Chapter 2. Forecasts of Aviation Activity

Chapter 2. FORECASTS OF AVIATION ACTIVITY

The aviation demand forecasts for Dayton International Airport (DAY) presented herein are unconstrained. That is, no artificial capacity barriers to growth are foreseen. The aviation forecasts provide the information needed to conduct future demand/capacity analysis of airport facilities for the years 2003, 2008, 2013, and 2018, the design analysis years of the Master Plan. This demand/capacity analysis of the airport will help develop the requirements necessary to accommodate DAY's future facility needs. This analysis is divided into the following sections:

- Economic Base for Air Passenger Transportation Demand
- Historical Passenger Air Traffic
- Passenger Air Service Comparisons
- Forecast of Enplaned Passenger Demand
- Air Cargo Forecast
- Aircraft Operations Forecasts
- Forecast of Peak Period Demand

1. SUMMARY

The most significant results of the forecast are presented below in summary of the analysis.

(1) Enplaned Passenger Forecast

Enplaned passengers are broken down into originating and connecting enplaned passengers. Total enplanements are divided into those expected to be transported by air carrier airlines and those traveling on commuter airlines. The airport's combined air carrier and commuter enplaned passenger volumes are forecast to increase from approximately 1.1 million enplanements in 1998 to 1.5 million enplanements in 2018. This change in passenger traffic represents nearly a 50.0 percent increase over 20 years, or a 1.9 percent average annual compound growth rate.

(2) Air Cargo Forecast

The Federal Aviation Administration (FAA) defines air cargo as the shipment of mail and freight by air. The basic premise of the air cargo demand forecast is that Emery Worldwide's (Emery) hub continues to expand. Total air cargo is forecast to increase from almost 1.0 million tons in 1998 to almost 2.5 million tons in 2018, an average annual growth rate of 4.7 percent.

(3) Aircraft Operations and Based Aircraft Forecast

Aircraft operations forecasts provide estimates of future aircraft operation levels that will be required to satisfy forecast passenger volumes and all-cargo shipments. In addition, military and general aviation (GA) aircraft operations forecasts are also developed to estimate the full range of aircraft activity at the airport. The forecasts of commercial passenger aircraft operations are divided into two categories: air carrier and commuter. Aircraft activity forecasts provide information for future master plan work tasks (i.e., calculating existing and future airfield demand and capacity and configuring apron/terminal areas). Air carrier operations are expected to grow rather slowly as larger aircraft and regional jets are added to the fleet. Commuter operations are also expected to grow rather slowly in total number, due to a more dramatic shift to regional jets from smaller turboprops. The average number of passengers per operation is anticipated to rise from approximately 40 to 48 during the planning period as the average aircraft size increases. Air cargo operations are anticipated to increase 6.5 percent as cargo tonnages grow. Military and GA operations are forecast to remain equal to today's levels.

(4) Forecasts of Peak Period Demand

This forecast element provides the peak month/average week day and peak hour aviation activity levels, based on the passenger and aircraft operations forecasts. These detailed forecasts show a continued growth of peak activity and provide the data necessary to conduct the demand/capacity analysis for passenger terminal facilities, air cargo space allocation, and airfield capacity. These measures are critical to determine the size and scale of future airport facilities.

(5) Alternative Hub Passenger Forecast

The baseline forecast for passengers in this report represents the most likely scenario for future activity. However, there is extensive potential at the airport to handle additional aircraft operations and terminal passengers. Further, the airport's Midwest geographic location offers potential for a passenger airline hub or mini-hub; alternatively, if additional "low-fare" airlines locate at DAY, passengers would be attracted from a much wider geographic area. This study will, therefore, include an alternative "high" growth scenario representing what might happen if an airline establishes a hub at the airport or a low-fare carrier establishes a significant presence. The result is that passengers would more than double from the base forecast.

(6) Limitations of Use and Summary

Although the forecasts contained in this document provide the basis to guide future facility growth and development at DAY, regular updates will be necessary to ensure that the airport's capital development plan remains sufficiently focused to accommodate actual events and circumstances.

The forecast is intended to provide insight on the long-term growth of the airport for facility planning purposes. That is, the trends and direction of change are most significant. Because of its long-term facility focus, the forecast may not be appropriate for short-term planning, bond feasibility or other uses.

Table 2-1 contains summaries of the forecasts developed and presented throughout this report.

Table 2-1 - Summary of Aviation Activity Forecasts

	Actual 1998	Forecast 2003	2008	2013	2018
Enplaned Passengers	1,096,613	1,201,000	1,318,000	1,403,000	1,495,000
Total Air Cargo Tons	984,827	1,449,600	1,916,100	2,201,000	2,487,300
Aircraft Operations					
Passenger	55,546	55,000	55,600	58,000	62,300
Air Cargo	42,540	68,900	104,400	122,500	140,500
Military	2,000	2,000	2,000	2,000	2,000
General Aviation (GA)	48,700	48,700	48,700	48,700	48,700
TOTAL	148,786	174,600	210,700	231,200	253,300
Based GA Aircraft	56	56	56	56	56
Peak Period Demand (Terminal)					
PMAD Enplanements	3,400	3,700	4,100	4,400	4,600
Peak Hour PMAD Enplanements	430	460	510	550	580
Peak Hour PMAD Jet Gates Required	11	11	10	10	11
Peak Period Demand (Airfield)					
Peak Hour Arrivals	32	34	36	N/A	43
Peak Hour Departures	39	43	56	N/A	67

PMAD = Peak Month/Average Day.
N/A = Not Available.
Source: Landrum & Brown.

2. ECONOMIC BASE FOR AIR PASSENGER TRANSPORTATION DEMAND

Greater Dayton area demographic and economic factors provide the foundation for origin and destination air service demand at the airport. This section will identify the Dayton Air Trade Area and define regional factors that are important for the air traffic forecast.

(1) Identification of the Air Trade Area

The prime geographic region served by an airport is generally referred to as an "Air Trade Area." For purposes of this report, the Dayton International Airport Air Trade Area is defined as the Dayton-Springfield, Ohio Metropolitan Statistical Area (MSA). The Bureau of Census definition is used in this report because it is the most common identification of Greater Dayton. It is recognized that air passengers come into the Air Trade Area from outside the MSA and that local residents can use airports other than DAY, however, the majority of air traffic demand is focused within the MSA.

As shown in **Table 2-2**, the following four counties make up the Dayton MSA:

Table 2-2 - MSA Population By County

County	1997 Population	Share
Montgomery	561,000	59.4%
Clark	146,000	15.4%
Greene	140,000	14.8%
Miami	98,000	10.4%
TOTAL	945,000	100.0%

Source: U.S. Department of Commerce, Statistical Abstract of the United States, 1998.

As shown in the above table, Montgomery County has 59.4 percent of the MSA's population and contains the City of Dayton, which has approximately 180,000 people and is the 100th largest city in the United States. Springfield is the second-largest city in the Air Trade Area and is located in Clark County.

The airport is the only airport within this MSA that has scheduled commercial passenger service. It is assumed that this airport will remain the only commercial scheduled passenger airport in the MSA during the forecast period.

(2) Population

Historical and forecast populations for the Air Trade Area, the Midwest (Illinois, Indiana, Michigan, Ohio and Wisconsin), and the United States are shown on **Exhibit 2-1**. The MSA's population has remained steady over the last 10 years, compared to an approximate 0.5 percent average annual increase for the Midwest and 1.0 percent increase for the United States. Over the next 20 years, Woods & Poole Economics expects the MSA's population to remain static, while the Midwest and U.S. continue to grow at close to their previous rates.

(3) Employment

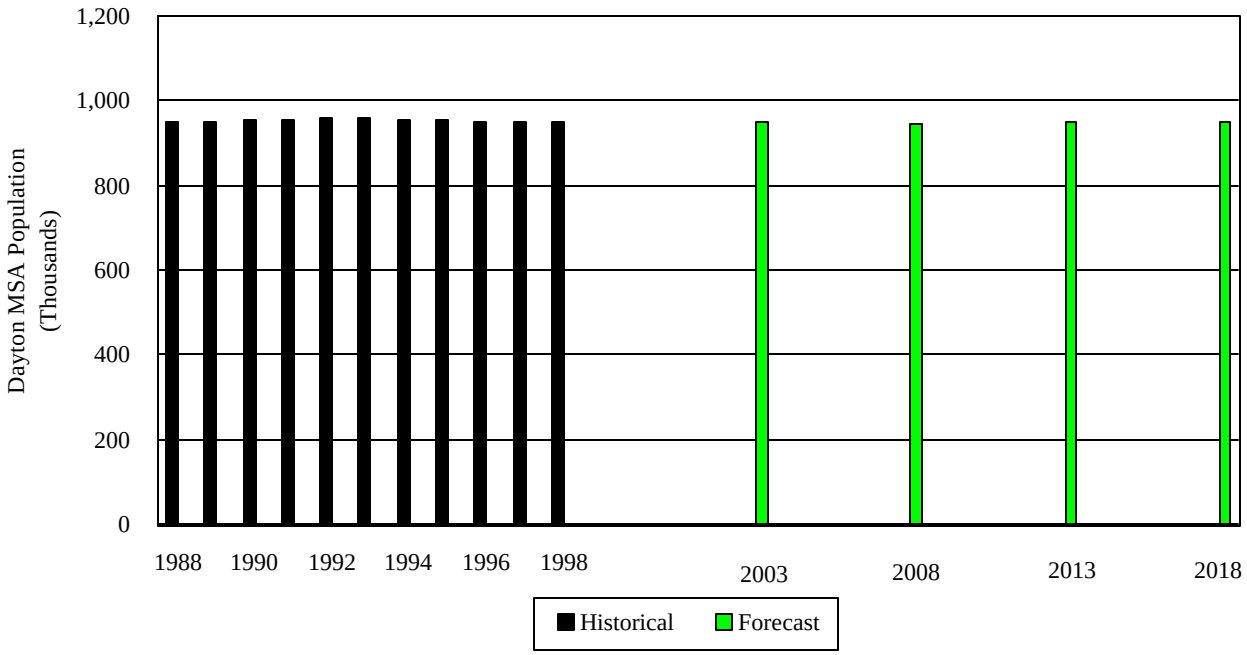
Employment in the Dayton Air Trade Area has grown at a rate of 1.0 percent over the past 10 years, compared to 1.6 percent growth for the Midwest and 1.5 percent growth for the entire United States. For the next 20 years, employment in the Dayton MSA is anticipated to grow at rates similar to the Midwest and United States, an average of approximately 1.0 percent annually. These projections are shown on **Exhibit 2-2**.

(4) Personal Income

On a per capita basis, personal income in the Dayton Air Trade Area is currently similar to the Midwest and the United States. The historical per capita personal income amounts are also similar, but for the future, the per capita personal income for the Dayton MSA is expected to increase at a slightly faster rate than the Midwest and United States as shown on **Exhibit 2-3**.

(5) Other Local Economic Indicators

The Air Trade Area's population and economic growth levels have been slightly weaker than many other major cities in Ohio and the Midwest during the last 10 years. This has occurred because the Air Trade Area has lost heavy manufacturing jobs and has not benefited as much as some other cities from new high technology and service industry growth. The Air Trade Area is still dependent upon such traditional "smokestack" industries as automobile parts and assembly. However, good interstate highway access, the rebirth of NCR, and growth of the Emery air cargo hub are expected to stimulate local economic activity in the future. Continued consolidation of U.S. Air Force equipment acquisition activities in the region is anticipated to provide direct employment and stimulate off-base employment.



Year	Population (1) Dayton MSA (2)	Midwest (3)	United States
Actual			
1988	950,635	41,720,949	244,499,828
1989	950,087	41,872,537	246,819,820
1990	952,071	42,076,634	249,399,200
1991	955,792	42,363,647	252,111,403
1992	958,458	42,662,996	255,013,069
1993	959,013	42,935,021	257,797,566
1994	953,682	43,152,439	260,374,361
1995	952,411	43,381,227	262,887,752
1996	950,661	43,614,174	265,284,042
1997	950,601	43,826,954	267,688,850
1998	950,394	44,032,309	270,043,121
Forecast			
2003	948,596	45,013,464	281,511,640
2008	947,171	46,005,426	293,006,720
2013	948,216	47,111,348	305,201,971
2018	950,513	48,278,189	317,785,467
	Average Annual Compound Growth Rates		
1988 - 1998	0.00%	0.54%	1.00%
1998 - 2003	-0.04%	0.44%	0.84%
2003 - 2008	-0.03%	0.44%	0.80%
2008 - 2013	0.02%	0.48%	0.82%
2013 - 2018	0.05%	0.49%	0.81%

Source: Woods & Poole Economics, Inc.
(1) Non-Census based on Woods & Poole Estimates
(2) Dayton MSA includes: Clark, Greene, Miami and Montgomery counties in Ohio
(3) Midwest includes Illinois, Indiana, Michigan, Ohio and Wisconsin
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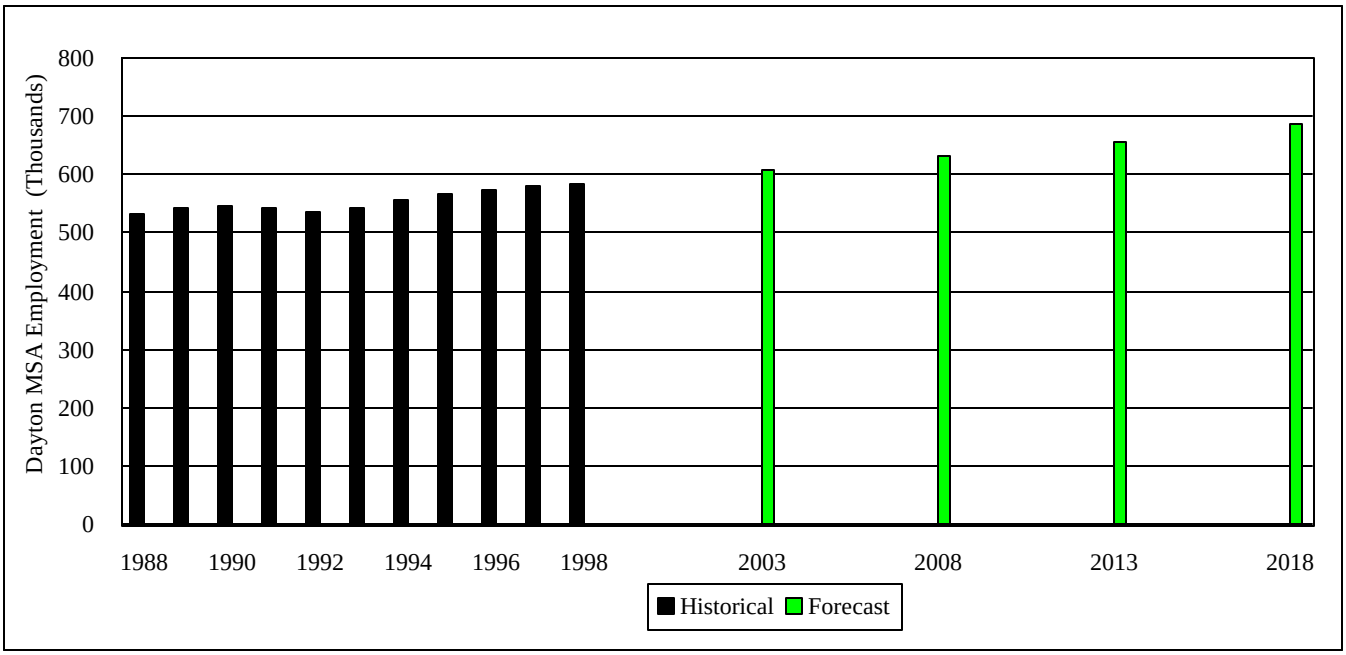

Employment

Year	Dayton MSA (1)	Midwest (2)	United States
Actual			
1988	531,024	22,222,303	134,597,191
1989	542,928	22,816,890	137,934,689
1990	544,349	23,146,502	139,891,289
1991	540,860	23,090,274	139,235,293
1992	537,158	23,237,072	139,947,999
1993	541,592	23,674,818	142,488,181
1994	555,789	24,360,441	146,112,188
1995	566,466	24,948,983	149,290,097
1996	574,765	25,375,976	152,132,065
1997	579,101	25,635,674	153,925,896
1998	583,468	25,894,095	155,733,357
Forecast			
2003	606,103	27,186,533	164,971,524
2008	630,614	28,496,034	174,527,685
2013	657,313	29,827,403	184,376,674
2018	686,327	31,177,069	194,488,526

Average Annual Compound Growth Rates

1988 - 1998	0.9%	1.5%	1.5%
1998 - 2003	0.8%	1.0%	1.2%
2003 - 2008	0.8%	0.9%	1.1%
2008 - 2013	0.8%	0.9%	1.1%
2013 - 2018	0.9%	0.9%	1.1%

Source: Woods & Poole Economics, Inc.
(1) Dayton MSA includes: Clark, Greene, Miami, and Montgomery counties in Ohio
(2) Midwest includes: Illinois, Indiana, Michigan, Ohio, and Wisconsin
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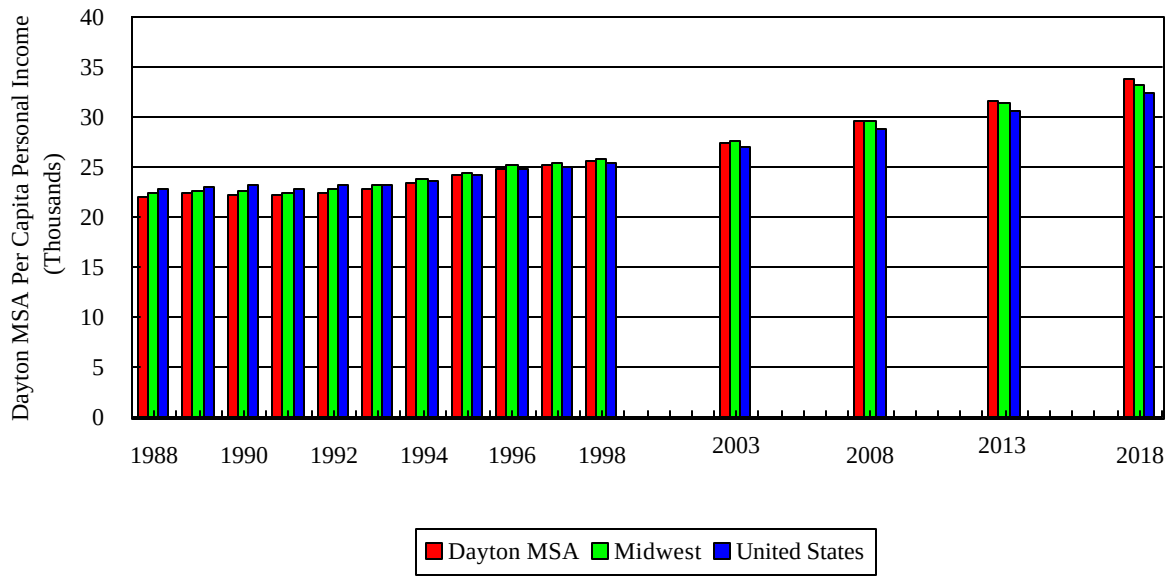
Dayton International Airport **Master Plan Study**	**Forecast Employment**	**Exhibit** **2-2**



Year	Personal Income (1) Dayton MSA (2) Total Personal Income (000)	Dayton MSA (2) Per Capita Personal Income	Midwest (3) Total Personal Income (000)	Midwest (3) Per Capita Personal Income	United States Total Personal Income (000)	United States Per Capita Personal Income
Actual						
1988	$20,925,125	$22,012	$931,559,321	$22,328	$5,556,193,000	$22,725
1989	21,240,554	22,356	949,867,549	22,685	5,696,223,135	23,078
1990	21,066,735	22,127	955,011,842	22,697	5,785,738,506	23,199
1991	21,144,472	22,122	946,961,139	22,353	5,757,697,774	22,838
1992	21,423,512	22,352	975,081,149	22,855	5,909,938,236	23,175
1993	21,809,408	22,742	993,194,379	23,133	6,000,868,169	23,277
1994	22,298,491	23,381	1,026,100,580	23,779	6,146,526,233	23,606
1995	23,098,655	24,253	1,060,850,273	24,454	6,364,187,659	24,209
1996	23,569,333	24,793	1,095,748,148	25,124	6,568,641,857	24,761
1997	23,912,851	25,156	1,116,521,049	25,476	6,710,505,959	25,068
1998	24,259,513	25,526	1,137,456,111	25,832	6,854,771,037	25,384
Forecast						
2,003	$26,053,670	$27,466	$1,245,061,546	$27,660	$7,612,789,938	$27,043
2,008	27,966,033	29,526	1,357,906,597	29,516	8,433,706,140	28,783
2,013	30,008,725	31,648	1,475,924,606	31,328	9,319,890,332	30,537
2,018	32,188,406	33,864	1,598,809,447	33,117	10,273,830,005	32,329
	Average Annual Compound Growth Rates					
1988 - 1998	1.5%	1.5%	2.0%	1.5%	2.1%	1.1%
1998 - 2003	1.4%	1.5%	1.8%	1.4%	2.1%	1.3%
2003 - 2008	1.4%	1.5%	1.8%	1.3%	2.1%	1.3%
2008 - 2013	1.4%	1.4%	1.7%	1.2%	2.0%	1.2%
2013 - 2018	1.4%	1.4%	1.6%	1.1%	2.0%	1.1%

Source: Woods & Poole Economics, Inc.

(1) Expressed in 1997 constant dollars.

(2) Dayton MSA includes: Clark, Greene, Miami and Montgomery counties in Ohio.

(3) Midwest includes Illinois, Indiana, Michigan, Ohio and Wisconsin.

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Dayton International Airport **Master Plan Study**	**Personal Income**	**Exhibit 2-3**

Dayton grew with the automobile industry; General Motors and Chrysler remain large local employers. Dayton is located on the I-75 corridor, which connects Detroit and many of the automobile plants of Ohio, Kentucky and Tennessee. Therefore, future large employment in automobile-related industries is likely to continue.

The Air Trade Area is also the world headquarters of NCR and Mead, two companies on the 1998 Fortune 500 list of largest U.S. corporations. The information provider Lexis/Nexis is also based in the Air Trade Area.

Wright-Patterson Air Force Base is about ten miles south-east from the airport and is the largest single employer in the Air Trade Area. The base is headquarters of various units associated with acquiring and testing new equipment and technologies. While other military bases have been eliminated in recent years, Wright-Patterson has remained active, as several units and functions have been consolidated there. Wright-Patterson AFB is believed to be responsible for the growth of certain high-tech industries in the region and the high volume of air traffic between Dayton and Washington, D.C.

3. HISTORICAL PASSENGER AIR TRAFFIC

This section presents historical air traffic activity at the airport. This data, along with estimates of future conditions, forms the basis for the projections of future air traffic.

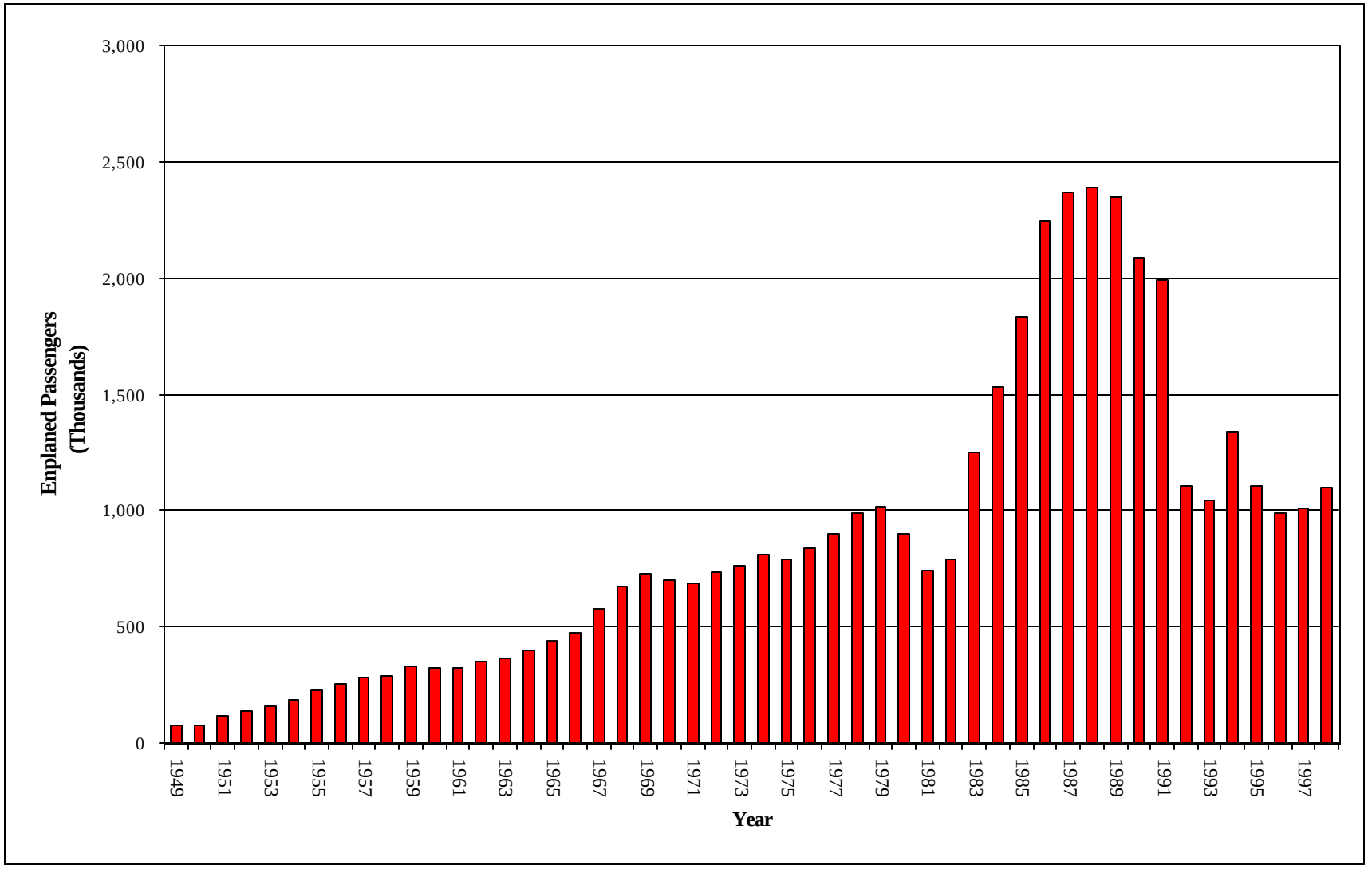
(1) Total Enplaned Passengers

As shown below, 1998 total enplanements at the airport are over 15 times larger than the 73,994 enplanements recorded in 1949. Increases were recorded during 36 of these years and decreases during 13 years. The decreases were largely due to the closure of the Piedmont (now US Airways) hub in the early 1990s. See **Table 2-3** and **Exhibit 2-4**.

Table 2-3 - Enplaned Passenger Statistics

Year	Total Enplanements	Annual Growth	Year	Total Enplanements	Annual Growth
1949	73,994	-	1974	810,517	6.5%
1950	77,096	4.2%	1975	788,918	-2.7%
1951	114,716	48.8%	1976	839,760	6.4%
1952	136,756	19.2%	1977	897,947	6.9%
1953	159,545	16.7%	1978	990,529	10.3%
1954	184,108	15.4%	1979	1,016,883	2.7%
1955	223,544	21.4%	1980	901,458	-11.4%
1956	253,436	13.4%	1981	743,110	-17.6%
1957	282,746	11.6%	1982	788,465	2.4%
1958	285,267	0.9%	1983	1,248,891	58.4%
1959	331,082	16.1%	1984	1,530,478	22.5%
1960	321,881	-2.8%	1985	1,834,813	19.9%
1961	325,370	1.1%	1986	2,244,978	22.4%
1962	348,842	7.2%	1987	2,370,496	5.6%
1963	366,770	5.1%	1988	2,389,439	0.8%
1964	397,353	8.3%	1989	2,346,130	-1.8%
1965	442,014	11.2%	1990	2,085,554	-11.1%
1966	476,628	7.8%	1991	1,988,102	-4.7%
1967	576,556	21.0%	1992	1,107,428	-44.3%
1968	670,920	16.4%	1993	1,044,221	-5.7%
1969	729,805	8.8%	1994	1,337,972	28.1%
1970	700,187	-4.1%	1995	1,102,708	-17.6%
1971	688,707	-1.6%	1996	989,525	-10.3%
1972	737,926	7.1%	1997	1,011,119	2.2%
1973	760,872	3.1%	1998	1,096,613	8.5%

Source: Airport Records; includes charter passengers.



Source: Airport

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Dayton International Airport **Master Plan Study**	**Historical Enplaned Passengers**	**Exhibit** **2-4**

(2) Enplanements By Carrier

US Airways (including ex-Piedmont traffic) has been the largest single carrier at the airport for many years, however, in 1998 the Delta-Comair alliance became the largest carrier group. The number of carriers at the airport has varied somewhat over the years. The 1998 enplaned passenger activity by carrier is shown in **Table 2-4**.

Table 2-4 – Passenger Carrier Share of Market

Carrier	1998 Enplanements	Percent Share
US Airways Group		
US Airways	222,220	20.3%
Chautauqua	12,009	1.1%
US Airways Express	40,599	3.7%
Total US Airways Group	274,828	25.1%
Delta Group		
Delta	204,564	18.7%
Comair	89,939	8.2%
Total Delta Group	294,503	26.9%
United Group		
United	103,037	9.4%
Atlantic Coast	15,645	1.4%
Total United Group	118,682	10.8%
TWA	108,353	9.9%
American Group		
American	46,611	4.2%
Simmons	43,495	4.0%
Total American Group	90,106	8.2%
Northwest Group		
Northwest	52,087	4.7%
Mesaba	32,297	3.0%
Total Northwest Group	84,384	7.7%
Continental Group		
Continental[1/]	-0-	0%
Continental Express	45,672	4.2%
Total Continental Group	45,672	4.2%
Air Tran	59,208	5.4%
Chicago Express	13,841	1.2%
Skyway (Midwest Express)	5,406	.5%
Charters	1,409	.1%
TOTAL	1,096,613	100.0%

1/ Continental ceased service in September 1997.

Source: Airport.

As shown in **Table 2-5**, the airport has current nonstop passenger service to the following cities.

Table 2-5 - Average Weekday Nonstop Scheduled Service By Passenger Market

Service To:	Number of Daily Flights	Carrier(s)
Atlanta	9	FL, DL
Charlotte	3	US, US*
Chicago	14	AA*, TZ*, UA
Cincinnati	9	DL*
Cleveland	6	CO*
Columbus	1	US*
Dallas/Ft. Worth	2	AA
Detroit	6	NW*
Grand Rapids	2	US*
Indianapolis	1	US*
Minneapolis	2	NW
New York	3	CO*, DL*
Philadelphia	2	US
Pittsburgh	9	US, US*
St. Louis	5	TW
South Bend	3	YX*
Toronto	2	US*
Washington, D.C.	9	UA*, US, US*

Source: Official Airline Guide, March 1999.

* Indicates commuter affiliate routes.

DAY has air service to three major types of markets. First are airline hubs such as Atlanta, Pittsburgh and Cincinnati. Second are airports that serve both as airline hubs and are major travel markets from DAY such as Chicago and Dallas-Ft. Worth. Finally, nonstop flights are also available to key destinations that are not hubs, such as New York and Washington.

The airlines currently serving the airport are shown in **Table 2-6**.

Table 2-6 - Scheduled Passenger Airlines

Code	Airline
AA	American
AA*	American Eagle
CO*	Continental Express
DL	Delta
DL*	Comair
FL	Air Tran
NW	Northwest
NW*	Mesaba
TW	TWA
TZ*	American Trans Air Commuter
UA	United
UA*	United Express
US	US Airways
US*	US Airways Express
YX*	Midwest Express

Source: Official Airline Guide, March 1999.

(3) Origin and Destination Passengers

Origin and destination (O&D) passenger data identifies the principal markets for an airport. Chicago, Orlando, and Washington, D.C., respectively, are the airport's three largest markets. The ten largest originating passenger markets from DAY are shown in **Table 2-7**, as well as whether these cities have scheduled nonstop airline service.

Table 2-7 - O&D Market Rank and Current Service

Rank	Market	1997 Originating Passengers	Nonstop Service
1	Chicago	57,080	Yes
2	Orlando	51,890	No
3	Washington, D.C.	51,440	Yes
4	Atlanta	48,280	Yes
5	New York/Newark	44,440	Yes
6	Dallas/Ft. Worth	33,650	Yes
7	Philadelphia	29,190	Yes
8	Los Angeles	27,770	No
9	Tampa	25,200	No
10	Boston	20,560	No
Total All Other Cities		548,690	
TOTAL		938,190	

Sources: DOT via Data Base Products Company and Official Airline Guide, March 1999.

O&D passengers indicate the true measure of an airport's ability to attract local passengers. This data eliminates the influence of connecting passengers. Both the number of

originating and total enplaned passengers are shown on **Exhibit 2-5.** The increase in connecting passengers which occurred during the period of Piedmont-US Airways is evident.

(4) Comparison to Other Airports

According to Airports Council International (ACI) statistics for 1997, DAY is the 87th largest airport in the US based upon total passengers and the 84th largest in aircraft operations. In terms of cargo, the airport is ranked 10th.

FAA statistics indicate that the airport is a Small Hub, or an airport that has between 0.05 percent and 0.249 percent of the total enplaned passengers in the United States. In 1996, the airport had 0.15 percent of the total U.S. enplanements, making the airport similar in size to Albany, New York; Des Moines, Iowa and Grand Rapids, Michigan. For cargo volume, the airport is similar in size to Atlanta and Dallas/Ft. Worth.

4. PASSENGER AIR SERVICE COMPARISON

The purpose of this section is to discuss certain aspects of air passenger activity and air service at the airport. This is not a complete air service analysis, but rather an additional verification of the logic of the projection of air passenger demand in the Air Trade Area.

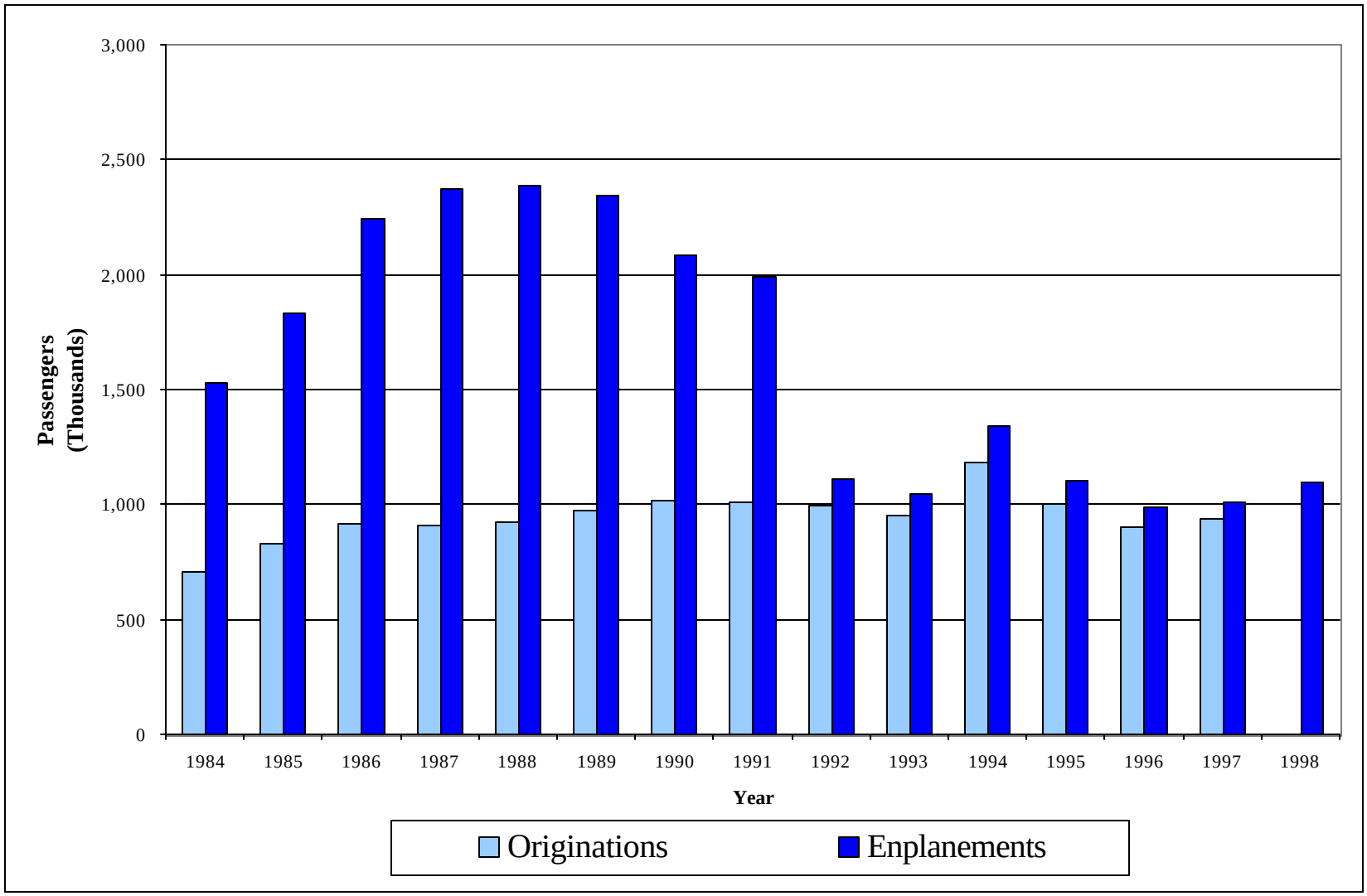
(1) State Air Service Comparison

The greater Dayton market, as defined by the U.S. Bureau of Census, is the fourth largest metropolitan area in the State of Ohio and 50th-largest in the United States. The largest Metropolitan Statistical Areas (MSAs) or Consolidated MSAs (CMSAs) in Ohio are shown in **Table 2-8**.

Table 2-8 – Comparison of Ohio MSAs Population

	1997 Population	Percent of Ohio
Cleveland-Akron CMSA	2,908,000	26.0%
Cincinnati-Hamilton CMSA	1,934,000 1/	17.3% 1/
Columbus MSA	1,460,000	13.1%
Dayton-Springfield MSA	**945,000**	**8.4%**
Toledo MSA	612,000	5.5%
Youngstown-Warren MSA	595,000	5.3%
Canton-Massilion MSA	407,000	3.6%
Total Areas Above	8,857,000 1/	79.2% 1/
Total State of Ohio	11,186,000	100.0%

1/ Includes areas outside of Ohio.
Source: U.S. Department of Commerce, Statistical Abstract of the United States 1998.



Source: Airport and DOT

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Dayton International Airport **Master Plan Study**	**Historical Passengers**	**Exhibit** **2-5**

As shown on **Exhibit 2-6**, population in the State of Ohio is concentrated in five counties that are the core of the five largest MSAs. These counties and their primary cities are shown below in **Table 2-9.**

Table 2-9 - Largest Counties in Ohio and Their Principal City

Metro City	County
Cleveland	Cuyahoga
Cincinnati	Hamilton
Columbus	Franklin
Dayton	Montgomery
Toledo	Lucas

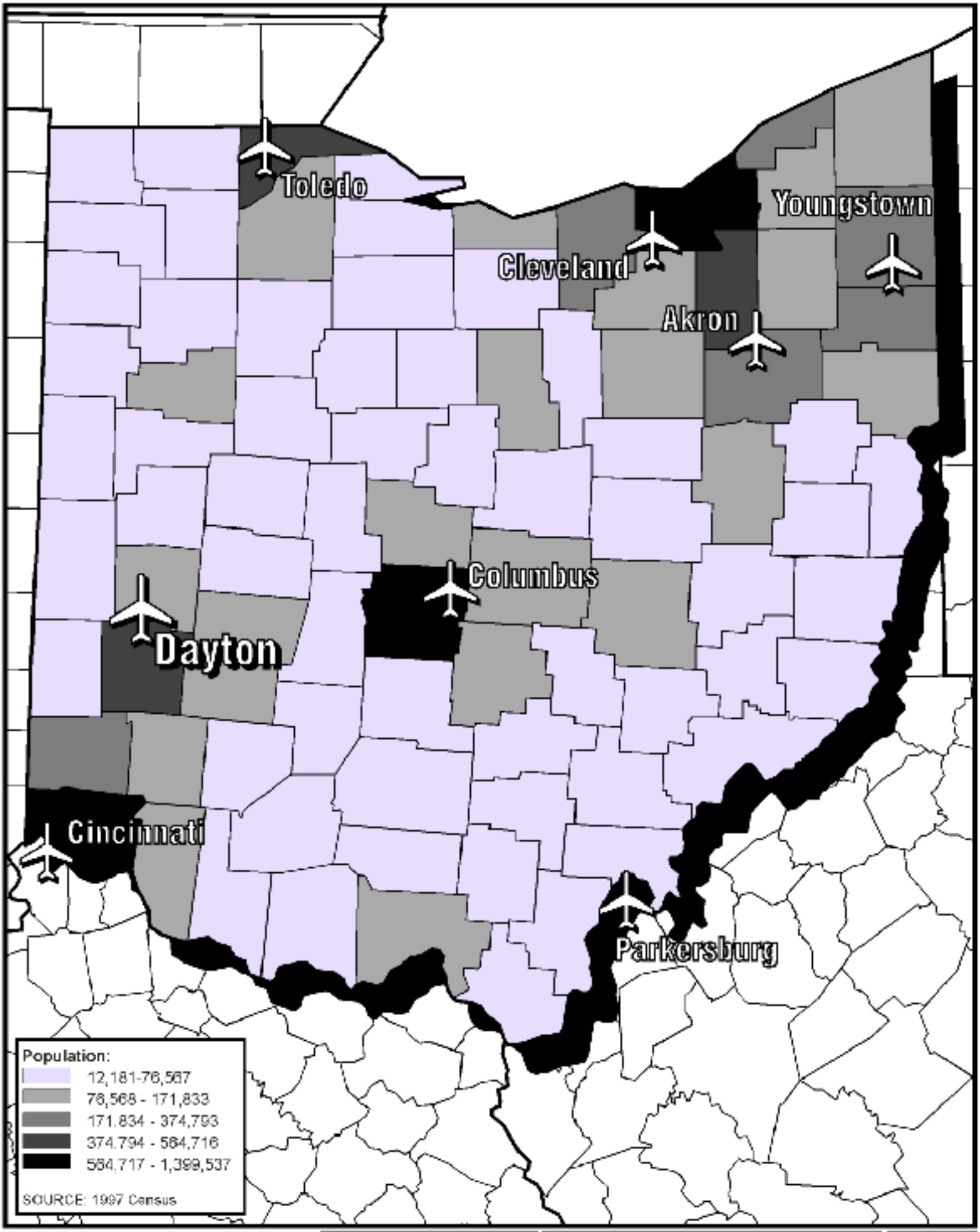
Table 2-10 indicates that air service within Ohio is limited to the five largest metropolitan areas with the exception of an additional airport within the Cleveland metropolitan area and commuter service to Youngstown and Parkersburg/Marietta. Two tiers of air service are apparent. Cleveland, Cincinnati, Columbus, and Dayton have service from all or most of the large U.S. airlines, while Akron, Toledo, Youngstown, and Parkersburg are principally feed points for commuter carriers.

Only the largest metropolitan areas are served by air carrier service airports. Eight airports serve Ohio, but two are located outside the state. Cincinnati's airport is in Kentucky, and the Parkersburg (West Virginia) airport serves Marietta. The number of airlines serving each of these airports is shown below:

Table 2-10 - State of Ohio Commercial Airports Number of Air Carriers

	Number of Carriers		
Metro Area	Major [1/]	Commuter [1/]	Total
Top Tier			
Cleveland	11	7	18
Cincinnati	7	6	13
Dayton	**7**	**8**	**15**
Columbus	10	10	20
Lower Tier			
Akron[2/]	2	5	7
Toledo	1	5	6
Youngstown	0	3	3
Parkersburg	0	1	1

1/ Major air carrier means large all-jet carriers. Commuter carriers fly smaller jets as well as turbo-props.
2/ Part of the greater Cleveland Metropolitan Area.
Source: Official Airline Guide, March 1999.



Dayton International Airport
Master Plan Study

Landrum & Brown

Density of Population
in the State of Ohio

EXHIBIT
2-6

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Based on traditional passenger air service theory, the following generalizations can be drawn from the concentration of population in just five areas and the number of airports within the State:

- Only the most populous areas have air service; the jet air carriers and the commuter (regional) carriers are concentrated at these same major airports.
- With the exception of service to Akron, which is within the greater Cleveland CMSA, metropolitan areas do not normally support multiple airports.
- Rural areas do not support scheduled air carrier airports. In fact, only the five largest metropolitan areas in the state have significant air service. Rural areas lack sufficient population density, and the propensity of metropolitan area residents to fly is normally much higher than rural area residents.
- Major air carriers and their jet aircraft are limited in Ohio to the largest metropolitan areas. Cleveland, Cincinnati, Columbus and Dayton are served by at least seven jet carriers. Outside of these four largest metropolitan areas, major carrier jet service is very limited.
- Commuter carrier service is also concentrated at the largest metropolitan areas within Ohio.
- While the supporting data is not shown, international passenger air service in Ohio is limited, with only Cincinnati having extensive overseas routes. Nonstop service to Canada is available from Cleveland, Columbus, Cincinnati and Dayton.

(2) Air Service Assumptions

Based on the previous analysis and review of DAY's historical aviation activity, the following basic assumptions concerning passenger aviation activity for the forecast period are made:

- The airport will remain the only commercial service airport in the Dayton-Springfield MSA.
- Because DAY is approximately 100 miles from other airports, no other Ohio airport will attract a significant portion of DAY's business-related air traffic in the foreseeable future. In the same manner, the airport will not attract a significant level of air passengers from other metropolitan areas because of its distance from other metropolitan airports.
- The forecasts in this analysis are based on population, employment and other economic indicators for the metropolitan area. Tourism or other highly cyclical components are not the principal factors of the airport's traffic.

- The airport's level of air service is not stimulated by connecting traffic. If a more extensive hubbing operation would occur in the future, it would have a positive impact on scheduled air service at the airport. However, the O&D forecast (and ultimately the airfield, parking access, and other facilities dependent upon passenger volume) appear to be based on more dependable local demand.

- The airport has a similar number of airlines providing service when compared to other major airports in the State; however, it does not have extensive service by "low-fare" airlines such as Delta Express, Metro Jet, or Southwest. Air Tran operates three daily flights to Atlanta from DAY. If the airport were to attract one or more high-volume, low-fare carriers to provide extensive service, then a significant increase in passengers would be expected from an increased propensity of local residents to fly.

The airport appears to have a stable market area and solid base of air service. With the large number of carriers and availability of air service to the largest U.S. markets, the quantity and quality of air service is what would be expected. Passenger growth at the airport is dependent upon quality air service continuing, which is assumed in this analysis.

5. FORECAST OF ENPLANED PASSENGER DEMAND

Aviation demand forecasts are a key element in developing or updating an airport's master plan. Because aviation forecasts are sometimes quickly outdated, periodic updates are required to ensure that key master plan elements and recommendations are consistent with characteristics of aircraft activity and reasonable expectations of future activity. In addition, the forecast must reflect an airport's mission to promote air service as an essential economic development tool.

This section presents the enplaned passenger forecast elements for the airport. In subsequent tasks of the Master Plan study, these forecasts are used to assess the adequacy of existing airport facilities, to identify additional facilities required to accommodate future traffic levels and to provide a basis for determining the effects of aviation and related activities on surrounding communities. In addition, the forecasts provide information used to prepare the financial plan that supports the recommended airport development plan.

(1) Enplaned Passenger Forecast

Enplaned passengers are broken down into originating and connecting enplaned passengers, as well as those expected to be transported by air carrier airlines and those traveling on commuter airlines. The conclusion of this analysis is that the airport's total enplaned passenger volume is forecast to increase from approximately 1.1 million

enplanements in 1998 to 1.5 million enplanements in 2018. This increase in passenger traffic represents a 1.9 percent average annual compound growth rate from 1998 through 2018.

The level of originating enplanements reflects the attractiveness of the Dayton MSA as a place to live, a place to visit, and a place to work and conduct business. Originating enplanements grew at an average annual rate of 1.5 percent between 1970 and 1997, from 630,200 originating enplanements in 1970 to 938,190 in 1997. Originating enplanements are projected to increase to 1.4 million in 2018, for an average annual growth rate of 1.8 percent.

From 1970 through 1997, connecting enplanements represented between 7.2 percent and 61.5 percent of total enplanements at the airport. The high point of connecting traffic was reached in 1987 when the airport served as a major connecting hub for Piedmont-US Airways. US Airways ceased its connecting hub operation at DAY in 1991. In the last few years, the connecting percentage has been close to 8.0 percent, which is similar to other spoke airports. Therefore, this 8.0 percent ratio is projected to continue in the forecast. The result is connecting enplanements are projected to increase from approximately 73,000 in 1997 to 120,000 in 2018, an average annual growth rate of 2.4 percent.

In 1998, commuter activity represented 27.3 percent of total enplanements, up from 23.7 percent in 1997. Commuter carriers are projected to retain their same share of total airport enplanements in the future since we assume their share will remain constant from this point forward. But there is a trend for commuter carriers to utilize larger jet aircraft, so the distinction between air carriers and commuters is becoming blurred. For example, American Eagle (Simmons), Comair, and Mesaba all fly regional jets to the airport, and each of these carriers is anticipated to have an all-jet fleet within the forecast period at DAY.

The forecast of passenger enplanements is the most critical of the various aviation demand elements for terminal and roadway access planning. These forecasts are presented in five-year planning horizons for the years 2003, 2008, 2013, and 2018. The total enplaned passenger demand forecast is detailed in the following sections:

- Originating Enplanements
- Connecting Enplanements

- Air Carrier/Commuter Enplanements
- Total Enplanements

Table 2-11 presents historical originating and connecting enplaned passengers for the period 1970 through 1998.

Table 2-11 – Historical Enplaned Passengers

Year	Originations	Connections	Enplaned Passengers	Percent of Total Originations	Percent of Total Connections
1970	630,200	69,987	700,187	90.0%	10.0%
1971	611,380	77,327	688,707	88.8%	11.2%
1972	660,420	77,506	737,926	89.5%	10.5%
1973	685,350	75,522	760,872	90.1%	9.9%
1974	712,310	98,207	810,517	87.9%	12.1%
1975	685,960	102,958	788,918	86.9%	13.1%
1976	727,360	112,400	839,760	86.6%	13.4%
1977	761,560	136,387	897,947	84.8%	15.2%
1978	841,260	149,269	990,529	84.9%	15.1%
1979	877,180	139,703	1,016,883	86.3%	13.7%
1980	769,220	132,238	901,458	85.3%	14.7%
1981	618,500	124,610	743,110	83.2%	16.8%
1982	600,020	188,445	788,465	76.1%	23.9%
1983	641,350	607,541	1,248,891	51.4%	48.6%
1984	704,010	826,468	1,530,478	46.0%	54.0%
1985	831,670	1,003,143	1,834,813	45.3%	54.7%
1986	914,390	1,330,588	2,244,978	40.7%	59.3%
1987	911,550	1,458,946	2,370,496	38.5%	61.5%
1988	925,380	1,464,059	2,389,439	38.7%	61.3%
1989	972,290	1,373,840	2,346,130	41.4%	58.6%
1990	1,016,850	1,068,704	2,085,554	48.8%	51.2%
1991	1,006,080	982,022	1,988,102	50.6%	49.4%
1992	993,390	114,038	1,107,428	89.7%	10.3%
1993	952,400	91,821	1,044,221	91.2%	8.8%
1994	1,183,490	154,482	1,337,972	88.5%	11.5%
1995	999,020	103,688	1,102,708	90.6%	9.4%
1996	899,130	90,395	989,525	90.9%	9.1%
1997	938,190	72,929	1,011,119	92.8%	7.2%
1998	1,014,260	82,353	1,096,613	92.5%	7.5%
Average Annual Growth					
1970-1997	1.5%	0.2%	1.4%		
1980-1997	1.2%	-3.4%	0.7%		
1990-1997	-1.1%	-31.9%	-9.8%		

Source: Airport Records; US DOT Passenger Ticket Survey.

(2) Originating Enplanement Forecasts

Any effort to project future airline passengers begins with a forecast of originating enplanements (i.e., passengers whose first flight on their ticket begins at DAY and are therefore not connecting passengers). As previously stated, the level of originating enplanements reflects the attractiveness of the Dayton MSA as a place to live, visit, work,

and conduct business. An accurate forecast of originating passengers is critical in order to estimate future demands for such terminal facilities as ticketing, baggage claim, automobile parking, and access roadways.

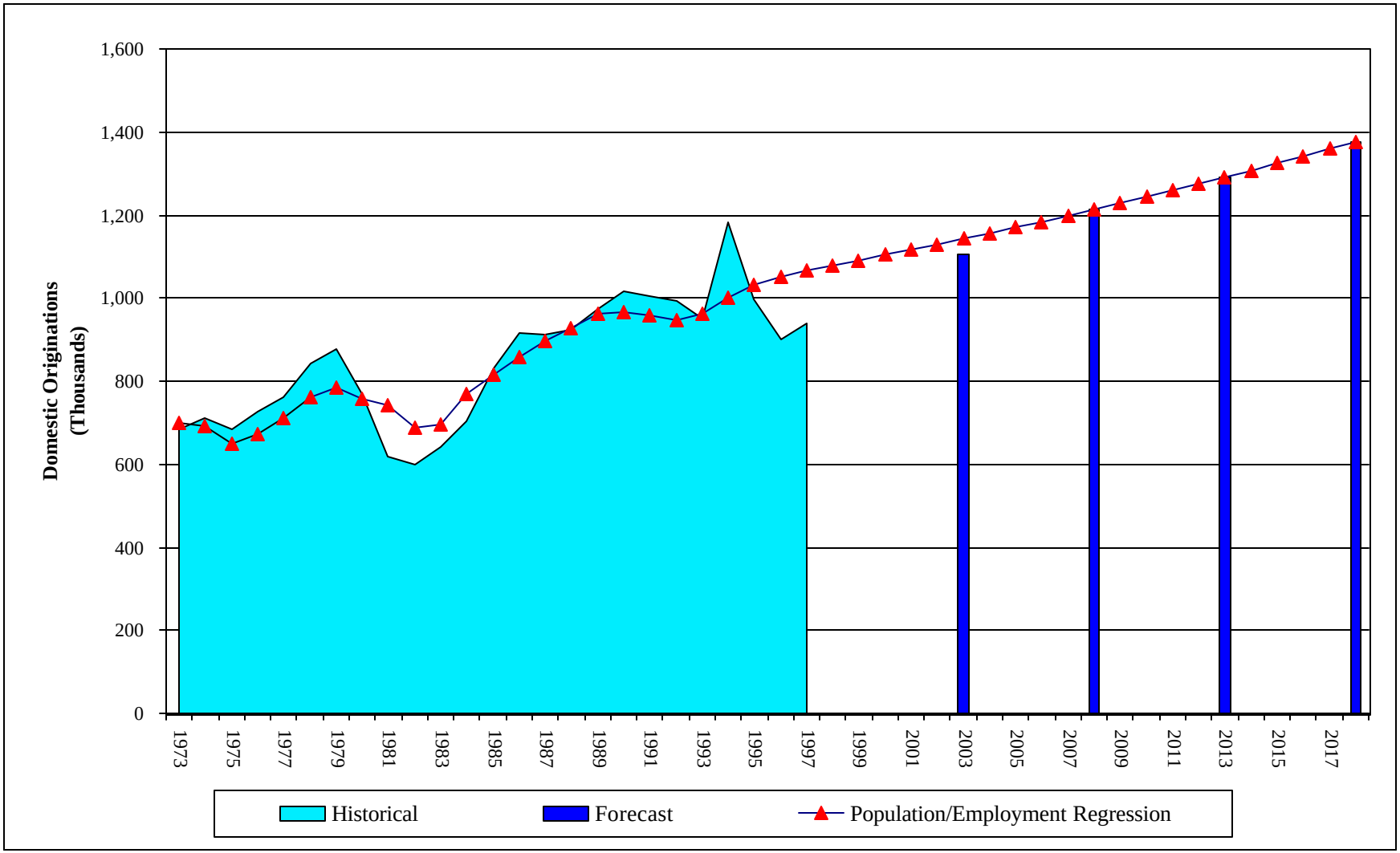
The variables used to develop the forecast for originating enplanements were population, per capita personal income, employment, and yield (average revenue to the airline per passenger mile). Yield reflects the cost of air travel to the traveling public. Many combinations of these variables were tested as independent variable inputs against historical originating enplanements in a regression model. The chosen regression analysis that provided the highest confidence correlation used population and employment as the independent variables; this provides a reasonable basis for predicting the total level of domestic originating enplanement activity.

Woods & Poole forecast population to remain flat in the Air Trade Area during the forecast period. Employment was forecast to increase at an average annual rate of 0.81 percent between 1997 and 2017. **Exhibit 2-7** shows the relationship between the historical originating enplanements and the regression of historical population and employment levels.

Originating enplanements grew at an average annual rate of 1.5 percent between 1970 and 1997, from 630,200 in 1970 to 938,190 in 1997. Originations declined from a high of 1,016,850 in 1990 after USAir (now US Airways) ceased its hubbing operation. The base year used for the originating passenger forecast was 1997. Originating enplanements are projected to increase to 1.4 million by 2018, an average annual growth rate of 1.8 percent.

(3) Connecting Enplanement Forecasts

Connecting enplanements are calculated by subtracting originating enplanements from total enplaned passengers as recorded by the airport. From 1970 through 1997, connecting enplanements have represented between 7.2 percent and 61.5 percent of total enplanements at the airport. Connecting enplanements increased from 13 percent to 16 percent prior to USAir's establishing a connecting hub. Enplaned passengers making connections at the airport reached a peak of 1.5 million in 1988, representing 61.3 percent of total enplanements. After the hub was discontinued in 1991, connections dropped from 49.4 percent to 10.3 percent. Connecting enplanements are projected to increase from 72,929 in 1997 to 120,000 in 2018, an average annual growth rate of 2.4 percent. This forecast is



Sources: Airport and Landrum & Brown

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Dayton International Airport Master Plan Study	Originations Forecast	Exhibit 2-7

based upon connecting passengers remaining at 8.0 percent of total enplanements; a figure derived from the last two years' actual connecting ratio. **Table 2-12** presents historical and forecast connecting enplanements.

Table 2-12 – Forecast Enplaned Passengers

Year				Percent of Total	
Actual	Originations	Connections	Enplaned Passengers	Originations	Connections
1990	1,016,850	1,068,704	2,085,554	48.8%	51.2%
1991	1,006,080	982,022	1,988,102	50.6%	49.4%
1992	993,390	114,038	1,107,428	89.7%	10.3%
1993	952,400	91,821	1,044,221	91.2%	8.8%
1994	1,183,490	154,482	1,337,972	88.5%	11.5%
1995	999,020	103,688	1,102,708	90.6%	9.4%
1996	899,130	90,395	989,525	90.9%	9.1%
1997	938,190	72,929	1,011,119	92.8%	7.2%
1998	N/A	N/A	1,096,613	N/A	N/A
Forecast					
2003	1,105,000	96,000	1,201,000	92.0%	8.0%
2008	1,213,000	105,000	1,318,000	92.0%	8.0%
2013	1,291,000	112,000	1,403,000	92.0%	8.0%
2018	1,375,000	120,000	1,495,000	92.0%	8.0%
Average Annual Growth					
1990-1997	-1.1%	-31.9%	-9.8%		
1997-2003	2.8%	4.7%	2.9%		
2003-2008	1.9%	1.8%	1.9%		
2008-2013	1.3%	1.3%	1.3%		
2013-2018	1.3%	1.4%	1.3%		
1997-2018	1.8%	2.4%	1.9%		

Source: Airport Records; Annual US DOT Passenger Ticket Survey; Landrum & Brown.

(4) Air Carrier/Commuter Enplanements

In 1998, commuter carriers enplaned 298,903 passengers at the airport, representing 27.3 percent of total enplanements. Commuter carriers are forecast to retain this same share of total airport enplanements. By 2018, the total number of commuter enplanements is expected to be 408,000. **Table 2-13** presents historical and forecast commuter enplanements. As previously mentioned, more of the commuter flights are on regional jets (such as the 50-passenger Canadair RJ), so the distinction between air carrier and commuter passenger may be somewhat blurred.

Table 2-13 - Air Carrier/Commuter Passenger Forecast

Year	Total Passengers	Commuter Passengers	Commuter Share
1996	989,525	217,609	22.0%
1997	1,011,119	239,359	23.7%
1998	1,096,613	298,903	27.3%
Forecast			
2003	1,201,000	328,000	27.3%
2008	1,318,000	360,000	27.3%
2013	1,403,000	383,000	27.3%
2018	1,495,000	408,000	27.3%

Source: Historical Airport/ Forecast Landrum & Brown.

(5) International and Other Enplanements

International passengers have not been identified separately because international passengers are included in the total passenger statistics. The expectation is that some international passengers will arrive directly at DAY, but from locations such as Canada, Nassau or other places that have customs pre-clearance. If other direct international service is initiated in the forecast period, it is unlikely the total number of such passengers will significantly change the overall passenger totals since these passengers will replace some of those currently counted as domestic passengers. Charter passenger volumes (whether international or domestic) are also assumed to be part of the forecast because of their historically small share and their substitution effect with scheduled services.

(6) Other Forecasts of National Demand

The FAA's latest U.S. and international forecasts for 1998-2009 anticipate traffic over the next 12 years increasing at an average annual rate of 3.5 percent for domestic passengers, 5.8 percent for international passengers, and 3.9 percent for total passengers.

The FAA's Terminal Area Forecast (TAF) released in December 1998 specifically for DAY predicts that passengers will grow at an average annual rate of 0.5 percent.

The International Air Transport Association's (IATA) 1997 projection sees U.S. domestic passengers growing by 3.7 percent between 1996 and 2011, while Boeing's 1998 projection sees such domestic U.S. passengers growing at 3.5 percent and Airbus predicts a 1.9 percent average annual growth rate in its 1998 forecast.

(7) Alternative Additional Passenger Forecast

The preceding forecast is based upon continuation of present air service trends where DAY is a "spoke" for airline service. However, introduction of an airline mini-hub or development of extensive "low-fare" carrier service could stimulate demand to higher levels than forecast. This section presents activity levels assuming a major airline develops a mini-hub at DAY. Local demand is then stimulated, and the number of connecting passengers increases.

The increased passenger volumes would occur for three reasons:

- DAY would retain a higher share of its air trade area passengers currently using alternative airports such as Columbus, Cincinnati and Indianapolis and people in rural areas within 50 to 150 miles would increase use of DAY.
- Local demand would be stimulated by increased number of cities served, nonstop flights and pricing alternatives.
- The number of connecting passengers will increase dramatically.

Assumptions for this alternative passenger forecast alternative are:

- Full airline service would be instituted prior to 2003 (the first forecast year) and the mini-hub would be in full operation at that time.
- Introduction of new airlines/new service does nothing to diminish existing air service, in fact at most airports, introduction of new air services forces the other carriers to increase service levels to match their competitors.
- Adequate terminal and other facilities are available or are constructed at DAY and no airspace or other congestion issues limit this new airline service.
- A mix of commuter and jet service is initiated so extensive connecting passenger synergy is developed at the hub. Seven banks of daily flights are assumed with exchange of passengers between the jet and commuter operation.

This incremental new air service is anticipated to result in enplaned passenger activity as shown in **Table 2-14.**

Table 2-14 - Increased Passenger Related Forecast Activity Scenario

	2003	2008	2013	2018
Enplaned Passengers				
Jet Carrier	1,053,000	1,157,000	1,271,000	1,396,000
Regional Carrier	307,000	337,000	370,000	407,000
Total Increase	1,360,000	1,494,000	1,641,000	1,803,000

The resultant total air service is shown on **Table 2-15.**

Table 2-15 - Total Airport Passengers Assuming New Air Service

	2003	2008	2013	2018
Enplaned Passengers				
Original Scenario	1,201,000	1,318,000	1,403,000	1,495,000
Mini-Hub Scenario	1,360,000	1,494,000	1,641,000	1,803,000
Total Enplaned Passengers	2,561,000	2,812,000	3,044,000	3,298,000

6. AIR CARGO FORECAST

From 1968 to 1998, air cargo activity at DAY has increased from 25,769 tons to 984,827 tons. DAY was the 10th largest North American airport in 1997 for air cargo tonnage based on Airport's Council International data. This phenomenal (nearly 4,000 percent) increase is attributed to Emery establishing its principal U.S. sort hub at DAY.

Between 1990 and 1997, world air cargo grew at an average annual rate of 8.8 percent. Non-U.S. airlines showed a 9.3 percent average annual growth during this period, while U.S. airlines were at 7.7 percent. This dramatic growth is principally the result of expansion of the overnight air express industry caused by price and service innovations made by FedEx, United Parcel Service (UPS), Airborne, Emery, and others.

The FAA defines air cargo as the shipment of freight and mail by air. It must be recognized that freight is divided between express and the traditional (or heavy) shipments. Express consists of the small packages shipped by the integrated (overnight) carriers such as Airborne, FedEx, and UPS. They are called integrated carriers because each company controls the entire shipping process, including pick-up, handling, and delivery. Traditional (heavy) refers to the shipments handled by passenger and/or all-cargo airlines, generally consolidated by an independent freight forwarder. However, the line between express and traditional freight is becoming blurred -

particularly for Emery because it specializes in large shipments that are carried in overnight services. The term "overnight" now includes the time definite two-day and three-day service, as well as delivery the next day by 8 a.m., 10:30 a.m., afternoon and other types of service offered by the individual airlines.

This report will forecast freight and mail volumes separately. The freight category contains both the traditional and overnight express items, because Emery's operating procedures historically did not separate the specific type of shipment, and these types are included in the same air freight category. Emery handles bulk mail under a separate contract with the U.S. Postal Service that has historically not been counted in the airport's "Mail" category.

(1) Background on Air Cargo Demand

The nationwide demand for air cargo is derived from several unrelated types of economic activity. That is, the need for air cargo service is created by demand for a commodity or product in one locale to be consumed or further processed at another geographic location and by the choice of how to ship the product. Airlines and airports function only as conduits through which the goods pass. This makes forecasting such activity by airline or airport difficult for three reasons: 1) the level of total economic activity which creates demand for products is unpredictable, 2) the volume of total production that is shipped by air is a very minor and variable subset of overall production/consumption, and 3) the level of such shipments on any one airline or through any one airport can change based on numerous business factors.

Air cargo demand in the Dayton Air Trade Area is further complicated because DAY is the hub for Emery. Thus, the total volume of air cargo included the local Dayton Air Trade Area demand for air cargo service, as well as the volume of air cargo that is transferred and sorted at DAY. This forecast is therefore largely dependent upon the strength of Emery and its use of DAY as its principal sort hub. Additional volume is also created by Emery's use of DAY as a sort hub for bulk mail. Included in this section is a discussion of the growth of air cargo in general and the direction that air cargo volumes will likely take at DAY based on the airport's use as an air cargo hub, as well as handling the local origin and destination demand.

In general, the worldwide volume of air cargo is growing rapidly for the following three interrelated reasons:

- Business and consumers are demanding more just-in-time delivery service for products such as computers, electronics, clothing, replacement parts, and documents. The result has been a reduction in the number of local warehouses and manufacturing facilities in favor of a single, more efficient, central warehouse or facility that meets all the demand of a larger region, the nation, or even the entire world.

- World trade is rapidly growing because of international free trade policies; trade within the United States is growing because of specialization of skills and standardization of products. With such specialization and standardization, products are made and consumed on a much more national and global basis, which has largely eliminated the local source and/or local warehouse. This new trend to national markets has occurred partly because of the availability of rapid, dependable air shipping schedules. Costs to consumers are usually lowered and quality is normally increased with such specialization of production and dependable, low-cost shipping.

- A new class of air express shipment began in 1977 when FedEx started overnight shipment of small packages anywhere in the United States. Since that time, the air cargo market has blossomed as many more carriers have entered into the business. The results are 1) air shipment service levels and quality have dramatically increased, 2) prices have steadily dropped, 3) customers have learned how to use the system(s), and 4) innovative automation, tracking systems and other concepts have made shipping by air easy-to-use and cost competitive. Therefore, shippers and consumers have a choice they didn't have over 20 years ago.

As a result, the United States and the world have become reliant upon fast, easy delivery of products. This includes the increased reliance upon logistics management systems where items are shipped on a just-in-time basis to avoid warehousing and other costs, as well as assure all products are exactly as required, when they are required, without waste or obsolescence. All indications are that the transport of air cargo will continue to expand rapidly as the economy grows and as the previously stated trends continue to positively influence air traffic volumes.

(2) Historical Air Cargo Volume

Specifically for DAY, the historical level of air cargo has exploded since 1978 when the air cargo revolution started and as the airport became an air cargo hub. This activity is shown in **Table 2-16**.

Table 2-16 - Historical Total Air Cargo Tonnage by Year

Year	Freight	Mail [1/]	Total Air Cargo	Annual Growth
1966	16,637	2,220	18,857	-
1967	18,673	3,090	21,763	15.4%
1968	22,050	3,719	25,769	18.4%
1969	26,446	4,229	30,675	19.0%
1970	27,738	3,944	31,682	3.3%
1971	23,577	3,854	27,431	-13.4%
1972	25,774	3,622	29,396	7.2%
1973	26,037	3,674	29,711	1.1%
1974	27,374	4,990	32,364	8.9%
1975	24,490	4,813	29,303	-9.5%
1976	27,678	5,335	33,013	12.7%
1977	20,257	4,574	24,831	-24.8%
1978	72,308	4,375	76,683	208.8%
1979	114,040	3,851	117,891	53.7%
1980	113,076	3,682	116,758	-1.0%
1981	150,672	4,417	155,089	32.8%
1982	281,769	3,694	285,463	84.1%
1983	317,293	4,291	321,584	12.7%
1984	382,728	6,041	388,769	20.9%
1985	435,970	9,186	445,156	14.5%
1986	456,353	9,856	466,209	4.7%
1987	481,606	10,375	491,981	5.5%
1988	542,493	8,809	551,302	12.1%
1989	572,645	9,949	582,594	5.7%
1990	597,955	9,987	607,942	4.4%
1991	478,131	8,548	486,679	-19.9%
1992	490,807	5,398	496,205	2.0%
1993	577,916	5,498	583,414	17.6%
1994	738,837	5,284	744,121	27.5%
1995	734,205	5,942	740,147	-0.5%
1996	839,470	6,455	845,925	14.3%
1997	889,664	6,896	896,560	6.0%
1998	979,901	4,926[1/]	984,827	9.8%

Source: Airport.

1/ Excludes mail carried by Emery. Emery's bulk mail volume is included under "Freight."

In both 1996 and 1997, Emery carried 97.9 percent of the air cargo volume at DAY and in 1998 this share increased to 98.3 percent. The other carrier of significance is Federal Express which handles most of the remaining volume.

An unknown amount of air cargo is carried in and out of the Dayton Air Trade Area on trucks. For example, Airborne, UPS, Federal Express and other firms all truck some items to and from their hubs in Wilmington, Louisville, Indianapolis, etc. Other local air freight (particularly international) is trucked to/from the major foreign gateway airports of Chicago-O'Hare and Detroit Metro. Approximately 25 percent of Emery's annual volume of cargo is trucked in and out of Emery's sort hub at DAY. Based on Emery's information, and confirmed by analysis of time involved, most "air cargo" shipments within 250 miles of DAY move by truck, not aircraft. As the price competition between the air cargo companies intensifies and as the volume of multi-day service grows, one would expect the volume and range of truck shipments to increase. For example, Emery provides a service for a product to be shipped from the West Coast to DAY by air that is then delivered by truck to almost anywhere in the Midwest or East Coast within two days.

(3) Air Cargo Methodology and Forecast

To develop a forecast of air cargo growth at DAY, this study has analyzed and combined several forecasting methodologies:

- Identification and analysis was made of standard industry forecasts for their applicability to DAY.
- Historical trend analysis was calculated on past DAY traffic.
- Major shippers, users, and experts were asked for their opinions of future trends, in particular the hub carrier - Emery.

We have used our industry expertise and advice from experts to develop a composite forecast with a number of stated assumptions:

- Emery will continue to have its principal domestic hub at DAY, and most of its domestic air freight will transit through DAY. The resulting total average annual growth of Emery air cargo is forecast at 4.8 percent between 1998 and 2018.
    - Emery's overnight air cargo volume will grow at an average annual rate of 3.2 percent.

- The daytime mail sort air cargo will grow at an average annual rate of 7.5 percent over the next 20 years as the U.S. Postal Service expands its use of contract air mail handlers and Emery wins a significant number of these contracts.

- Alternatively, if Emery did not handle substantial U.S. Postal Service (USPS) business, some other firm is assumed to utilize the airport for daytime handling of mail.

- Other air cargo service at DAY consists of two flights per business day by FedEx. It is assumed this type of service will grow at industry average rates.

- No airspace, runway, ramp, or facility capacity constraints will occur at DAY that cannot be addressed, as necessary, over time. Cargo area ramp space and roadway access is assumed to be improved at DAY, and adequate airfield capacity is assumed to be available.

- No noise or other environmental constraints will occur at DAY or in the Emery system that will significantly impact the growth of air cargo service.

- Domestic air cargo remains dominant at DAY, and most of Emery's international cargo (other than Canada and Mexico) is handled at coastal gateway points.

One of the principal assumptions of the DAY air cargo forecast is that the USPS will increase its use of exclusive contract air cargo handlers and that Emery and/or DAY will expand its role in this market. This is assumed because the USPS is increasing its use of exclusive contract air carriers because they are believed to be more cost efficient and dependable than the current use of space available shipments in the belly of regularly scheduled passenger flights. Contract carriers handle mail as their principal product so the USPS can expect faster and more cost-efficient service. The USPS is greatly expanding its Priority and Express mail products because its per package rates are much lower than FedEx, UPS, and other integrated private carriers. However, these USPS time-sensitive services require the use of a dedicated airline service to handle the volume of mail and to meet the delivery expectation and Emery seems well positioned to continue its capturing of USPS contracts. The airport is a likely hub for such increased use of contract carriers by the USPS because of the:

- Ideal central U.S. location of DAY to be a national hub and prime location for an East Coast/Midwest mail hub.

- Reasonable weather conditions, adequate airfield capacity, and proximity to several major cities to supply a labor force and generate local demand for products.

- Multiple ILS approaches and available snow removal services, ARFF, full-time tower and other airport services/facilities which provide all-weather, 24 hour a day airfield dependability.

- Ample ramp space aircraft parking that is only readily available at a handful of comparable airports.

- Existence of Emery's current nighttime hub facility which provides much of the required aircraft ramp, highway access and sort-facility infrastructure for incremental new daytime services.

- Co-existence with a scheduled passenger airport so that crews and company officials can access the cargo hub. This sharing of facilities also spreads airport costs over multiple users which lowers the per operation costs and provides alternative capacity for some cargo.

- Easy access to other air cargo hubs (i.e., Cincinnati, Indianapolis, Wilmington, Louisville, and Toledo) so that air cargo capacity can be shared with other carriers.

In addition, Emery has company specific reasons for expanding its USPS and other services at DAY.

- Emery is seeking to strengthen its position as the dominant carrier of bulk U.S. mail based upon its current role as the principal supplier of such services in the eastern U.S.

- Emery has economies of scale by use of its existing DAY facilities and would be able to better utilize its aircraft, as well as have back-up capability for its night sort by its day sort and vice versa.

- The current contract between the USPS and Emery has provisions for extension so there is a good possibility of continuation of the existing contract.

The air cargo forecast for DAY is based on the analysis and assumptions above, and is summarized in **Table 2-17**.

Table 2-17 - Air Cargo Forecast (in Tons)

	Air Freight[1/]				
	Emery	Other	Total	Mail[2/]	Total Air Cargo
1997	878,014	11,650	889,664	6,896	896,560
1998	968,013	11,888	979,901	4,926	984,827
Forecast					
2003	1,429,200	15,200	1,444,400	5,200	1,449,600
2008	1,891,200	19,400	1,910,600	5,500	1,916,100
2013	2,170,400	24,800	2,195,200	5,800	2,201,000
2018	2,449,500	31,700	2,481,200	6,100	2,487,300
Average Annual Growth					
1998-2018	4.8%	5.0%	4.8%	1.1%	4.7%

1/ Forecast Air Freight includes bulk mail handled in-transit.

2/ Includes only local O&D mail; transfer mail included in Emery forecast.

Source: Landrum & Brown.

Emery's nighttime air-sort volume is expected to grow from approximately 2,690 tons per business night in 1998 to 5,040 tons in 2018, an average annual growth rate of 3.2 percent. Emery's daytime air-sort is anticipated to grow from approximately 1,020 tons in 1998 to 4,360 tons in 2018, an average annual growth rate of 7.5 percent. Emery's total air cargo volume is expected to grow at an average annual rate of 4.8 percent from approximately 3,710 tons per average business day in 1998 to approximately 9,400 tons per day in 2018. This Emery specific forecast is based upon what is believed to be a reasonable estimate of air cargo over the next 20 years based upon the assumptions previously presented.

Air freight other than Emery is assumed to grow at an average annual growth rate of 5.0 percent at DAY. This is the growth rate in the October 1998 Boeing 1998/1999 World Air Cargo Forecast, which is a well-researched standard for identifying future cargo trends. Boeing's U.S. air freight forecast is below its world forecast (an average annual growth over the next 20 years of 6.4 percent), but the U.S. domestic forecast is believed more appropriate for other air freight at DAY. Use of this forecast results in the airport's "other" air cargo volume almost tripling in the 20-year forecast period from 11,888 tons to 31,700 tons.

The growth of mail shipments that originate in or are destined for the greater Dayton area is projected at a 1.1 percent average annual rate between 1998 and 2018. Based on the historical, rather static, nature of origin and destination mail volume at DAY and the stable forecast for Dayton area population growth, a 1.1 percent rate of increase is believed reasonable. Origin and destination mail constitutes such an insignificant percentage of the airport's air cargo traffic that the volumes are easily handled by current and projected scheduled passenger flights.

(4) Comparative Forecasts

In contrast to DAY's forecast 4.7 percent average annual growth of air cargo volume over the next 20 years, most national and international forecasts predict slightly higher growth rates as shown in **Table 2-18**.

Table 2-18 - Comparative Forecasts

	Boeing Air Cargo 1998-2017[1/]	ACI Air Cargo 1997-2010[2/]	Merge Global Air Freight 1998-2002[3/]	IATA Air Freight 1998-2002[4/]
North America	5.1%	5.8%	6.9%	-
United States	**5.0%**	-	5.9%	-
World	6.4%	6.4%	6.6%	5.3%

Sources:

1/ Boeing 1998/1999 World Air Cargo Forecast, October 1998.

2/ Airports Council International Worldwide and Regional Forecast 1997-2010, August 1998.

3/ Merge Global 1998 World Air Freight Industry Analysis and Forecast.

4/ International Air Transport Association, December 1998.

While there are differences of product definitions, time periods, geographical areas covered, and other factors in the comparative forecasts, most outside observers are predicting North American growth rates of air cargo of between 5 and 7 percent annually. The North American forecast is believed more relevant for DAY than the United States or world forecasts because the Emery hub and the airport's other cargo carriers handle principally U.S., Canadian, and Mexican air cargo. Such strong growth is, of course, highly dependent upon continuation of past trends such as:

- U.S. economic growth
- Trade globalization

- Continued lean inventories/just-in-time production strategies
- Declining shipping rates/competitive markets

The DAY forecast is similar to the consensus national forecasts, however, the long-term DAY planning estimate is more dependent upon bulk mail, which has its own growth characteristics which are critical to this forecast. Further, as Emery grows its national freight network, it will likely establish satellite cargo hubs that will supplement its principal all-points hub at DAY. Emery has support hubs in Charlotte, NC; Chicago, IL; Dallas, TX; Los Angeles, CA; Orlando, FL; Atlanta, GA; Nashville, TN; Sacramento, CA; and Poughkeepsie, NY. These satellite hubs, however, only supplement the principal DAY hub and will grow only as the principal hubs grows and not in place of it.

7. AIRCRAFT OPERATIONS FORECAST

This section presents the forecast of aircraft operations at the airport. An operation is defined as the arrival or departure of an aircraft. Aircraft operations are forecast for the following categories of airport users:

- Commercial passenger carriers (air carriers and commuters)
- Air cargo
- Military
- General aviation (GA)

The forecasts are further broken down by aircraft size. The following categories are based on aircraft manufacturers' maximum allowable take off weight (MTOW) and not what the aircraft may be carrying from the airport.

- Small aircraft - MTOW less than 41,000 pounds
- Large aircraft - MTOW between 41,000 pounds and 255,000 pounds
- Heavy aircraft - MTOW over 255,000 pounds and all Boeing-757 aircraft

These aircraft categories are vital to accurately determine airspace and runway capacity.

This analysis assumes any new very large aircraft will not form a significant portion of the fleet in the forecast period. The historical aircraft operations are presented in **Table 2-19**.

Table 2-19 - Historical Aircraft Operations

Year	Air Carrier [1/]	Commuter	GA	Military	Total	Change
1976	51,695	6,036	97,068	1,240	156,039	
1977	51,006	11,042	103,736	1,003	166,787	6.9%
1978	50,963	11,566	87,359	1,327	151,215	-9.3%
1979	45,957	21,775	88,316	1,250	157,298	4.0%
1980	41,249	22,654	79,446	995	144,344	-8.2%
1981	34,886	27,896	65,623	1,482	129,887	-10.0%
1982	35,592	40,315	57,901	1,724	135,532	4.3%
1983	52,390	34,602	55,169	1,483	143,644	6.0%
1984	84,677	24,125	55,134	1,237	165,173	15.0%
1985	86,940	23,830	51,441	723	162,934	-1.4%
1986	94,457	44,860	50,333	472	190,122	16.7%
1987	101,901	47,990	50,526	414	200,831	5.6%
1988	109,689	64,240	42,764	478	217,171	8.1%
1989	107,484	56,967	40,491	405	205,347	-5.4%
1990	104,761	53,062	38,656	886	197,365	-3.9%
1991	90,381	58,854	41,254	2,223	192,712	-2.4%
1992	54,008	51,676	41,981	2,214	149,879	-22.2%
1993	48,142	38,068	43,931	2,093	132,234	-11.8%
1994	72,657	29,180	50,201	2,443	154,481	16.8%
1995	71,790	28,198	49,435	1,825	151,248	-2.1%
1996	70,746	27,394	48,139	2,064	148,343	-1.9%
1997	72,420	24,296	48,739	1,846	147,301	-0.7%
1998[2/]	66,688	31,398	N/A	N/A	N/A	N/A

1/ Includes passenger and all cargo flights.

2/ Airport records.

N/A = Not applicable.

Source: FAA Terminal Area Forecast.

Each category of aircraft operations forecast is presented below:

(1) Commercial Passenger Carriers

Commercial passenger carrier operations at DAY currently total approximately 55,000 per year with an average estimated 40 passengers per arriving and departing flight. Since the U.S. Airways hub was dissolved in 1991, the number of commercial passenger operations has been slowly decreasing. While there was an increase in 1994 when Continental Lite introduced service, in general, the trend has shown slight decreases in annual operations each year until 1998 where an upward movement occurred.

The forecast of 1.9 percent annual growth of passengers is assumed to impact the number of aircraft operations as follows:

- Widebody (i.e., Heavy) jet aircraft will be introduced into the passenger aircraft fleet serving DAY during the period.
- The number of Large air carrier aircraft will increase to handle the anticipated higher traffic volumes.
- Large commuter aircraft will substantially increase as regional jets and/or larger new technology turboprops replace existing commuter aircraft, which are mostly in the Small category.
- The number of Small commuter aircraft (the largest proportion of air carrier aircraft) decreases as they are replaced by air carrier and regional jet aircraft.

As shown in **Table 2-20**, the result is that total commercial passenger aircraft operations continue to remain flat during the early part of the forecast period as passengers increase, but larger aircraft replace smaller aircraft. However, by 2018, the total number of commercial passenger operations will be above the current levels as passenger traffic increases. Based on this forecast of larger aircraft at DAY, the average number of passengers per flight is expected to increase from 40 in 1998 to 48 in 2018.

Table 2-20 - Commercial Passenger Carrier Aircraft Operations Forecast

	Air Carrier			Commuter				Average Passengers
Year	Heavy	Large	Total	Large	Small	Total	Total Operations	Per Operation
1997	N/A	N/A	25,060	N/A	N/A	29,656	54,716	37
1998	0	24,148	24,148	N/A	N/A	31,398	55,546	39
Forecast								
2003	200	24,700	24,900	12,200	17,900	30,100	55,000	44
2008	500	25,600	26,100	15,600	13,900	29,500	55,600	47
2013	700	26,500	27,300	19,900	10,800	30,700	58,000	48
2018	1,100	27,400	28,500	25,400	8,400	33,800	62,300	48
Average Annual Growth								
1998-2018			0.8%			0.4%	0.6%	1.0%

Source: Airport records and Landrum & Brown.
N/A = Not Available.

(2) Air Cargo Operations

Air cargo operations have increased in line with the volume of air freight moved by Emery. Forecast aircraft operations are shown in **Table 2-21.**

Table 2-21 - Forecast Air Cargo Operations

	Emery				
Year	Heavy	Large	Total	Other [3/]	Total
1997[1/]	N/A	N/A	35,006	1,380	36,386
1998	N/A	N/A	41,382	1,158	42,540
Forecast [2/]					
2003	49,800	17,200	67,000	1,900	68,900
2008	84,700	17,200	101,900	2,500	104,400
2013	93,600	25,800	119,300	3,200	122,500
2018	102,400	34,300	136,700	3,800	140,500
Average Annual Growth					
1998-2018			6.2	6.1	6.2

1/ Based on airport records.
2/ Forecast based on typical business day operation.
3/ All Other aircraft are classified as large.
N/A = Not Available.
Source: Landrum & Brown.

Emery operations are forecast to grow at an annual average of 6.2 percent, while all-other air cargo operations will grow at 6.1 percent annually. Total operations are projected to increase from 42,540 in 1998 to 140,500 in 2018.

(3) Military Operations

Military operations since 1991 have been relatively stable at approximately 2,000 annually; for 1997, the actual number was 1,846. For the future, this same general level is assumed. The FAA's Terminal Area Forecast also assumes a stable level of military operations.

No military units are based at DAY, but military operations occur during the annual airshow, and aircraft from Wright-Patterson Air Force Base regularly fly into DAY. However, few of these operations are assumed to occur at "peak" times.

(4) General Aviation Operations

GA operations were over 100,000 annually in 1977, but have decreased significantly since that time. The GA airports in the vicinity of DAY are believed adequate to accommodate most regional traffic. DAY is surrounded by such GA airports such as Versailles, Sidney,

Piqua, Urbana, Springfield, London, Moraine, Green County, Wright Brothers, and Middletown. Most small GA aircraft avoid airports such as DAY because commercial airports generally serve much larger aircraft and have dense air traffic and high fees. Therefore, it is assumed that GA operations will remain relatively static near the current level of 48,739 annually throughout the forecast period. The FAA's Terminal Area Forecast assumes a slight increase over time in GA operations.

(5) Total Operations

Over the next 20 years, total aircraft operations at DAY are expected to increase at a 2.7 percent average annual growth rate based almost exclusively on growth of the air cargo traffic. The summary of forecast operations is presented in **Table 2-22**. The 2.7 percent average annual growth forecast in this analysis is higher than the 1.5 percent average annual growth between 1997 and 2015 shown in the FAA's Terminal Area Forecast for DAY because the air cargo hub growth was not originally anticipated.

Assuming a passenger airline mini-hub is established, total aircraft operations would increase from 148,786 in 1998 to 340,500 in 2018, an average annual increase of 4.5 percent. This alternative scenario operations forecast is shown on **Table 2-23.**

(6) Based Aircraft

Because of the static nature of the anticipated level of GA operations and the availability of alternative GA airport facilities in the greater Dayton region, the number of based aircraft is anticipated to remain stable at the current level of 56. The FAA's Terminal Area Forecast identifies the number of based aircraft as 56 in 1997 and projects the same number through 2015.

With the redevelopment of airport facilities to better support commercial passenger and cargo operations, as well as to provide adequate facilities for the annual air show, the availability of GA hangars may decrease in the future as old facilities are not replaced. As aircraft operations increase, particularly with more Large and Heavy jet aircraft, GA aircraft normally choose to relocate to less busy facilities. It is likely that DAY will transition principally to a corporate jet GA facility rather than a base for piston-engine aircraft.

Table 2-22

Dayton International Airport
Strategic Master Plan Update Study
Operations Forecast Summary

	SCHEDULED PASSENGER							AIR CARGO							
	Air Carrier			Commuter				Emery							
	Heavy	Large	Total	Large	Small	Total	Total	Heavy	Large	Total	Other	Total	MILITARY	GA	TOTAL
Actual															
1992			38,083			30,920	69,003			17,934	1,998	19,932	2,214	41,981	133,130
1993			33,961			26,866	60,827			22,158	1,862	24,020	2,093	43,931	130,871
1994			39,491			33,450	72,941			28,984	1,020	30,004	2,443	50,201	155,589
1995			29,770			34,160	63,930			29,378	822	30,200	1,822	49,435	145,387
1996			27,965			31,730	59,695			34,776	1,080	35,856	2,064	48,139	145,754
1997			25,060			29,656	54,716			35,006	1,380	36,386	1,846	48,739	141,687
1998			24,148			31,398	55,546			41,382	1,158	42,540	2,000 E.	48,700 E.	148,786
Forecast															
2003	200	24,700	24,900	12,200	17,900	30,100	55,000	49,800	17,200	67,000	1,900	68,900	2,000	48,700	174,600
2008	500	25,600	26,100	15,600	13,900	29,500	55,600	84,700	17,200	101,900	2,500	104,400	2,000	48,700	210,700
2013	800	26,500	27,300	19,900	10,800	30,700	58,000	93,600	25,800	119,300	3,200	122,500	2,000	48,700	231,200
2018	1,100	27,400	28,500	25,400	8,400	33,800	62,300	102,400	34,300	136,700	3,800	140,500	2,000	48,700	253,500
Average Annual Growth															
1998 - 2018			0.8%			0.4%	0.6%			6.2%	6.1%	6.2%			2.7%

E = Estimated

Source: Historical from Airport; Forecast from Landrum & Brown

See text for definition of "Heavy," "Large," and "Small." All Military and Other Cargo are assumed to be Large, all GA are Small.

Draft: 01/13/2000

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Table 2-23

Dayton International Airport
Strategic Master Plan Update Study
Operations Forecast Summary With Passenger Airline Mini-Hub

	SCHEDULED PASSENGER							AIR CARGO							
	Air Carrier			Commuter				Emery							
	Heavy	Large	Total	Large	Small	Total	Total	Heavy	Large	Total	Other	Total	MILITARY	GA	TOTAL
Actual															
1992			38,083			30,920	69,003			17,934	1,998	19,932	2,214	41,981	133,130
1993			33,961			26,866	60,827			22,158	1,862	24,020	2,093	43,931	130,871
1994			39,491			33,450	72,941			28,984	1,020	30,004	2,443	50,201	155,589
1995			29,770			34,160	63,930			29,378	822	30,200	1,822	49,435	145,387
1996			27,965			31,730	59,695			34,776	1,080	35,856	2,064	48,139	145,754
1997			25,060			29,656	54,716			35,006	1,380	36,386	1,846	48,739	141,687
1998			24,148			31,398	55,546			41,382	1,158	42,540	2,000 E.	48,700 E.	148,786
Forecast															
2003	200	49,700	49,900	12,200	58,900	71,100	121,000	49,800	17,200	67,000	1,900	68,900	2,000	48,700	240,600
2008	500	52,600	53,100	15,600	58,900	74,500	127,600	84,700	17,200	101,900	2,500	104,400	2,000	48,700	282,700
2013	800	56,500	57,300	19,900	59,800	79,700	137,000	93,600	25,800	119,300	3,200	122,500	2,000	48,700	310,200
2018	1,100	60,400	61,500	25,400	62,400	87,800	149,300	102,400	34,300	136,700	3,800	140,500	2,000	48,700	340,500
Average Annual Growth															
1998 - 2018			4.8%			5.3%	5.1%			6.2%	6.1%	6.2%			4.2%

E = Estimated

Source: Historical from Airport; Forecast from Landrum & Brown

See text for definition of "Heavy," "Large," and "Small." All Military and Other Cargo are assumed to be Large, all GA are Small.

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8. FORECAST OF PEAK PERIOD DEMAND

The traffic demand patterns imposed upon an airport exhibit considerable variations on a monthly, daily, and hourly basis. These variations are referred to as peaks. A peak period is defined as the greatest amount of demand placed upon facilities required to accommodate passenger, cargo, and aircraft movement over a given period of time. These peak periods of demand must be considered to identify properly the airport facilities necessary to satisfy projected levels of passenger, cargo, and aircraft traffic demand while ensuring that the facilities can be effectively utilized. Note that these are not the extreme peaks of the day before Thanksgiving for passengers or the week before Christmas for cargo, but rather a typical busy time.

The airport's peak periods of passenger terminal, cargo hub, and airfield demand were determined through review of current and historical airport records. Peaking characteristics are critical in assessing existing terminal facilities, cargo facilities, and airfield capacities to determine their ability to accommodate forecast increases in passenger, cargo, and aircraft demand throughout the forecast period. The objective of developing peak period forecasts is to project a design level that, if airport facilities were planned to accommodate that level of demand, the facilities would be neither underutilized, nor overcrowded too often. This design level is typically represented by the number of enplaned passengers and aircraft operations during the peak hour of an average weekday of the peak month of activity. Two terminal peak characteristics are analyzed: peak month average weekday ("PMAD") and the peak hour of the average day of the peak month (peak hour PMAD). The peak hour of the day for airfield demand is also analyzed to determine the proper airfield configuration. These peaking characteristics are determined for passenger activity and aircraft operations activity for the planning period years 2003, 2008, 2013, and 2018.

This peaking analysis also considers the forecast fleet mix. To meet the increased passenger and cargo demands, the carriers serving DAY are expected to increase the average aircraft size in their fleets. This analysis also recognizes the phasing out of Stage 2 aircraft by the end of 1999 as required by federal law. This forecast also assumes increased use of regional jets, narrowbody jets, and widebody aircraft such as Boeing 747, DC10-10, Boeing-767 and Airbus 330.

(1) Peak Month Average Day (PMAD) Passengers

A review of historical data shows that June is the peak month for airline passengers (see **Exhibit 2-8**). Historically, June has accounted for approximately 9.3 percent of annual passenger enplanements. Monthly passenger traffic statistics are very stable for the airport, indicating a business-type market, but these peak-month statistics were reviewed to obtain the typical peak month.

As shown in **Table 2-24**, the PMAD total commercial passenger enplanements are forecast to increase from 3,400 in 1998 to approximately 4,600 in 2018.

The peak hour of the average day of the peak month (based on the June 1998 schedule) represents 11 aircraft departures out of a total of 88. This is an extreme peak of 12.5 percent of all daily departures within this one hour period. This peak is based upon the current peak month, average day airline schedule where 11 passenger aircraft were scheduled to depart DAY between 7:00 a.m. and 7:59 a.m. Utilizing the same percentage as the current schedule, the future peak hour PMAD ranges from approximately 390 passengers in 1997 to 580 in 2018.

Table 2-24 – PMAD Enplanement Forecast

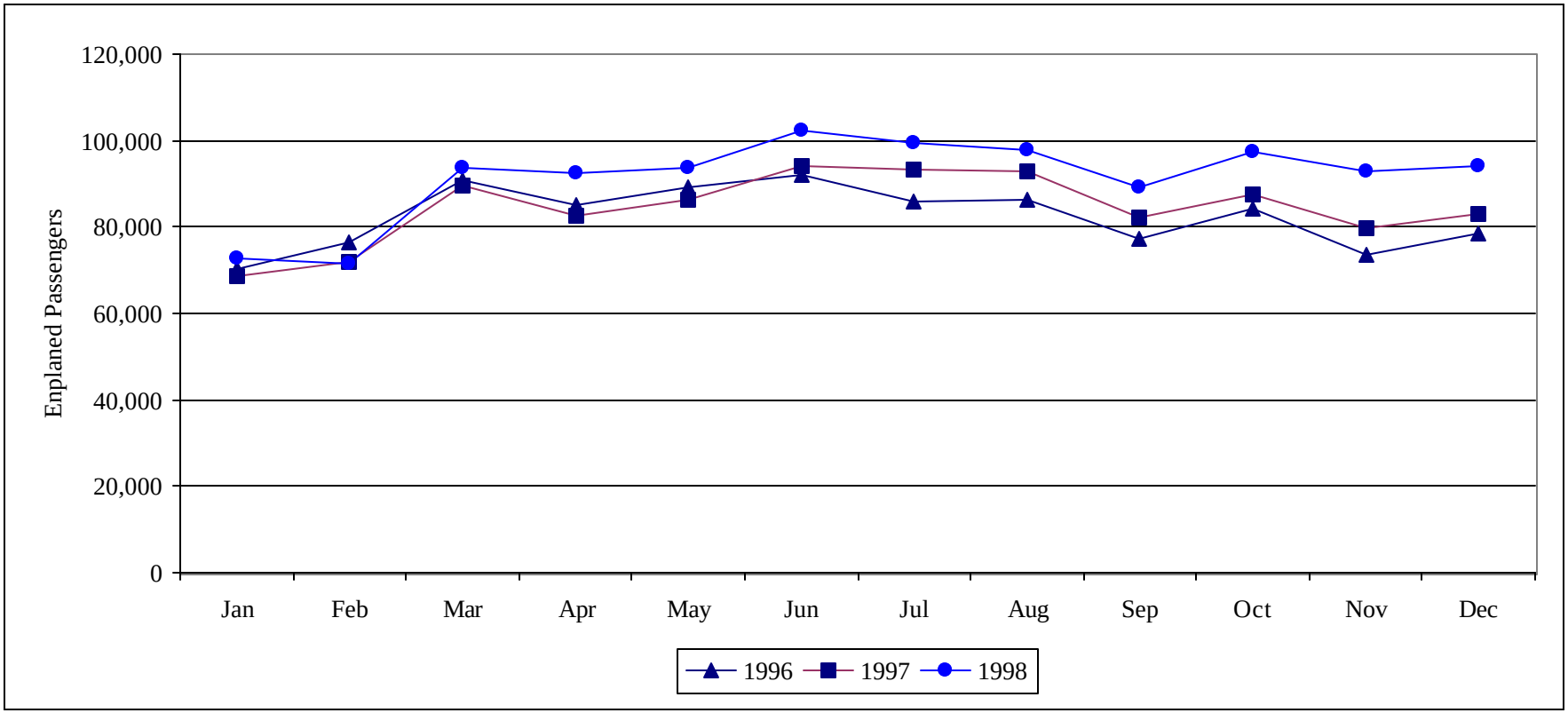
	Enplanements			
	Annual	Peak Month	Average Day of Peak Month	Average Hour of Peak Day
Actual				
1997	1,011,119	94,054	3,100 E	390 E
1998	1,096,613	102,148	3,400 E	430 E
Forecast				
2003	1,201,000	111,900	3,700	460
2008	1,318,000	122,800	4,100	510
2013	1,403,000	130,700	4,400	550
2018	1,495,000	139,300	4,600	580

E = Estimated.

Source: Landrum & Brown.

(2) Peak Month Average Day (PMAD) Operations

The peak month for passenger airlines has historically occurred in June and the peak month for cargo operations is typically November. Therefore, PMAD forecasts were developed based on airline schedules for June 1998 and information from Emery regarding November operations in 1998, which represents an average peak season business day. PMAD operations are expected to increase from 478 in 1998 to 790 in 2018. The majority of this growth is due to projected Emery expansion.



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	70,204	76,515	90,659	85,077	89,279	92,198	85,825	86,348	77,462	84,166	73,471	78,321
1997	68,582	71,860	89,553	82,755	86,240	94,054	93,095	92,850	82,039	87,408	79,746	82,937
1998	72,763	71,495	93,497	92,431	93,701	102,148	99,373	97,688	89,014	97,562	92,702	94,239

Source: Airport

Draft, 01/14/2000

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Dayton International Airport
Master Plan Study

Passenger Enplanements by Month

Exhibit 2-8

Tables 2-25 and **2-26** present the hourly operations by user group: Emery Worldwide, Passenger Airlines, Other Cargo, and GA. This hourly distribution was developed for use in the airfield/airspace simulation analysis. The methodology used to calculate the hourly distribution of PMAD operations involved review of the actual airline schedules for June 1998 and Emery operations in July and November 1998.

The peak arrival hour is 24:00 (00:00) in 1998 with 32 arrivals. By 2018, the arrival peak hour shifts to 12:00 and increases to 75 arrivals. The majority of the peak hour arrivals are Emery operations. The shift of the peak arrival hour to the daytime can be attributed to Emery's projected contracts with the USPS to handle its daytime Priority and Express mail. Peak hour departures are forecast to increase from 39 in 1998 to 67 in 2018. The peak departure hour occurs at 05:00 throughout the forecast period.

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Table 2-25

Dayton International Airport
Strategic Master Plan Update Study
Arrival Operations by User Group

	Emery Worldwide				Passenger Airlines				Other Cargo				General Aviation				Total			
Hour	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018
0	29	30	32	37	1	1	1	2	1	2	2	3	1	1	1	1	32	34	36	43
1	22	25	30	37	0	0	0	0	0	0	0	0	0	0	0	0	22	25	30	37
2	9	11	16	19	0	0	0	0	0	0	0	0	0	0	0	0	9	11	16	19
3	2	3	5	2	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5	2
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	1	1	3	4	0	0	0	0	1	1	3	4
6	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
7	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2
8	0	0	0	0	4	3	4	4	0	0	0	0	3	3	3	3	7	6	7	7
9	0	0	0	0	6	5	4	4	0	0	0	0	10	10	10	10	16	15	14	14
10	5	10	21	36	4	4	3	4	0	0	0	0	2	2	2	2	11	16	26	42
11	10	20	41	66	8	7	7	8	0	0	0	0	1	1	1	1	19	28	49	75
12	7	14	30	36	5	4	4	4	0	0	0	0	5	5	5	5	17	23	39	45
13	0	0	0	0	3	2	2	1	0	0	0	0	1	1	1	1	4	3	3	2
14	0	0	0	0	4	4	5	5	0	0	0	0	3	3	3	3	7	7	8	8
15	0	0	0	0	7	6	7	7	0	0	0	0	6	6	6	6	13	12	13	13
16	0	0	0	0	4	4	3	4	0	0	0	0	11	11	11	11	15	15	14	15
17	0	0	0	0	7	6	5	5	0	0	0	0	9	9	9	9	16	15	14	14
18	0	0	0	0	6	6	6	7	0	0	0	0	3	3	3	3	9	9	9	10
19	0	0	0	0	4	4	5	6	0	0	0	0	2	2	2	2	6	6	7	8
20	0	0	0	0	7	8	7	9	0	0	0	0	1	1	1	1	8	9	8	10
21	0	0	0	0	6	5	6	6	0	0	0	0	1	1	1	1	7	6	7	7
22	0	0	0	0	6	5	4	4	0	0	0	0	2	2	2	2	8	7	6	6
23	4	4	3	6	6	7	7	8	0	0	0	0	0	0	0	0	10	11	10	14
Total	88	117	178	239	88	81	80	88	2	3	5	7	64	64	64	64	242	265	327	398

Source: Landrum & Brown

Draft: 01/13/2000

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Table 2-26

Dayton International Airport
Strategic Master Plan Update Study
Departure Operations by User Group

	Emery Worldwide				Passenger Airlines				Other Cargo				General Aviation				Total			
Hour	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018	1998	2003	2008	2018
0	0	0	0	0	0	0	0	0	1	2	2	4	0	0	0	0	1	2	2	4
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	18	20	23	0	0	0	0	0	0	0	0	0	0	0	0	3	18	20	23
5	39	43	56	67	0	0	0	0	0	0	0	0	0	0	0	0	39	43	56	67
6	24	12	10	11	9	8	9	10	2	2	3	4	2	2	2	2	37	24	24	27
7	0	0	0	0	11	11	9	11	0	0	0	0	4	4	4	4	15	15	13	15
8	1	2	5	6	5	4	4	4	0	0	0	0	2	2	2	2	8	8	11	12
9	0	0	0	0	5	4	5	5	0	0	0	0	7	7	7	7	12	11	12	12
10	0	0	0	0	7	6	7	7	0	0	0	0	5	5	5	5	12	11	12	12
11	0	0	0	0	5	5	4	3	0	0	0	0	3	3	3	3	8	8	7	6
12	0	0	0	0	2	2	2	3	0	0	0	0	2	2	2	2	4	4	4	5
13	2	5	10	12	9	8	6	9	0	0	0	0	3	3	3	3	14	16	19	24
14	7	14	29	39	2	2	2	2	0	0	0	0	1	1	1	1	10	17	32	42
15	6	11	21	35	6	5	6	6	0	0	0	0	6	6	6	6	18	22	33	47
16	2	5	9	20	4	4	5	5	0	0	0	0	6	6	6	6	12	15	20	31
17	2	4	10	12	7	6	5	5	0	0	0	0	5	5	5	5	14	15	20	22
18	0	0	0	0	6	6	6	6	0	0	0	0	7	7	7	7	13	13	13	13
19	1	1	3	8	7	7	8	8	0	0	0	0	0	0	0	0	8	8	11	16
20	0	0	0	0	2	2	1	2	0	0	0	0	2	2	2	2	4	4	3	4
21	1	2	5	6	1	1	1	2	0	0	0	0	1	1	1	1	3	4	7	9
22	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	88	117	178	239	88	81	80	88	3	4	5	8	57	57	57	57	236	259	320	392

Source: Landrum & Brown

Draft: 01/13/2000

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