network planning techniques, including observation of 2012 O&D passenger traffic flows to identify potential demand for new nonstop flights and flights that may require downsizing should current traffic flows change, examination of the top unserved/underserved O&D markets, and examination of connecting passenger traffic that would benefit from additional connections offered through the Airport. Three airline service profiles were developed based on three possible schedules operated by Southwest Airlines. These schedules are defined by the number of turns, or departures, per gate per day on an average weekday in the peak month of service for the airline. Airline service profiles incorporating 10, 11, and 12 turns per gate were developed.

Schedules of service by other airlines (currently, United, Delta, and SeaPort) were also developed for these airline service profiles. It was assumed that these other airlines will continue to use the Airport as a spoke in their route systems, and increases in aircraft size or the initiation of new nonstop service would occur only as local market demand and/or demand through connecting hubs warrant.

For each airline service profile developed, a Quality of Service Index fair share demand analysis was performed to estimate O&D and connecting passenger demand for each modeled flight segment. For O&D passenger demand, additional analysis was conducted to estimate the percentage of demand above or below the fair share of capacity that might be realized on each segment. This analysis (often referred to as city presence or S-curve analysis) incorporates the historical patterns of actual O&D passenger distributions across flight segments compared with the fair share of passenger demand each segment would be expected to garner, and helps account for additional factors, such as loyalty programs, that affect customer choice of airlines. The resulting O&D and connecting passenger demand values were calculated on an unconstrained<sup>2</sup> basis to provide an adjusted 2012 base demand for the Airport upon which growth could be forecast.

### 3.3.2.2 Unconstrained Demand

Both passenger traffic segments, O&D and connecting, were increased through the planning period at rates derived through traditional methods. For O&D passenger demand, socioeconomic regression analysis was used. Socioeconomic regression analyses are used to compare historical relationships between a dependent variable (e.g., enplaned passengers) and one or more independent variables (socioeconomic factors, such as population, employment, per capita personal income) to forecast future growth in aviation activity. Socioeconomic regression analyses were conducted to determine causal relationships between Dallas area O&D passenger traffic (the dependent variable) and socioeconomic variables at the national level and for the Dallas-Fort Worth-Arlington MSA. To determine growth in potential connecting passenger activity over the planning period, the results of socioeconomic regression analyses were also considered, as forecast growth in numbers of U.S. domestic enplaned passengers, as published in the *FAA Aerospace Forecast Fiscal Years 2013-2033*. Regression results for both O&D and connecting passengers are presented in **Table 3-20**.

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<sup>2</sup> For purposes of this discussion, the term "unconstrained" refers to seat capacity on a flight segment. The overall hub profile was developed on a gate-constrained basis.

**Table 3-20: Forecast Growth Rates for Unconstrained O&D and Connecting Passenger Demand**

PASSENGER DEMAND ELEMENT	INDEPENDENT VARIABLES	R-SQUARE	ANNUAL GROWTH RATE
O&D Passenger Demand	U.S. Employment	87.7%	1.6%
	U.S. Population/U.S. Employment	90.1%	1.7%
	U.S. Employment/U.S. Gross Domestic Product	91.6%	1.7%
	U.S. Employment/U.S. per Capita Personal Income	88.3%	1.8%
	U.S. Employment/U.S. Personal Income	89.2%	2.2%
	FAA Aerospace Forecast of Domestic Enplaned Passengers	NA	1.9%
	Growth Rate Used		1.8%
Connecting Passenger Demand	MSA Population/MSA Employment	84.4%	1.4%
	U.S. Population/MSA Employment	80.6%	1.7%
	U.S. Employment/U.S. Gross Domestic Product	81.1%	1.7%
	MSA Population/MSA Personal Income	82.3%	2.8%
	Growth Rate Used		1.7%

NOTE: MSA = Metropolitan Statistical Area; NA = Not Applicable

SOURCES: Woods & Poole Economics, Inc., March 2013; Ricondo & Associates, Inc. (analysis), March 2013.

PREPARED BY Ricondo & Associates, Inc., March 2013.

A standard measure of how well each socioeconomic variable or combination of socioeconomic variables explains the annual variations in passenger numbers is the regression model's coefficient of determination, or R-square. For O&D passengers, the models exhibited coefficients of determination ranging from a high of 91.6 percent to a low of 87.7 percent. For connecting passengers, the models exhibited coefficients of determination ranging from a high of 84.4 percent to a low of 80.6 percent. A result of 100.0 percent is the maximum possible for a coefficient of determination and represents a perfect fit between the variables analyzed. The socioeconomic regression analyses provided a range of possible annual growth rates between 1.6 percent and 2.2 percent for O&D passengers. For connecting passengers, the socioeconomic regression analyses provided a range of possible annual growth rates between 1.4 percent and 2.8 percent. In comparison, the FAA forecast for U.S. domestic enplaned passengers for the period is an average increase of 1.9 percent per year.

Growth rates for both O&D and connecting passengers were applied to the unconstrained demand estimated for each flight segment in all three of the airline service profiles developed, resulting in an unconstrained demand forecast for each segment in each year of the planning period. In addition, growth rates were applied to demand elements for potential markets that might materialize over the planning period to help determine if and when new service would be initiated.

### 3.3.2.3 Constrained Demand

For each flight segment in each airline service profile, demand was constrained each year based on estimates of the number of aircraft available, the capacity of those aircraft, the best assignment of those aircraft at the Airport, and assumptions regarding maximum sustainable load factors on a segment.

- **Southwest Airlines constrained:** Southwest Airlines' aircraft fleet plan was analyzed, and the total number of aircraft by type (Boeing 737-300/500/700/800) was projected for the airline for each year of the planning period. It was assumed that no regional aircraft would enter the airline's fleet during the planning period, and that aircraft would be allocated by Southwest Airlines to operations at the Airport generally in proportion by type to the overall Southwest Airlines network. As stated earlier, total operations were limited to the number of turns per gate determined to be the limit on the average weekday of the peak month for each profile, and the number of gates available for Southwest Airlines was restricted to 16.
- **Other Airlines constrained:** Additional demand for existing or new nonstop markets was considered achievable mainly by increases in load factor and aircraft size. The fleet profiles of the other airlines serving the Airport contain or will likely contain numerous variations of aircraft size, which enables growth in smaller increments. In addition, operations by the other airlines were assumed to remain unconstrained by gate availability.

As demand constraints were encountered at the flight segment level, where demand could not be met by increasing aircraft size, increasing the load factor, or adding flights, demand was rejected or "spilled." Because O&D demand is central to the sustainability of an airline's core operation at any airport, connecting passenger demand was spilled at a higher rate than O&D demand. Connecting passengers spilled on one segment because of capacity constraints were removed from the corresponding connecting segment.

On the basis of conversations with Southwest Airlines' representatives, observations of the Southwest Airlines network, and professional judgment, the 10 turns-per-gate airline service profile was used as the basis for the activity forecasts presented herein. The lower number of turns per gate is sensible, particularly as aircraft size and average load factors increase throughout the planning period, increasing operational challenges associated with more turns per gate.



### 3.3.3 SPECIFIC ASSUMPTIONS AND RESULTS

#### 3.3.3.1 Southwest Airlines

Actual 2012 and forecast operating statistics through 2032 are presented in **Table 3-21**. It was assumed that Southwest Airlines would implement a new service profile in October 2014 (the first month of FY 2015), upon the repeal of the Wright Amendment restrictions. Prior to that period, in the short term, the airline's hub system was expected to operate as published by Official Airline Guides, Inc., for 2013 and through September 2014. The average number of seats per departure for the airline was estimated to number 134.7 in 2013 and 2014, down from 136.4 in 2012 as a result of the greater use of the 122-seat Boeing 737-500 aircraft at the Airport as the airline concentrates this fleet geographically until ultimately retiring the aircraft from its fleet in 2016. Also in the short term, the average number of daily departures is generally estimated to remain flat, while load factors increase to approximately 78 percent. The total number of Southwest Airlines passengers at the Airport was split 65 percent O&D and 35 percent connecting in 2012, and that split was expected to be consistent through 2014.

With implementation of the new airline service profile as of October 2014, the average number of daily departures increases to 151, as the airline takes advantage of the liberalization of service opportunities, and offers new nonstop service to destinations outside the restricted boundaries. Demand, both by O&D and connecting passengers, would support the maximum number of operations under the 10 turns-per-gate profile in 2015. Therefore, in subsequent years, capacity growth by Southwest Airlines would only materialize through the use of larger aircraft and an ability to manage a higher average load factor.

The increased use of 175-seat Boeing 737-800 aircraft, along with the continued increase in seat capacity across the Boeing 737-700 and Boeing 737-300 fleet to 143 seats (from 137 seats), would result in an increase in average number of seats per departure to 146.7 in 2015, and ultimately to 151.0 in 2032. Southwest Airlines' average load factor is projected to increase to 80.4 percent in 2015 and to 85.2 percent in 2032. In 2015, the airline's passengers at the Airport are expected to consist of approximately 53 percent O&D passengers and 47 percent connecting passengers as a result of greater opportunities for connections in the new airline service profile. However, because Southwest Airlines' growth at the Airport would be constrained over the planning period, demand will outpace supply, and it was assumed that O&D passengers will be accommodated at a greater rate than connecting passengers. By 2032, the composition of Southwest Airlines' passengers was assumed to consist of 62 percent O&D passengers and 38 percent connecting passengers.

#### 3.3.3.2 Other Airlines

Other airlines serving the Airport are expected to continue operating as they currently do, with the Airport operating as a spoke destination served from the hubs of those airlines, or on a point-to-point basis. The primary operations of the other airlines (Delta and United) are anticipated to remain largely concentrated at DFW. Historically, United served Denver International Airport and Delta served Memphis International Airport nonstop from the Airport. The repeal of the Wright Amendment restrictions is not expected to be a catalyst for significant structural changes for these airlines; however, it will allow larger aircraft to operate to destinations in non-Wright Amendment states, which may drive additional capacity to current destinations (specifically, Delta to Hartsfield-Jackson Atlanta International Airport), or help support profitable operations to new destinations.

Table 3-21: Actual 2012 and Forecast Operating Statistics for Airlines Serving the Airport

FISCAL YEAR	SOUTHWEST AIRLINES				OTHER AIRLINES				COMBINED AIRLINES			
	AVERAGE SEATS/ DEPARTURE	DAILY DEPARTURES	LOAD FACTOR (%)	LOCAL O&D SHARE (%)	AVERAGE SEATS/ DEPARTURE	DAILY DEPARTURES	LOAD FACTOR (%)	LOCAL O&D SHARE (%)	AVERAGE SEATS/ DEPARTURE	DAILY DEPARTURES	LOAD FACTOR (%)	LOCAL O&D SHARE (%)
2012	136.4	115.1	73.9%	64.8%	46	13.2	70.0%	100%	127.1	128.3	73.8%	66.0%
2013	134.7	117.0	77.7%	64.8%	46	13.2	71.1%	100%	125.7	131.2	77.5%	66.0%
2014	134.7	119.0	77.7%	64.8%	46	13.2	73.2%	100%	125.9	132.2	77.5%	66.0%
2015	146.7	150.8	80.4%	52.6%	60	13.9	67.5%	100%	139.4	164.7	79.9%	54.1%
2016	146.7	150.8	82.0%	52.6%	61	14.2	67.8%	100%	139.3	165.0	81.5%	54.1%
2017	146.7	150.8	83.3%	52.9%	62	14.5	68.0%	100%	139.3	165.3	82.7%	54.4%
2018	146.9	150.8	84.3%	53.2%	63	14.8	68.3%	100%	139.4	165.6	83.6%	54.7%
2019	147.3	150.8	85.2%	53.4%	64	15.1	68.5%	100%	139.7	165.9	84.5%	55.0%
2020	147.5	150.8	85.3%	54.1%	64	15.4	68.8%	100%	139.8	166.2	84.6%	55.7%
2021	147.7	150.8	85.2%	54.9%	65	15.7	69.0%	100%	139.9	166.5	84.5%	56.5%
2022	147.9	150.8	85.2%	55.7%	66	15.9	69.3%	100%	140.1	166.8	84.5%	57.3%
2023	148.1	150.8	85.2%	56.4%	67	16.2	69.5%	100%	140.2	167.0	84.5%	58.0%
2024	148.1	150.8	85.2%	57.2%	68	16.5	69.8%	100%	140.2	167.3	84.5%	58.8%
2025	148.3	151.2	85.2%	57.8%	69	16.8	70.0%	100%	140.3	168.0	84.5%	59.5%
2026	148.7	150.8	85.2%	58.5%	70	17.1	70.2%	100%	140.6	167.8	84.5%	60.2%
2027	149.0	150.8	85.2%	59.0%	71	17.3	70.5%	100%	141.0	168.1	84.5%	60.8%
2028	149.4	150.8	85.2%	59.6%	71	17.6	70.7%	100%	141.3	168.4	84.4%	61.4%
2029	149.8	150.8	85.1%	60.2%	72	17.8	71.0%	100%	141.6	168.6	84.4%	62.0%
2030	150.2	150.8	85.1%	60.8%	73	18.1	71.2%	100%	142.0	168.9	84.4%	62.6%
2031	150.6	150.8	85.1%	61.2%	74	18.3	71.5%	100%	142.3	169.1	84.4%	63.1%
2032	151.0	150.8	85.2%	61.6%	75	18.6	71.7%	100%	142.7	169.3	84.4%	63.5%

SOURCES: City of Dallas Department of Aviation; U.S. DOT T-100 database, accessed March 2013; Ricondo & Associates, Inc. (forecasts), March 2013.  
 PREPARED BY Ricondo & Associates, Inc. March 2013.

In the near term, average numbers of seats and daily departures are expected to remain constant at approximately 46 seats per departure and 13 departures per day. Load factors are also expected to remain constant in the low 70 percent range. All passengers enplaned by the other airlines are expected to be O&D passengers. In the longer term, average seat capacity is forecast to increase, initially to 60 seats per departure as seat capacity restrictions lapse, and also as smaller regional aircraft are replaced in airline fleets with larger capacity regional aircraft allowed under new labor scope arrangements with the larger network airlines. The average number of daily flights would initially remain constant at approximately 14 per day in 2015.

The increase in average seat capacity would initially result in a decrease in average load factors to approximately 68 percent in 2015. Over the course of the long-term forecasts, the other airlines' average seat capacity is forecast to increase by approximately one seat per departure per year with the increased use of larger regional aircraft in service at the Airport, and with the potential for large mainline aircraft to enter service at the Airport by airlines other than Southwest Airlines. Load factors are forecast to increase gradually to approximately 71.7 percent in 2032 as a result of overall demand growth, tempered by gradually increasing aircraft size.

### 3.3.3.3 Combined Forecast Results for Passengers

In 2012, O&D passengers accounted for approximately 66 percent of total enplaned passengers at the Airport, with connecting passengers accounting for the remaining 34 percent. As the new airline service profile is implemented at the Airport, greater schedule connectivity will lead to an increase in the connecting share of enplaned passengers to approximately 45 percent. However, as both O&D and connecting passenger demand increases over the planning period, capacity constraints will result in a substantial spill of demand, which is expected to affect connecting passenger demand disproportionately more than originating passenger demand. As a result, by 2032, the O&D share of passengers is expected to increase to nearly 64 percent, and the connecting share would decrease to approximately 36 percent.

Enplaned passenger forecasts are presented in **Table 3-22** and shown graphically on **Exhibit 3-2**. Using the approach outlined above, the combined forecasts of O&D and connecting enplaned passengers are 4.2 million in 2013, increasing to 6.2 million in 2015, following the repeal of the Wright Amendment when the Airport is able to accommodate a significantly different airline service profile. By 2032, enplaned passengers are forecast to number 7.0 million, reflecting the effects of a gate-constrained environment. Between 2012 and 2015, the number of enplaned passengers is forecast to increase nearly 52 percent, or an average of 15 percent annually, as a result of the expected change in airline service. Over the planning period (2013-2032), the number of enplaned passengers is forecast to increase at a CAGR of 2.7 percent, but at a CAGR of only 0.7 percent between 2015 and 2032.

### 3.3.4 AIRCRAFT OPERATIONS FORECAST DEVELOPMENT PROCESS AND RESULTS

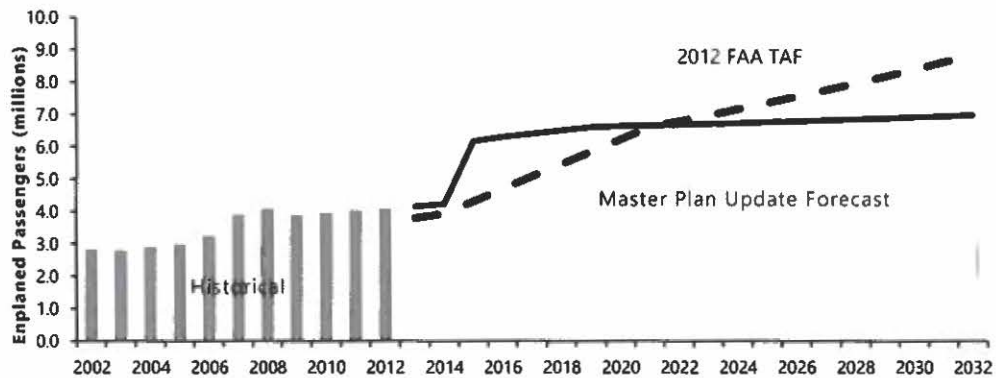
The forecasts of aircraft operations at the Airport are presented in **Table 3-23**, and are shown graphically on **Exhibit 3-3** compared with the 2012 FAA *Terminal Area Forecast* (TAF) for the Airport. The various components of the aircraft operations forecasts were developed as described in the following subsections.

**Table 3-22: Historical and Forecast Enplaned Passengers**

FISCAL YEAR	MAINLINE	REGIONAL/ COMMUTER	TOTAL
<b>Historical</b>			
2007	3,606,129	304,398	3,910,527
2008	3,853,325	214,943	4,068,268
2009	3,722,812	148,875	3,871,687
2010	3,823,138	125,984	3,949,122
2011	3,916,851	100,270	4,017,121
2012	3,973,171	100,996	4,074,167
<b>Forecast</b>			
2013	4,050,764	102,968	4,153,732
2014	4,129,874	104,979	4,234,853
2015	5,966,074	205,079	6,171,153
2016	6,090,164	213,476	6,303,640
2017	6,183,631	222,026	6,405,657
2022	6,414,967	266,737	6,681,704
2027	6,503,851	314,683	6,818,534
2032	6,616,616	364,901	6,981,517
<b>Compound Annual Growth Rate</b>			
2012-2014	2.0%	2.0%	2.0%
2012-2015	14.5%	26.6%	14.8%
2015-2032	0.6%	3.4%	0.7%
2012-2032	2.6%	6.6%	2.7%

SOURCES: City of Dallas Department of Aviation; March 2013; Ricondo & Associates, Inc. (forecasts), March 2013.  
 PREPARED BY Ricondo & Associates, Inc., March 2013.

**Exhibit 3-2: Historical and Forecast Enplaned Passengers**



SOURCES: City of Dallas Department of Aviation; FAA, *Terminal Area Forecast Fiscal Years 2012 – 2040*, March 2013; Ricondo & Associates, Inc., March 2013.  
 PREPARED BY: Ricondo & Associates, Inc., March 2013.

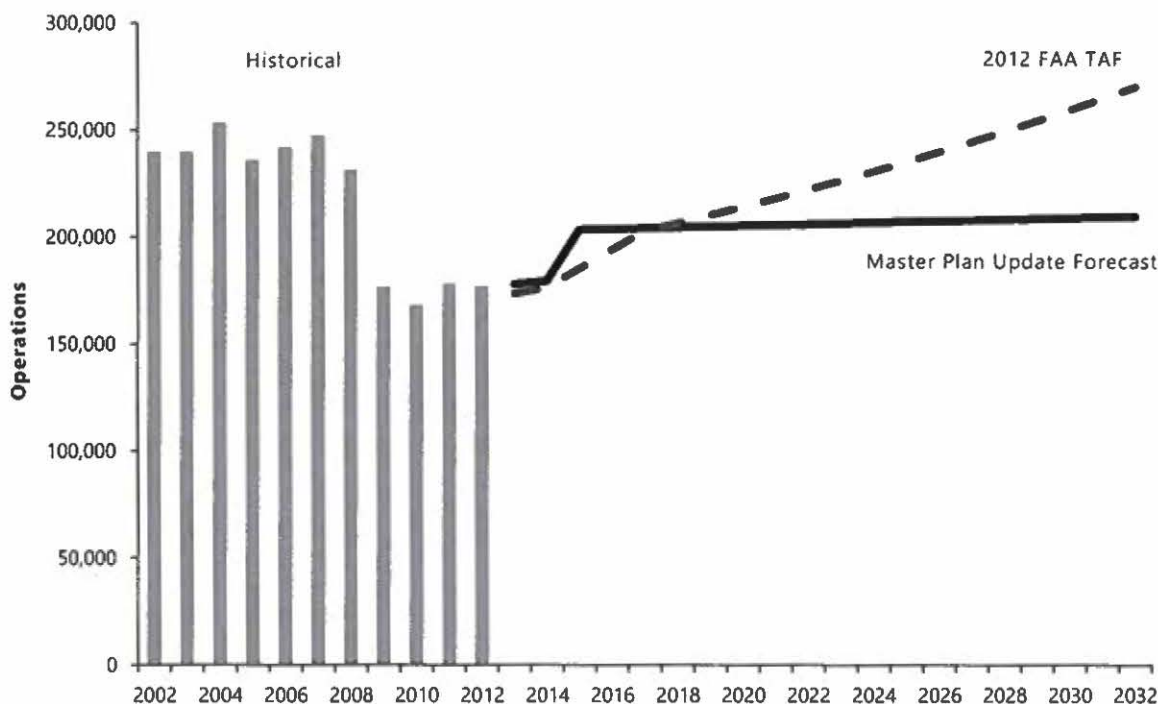
Table 3-23: Historical and Forecast Aircraft Operations

PASSENGER AIRLINES								
FISCAL YEAR	MAINLINE	REGIONAL/ COMMUTER	TOTAL	ALL- CARGO AIRLINES	OTHER AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
<b>Historical</b>								
2002	83,944	7,652	91,596	52	35,647	110,399	2,038	239,732
2003	82,480	6,416	88,896	1,540	35,877	111,984	1,604	239,901
2004	82,996	5,262	88,258	1,601	40,156	121,474	1,953	253,442
2005	77,626	6,538	84,164	1,632	39,861	107,774	2,468	235,899
2006	80,526	11,988	92,514	1,734	37,719	107,220	2,803	241,990
2007	87,768	17,990	105,758	1,111	39,976	97,991	2,498	247,334
2008	91,734	16,760	108,494	1,260	40,572	78,767	2,255	231,348
2009	88,488	9,116	97,604	208	22,276	55,420	1,469	176,977
2010	85,318	6,758	92,076	88	21,325	53,795	1,089	168,373
2011	84,110	7,398	91,508	82	23,801	61,578	1,087	178,056
2012	84,232	9,502	93,734	94	25,936	55,807	1,496	177,067
<b>Forecast</b>								
2013	85,410	9,614	95,024	94	26,027	55,305	1,496	177,946
2014	86,879	9,614	96,493	94	26,118	55,379	1,496	179,580
2015	110,074	10,127	120,201	94	26,209	55,454	1,496	203,454
2016	110,074	10,351	120,425	94	26,301	55,529	1,496	203,845
2017	110,074	10,573	120,647	94	26,393	55,604	1,496	204,234
2022	110,088	11,641	121,729	94	26,858	55,980	1,496	206,157
2027	110,057	12,647	122,704	94	27,332	56,359	1,496	207,985
2032	110,060	13,562	123,622	94	27,813	56,741	1,496	209,766
<b>Compound Annual Growth Rate</b>								
2012-2014	1.6%	0.6%	1.5%	0.0%	0.4%	-0.4%	0.0%	0.7%
2012-2015	9.3%	2.1%	8.6%	0.0%	0.3%	-0.2%	0.0%	4.7%
2015-2032	0.0%	1.7%	0.2%	0.0%	0.4%	0.1%	0.0%	0.2%
2012-2032	1.3%	1.8%	1.4%	0.0%	0.3%	0.1%	0.0%	0.9%

SOURCES: City of Dallas Department of Aviation; FAA Air Traffic Activity Data System; U.S. DOT T-100 database, accessed March 2013; Ricondo & Associates, Inc. (forecasts), March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

**Exhibit 3-3: Historical and Forecast Aircraft Operations**



SOURCES: City of Dallas Department of Aviation; FAA, *Terminal Area Forecast Fiscal Years 2012 - 2040*, March 2013; Ricondo & Associates, Inc., March 2013.  
 PREPARED BY: Ricondo & Associates, Inc., March 2013.

**3.3.4.1 Air Carrier**

To calculate the annual number of aircraft operations required to carry the forecast number of enplaned passengers at the Airport, assumptions were made regarding average load factors and numbers of seats per departure. The majority of the increase in aircraft operations results from changes in Southwest Airlines' activity over the planning period. As described above, Southwest Airlines in 2012 operated aircraft with an average of 136.4 seats per departure at a 73.9 percent load factor. As Southwest Airlines implements a new service profile at the Airport, its average number of aircraft seats per departure is expected to increase to 146.7 in 2015 with both the greater use of larger Boeing 737-800 aircraft having 175 seats and an increase in the average number of seats on its Boeing 737-700 and Boeing 737-300 fleet to 143. Additionally, it is expected that smaller Boeing 737-500 aircraft with 122 seats will be phased into retirement. The load factor for Southwest Airlines is forecast to be 80.4 percent in 2015 and 85.2 percent by 2032 (see Table 3-21). As the Airport is gate constrained, air carrier aircraft operations growth is tempered through the planning period, with the majority of growth in operations occurring by 2015. Air carrier aircraft operations are forecast to increase 28.2 percent between 2012 and 2015, or at a CAGR of 8.6 percent. However, from 2015 through 2032, air carrier aircraft operations are forecast to increase at a CAGR of 0.2 percent.

### 3.3.4.2 General Aviation, Other Air Taxi, Military, and Cargo Aircraft Operations

General aviation operations at DAL have been slowly decreasing as a percentage of overall Texas general aviation operations, as reported in the 2012 FAA TAF. The forecast of general aviation operations through 2032 at the Airport continues this trend, resulting in a CAGR of 0.1 percent through the planning period.

Other air taxi operations are forecast to increase at a CAGR of 0.3 percent, generally in line with the FAA TAF forecast for the Airport. Military aircraft operations are forecast to be constant at the 2012 level through the planning period, as are all-cargo aircraft operations.

### 3.3.5 BASED AIRCRAFT

The forecasts of based aircraft at the Airport are presented in **Table 3-24**. These forecasts are generally in line with the FAA TAF forecast for the Airport, with the exception of single-engine aircraft. These aircraft are expected to decrease at a CAGR of approximately 0.2 percent, more in line with the *FAA Aerospace Forecast* for the Airport, and recognizing that the increased commercial activity at the Airport may influence the shift of single-engine aircraft to surrounding airports because of airspace restrictions at Dallas Love Field.

### 3.3.6 FLEET MIX

**Table 3-25** presents forecast aircraft operations for mainline and regional/commuter airline aircraft serving the Airport by aircraft category. As shown, it is expected that operations by regional/commuter aircraft at the Airport will increase and represent approximately 11.0 percent of total scheduled passenger airline operations in 2032. An upward trend in operations is forecast for the larger regional jet aircraft (over 50 seats). All operations by mainline airlines were assumed to be conducted using narrowbody aircraft and forecast to increase in the short term and then to remain stable over the long term. Operations by the Boeing 737-500 aircraft are projected to cease by 2017 as a result of Southwest Airlines' commitment to retire the aircraft from its fleet mix. Boeing 737-300 and 737-700 aircraft operations are forecast to decrease over the planning period. However, these decreases would be offset by forecast increased operations by the Boeing 737-800. As a result, the share of mainline airline operations using narrowbody aircraft is forecast to decrease from 89.8 percent in 2012 to 89.0 percent in 2032.

### 3.3.7 PEAK MONTH AND PEAK AVERAGE WEEKDAY OPERATIONS

The derivation of peak month and peak month average weekday operations is typically based on average percentages – the historical ratio of peak month activity to annual activity. The peak month for operations at the Airport has varied historically, but has mostly been October. October accounts for approximately 8.8 percent of annual operations at the Airport, as well as the highest average daily number of operations. Peak month, peak month average weekday, and peak hour of the peak month average weekday aircraft operations are presented in **Table 3-26**.

Table 3-24: Historical and Forecast Based Aircraft

FISCAL YEAR	SINGLE-ENGINE	MULTI-ENGINE	JET <sup>2/</sup>	HELICOPTER	TOTAL
<b>Historical</b>					
2002	16	30	472	7	525
2003	15	29	479	6	529
2004	11	62	522	7	602
2005	11	62	522	7	602
2006	20	24	577	6	627
2007	20	24	577	6	627
2008	32	53	649	6	740
2009	31	29	669	8	737
2010	31	29	669	8	737
2011	22	4	734	7	767
2012 <sup>v</sup>	22	4	745	7	778
<b>Forecast</b>					
2013	22	4	757	7	790
2014	22	4	769	8	803
2015	22	4	781	8	815
2016	22	4	793	8	827
2017	22	4	805	8	839
2022	22	4	869	9	904
2027	21	4	937	9	971
2032	21	4	1,010	9	1,044
<b>Compound Annual Growth Rate</b>					
2012-2014	0.0%	0.0%	1.6%	6.9%	1.6%
2012-2015	0.0%	0.0%	1.6%	4.6%	1.6%
2015-2032	-0.3%	0.0%	1.5%	0.7%	1.5%
2012-2032	-0.2%	0.0%	1.5%	1.3%	1.5%

## NOTE:

1/ The 2012 number is also forecast.

2/ Figures are sourced from FAA TAF. Jet aircraft total likely includes a portion, if not all of Southwest's fleet.

SOURCES: FAA, *Terminal Area Forecast Fiscal Years 2012 – 2040*, March 2013; Ricondo & Associates, Inc., March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.



Table 3-25: Projected Aircraft Fleet Mix

CATEGORY	REPRESENTATIVE TYPES	CAPACITY (SEATS)	OPERATIONS				
			HISTORICAL		FORECAST		
			2012	2017	2022	2027	2032
Regional Jet I	Cessna 208 CRJ-200/400 ERJ 135/145 Pilatus PC-12	9-50	7,948	1,923	1,434	758	200
Regional Jet II	CRJ-700/900 and Q400	51-76	1,590	8,641	10,194	11,989	13,362
Regional/Commuter Total			9,538	10,564	11,628	12,747	13,562
Regional/Commuter Percent of Airport Total			10.2%	8.8%	9.6%	10.4%	11.0%
Narrowbody I	Boeing 737-300/500	122-137	84,170	-	-	-	-
Narrowbody II	Boeing 737-300/700	138-150	14	97,266	93,317	89,483	82,545
Narrowbody III	Boeing 737-800	151-175	12	12,764	16,727	20,582	27,515
Mainline Total			84,196	110,030	110,044	110,065	110,060
Mainline Percent of Airport Total			89.8%	91.2%	90.4%	89.6%	89.0%
Airport Total			93,734	120,594	121,672	122,812	123,622

SOURCES: Innovata (historical); Ricondo & Associates, Inc. (projected), March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

Table 3-26: Peaking Profile of Aircraft Operations

	2012	2015	2020	2025	2032
<b>Annual</b>					
Mainline	84,326	110,168	110,194	110,462	110,154
Regional/Commuter	9,502	10,127	11,226	12,264	13,562
Other Air Taxi	25,936	26,209	26,671	27,141	27,813
General Aviation	55,807	55,454	55,829	56,207	56,741
Military	1,496	1,496	1,496	1,496	1,496
<b>Total</b>	<b>177,067</b>	<b>203,454</b>	<b>205,146</b>	<b>207,570</b>	<b>209,766</b>
<b>Peak Month</b>					
Mainline	7,149	9,340	9,342	9,365	9,339
Regional/Commuter	781	832	923	1,008	1,115
Other Air Taxi	1,983	2,004	2,039	2,075	2,127
General Aviation	5,422	5,388	5,424	5,461	5,513
Military	88	88	88	88	88
<b>Total</b>	<b>15,423</b>	<b>17,652</b>	<b>17,816</b>	<b>17,997</b>	<b>18,182</b>
<b>Peak Month Average Weekday</b>					
Mainline	247	322	322	323	322
Regional/Commuter	27	29	32	35	38
Other Air Taxi	74	75	76	77	79
General Aviation	179	178	179	180	182
Military	4	4	4	4	4
<b>Total</b>	<b>531</b>	<b>608</b>	<b>613</b>	<b>619</b>	<b>625</b>
<b>Peak Hour</b>					
Mainline	20	32	32	32	32
Regional/Commuter	2	3	3	3	4
Other Air Taxi	6	7	7	7	7
General Aviation	15	16	16	17	17
Military	0	0	0	0	0
<b>Total</b>	<b>43</b>	<b>58</b>	<b>58</b>	<b>59</b>	<b>60</b>

SOURCES: City of Dallas Department of Aviation; Ricondo & Associates, Inc., March 2013.

PREPARED BY: Ricondo & Associates, Inc., March 2013.

### 3.3.8 COMPARISONS WITH THE 2013 TAF

As shown on Exhibits 3-2 and 3-3 and as presented in **Table 3-27**, the Master Plan Update forecasts vary from the 2013 FAA *Terminal Area Forecast* by different magnitudes over the course of the planning period. This variation results, in large part, from the expectation of a network transformation by Southwest Airlines in the period immediately following the Wright Amendment repeal, as projected by Airport management. The FAA TAF reflects a more gradual increase in service. Assumed capacity limits on growth in the longer term and the use of larger aircraft are likely reasons for the divergence from the FAA TAF forecast of operations at the Airport. **Table 3-28** provides a summary of forecast metrics for selected years, in a format consistent with that described in Appendix B of the FAA guide titled *Forecasting Aviation Activity by Airport*.

**Table 3-27: Master Plan Update and 2013 TAF Comparison (TAF 2013-2040 for DAL)**

	YEAR	MASTER PLAN UPDATE FORECAST	FAA TAF	MASTER PLAN UPDATE/TAF (% DIFFERENCE)
<b>Enplaned Passengers</b>				
Base Year	2012	4,074,167	3,899,014	4.5%
Base Year + 5	2017	6,405,657	5,290,125	21.1%
Base Year + 10	2022	6,681,704	5,734,808	16.5%
Base Year + 15	2027	6,818,533	5,908,923	15.4%
Base Year + 20	2032	6,981,518	6,082,273	14.8%
<b>Commercial Aircraft Operations</b>				
Base Year	2012	119,764	119,764	0.0%
Base Year + 5	2017	147,134	146,386	0.5%
Base Year + 10	2022	148,681	164,503	-9.6%
Base Year + 15	2027	150,130	182,364	-17.7%
Base Year + 20	2032	151,529	201,910	-25.0%
<b>Total Aircraft Operations</b>				
Base Year	2012	177,067	177,067	0.0%
Base Year + 5	2017	204,234	204,607	-0.2%
Base Year + 10	2022	206,158	223,830	-7.9%
Base Year + 15	2027	207,985	242,818	-14.3%
Base Year + 20	2032	209,766	263,514	-20.4%

SOURCES: FAA *Terminal Area Forecast Fiscal Years 2013 – 2040*, March 2014; Ricondo & Associates, Inc., March 2014.

PREPARED BY: Ricondo & Associates, Inc., March 2014.

Table 3-28: Master Plan Update Forecast Summary

	BASE YEAR	BASE YEAR + 1	BASE YEAR + 5	BASE YEAR + 10	BASE YEAR + 15	BASE YEAR + 20	COMPOUND ANNUAL GROWTH RATES				
							BASE YEAR + 1	BASE YEAR + 5	BASE YEAR + 10	BASE YEAR + 15	BASE YEAR + 20
BASE YEAR: 2012	2012	2013	2017	2022	2027	2032	2013	2017	2022	2027	2032
<b>Enplaned Passengers</b>											
Mainline (Air Carrier)	3,973,171	4,050,764	6,183,631	6,414,967	6,503,851	6,616,616	2.0%	9.2%	4.9%	3.3%	2.6%
Regional/Commuter	100,996	102,968	222,026	266,737	314,683	364,901	2.0%	17.1%	10.2%	7.9%	6.6%
<b>Total Enplaned Passengers</b>	<b>4,074,167</b>	<b>4,153,732</b>	<b>6,405,657</b>	<b>6,681,704</b>	<b>6,818,534</b>	<b>6,981,517</b>	<b>2.0%</b>	<b>9.5%</b>	<b>5.1%</b>	<b>3.5%</b>	<b>2.7%</b>
<b>Aircraft Operations</b>											
<b>Itinerant</b>											
Air Carrier	84,326	85,504	110,168	110,182	110,151	110,154	1.4%	5.5%	2.7%	1.8%	1.3%
Commuter/Air Taxi	35,438	35,641	38,499	38,499	39,979	41,375	0.6%	1.7%	0.8%	0.8%	0.8%
<b>Total Commercial Aircraft Operations</b>	<b>119,764</b>	<b>121,145</b>	<b>148,687</b>	<b>148,681</b>	<b>150,130</b>	<b>151,529</b>	<b>1.2%</b>	<b>4.4%</b>	<b>2.2%</b>	<b>1.5%</b>	<b>1.2%</b>
General Aviation	55,807	55,305	55,604	55,980	56,359	56,741	-0.9%	-0.1%	0.0%	0.1%	0.1%
Military	1,496	1,496	1,496	1,496	1,496	1,496	0.0%	0.0%	0.0%	0.0%	0.0%
Local	-	-	-	-	-	-	-	-	-	-	-
General Aviation	-	-	-	-	-	-	-	-	-	-	-
Military	-	-	-	-	-	-	-	-	-	-	-
<b>Total Aircraft Operations</b>	<b>177,067</b>	<b>177,946</b>	<b>205,767</b>	<b>206,157</b>	<b>207,985</b>	<b>209,766</b>	<b>0.5%</b>	<b>3.0%</b>	<b>1.5%</b>	<b>1.1%</b>	<b>0.9%</b>
<b>Instrument Operations (not developed)</b>											
Peak Hour Operations	43	43	58	58	59	60					
<b>Cargo/Mail (enplaned + deplaned tons) (not developed)</b>											
<b>Based Aircraft</b>											
Single Engine (Nonjet)	22	23	24	26	30	35	4.5%	1.8%	1.7%	2.1%	2.3%
Multi-engine (Nonjet)	4	4	4	4	4	4	0.0%	0.0%	0.0%	0.0%	0.0%
Jet Engine	745	757	805	869	937	1,010	1.6%	1.6%	1.6%	1.5%	1.5%
Helicopter	7	7	8	9	9	9	0.0%	2.7%	2.5%	1.7%	1.3%
Other	-	-	-	-	-	-	-	-	-	-	-
<b>Total Based Aircraft</b>	<b>778</b>	<b>791</b>	<b>841</b>	<b>908</b>	<b>980</b>	<b>1,058</b>	<b>1.7%</b>	<b>1.6%</b>	<b>1.6%</b>	<b>1.6%</b>	<b>1.5%</b>
<b>Average Aircraft Size (number of seats)</b>											
Mainline (Air Carrier)	136.4	134.7	146.7	147.9	149.0	151.0					
Regional/Commuter	46.0	46.0	62.0	66.0	71.0	75.0					
<b>Average Enplaning Load Factor</b>											
Mainline (Air Carrier)	73.9%	77.7%	83.3%	85.2%	85.2%	85.2%					
Regional/Commuter	70.0%	71.1%	68.0%	69.3%	70.5%	71.7%					
<b>General Aviation Operations per Based Aircraft</b>	<b>71.7</b>	<b>69.9</b>	<b>66.1</b>	<b>61.7</b>	<b>57.5</b>	<b>53.6</b>					

SOURCES: City of Dallas Department of Aviation; FAA Terminal Area Forecast Fiscal Years 2012 – 2040, March 2014; Ricondo &amp; Associates, Inc., March 2013.

PREPARED BY: Ricondo &amp; Associates, Inc., March 2013.